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Level crossings Summary of findings and key human factors issues

Prepared by **Davis Associates Limited** for the Health and Safety Executive 2005

RESEARCH REPORT 359



Level crossings Summary of findings and key human factors issues

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Level crossings currently present the largest risk of a multi-fatality incident on the railway network. Her Majesty's Railway Inspectorate (HMRI), a division of the Health and Safety Executive (HSE), has a role in the approval, inspection and investigation of incidents involving level crossings. To ensure risks are better controlled, HMRI are seeking to develop their understanding of human factors issues at level crossings.

This report is the first of three reports being produced by Davis Associates for HMRI's project, 'Level crossings: Future Human Factors Priorities, new technologies and tools for inspectors'.

This report summarises the findings from a literature review, site visits, interviews with stakeholders and a validation exercise. The findings and key human factors issues are presented in a database format for ease of use and searching using keywords. It also provides a traceable source of information for the development of Inspectors' tools and approaches.

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Executive Summary

Level crossings currently present the largest risk of a multi-fatality incident on the railway network. Her Majesty's Railway Inspectorate (HMRI), a division of the Health and Safety Executive (HSE), has a role in the approval, inspection and investigation of incidents involving level crossings. To ensure risks are better controlled, HMRI are seeking to develop their understanding of human factors issues at level crossings.

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A summary of the findings are:

- To date, 104 human factors issues have been defined.
- 94 human factors issues relate to protected level crossings.
- 51 issues relate to unprotected crossings.
- The signaller is referred to within 6 of the issues, with regard to communication, contacting, detection of objects and track-side workers, camera angle and signal sections
- Groups of level crossing users have been identified as impacting on 5 of the human factors issues. These refer to groups in general, position of safety, pedestrians on vehicular crossings, passenger compliance with MWL, trespassers and walkers in groups.
- Of particular note, pedestrian users are affected by only 49 issues, while vehicle drivers (cars, vans, HGVs & motorcyclists) are affected by 80 human factors issues.
- 52 human factors issues relate to user-worked crossings, including those with telephones or miniature warning lights.
- Automatic open level crossings are affected by 73 of the human factors issues.



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Organisation	Name	Job title	Interviewed
Arriva	Keith Stephenson	Section Manager	~
Arthur Mellows College	Fred Mann	Warden	~
Automobile Association (AA)	Andrew Howard	Head of Road Safety	~
British Transport Police	Becky Jackson	Acting Sergeant	
British Transport Police	Dave Robertson	Police Constable	✓
British Transport Police	John Thompson	Chief Inspector	✓
Delaine Buses	Anthony Delaine- Smith	Managing Director	
Delaine Buses	Mark Delaine-Smith	Manager	~
Health and Safety Laboratory (HSL)	Mary Miller	Higher Ergonomist	~
Health and Safety Laboratory (HSL)	Mike Gray	Head of Ergonomics Section	
Helpston Parish Council	Joe Dobson	Councillor	~
Helpston Parish Council	Kathie Rowbotham	Parish Clerk	
Her Majesty's Railway Inspectorate (HMRI)	Andrew Harvey	HM Inspector of Railways (Level Crossing section)	
Her Majesty's Railway Inspectorate	Darren Anderson		
Her Majesty's Railway Inspectorate	John Cullen		
Her Majesty's Railway Inspectorate	John Tilly	HM Principal Inspector of Railways	~
Her Majesty's Railway Inspectorate	Keith Shepherd	HM Inspector of Railways	
Her Majesty's Railway Inspectorate	Paul Wilkinson	Operations Intelligence Manager	
Her Majesty's Railway Inspectorate	Robert Beveridge	Railway Inspectorate Contact Officer (RICO)	~
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Her Majesty's Railway Inspectorate	Sue Johnston		

Her Majesty's Railway Inspectorate	Mark Whitham	Inspector	
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Network Rail	David Jones	Level Crossing Engineer	~
Network Rail	Emma Lowe	Human Factors Advisor	
Network Rail	Gaynor Farrington	Level Crossing Risk Manager	~
Network Rail	Gilbert Fraser	SPAD Strategy Manager	~
Network Rail	John Whitehead	Level Crossing Risk Control Co-ordinator	~
Network Rail	Martin Shore	Signaller, Helpston signal box	~
Network Rail	Robert Havercroft	Level Crossing Risk Control Co-ordinator	~
Network Rail	Steve Ray	Assistant Signaller Manager (Peterborough Signal Box)	
Northamptonshire County Council (represents Traffic and Safety Working Group)	Robin Hodsdon	Traffic Engineer	•
Rail Passengers Council (North West England)	Ian Watson	Safety Task Force member	~
Rail Passengers Council (Scotland)	James King	Safety Task Force member	~
Rail Passengers Council (East of England)	John Hawkins	Safety Task Force member	~
Rail Passengers Council	Shelley Gould	Safety Task Team Co- ordinator	
Rail Safety and Standards Board (National Level Crossing Safety Group)	Alan Davies	Project Manager (National Level Crossing Safety Group - Secretary)	
Rail Safety and Standards Board	Dr. Ann Mills	Principal Human Factors	
Rail Safety and Standards Board	Michael Woods	Head of Operations Research	
Retired (Network Rail)	Harry Tabaert	Ex-Level Crossing Strategy Manager	~

Abbreviations

	A		
AA	Automobile Association (UK)		
Accom.	Accommodation level crossing (User worked crossing)		
AHB	Automatic half barrier		
ABCL	Automatic barrier crossing locally monitored		
AOCL	Automatic open crossing locally monitored		
AOCR	Automatic open crossing remotely monitored		
BS	British Standard		
BTP	British Transport Police		
BW	Bridleway crossing		
CIRAS	Confidential Incident Reporting and Analysis System		
CCTV	Closed Circuit Television		
DA	Davis Associates Limited		
DfT	Department for Transport (UK)		
DOT	Department of Transport (USA)		
DTLR	Department for Transport, Local Government and the Regions (UK)		
FC	Footpath crossing		
FRA	Federal Railroad Administration		
НА	Highways Agency		
HF	Human Factors		
HGV	Heavy goods vehicle		
HMSO	Her Majesty's Stationery Office (UK)		
HMRI	Her Majesty's Railway Inspectorate (UK)		
NR	Network Rail (UK)		
HSE	Health and Safety Executive (UK)		
HSL	Health and Safety Laboratories		
LC	Level crossing		
MCG	Manually controlled gate		
МСВ	Manually controlled barrier (worked from adjacent cabin/signal box)		
MCB+CCTV	Manually controlled barrier protected by closed circuit television		
MWL	Miniature warning lights		
NRCI	Network Rail Controlled Infrastructure		
ОС	Open crossing		
Occup.	Occupation level crossing (User worked crossing)		
RPC	Rail Passenger Council		
RGS	Railway Group Standard		
RIDDOR	Reporting of injuries, diseases and dangerous occurrences regulations		

RSC	Railway Safety Case	
RSSB	Rail Safety and Standards Board	
SFX	Station foot crossing	
SMIS	Safety Management Information System	
TRL	Transport Research Laboratory	
UK	United Kingdom (of Great Britain)	
USA	United States of America	
UWC	User worked crossing	
UWC+T	User worked crossing with telephone	
UWC+MWL	User worked crossing with miniature warning lights	
www	World Wide Web	

Definitions

Term	Definition	Source
Accommodation level crossing	A private vehicular level crossing connecting land in the same ownership separated by a railway line. Most commonly refered to as 'User Worked'.	RGS, GK/ GN0802, 2004
Active warning	A device which warns users of the imminent arrival of a train. Such devices may be either visible or audible.	RGS GI/RT7011, 2002
Automatic crossing	A level crossing where the protective equipment (e.g., barriers and active warnings) is automatically activated by the approaching train	RGS, 2002
Barrier	Any elementpermanent or temporary, intended to prevent people from falling, and to retain, stop or guide people.	DCMS, 1998
Behaviour	A manner of behaving or the response of an organism to a stimulus.	Collins dictionary
Blocking-back	The formation of a stationary or slow-moving queue of road traffic over a level crossing causing obstruction of the line.	RGS, 2002
Closure sequence	The sequence of events, initiated by the signaller, crossing keeper or the approach of a train (automatically), which applies the protection to the level crossing to prevent users from crossing the railway.	RGS, 2004
Communication	The imparting or exchange of information.	Collins dictionary
Crossing	Used in level crossing documentation to mean 'level crossing', where the continued use of 'level crossing' becomes repetitive and laboured.	RGS, 2002
Crossing abuse	Any deliberate activity by a user at a level crossing which differs from the correct procedure for using the crossing	RGS, 2002
Crossing keeper	A person appointed at a permanent gate box to carry out the normal operating procedure of a level crossing.	RGS, 2002
Crossing time	The time taken for a user to transverse the crossing from the decision point to a position of safety on the other side of the railway lines. Crossing time includes time taken for the user to make a decision to cross.	RGS, 2002
Decision point	The point at which a level crossing user makes a decision to cross or wait.	RGS, 2002

Emergency	An unforeseen or sudden occurrence, especially of danger, demanding immediate action.	Collins Dictionary
Level crossing	An intersection at the same level of a road, footpath or bridleway and one or more railway tracks	RGS, 2002
Occupation level crossing	A private level crossing which gives access between premises and a public highway. Most commonly refered to as 'User Worked'.	RGS, GK/ GN0802, 2004 HMRI, 2004
Opening sequence	The sequence of events, initiated by the signaller or crossing keeper or the train clearing the crossing, which withdraws the level crossing protection, allowing users to cross the railway.	RGS, 2004
Phonetic Alphabet	A list of words used in communications to represent the letters of the alphabet, as in E for Echo and T for Tango.	Collins English Dictionary
Protected (LC)	Having gates or barriers or having road traffic signals or miniature red/green lights giving a positive warning of the approach of trains.	HSE, 2003
Rush-hour	A period at the beginning and end of the working day when large numbers of people are travelling to or from work.	Collins English Dictionary
Signaller	A competent person responsible for the operation of the signalling system, to safely control the passage and regulation of trains, usually located in a signal box.	RGS, 2004
Traffic calming system	Road junction(s) strategically positioned to encourage slower and safer driving speeds by vehicle drivers.	nationmaster.com
Type (of level crossing)	A recognised combination of control measures used at level crossings, appropriate to particular circumstances.	RGS, 2002
Wig-wag light	A colloquial term for road traffic signals. Light signals for the control of traffic at level crossings. The sequence for illuminationa) a single steady amber light, b) two intermittent red lights.	1. RGS, 2004 2. The Traffic Sign Regulations & General Directions, 2002
Zigzagging	Sharp angular movements from one side to another. In the case of level crossings, to move around the barriers at a half barrier crossing to avoid having to wait.	DA, 2004

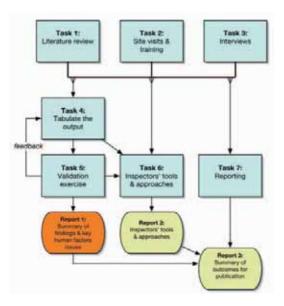
1 Introduction

1.1 Background

Davis Associates Limited (DA) has prepared this document for Her Majesty's Railway Inspectorate (HMRI). This report represents the first of three deliverables to be produced by DA as part of the HMRI project 'Level crossings: Future human factors priorities, new technologies and tools for inspectors'.

DA proposed the following scope of work to be delivered, broken down into a number of tasks. This deliverable is highlighted in orange (figure 1).

Figure 1
Scope of work divided by tasks and deliverables



1.2 Scope

This report identifies human factors issues at level crossings and summarises the findings of the literature review, site visits and training undertaken by DA and the findings from the interviews with stakeholders. It also includes the results from the validation exercise.

1.3 Objectives

The objectives of this report are to:

- define a list of human factors issues at level crossings.
- summarise the findings from the literature review, sites visits and interviews, which support the identified issues.
- validate a method for assigning HF issues to level crossings.
- capture findings so as to support the development of tools and approaches for Inspectors.

2 Method

2.1 Introduction

The following section briefly describes the methods employed for identifying human factors issues for inclusion within the database.

2.2 Literature review

A review of key literature from rail, road, user risk perception and behaviour was undertaken, using a variety of search methods. These included using the in-house catalogue and journal search facilities of the Transport Research Laboratory and the British Library.

A review of literature was made from the following sources and research areas:

- RSSB research
- HMRI incident reports
- RSSB and Network Rail Standards & Guidance notes
- Ergonomics Information Analysis Centre (EIAC)
- The findings of research commissioned by Network Rail
- The findings of research commissioned by HSE
- The findings of research commissioned by road transport bodies, e.g., TRL
- Human behaviour, e.g. human error, risk taking behaviour, human reliability
- Trespass & vandalism at level crossings
- European and world-wide level crossing research and incidents

2.3 Level crossing visits

To date, a total of 45 site visits to key examples of level crossing types have been undertaken to build a greater understanding of the issues first-hand. Still photographs and video recordings were taken at each of the site visits.

Photographs from each crossing visited can be found in Appendix A.

Table 1
Level crossing visits. Stopping was not possible at all sites and these were viewed via a vehicle 'drive-by'. These are marked with an asterisk (*) in the table.

Nearest Town	Level Crossing Name	Level Crossing Type
Bedford	Kempston Hardwick Station	ABCL
Bedford	Millbrook Station	MCG
Bedford	Stewartby Brickworks	Private Gatekeeper
Bedford	Stewartby Green Lane Station	MCG



Figure 2
Berry Lane user-worked level crossing



Figure 3 Lolham Bridges CCTV level crossing



Figure 4
St. Margarets Station CCTV level crossing



Figure 5
Ware footpath crossing (a)

Nearest Town	Level Crossing Name	Level Crossing Type
Bedford	Wootton Broadmead Station	ABCL
Doncaster	Arksey*	MCB CCTV
Doncaster	Creykes	UWC+MWL
Doncaster	Daw Lane*	MCB CCTV
Doncaster	Dockhills	MCB CCTV
Doncaster	Eggborough Ings	Footpath
Doncaster	Fields Lane	AOCL
Doncaster	Hensall	MCB
Doncaster	Joan Croft*	MCG
Doncaster	Kirton Lane*	MCB CCTV
Doncaster	Marsh Lane	Footpath
Doncaster	Moathills*	MCB CCTV
Doncaster	Snaith Road*	AHB
Doncaster	Snaith Station	AOCL
Doncaster	Snaith & Pontefract	AHB
Doncaster	Stainforth Road	AHB
Doncaster	Thorpe	AOCL
Doncaster	Thorne Moorends*	AHB
Doncaster	Thorpe Road*	AHB
Doncaster	Whitley	MCB CCTV
Hertford	Roydon	MCB CCTV
Hertford St. Margarets Station (figure 4)		MCB CCTV
Hertford	Ware Station	MCB CCTV
Hertford	Ware (a), (figure 5)	Footpath
Hertford Ware (b) Footpath		Footpath
Middlesbrough	Long Beck	MCB
Middlesbrough	Redcar Lane	MCB CCTV
Middlesbrough	Westside Road	MCB CCTV
Milton Keynes	Berry Lane, (figure 2)	UWC+T
Milton Keynes	Bow Brickhill Station	MCB CCTV
Milton Keynes	Woburn Sands	Footpath
Milton Keynes	Woburn Sands Station	MCB
Milton Keynes	Leighton Buzzard	National Heritage Railway Open Crossing
Peterborough	Bainton Green	AHB
Peterborough	Bainton Village	AHB
Peterborough	Ballast Pits	UWC+T
Peterborough	Fox Covert Road	Footpath
Peterborough	Greatford	MCB CCTV

Peterborough	Helpston	MCB
Peterborough	Lolham Bridges, see figure 3	MCB CCTV
Peterborough	Lolham	Footpath
Peterborough	Maxey	MCB CCTV
Peterborough	Tallington	MCB CCTV
Peterborough	Woodcroft	Manned gates

2.4 Signal box visits

Visits were made to Peterborough and Helpston signal boxes. At each signal box, the process for operating the closing and opening sequence of each crossing was observed for a period of time. In addition to this, a detailed explanation of the process was provided by the signaller as they progressed through the sequence for each crossing.

Signallers were also asked about the effectiveness of the equipment to detect objects on the crossing and their own experiences of the behaviour of different level crossing users.

2.4.1 Peterborough

At Peterborough (figure 6), the panels are arranged to control the movement of trains as well as for monitoring and controlling five local level crossings. Two signallers operate the level crossing control panel at all times, and their position supports communication with and a view of the work of other signallers controlling the movements of trains via the main control panel.



Figure 7 The level crossing control panel mimics the order of the crossings positioned directly above the on the rail infrastructure.



Figure 8 Monitors for each crossing are crossing on the panel.



Figure 9 The order of the closing procedure control buttons require the signaller to double check the crossing is clear prior to completing the closing



Figure 6

Peterborough signal box. The level

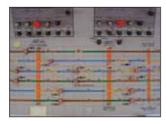
crossings control panel is positioned with views of the main panel.

Figure 10 Helpston level crossing signal box.

2.4.2 Helpston

Helpston signal box (figure 9) is a dedicated level crossing box. Two signallers control the closing and opening sequence of four CCTV, one manned gate, and the Helpston MCB crossing, positioned on the Stamford and/or East Coast mainline train routes. The control panel mimics the order of the crossings on the rail infrastructure and also shows an additional four crossings, not controlled by the signallers.

Following the signal box visit, brief visits were made to six of the crossings in the Helpston area.



The level crossing control panel mimics the order of the crossings crossing from the signal box. on the rail infrastructure.



Figure 12 The view of the Helpston



Figure 13 The signallers receive calls from crossing users, track-side workers and the crossing keeper at Woodcroft.

2.5 Level crossing training

DA attended the HSE two-day level crossing training course, held in Doncaster in July 2004. The course covered the following level crossing issues:

- Basic legislation
- Network Rail's level crossing risk assessment process
- Level crossing orders
- Normal operation and failure modes
- Investigating level crossing accidents
- HSE level crossing strategy and intervention plan

The two-day training course also included level crossing visits in and around the Doncaster area.

2.6 Interviews

Level crossing stakeholders were interviewed regarding their particular experience and knowledge of crossings and user behaviour. A complete list of all stakeholders interviewed can be found in the 'Acknowledgements' section at the beginning of this report.

Interviews were carried out at the respondent's place of work or over the telephone. Interviews lasted between 1 and 3 hours.

Each interviewee was provided with an agenda and letter of authority prior to the meeting or telephone interview taking place. Each interview agenda followed a similar format, however the questions were tailored to each respondent's area of expertise.

The agenda format was as follows:

- Introduction to project
- · Role of Davis Associates
- Aim of project and how outputs from work will be applied
- Personal experiences of observing level crossing users
- Behaviour patterns of level crossing users
- Characteristics of crossings or surrounding environment that do not support or influence the way the user behaves

Documents provided by some of the respondents to support their comments were for internal use only. Therefore these have been referenced as an internal document within the database, however no references to names or locations contained within these documents have been included.

2.6.1 Interview boundaries

To help define a list of suitable stakeholders, both Network Rail and HMRI recommended a cross-section of individuals to support the interview stage of this project. Although there are many more potential stakeholders within the rail industry with extensive knowledge of level crossings, once commonalities of human factors issues were identified between individuals this was taken as the point at which additional stakeholders were not included.

3 Database

3.1 Recording the findings

The findings were recorded in a database, created by DA for the purpose of this project. A database was used as the most efficient way of recording the human factors issues because:

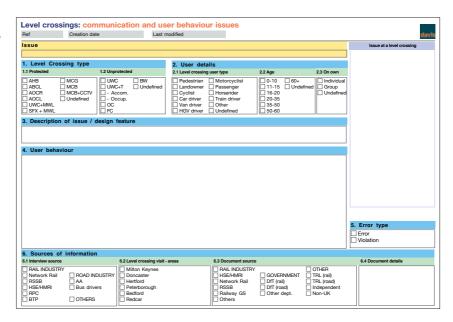
- the findings were not necessarily unique to one piece of research or respondent and the database allowed this to be conveyed easily and without duplication;
- the database allowed identification of many variables associated with a single issue, such as the level crossing type or the specific user;
- the database will be the primary source of information for developing Task 6, 'Inspectors' tools and approaches'. This will allow the developed tools and approaches to be traceable to a source of information; and
- the database allows for easy searches to be made of its contents, by choosing
 the required data entry fields (e.g., level crossing type or user details) or using
 keywords for extracting the relevant human factors issues. A listing of identified
 HF issues by level crossing type has been compiled in Appendix B. This search
 function will also support the development of Inspectors tools and approaches.

Each database entry has a set of data fields, allowing a range of information to be recorded against each human factors issue. Table 2 describes the type of information recorded in each data entry field.

Table 2The type of information recorded in each data entry field.

Data entry field	Information recorded
Ref.	A unique number for each database entry.
Creation date & Last Modified	For effective management of data input and
date	changes.
Issue	Brief title of the human factors issue.
Level crossing type	Identifies the type of level crossing which are relevant to the human factors issue.
User details	Identifies the users which are relevant to the human factors issue.
Issue at a level crossing	An example of the identified issue at a UK level crossing.
Description of issue	A concise description of the human factors issue.
User behaviour	Identifies the behaviour of the level crossing users as a result of the issue.
Sources of information	Identifies the source(s) of information for each issue.
Failure type	Identifies the type of failure committed by the user as a result of the issue. See section 3.2.2 for further clarification.

Figure 14
A blank database entry. Please refer to page 7 for clarification of each abbreviation.



3.2 Database content

3.2.1 Sources of information

Each database entry indicates the sources of the information. Where a reference to a particular piece of research has been made in the 'User behaviour' section, the document code can be found in section '6.4 Document details'. An explanation of how the coding applies and the list of references it refers to are provided on page 91 of this report.

3.2.2 User failure classification

The database has a data entry field for the type of failure committed by the user as a result of the human factors issue. This human failure has been classified into two error modes, 'Error' and 'Violation', [re/hu] & [HSE/re]. Both 'Errors' and 'Violations' are normally subdivided to identify the users preceeding cognitive processess. For the purposes of this report a simple error classification has been used, because it has not been within the scope of the report to analyse the detailed cognitive mechanisms involved in each of the human behaviours for all HF issues.

The human failure types have been defined as follows:

- 'Error' is an unintentional act by a user, however it deviates from the correct user behaviour. For example, poorly written signage information may result in the user misinterpreting the instructions and undertaking the incorrect crossing procedure.
- 'Violation' refers to an intentional act on behalf of the user. The user knowingly
 undertakes a particular behaviour, that deviates from the correct user behaviour.
 For example, the user does not want to be held at the crossing and therefore they
 choose to pass through the activated warning information.

Identifying the type of user error committed as a result of the HF issue will support the correct application of measures to help control the level of risk at the crossing.

Violation behaviour is addressed through emphasising the consequences, while slips, lapses and mistakes are addressed by designing out the reason for the error.

3.3 Additional information

To maintain a useable database, only information on the user behaviour (i.e., the user's actions) that is a direct result of the identified human factors issue have been included. Detailed findings that describe the underlying theories behind user behaviour and risk perception are recorded separately of the database in section 4.3.

4 Findings

crossing control measures.

4.1 Summary of key literature information

A total of 105 documents were reviewed as part of Task 1, Literature review. A complete list of these are provided in the references section of this report.

Of particular note are the following documents, which provide an overview of the range of literature reviewed.

- Railway Safety Principles and Guidance, part 2, section E: Guidance on level crossings (HS(G)153/6) [HSE/ra]

The RSPG provides guidance and advice to those persons involved in the provision and maintenance of the protection arrangements at level crossings. It is also a benchmark for compliance by the Inspectorate. The guidance book details the conditions of suitability for particular types of crossings to the general description, method of operation, railway signalling and control for each crossing type. It also provides a diagram showing the typical layout for each crossing type.

- Requirements for level crossings, issue 1 [GI/RT7012]
 The Railway Group Standard mandates the requirements for all aspects of level crossings, including the design, construction, inspection, maintenance, operation and decommissioning, for all Railway Group members. This document supercedes 10 separate level crossing RGP documents, and provides a complete listing of the
- Provision, risk assessment and review of level crossings, issue 1 [GI/RT7011]
- Guidance on provision, risk assessment and review of level crossings [GI/GN7611] The guidance note for Railway Group Standard GI/RT7011, details factors to be included as part of a level crossing risk assessment. Some of the factors identified are similar to those within the HF issues database, however, they do not detail the behavioural traits of users as a result of the identified factors.
- Determining the final decision point at user worked crossings [hu/de]
- Human Factors assessment of the risks associated with MWL crossings [hu/hu] This research was carried out by Human Engineering, on behalf of RSSB. The research details user behaviour at user worked crossings, and draws conclusions on risk perception of crossing users and the reasons for user violations. These documents provide a source of information for the types of errors committed by users and may support the appropriate selection of risk control measures.
- Road vehicle level crossings special topic report [rssb/ro]

 This report provides a detailed review of the numbers of different level crossing types and the numbers of incidents involving road vehicles and trains at crossings. It also identifies the high level causes of collision risk, of which road vehicle driver error is

the most common cause and violations the second most common. This report differs from the road vehicle report, in that it provides information about detailed human factor issues that can lead to incidents at all types of crossings.

- Reducing error and influencing behaviour [HSE/re]

This document guides those with responsibilities for workplace health and safety to consider the benefits of human factors. It defines the impact of human error and behaviour on health and safety, the types of human error and methods for reducing them and the improvement of health and safety through appropriate application of tasks, equipment, procedures and warnings.

Many of the documents reviewed provided useful human factors information, yet focus on limited crossing types or users. This report brings together the human factors information from all the references reviewed.

4.2 Summary of main database findings

Below is a summary of the main findings from the database.

- To date, 104 human factors issues have been defined.
- 94 human factors issues relate to protected level crossings.
- 51 issues relate to unprotected crossings.
- The signaller is referred to within 6 of the issues, with regard to; communication (107), contacting (68), detection of objects (101) and track-side workers (9), camera angle (84) and signal sections (68).
- Groups of level crossing users have been identified as impacting on 5 of the human factors issues. These refer to; groups in general (13), position of safety (35), pedestrians on vehicular crossings (76), passenger compliance with MWL (85), trespassers (94) and walkers in groups (100).
- Of particular note, pedestrian users are affected by only 49 issues, while vehicle drivers (cars, vans, HGVs & motorcyclists) are affected by 80 human factors issues.
- 52 human factors issues relate to user-worked crossings, including those with telephones or miniature warning lights.
- Automatic open level crossings are affected by 73 of the human factors issues.

4.3 Recurring HF themes

A range of recurring HF themes have been identified from the database. These themes briefly describe the reasons for user behaviours as a result of the human factors issues.

4.3.1 Competence

Competence theme explains the behaviours of users as a result of the user not being

aware of or failing to fully understand the correct rules and procedures for using level crossings. An example of a database issue which demonstrates this competence theme, is issue 82: Highway Code: the highway code currently contains 275 rules for vehicle drivers. Due to the current method for learning the code and its depth and complexity of legal requirements, not all vehicle drivers are fully aware of the exact procedures for responding correctly to level crossings.

The competence theme differs from compliance, which is addressed fully in section 4.3.4. Compliance is associated with user behaviour that results from being aware of the rules and procedures for correctly using level crossings, however choosing not to comply with these legal requirements for various reasons, for example, passing through the activated warning system so as to avoid having to wait.

4.3.2 Distraction

Distraction has also been identified as a HF theme throughout the database. An example HF issue, 95: Noise: noisy surroundings may impair the performance of the users to detect trains at level crossings. Noisy surroundings close to the crossing can distract the level crossing user from assessing for the presence of a train.

4.3.3 Inadequate design

In many areas of the UK, level crossings have been established for some time. The development of areas to include more homes and larger road infrastructures has been accommodated through changes to the level of protection at crossings. However, the continued increases in development will mean that at some point the extent of change to level crossing protection is inadequate and unable to keep pace.

The inadequacy of level crossing design is a feature of some of the HF issues. For example, issue 63: Housing developments: increases road traffic and level crossing use.

4.3.4 Behaviour arising from risk

An outline of each type of risk behaviour is provided with a summary of supporting risk perception research, which frames the background to the resultant user behaviours within the database.

The HSE document, 'Reducing error and influencing behaviour' [HSE/re] provides practical guidance to many of the following risk themes.

4.3.4.1 Type of risks

Risks can be experienced through a physical or psychological way. A level crossing user may experience a physical risk through the potential of being hit by a train. A psychological risk may be experienced through the potential of being caught by the police for passing through the activated warning lights.

4.3.4.2 Individual perceived control

People adopt their own levels of risk orientation, and these are generally defined by the following factors:

- An individual's own personality characteristics. Those that seek out risk are
 often referred to as sensation seekers and have a need for much higher levels of
 stimulation (we/ri & ad/ri).
- The social affect on a person's behaviour, e.g., through approval or disapproval by others.
- Their own locus of control, which determines how in control an individual feels about their own behaviour (bu/ri).

The level of perceived risk can change dependent upon the user's situation. Violations can be explained by an understanding of how people assess the perceived risks. For example, HF issue 43: Time of day: risk-taking behaviour at level crossings increases during rush-hours, at midday and at the beginning and end of the school day. A vehicle driver calculates the perceived risk of crossing illegally when having to wait at the crossing, compared with the risks of other things, such as being late for an appointment. The benefit of crossing illegally is obvious to the driver; not having to wait at the crossing and reaching their desired destination on time. If this risk outweighs their assessment of the potential costs of being hit by train, then the user is likely to cross.

4.3.4.3 Risk compensation

People respond to or compensate for perceived changes in the dangers to which they are exposed, by adapting their behaviour. People adopt cognitive strategies for coping with their behaviour when within risk exposed environments. It is based on a 'risk thermostat' model that defines each of our own level of risk, mainly from one's personality. It must be noted that the risk compensation theory has strong arguments both for and against.

An individual's propensity to take risks is influenced by their own experience and that of others and this model assumes that the degree to which we take risks varies from one individual to another. An individual's target risk level changes dependent upon the positive (i.e. saving in time) or negative (i.e. injury) gains with which risky behaviour achieves. Therefore if a person's target risk level is low and their perception of risk is high, then that person will behave in a cautious manner. However, if the target level remains the same, but the perception of risk is also low, then it is suggested that the person will behave in a more risky manner.

Recent RSSB unprotected crossing research advises against lowering the user's perception of risk at a crossing, without actually increasing the protection at the level crossing. It suggests that this could potentially lead to an increase in accidents (this view could also be applied to protected level crossings), however this recommendation has yet to be validated. HF issue 33: Sighting distance: good sighting distance should indicate the level crossing as high risk, is an example of user risk compensation.

4.3.4.4 Familiarity

A person's familiarity with a task can also affect their behaviour. Habits form over a period of time to help people cope with regular situations and environments, through

applying behaviours that require minimal 'thinking'. The resultant behaviour in a known situation (which will ultimately be influenced by one's personality) will be as an "implementation intention" (bu/ri), where an action is carried out in response to a situation. This enables people to undertake particular tasks (and many tasks at once) without having to concern themselves with the finer details of how that task is actually formed, thus allowing them to concentrate less.

The finer details that people gradually fail to take into account when undertaking a regular task can be explained as all the information presented to us from the environment, which we process to determine the most suitable behavioural response.

However, by not thinking about these finer details of a task, users tend to miss the "external cues" from the environment that would normally inform them whether the behaviour they are undertaking is appropriate (bu/ri).

For example, HF issue 85: Passenger compliance with MWL: the red light of a MWL is associated with the train passengers have alighted from. A passenger using a station foot crossing with miniature warning lights, on a regular basis, may exhibit this familiarity behaviour. They may cross against a red light, unaware of the information requesting them to stop, because the situation has triggered an habitual response. They have failed to take into account the situational and environmental information before they have acted.

Familiarity also presents other problems. Continued implementation of a task, which does not present dangers on a regular basis can lead a user to think they are never going to be exposed to the risk, therefore they behave less cautiously in these circumstances. For example, HF issue 05: Frequency of trains: crossings with low frequency of trains are likely to increase the risk-taking behaviour of regular users. A vehicle driver using a crossing that has only a few trains passing each day may reduce their level of caution. The combination of continued use and only ever seeing a few or possibly no trains duirng this period of time, removes the individuals "ability to think logically and rationally about their behaviour" (bu/ri).

4.3.4.5 Complacency

It could be suggested that users take a "it won't happen to me" approach while crossing. Known as the "influence of attributional biases on people's comparative risk evaluation" (we/ri), people will perceive to be at a lesser risk than others, often related to judging themselves as being more skilled, and therefore leading to reduced levels of caution.

RSSB research identified a weak correlation between a users' perception of how risky a situation was and their knowledge of level crossings with previous near-misses or accidents. It points out how this complacency of crossing users is in contrast to the road safety 'black-spot' theory used by the Government, to identify to vehicle drivers previous areas of high accidents, therefore drivers adjusting their behaviour to reduce risk to themselves. In some of the cases observed, users that confirmed they knew of a previous incident, continued to leave gates open at a footpath crossing.

4.3.4.6 Mental Models

Users form mental models of situations to help them make sense of and put structure into the world around them. However, if the model does not contain all the correct information or they have misrepresentations of the environment, the user may perceive themselves as safe when undertaking tasks, when in fact they are exposing themselves to danger (we/ri).

In the context of level crossings, users often have an incorrect mental model of train speed and distance. HF issue 25: User perception of train speed and distance: train speed and distance is underestimated by users, which may result in increased decision making errors by level crossing users. Their model is based upon road vehicle speed, which exposes them to increased risk when judging train movement.

4.4 Addressing HF issues

The database has identified the type of user failure as a result of each HF issue. The type of failure committed by a user will determine the appropriate risk control measure to be implemented to ensure the risk is as low as reasonably practicable.

How HMRI address these issues, in terms of ensuring the appropriate risk control measures are in place, is dependent upon knowing the type of failure committed by the user. The human failure types have been simplified for the purposes of this work, into the following categories:

- Violation behaviour is a deliberate deviation from the correct procedure. The user
 perceives the benefits (i.e., saving time) of undertaking the violation outweighs
 those risks of committing it (i.e., risk of being hit by a train). This type of behaviour
 is most appropriately dealt with through emphasising the consequences.
- Error behaviour is an unintentional behaviour that deviates from the correct
 procedure. The user carries out a task (i.e., crossing the railway) but fails to take
 account of the correct crossing procedure (i.e., does not comprehend change
 in audible warning tone). These are better addressed through the application of
 appropriate measures which design out the error.

4.4.1 Issues beyond HSE control

It is recognised that some of the identified issues are outside the control of the railway industry and fall under the responsibility of other organisations. However, they have been maintained within the database as they continue to impact on the behaviour of level crossing users.

Co-ordination with these outside organisations may support the development of measures to deal with some of the HF issues, for example, collaboration with Highway Authorities to drive changes in signage design, to address the error behaviour of users.

HF issues such as these may present an opportunity for review by the HSE's Railways Policy Team. But limitations are again recognised where the level of risk control is benchmarked by established rules and principles, such as the Highway Code.

4.5 Moving forward to tools and approaches for Inspectors

Applying the human factors issues during the inspection process, for defining what should be expected at a particular crossing type, to ensure any risk is controlled, will be covered as part of the development of tools and approaches.

4.6 Database of human factors issues

The following pages contain the 104 human factors issues. Two issues are presented per page, in numerical order using the reference numbers.

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HSE/HMRI
Network Rail
RSSB
Railway GS
Others

GOVERNMENT
DfT (rail)
DfT (road)
Other dept.

Milton Keynes
Doncaster

| Doncaster | Hertford | Peterborough | Bedford | Redcar OTHER
TRL (rail)
TRL (road)
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□ RAIL INDUSTRY
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Issue	Creation date 10.06						leave et a level executer
Frequency of train	ns						Issue at a level crossing
1. Level Crossir			2. User detail	le			
1.1 Protected	1.2 Unpr	otected	2.1 Level crossing u		2.2 Age	2.3 On own	
☐ AOCL ☐ MCBc				Motorcyclist	O-10 G60+	☐ Individual	
⊠ AOCR □ Undefi ⊠ ABCL	ined WC			Passenger Horserider	☐ 11-15 ☐ Unde	fined Group Undefined	
⊠ AHB	⊠ oc		Car driver	Train driver	20-35		
⊠ MG ⊠ MCB	FP/N	ИWL		Other Undefined	35-50 50-60		
	f issue / design	feature					
<u> </u>	ow frequency of train		se the risk taking b	ehaviour of regular	r users.		
3			3 .				
4. User behavio	ıır						
	ation behaviour of us	ears avalains that us	ers will hehave less	cautiously when t	hey have a low per	cention of risk	
User risk perceptio	n tends to be low w	here there are infreq	uent trains. A regul	lar user's expectati	ions of not seeing a	train are	
	ne they use the cros his results in the use						
time they cross. Th	riis results iir trie use	or adapting their ben	aviour to triis coria	intion, such as bone	aving icos cadilousi	у.	
	ent history are assoc			,	example, at a train l	ine with only two	
trains per week, the	e same regular user	of the crossing has	been hit twice by p	assing trains.			
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6 Sources of !-	nformation						
6. Sources of it 6.1 Interview source	mormation	6.2 Level crossing visit	- areas	6.3 Document source	1		6.4 Document details
☐ RAIL INDUSTRY		Milton Keynes		☐ RAIL INDUSTRY			ar/us
Network Rail	ROAD INDUSTRY	☐ Doncaster		☐ HSE/HMRI	GOVERNMENT	□ TRL (rail)	pi/ve
RSSB HSE/HMRI	☐ AA ☐ Bus drivers	☐ Hertford ☐ Peterborough		Network Rail□ RSSB	□ DfT (rail)□ DfT (road)	☐ TRL (road) ☐ Independent	ar/us ad/ri
RPC		Bedford		Railway GS	Other dept.	Non-UK	GI/RN7611
☐ BTP	OTHERS	Redcar		Others			ra/dr, ab/dr2
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Ref 06	_						Issue at a level crossing
Ref 06 Ssue Road junctions	Creation date 10.06		modified 02.02.2005	5			Issue at a level crossing
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Ref 06 SSUE Road junctions 1. Level Crossin 1.1 Protected AOCL MCBc AOCR Undefi ABCL AHB MG MCB 3. Description of Road junctions closever the crossing. 4. User behavior Roads that intersect presented to the vectors assessing the presented to the vectors as a vector to the	ng type 1.2 Unprinted UWC	otected O Undefined O/WWL MWL feature ing may result in inci- river's road before or refore cause distract ng the actions of oth	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver HGV driver reased decision ma	Is Juser type Motorcyclist Passenger Horserider Train driver Other Undefined aking and errors by ssing may increase er's primary focus of	o-10 60+ 11-15 Under 16-20 20-35 35-50 50-60 vehicle drivers, and the the amount of visus of attention is likely and the junctions, and	inined Individual Group Undefined Undefined Individual Ind	Woburn Sands MCB: the road junction close to the crossing is used by local people and
Ref 06 SSUE Road junctions 1. Level Crossin 1.1 Protected AOCR Undefi ABCL Undefi ABCL HB MG MG MGB 3. Description of the crossing. 4. User behavior Road sthat intersectoresented to the versus the decisions and at the crossing the presented to the	rig type 1.2 Unpricty ined UWC UWC UWC UWC OC FP// FC f issue / design se to the level cross ur ct with the vehicle drehicle driver and there	otected Compared Undefined Compared Undefine	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver Van driver HGV driver reased decision ma	Is Is Iser type Motorcyclist Passenger Horserider Train driver Other Undefined Aking and errors by Train griver When the series of the se	o-10 G6+ 11-15 Unde 16-20 20-35 35-50 50-60 The the amount of visus of attention is likely and the junctions, arcrossing and/or the	inined Individual Group Undefined Undefined Individual Ind	Woburn Sands MCB: the road junction close to the crossing is used by local people and
Ref 06 SSUE Road junctions 1. Level Crossin 1.1 Protected AOCL MCBc AOCR Undefi ABCL AHB MG MGB 3. Description of the control of t	rig type 1.2 Unpricty Indian	otected OTTOMWL MWL feature ing may result in inci- river's road before or refore cause distract ng the actions of oth level crossing. This er vehicle drivers may	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver Van driver HGV driver reased decision ma r after the level crosion. A vehicle driver ler road users moves a reduction in obsery increase their dec	Motorcyclist Passenger Horserider Train driver Other Undefined aking and errors by essing may increase er's primary focus of ement in and arout vation of the level cision making errors	o-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 The amount of visuof attention is likely and the junctions, ar crossing and/or the s at the crossing.	d blocking-back al information to be on a activated	Woburn Sands MCB: the road junction close to the crossing is used by local people and
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Ref 06 SSUE Road junctions 1. Level Crossin 1.1 Protected AOCL MCBc AOCR Undefi ABCL AHB MG MGB 3. Description of the control of the crossing. 4. User behavior Roads that intersect or the crossing the presented to the vertice of the control of the decisions and a warning system to the decisions and a warning system to the crossing queue over the crosning queue over the crosn	rig type 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.3 Unprocess 1.4 Unprocess 1.5 Unprocess 1.6 Unvolute 1.7 Unprocess 1.7 Unprocess 1.8 Unprocess 1.9 Unvolute 1.9 Unvolu	Totected Compared to the control of	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver Van driver HGV driver reased decision ma r after the level crossion. A vehicle drivener road users move ar reduction in obsery increase their decisions the path of oncrovided by research that vehicle drivers	Is Is Iser type Motorcyclist Passenger Horserider Train driver Other Undefined Aking and errors by Sesing may increase er's primary focus of ement in and arou- vation of the level cision making errors cles blocking-back coming traffic, waitin for vehicle drivers	over the crossing, and traffic behind the	Individual Group Undefined Individual Information to be on a cativated Individual et urning vehicle,	Woburn Sands MCB: the road junction close to the crossing is used by local people and commercial traffic.
Ref 06 SSUE Road junctions 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undefi ABCL AHB MG MCB 3. Description of Road junctions close over the crossing. 4. User behavior Roads that intersect or sessessing the presented to the vertical and a warning system to eautomatic crossing queue over the croinsufficient clearan. Unaware of the decores.	rig type 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.3 Unprocess 1.4 Unprocess 1.5 Unprocess 1.6 UNC 1.7 U	cotected C Undefined C/T C/MWL MWL feature ing may result in incidence of the company of t	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver HGV driver reased decision ma r after the level crossion. A vehicle drivener road users move the reduction in observer increases their decision on the path of oncrovided by research that vehicle drivers up;	Is Iser type Motorcyclist Passenger Horserider Train driver Other Undefined Aking and errors by Aking and errors by Essing may increase Pr's primary focus of the level o	over the crossing. over the crossing. over the crossing traffic behind the continuing to crossing and crossing traffic behind the continuing to crossing to crossing to crossing traffic behind the continuing to crossing to crossing to crossing to crossing traffic behind the continuing to crossing to crossing to crossing traffic behind the continuing to crossing to crossing traffic behind the continuing t	Individual Group Undefined Individual Information to be on a secondly on a cativated Individual Information to be on the secondly on a cativated Individual Individua	Woburn Sands MCB: the road junction close to the crossing is used by local people and commercial traffic. 5. Error type
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Ref 06 SSUE Road junctions 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undefi ABCL AHB MG MG MCB 3. Description of Road junctions close over the crossing. 4. User behavior Roads that intersect or seemed to the versus seemed	rig type 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.3 Unprocess 1.4 Unprocess 1.5 Unprocess 1.6 Unprocess 1.7 Unprocess 1.8 Unprocess 1.9 Unproce	otected Comparison of the content o	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver Van driver HGV driver reased decision ma r after the level crossion. A vehicle drivers or reduction in observation in observation in consistence of the path of oncrovided by research that vehicle drivers between the consistence of the path of oncrovided by research that vehicle drivers between the consistence of the c	Is Is Iser type Motorcyclist Passenger Horserider Train driver Other Undefined Aking and errors by Issing may increase Increase or's primary focus of Increase or sprimary focus of I	over the crossing. over the crossing. over the crossing traffic behind the continuing to crossystem will not be a	Individual Group Group Undefined Individual Group Undefined Individual Indivi	Woburn Sands MCB: the road junction close to the crossing is used by local people and commercial traffic. 5. Error type Error
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Ref 06 SSUE Road junctions 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undefi ABCL AHB MG MG MGB 3. Description of Road junctions close over the crossing. 4. User behavior Road stat intersectoresented to the vertice of the decisions and awarning system to Right turns on the cautomatic crossing queue over the cronsufficient clearant unaware of the decision after the preventile on after the preventile of th	rig type 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.3 Unprocess 1.4 Unprocess 1.5 Unprocess 1.6 Unprocess 1.7 Unprocess 1.8 Unprocess 1.9 Unproce	cotected Comparison of the properties of the actions of othe level crossing. This er vehicle drivers may sing pose a particular swaiting to turn acrusted actions of the properties of the prop	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver Van driver HGV driver reased decision ma r after the level crossion. A vehicle drivener road users mover reduction in obsery increase their decar problem for vehicles the path of oncrovided by research that vehicle drivers by on the crossing, to	Is Is Iser type Motorcyclist Passenger Horserider Train driver Other Undefined Aking and errors by Issing may increase er's primary focus of ement in and aroun vation of the level cision making errors cles blocking-back coming traffic, waitin for vehicle drivers are: Is elieve the warning avoid having to wa 6.3 Document source	over the crossing. over the crossing and/or the sat the crossing. over the crossing. over the crossing. over the crossing. over the crossing traffic behind the continuing to crossing aid if the warning sy	Individual Group Undefined Individual Group Undefined Individual Group Undefined Individual Individ	Woburn Sands MCB: the road junction close to the crossing is used by local people and commercial traffic. 5. Error type Error Violation 6.4 Document details
Ref 06 SSUE Road junctions 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undefi ABCL AHB MG MCB 3. Description of Road junctions closed for the presented to the vector state of the company o	ring type 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.3 Unprocess 1.4 Unprocess 1.5 Unprocess 1.6 Univers 1.7 Unprocess 1.7 Unprocess 1.8 Unprocess 1.9 Univers	cotected Company Company Content of Company Content of Company Company Content of Conten	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver Van driver HGV driver reased decision ma r after the level crossion. A vehicle drivener road users mover reduction in obsery increase their decar problem for vehicles the path of oncrovided by research that vehicle drivers by on the crossing, to	Is Iser type Motorcyclist Passenger Horserider Train driver Other Undefined Aking and errors by Aking and errors by Besing may increase er's primary focus of the level o	o-10 60+ 11-15 Under 16-20 20-35 35-50 50-60 vehicle drivers, and the junctions, ar crossing and/or the state crossing. over the crossing. over the crossing traffic behind the continuing to crossing at the crossing at the crossing at the crossing.	Individual Group Group Undefined Individual Group Undefined Individual Group Undefined Individual Information to be on and secondly on activated Individual Group Individual Group Individual Individual Group Individual In	Wobum Sands MCB: the road junction close to the crossing is used by local people and commercial traffic. 5. Error type Error Violation 6.4 Document details Intsb/sa tr/ah
Ref 06 SSUE Road junctions 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undefi ABCL AHB MG MG MGB 3. Description of Road junctions close over the crossing. 4. User behavior Roads that intersect or sessing the presented to the vertice of the presented to the vertice of the construction of the decisions and a swarning system to resented to the vertice of the decision of the decision of the decision of the construction of the decision of the construction of the decision of the construction of the decision of the decision of the construction of the decision of the decisio	ring type 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.3 Unprocess 1.4 Unprocess 1.5 Unprocess 1.6 Unprocess 1.7 Unprocess 1.8 Unprocess 1.9 Unproc	cotected Company Comp	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver Van driver HGV driver reased decision ma r after the level crossion. A vehicle drivener road users mover reduction in obsery increase their decar problem for vehicles the path of oncrovided by research that vehicle drivers by on the crossing, to	Is Is Iser type Motorcyclist Passenger Horserider Train driver Other Undefined Aking and errors by Aking and errors by Issing may increase er's primary focus of ement in and aroun vation of the level cision making errors cles blocking-back coming traffic, waitin for vehicle drivers are: In elieve the warning avoid having to waitin ARAIL INDUSTRY HSE/HMRI Network Rail	o-10 60+ 11-15 Under 16-20 20-35 35-50 50-60 vehicle drivers, and the junctions, arcrossing and/or the s at the crossing. over the crossing, over the crossing traffic behind the continuing to crossing traffic behind the scontinuing to crossing and/or the second traffic behind the continuing to crossing traffic behind the scontinuing to crossing traffic behind the scontinuing traffic behind the sc	Individual Group Group Undefined Group Undefined Group Undefined Group Undefined Group Gro	Woburn Sands MCB: the road junction close to the crossing is used by local people and commercial traffic. 5. Error type Error Violation 6.4 Document details ntsb/sa
Ref 06 Issue Road junctions 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undefi ABCL AHB MG MCB 3. Description of Road junctions close over the crossing. 4. User behavior Road junctions and a warning system to the veasessing the presented to the veasessing the presented to the veases of the decisions and a warning system to road and the control of t	ring type 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.2 Unprocess 1.3 Unprocess 1.4 Unprocess 1.5 Unprocess 1.6 Univers 1.7 Unprocess 1.7 Unprocess 1.8 Unprocess 1.9 Univers	cotected Company Company Content of Company Content of Company Company Content of Conten	2. User detail 2.1 Level crossing u Pedestrian Farmer Cyclist Car driver Van driver HGV driver reased decision ma r after the level crossion. A vehicle drivener road users mover reduction in obsery increase their decar problem for vehicles the path of oncrovided by research that vehicle drivers by on the crossing, to	Is Iser type Motorcyclist Passenger Horserider Train driver Other Undefined Aking and errors by Aking and errors by Besing may increase er's primary focus of the level o	o-10 60+ 11-15 Under 16-20 20-35 35-50 50-60 vehicle drivers, and the junctions, ar crossing and/or the state crossing. over the crossing. over the crossing traffic behind the continuing to crossing at the crossing at the crossing at the crossing.	Individual Group Group Undefined Individual Group Undefined Individual Group Undefined Individual Information to be on and secondly on activated Individual Group Individual Group Individual Individual Group Individual In	Wobum Sands MCB: the road junction close to the crossing is used by local people and commercial traffic. 5. Error type Error Violation 6.4 Document details Intsb/sa tr/ah

Level crossings: communication and u Ref 07 Creation date 11.06.2004 Last	ser behaviour issues modified 02.02.2005		davi
Issue			Issue at a level crossing
Vehicle approach speed			_
1. Level Crossing type	2. User details		ı
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age 2.3 On own	
	☐ Pedestrian ☐ Motorcyclist ☐ Farmer ☐ Passenger	0-10 G0+ Individual Group	
☐ UWC/MWL	☐ Cyclist ☐ Horserider	☐ 16-20 ☐ Undefined	
□ AHB □ OC □ MG □ FP/MWL	☐ Car driver ☐ Train driver ☐ Van driver ☐ Other	20-35 35-50	
MCB □ FC	HGV driver Undefined	50-60	
3. Description of issue / design feature			
The speed of the road traversing a level crossing is a factor	r in vehicle driver errors.		
4. User behaviour			
Road vehicle research has suggested that speed is a factor contributor to vehicle drivers not stopping at level crossing activated warning at a level crossing. Greater numbers of drivers passing through at a higher average speed.	s. With increased speed, vehicle driv red light violations have been recorded	ers will have less time to react to an d at a level crossing with road vehicle	
Vehicle drivers have responded to red light violations (or p stating their concern that stopping when travelling at high therefore they continue across the crossing which they pe	er speeds will result in a vehicle-vehicle	e collision at the level crossing,	
			5. Error type
			☐ Error ☐ Violation
6. Sources of information 6.1 Interview source 6.2 Level crossing visi	t - areas 6.3 Document source		6.4 Document details
☐ RAIL INDUSTRY ☐ Milton Keynes	RAIL INDUSTRY	OTHER	vi/re
□ Network Rail □ ROAD INDUSTRY □ Doncaster □ RSSB □ AA	☐ HSE/HMRI ☐ Network Rail	GOVERNMENT TRL (rail)	st/au wi/an2
☐ HSE/HMRI ☐ Bus drivers ☐ Peterborough	RSSB	☐ DfT (road) ☐ Independent	Wi/anz
□ RPC □ Bedford □ BTP □ OTHERS □ Redcar	Railway GS Others	☐ Other dept. ☐ Non-UK	
Level crossings: communication and u Ref 08 Creation date 11.06.2004 Last Issue	ser behaviour issues modified 02.02.2005		Issue at a level crossing
Age of drivers			issue at a level crossing
1. Level Crossing type	2. User details		
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age 2.3 On own	
☐ AOCL ☐ MCBcctv ☐ UWC ☐ Undefine	Pedestrian Motorcyclist	□ 0-10 ⊠ 60+ ⊠ Individual	1
□ AOCR □ Undefined □ UWC/T □ ABCL □ UWC/MWL	☐ Farmer ☐ Passenger ☐ Cyclist ☐ Horserider	☐ 11-15 ☐ Undefined ☐ Group ☐ 16-20 ☐ Undefined	
ABCL	☐ Cyclist ☐ Horsender ☐ Car driver ☐ Train driver	□ 16-20 □ Ondelined □ 20-35	
☐ MG ☑ MCB ☐ FP/MWL	☐ Van driver ☐ Other☐ HGV driver ☐ Undefined	□ 35-50 □ 50-60	
3. Description of issue / design feature		30-00	
Violations at level crossings may be influenced by the age	of the local population		
Violations at level crossings may be initiatineed by the age	or the local population.		
4. User behaviour			Lincolnshire is a retirement county. They have a high
Local populations with higher numbers of a certain age-g	roup may result in an increased number	er of violations or errors at level	percentage of elderly drivers who drive during the day and at
crossings. At a red light camera testing site, a disproporti warning lights. This behaviour has been associated with I surroundings, rather than being assigned to them purpos	ower reaction speed and lack of visual	awareness of their immediate	relatively low speeds. However, there are problems with elderly drivers passing through the activated warning system.
High numbers of other age-groups within a geographical crossings.	ocation may also contribute to increas	ed violations or errors at level	Recently a elderly driver went through a red light while travelling at only 40mph in a 60mph zone.
			5. Error type
			│
			Violation
			☑ Violation
6. Sources of information 6.1 Interview source 6.2 Level crossing visiting RAIL INDUSTRY Mitten Keynes			○ Violation 6.4 Document details
6.1 Interview source 6.2 Level crossing visi RAIL INDUSTRY Network Rail ROAD INDUSTRY Doncaster	RAIL INDUSTRY	☐ GOVERNMENT ☐ TRL (rail)	6.4 Document details vi/ve hu/in
6.1 Interview source 6.2 Level crossing visit ☐ RAIL INDUSTRY ☐ Milton Keynes	☐ RAIL INDUSTRY		6.4 Document details
6.1 Interview source RAIL INDUSTRY Network Rail ROAD INDUSTRY RSSB AA ROAD INDUSTRY Hertford	⊠ RAIL INDUSTRY ☐ HSE/HMRI ☐ Network Rail	☐ GOVERNMENT ☐ TRL (rail) ☐ DfT (rail) ☐ TRL (road)	6.4 Document details vi/ve hu/in dft/in2

Level crossings: communication and us Ref 09 Creation date 27.08.2004 Last r	modified 02.02.2005			davis
Issue				Issue at a level crossing
Signal box: track side workers				3
1. Level Crossing type	2. User details			
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age	2.3 On own	
AOCL MCBcctv Undefined	Pedestrian Motorcyclist	☐ 0-10 ☐ 60+	_ Individual	
☐ AOCR ☐ Undefined ☐ UWC/T ☐ UWC/MWL	☐ Farmer ☐ Passenger ☐ Cyclist ☐ Horserider	☐ 11-15 ☐ Undefined ☐ 16-20	☐ Group ☐ Undefined	
□ AHB □ OC	☐ Car driver ☐ Train driver	20-35	_ ondomica	
☐ MG ☐ FP/MWL ☐ FC	☐ Van driver ☐ Other☐ HGV driver☐ Undefined	☐ 35-50 ☐ 50-60		
 Description of issue / design feature High-visibility clothing appears white on black & white mor 	aitara			
riigii-visibiiity clottiirig appears writte on black & writte mor	iitors.			
4. User behaviour				
If track side workers are carrying out duties in the vicinity of the type of work being carried out, the area they are wo		e the local signaller and in	form them	
of the type of work being carried out, the area they are wo	TKING WITHIN AND TO NOW TONG.			
However, this does not always happen and can create prol				
crossing is clear. The high-visibility clothing worn by track If the signaller has not been made aware of any work being				
public standing track side.	g carried out, the signalier assumes	the people to be members	o or trie	
It is now policy for track-side workers to wear hardhats, whether from the general public. However, these are not workers to wear hardhats, where the same public is now policy to the same public.				
distinguishing between workers and the general public.	i consistently by all workers, and the	no oan again oreate problet	1113 101	5. Error type
		to a constant		⊠ Error
Recent research has suggested the use of colour monitors	as acceptable for use within signal	boxes.		☑ Violation
6. Sources of information				
6.1 Interview source 6.2 Level crossing visit	- areas 6.3 Document sour	ce		6.4 Document details
☐ RAIL INDUSTRY ☐ Milton Keynes	☐ RAIL INDUSTF	Y 🗆 O	THER	
Network Rail ☐ ROAD INDUSTRY ☐ Doncaster	☐ HSE/HMRI	☐ GOVERNMENT ☐ T	RL (rail)	
☐ RSSB ☐ AA ☐ Hertford ☐ HSE/HMRI ☐ Bus drivers ☐ Peterborough	☐ Network Rail☐ RSSB		RL (road) idependent	
□ RPC □ Bedford	☐ Railway GS		on-UK	
☐ BTP ☐ OTHERS ☐ Redcar	Others			
Level crossings: communication and us Ref 10 Creation date 11.06.2004 Last r	ser behaviour issues modified 02.02.2005			davis
				Issue at a level crossing
Ref 10 Creation date 11.06.2004 Last I				Issue at a level crossing
Ref 10 Creation date 11.06.2004 Last r				Issue at a level crossing
Ref 10 Creation date 11.06.2004 Last r Issue Representation of HGV users	nodified 02.02.2005	2.2 Age	2.3 On own	Issue at a level crossing
Ref 10 Creation date 11.06.2004 Last Insue Representation of HGV users 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC Undefined	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist	□ 0-10 □ 60+	☐ Individual	Issue at a level crossing
Ref 10 Creation date 11.06.2004 Last r	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger	0-10	☐ Individual☐ Group	Issue at a level crossing
Ref 10 Creation date 11.06.2004 Last Insue Representation of HGV users 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC Undefined	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist	□ 0-10 □ 60+	☐ Individual	Issue at a level crossing
Ref 10 Creation date 11.06.2004 Last	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other	☐ 0-10 ☐ 60+ ☐ 11-15 ☐ Undefined ☐ 16-20 ☐ 20-35 ☐ 35-50	☐ Individual☐ Group	Issue at a level crossing
Ref 10 Creation date 11.06.2004 Last results	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver	□ 0-10 □ 60+ □ 11-15 ☑ Undefined □ 16-20 □ 20-35	☐ Individual☐ Group	Issue at a level crossing
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ABCL		UWC/MW	/L		Horserider	□ 16-20	☐ Undefined	
☑ AHB ☑ MG		□ OC □ FP/MWL			Train driver Other	20-35 35-50		
MCB		FC			Undefined	50-60		THE REAL PROPERTY.
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edestrian and pa	assengers are m	nore likely t	to undertake risk	ky behaviour at ve	hicular level crossii	ngs where bridges a	re not provided.	
								Roydon CCTV: as the barriers
. User behavi	our							descend, a school boy runs
		pedestriar	n bridges influen	ces the risk taking	behaviour of both	n pedestrians and tra	in passengers.	underneath to gain access to the platform at the other side of the
	•		· ·	·		•		crossing. Once across, the
						ng and/or hearing the sing without bridges		school boy realised the train was a through-train and he casually
						e means of crossing		waited for the next train.
ctivated warning	g. At crossings	with bridge	es, users are ab	le to use an altern	ative access for cr	ossing the railway lir	es.	
rossinas withou	it bridges, used	by train pa	ssengers to gai	n access to other	platforms at a nea	rby station may unde	ertake particularly	
sky behaviour to	avoid missing	their train.	The activated v			a train is approachin	' '	
ontinue to cross	to ensure they	catch their	r train.					5 Error tuno
								5. Error type Error
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Sources of	information							
1 Interview source	mormation	6.2	Level crossing visit -	- areas	6.3 Document source	e		6.4 Document details
RAIL INDUSTRY	•		Milton Keynes		RAIL INDUSTRY	· · · · · · · · · · · · · · · · · · ·	OTHER	
Network Rail	☐ ROAD INDU		Doncaster Hertford		☐ HSE/HMRI ☐ Network Rail	GOVERNMENT	TRL (rail)	
HSE/HMRI	☐ Bus drivers		Peterborough		RSSB	☐ DfT (rail) ☐ DfT (road)	☐ TRL (road)☐ Independent	
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ef 12	Creation date	15.06.200	4 Last n	modified 02.02.200	5			da
ssue								Issue at a level crossing
Regularity of tra	ains							
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1 Protected	1	.2 Unprotect	ed	2.1 Level crossing	user type	2.2 Age	2.3 On own	
AOCL MCE		⊠ uwc	Undefined		Motorcyclist	O-10 O60+	☐ Individual	
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AHB		⊠ oc	'L	☐ Car driver	Train driver	20-35	Ondenned	
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. User behavi								
						ing users to make ju ng the crossing to b		
						an accurate assessm		
				der the variations	in train schedules	and that many train	s, such as freight	
re not scheduled	under passeno	yer timetab	nes.					
						nim to make 'safe' as		
	vaca Other rea		identified 4% o	ot users considere	d a crossing to be	'safe' because they	were	
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nowioagoabio o	f the train timeta	able.				·		
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Level crossings: communication and user behaviour issues

Level crossings: communication a Ref 13 Creation date 15.06.2004	nd user behaviou Last modified 02.02.200				davi
Issue					Issue at a level crossing
Groups					
1. Level Crossing type	2. User deta	ils			
1.1 Protected 1.2 Unprotected	2.1 Level crossing	user type	2.2 Age	2.3 On own	
	☐ Farmer ☐ Cyclist ☐ Car driver ☐ Van driver ☐	Motorcyclist Passenger Horserider Train driver Other Undefined	□ 0-10 □ 60+ □ 11-15 □ Undefined □ 16-20 □ 20-35 □ 35-50 □ 50-60	☐ Individual ☐ Group ☐ Undefined	
		Criderinied			The state of the s
Description of issue / design featurePeople in groups may undertake more risky behave	iour, than when on their o	own.			
					Helpston: youngsters use this crossing mainly on bicycles. The
4. User behaviour				h - dii	signallers at Helpston signal box
The nature of a group of people will mean they loo of the group. This may result in the first few of a g continuing to progress over the railway line withou and bridleway crossings on routes used often by ra Young people in groups also exhibit more risky be	roups of walkers crossing t checking for oncoming to amblers.	g carefully, but the rains. This may be	emaining group membe a particular problems a	rs t footpath	are aware that a group of youngsters riding bicycles up to the crossing, will probably all attempt to jump the lights if the first youngster does so.
nowever, although most young people will not eng	age in extreme danger, th				
Many of the behaviours exhibited by young people picked upon or to just be accepted by others. Wh					5. Error type
undertake very risky behaviours, more so than whe			, and a young poo		Error
					☑ Violation
6. Sources of information					
	ssing visit - areas	6.3 Document source)		6.4 Document details
RAIL INDUSTRY		RAIL INDUSTRY		OTHER	
☐ Network Rail ☐ ROAD INDUSTRY ☐ Doncaste		☐ HSE/HMRI	☐ GOVERNMENT ☐	TRL (rail)	
☐ RSSB ☐ AA ☐ Hertford ☐ HSE/HMRI ☐ Bus drivers ☐ Peterbore	ough	☐ Network Rail☐ RSSB		TRL (road) ndependent	
RPC Bedford	ougii	Railway GS		Non-UK	
☐ BTP ☐ OTHERS ☐ Redcar		Others			
Level crossings: communication a Ref 14 Creation date 15.06.2004	nd user behaviou Last modified 02.02.200				dav
ssue					Issue at a level crossing
Time of day					
1. Level Crossing type	2. User deta	ils			
1.1 Protected 1.2 Unprotected	2.1 Level crossing	user type	2.2 Age	2.3 On own	
A AOCR Undefined ABCL UWC/T AHB □ UWC/MWL	☐ Farmer [☐ Cyclist [☐ Car driver [Motorcyclist Passenger Horserider Train driver	0-10	☐ Individual ☐ Group ☑ Undefined	
⊠ MG ⊠ MCB		Other Undefined	35-50 50-60		
B. Description of issue / design feature	,				
Risk taking at level crossings increases during rush	n-hours, at midday and at	the beginning and	end of the school day		
5	,				Halaston (B. 111)
I Haar bahariar					Helpston: 'Parents' have been observed by the signallers at
I. User behaviour	- time - f u	and the state of t		da - 46 ·	Helpston signal, driving past the
/ehicle driver violations may be associated with the morning and evening rush-hours. Vehicle drivers in passing through the activated warning lights to be compounded with the general increase in road trait	needing to arrive somewhe lower than the perceived r	ere on time (e.g.,merisks associated wi	eeting) may consider the th being late. This may	e risks of oe further	activated warning lights, with children in the vehicle.
and the control of th	arrad alcohol - 0 - 1 - 1				
ncreases in vehicle driver violations were also dete he school-run (vi/re). Parents on multi-school run:	ected during the later afteri	noon hours and is s		ciated with	
pecause of the need to drive to various locations w	s, prior to driving to work i vithin a short period of tim	is also considered e. Crossings used	a factor in risk taking be as access routes for the	haviour,	
pecause of the need to drive to various locations was well as those in close proximity to the school m	s, prior to driving to work i vithin a short period of tim ay have higher number of	is also considered e. Crossings used violations as a resi	a factor in risk taking be as access routes for the alt.	haviour, e school-run,	
pecause of the need to drive to various locations was well as those in close proximity to the school maked light violations are also high for some sites at unch-hour. Factories and other similar industrial was a single on-mass. This may result in violations at c	s, prior to driving to work in vithin a short period of tim ay have higher number of midday. This may be due vorking environments have	is also considered e. Crossings used violations as a resi to people trying to e specific staff wor	a factor in risk taking be as access routes for the alt. fit in activities within the king hours, with workers	haviour, e school-run, eir s arriving and	5. Error type □ Error □ Violation
pecause of the need to drive to various locations was well as those in close proximity to the school maked light violations are also high for some sites at unch-hour. Factories and other similar industrial was eaving on-mass. This may result in violations at capecific times.	s, prior to driving to work in vithin a short period of tim ay have higher number of midday. This may be due vorking environments have	is also considered e. Crossings used violations as a resi to people trying to e specific staff wor	a factor in risk taking be as access routes for the alt. fit in activities within the king hours, with workers	haviour, e school-run, eir s arriving and	Error
pecause of the need to drive to various locations was well as those in close proximity to the school maked light violations are also high for some sites at unch-hour. Factories and other similar industrial was eaving on-mass. This may result in violations at capecific times. 5. Sources of information	s, prior to driving to work in vithin a short period of tim ay have higher number of midday. This may be due vorking environments have	is also considered e. Crossings used violations as a resi to people trying to e specific staff wor	a factor in risk taking be as access routes for the alt. fit in activities within the king hours, with workers s of traffic using the cro	haviour, e school-run, eir s arriving and	Error
pecause of the need to drive to various locations was well as those in close proximity to the school maked light violations are also high for some sites at unch-hour. Factories and other similar industrial weaving on-mass. This may result in violations at capecific times. 6. Sources of information 6.1 Interview source 6.2 Level cros RAIL INDUSTRY	s, prior to driving to work in within a short period of tim ay have higher number of midday. This may be due working environments have rossings nearby because of the sing visit - areas evenes	is also considered e. Crossings used violations as a resi to people trying to e specific staff wor of the large volume 6.3 Document source RAIL INDUSTRY	a factor in risk taking be as access routes for the alt. fit in activities within the king hours, with workers s of traffic using the cro	haviour, e school-run, eir s arriving and ssing at	☐ Error ☐ Violation 6.4 Document details ☐ pi/ve
cecause of the need to drive to various locations was well as those in close proximity to the school media and the school media and the similar industrial was eaving on-mass. This may result in violations at capecific times. 5. Sources of information 5.1 Interview source 8.2 Level cros RAIL INDUSTRY Network Rail ROAD INDUSTRY Hertford Hertford	s, prior to driving to work in within a short period of time ay have higher number of midday. This may be due working environments have rossings nearby because of the sing visit - areas eynes er	is also considered e. Crossings used violations as a resi to people trying to e specific staff wor of the large volume 6.3 Document source RAIL INDUSTRY HSE/HMRI Network Rail	a factor in risk taking be as access routes for the alt. fit in activities within the king hours, with workers s of traffic using the cro	haviour, e school-run, eir s arriving and ssing at DTHER TRL (rail) TRL (road)	Error Violation 6.4 Document details
because of the need to drive to various locations was well as those in close proximity to the school m Red light violations are also high for some sites at lunch-hour. Factories and other similar industrial vleaving on-mass. This may result in violations at c specific times. 6. Sources of information 6.1 Interview source 6.2 Level cros RAIL INDUSTRY ROAD INDUSTRY Milton K	s, prior to driving to work in within a short period of time ay have higher number of midday. This may be due working environments have rossings nearby because of the sing visit - areas eynes er	is also considered e. Crossings used violations as a resi to people trying to e specific staff wor of the large volume 6.3 Document source RAIL INDUSTRY HSE/HMRI	a factor in risk taking be as access routes for the alt. fit in activities within the king hours, with workers s of traffic using the cro	haviour, e school-run, eir s arriving and ssing at	G.4 Document details pi/ve vi/re

Ref 15 Creation date 15.	06.2004 Last r	nodified 02.02.2005			day
Issue					Issue at a level crossing
Visual clutter					
1. Level Crossing type		2. User details			-
.1 Protected 1.2 Un	protected VC Undefined	2.1 Level crossing user type Pedestrian Motorcyclist	2.2 Age	2.3 On own	
AOCR Undefined		☐ Farmer ☐ Passenger	☐ 11-15 ☐ Und	lefined Group	
☑ ABCL □ UN ☑ AHB □ ON	VC/MWL	☐ Cyclist ☐ Horserider ☐ Car driver ☐ Train driver	☐ 16-20 ☐ 20-35	☐ Undefined	
] MG	/MWL	☐ Van driver ☐ Other	35-50		
MCB FC	;	☐ HGV driver ☐ Undefined	50-60		
. Description of issue / design	feature				
uperfluous information and roadside	e structures on the app	proach to the crossing may reduc	e the user's detection	of level crossing	
formation and warning signs.					Tallington CCTV: the approach to
. User behaviour					this crossing is heavily cluttered with additional information. The
ehicle drivers approaching the level					branding of the petrol station on
lowever, superfluous information an educe the impact of the level crossir		both rail and other authorities) in	the vehicle driver's vis	sual field may	the right-hand side is of similar colour to the crossing signs, thus
sade the impact of the level didden	ig imorridaeri.				reducing the impact of the sign
					information on the vehicle driver's attention.
					attention.
					5. Error type
					⊠ Error
					∇iolation
. Sources of information					
1 Interview source	6.2 Level crossing visit	areas 6.3 Document so	urce		6.4 Document details
RAIL INDUSTRY	Milton Keynes	RAIL INDUST		OTHER	
☐ Network Rail ☐ ROAD INDUSTR ☐ RSSB ☐ AA	Y Doncaster Hertford	☐ HSE/HMRI ☐ Network Rai	☐ GOVERNMENT ☐ DfT (rail)	TRL (rail)	
HSE/HMRI Bus drivers	□ Peterborough	☐ RSSB	DfT (road)	Independent	
] RPC] BTP □ OTHERS	☐ Bedford ☐ Redcar	Railway GS	Other dept.	☐ Non-UK	
evel crossings: communities 16 Creation date 15.		nodified 02.02.2005			da
ssue					Issue at a level crossing
resence of rail staff					
Level Crossing type		2. User details			
	protected	2.1 Level crossing user type	2.2 Age	2.3 On own	1
☐ AOCL ☐ MCBcctv ☐ UN AOCR ☐ Undefined ☐ UN		 □ Pedestrian □ Motorcyclist □ Passenger 	□ 0-10 □ 60+ □ 11-15 ⊠ Und		
☑ ABCL ☑ U\	VC/MWL	Cyclist Horserider	☐ 16-20	☐ Undefined	
☐ AHB ☐ OC ☐ MG ☐ FF	C P/MWL	☐ Car driver ☐ Train driver ☐ Van driver ☐ Other	20-35 35-50		
MCB S FC		☐ HGV driver ☐ Undefined	50-60		
. Description of issue / design	feature				
he presence of rail staff in high-visib	pility clothing may have	an undesirable influence on leve	crossing user behav	iour.	
					Helpston: has had significant
. User behaviour					maintenance over the last few
ail staff are required to wear high-vi	sibility clothing when v	vorking on or near the railway. Ve	hicle drivers and ped	estrians may	years and they often close the main road to all vehicles.
nisinterpret an activated warning sys					However, because people see the
ney can continue to pass through th ains would be passing if staff are tra		they believe the rail staff are are	only testing the equip	ment or that no	staff maintenance cars at the crossing, they still perceive it
					acceptable to use and since they
sers at unprotected crossings may ehaving less cautiously when cross		ence of rail staff to mean the line is	s closed to trains, res	ulting in users	have made the effort to drive all the way to the crossing, they
enaving less cautiously when cross	ing.				request permission to cross.
					5. Error type
					Error
					Violation
Sources of information					
Interview source	6.2 Level crossing visit	areas 6.3 Document so	urce		6.4 Document details
RAIL INDUSTRY	☐ Milton Keynes	☐ RAIL INDUST	TRY	OTHER	.,
Network Rail ROAD INDUSTR	. I □ □ □ · ·				pi/ve
RSSB AA	Y Doncaster Hertford	⊠ HSE/HMRI □ Network Rai	☐ GOVERNMENT	TRL (rail)	pi/ve
☐ RSSB ☐ AA ☑ HSE/HMRI ☐ Bus drivers ☐ RPC		☐ HSE/HMRI☐ Network Rai☐ RSSB☐ Railway GS	☐ GOVERNMENT		pi/ve

Level crossings: communication and user behaviour issues

Uot 17			nodified 02.02.2005				dente
Ref 17	Creation date 15	.00.2004 Last II	10dilled 02.02.2005				Gavis
Issue	f warming lights						Issue at a level crossing
Understanding of							
1. Level Crossi 1.1 Protected	•	nprotected	2. User details 2.1 Level crossing user	tyne	2.2 Age	2.3 On own	-
AOCL MCBc		WC Undefined		Notorcyclist	0-10 060+	☐ Individual	
AOCR Undef	fined 🔲 U	WC/T	☐ Farmer ☐ Pa	assenger	11-15 🖾 Unde	efined Group	· ·
		WC/MWL C		lorserider rain driver	16-20 20-35	Undefined	Hall Man San Man Man Man Man Man Man Man Man Man M
☐ MG		P/MWL	□ Van driver □ O	ther	35-50		
⊠ MCB				inaetinea	50-60		
The onset of the arcrossings.		n feature ling red lights of the act	ivated warning syster	m lead to variou	s vehicle driver bel	naviours at level	
							Tallington CCTV: vehicle drivers approaching the crossing in a
4. User behavio							30mph zone, continue to drive
understanding of t	the steady amber	nd the instruction given at road traffic lights and the required action for	at level crossing ligh	nts was compare	ed. Higher number	s of users (slightly	through the amber flashing light on numerous occasions. The approaching vehicle was in a position to stop at the lights,
		ers incorrectly determin					however they continued through the amber light.
The wigwag light s		at fire stations to stop r	oad traffic and allow t	the fire pumps t	o be driven onto th	ne road, are	
. Summery ignored b	, vornoic alivers.						
							5. Error type
							Violation
6. Sources of i 6.1 Interview source	information	6.2 Level crossing visit -	areas	3 Document source			6.4 Document details
RAIL INDUSTRY		Milton Keynes		RAIL INDUSTRY	<u>'</u>		pi/ve
Network Rail	☐ ROAD INDUSTE	RY Doncaster		HSE/HMRI	GOVERNMENT	☐ TRL (rail)	vi/hg
RSSB HSE/HMRI		☐ Hertford ☐ Peterborough		Network Rail RSSB	☐ DfT (rail) ☐ DfT (road)	☐ TRL (road)☐ Independent	
☐ RPC ☐ BTP	OTHERS	☐ Bedford ☐ Redcar		Railway GS Others	Other dept.	☐ Non-UK	
Ref 18	ngs: commu Creation date 15	nication and us	er behaviour is	ssues			davis
Ref 18				ssues			Issue at a level crossing
Ref 18 Issue Closure time	Creation date 15		nodified 02.02.2005	ssues			davis
Ref 18 Issue Closure time 1. Level Crossii	Creation date 15	.06.2004 Last n	2. User details		22 Ana	23 On own	davis Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossi 1.1 Protected	Creation date 15	.06.2004 Last n	2. User details 2.1 Level crossing user	type	2.2 Age	2.3 On own	davis Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossi 1.1 Protected AOCL MCBc AOCR Undef	ing type 1.2 U cctv fined	.06.2004 Last n nprotected WC Undefined WC/T	2. User details 2.1 Level crossing user Pedestrian M Farmer P.	type lotorcyclist assenger	☐ 0-10 ☐ 60+ ☐ 11-15 ☑ Unde	Individual Group	davis Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossii 1.1 Protected AOCL MCBc AOCR Undef ABCL	ing type 1.2 U cetv fined U U U U U U U U U U U U U	nprotected WC Undefined WC/TWC/MWL	2. User details 2.1 Level crossing user Pedestrian M Farmer P Oyclist H	type fotorcyclist assenger lorserider	0-10	☐ Individual	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undef ABCL AHB MG	ing type 1.2 U cotv fined F	nprotected WC Undefined WC/T WC/MWL C P/MWL	2. User details 2. Level crossing user Pedestrian M Farmer P Oyclist H Car driver T	type Intorcyclist assenger lorserider rain driver	0-10	Individual Group	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossii 1.1 Protected AOCL MCBc AOCR Undef ABCL AHB MG MG MCB	ing type 1.2 U cotv fined Cotv	nprotected WC Undefined WC/T WC/MWL C P/MWL C	2. User details 2. Level crossing user Pedestrian M Farmer P Oyclist H Car driver T	type Motorcyclist assenger lorserider rain driver	□ 0-10 □ 60+ □ 11-15 ⊠ Unde □ 16-20 □ 20-35	Individual Group	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undef ABCL AHB MG MCB 3. Description o	ing type 1.2 U cotv fined F of issue / desig	nprotected WC Undefined WC/T WC/MWL CC P/MWL CC n feature	2. User details 2.1 Level crossing user Pedestrian M Farmer P: Cyclist H Car driver Tr Van driver U HGV driver U	otorcyclist assenger lotorserider rain driver ther Indefined	0-10 60+ 11-15 Under 16-20 20-35 35-50 50-60	Individual Group	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undef ABCL AHB MG MCB 3. Description o	ing type 1.2 U cotv fined F of issue / desig	nprotected WC Undefined WC/T WC/MWL C P/MWL C	2. User details 2.1 Level crossing user Pedestrian M Farmer P: Cyclist H Car driver Tr Van driver U HGV driver U	otorcyclist assenger lotorserider rain driver ther Indefined	0-10 60+ 11-15 Under 16-20 20-35 35-50 50-60	Individual Group	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undef ABCL AHB MG MCB 3. Description o	ing type 1.2 U cetv fined Of issue / designer the user expects	nprotected WC Undefined WC/T WC/MWL CC P/MWL CC n feature	2. User details 2.1 Level crossing user Pedestrian M Farmer P: Cyclist H Car driver Tr Van driver U HGV driver U	otorcyclist assenger lotorserider rain driver ther Indefined	0-10 60+ 11-15 Under 16-20 20-35 35-50 50-60	Individual Group	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undef ABCL AHB MG MG MCB 3. Description o The amount of time Vehicle drivers cordivers at automatic appointment to ma	creation date 15 ing type 1.2 U cctv fined of issue / design te the user expects cour nsider the warning tic crossings also come advanting system ake' were time relations.	nprotected WC Undefined WC/T WC/MWL C Pr/MWL C n feature s to wait at the level cro time of the activated so overestimate the time the s said they were unwilling ated. The greater the time	2. User details 2.1 Level crossing user Pedestrian M Farmer T Cyclist H Car driver T Van driver U ssing may influence t ystem (required to allow yare required to wang to stop. Reasons me delay, the more ri	Into the control of t	0-10 60+	Individual Group Undefined Undefined	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Undef ABCL AHB MG MG MCB 3. Description o The amount of time Vehicle drivers cordivers at automatic appointment to ma	Creation date 15 ing type 1.2 U cctv U U C C U U U C C U U U U C C U U U U	nprotected WC Undefined WC/T WC/MWL C P/MWL C In feature Is to wait at the level cross to wait at the level cross to wait at the greater the time the pect trains to arrive with	2. User details 2.1 Level crossing user Pedestrian M Farmer T Cyclist H Car driver T Van driver U ssing may influence t ystem (required to allow yare required to wang to stop. Reasons me delay, the more ri	Into the control of t	0-10 60+	Individual Group Undefined Undefined	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Under ABCL AHB MG MCB 3. Description o The amount of time 4. User behavio Vehicle drivers conditivers at automate appointment to ma research suggests crossings and after In particular, this o	creation date 15 ing type 1.2 U cctv fined of issue / design te the user expects our nsider the warning ic crossings also of the design ded warning system ake' were time related to the design of the desi	nprotected WC Undefined WC/T WC/MWL C P/MWL C In feature Is to wait at the level cross to wait at the level cross to wait at the greater the time the pect trains to arrive with	2. User details 2.1 Level crossing user Pedestrian MFarmer To Pedestrian To Van driver Van driver To Van driver Usessing may influence to var erequired to war go to stop. Reasons me delay, the more rinin 20 seconds, but the	Into the control of t	□ 0-10 □ 60+ □ 11-15 □ Unde □ 16-20 □ 20-35 □ 35-50 □ 50-60 behaviour. argins) to be far too didrivers who traver ctions, such as 'haf level crossing use e patience after 40	o long. Vehicle sed a crossing lying an seconds at open	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL	creation date 15 ing type 1.2 U cctv fined of issue / design te the user expects our nsider the warning ic crossings also of the design ded warning system ake' were time related to the design of the desi	nprotected WC Undefined WC/T WC/MWL C P/MWL C In feature Is to wait at the level crossoverestimate the time the said they were unwilling the d. The greater the tile pect trains to arrive with arrier crossings.	2. User details 2.1 Level crossing user Pedestrian MFarmer To Pedestrian To Van driver Van driver To Van driver Usessing may influence to var erequired to war go to stop. Reasons me delay, the more rinin 20 seconds, but the	Into the control of t	□ 0-10 □ 60+ □ 11-15 □ Unde □ 16-20 □ 20-35 □ 35-50 □ 50-60 behaviour. argins) to be far too didrivers who traver ctions, such as 'haf level crossing use e patience after 40	o long. Vehicle sed a crossing lying an seconds at open	Issue at a level crossing
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Under ABCL AHB MG MCB 3. Description o The amount of time 4. User behavio Vehicle drivers conditivers at automate appointment to ma research suggests crossings and after In particular, this o	creation date 15 ing type 1.2 U cctv fined of issue / design te the user expects our nsider the warning ic crossings also of the design ded warning system ake' were time related to the design of the desi	nprotected WC Undefined WC/T WC/MWL C P/MWL C In feature Is to wait at the level crossoverestimate the time the said they were unwilling the d. The greater the tile pect trains to arrive with arrier crossings.	2. User details 2.1 Level crossing user Pedestrian MFarmer To Pedestrian To Van driver Van driver To Van driver Usessing may influence to var erequired to war go to stop. Reasons me delay, the more rinin 20 seconds, but the	Into the control of t	□ 0-10 □ 60+ □ 11-15 □ Unde □ 16-20 □ 20-35 □ 35-50 □ 50-60 behaviour. argins) to be far too didrivers who traver ctions, such as 'haf level crossing use e patience after 40	o long. Vehicle sed a crossing lying an seconds at open	5. Error type
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Under ABCL AHB MG MCB 3. Description o The amount of time 4. User behavio Vehicle drivers conditivers at automate appointment to ma research suggests crossings and after In particular, this o	creation date 15 ing type 1.2 U cctv fined of issue / design te the user expects our nsider the warning ic crossings also of the design ded warning system ake' were time related to the design of the desi	nprotected WC Undefined WC/T WC/MWL C P/MWL C In feature Is to wait at the level crossoverestimate the time the said they were unwilling the d. The greater the tile pect trains to arrive with arrier crossings.	2. User details 2.1 Level crossing user Pedestrian MFarmer To Pedestrian To Van driver Van driver To Van driver Usessing may influence to var erequired to war go to stop. Reasons me delay, the more rinin 20 seconds, but the	Into the control of t	□ 0-10 □ 60+ □ 11-15 □ Unde □ 16-20 □ 20-35 □ 35-50 □ 50-60 behaviour. argins) to be far too didrivers who traver ctions, such as 'haf level crossing use e patience after 40	o long. Vehicle sed a crossing lying an seconds at open	
Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL MCBC AOCR Under ABCL AHB MG MCB 3. Description o The amount of time 4. User behavio Vehicle drivers conditivers at automate appointment to ma research suggests crossings and after In particular, this o	creation date 15 ing type 1.2 U cetv fined of issue / design the the user expects cour nsider the warning it crossings also count ric crossings also count as vehicle drivers experted to the count of the c	nprotected WC Undefined WC/T WC/MWL C P/MWL C In feature Is to wait at the level crossoverestimate the time the said they were unwilling the d. The greater the tile pect trains to arrive with arrier crossings.	2. User details 2.1 Level crossing user Pedestrian MFarmer To Pedestrian To Van driver Van driver To Van driver Usessing may influence to var erequired to war go to stop. Reasons me delay, the more rinin 20 seconds, but the	Into the control of t	□ 0-10 □ 60+ □ 11-15 □ Unde □ 16-20 □ 20-35 □ 35-50 □ 50-60 behaviour. argins) to be far too didrivers who traver ctions, such as 'haf level crossing use e patience after 40	o long. Vehicle sed a crossing lying an seconds at open	5. Error type
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Ref 18 Issue Closure time 1. Level Crossin 1.1 Protected AOCL	ing type 1.2 U cctv fined of issue / designet the user expects our nsider the warning gic crossings also of the designet warning system also were time related with the series of t	nprotected WC Undefined WC/T WC/MWL C P/MWL C In feature Is to wait at the level crossoverestimate the time the said they were unwilling the d. The greater the tippect trains to arrive wit arrier crossings. Waiting time has been for the said they were unwilling the said they will be said they were unwilling to the said they will be said they wi	2. User details 2.1 Level crossing user Pedestrian M Farmer To Value Car driver To Wand driver U Sasing may influence to the value of value of the	Interpretation of the control of the	0-10 60+	o long. Vehicle sed a crossing wing an seconds at open the phase at	5. Error type Error Violation 6.4 Document details pi/ve
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Level crossings: communication and user behaviour issues Ref 19 Creation date 15.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Open gates 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ☐ MCBcctv Undefined Pedestrian 0-10 60+ Motorcyclist AOCR UWC/T UWC/MWL Passenger Undefined Undefined Farmer 11-15 Group ABCL Cvclist Horserider 16-20 Undefined AHB MG OC FP/MWL Car driver Train driver 20-35 Van driver Other 35-50 Undefined 3. Description of issue / design feature Open gates increases the risk to approaching users. 4. User behaviour UWC gates are provided closed across the road and open away from the railway lines. Footpath and Bridleway crossings have a variety of gates fitted that are closed across the paths on the approach to both sides of the crossing. Gates left open affect the behaviour of users approaching a crossing. It predisposes users to see the crossing as 'safe', and cross without carrying out the required crossing procedure. This is especially relevant in the case of irregular or first time users at UWC. It has been suggested that these types of users may have a mental model of an open gate being similar to an automatic crossing. If the gate is open, then it is safe to cross Train drivers often report open gates to the local signaller. This impacts on the running of the trains as the signaller will request train drivers to slow on approach and observe for any level crossing users. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER tu/us ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster ar/us DfT (rail) DfT (road) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) HMRI internal report _ HSE/HMRI RSSB Peterborough Independent hu/hu Bedford Other dept RPC Railway GS Non-UK OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 20 Creation date 15.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Audible alarm 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Group Farmer ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver FP/MWL Other MG Van driver 35-50 FC HGV driver Undefined 50-60 3. Description of issue / design feature Second audible warning tone is not detected and/or understood by level crossing users. 4. User behaviour When two trains arrive at an automatic vehicular crossing without the minimum road opening time, users are provided with a change in the tone of the audible warning. Pedestrians waiting at the level crossing for a train to pass, do not detect or understand the continued warning system to apply to another train coming, only to the train just passed. Users have traversed the level crossing while the second tone has been audible Human factors research into miniature warning lights at UWC/MWL also highlighted that users poorly understood the meaning of the change of tone associated with a second train approaching. Other users have commented that the change in tone is not distinctive enough. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) HSF/ra_section F RSSB Network Rail DfT (rail) TRL (road) Hertford tu/us IndependentNon-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) hu/hu RPC Railway GS Bedford Other dept

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B. Description of issue / design feature				
Jnprotected crossings (without MWL) used during the hour isers.	rs of darkness may lead to increased	d decision making error	rs by crossing	
				Fox covert footpath: this crossing
l. User behaviour				is used by local school children as an access point between their
The speed of an object can be judged by assessing the moderkness, the background is not visible against the moving				homes and the school. During
issessing speed, resulting in increased decision making err		important visual imorn	lation cue ioi	winter months, many children will be using this crossing during the
				hours of darkness.
armers often continue to use UWC's during the hours of c luring darkness and under tight timescales to transport pro				
se the crossing safely.	sauce nom their farms could impact	on the behaviour of the	c lamer to	
one OF "I love percention of their area of their area of their areas of their are	dragged the upp of an income of the come	tal madal of turbs are see	l and distant	
ssue 25 "Users perception of train speed and distance" ad is a factor in why level crossing users may cross during an				
etermine train speed remains a separate issue because it is		,		5. Error type
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1 Interview source 6.2 Level crossing visit -	- areas 6.3 Document source			6.4 Document details
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Level crossings: communication and user behaviour issues Ref 23 Creation date 31.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Sunlight strobing 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ⊠ uwc Undefined Pedestrian 0-10 Motorcyclist 60+ Passenger AOCR Undefined UWC/T Farmer 11-15 Undefined Group UWC/MWL ABCL Cvclist Horserider 16-20 Undefine AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers Kirknewton crossing: on the approach to this crossing in Scotland, sunlight strobing across Trees along the sides of the road, combined with sunlight passing through the trees can provide a strobe lighting affect along the the road causes particular road. A vehicle driver approaching a level crossing is subjected to a broken line of shadow and light, which may affect the vehicle problems for road vehicle users. driver's detection of objects ahead of them. This may result in the vehicle driver continuing to cross over a level crossing, including those with activated warning lights. This is a particular problem at open crossings, those with and without activated warning lights because of the lack of any physical barrier across the road to act as a final warning cue of the presence of a crossing. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB DfT (road) Peterborough Independent Other dept RPC Bedford Railway GS Non-UK OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 24 Creation date 15.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Half barrier 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own Undefined AOCL MCBcctv UWC Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Group Farmer ☐ ABCL ⊠ AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC Car driver Train driver 20-35 MG FP/MWL Van driver Other 35-50 ☐ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Automatic half barriers facilitate vehicle drivers to undertake risk taking behaviour. 4. User behaviour Automatic half barriers are normally kept in the raised position and when lowered, the barriers extend only across the entrances to the crossing. The exits from the crossing are left clear and therefore allow for vehicle drivers to clear the crossing. Although half barriers increase the observance by drivers of the automatic warning system, they introduce another undesirable risk taking behaviour, known as zigzagging. The vehicle driver not wanting to wait at the level crossing, weaves around the first barrier onto the other side of the road and exits via the open gate side. An earlier report stated that half of all accidents at AHB's are due to the drivers violating user procedures and zigzagging around the barriers (pi/re, st/au) 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes HSE/Ra ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) vi/re RSSB Network Rail DfT (rail) TRL (road) Hertford pi/re IndependentNon-UK HSE/HMRI Bus drivers Peterborough RSSB DfT (road) HSE/ra, section E RPC Railway GS Bedford Other dept mo/vi

Others

st/au

BTP

OTHERS

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User perception of train	speed & distance				Issue at a level crossing
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1.1 Protected	1.2 Unprotected	2.1 Level crossing user type	2.2 Age	2.3 On own	
AOCL MCBcctv		Pedestrian Motorcyclist	O-10 G0+	☐ Individual	
	UWC/T UWC/MWL	☐ Farmer☐ Passenger☐ Cyclist☐ Horserider	☐ 11-15 ☐ Undefine ☐ 16-20	d ☐ Group ☐ Undefined	
	⊠ oc	Car driver Train driver	□ 20-35		
☐ MG ☐ MCB	FP/MWL	✓ Van driver✓ Other✓ HGV driver✓ Undefined	35-50 50-60		
3. Description of issue	e / design feature				
•		h may result in increased decision m	naking errors by users at	level	
4. User behaviour					
various perceptual proble	ns that may increase the decisior	rain to stop is vastly underestimated n making errors of users at level cros ejects travelling at the same speed.		There are	
	o an approaching train, the rate of es easier to determine its actual s	of change of the trains size is extrem speed and distance.	nely slow and it is not ur	til the train is	
and potential stopping dis	tances. This may increase the de	nicle movement for estimating train secision making errors of users when			
unprotected level crossing					5. Error type
		nses normally evoked from a high sp n standing close to a passing train.	peed passing train. A gr	eater	☐ Error ☐ Violation
6. Sources of informa					
6.1 Interview source	6.2 Level crossing visit			OTLIED	6.4 Document details
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RPC	Bedford	Railway GS		Non-UK	
⊠ BTP ⊠ OTH	ERS Redcar	Others			
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Level crossings: communication and user behaviour issues Ref 27 Creation date 16.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Harvesting time 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ☐ MCBcctv ⊠ uwc Undefined Pedestrian 0-10 Motorcyclist 60+ AOCR UWC/T UWC/MWL Undefined Undefined Farmer Passenger 11-15 Group ABCL Cvclist Horserider 16-20 Undefined AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Harvesting time influences the risk taking behaviour of UWC users. Farmers will need to transport produce between fields and storage areas and from their farmland to other sites. The increased frequency of use of UWC's over a short period of time, the time critical factor of harvesting and the lengthy procedure required for crossing the railway line, results in increased risk taking behaviour by farmers. During harvesting, farmers are more likely to leave the gates open and fail to follow the correct crossing procedure to avoid hindering their work progress. Farmers may also adopt alternative crossing methods, such as positioning a 'look-out' at the UWC to observe for oncoming trains, allowing the UWC users to cross with minimal disruption. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER hu/hu ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) HMRI internal report Network Rail Doncaster DfT (rail) DfT (road) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB Peterborough Independent Bedford Other dept Non-UK RPC Railway GS OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 28 Creation date 16.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Position of warning lights 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Group Farmer ABCL AHB UWC/MWL Cyclist Horserider 16-20 Undefined OC Car driver Train driver 20-35 MG FP/MWL Van driver Other 35-50 ⋈ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature The effectiveness of warning lights is influenced by their position. 4. User behaviour If a user is unable to clearly see the warning lights at a level crossing, from either a position of safety at the crossing, or a clear line of sight from their direction of approach, this may result in the user moving into an unsafe area to read the lights or cross without taking account of the warning information. The 10cm diameter of the red and green miniature warning lights at UWC were found to be of adequate size for being discerned from a distance of up to 15m. However, it was suggested that an 'alternative' to MWL's be considered if they were to positioned on the far side of the tracks and the total distance across the tracks was greater than 15m. There is currently on-going discussions within NWR to address this issue. The position of road vehicle wigwag lights is also critical for providing sufficient time for approaching vehicle drivers to observe and respond to the lights. Their position should accommodate the approach route of all types of road vehicles and take account of any 5. Error type internal vehicle features that may reduce the vehicle driver's detection of the lights. Poorly positioned lights may reduce the time Error available for the vehicle driver to respond accordingly. Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes hu/hu ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) Independent RPC Railway GS ☐ Non-UK

Other dept

Others

Bedford

Redcar

BTP

☐ OTHERS

Issue						Cav III
						Issue at a level crossing
Quantity of information						
1. Level Crossing type		2. User details				
1.1 Protected 1.2 Unpr		2.1 Level crossing use	••	2.2 Age	2.3 On own	
AOCL			Motorcyclist Passenger	0-10	☐ Individual ☐ Group	
☐ UWC		☐ Cyclist ☐ I	Horserider	⊠ 16-20	Undefined	plante No.
AHB	MWL		Train driver Other			20 20 20 20 20 20 20 20 20 20 20 20 20 2
			Undefined	⊠ 50-60		
3. Description of issue / design						4.9 K
The quantity of signage information that	at can be read and ur	nderstood decreases	s with road speed	d.		
						Information sign for indicating to
4. User behaviour						drivers of large or slow vehicles to park at the sign and call the
A road transport study provided a mini and driver speed) for drivers of vehicles						signaller from the phone box at crossing, to obtain permission to
and univer speed) for univers of verticles	s to register and unde	astana the imornati	ion provided by a	i veriicie activated w	arriing system.	cross.
Large quantities of information on sign user behaviours:	s with an inadequate	time for users to re	egister and interpr	ret the information n	nay result in two	The above sign is located on a
user benaviours.						bend prior to the crossing on a
1. The time it takes the user to read all				ions, they have proc	eeded past the	road with a national speed limit.
sign and decide to ignore its requireme	ents and continue aci	oss trie crossing; or	ı			
2. The user does not have sufficient tir	me to comprehend al	l of the information a	and makes a jud	gment that it does n	ot apply to them	
anyway.						5. Error type
						☑ Error☑ Violation
C. Courses of information						
6. Sources of information 6.1 Interview source	6.2 Level crossing visit -	areas 6	6.3 Document source			6.4 Document details
RAIL INDUSTRY	Milton Keynes		RAIL INDUSTRY		OTHER	wi/ve
☐ Network Rail ☐ ROAD INDUSTRY ☐ RSSB ☐ AA	☐ Doncaster☐ Hertford		HSE/HMRI Network Rail	☐ GOVERNMENT ☐ DfT (rail)	☐ TRL (rail) ☐ TRL (road)	
☐ HSE/HMRI ☐ Bus drivers	□ Peterborough		RSSB	DfT (road)	Independent	
☐ RPC ☐ BTP ☐ OTHERS	Bedford Redcar		Railway GS Others	Other dept.	☐ Non-UK	
Level crossings: communi		er behaviour nodified 02.02.2005	issues			davis
Ref 30 Creation date 17.06			issues			Issue at a level crossing
Ref 30 Creation date 17.06 Issue Trespassing on rail structures		nodified 02.02.2005				Issue at a level crossing
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type	5.2004 Last m	2. User details				Issue at a level crossing
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unput	5.2004 Last m	2. User details 2.1 Level crossing use	; er type	2.2 Age	2.3 On own	Issue at a level crossing
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unpr AOCL MCBcctv AOCR Undefined WWG	rotected Undefined	2. User details 2.1 Level crossing use Pedestrian 1 Farmer 5	er type Motorcyclist Passenger	◯ 0-10 ☐ 60+ ◯ 11-15 ☐ Undef	Individual Group	Issue at a level crossing
Ref 30 Creation date 17.06	rotected Undefined	2. User details 2.1 Level crossing use Pedestrian Farmer Cyclist	er type Motorcyclist Passenger Horserider	□ 0-10 □ 60+ □ 11-15 □ Undef □ 16-20	☐ Individual	Issue at a level crossing
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unpr AOCL MCBcctv ACCR Undefined UWC ABCL ABCL AHB OCC FP/M	rotected C Undefined C/MWL	2. User details 2. Level crossing use Pedestrian 1 Farmer F Cyclist 1 Car driver 0 Van driver 0 Car driv	er type Motorcyclist Passenger Horserider Train driver Other	□ 0-10 □ 60+ □ 11-15 □ Undef □ 16-20 □ 20-35 □ 35-50	Individual Group	Issue at a level crossing
Ref 30 Creation date 17.06	rotected C Undefined C/MWL	2. User details 2. Level crossing use Pedestrian 1 Farmer 6 Cyclist 1 Car driver 0	er type Motorcyclist Passenger Horserider Train driver	□ 0-10 □ 60+ □ 11-15 □ Undef □ 16-20 □ 20-35	Individual Group	Issue at a level crossing
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unpr AOCL MCBcctv Undefined UWW AOCR Undefined UWW AHB MG PFP/N MCB 3. Description of issue / design	rotected C Undefined C/MWL MWL	2. User details 2.1 Level crossing use Pedestrian	er type Motorcyclist Passenger Horserider Train driver Other Undefined	□ 0-10 □ 60+ □ 11-15 □ Undef □ 16-20 □ 20-35 □ 35-50 □ 50-60	ined Individual Group Undefined	Issue at a level crossing
Ref 30 Creation date 17.06	rotected C/T C/MWL MWL feature and exit areas to cross	2. User details 2.1 Level crossing use Pedestrian	er type Motorcyclist Passenger Horserider Train driver Other Undefined	□ 0-10 □ 60+ □ 11-15 □ Undef □ 16-20 □ 20-35 □ 35-50 □ 50-60	ined Individual Group Undefined	
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unpr AOCL MCBcctv UWCACCR UWCACCR UWCACCR UWCACCR FP/h MCB FP/h MCB FP/h 3. Description of issue / design Rail structures located at the entrance taking behaviour by members of the processing in the processin	rotected C/T C/MWL MWL feature and exit areas to cross	2. User details 2.1 Level crossing use Pedestrian	er type Motorcyclist Passenger Horserider Train driver Other Undefined	□ 0-10 □ 60+ □ 11-15 □ Undef □ 16-20 □ 20-35 □ 35-50 □ 50-60	ined Individual Group Undefined	Woburn Sands: ladder for railway
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unp AOCL MCBcctv UW AOCR Undefined UW ABCL UW ABCL WMG ABCL FP/h MCB 3. Description of issue / design Rail structures located at the entrance taking behaviour by members of the profile of th	Totected Company Undefined Community Undefine	2. User details 2.1 Level crossing use Pedestrian 1 Farmer 1 Cyclist 1 Car driver Car driver CHOY driver Level crossing sthat appear substitution Level crossing that appear substitution Level crossing uses Level cr	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin	0-10	Individual Group Undefined	
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unpr AOCL MCBcctv UWCACCR UWCACCR UWCACCR UWCACCR FP/h MCB FP/h MCB FP/h 3. Description of issue / design Rail structures located at the entrance taking behaviour by members of the processing in the processin	rotected OUT OWN Feature and exit areas to crosublic.	2. User details 2.1 Level crossing use Pedestrian	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin	0-10	Individual Group Undefined	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unpt AOCL MCBcctv UNG AOCR Undefined UNG ABCL UNG ABCL UNG ABCL WMG ABCB TO CO	Totected COTT COMWL WWL feature and exit areas to crosublic. ome people as an accopects or create oppoonusing areas, school	2. User details 2.1 Level crossing use Pedestrian 1	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruc y increase the like	0-10	Individual Group Undefined Besirable risk d at level ryoung people	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unpt AOCL MCBcctv UWACR Undefined UWWABCL UWWABCL AHB WG FP/M MCB 3. Description of issue / design Rail structures located at the entrance taking behaviour by members of the processings, that resemble day-to-day of playing in and around level crossings. The position of the crossing close to h	Totected Company Undefined Co	2. User details 2.1 Level crossing use Pedestrian 1	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruc y increase the like where children an	0-10	esirable risk d at level r young people y utilise the	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both a school and a children's playground. The playground provided children with similar
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unp AOCL MCBcctv UW ABCL UMG ABCL UWG ABCL WG ABCL W	Totected Company Undefined Co	2. User details 2.1 Level crossing use Pedestrian 1	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruc y increase the like where children an	0-10	esirable risk d at level r young people y utilise the	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both a school and a children's playground. The playground provided children with similar
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unp AOCL MCBcctv UW ABCL UMG ABCL UWG ABCL WG ABCL W	Totected Company Undefined Co	2. User details 2.1 Level crossing use Pedestrian 1	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruc y increase the like where children an	0-10	esirable risk d at level r young people y utilise the	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both a school and a children's playground. The playground provided children with similar looking 'climbing ladders'. 5. Error type Error
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unp AOCL MCBcctv UW ABCL UMG ABCL UWG ABCL WG ABCL W	Totected Company Undefined Co	2. User details 2.1 Level crossing use Pedestrian 1	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruc y increase the like where children an	0-10	esirable risk d at level r young people y utilise the	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both a school and a children's playground. The playground provided children with similar looking 'climbing ladders'. 5. Error type
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unp AOCL MCBcctv UW ABCL UW6 ABCL UW6 ABCL FP/h MCB FC 3. Description of issue / design Rail structures located at the entrance taking behaviour by members of the processings, that resemble day-to-day of playing in and around level crossings. The position of the crossing close to h crossing, may also contribute to increal Youth perception of risk tends to be on perception of risk is sufficient for them 6. Sources of information	Totected Communication of the control of the contr	2. User details 2.1 Level crossing use Pedestrian	Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruc y increase the like where children an	0-10	esirable risk d at level r young people y utilise the	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both a school and a children's playground. The playground provided children with similar looking 'climbing ladders'. 5. Error type □ Error □ Violation
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unpt AOCL MCBcctv UWCACCR UWCACCR UWCACCR ABCL WAGE ABCL WAGE ABCL WGG ABCL ABCL ABCL ABCL ABCL ABCL ABCL ABCL	Totected Communication of the control of the contr	2. User details 2.1 Level crossing use Pedestrian Farmer Cyclist HGV driver Van driver Sisings that appear subsciessible point to the extrunities for use may Although most you sly, especially when	Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruc y increase the like where children ar ung people will no provided with op	0-10	esirable risk d at level r young people y utilise the e danger, their	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both a school and a children's playground. The playground provided children with similar looking 'climbing ladders'. 5. Error type Error Violation
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unp AOCL MCBcctv UW ABCL UMC ABCL UMC ABCL AHB COC MG MG MCB Tep/h FC 3. Description of issue / design Rail structures located at the entrance taking behaviour by members of the protection of the crossings, that resemble day-to-day of playing in and around level crossings. The position of the crossing close to h crossing, may also contribute to increation of risk tends to be on perception of risk is sufficient for them 6. Sources of information 6.1 Interview source RAIL INDUSTRY Network Rail ROAD INDUSTRY	Totected Comparison Undefined	2. User details 2.1 Level crossing use Pedestrian 1 Farmer F Cyclist H Car driver U Car driv	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruct y increase the like where children ar ung people will no provided with op 3.3 Document source	Q-10	esirable risk d at level r young people y utilise the e danger, their	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both a school and a children's playground. The playground provided children with similar looking 'climbing ladders'. 5. Error type □ Error □ Violation
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unp AOCL MCBcctv UW ABCL UW6 ABCL UW6 ABCL WMG BISTUCTURES IOCATE OF THE PROFILE OF THE	Totected Composition Undefined Composition Undefi	2. User details 2.1 Level crossing use Pedestrian Farmer Cyclist Car driver HGV driver Ussings that appear sussings that appear sussing	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruc y increase the like where children an ung people will nu provided with op 3.3 Document source RAIL INDUSTRY HSE/HMRI Network Rail	Q0-10	ined Individual Group Undefined Group Undefined Individual Group Undefined Individual Ind	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both a school and a children's playground. The playground provided children with similar looking 'climbing ladders'. 5. Error type □ Error □ Violation
Ref 30 Creation date 17.06 Issue Trespassing on rail structures 1. Level Crossing type 1.1 Protected 1.2 Unp AOCL MCBcctv UW ABCL UMC ABCL UMC ABCL AHB COC MG MG MCB Tep/h FC 3. Description of issue / design Rail structures located at the entrance taking behaviour by members of the protection of the crossings, that resemble day-to-day of playing in and around level crossings. The position of the crossing close to h crossing, may also contribute to increation of risk tends to be on perception of risk is sufficient for them 6. Sources of information 6.1 Interview source RAIL INDUSTRY Network Rail ROAD INDUSTRY	Totected Comparison Undefined	2. User details 2.1 Level crossing use Pedestrian	er type Motorcyclist Passenger Horserider Train driver Other Undefined uitable for climbin railway infrastruct y increase the like where children ar ung people will no provided with op 3.3 Document source	Q-10	esirable risk d at level r young people y utilise the e danger, their	Woburn Sands: ladder for railway use only, located at the entrance to a footpath level crossing. The crossing provided access from a large housing area to both a school and a children's playground. The playground provided children with similar looking 'climbing ladders'. 5. Error type □ Error □ Violation

Level crossings: communication and us Ref 31 Creation date 17.06.2004 Last	ser behaviour issues		davi
Issue			Issue at a level crossing
Location near rail stations			
1. Level Crossing type	2. User details		
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age 2.3 On own	187 300
	□ Pedestrian □ Farmer □ Cyclist □ Gradiver □ Car driver □ Van driver □ Other	□ 0-10 □ 60+ □ Individual □ 11-15 □ Undefined □ Group □ 16-20 □ 20-35	THE RESERVE TO SHARE THE PARTY OF THE PARTY
☐ MG ☐ MCB ☐ FP/MWL ☐ FC	☐ HGV driver ☐ Undefined	□ 35-50 □ 50-60	
3. Description of issue / design feature			
Level crossings adjacent to rail stations influence the risk to	aking behaviour of vehicle drivers a	nd other users.	
			St.Margarets CCTV: this crossing
4. User behaviour			is positioned next to the station. The barrier downtime is lengthy,
Level crossings located adjacent to a rail station can increat require users to wait for longer periods of time at the cross close proximity from either direction and the interval betwee deactivated. At level crossings located next to a rail station, users estim	sing. This is due to slower trains peen the trains being too short to all	ulling into and out of the station in ow the warning system to be	especially during the evening rush-hour when there is an increase in train traffic.
the vicinity of a station. It is suggested that users (for exar may have been encouraged to violate the warning system			
, and the same system	a prote	5	
			5. Error type
			Error
			☑ Violation
6. Sources of information			
6.1 Interview source 6.2 Level crossing visit	- areas 6.3 Document sou	irce	6.4 Document details
⊠ RAIL INDUSTRY □ Milton Keynes □ Network Rail □ ROAD INDUSTRY □ Doncaster	☐ RAIL INDUST ☐ HSE/HMRI	RY SOTHER SOVERNMENT TRL (rail)	pi/ve wi/an2
☐ RSSB ☐ AA ☐ Hertford ☐ Hertford ☐ Peterborough	☐ Network Rail ☐ RSSB	□ DfT (rail)□ TRL (road)□ Independent	
RPC Bedford	☐ Railway GS	Other dept.	
☐ BTP ☐ OTHERS ☐ Redcar	☐ Others		
Level crossings: communication and us Ref 32 Creation date 17.06.2004 Last	ser behaviour issues modified 02.02.2005		davi
Issue			Issue at a level crossing
Train speeds			
1. Level Crossing type 1.1 Protected 1.2 Unprotected	2. User details 2.1 Level crossing user type	2.2 Age 2.3 On own	
□ AOCL	Pedestrian Motorcyclist	□ 0-10 □ 60+ □ Individual	7
A AOCR	Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined	11-15 Ordefined Group Undefined Group Undefined Unde	
3. Description of issue / design feature			
Low train speeds may increase the risk taking behaviour or	users.		
4. User behaviour	regult in changes to a vess's baba	viour. It has been established that	
Circumstances which present a lower perceived risk, often users perceive UWC and footpath crossings to be safer wh perceived low level of risk presented by slower trains by be view, they may not cross as quickly or they may look less	nen trains are slower. In this case, having less cautiously. For examp	the users are responding to the	
At open crossings with slow moving trains, vehicle drivers able to edge forward past a point of safety and look along crossing in front of a slower train. This behaviour may also the barrier.	the railway line, they may believe the	ney have ample time to make a safe	
Railway Group Standard Gl/GN7611 identifies "maximum t	rain speed" as a factor for conside	ration within risk assessments at level	5. Error type
crossings. However, slow trains speeds are also a factor b			
			Violation
6. Sources of information			0.4.0
6.1 Interview source 6.2 Level crossing visit			6.4 Document details
☑ RAIL INDUSTRY ☐ Milton Keynes ☑ Network Rail ☐ ROAD INDUSTRY ☐ Doncaster ☐ RSSB ☐ AA ☐ Hertford ☐ Peterborough ☐ HSE/HMRI ☐ Bus drivers ☐ Bedford	□ RAIL INDUST □ HSE/HMRI □ Network Rail □ RSSB □ Railway GS	GOVERNMENT	ar/us GI/GN7611
☐ BTP ☐ OTHERS ☐ Redcar	Others	_ Gallot dopt Noti-oft	

	.ast modified 02.02.2005				day
Issue					Issue at a level crossing
Sighting distance					
1. Level Crossing type	2. User details				
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age	:	2.3 On own	T. atta.
☐ AOCL ☐ MCBcctv ☐ UWC ☐ Unde	fined Pedestrian Motoro	cyclist 0-10	□ 60+	Individual	40.00
AOCR □ Undefined □ UWC/T APOL	Farmer Passer			Group	The second second
☐ ABCL ☐ UWC/MWL ☐ OC	□ Cyclist □ Horser □ Car driver □ Train c			Undefined	
☐ MG ☐ FP/MWL	☐ Van driver ☐ Other	35-50			
☐ MCB ☐ FC		ned 50-60			
3. Description of issue / design feature					2000年第二年 2000年 1000年
Good sighting distance should indicate the level cross	ing as high risk				Black of the second
	ang an mga mem				
					Marsh Lane: the sighting distance
4. User behaviour					is good at this footpath level crossing.
There is a low occurrence of accidents at UWC and fo established view that good sighting times will always n confirmed the issue of risk compensation by users, as	educe the risk of accidents at u discussed in the AD Little repo	nprotected level cros	sings. Researd ers aware of th	h at UWCs e poor	, c
sight times, perceive the crossing as dangerous and the user perception of risk is low, and they may adapt often for approaching trains.					
Note: the research does not suggest that poor sighting		owever it identifies th	at those with g	ood	
sighting times should also be considered as 'high risk Clear sighting distance of a train at AHB, AOCR and A		le vehicle drivers with	the opportunit	ty to move	5. Error type
close to the tracks and check for oncoming trains, thu					Error type
Good sighting of the railway line from the road, may a	so encourage some vehicle dri				
sufficient time to move past the activated warning sys	em and cross the railway line.				
6. Sources of information					
i.1 Interview source 6.2 Level crossing	visit - areas 6.3 Doci	ument source			6.4 Document details
RAIL INDUSTRY	es 🔲 RAIL	INDUSTRY		THER	ar/us
☐ Network Rail ☐ ROAD INDUSTRY ☐ Doncaster	☐ HSE			RL (rail)	me/an
RSSB AA Hertford		vork Rail		RL (road) dependent	
☐ HSE/HMRI ☐ Bus drivers ☐ Peterborougi ☐ RPC ☐ Bedford	n			on-UK	
BTP OTHERS Redcar	Othe		dopt.	511 511	
evel crossings: communication and					
Ref 34 Creation date 18.06.2004 I	ast modified 02.02.2005	es			dav
ssue		es			Issue at a level crossing
ssue Parked cars	ast modified 02.02.2005	es			Issue at a level crossing
ssue Parked cars I. Level Crossing type	ast modified 02.02.2005 2. User details				Issue at a level crossing
Parked cars . Level Crossing type .1 Protected 1.2 Unprotected	2. User details 2.1 Level crossing user type	2.2 Age		2.3 On own	Issue at a level crossing
Parked cars Level Crossing type 1 Protected AOCL MCBcctv MCC Unde	2. User details 2.1 Level crossing user type [ined] Pedestrian Motoro	2.2 Age cyclist 0 0-10	□ 60+	☐ Individual	Issue at a level crossing
Carked cars Carked cars Carked cars Carked cars Carked cars Carked cars Carked care care care care care care care care	2. User details 2.1 Level crossing user type [Pedestrian	2.2 Age syclist	☐ 60+ ☑ Undefined	☐ Individual ☐ Group	Issue at a level crossing
AOCR	2. User details 2.1 Level crossing user type [ined] Pedestrian Motoro	2.2 Age cyclist	☐ 60+ ☑ Undefined	☐ Individual	Issue at a level crossing
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Coc	2. User details 2.1 Level crossing user type fined Pedestrian Motoro Farmer Passer Cyclist Horser Car driver Train C	2.2 Age cyclist	☐ 60+ ☑ Undefined	☐ Individual ☐ Group	Issue at a level crossing
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ACCR Undefined UWC/TUWC/TUWC/MWL AND	2. User details 2.1 Level crossing user type fined Pedestrian Motoro Farmer Passer Cyclist Horser Van driver Other HGV driver Undefin	2.2 Age eyclist	☐ 60+ ☑ Undefined	☐ Individual ☐ Group ☑ Undefined	Issue at a level crossing St. Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level
ACCL MCBcctv UWC UMC/S MCB	2. User details 2.1 Level crossing user type Pedestrian Motorc Farmer Passer Cyclist Horser Van driver Undefinent HGV driver Undefinent Sult in vehicle drivers slowing and the flow of traffic approaching and the end of them, coupled with once	2.2 Age syclist	□ 60+ □ Undefined the level crossing. As vel	☐ Individual☐ Group☐ Undefined☐ Group☐ ☐ Undefined☐ ☐ Undefined☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they
Parked cars Level Crossing type 1.1 Protected AOCL MCBcctv UWC UWC/T UWC/TWL UWC/T UWC/TWL UWC/TWL UWC/TWL UWC/TWL UWC/TWL UWC/TWL UWC/TWL UWC/T UWC/TWL UWC/T UWC/T UWC/TWL UWC/T UWC/T UWC/T UWC/T UWC/TWL UWC/T UWC/T UWC/T UWC/T	2. User details 2.1 Level crossing user type Pedestrian Motore Passer Posser Car driver Train c Van driver Undefined HGV driver Undefined Details Posser P	2.2 Age Excellent and moving over the coming traffic prevents.	the level crossing. As vels them from m	☐ Individual ☐ Group ☑ Undefined ☐ Undefined	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they
Level Crossing type Level Crossing type La Unprotected ACCL MCBcctv UWC/T UWC/T UWC/MWL ABCL UWC/MWL FP/MWL ARBCL FP/MWL ARCB FP/MWL Carked cars before and after the level crossing may recovered to the company of the compan	2. User details 2. Level crossing user type fined Pedestrian Motoro Farmer Passer Van driver Train o HGV driver Undefine sult in vehicle drivers slowing an ead of them, coupled with oncossing. Page 18 Pedestrian Motoro Page 18 Pedestrian Passer Undefine HGV driver Undefine sult in vehicle drivers slowing an ead of them, coupled with oncossing.	22 Age cyclist	the level crossing. As vels them from m	☐ Individual ☐ Group ☑ Undefined ☐ Undefined	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they then stop on the crossing becaus the cars they are following are
Level Crossing type 1.2 Unprotected AOCL MCBcctv UWC/T UWC/T UWC/MWL ACCR Undefined FP/MWL ARBCL FP/MWL ARBCL FC B. Description of issue / design feature Parked cars before and after the level crossing may re Compared cars before and after the level crossing affect to progress over the crossing, parked cars in the road after the level crossing on the level crowards, resulting in vehicles stopping on the level crossing to do this. It is the are tailgating the car in front to avoid being held a They do not expect the level crossing to be activated	2. User details 2.1 Level crossing user type Farmer Passer Cyclist Horser Van driver Other HGV driver Undefi	2.2 Age Expolist	the level crossing. As velos them from metas been obsets reasons:	☐ Individual ☐ Group ☑ Undefined ☐ Undefined ☐ Undefined ☐ Undefined ☐ Undefined	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they then stop on the crossing becaus the cars they are following are prevented from moving forwards.
Level Crossing type 1. Protected 1. Level Crossing type 1. Protected 1. Level Crossing type 1. Protected 1. Level Crossing type 1. Level Crossing feature 1. Level Crossing may recover the crossing affect the level crossing may recover the crossing, parked cars in the road after the level crossing on the level crowards, resulting in vehicles stopping on the level crossing to the level crossing to do this. It is the product of the tree tailing the car in front to avoid being held a they do not expect the level crossing to be activated in our opinion, parked cars are often a result of home	2. User details 2.1 Level crossing user type fined Pedestrian Motoro Farmer Passet Van driver Train of HGV driver Undefine sult in vehicle drivers slowing an ead of them, coupled with once on the other side, before in our opinion that vehicle drives topping on the crossing; at the crossing if the warning system on the other side, before in our opinion that vehicle drives on after the road has just owners that do not have off-strowners that do not have off-strowners.	2.2 Age cyclist	the level crossing. As vel s them from m has been obsets reasons:	☐ Individual ☐ Group ☑ Undefined ☐ Undefined	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they then stop on the crossing because the cars they are following are
Level Crossing type 1.2 Unprotected 1.2 Unprotected 1.2 Unprotected 1.2 Unprotected 1.2 Unprotected 1.3 AOCL	2. User details 2. Level crossing user type fined Pedestrian Motoro Farmer Passer Van driver Train o HGV driver Undefine sult in vehicle drivers slowing an ead of them, coupled with oncossing. Tarance on the other side, before is in our opinion that vehicle driver stopping on the crossing; at the crossing if the warning system of the stopping on the crossing; at the crossing if the warning system of the stopping on the crossing; at the crossing if the warning system owners that do not have off-strend, are often a source of this	2.2 Age cyclist	the level crossing. As vel s them from m has been obsets reasons:	☐ Individual ☐ Group ☑ Undefined ☐ Undefined	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they then stop on the crossing becaus the cars they are following are prevented from moving forwards.
Level Crossing type 1. Protected AOCC	2. User details 2.1 Level crossing user type Fined Pedestrian Motorc Farmer Passer Van driver Other HGV driver Undefit sult in vehicle drivers slowing at the crossing. Passer Farmer Passer Farmer Passer Sin our opinion that vehicle drivers in our opinion that vehicle drivers open on the crossing; at the crossing if the warning sy so soon after the road has just owners that do not have off-strend, are often a source of this oach and exit roads to level creen.	2.2 Age cyclist	the level crossing. As vel s them from m has been obsets reasons:	☐ Individual ☐ Group ☑ Undefined ☐ Undefined	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they then stop on the crossing because the cars they are following are prevented from moving forwards. 5. Error type Error
Parked cars Level Crossing type	2. User details 2.1 Level crossing user type Fined Pedestrian Motorc Farmer Passer Van driver Train c Van driver Undefit Sult in vehicle drivers slowing at the crossing. Passer Farmer Passer Farmer Passer Van driver Undefit Sult in vehicle drivers slowing at the crossing of the warning system to consider the warning system on the crossing if the warning system on the crossing if the warning system on the consider of this passer of this powers that do not have off-strend, are often a source of this poach and exit roads to level crossing the consideration of the consid	2.2 Age Pyclist	the level crossing. As velos them from m has been obsens reasons: I traffic again.	☐ Individual ☐ Group ☑ Undefined ☐ Undefined	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they then stop on the crossing because the cars they are following are prevented from moving forwards. 5. Error type Error Violation
Parked cars Level Crossing type	2. User details 2.1 Level crossing user type Fined Pedestrian Passet Van driver Train of HGV driver Undefined The flow of traffic approaching an ead of them, coupled with oncossing. The crossing if the warning system of the warning system o	2.2 Age cyclist	the level crossing. As velous them from means been observed in the reasons: I traffic again. Their vehicles on the of local village the reasons of the reas	□ Individual □ Group □ Undefined □ Undefi	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they then stop on the crossing becaust the cars they are following are prevented from moving forwards. 5. Error type Error Violation
Parked cars Level Crossing type	2. User details 2.1 Level crossing user type Fined Pedestrian Motorc Farmer Passer Van driver Train c Van driver Other HGV driver Undefine The flow of traffic approaching an ead of them, coupled with oncossing; at the crossing if the warning system of the warning	2.2 Age Oyclist	the level crossing. As velous them from m has been observed is reasons: I traffic again. Their vehicles on of local village.	□ Individual □ Group □ Undefined Individual □ Group □ Undefined	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they then stop on the crossing becaust the cars they are following are prevented from moving forwards. 5. Error type Error Violation
Parked cars 1. Level Crossing type 1.1 Protected	2. User details 2.1 Level crossing user type Fined Pedestrian Motorc Farmer Passer Van driver Train c Van driver Other HGV driver Undefine The flow of traffic approaching an ead of them, coupled with oncossing; at the crossing if the warning system of the warning	2.2 Age cyclist	the level crossing. As vels them from metas been obsets reasons: It traffic again. The characteristic again. The control of local village again.	□ Individual □ Group □ Undefined □ Undefi	St.Margarets CCTV: cars parked on the side of the road affect the flow of traffic over the level crossing. As vehicle drivers continue to drive across, they then stop on the crossing becaust the cars they are following are prevented from moving forwards. 5. Error type Error Violation

Level crossings: communication and user behaviour issues Ref 35 Creation date 18.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Position of safety 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ☐ MCBcctv UWC Undefined Pedestrian 0-10 Motorcyclist 60+ AOCR Passenger Undefined Group Undefined UWC/T Farmer 11-15 UWC/MWL ABCL Cvclist Horserider 16-20 Undefined AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Insufficient space between the trackside gate and rail results in potential obstruction of the track by bicycles and pushchairs. Footpath and bridleway crossings are often used by cyclists and people with pushchairs. These users will need to stand at a trackside position to clearly check for any oncoming trains before moving over the railway line. However, insufficient space trackside (between the railway line and gate they have just moved through) to stand with their bicycle or pushchair and observe along the track may result in users obstructing the railway line with the bicycle or pushchair. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER hu/de ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster ar/us DfT (rail) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) _ HSE/HMRI RSSB DfT (road) Peterborough Independent Bedford RPC Railway GS Other dept Non-UK ○ OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 36 Creation date 18.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Telephone use 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Group Farmer ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ☐ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Level crossing users failure to use the telephone is a factor in incidents at UWC. 4. User behaviour Visitors, workers and local people who use a UWC must all follow the required crossing procedures. However, it is apparent that users are not complying with the telephone procedures of calling the signaller to request permission to cross. 17 UWC accidents in the last 10 years are associated with users not using the telephone prior to crossing. Research has highlighted, for example, a female resident crossing up to three times a day, chose not to use the telephone, because she regarded the crossing as safe due to good sighting distances. It is also common for regular UWC users to call the signaller only at the beginning of the day to inform them they will be using the crossing all day but will not be phoning for each crossing made. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ar/us ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford IndependentNon-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) RPC Railway GS Bedford Other dept

Others

BTP

Level crossings: communication and Ref 37 Creation date 21.06.2004 L	user behaviou				بذسائد
Issue	ast modified 02.02.200				Jeans et a level eveneine
Traffic moment					Issue at a level crossing
1. Level Crossing type	0 11	:1-			
1.1 Protected 1.2 Unprotected	2. User deta 2.1 Level crossing		2.2 Age	2.3 On own	
AOCL MCBcctv UWC Undef		Motorcyclist	0-10 060+	Individual	1
☐ AOCR ☐ Undefined ☐ UWC/T	☐ Farmer	Passenger	☐ 11-15 ☐ Undefined	Group	
□ ABCL □ UWC/MWL □ OC		☐ Horserider ☐ Train driver	☐ 16-20 ☐ 20-35	☐ Undefined	
☐ MG ☐ FP/MWL	☐ Van driver	Other	□ 35-50		
☐ MCB ☐ FC	☐ HGV driver	Undefined □	50-60		
3. Description of issue / design feature					
High levels of traffic moment at user worked crossings	increase the chances	of an incident.			
4. User behaviour					
Traffic moment is a measure of the frequency of trains	and utilisation of the	crossing by users.			
Traffic moment = traverses (by user) per day X trains p	er day				
Traine moment = traverses (by user) per day X trains p	or day.				
Research has identified high traffic moment as a feature	•				
56% of crossings surveyed to have traffic moments in versus 12%).	excess of 1000. A hi	gh percentage of th	nese had accident histor	y (44%	
Versus 1270).					
It should be noted that the HSE, Railway Safety Princip					
traffic moment for UWC's or footpath crossings. The c MWL's should be provided on both sides of the crossi			ιττιc moment) is that tele	pnones or	5. Error type
	douge exce				Error type
					☐ Violation
					,
6. Sources of information 6.1 Interview source 6.2 Level crossing	vioit areas	6.3 Document source			6.4 Document details
RAIL INDUSTRY Milton Keyne		RAIL INDUSTRY		OTHER	st/au
□ Network Rail □ ROAD INDUSTRY □ Doncaster	5	☐ HSE/HMRI		TRL (rail)	ar/au
RSSB AA Hertford		Network Rail		TRL (road)	HSE/ra, section E
☐ HSE/HMRI ☐ Bus drivers ☐ Peterborough ☐ RPC ☐ Bedford		☐ RSSB ☐ Railway GS		ndependent Non-UK	
□ BTP □ OTHERS □ Redcar		Others			
Level crossings: communication and Ref 38 Creation date 21.06.2004 L	user behaviou ast modified 02.02.200				davi
Issue					Issue at a level crossing
Visitor parking					
1. Level Crossing type	2. User deta	ils			7
1.1 Protected 1.2 Unprotected	2.1 Level crossing	user type	2.2 Age	2.3 On own	4
☐ AOCL ☐ MCBcctv ☐ UWC ☐ Undef		Motorcyclist	☐ 0-10 ☐ 60+	_ Individual	TOTAL MAN
		Passenger Horserider	☐ 11-15 ☐ Undefined ☐ 16-20	☐ Group ☐ Undefined	
□ ABB		Train driver	20-35	Oridenned	
☐ MG ☐ FP/MWL		Other	35-50)
MCB	☐ HGV driver	Undefined	50-60		The second second
3. Description of issue / design feature			Late and		
The position of visitors parked vehicles at a level crossi	ng may aπect the beh	aviour of other road	a arivers.		
					Bainton Green AHB: Contractors
4. User behaviour					park on the road in front of the crossing. Vehicle drivers
'Visitor' parking refers to those persons using the level maintenance. It differs from <i>Issue 34: Parked cars</i> , as	,		0,	· ·	approaching from the Lolham bridges level crossing are forced
the approach and exit roads of the crossing. Because of the remote position of many level crossings	s neonle tend to drive	their vehicles who	n visiting a level crossing	n The	to drive on the opposite of the road, crossing the double white lines.
location of where the visitor parks their vehicle can influ				g. 111 0	
For example, if they park in the 'long/slow' parking bay influence them to drive straight over the crossing with			vehicles from stopping a	nd therefore	
Parking on the immediate approach or exit to the cross			ve action, such as driving	g into the	5. Error type
middle of the crossing or it may cause blocking-back of		•			⊠ Error ⊠ Violation
The position of their parked vehicle can also block from	i view the warning inf	ormation from othe	r approaching vehicle dr	ivers.	
6. Sources of information 6.1 Interview source 6.2 Level crossing	visit - arose	6.3 Document source			6.4 Document details
■ RAIL INDUSTRY ■ Milton Keyne		RAIL INDUSTRY		OTHER	0.4 Document details
□ Network Rail □ ROAD INDUSTRY □ Doncaster	~	☐ HSE/HMRI	☐ GOVERNMENT ☐ 1	ΓRL (rail)	
RSSB AA Hertford					
HSE/HMRI Rue drivare Deterberacies		☐ Network Rail		TRL (road)	
HSE/HMRI Bus drivers □ Peterborough RPC □ Bedford BTP □ OTHERS □ Redcar		Network Rail RSSB Railway GS Others	☐ DfT (road) ☐ I	TRL (road) ndependent Non-UK	

Level crossings: communication and us Ref 39 Creation date 21.06.2004 Last	ser behaviour issues modified 02.02.2005			davis
Issue				Issue at a level crossing
Crossing utilisation				_
1. Level Crossing type	2. User details			
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age	2.3 On own	
☐ AOCL ☐ MCBcctv ☐ UWC ☐ Undefined		☐ 0-10 ☐ 60+	_ Individual	
□ AOCR □ Undefined □ UWC/T □ ABCL □ UWC/MWL	☐ Farmer ☐ Passenger ☐ Cyclist ☐ Horserider	☐ 11-15 ☐ Undefined ☐ 16-20	☐ Group ☐ Undefined	
☐ AHB ☐ OC	☐ Car driver ☐ Train driver	□ 20-35	Z ondomica	
☐ MG ☐ MCB ☐ FP/MWL ☐ FC	☐ Van driver ☐ Other☐ HGV driver☐ Undefined	35-50 50-60		
3. Description of issue / design feature	And a first second			
Level crossings with high crossing utilisation increases the	erisks to users.			
4. User behaviour				
Research has shown that 100+ pedestrian users equates teffects on utilisation which may not be captured during spe				
numerous visits must be made to each crossing.				
Where there is high pedestrian utilisation, this usually mear	ns the crossing is located as an ac	cess point between places s	such as a	
school, a housing estate, places of work or a local shoppir	ng area. Pedestrians may be using	the crossing a couple of tir	mes a day	
and therefore they are likely to be regular users of the cross				
these crossings, however it can be assumed that with con crossing, resulting in less cautious crossing behaviour. The				
dominant risk factor at level crossings that have previous a	9			
				5. Error type
				Error
				∀iolation
6. Sources of information				
6.1 Interview source 6.2 Level crossing visit	- areas 6.3 Document so	urce		6.4 Document details
RAIL INDUSTRY	⊠ RAIL INDUST		THER	ar/us
Network Rail	☐ HSE/HMRI ☐ Network Rail		RL (rail) RL (road)	HMRI internal report
☐ HSE/HMRI ☐ Bus drivers ☐ Peterborough	⊠ RSSB		ndependent	
☐ RPC ☐ Bedford			lon-l IK	
	Railway GS	Other dept.	ion-orc	
BTP OTHERS Redcar	☐ Railway GS ☐ Others	☐ Other dept. ☐ N		
□ BTP □ OTHERS □ Redcar Level crossings: communication and us	Others	☐ Other dept. ☐ N	or o	davis
□ BTP □ OTHERS □ Redcar Level crossings: communication and us	□ Others	☐ Other dept. ☐ N	or or	Issue at a level crossing
□ BTP □ OTHERS □ Redcar Level crossings: communication and us Ref 40 Creation date 21.06.2004 Last	□ Others	Other dept. N	or o	Issue at a level crossing
□ BTP □ OTHERS □ Redcar Level crossings: communication and us Ref 40 Creation date 21.06.2004 Last Issue Type of trains	ser behaviour issues modified 02.02.2005	Other dept. N		Issue at a level crossing
□ BTP □ OTHERS □ Redcar Level crossings: communication and use Ref 40 □ Creation date 21.06.2004 □ Last Issue	□ Others		2.3 On own	Issue at a level crossing
Level crossings: communication and us Ref 40 Creation date 21.06.2004 Last Issue Type of trains 1. Level Crossing type 1.1 Protected 1.2 Unprotected	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type	2.2 Age	2.3 On own	Issue at a level crossing
Level crossings: communication and us Ref 40 Creation date 21.06.2004 Last Issue Type of trains 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv WWC Undefined AOCR Undefined	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger	22 Age 0-10 060+ 11-15 Undefined	2.3 On own Individual Group	Issue at a level crossing
Level crossings: communication and us Ref 40 Creation date 21.06.2004 Last Issue Type of trains 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T Undefined ABCL UWC/T UWC/TWL	Ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider	2.2 Age 0-10	2.3 On own	Issue at a level crossing
Level crossings: communication and us Ref 40 Creation date 21.06.2004 Last Issue Type of trains 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv WWC Undefined AOCR Undefined	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger	22 Age 0-10 060+ 11-15 Undefined	2.3 On own Individual Group	Issue at a level crossing
□ BTP □ OTHERS □ Redcar Level crossings: communication and us Ref 40	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver	22 Age 0-10 60+	2.3 On own Individual Group	Issue at a level crossing
Level crossings: communication and us Ref 40 Creation date 21.06.2004 Last Issue Type of trains 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T UWC/T ABCL ABCL ABCL AMG FP/MWL	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other	22 Age 0-10 60+ 11-15 Undefined 16-20 20-35 35-50	2.3 On own Individual Group	Issue at a level crossing
Level crossings: communication and us Ref 40 Creation date 21.06.2004 Last Issue Type of trains 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCR Undefined UWC/T ABCL ABCL ABCL AHB AGG AMG AMG AMG AMG AMG AMG AMG AMG AMG	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined	22 Age 0-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60	2.3 On own Individual Group	Issue at a level crossing
Level crossings: communication and use Ref 40 Creation date 21.06.2004 Last Issue Type of trains 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T AOCR Undefined UWC/T ABCL AHB AGC AHB AGG AGG AGG AGG AGG AGG AGG AGG AGG AG	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined	22 Age 0-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60	2.3 On own Individual Group	Issue at a level crossing Lolham Footpath: is used regularly
Level crossings: communication and use Ref 40 Creation date 21.06.2004 Last Issue Type of trains 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T AOCR Undefined UWC/T ABCL AHB AGC AHB AGG AGG AGG AGG AGG AGG AGG AGG AGG AG	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined	22 Age 0-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60	2.3 On own Individual Group	Lolham Footpath: is used regularly by the Peterborough Bird Watching
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Level crossings: communication and us Ref 40 Creation date 21.06.2004 Last Issue Type of trains 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T UWC/T UWC/TWL ABCL UWC/MWL ABCL FC 3. Description of issue / design feature Train lines with high frequency of both freight and passenger 4. User behaviour Both passenger and freight trains using a train line route w	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian	22 Age 0-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60 taking behaviour of users.	2.3 On own Individual Group Undefined	Lolham Footpath: is used regularly by the Peterborough Bird Watching
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Level crossings: communication and us Ref 40	Others Others	2.2 Age 0-10	2.3 On own Individual Group Undefined	Lolham Footpath: is used regularly by the Peterborough Bird Watching Club for access to a local wildlife area. Both freight and passenger
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ssue						Issue at a level crossing
ehicle-activated signs	-					
Level Crossing typ	1.2 Unprotected	2. User deta		2.2 Age	2.3 On own	
AOCL MCBcctv	UWC Und		Motorcyclist	0-10 060+	Individual	
AOCR Undefined	UWC/T	☐ Farmer	☐ Passenger	☐ 11-15 ☐ Undefined	Group	$I \wedge I \cap I$
] ABCL] AHB	UWC/MWL		☐ Horserider ☐ Train driver	☐ 16-20 ☐ 20-35	Undefined	411
MG	FP/MWL		Other	35-50		
MCB	☐ FC	☐ HGV driver	Undefined	<u>50-60</u>		
Description of issu	e / design feature					
er a period of time, veh	icle drivers remain responsi	ve to the specific mess	age given by vehic	le-activated signs.		
						A 40mph vehicle-activated sp
User behaviour						sign.
ample, junctions or ber plays a message relati	rised a range of measures to ds. One method currently ig to the road conditions to abitual nature of vehicle dri	in use at various sites v specific drivers that are	within the UK, are versions are versions.	vehicle-activated signing. cular speed threshold. The	The sign he signs are	
	the road industry that the bessage could also be applie					
ote: vehicle activated siç	ns are due to be tested at v	rarious level crossing sit	tes.			F F
						5. Error type
						☐ Error Violation
Course	Al au					
Sources of information of the source of information of the source of the	ation 6.2 Level crossin	ng visit - areas	6.3 Document sour	ce		6.4 Document details
RAIL INDUSTRY	Milton Keyr	=	RAIL INDUSTR		OTHER	wi/wh
Network Rail	D INDUSTRY Doncaster		☐ HSE/HMRI	☐ GOVERNMENT ☐ 1	ΓRL (rail)	
RSSB ⊠ AA HSE/HMRI □ Bus	drivers Hertford	ah	☐ Network Rail☐ RSSB		TRL (road) ndependent	
RPC	Bedford	g.,	Railway GS		Non-UK	
BTP ⊠ OT⊦	IERS Redcar		Others			
	communication and	d user behaviou				
f 42 Creation						Issue at a level crossing
f 42 Creation						Issue at a level crossing
f 42 Creationsus	n date 24.06.2004	Last modified 02.02.200	05			Issue at a level crossing
f 42 Creationsus Sue Buys of the week Level Crossing type	n date 24.06.2004		nils	2.2 Age	2.3 On own	Issue at a level crossing
f 42 Creation sue ays of the week Level Crossing type Protected	n date 24.06.2004	2. User deta	nils	2.2 Age	2.3 On own	Issue at a level crossing
f 42 Creation Sue lys of the week Level Crossing type Protected AOCL MCBcctv AOCR Undefined	n date 24.06.2004 Pe 1.2 Unprotected UWC ☑ Und UWC/T	2. User deta 2.1 Level crossing efined Pedestrian Farmer	ails guser type Motorcyclist Passenger	0-10 060+ 11-15 Undefined	☐ Individual☐ Group	Issue at a level crossing
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42 Creation ue ys of the week Level Crossing type Protected AOCL MCBcctv AOCR Undefined ABCL AHB MG MCB	1.2 Unprotected 1.2 Unc/T UWC/T UWC/MWL OC FP/MWL FC	2. User deta 2. Level crossing lefined Pedestrian Farmer Cyclist Car driver Van driver	nils guser type Motorcyclist Passenger Horserider Train driver Other	□ 0-10 □ 60+ □ 11-15 □ Undefined □ 16-20 □ 20-35 □ 35-50	☐ Individual☐ Group	Issue at a level crossing
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Level crossings: communication and user behaviour issues Ref 43 Creation date 24.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Suicide 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL MCBcctv ✓ UWC Undefined Pedestrian 0-10 60+ Motorcyclist AOCR ABCL UWC/T UWC/MWL Passenger Undefined Group Undefined Farmer 11-15 Cvclist Horserider 16-20 Undefined AHB MG OC FP/MWL Car driver Train driver 20-35 Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Level crossings are a potential target for use by persons attempting to commit suicide 4. User behaviour With access onto the UK railways, level crossings could be used by persons wanting to committ suicide. This could have a severe impact on both railway employees and passengers. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER hse/tr ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) DfT (road) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) _ HSE/HMRI RSSB Peterborough Independent Bedford RPC Railway GS Other dept Non-UK OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 44 Creation date 24.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Automatic open crossings 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR Undefined UWC/T 11-15 Undefined Farmer Passenger Group ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ☐ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Automatic open level crossings result in increased risk taking behaviour, later in the crossing cycle. 4. User behaviour Automatic open crossings have wigwag lights, but there is no physical barrier that closes the road off to traffic during the activated warning system. Without a barrier present, vehicle drivers or pedestrians can quite easily choose to violate the crossing procedures. A higher percentage of vehicle drivers cross AOCL's at between 20 and 40 seconds after the warning system has been activated, a time at which they are at a greater chance of being hit by a train. This is often due to vehicle drivers becoming agitated at the time required to wait at the lights and perceiving there to be time available to cross before the train arrives, or that the system is faulty, resulting in users crossing later in the crossing cycle. Without a barrier present, vehicle drivers can also move past a point of safety and look for oncoming trains more easily than when a barrier is present. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source Milton Keynes RAIL INDUSTRY RAIL INDUSTRY ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford IndependentNon-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) RPC Railway GS Bedford Other dept

Others

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OTHERS

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Level crossings: communicati Ref 45 Creation date 26.08.2004	on and user behaviou Last modified 02.02.200				day
ssue					Issue at a level crossing
Animals: Horses					
1. Level Crossing type	2. User deta	ils			
.1 Protected 1.2 Unprotected			2.2 Age	2.3 On own	
AOCL MCBcctv UWC		Motorcyclist	□ 0-10 □ 60+	☐ Individual	
AOCR Undefined UWC/T	☐ Farmer	Passenger	☐ 11-15 ☐ Undefin	ed Group	
ABCL WC/MWL		Horserider	16-20	□ Undefined	
☑ AHB ☐ OC ☐ MG ☐ FP/MWL		Train driver Other	20-35 35-50		
MCB FC		Undefined	☐ 50-60		
B. Description of issue / design feature	re				
Activated warnings at level crossings may re		horses and influence	e the behaviour of of	ther road	
rehicle users.	Suit in unaconable benaviour by	moroco, and initiative	o the behaviour of or	anor roud	
I. User behaviour					
Activated crossings used as access by horse alarms can affect the behaviour of horses or	the approach to and while waiti	ing at the level cross			
noving across the crossing or along the train	n lines during the activated warn	ning system.			
Normal courteous behaviour exhibited by the	e maiority of vehicle drivers are o	often not followed wi	hen approaching a cr	rossina beina	
used by horses. The vehicle driver not want the horse and result in the horse failing to re-	ting to risk being caught at the c	rossing, continues to			
evel crossings located on-route to local sta			s and riders using the	e crossing.	
					5. Error type
					☐ Error
					∀iolation
6. Sources of information					
	evel crossing visit - areas	6.3 Document source			6.4 Document details
	lilton Keynes	RAIL INDUSTRY		OTHER	
Network Rail 🔲 ROAD INDUSTRY 🔲 Do	oncaster	☐ HSE/HMRI	GOVERNMENT	TRL (rail)	
	ertford	Network Rail		TRL (road)	
	eterborough edford	RSSB		Independent	
_ 1 0				Non-LIK	
	edcar	Railway GS		Non-UK	
□ BTP	on and user behaviou	□ Others	3,000	」Non-UK	
Level crossings: communicating Great 46 Creation date 24.06.2004	edcar	□ Others		Non-UK	day of a load was in
Level crossings: communicati Ref 46 Creation date 24.06.2004 ssue	on and user behaviou	□ Others		Non-UK	Issue at a level crossing
Level crossings: communications of the description	on and user behaviou Last modified 02.02.200	others r issues		Non-UK	Issue at a level crossing
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Level crossings: communications of the day to all Gates open for short periods of the day to all Gates open for short periods of the day to Only one gate closed for the purposes of forossings. It is suggested that following the migeneral, users perceive the process for crossings. It is suggested that following the migeneral, users perceive the process for crossings. It is suggested that following the migeneral, users perceive the process for crossings. It is suggested that following the migeneral, users perceive the process for crossings. It is suggested that following the migeneral, users perceive the process for crossings. It is suggested that following the migeneral, users perceive the process for crossings. It is suggested that following the migeneral, users perceive the process for crossings. It interview source 6.2 Levilla 1.	Last modified 02.02.200 Last modified 02.02.200 2. User deta 2.1 Level crossing Pedestrian Farmer Qyclist Car driver Van driver HGV driver HGV driver re re rollowing a procedure of crossin daccommodate shorter visits, suctending off the owner's land; nting to reduce the amount of tiron; correct crossing procedure. gate procedures, when their wo correct procedures for gate operations of the operation of the	ils user type Motorcyclist Passenger Horserider Train driver Other Undefined gthe tracks five time tes open. Reasons places of work either ch as deliveries to a me they are exposed which are they are they are they are they are they are	22 Age 0-10 0+0+ 11-15 Undefin 16-20 20-35 35-50 50-60 des, is a factor in why for this behaviour are raide of the crossing farm; If to the weather; If require them to und ay hinder their work pof crossing which is a	2.3 On own Individual Group Undefined gates are left e: g; ertake multiple progress. regarded as	5. Error type □ Error ☑ Violation 6.4 Document details
Level crossings: communications of the process of the day to all Gates open for short periods of the day to all Gates open for periods of the day to all Gates open for periods of the day to all Gates open for periods of the day to all Gates open for periods of the day to all Gates open for periods of the d	Last modified 02.02.200 Last modified 02.02.200 2. User deta 2.1 Level crossing Pedestrian Farmer Qyclist Car driver HGV driver HGV driver re re rollowing a procedure of crossing ow easier access to homes and accommodate shorter visits, sucfencing off the owner's land; nting to reduce the amount of tiron; correct crossing procedure. gate procedures, when their wo correct procedures, when their wo correct procedures for gate oper opsing correctly as complex, consistency of the oper oper oper oper oper oper oper ope	Ir issues Is user type Motorcyclist Passenger Horserider Train driver Other Undefined The tracks five time tes open. Reasons places of work either that as deliveries to a me they are exposed Train and closing management of the tracks five time.	22 Age 0-10 60+ 11-15 Undefin 16-20 20-35 35-50 50-60 des, is a factor in why 15 to the weather; 15 to the weather; 16 to the weather; 17 to the weather; 17 to the weather; 18 to the weather; 19 to the weather;	2.3 On own Individual Group Undefined gates are left e:	5. Error type ☐ Error ☑ Violation
Level crossings: communications of the day to allogates open for short periods of the day to allogates open for short periods of the day to Only one gate closed for the purposes of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for short periods of the day to All Gates open for periods of the day to All Ga	Con and user behavious Last modified 02.02.200 2. User deta 2.1 Level crossing Farmer Cyclist Van driver HGV driver re I following a procedure of crossing ow easier access to homes and accommodate shorter visits, sucfencing off the owner's land; ning to reduce the amount of time on; correct crossing procedure. If gate procedures, when their wo correct procedures, when their wo correct procedures for gate open ossing correctly as complex, consistenciates of the consistence of the c	Ir issues Is user type Motorcyclist Passenger Horserider Train driver Other Undefined The tracks five time tes open. Reasons places of work either thas deliveries to a me they are exposed The tracks five time the solution of the tracks five time the sol	2.2 Age O-10 O+0+ I1-15 OHndefin I6-20 O-35 O-60 Des, is a factor in why for this behaviour are raide of the crossing farm; If to the weather; If to the weather; If require them to und any hinder their work professing which is a considerable of crossing which is a considerable o	2.3 On own Individual Group Undefined Individual Group Undefined Individual Group Individual Indi	5. Error type Error Violation 6.4 Document details hu/hu ar/us tth/me
Level crossings: communications and the second seco	Car driver Undefined Undefined Undefined Car driver HGV driver Te I following a procedure of crossin defencing off the owner's land; niting to reduce the amount of tiron; correct crossing procedure. I gate procedures, when their wo correct procedures for gate open cossing correctly as complex, conserved crossing visit - areas liliton Keynes oncaster	ils user type Motorcyclist Passenger Horserider Train driver Other Undefined Test open. Reasons places of work either ch as deliveries to a me they are exposed which are they are th	22 Age 0-10 60+ 11-15 Undefin 16-20 20-35 35-50 50-60 Des, is a factor in why for this behaviour and arrived are side of the crossing farm; If to the weather; If to the weather; If to the weather; If to the weather to und any hinder their work professing which is a continuous profession pr	2.3 On own	5. Error type □ Error □ Violation 6.4 Document details hu/hu ar/us

Level crossings: communication and user behaviour issues Ref 47 Creation date 28.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Violations at MWL 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ☐ MCBcctv UWC Undefined Pedestrian 0-10 60+ Motorcyclist UWC/T UWC/MWL Passenger Undefined AOCR Undefined Farmer 11-15 Group ABCL Cvclist Horserider 16-20 Undefined AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined **HGV** driver 3. Description of issue / design feature Over estimation of warning time and underestimation of crossing leads to risk taking behaviour. 4. User behaviour A suggestion of why crossing violations are likely to occur is provided by those users who say they would consider violating a red warning light. A combination of underestimating their crossing time and overestimating the time between the warning onset and train arrival indicates that users feel they have time to make the violation 'safely'. The research suggests, the user is more likely to make a crossing if they believe they have more time than the actual warning time. Of those that would consider violating a red light at a UWC/MWL, car and truck drivers regularly underestimated how long it would take to complete the full crossing procedure. 80% of vehicular users were observed to take longer to complete the crossing procedure than the actual allocated crossing time. 5. Error type Users are underestimating the level of risk associated with violating the crossing procedures. Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER hu/hu ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) DfT (road) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) _ HSE/HMRI RSSB Peterborough Independent RPC Bedford Railway GS Other dept Non-UK OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 48 Creation date 30.06.2004 Last modified 02.02.2005 Issue Issue at a level crossing Observation of amber light 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Group Farmer ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ⋈ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature The length of activation time of the amber light has little affect on the behaviour of the vehicle driver. 4. User behaviour Once the crossing closure procedure has been activated, the amber light of the road traffic lights immediately shows for approximately 3 seconds. After this period, the intermittent red lights immediately show. Vehicle drivers approaching the level crossing often continue to drive through the amber light stage. The length of time the light is activated for provides vehicle drivers with limited viewing time to react and stop prior to the crossing. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford ☐ Independent☐ Non-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road)

Railway GS

Others

Other dept

Bedford

RPC

BTP

Ref 49	Creation date 30.06	5.2004 Last m	nodified 02.02.2005	5			davis
Issue							Issue at a level crossing
Road access							
1. Level Crossi 1.1 Protected	ing type 1.2 Unpr	rotected	2.1 Level crossing		2.2 Age	2.3 On own	
AOCL	fined UWC	_	☐ Farmer ☐ Cyclist ☐ Car driver ☐ Van driver ☐	Motorcyclist Passenger Horserider Train driver Other Undefined	□ 0-10 □ 60+ □ 11-15 ⋈ Undefined □ 16-20 □ 20-35 □ 35-50	☐ Individual☐ Group☐ Undefined	
	of issue / design	footuro	HGV driver	_ Undelined	50-60		
-			r side of the cross	ing influences the r	isk taking behaviour of	vehicle	
drivers.							
behaviour. Know	ing level crossings th	at the crossing for so			e area, may increase the to seek an alternative		
							5. Error type
							Error
							☑ Violation
6. Sources of i 6.1 Interview source	information	6.2 Level crossing visit -	areas	6.3 Document source			6.4 Document details
RAIL INDUSTRY		☐ Milton Keynes		RAIL INDUSTRY		OTHER	
Network Rail RSSB HSE/HMRI RPC BTP	☐ ROAD INDUSTRY ☐ AA ☐ Bus drivers ☐ OTHERS	Doncaster Hertford Peterborough Bedford Redcar		HSE/HMRI Network Rail RSSB Railway GS Others	DfT (rail) DfT (road)	TRL (rail) TRL (road) Independent Non-UK	
Ref 50	ngs: communi	cation and us 5.2004 Last m	er behaviou nodified 02.02.200				Issue at a level crossing
Passenger drop-	off points						
1. Level Crossi 1.1 Protected	•		2. User detai		00.4	0.00	450
AOCL MCBc AOCR Undet ABCL AHB	fined UW0	C Undefined	☐ Farmer ☐ Cyclist	Motorcyclist Passenger Horserider Train driver	2.2 Age 0-10	2.3 On own Individual Group Undefined	
⊠ MG ⊠ MCB		MWL		Other Undefined	☐ 35-50 ☐ 50-60		
3. Description of	of issue / design				ur of traffic approaching	g a crossing.	Roydon CCTV: vehicle drivers
4. User behavio	our						parking before the level crossing to drop passengers off for the
short periods of tir	me to allow their pas		hicle. This results	s in traffic flow prob	nent, close to the level lems over the level cro redures.		train station. On many occasions, other vehicle drivers were observed driving onto the opposite side of the road, just prior to the crossing and ahead of oncoming traffic, to avoid the parked vehicles.
							5. Error type
							☐ Error ☐ Violation
6. Sources of i 6.1 Interview source	Information	6.2 Level crossing visit -	areas	6.3 Document source			6.4 Document details
□ RAIL INDUSTRY □ Network Rail □ RSSB □ HSE/HMRI □ RPC □ BTP	ROAD INDUSTRY AA Bus drivers OTHERS	Milton Keynes Doncaster Hertford Peterborough Bedford Redcar		RAIL INDUSTRY HSE/HMRI Network Rail RSSBRailway GS Others	GOVERNMENT DfT (rail) DfT (road)	OTHER TRL (rail) TRL (road) Independent Non-UK	

Level crossings: communication and user behaviour issues

Level crossings: comm Ref 51 Creation date		modified 02.02.2005			dav
ssue					Issue at a level crossing
See-through effect					
1. Level Crossing type		2. User details			
	Unprotected	2.1 Level crossing user type	2.2 Age	2.3 On own	
	UWC Undefined UWC/T	☐ Pedestrian ☐ Motorcyclist☐ Farmer ☐ Passenger	t 0-10 060+	Individual Group	
⊠ ABCL	UWC/MWL	☐ Cyclist ☐ Horserider	☐ 16-20	☐ Undefined	
	OC FP/MWL	☐ Car driver ☐ Train driver ☐ Van driver ☐ Other	20-35 35-50		
	FC	☐ HGV driver ☐ Undefined	50-60		
3. Description of issue / des	gn feature				
Level crossing located in a dip or	on a brow of a long strain	ght road may result in increases	s of red-light running.		
4. User behaviour					
The see-through effect is an estab					
therefore fail to respond with the r and road traffic lights, where the r					
traffic lights continue to drive strai					
to see any lights at all.			•		
This effect is also an issue for vehi	ele drivers approaching :	a level crossing. As the vehicle	driver looks ahead the ra	ail line and	
surrounding crossing information					
road, resulting in the vehicle drive	fixating their vision furth	ner along the road. The driver u	nintentionally misses the	information	
regarding the level crossing.					5. Error type
					⊠ Error
					☐ Violation
6. Sources of information					
6.1 Interview source	6.2 Level crossing visit	- areas 6.3 Document	source		6.4 Document details
RAIL INDUSTRY	Milton Keynes	RAIL INDU		OTHER	trl/ar
Network Rail	ΓRY □ Doncaster □ Hertford	☐ HSE/HMRI ☐ Network F		☐ TRL (rail) ☐ TRL (road)	
☐ HSE/HMRI ☐ Bus drivers	☐ Peterborough	☐ RSSB	☐ DfT (road)	Independent	
☐ RPC ☐ BTP ○ OTHERS	☐ Bedford ☐ Redcar	Railway G	S Other dept.	☐ Non-UK	
		JL			
_evel crossings: comm Ref 52 Creation date		JL			dav
		ser behaviour issues			Issue at a level crossing
Ref 52 Creation date	30.06.2004 Last r	ser behaviour issues			Issue at a level crossing
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type	30.06.2004 Last r	ser behaviour issues modified 02.02.2005 2. User details			Issue at a level crossing
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.2	00.06.2004 Last r	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type	2.2 Age	2.3 On own	Issue at a level crossing
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.3 AOCL MCBcctv	acilities Unprotected UWC Undefined	ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type Pedestrian Motorcyclist	t 0-10 060+	☐ Individual	Issue at a level crossing
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined	Collities Unprotected UWC UNC/T UWC/T UWC/MWL	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Horserider	t 0-10	☐ Individual	
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.3 AOCL MCBcctv AOCR Undefined ABCL AHB	Collities Unprotected UWC UNC/TUWC/MUL OC	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver	t 0-10	Individual Group	
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.2 A AOCL MCBcctv A AOCR Undefined ABCL AHB MG	Collities Unprotected UWC UNC/T UWC/T UWC/MWL	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Horserider	t 0-10	Individual Group	
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.3 AOCL MCBcctv AOCR Undefined ABCL AHB MG MCB	Collities Unprotected UWC UNC/TUWC/TWUL OC FP/MWL FC	Ser behaviour issues modified 02.02.2005 2. User details 2.1 Level crossing user type	t	Individual Group	
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.3 AOCL MCBcctv AOCR Undefined ABCL AHB MG MCB MCB 3. Description of issue / des	Collities Unprotected UWC UNC/TUWC/TUWC/MWL OC FP/MWL FC gn feature	Ser behaviour issues	t	Individual Group	
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG	Collities Unprotected UWC UNC/TUWC/TUWC/MWL OC FP/MWL FC gn feature	Ser behaviour issues	t	Individual Group	
Ref 52 Creation date SSUE HGV drivers using rail station f Level Crossing type 1.1 Protected 1.2 AOCL	Collities Unprotected UWC UNC/TUWC/TUWC/MWL OC FP/MWL FC gn feature	Ser behaviour issues	t	Individual Group	St.Margarets CCTV: a HGV driver parked in front of the station. The
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected AOCR MCBcctv AOCR Undefined ABCL AHB MG MG MCB 3. Description of issue / des The effectiveness of information is	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver
Ref 52 Creation date SSUE HGV drivers using rail station f Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG MG MCB MG MCB The effectiveness of information is 4. User behaviour	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked
Ref 52 Creation date SSUE HGV drivers using rail station f Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG MG MCB MCB MCB Comparison of issue / des The effectiveness of information is 4. User behaviour Information signs and warning light Information signs and warning lig	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from
Ref 52 Creation date SSUE HGV drivers using rail station f Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG MG MCB MCB MCB He effectiveness of information is 4. User behaviour Information signs and warning lighter Creation date Creation date	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected AOCL MCBcctv AOCR Undefined ABCL AHB MG MCB MCB 3. Description of issue / des The effectiveness of information is 4. User behaviour Information signs and warning light	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected AOCL MCBcctv AOCR Undefined ABCL AHB MG MCB MCB 3. Description of issue / des The effectiveness of information is 4. User behaviour Information signs and warning light	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from
Ref 52 Creation date SSUE HGV drivers using rail station f Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG MG MCB MCB MCB He effectiveness of information is 4. User behaviour Information signs and warning lighter Creation date Creation date	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from
Ref 52 Creation date SSUE HGV drivers using rail station f Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG MG MCB MCB MCB He effectiveness of information is 4. User behaviour Information signs and warning lighter Creation date Creation date	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from
Ref 52 Creation date SSUE HGV drivers using rail station f Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG MG MCB MCB MCB He effectiveness of information is 4. User behaviour Information signs and warning lighter Creation date Creation date	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from approaching traffic.
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected AOCL MCBcctv AOCR Undefined ABCL AHB MG MCB MCB 3. Description of issue / des The effectiveness of information is 4. User behaviour Information signs and warning light	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from approaching traffic. 5. Error type
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG MG MCB 3. Description of issue / des The effectiveness of information is 4. User behaviour Information signs and warning lightstation facilities.	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from approaching traffic. 5. Error type Error
Ref 52 Creation date SSUE HGV drivers using rail station f Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG MG MCB MCB MCB He effectiveness of information is 4. User behaviour Information signs and warning lighter Creation date Creation date	Collities Unprotected UWC UWC/T UWC/T UWC/MWL CC FP/MWL FC gn feature reduced by HGV drivers	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60	fined	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from approaching traffic. 5. Error type Error
Ref 52 Creation date SSUE HGV drivers using rail station f 1. Level Crossing type 1.1 Protected 1.2 AOCL MCBcctv AOCR Undefined ABCL AHB MG MG MCB 3. Description of issue / des The effectiveness of information is 4. User behaviour Information signs and warning light station facilities.	Co.06.2004 Last rocalities Unprotected UWC UNDEFINATION UNDEFINATION OC FP/MWL FC gn feature reduced by HGV drivers ts can be blocked from the control of the control	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Van driver Other HGV driver Undefined s parking in front of signs and w the view of approaching traffic to	t 0-10 60+ 11-15 Unde 16-20 20-35 35-50 50-60 source Unde	ined Individual Group Undefined Heart Heart	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from approaching traffic. 5. Error type Error Violation
Ref 52 Creation date SSUE HGV drivers using rail station f Level Crossing type 1.1 Protected	Co.06.2004 Last rocalities Unprotected UWC UNDEFINATION UNDEFINATION OC FP/MWL FC gn feature reduced by HGV drivers ts can be blocked from the control of the control	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Other HGV driver Undefined s parking in front of signs and w	o-10	ined Individual Group Undefined Individual Group Undefined Individual Individual	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from approaching traffic. 5. Error type Error Violation
Ref 52 Creation date SSUE	Co.06.2004 Last reconstruction in the control of th	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined s parking in front of signs and w the view of approaching traffic to	source JSTRY GOVERNMENT GOVERNMENT GOUTE GOVERNMENT GOUTE GOVERNMENT GOUTE GOVERNMENT GOUTE GOVERNMENT GOUTE GOVERNMENT GOUTE G	ined Individual Group Undefined Heart Heart	St.Margarets CCTV: a HGV driver parked in front of the station. The driver vehicle completely blocked the view of the warning light from approaching traffic. 5. Error type Error Violation

Level crossings: communication and us Ref 53 Creation date 30.06.2004 Last n	er behaviour issues nodified 02.02.2005			davis
Issue				Issue at a level crossing
Events				
1. Level Crossing type	2. User details			
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age	2.3 On own	
	□ Pedestrian	0-10	☐ Individual☐ Group☐ Undefined☐	BURGHLEV HORSE TRIALS
MCB □ FC	☐ HGV driver ☐ Undefined	50-60		
3. Description of issue / design feature				
Events increase the amount of irregular users at level cross	ngs.			
4. User behaviour				Helpston: the Burghley horse trials are held for a few days each September. Horse-trailers,
Events can attract enormous increases in visitors to an area Visitors may be needing to arrive at their destination at a pa wanting to avoid any further delays by being held at a cross The general increase in vehicle and pedestrian traffic also a when visitors may have additional vehicle equipment, such	rticular time or have a had a long an sing. This may result in increased ri ffects the flow of traffic on the level o	d difficult journey, resultir sk taking behaviour by th	in users ese users.	caravans and the overall increase in local traffic cause blocking-back and result in increased risk taking behaviour at the Helpston crossing.
				5. Error type Serror Violation
6. Sources of information	60 Pariment	_		O A De sum out detelle
6.1 Interview source 6.2 Level crossing visit - ☐ RAIL INDUSTRY ☐ Milton Keynes	areas 6.3 Document source		THER	6.4 Document details
NALINDUSTRY	HSE/HMRI Network Rail RSSB Railway GS Others	☐ GOVERNMENT ☐ T ☐ DfT (rail) ☐ T ☐ DfT (road) ☐ Ir	RL (rail) RL (road) Idependent on-UK	
Level crossings: communication and us Ref 54 Creation date 27.08.2004 Last n	er behaviour issues nodified 02.02.2005			davi
ssue				Issue at a level crossing
Narrow roads				
1. Level Crossing type	2. User details			ALC 4350
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age	2.3 On own	-
	□ Pedestrian □ Farmer □ Passenger □ Cyclist □ Horserider □ Car driver □ Van driver □ HGV driver □ Undefined	0-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60	☐ Individual☐ Group☐ Undefined	
3. Description of issue / design feature				Apply Vigor
Narrow roads before and after the level crossing may result	in vehicle drivers slowing and stopp	oing while on the level cro	ssing.	
		9	9-	Lally and OOTM bally added of the
4. User behaviour				Lolham CCTV: both sides of this crossing are accessed by a single
Narrow roads before and after the crossing affect the traffic crossing, they may have to slow to accommodate the narro have to wait for some time before they can move off from the control of the contro	ow road or stop to allow oncoming v			road. Passing points are provided further along the road and vehicle drivers move slowly or stop on the crossing to accommodate for oncoming traffic.
The road infrastructure around the crossing could further in force the level crossing users to have to wait for longer peri to jump the red lights to avoid having to wait.				Stopping on the crossing occurs more often during rush hours.
				5. Error type
				☐ Error ☐ Violation
6. Sources of information 6.1 Interview source 6.2 Level crossing visit	areas 6.3 Document source	Α		6.4 Document details
RAIL INDUSTRY Milton Keynes	RAIL INDUSTRY		THER	0.7 Document details
Network Rail	☐ HSE/HMRI ☐ Network Rail ☐ RSSB	☐ GOVERNMENT ☐ T ☐ DfT (rail) ☐ T	RL (rail) RL (road) dependent	
☐ RPC ☐ BETP ☐ OTHERS ☐ Bedford ☐ Redcar	Railway GS Others		on-UK	

Level crossings: communication and user behaviour issues Ref 55 Creation date 27.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Contractors 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ☑ UWC Undefined Pedestrian 0-10 Motorcyclist 60+ UWC/T UWC/MWL Passenger Undefined Group AOCR Undefined Farmer 11-15 ABCL Cvclist Horserider 16-20 Undefined AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Landowners failure to inform new contractors of the procedures and restrictions for using their vehicles across the level crossing may increase the risk of an incident. Landowners should always inform new contractors of the restrictions and any implications for using vehicles over the level crossing to gain access to their land. Users not fully aware of the restrictions the level crossing imposes on their vehicles, may experience problems when traversing the crossing. For example, while transporting goods they may not be aware of restrictions on vehicle size and therefore unable to manoeuvre their vehicle easily or without creating an obstruction on the crossing. In Scotland, crossings only previously used by the forestry commission are now being used by contractors, because of the rapid development of wind farms in recent years, bringing contractors into areas that require the use of UWC. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER HMRI internal report ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB DfT (road) Peterborough Independent Bedford RPC Railway GS Other dept Non-UK OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 56 Creation date 27.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Location near major roads 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own Undefined AOCL MCBcctv UWC Pedestrian Motorcyclist 0-10 60+ Individual AOCR Undefined UWC/T 11-15 Undefined Passenger Group Farmer ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 FC HGV driver Undefined 50-60 3. Description of issue / design feature The risk of vehicle drivers blocking-back over the level crossing, or general risk taking behaviour is increased when the crossing is located on roads with direct access to major roads or motorways. Long traffic queues onto and off of major roads and motorways result in queues forming on either side of the level crossings. While the crossing is open to road traffic, users do not wait for traffic to exit the other side before progressing across, therefore creating a queue of traffic over the crossing. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes HMRI internal report ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford ☐ Independent☐ Non-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road)

Railway GS

Others

Other dept

Bedford

RPC

BTP

Level crossings: communication and us Ref 57 Creation date 27.08.2004 Last r	ser behavious modified 02.02.2005				davi
Issue					Issue at a level crossing
Traffic calming systems					
1. Level Crossing type 1.1 Protected 1.2 Unprotected	2. User detai	-			- No. 400
1.1 Protected 1.2 Unprotected ☑ AOCL ☑ MCBcctv ☐ UWC ☐ Undefined	2.1 Level crossing u	Motorcyclist	2.2 Age	2.3 On own	3 34
ACCE	☐ Farmer	Passenger	11-15 Undefine	ed Group	
ABCL		Horserider Train driver	☐ 16-20 ☐ 20-35	□ Undefined	AL ALLESSA
☐ MG ☐ FP/MWL		Other	35-50		
MCB □ FC		Undefined	50-60		
3. Description of issue / design feature					
Road traffic calming systems on the approaches to a level of	crossing may incre	ase the risk of vehi	cles blocking-back.		Helpston signal box: signallers
4. User behaviour					discouraged the installation of
Traffic calming systems positioned on the approach roads to onto the crossing.	to a level crossing	may increase the r	sk of vehicle drivers b	locking-back	more traffic calming islands on the eastside approach to the Helpston level crossing because of
While the crossing is active, and the road closed to traffic, the traffic islands, so they are located in a stationary position traffic again, oncoming vehicles cannot continue along the creates slow moving traffic and momentarily causes vehicles.	on on the opposite road because of o	side of the road. ther vehicles posit	When the road is then	opened to	blocking-back already caused by islands situated on the westside approach.
					5. Error type
					Error type
					☑ Violation
6. Sources of information					
6.1 Interview source 6.2 Level crossing visit	- areas	6.3 Document source			6.4 Document details
RAIL INDUSTRY Milton Keynes		☐ RAIL INDUSTRY		OTHER	HMRI internal report
☐ Network Rail ☐ ROAD INDUSTRY ☐ Doncaster		☐ HSE/HMRI		TRL (rail)	· ·
☐ RSSB ☐ AA ☐ Hertford ☐ HSE/HMRI ☐ Bus drivers ☐ Peterborough		□ Network Rail□ RSSB		TRL (road) Independent	
RPC Bedford		Railway GS		Non-UK	
☐ BTP ☐ OTHERS ☐ Redcar		Others			
Level crossings: communication and us Ref 58 Creation date 27.08.2004 Last r	ser behaviou				davi
Issue					Issue at a level crossing
Diversification in farming					
1. Level Crossing type	2. User detai	le			
1.1 Protected 1.2 Unprotected	2.1 Level crossing u		2.2 Age	2.3 On own	
□ AOCL □ MCBcctv □ UWC □ Undefined		Motorcyclist	□ 0-10 □ 60+	☐ Individual	
☐ AOCR ☐ Undefined ☐ UWC/T	☐ Farmer	Passenger	☐ 11-15 ☐ Undefine	ed 🗌 Group	
☐ ABCL ☐ UWC/MWL ☐ OC		☐ Horserider ☐ Train driver	☐ 16-20 ☐ 20-35		
☐ MG ☐ FP/MWL	☐ Van driver ☐	Other	□ 35-50		
☐ MCB ☐ FC	☐ HGV driver	Undefined	50-60		
3. Description of issue / design feature					
Diversification in farming increases public access to user-w	orked crossings.				
4. User behaviour					
Farming is changing the use of its land to ensure the surviv	,	•	•	•	
methods, many are encouraging the public to access their However, members of the public are using UWC to access			· ·		
users to be informed of how to correctly use these crossin which relies upon the user to take full responsibility in oper procedures.	igs. This results is	many untrained us	sers passing through a	a crossing	
t is also resulting in additional vehicles using UWC, including	ng vehicles comple	etely unsuitable for	certain crossings.		
					5. Error type
					Error
					Violation
6. Sources of information					
6.1 Interview source 6.2 Level crossing visit	- areas	6.3 Document source			6.4 Document details
☐ Milton Keynes		RAIL INDUSTRY			HMRI internal report
Network Rail		□ HSE/HMRI □ Network Rail		TRL (rail) TRL (road)	
☐ HSE/HMRI ☐ Bus drivers ☐ Peterborough		RSSB		IRL (road) Independent	
⊠ RPC □ Bedford		Railway GS		Non-UK	
☐ BTP ☐ OTHERS ☐ Redcar		Others			II.

Level crossings: communication and user behaviour issues Ref 59 Creation date 27.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Foreign vehicle drivers 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL UWC Undefined Pedestrian 0-10 60+ Motorcyclist AOCR ABCL Passenger Undefined Undefined UWC/T Farmer 11-15 Group UWC/MWL Cvclist Horserider 16-20 Undefined AHB MG OC FP/MWL Car driver Train driver 20-35 Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Areas with high levels of foreign vehicle drivers may result in increased decision making errors at level crossings. This may be more evident during seasonal periods. Other countries have alternative measures in place for controlling access across level crossings and require different procedures to be followed. Vehicle drivers are unlikely to be familiar with UK procedures and they may also have some difficulty in correctly interpreting written information. This is particularly prevalent in areas with high volumes of continental HGV drivers. Although they are legally required to be aware of the rules and procedures for using UK crossings, it is unlikely that all foreign HGV drivers will be aware of these. This may result in them failing to make any necessary calls to a signaller if their vehicle is too long or slow for passing over a crossing without previously obtaining permission. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER HMRI internal report ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB DfT (road) Peterborough Independent Bedford RPC Railway GS Other dept Non-UK OTHERS 🛛 BTF Redcar Others Level crossings: communication and user behaviour issues Ref 60 Creation date 27.08.2004 Last modified 13.01.2005 Issue Issue at a level crossing **Bus stops** 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Group Farmer ☐ ABCL ⊠ AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ☐ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Unofficial bus stops in the level crossing lay-by, affects the behaviour of large or slow vehicle drivers. 4. User behaviour A lay-by is often provided at the approach and exit of AHB's, so vehicles required to call the signaller for permission to cross, can park clear of the crossing However, the lay-by is often used as an unofficial bus stop, sometimes preventing large or slow vehicles from stopping, forcing them to continue across the crossing without calling the signaller. These unofficial bus stops can arise for various reasons, such as: The lay-by is closer to bus users' homes than the official bus stop, and users make a request for the bus driver to stop in the lav-bv: The bus company is temporarily using the lay-by because roadworks have blocked the official bus stop; The local council have allocated the lay-by as an official stop. 5. Error type Error Violation 6. Sources of information 6.4 Document details 6.1 Interview source 6.2 Level crossing visit - areas 6.3 Document source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Hertford Network Rail DfT (rail) TRL (road) HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) Independent

Railway GS

Others

Other dept

Bedford

Redcar

RPC

BTP

OTHERS

☐ Non-UK

Level crossi	Creation date 27.0	3.2004 Last m	nodified 02.02.200	5				G
ssue								Issue at a level crossing
rossing surface	e							
Level Cross	•		2. User detail					14 15
AOCL MCE		rotected Undefined	2.1 Level crossing Pedestrian	Motorcyclist	2.2 Age	60+	.3 On own	
AOCR Unde	lefined 🗵 UW	C/T	□ Farmer □	Passenger	11-15	Undefined	Group	
ABCL AHB	⊠ UW	C/MWL		⊠ Horserider ⊠ Train driver	☐ 16-20 ☐ 20-35		Undefined	XXXXXXXX
MG	⊠ FP/	MWL	✓ Van driver	Other	35-50			
MCB	. FC		☐ HGV driver	Undefined	50-60			
•	of issue / design pery level crossing sur		octoptial bazard to	those using the or	roccina			
ieven and slipp	bery level crossing sui	race may present a p	oterilar nazaru to	those using the ci	rossing.			
User behavi	iour							Woburn Sands: the crossing surface was heavily worn in pa at this level crossing.
arefully at where orseriders, elder	urfaces increases the ce they are stepping ar rly, visually or physica I as a hazard to trains	d this may also increally impaired crossing	ase user crossing	time. It may prese	ent particular pr	oblems for	cyclists,	
								5. Error type
								☐ Error ☐ Violation
Sources of	information							
Interview source		6.2 Level crossing visit -	areas	6.3 Document source		F-4	150	6.4 Document details
RAIL INDUSTRY Network Rail	✓ □ ROAD INDUSTRY	☐ Milton Keynes ☐ Doncaster		RAIL INDUSTRY HSE/HMRI	/ ☐ GOVERNMI	⊠ OT ENT □ TR	HER L (rail)	HMRI internal report
RSSB	\square AA	Hertford		Network Rail	□ DfT (rail)	☐ TR	L (road)	bi/hu
HSE/HMRI RPC	Bus drivers	☐ Peterborough			DfT (was and)	V 1		
BTP		Bedford		☐ RSSB ☐ Railway GS	☐ DfT (road) ☐ Other dept		lependent n-UK	sp/fa
	OTHERS			⊠ RSSB				sp/fa
evel crossi	OTHERS ings: commun Creation date 27.0	Bedford Redcar	er behaviou nodified 02.02.200	RSSB Railway GS Others				
evel crossi ef 62 <mark>sue</mark>	ings: commun	Bedford Redcar		RSSB Railway GS Others				Issue at a level crossing
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evel crossi ef 62 sue oadworks Level Cross 1 Protected	ings: commun Creation date 27.0 sing type 1.2 Unp Bcctv	ication and us 3.2004 Last m	2. User detail	RSSB Railway GS Others T issues Mils User type Motorcyclist	2.2 Age	2 60+ □	.3 On own	
evel crossi of 62 sue oadworks Level Cross I Protected AOCL MCE AOCR Unde	ings: commun Creation date 27.0 sing type 1.2 Unp Bcctv efined UW	ication and use 3.2004 Last m	2. User detail 2.1 Level crossing Pedestrian Farmer	RSSB Railway GS Others Trissues Motorcyclist Passenger	2.2 Age	z. No	.3 On own Individual Group	Issue at a level crossing
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evel crossi ef 62 sue oadworks Level Cross I Protected AOCR Under ABCL AHB MG MCB MCB MCB AOCR OB AOCR ABCL AHB MG MCB AOCR OB AOCR ABCL AHB MG MCB AOCR ABCL AHB MG AOCR ABCL AHB MG MCB AOCR ACC ACC ACC ACC ACC ACC ACC ACC ACC A	ings: commun Creation date 27.0 sing type 1.2 Unp Bcctv UW	rotected C/T Undefined C/T/C/MWL WWL feature res from the level crossing, m drivers tailgating the ted with roadworks lo metres away.	2. User detal 2.1 Level crossing Pedestrian Gardriver Van driver HGV driver sssing may still impact on vehicles in any be impeded by vehicle in-front to ocated in the immediate	RSSB Railway GS Others IIS USE Type Motorcyclist Passenger Horserider Train driver Other Undefined Dilocking-back over y slow moving traff of avoid potentially ediate vicinity, they	2.2 Age 0-10 11-15 16-20 20-35 35-50 50-60 locking-back.	2 60+ Undefined Vehicle driv of the road van activated	.3 On own Individual Group Undefined /ers vorks. warning	Issue at a level crossing
evel crossi ef 62 sue oadworks Level Cross 1 Protected AOCL MCE ABCL AHB MG MG MG MCB MCB Comparison AOCR Comparison AOCR A	ings: commun Creation date 27.0 sing type 1.2 Unp BCCtV UWU OC FFP/I Of issue / design tioned up to 3 kilomet iour ted on roads around a able to move forwards impounded by vehicle a also not just associated in located up to 3 kilometed in the contraction of	rotected C/T Undefined C/T/C/MWL WWL feature res from the level crossing, m drivers tailgating the ted with roadworks lo metres away.	2. User detal 2.1 Level crossing Pedestrian Gardriver Van driver HGV driver Sessing may still impedence in the immediate in the immediate occated in the immediate in the immedi	RSSB Railway GS Others IIS USE Type Motorcyclist Passenger Horserider Train driver Other Undefined Dilocking-back over y slow moving traff of avoid potentially ediate vicinity, they	2.2 Age 0-10 11-15 16-20 20-35 35-50 50-60 locking-back.	2 60+ Undefined Vehicle driv of the road van activated	.3 On own Individual Group Undefined /ers vorks. warning	Issue at a level crossing
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Level crossings: communication and user behaviour issues Ref 63 Creation date 27.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing **Housing developments** 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL UWC Undefined Pedestrian 0-10 Motorcyclist 60+ AOCR ABCL Undefined Undefined UWC/T Farmer Passenger 11-15 Group UWC/MWL Cvclist Horserider 16-20 Undefined ⊠ AHB ⊠ MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Housing developments increase road traffic and level crossing use. 4. User behaviour New housing developments near to crossings used as access to major towns or other key locations will affect the use and behaviour of both vehicle drivers and pedestrians over the crossing. These developments will increase vehicle and pedestrian traffic levels and the existing crossing type may be unsuitable for accommodating these increased levels. An additional factor in affecting the risk taking behaviour of vehicle drivers is the overall congestion of traffic in the local area. Vehicle drivers may be less inclined to stop at a level crossing if their overall journey time has increased since the development of new housing. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER ar/us ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster RSSB ☐ AA ☐ Bus drivers Hertford Network Rail DfT (rail) TRL (road) ☐ HSE/HMRI RSSB DfT (road) Peterborough Independent Bedford RPC Railway GS Other dept Non-UK OTHERS 🛛 BTF Redcar Others Level crossings: communication and user behaviour issues Ref 64 Creation date 27.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Vehicle shortcuts 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR Undefined UWC/T 11-15 Undefined Farmer Passenger Group ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ⋈ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers. 4. User behaviour Vehicle drivers may increase their risk taking behaviour when using level crossings on shortcut roads. Shortcuts are in themselves a means of the vehicle driver saving time, and their mindset is one of maintaining movement at all costs. In some cases, the vehicle driver may be more inclined to attempt to 'beat the lights', as waiting at the crossing has a negative impact on their goal of using the shortcut to save time. Shortcuts may have been established for a period of time and generally used by regular users to avoid busy main roads. However, new shortcuts may develop, both permanently and for interim periods, for the following reasons: Temporary roadworks: New housing developments; Changes to road infrastructures. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes HMRI internal report ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford ☐ Independent☐ Non-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road)

Railway GS

Others

Other dept

Bedford

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Ref 65 Creation date 27.08.2004	Last modified 02.02.2005			davis
Issue				Issue at a level crossing
Crossing instructions				
1. Level Crossing type	2. User details			
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age	2.3 On own	
□ AOCL □ MCBcctv □ UWC □ Un □ AOCR □ Undefined □ UWC/T	ndefined Pedestrian Motorcy		Individual Group	
□ ABCL □ Undefined □ UWC/MWL	☐ Cyclist ☐ Horseride		□ Group □ Undefined	
☐ AHB ☐ OC ☐ FP/MWL	☐ Car driver ☐ Train driver ☐ Other	/er □ 20-35 □ 35-50		
MCB FC	HGV driver Undefine			
3. Description of issue / design feature				
Ambiguous crossing instructions may result in users	s failing to undertake the correct cro	ossing procedure.		
4. User behaviour				
Users at UWC are provided with instructions to guic not always apparent to users the exact order in whi phone the signaller first to obtain permission to cros has a large impact on the overall time taken by the u	ch they should undertake the cross ss or open the first gate. If the user	ing procedure. For example, has incorrectly followed the	, should they procedure, this	
				5. Error type
				Error
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6. Sources of information				
6.1 Interview source 6.2 Level cross ☐ RAIL INDUSTRY ☐ Milton Ke		NDUSTRY		6.4 Document details
Network Rail □ ROAD INDUSTRY □ Doncaster □ RSSB □ AA □ Hertford □ HSE/HMRI □ Bus drivers □ Peterboro	r HSE/H Netwo	MRI GOVERNMENT rk Rail DfT (rail) DfT (road)	☐ TRL (rail) ☐ TRL (road) ☑ Independent	Railtrack internal report (ra/hu)
☐ RPC ☐ BEDFORD ☐ BEDFORD ☐ Redcar	Railwa		☐ Non-UK	
Level crossings: communication ar		s		davis
_	nd user behaviour issue Last modified 02.02.2005	s		Issue at a level crossing
Ref 66 Creation date 27.08.2004		s		Issue at a level crossing
Ref 66 Creation date 27.08.2004	Last modified 02.02.2005	s		Issue at a level crossing
Ref 66 Creation date 27.08.2004 Issue Another train approaching		S 22 Age	2.3 On own	Issue at a level crossing
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Level crossings: communication and user behaviour issues Ref 67 Creation date 27.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing **Animals: Dogs** 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ☐ MCBcctv ⊠ uwc Undefined Pedestrian 0-10 60+ Motorcyclist AOCR ABCL UWC/T UWC/MWL Passenger Undefined Group Undefined Farmer 11-15 Cvclist Horserider 16-20 Undefined __ AHB __ AHB __ MG OC FP/MWL Car driver Train driver 20-35 Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Unrestrained dogs may impair their owner's concentration while on the level crossing. 4. User behaviour An observation of users at UWC level crossings saw over a quarter of all people walking with dogs failing to use any form of dog restraint. A sign requesting dog walkers to put their dog on a lead was positioned on the majority of these UWC's. Train drivers also have reported seeing unrestrained dogs along side the tracks with their owners standing at the crossing. There have also been near-misses and an incident involving a collision between a train and a pedestrian who was attempting to retrieve their dog from the tracks. It appears that the risk of not restraining a dog is not evident to dog owners, possibly because of their assumption that they are capable of maintaining control of their pet. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER hu/de ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) HMRI internal report Network Rail Doncaster DfT (rail) DfT (road) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) bi/hu _ HSE/HMRI RSSB Peterborough Independent Bedford RPC Railway GS Other dept Non-UK OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 68 Creation date 27.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Contacting the signaller 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T 11-15 Undefined Undefined Farmer Passenger Group ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ☐ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Unclear 'user-type' information may result in users failing to contact the signaller prior to crossing. 4. User behaviour Information is provided at UWC to indicate which types of users must call the signaller to request permission to cross the railway line. Prior to crossing, all users must determine from this information, whether they should first contact the signaller. However, non-specific and unclear 'user-type' information may result in users failing to contact the signaller. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes hu/hu ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) Independent

Railway GS

Others

Other dept

Bedford

RPC

BTP

OTHERS

☐ Non-UK

Level crossings: communication and user behaviour issues Ref 69 Creation date 27.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Rural level crossings 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL UWC Undefined Pedestrian 0-10 Motorcyclist 60+ Passenger Undefined AOCR Undefined UWC/T Farmer 11-15 Group UWC/MWL ABCL Cvclist Horserider 16-20 Undefined ⊠ AHB ⊠ MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature The environmental context of a rural level crossing reduces the awareness of approaching vehicle drivers. 4. User behaviour Rural level crossings, positioned amongst roads with few surrounding roadside structures are often missed by approaching vehicle drivers. The vehicle driver, progressing through country roads, is in a mind-set that is unlikely to be expecting hazard information or a warning system to appear. They may not register the presence of a crossing until they are nearly driving over it or they may miss it completely. The problem is further increased when crossings are located on bends, hills or foliage covers information signs. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB DfT (road) Peterborough Independent Bedford RPC Railway GS Other dept Non-UK OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 70 Creation date 27.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Road markings 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T 11-15 Undefined Undefined Farmer Passenger Group ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ⋈ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature The effectiveness of vehicle drivers stopping in the correct location is impaired by worn road markings. 4. User behaviour Road markings are provided at some level crossings to help vehicle drivers stop their vehicle in a safe location during the activated warning system. It is important in preventing vehicles from parking underneath the lowering barriers and from positioning their vehicle too close to the train lines. Road markings that have been worn away reduce the effectiveness of informing vehicle drivers where they should stop. Markings are also a particularly important element in informing an irregular user of where they should The importance of road markings in providing vehicle drivers with information has been highlighted by the road industry. Dramatic reductions in vehicle drivers running through red lights have been recorded when the 'STOP' line has been newly painted on road surfaces. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes hu/hu GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) Independent ☐ Non-UK RPC Railway GS Bedford Other dept

Others

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Ref 71	Creation date 27.08	3.2004 Last m	nodified 02.02.2005	5			davi
Issue Number of train	lines						Issue at a level crossing
1. Level Cross			2. User detai	le			
1.1 Protected	1.2 Unpr	rotected	2.1 Level crossing		2.2 Age	2.3 On own	
AOCL MCB AOCR Unde ABCL AHB MG		C/T C/MWL	☐ Farmer ☐ Cyclist ☐	Motorcyclist Passenger Horserider Train driver Other	0-10	☐ Individual☐ Group☐ Undefined	
⊠ MCB	☐ FC			Undefined	<u>50-60</u>		
-	of issue / design in may increase the risk		oth vehicle drivers	and pedestrians.			
1. User behavio	our						
	ve a single train line to across the lines with						
This user behavio them behaving les	ur is in line with the ri ss cautiously.	sk compensation the	eory; the user perc	eiving there to be I	ess of a risk to thems	selves results in	
							5. Error type
							☑ Error☑ Violation
6. Sources of	information						
i.1 Interview source	ormanon	6.2 Level crossing visit -	areas	6.3 Document source			6.4 Document details
RAIL INDUSTRY Network Rail RSSB	☐ ROAD INDUSTRY	☐ Milton Keynes ☐ Doncaster ☐ Hertford		RAIL INDUSTRY HSE/HMRI Network Rail	☐ GOVERNMENT ☐ DfT (rail)	OTHER TRL (rail) TRL (road)	
ASE/HMRIRP RPC BTP	☐ Bus drivers ☐ OTHERS	Peterborough Bedford Redcar		RSSB Railway GS Others		Independent Non-UK	
lef 72	ngs: communi Creation date 27.08		nodified 02.02.2005				Issue at a level crossing
ocation near fa	rms						
. Level Cross	ing type		2. User detai	ls			
.1 Protected	1.2 Unpr		2.1 Level crossing		2.2 Age	2.3 On own	Mark Charles
☑ AOCL ☐ MCB ☑ AOCR ☐ Unde				Motorcyclist Passenger	0-10 060+ 11-15 Undefii	Individual Group	Ve at
ABCL AHB	□ uwo	C/MWL	☐ Cyclist ☐	Horserider Train driver	☐ 16-20 ☐ 20-35	Undefined	
MG	☐ FP/N	MWL	□ Van driver □	Other	□ 35-50		The sale
MCB	☐ FC			Undefined	50-60		
•	of issue / design farm traffic impact on		viour of other vehi	cles traversing the	crossing.		el/ctiliques:
							Bainton Green: a tractor using the crossing after leaving nearby farm
. User behavio	to move at a much s	lower peed and im	note on the array	and goneral district	a boboulous of the	and vehicles	land. Tractors combined with the
High volumes of frehicles traversing	arm traffic using loca g the level crossing. • evel crossing to avoid	I roads to transport p This may increase vel	oroduce or move t hicle driver frustra	petween farm land tion and result in th	will impact on the be	haviour of other	position of the crossing on a straight road, its proximity to Lolham crossing and use as a regular shortcut route could impact heavily on the behaviour o other vehicle drivers.
							5. Error type
							☐ Error ☐ Violation
Sources of	information	6.2 Lovel areas to make the	orooo	6.2 Document			6.4 Doggreent date!
.1 Interview source RAIL INDUSTRY		6.2 Level crossing visit - Milton Keynes	aı eas	6.3 Document source RAIL INDUSTRY		OTHER	6.4 Document details
☐ Network Rail ☐ RSSB ☐ HSE/HMRI	☐ ROAD INDUSTRY ☐ AA ☐ Bus drivers	☐ Doncaster ☐ Hertford ☐ Peterborough		☐ HSE/HMRI ☐ Network Rail ☐ RSSB	GOVERNMENT DfT (rail) DfT (road)	TRL (rail) TRL (road) Independent	
□ RPC ☑ BTP	OTHERS	☐ Bedford ☐ Redcar		☐ Railway GS ☐ Others	Other dept.	Non-UK	

Level crossings: communication and user behaviour issues

Level crossings: communication and us Ref 73 Creation date 27.08.2004 Last r	ser behaviour issues			davis
Issue			Iss	ue at a level crossing
Commercial traffic				ao at a lovol olooomig
1. Level Crossing type	2. User details			
1.1 Protected 1.2 Unprotected	2.1 Level crossing user type	2.2 Age 2.	3 On own	
☐ AOCL ☐ MCBcctv ☐ Uwc ☐ Undefined	☐ Pedestrian ☐ Motorcyclist		Individual	
☐ AOCR ☐ Undefined ☐ UWC/T ☐ UWC/MWL	Farmer Passenger		Group	
ABCL	☐ Cyclist ☐ Horserider ☐ Car driver ☐ Train driver	☐ 16-20 ☐ 20-35	Undefined	
⊠ MG □ FP/MWL	∇an driver □ Other	□ 35-50		
MCB □ FC	☐ HGV driver ☐ Undefined	50-60		
3. Description of issue / design feature				
Level crossings with high volumes of commercial traffic ma	ly result in increased risk taking beh	naviour.		
4. User behaviour				
Commercial vehicle drivers, such as salespersons, work to	strict timescales and therefore their	driving behaviour is often in	luenced	
by having to reach destinations on time. Commercial drive having to wait at the crossing, or they may fail to obey the o				
			5. Error	type
			☐ Error	
				on
6. Sources of information				
6.1 Interview source 6.2 Level crossing visit	- areas 6.3 Document sour	rce	6.4 Doo	cument details
RAIL INDUSTRY	RAIL INDUSTF			
☐ Network Rail ☐ ROAD INDUSTRY ☐ Doncaster ☐ RSSB ☐ AA ☐ Hertford	☐ HSE/HMRI ☐ Network Rail	☐ GOVERNMENT ☐ TRI ☐ DfT (rail) ☐ TRI	(rail) (road)	
☐ HSE/HMRI ☐ Bus drivers ☐ Peterborough	RSSB		pendent	
RPC Bedford	Railway GS	Other dept.	-UK	
☐ BTP ☐ OTHERS ☐ Redcar	☐ Others			
Level crossings: communication and us Ref 74 Creation date 27.08.2004 Last r	ser behaviour issues modified 02.02.2005			davis
Ref 74 Creation date 27.08.2004 Last r			Iss	davii
Ref 74 Creation date 27.08.2004 Last r			Iss	davii ue at a level crossing
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type	nodified 02.02.2005 2. User details			davi
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another	nodified 02.02.2005	2.2 Age 2.	lss 3 On own	davi ue at a level crossing
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC Mundefined	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist	0-10 060+	3 On own	ue at a level crossing
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC Undefined AOCR Undefined	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger	0-10 060+ 11-15 Undefined	B On own Individual Group	ue at a level crossing
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv Undefined UWC/T UWC/T UWC/T UWC/T ABCL AHB OCC	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider C car driver Train driver	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined □ 16-20 □ 20-35	3 On own	ue at a level crossing
Ref 74 Creation date 27.08.2004 Last r	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other	□ 0-10 □ 60+ □ 11-15 □ Undefined □ 16-20 □ 20-35 □ 35-50	B On own Individual Group	ue at a level crossing
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected AOCL MCBcctv UWC/T UWC/T UWC/MWL AAGC ABGL AHB OCC MGB MG MG MCB	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider C car driver Train driver	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined □ 16-20 □ 20-35	B On own Individual Group	ue at a level crossing
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T UWC/T AOCR Undefined UWC/TWWL AHB OCC MG MG MG MG MCB MCB 3. Description of issue / design feature	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined	0-10	B On own Individual Group	ue at a level crossing
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected AOCL MCBcctv UWC/T UWC/T UWC/MWL AAGC ABGL AHB OCC MGB MG MG MCB	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined	0-10	B On own Individual Group	ue at a level crossing
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T UWC/T AOCR Undefined UWC/TWWL AHB OCC MG MG MG MG MCB MCB 3. Description of issue / design feature	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined	0-10	B On own Individual Group Undefined Lolham C	CTV & Bainton Green
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T UWC/T AOCR Undefined UWC/TWWL AHB OCC MG MG MG MG MCB MCB 3. Description of issue / design feature	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined	0-10	B On own Individual Group Undefined Lolham C AHB: vehi	CTV & Bainton Green
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected AOCL MCBcctv UWC/MWL ABCL UWC/MWL ABCL UWC/MWL ABCL AHB CC ABCL ARBC ARBC ARBC ARBC ARBC ARBC ARBC ARBC	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined crossings located in close proximity bect their risk taking behaviour. The	o-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60 If vehicle drivers.	Bonown Individual Group Undefined Lolham C AHB: vehi at Lolham considera then also The lengti	CTV & Bainton Green cle drivers are often held crossing for a ble amount of time, and held at Bainton Green. The barrier downtimes at
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T UWC/T UWC/TWL AOCR Undefined UWC/T UWC/TWL ABCL UWC/MWL AHB CC AHB FP/MWL MCB FP/MWL FC 3. Description of issue / design feature Level crossings located in close proximity to another may in 4. User behaviour A road or geographical area may have more than one level level crossing and then at the next, and so on, this may affer	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Other HGV driver Undefined crossings located in close proximity ect their risk taking behaviour. The ur such as speeding to the approace	o-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60 If vehicle drivers.	Bonown Individual Group Undefined Lolham C AHB: vehi at Lolham considera then also The lengti the Lolhai	CTV & Bainton Green icle drivers are often held crossing for a ble amount of time, and held at Bainton Green. by barrier downtimes at m crossing, which is
Ref 74 Creation date 27.08.2004 Last r Issue	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Undefined mfluence the risk taking behaviour of their risk taking behaviour. The sur such as speeding to the approactights.	o-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60 If vehicle drivers.	Lolham Considera then also and avoid nose with a conse with a considera then also and avoid nose with a considera then also the Lolham considera the Lolham consideration that the L	CTV & Bainton Green cle drivers are often held crossing for a ble amount of time, and held at Bainton Green. By barrier downtimes at m crossing, which is uently as a shortcut rehicle drivers adds to
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected AOCL MCBcctv UWC Undefined AOCR Undefined UWC/T UWC/MWL ABCL WC/MWL FC ABCL ABCL	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Other HGV driver Undefined crossings located in close proximity ect their risk taking behaviour. The ur such as speeding to the approacing the crossings with lengthy barrier dow	o-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60 If vehicle drivers.	Individual Group Undefined Lolham C AHB: vehi at Lolham considera then also and avoid the Lolhar used frequences with derable.	CTV & Bainton Green icle drivers are often held crossing for a ble amount of time, and held at Bainton Green. The parrier downtimes at m crossing, which is uently as a shortcut rehicle drivers adds to ration when they are
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Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected AOCL	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Other HGV driver Undefined crossings located in close proximity ect their risk taking behaviour. The ur such as speeding to the approacing the crossings with lengthy barrier dow	o-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60 If vehicle drivers.	Individual Group Undefined Lolham C AHB: vehi at Lolham considera then also and avoid the Lolhar used frequences with derable.	CTV & Bainton Green icle drivers are often held crossing for a ble amount of time, and held at Bainton Green. The parier downtimes at m crossing, which is uently as a shortcut rehicle drivers adds to ration when they are tht crossings.
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Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC/T UWC/T UWC/MWL ABCL HB FP/MWL FC 3. Description of issue / design feature Level crossings located in close proximity to another may in the company of the compan	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Undefined Influence the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviou	o-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60 If vehicle drivers. y. If a driver is required to we vehicle driver may become a ch of the next crossing to try retimes on busy rail lines or teld at the crossing for a cons	Individual Group Undefined Lolham C AHB: vehi at Lolham considera ggitated and avoid nose with derable Lolham C AHB: vehi at Lolham considera groute by the individual used frequote by their frust held at both some properties of the consideration of the longitude of the consideration of the longitude of the lo	CTV & Bainton Green icle drivers are often held crossing for a ble amount of time, and held at Bainton Green. The parrier downtimes at m crossing, which is uently as a shortcut rehicle drivers adds to ration when they are oth crossings.
Ref 74 Creation date 27.08.2004 Last rollsus	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Undefined Motorcyclist Horserider Car driver Train driver Wan driver Undefined Influence the risk taking behaviour of the risk taking behaviour. The ur such as speeding to the approact ights. Crossings with lengthy barrier down over each crossing they may be here.	o-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60 If vehicle drivers. If a driver is required to we vehicle driver may become a ch of the next crossing to try Intimes on busy rail lines or teld at the crossing for a cons	Lolham C AHB: vehi at Lolham considera ggitated and avoid nose with derable Lolham C AHB: vehi at Lolham considera then also The lengti the Lolhai used freq route by v their frust held at bc 5. Error Fror Violatic	CTV & Bainton Green cle drivers are often held crossing for a ble amount of time, and held at Bainton Green. By barrier downtimes at m crossing, which is uently as a shortcut vehicle drivers adds to ration when they are other crossings.
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected AOCL MCBcctv WC/MWL WC/T WWC/MWL ABCL HG MG FP/MWL FC 3. Description of issue / design feature Level crossings located in close proximity to another may in the level crossing and then at the next, and so on, this may affe at being held again or crossing during the activated warning I was a vehicle drivers know that if they are unable to get time. 6. Sources of information 6.1 Interview source CAL Level crossing visit-Mall ROAD INDUSTRY Milton Keynes Doncaster	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Undefined Influence the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviour of the risk taking behaviour. The part of the risk taking behaviour of the risk taking behaviou	o-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60 Indefined 16-20 20-35 35-50 50-60 Indefined Indefined 16-20 20-35 35-50 50-60 Indefined Indefined	Individual Group Undefined Lolham Considerate then also The length the Lolhan used frequences with derable 5. Error From Violatic	CTV & Bainton Green icle drivers are often held crossing for a ble amount of time, and held at Bainton Green. The parrier downtimes at m crossing, which is uently as a shortcut rehicle drivers adds to ration when they are oth crossings.
Ref 74 Creation date 27.08.2004 Last r	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Undefined Influence the risk taking behaviour of the risk taking behaviour. The pur such as speeding to the approact ights. Crossings with lengthy barrier down over each crossing they may be here. - areas 6.3 Document sour RAIL INDUSTE HSE/HMRI Network Rail	O-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60	Individual Group Undefined Lolham C AHB: vehi at Lolham considera then also The length the Lolhan used frequences with derable 5. Error From C Violation 6.4 Documents of the Lolhan used frequences with derable of the length the Lolhan used frequences with the Lolhan used frequences	CTV & Bainton Green icle drivers are often held crossing for a ble amount of time, and held at Bainton Green. The parrier downtimes at m crossing, which is uently as a shortcut rehicle drivers adds to ration when they are oth crossings.
Ref 74 Creation date 27.08.2004 Last r Issue Proximity of level crossing to another 1. Level Crossing type 1.1 Protected AOCL MCBcctv WC/MWL WC/T WWC/MWL ABCL HG MG FP/MWL FC 3. Description of issue / design feature Level crossings located in close proximity to another may in the level crossing and then at the next, and so on, this may affe at being held again or crossing during the activated warning I was a vehicle drivers know that if they are unable to get time. 6. Sources of information 6.1 Interview source CAL Level crossing visit-Mall ROAD INDUSTRY Milton Keynes Doncaster	2. User details 2.1 Level crossing user type Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Man driver Undefined Indicate the risk taking behaviour of their risk taking behaviour. The urr such as speeding to the approacting the cover each crossing they may be here. Page 18	O-10 60+ 11-15 Undefined 16-20 20-35 35-50 50-60	Lolham C AHB: vehi at Lolham considerated and avoid nose with derable S. Error Fror Violatic Creal (real) (pendent) Creal (penden	CTV & Bainton Green icle drivers are often held crossing for a ble amount of time, and held at Bainton Green. The parties of the same of t

Level crossings: comn Ref 75 Creation date		ser behaviou modified 02.02.200				davi
Issue						Issue at a level crossing
Public houses						
1. Level Crossing type 1.1 Protected 1.	2 Unprotected	 User detail Level crossing in 		22 Ago	2.3 On own	
AOCL	☐ Undefined☐ Undefined☐ Uwc/T☐ UWC/MWL☐ OC☐ FP/MWL☐ FC	□ Pedestrian □ Farmer □ Cyclist □ Car driver □ Van driver	Motorcyclist Passenger Horserider Train driver Other Undefined	2.2 Age 0-10	☐ Individual	
3. Description of issue / des	sign feature					
Crossings located on route to pu	blic houses may result in i	ncreased violation	s of crossing proc	edures.		Tallington CCTV: the public house
4. User behaviour						is located on the left-hand side of the crossing. The nearest homes
Level crossings on routes between the crossing. Users under the influence behaviour. Rural level crossings may also be may be an increased chance of being the crossing of th	luence of alcohol may be used by local vehicle driv	more inclined to ig	nore normal cross	sing procedures and	d undertake risky	are located on the other side and some locals often use the crossing in their vehicle or on foot while under the influence of alcohol.
						5. Error type
						☐ Error ☐ Violation
6. Sources of information 6.1 Interview source	6.2 Level crossing visit	- areas	6.3 Document source	a		6.4 Document details
RAIL INDUSTRY Network Rail ROAD INDUSTRY RSSB AA HSE/HMRI Bus drivers RPC BTP OTHERS	☐ Milton Keynes		RAIL INDUSTRY HSE/HMRI Network Rail SSB Railway GS Others		OTHER TRL (rail) TRL (road) Independent Non-UK	GI/GN7611
Level crossings: comn Ref 76 Creation date		ser behaviou modified 02.02.200				day
Pedestrians on vehicular cross	sings					loode at a love, or cooking
1. Level Crossing type		2. User detai	Is			
~	2 Unprotected	2.1 Level crossing		2.2 Age	2.3 On own	
☐ AOCR ☐ Undefined ☐ ABCL ☐ AHB ☐ MG	UWC Undefined UWC/T UWC/MWL OC FP/MWL FC	☐ Farmer ☐ Cyclist ☐ Car driver ☐ Van driver	Motorcyclist Passenger Horserider Train driver Other Undefined	0-10	efined Individual Group Undefined	
3. Description of issue / des	sign feature					
Large volumes of pedestrians and	d cyclists using road level	crossings ignore tl	he activated warni	ng information and	barriers.	
4. User behaviour						
Both pedestrians and cyclists ign them only applicable to vehicle dr		information and ba	arriers on vehicular	crossings because	many perceive	
At AHB crossings, pedestrians ar and onto the train line. This is a p of group activity on an individual follow their behaviour.	particular problem when th	ere are large volur	nes of pedestrian	and cycle users bed	cause of the affect	
Users may also unintentionally pr barrier.	ogress past the barrier line	e and move onto the	ne train tracks bec	ause of the lack of	any physical	
ound.						5. Error type
						☐ Error ☐ Violation
6. Sources of information						
5.1 Interview source	6.2 Level crossing visit	- areas	6.3 Document source		M	6.4 Document details
☑ RAIL INDUSTRY ☐ Network Rail ☐ ROAD INDUSTRY ☐ RSSB ☐ AA ☐ HSE/HMRI ☐ Bus drivers ☐ RPC ☐ OTHERS	STRY Milton Keynes Doncaster Hertford Peterborough Bedford Redcar		RAIL INDUSTRY HSE/HMRI Network Rail RSSB Railway GS Others	GOVERNMENT DfT (rail) DfT (road) Other dept.	○ OTHER □ TRL (rail) □ TRL (road) □ Independent ○ Non-UK	va/sa

Level crossings: communic		r behaviou					dayle
Issue							Issue at a level crossing
Decision point							isolo di u ioroi orosonig
1. Level Crossing type		2. User detai	le				
1.1 Protected 1.2 Unpro		2.1 Level crossing u		2.2 Age		2.3 On own	No.
□ AOCL □ MCBcctv □ AOCR □ Undefined □ UWC □ ABCL □ UWC	Undefined /T	☐ Pedestrian ☐ ☐ Farmer ☐ ☐ Cyclist ☐	Motorcyclist Passenger Horserider	0-10 [11-15 [16-20	☐ 60+ ☑ Undefined	☐ Individual☐ Group☐ Undefined	Z I
□ AHB □ OC □ MG □ FP/M □ MCB □ FC	WL		Train driver Other Undefined	20-35 35-50 50-60			
3. Description of issue / design for	eature						
An obvious decision point is critical for the	users at unprotected le	evel crossings.					
4. User behaviour							Ware footpath: the user can stand in various positions to observe for
A decision point is the position at which	n the user can view ald	ong both sides o	of the tracks but no	t be standin	g past a poi	nt of safety.	oncoming trains, however it is unclear where they should not
This point is designated at 3 metres fror around the level crossing, for example, rail lines to ensure they have a clear vie be unclear, resulting in users standing in	foliage and other obstr w. The areas where a	ructions at the s user should not	ide of the line may stand while obser	force the us	er to stand	closer to the	stand while observing for trains.
							5. Error type ⊠ Error
							Violation
6. Sources of information							
6.1 Interview source	6.2 Level crossing visit - are	eas	6.3 Document source				6.4 Document details
RAIL INDUSTRY	☐ Milton Keynes ☐ Doncaster ☐ Hertford ☐ Peterborough ☐ Bedford ☐ Redcar		☐ RAIL INDUSTRY ☐ HSE/HMRI ☐ Network Rail ☐ RSSB ☐ Railway GS ☐ Others	GOVERN DfT (rail) DfT (road	IMENT ☐ T ☐ T d) ☐ Ir	OTHER RL (rail) RL (road) Independent Ion-UK	hu/de ar/us
Level crossings: communic Ref 78 Creation date 27.08.		r behaviou					davi
Issue							Issue at a level crossing
Signal sections							
1. Level Crossing type		2. User detai					
1.1 Protected 1.2 Unpro		2.1 Level crossing u		2.2 Age		2.3 On own	
☐ AOCL ☐ MCBcctv ☐ UWC ☐ AOCR ☐ Undefined ☐ UWC			Motorcyclist Passenger	0-10 [11-15]	☐ 60+ ☑ Undefined	☐ Individual☐ Group	
☐ ABCL ☐ UWC		Cyclist □	Horserider	☐ 16-20 ☐ 20-35		Undefined	
□ AHB □ OC □ MG □ FP/M	WL	🗆 Van driver 🛭	Train driver Other	□ 35-50			
☐ MCB ☐ FC 3. Description of issue / design for		☐ HGV driver ☐	Undefined	50-60			
Long signal sections increase the risk to		rs at UWC's.					
A Harm bahardana							
User behaviour UWC crossings positioned within long s	signal sections affect t	he behaviour of	users and the con	nmunication	between the	e user and	
the signaller.							
If a train is within a section, the signaller minutes. The signaller is then able to ir users do not understand why the signal waiting for an unknown and often lengt	nform the user whether ller cannot provide and hy period of time and	r the train is nov exact indication decides to cros	v out of the sectior of where the train s without confirma	and past the user	ne UWC. Ho becomes fr	wever,	
Additional factors which may further inc When the user is crossing multiple tin	nes during the day;			nivo Henry I	io o culfini	ut monte et al.	
While the user is waiting, they continu safe time to cross within;				•			5. Error type
If one train passes (but another may be confirmation from the signaller.	e within the section) the	his gives a clear	message to the us	ser, "I can g	o", without r	eceiving	☐ Error ☐ Violation
6. Sources of information							
6.1 Interview source	6.2 Level crossing visit - are	eas	6.3 Document source			THER	6.4 Document details
 □ RAIL INDUSTRY □ Network Rail □ ROAD INDUSTRY □ RSSB □ AA 	✓ Milton Keynes✓ Doncaster		RAIL INDUSTRY			THER RL (rail)	ro/hu
☐ HSE/HMRI ☐ Bus drivers ☐ RPC	Hertford Peterborough Bedford			GOVERN DfT (rail) DfT (road	□ T d) □ Ir	RL (road) ndependent lon-UK	

Level crossings: communication and user behaviour issues Ref 79 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Combined environmental features 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL UWC Undefined Pedestrian 0-10 60+ Motorcyclist AOCR ABCL UWC/T UWC/MWL Passenger Undefined Group Undefined Farmer 11-15 Cvclist Horserider 16-20 Undefined AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Level crossings with a combination of environmental features, such as bends, hills, trees and hedges, may increase the decision making errors of vehicle drivers. An environmental feature on the approach to a level crossing may require the vehicle driver to divide their attention, however they can continue to concentrate on and manage the information regarding the crossing. However, the combined affect of many environmental features, such as bends, hills, trees and hedges on the approach to a crossing, may result in increased decision making errors by the vehicle driver as their attention is diverted in accommodating a range of complex environmental features. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER ☐ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster RSSB ☐ AA ☐ Bus drivers Hertford Network Rail DfT (rail) TRL (road) ☐ HSE/HMRI RSSB DfT (road) Peterborough Independent Bedford RPC Railway GS Other dept Non-UK OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 80 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Cats-eyes 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T 11-15 Undefined Undefined Passenger Group Farmer ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ⋈ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Deteriorated 'cats-eyes' on the approach or on the level crossing may reduce the vehicle driver's ability to negotiate the road layout at night. 4. User behaviour Cats-eyes are located along the centre line and left hand-side of the road. They help vehicle drivers to see in advance the changes in road contour. Cats-eyes support approaching vehicle drivers to assess the position of the level crossing in relation to the road and the contour of the exit road. However, cats-eyes do deteriorate over a period of time and gradually fail to reflect any light, reducing their effectiveness in 'quiding' the vehicle driver along the road. Cats-eyes are particularly important in rural locations when lighting from surrounding roadside structures will be at a minimum. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford ☐ Independent☐ Non-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road)

Railway GS

Others

Other dept

Bedford

RPC

BTP

Ref 81 Creation date 26							Mary .
ssue							Issue at a level crossing
Sign pictogram							_
1. Level Crossing type		2. User details	s				
I.1 Protected 1.2 U	Inprotected	2.1 Level crossing us	ser type	2.2 Age		2.3 On own	
AOCL MCBcctv			Motorcyclist	0-10	60+	Individual	
	JWC/T JWC/MWL		Passenger Horserider	11-15 E	☑ Undefined	☐ Group ☐ Undefined	
□ AHB □ C	C	☐ Car driver ☐	Train driver	20-35		Gridomiod	A 2003
	P/MWL		Other	35-50			
MCB F		☐ HGV driver ☐	Undefined	50-60			
. Description of issue / desig							771 Raiway level crossing without gate
he 'Puffer' sign does not convey a	ny directly useful inforn	nation to users.					or harner ahead
							Sign 771, Schedule 3, The Traffic
. User behaviour							Signs Regulations and General Directions 2002
he information presented to the ve			he level crossing	should identi	ify the 'poter	ntial hazard'	Directions 2002
head of them and support them to	adjust their behaviour	accordingly.					
Subject matter experts in the road in	ndustry have suggested	I the image of a 'ste	eam' train does no	ot support us	sers in identif	fvina with	
he modern standards of the railway							
nat conveying the appropriate infor	mation of protection type	pe prior to each cros	ssing can help use	ers to adapt	their behavio	our	
ccordingly.							
here is no guidance in how this mi	ght affect user behavio	ur, but in our opinio	on it may lead to v	ehicle driver	rs not followi	ing the	
orrect level crossing procedures.		•					
							5. Error type
							□ Error □ Violation
							Violation
. Sources of information							
1 Interview source	6.2 Level crossing visit	areas	6.3 Document source				6.4 Document details
] RAIL INDUSTRY] Network Rail □ ROAD INDUSTF	Milton Keynes		☐ RAIL INDUSTRY☐ HSE/HMRI	☐ GOVERN		THER RL (rail)	tsr/2002 mo/vi
RSSB AA	Hertford		☐ Network Rail	DfT (rail)		RL (road)	1110/11
HSE/HMRI Bus drivers	Peterborough		RSSB	☐ DfT (road		dependent	
RPC BTP ⊠ OTHERS	☐ Bedford☐ Redcar		☐ Railway GS☐ Others	Other de	ept. 🖂 N	on-UK	
	unio atticuo aural con						
		er behaviour	issues				day
ef 82 Creation date 26			issues				Issue at a level crossing
ef 82 Creation date 26 sue ighway Code			issues				
ef 82 Creation date 26 ssue lighway Code . Level Crossing type	6.08.2004 Last r	nodified 02.02.2005 2. User details	s				
ef 82 Creation date 26 ssue lighway Code Level Crossing type 1 Protected 1.2 U	c.08.2004 Last r	2. User details	s ser type	2.2 Age		2.3 On own	
ef 82 Creation date 26 sue ighway Code Level Crossing type 1 Protected 1.2 U	Inprotected WC Undefined	2. User details 2.1 Level crossing us	s ser type Motorcyclist	O-10	<u>60+</u>	☐ Individual	
ef 82 Creation date 26 sue ighway Code Level Crossing type 1 Protected 1.2 U AOCL MCBcctv AOCR Undefined	Inprotected WC Undefined	2. User details 2.1 Level crossing us	s ser type Motorcyclist Passenger	0-10 11-15		☐ Individual ☐ Group	Issue at a level crossing
ef 82 Creation date 26 Sue ighway Code Level Crossing type 1 Protected 1.2 U AOCL MCBcctv AOCR Undefined ABCL AHB	Inprotected WC Undefined WC/T WVC/MWL	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver	ser type Motorcyclist Passenger Horserider Train driver	O-10	<u>60+</u>	☐ Individual	Issue at a level crossing
ef 82 Creation date 26 sue ighway Code Level Crossing type I Protected 1.2 U AOCL MCBcctv AOCR Undefined ABCL AHB MG	Inprotected WC Undefined WC/T WC/T WC/MWL CC P/MWL	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Van driver	ser type Motorcyclist Passenger Horserider Train driver Other	0-10 11-15 16-20 20-35 35-50	<u>60+</u>	☐ Individual ☐ Group	Issue at a level crossing
ef 82 Creation date 26 sue ighway Code Level Crossing type 1 Protected 1.2 U AOCL MCBcctv AOCR Undefined ABCL AHB MG MCB	Inprotected WC Undefined WC/T WC/MWL CC P/MWL C	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver Van driver	ser type Motorcyclist Passenger Horserider Train driver	0-10 [11-15 [16-20 20-35	<u>60+</u>	☐ Individual ☐ Group	Issue at a level crossing
ef 82 Creation date 26 sue ighway Code Level Crossing type 1 Protected 1.2 U AOCL MCBcctv AOCR Undefined ABCL AHB MG MCB	Inprotected WC Undefined WC/T WC/MWL DC P/MWL C C n feature	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver HGV driver	ser type Motorcyclist Passenger Horserider Train driver Other	0-10 11-15 16-20 20-35 35-50	<u>60+</u>	☐ Individual ☐ Group	Issue at a level crossing
ef 82 Creation date 26 sue ighway Code Level Crossing type 1 Protected 1.2 U AOCL MCBcctv AOCR Undefined ABCL AHB MG MCB	Inprotected WC Undefined WC/T WC/MWL DC P/MWL C C n feature	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver HGV driver	ser type Motorcyclist Passenger Horserider Train driver Other	0-10 11-15 16-20 20-35 35-50	<u>60+</u>	☐ Individual ☐ Group	Issue at a level crossing
ef 82 Creation date 26 SSUE lighway Code Level Crossing type 1 Protected 1.2 U AOCR UNdefined AOCR Undefined ABCL AHB MG MCB	Inprotected WC Undefined WC/T WC/MWL DC P/MWL C C n feature	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver HGV driver	ser type Motorcyclist Passenger Horserider Train driver Other	0-10 11-15 16-20 20-35 35-50	<u>60+</u>	☐ Individual ☐ Group	Issue at a level crossing
ef 82 Creation date 26 Ssue ighway Code Level Crossing type 1 Protected 1.2 U AOCR Undefined ABCL ABCL AHB MG MG MCB MCB Comparison of issue / designer in the protection o	Inprotected WC Undefined WC/T WC/MWL DC P/MWL C C n feature	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver HGV driver	ser type Motorcyclist Passenger Horserider Train driver Other	0-10 11-15 16-20 20-35 35-50	<u>60+</u>	☐ Individual ☐ Group	Issue at a level crossing
ef 82 Creation date 26 SSUE ighway Code Level Crossing type 1 Protected 1.2 U AOCR Undefined	Inprotected WC Undefined WC/T WC/MWL CC n feature s 278 rules for vehicle of	2. User details 2.1 Level crossing us Peacetrian Cyclist Cyclist HGV driver HGV driver	S Motorcyclist Passenger Horserider Train driver Other Undefined	0-10	00+ ⊠ Undefined	☐ Individual☐ Group☐ Undefined☐	An image of a level crossing from the Highway Code.
ef 82 Creation date 26 SSUE lighway Code Level Crossing type 1 Protected AOCR Undefined L. U.	Inprotected WC Undefined WC/TWC/MWL CC In feature s 278 rules for vehicle of the contains 278 rules.	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Van driver HGV driver drivers.	s Motorcyclist Passenger Horserider Train driver Other Undefined	0-10	60+ Undefined	☐ Individual☐ Group☐ Undefined☐ Group☐ Undefined☐ Group☐ Undefined☐ Group☐ Gro	An image of a level crossing from the Highway Code.
ef 82 Creation date 26 SSUE lighway Code Level Crossing type 1 Protected AOCR Onderined ABCL AHB MG MG MCB MCB MCB ABCL AHB MG MCB MCB MCB MCB MCB ABCL AHB ABCL AHB ABCL AHB ABCL AHB ABCL AHB AHB ABCL AHB AHB ABCL AHB AHB ABCL	Inprotected WC Undefined WC/T WC/MWL CC n feature s 278 rules for vehicle of the contains 278 rules. vehicle drivers making	2. User details 2.1 Level crossing us Peace Cyclist Car driver Van driver HGV driver Grivers.	Motorcyclist Passenger Horserider Train driver Other Undefined	0-10	90. With this	☐ Individual☐ Group☐ Undefined☐ Group☐ Undefined☐ Undefined☐ Group☐ Undefined☐ Group☐	An image of a level crossing fron the Highway Code.
ef 82 Creation date 26 Ssue lighway Code Level Crossing type 1 Protected 1.2 U AOCR	Inprotected MC Undefined MC/T MC/ML CC In feature s 278 rules for vehicle of the contains 278 rules. Vehicle drivers making mg vehicle drivers are no	2. User details 2.1 Level crossing us Pedestrian Gramer Cyclist Van driver HGV driver drivers.	s Motorcyclist Passenger Horserider Train driver Other Undefined	0-10	90. With this sing proced	Individual Group Undefined s quantity of ures is	An image of a level crossing from the Highway Code.
ef 82 Creation date 26 ssue ighway Code Level Crossing type 1 Protected AOCR Undefined Level Code	Inprotected MC Undefined MC/T MC/MWL OC P/MWL C n feature s 278 rules for vehicle of the contains 278 rules, vehicle drivers making ng vehicle drivers are now required to learn the contains 278 rules.	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver Van driver HGV driver drivers. Since 1959, the ruerrors in interpreting	Motorcyclist Passenger Horserider Train driver Other Undefined Jules have increased and understandi at their knowledge driving licence. T	0-10	90. With this ssing proced	Individual Group Undefined Group Undefined s quantity of ures is regular crossings	An image of a level crossing from the Highway Code.
ef 82 Creation date 26 ssue ighway Code Level Crossing type 1 Protected AOCR Undefined Level Code	Inprotected MC Undefined MC/T MC/MWL OC P/MWL C n feature s 278 rules for vehicle of the contains 278 rules, vehicle drivers making ng vehicle drivers are now required to learn the contains 278 rules.	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver Van driver HGV driver drivers. Since 1959, the ruerrors in interpreting	Motorcyclist Passenger Horserider Train driver Other Undefined Jules have increased and understandi at their knowledge driving licence. T	0-10	90. With this ssing proced	Individual Group Undefined Group Undefined s quantity of ures is regular crossings	An image of a level crossing from the Highway Code.
ef 82 Creation date 26 ssue ighway Code Level Crossing type 1 Protected AOCR Undefined Level Code	Inprotected MC Undefined MC/T MC/MWL OC P/MWL C n feature s 278 rules for vehicle of the contains 278 rules, vehicle drivers making ng vehicle drivers are now required to learn the contains 278 rules.	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver Van driver HGV driver drivers. Since 1959, the ruerrors in interpreting	Motorcyclist Passenger Horserider Train driver Other Undefined Jules have increased and understandi at their knowledge driving licence. T	0-10	90. With this ssing proced	Individual Group Undefined Group Undefined s quantity of ures is regular crossings	An image of a level crossing from the Highway Code.
ef 82 Creation date 26 Ssue lighway Code Level Crossing type 1 Protected AOCR Undefined AOCR	Inprotected MC Undefined MC/T MC/MWL OC P/MWL C n feature s 278 rules for vehicle of the contains 278 rules, vehicle drivers making ng vehicle drivers are now required to learn the contains 278 rules.	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver Van driver HGV driver drivers. Since 1959, the ruerrors in interpreting	Motorcyclist Passenger Horserider Train driver Other Undefined Jules have increased and understandi at their knowledge driving licence. T	0-10	90. With this ssing proced	Individual Group Undefined Group Undefined s quantity of ures is regular crossings	An image of a level crossing from the Highway Code.
ef 82 Creation date 26 SSUE lighway Code Level Crossing type 1 Protected AOCR MCBcctv L AOCR AOCR L AHB C AHB C AHB C AHB C AHB C ACCR C AHB C ACCR C AHB C AHB	Inprotected MC Undefined MC/T MC/MWL OC P/MWL C n feature s 278 rules for vehicle of the contains 278 rules, vehicle drivers making ng vehicle drivers are now required to learn the contains 278 rules.	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver Van driver HGV driver drivers. Since 1959, the ruerrors in interpreting	Motorcyclist Passenger Horserider Train driver Other Undefined Jules have increased and understandi at their knowledge driving licence. T	0-10	90. With this ssing proced	Individual Group Undefined Group Undefined s quantity of ures is regular crossings	An image of a level crossing from the Highway Code. 5. Error type
ef 82 Creation date 26 sue ighway Code Level Crossing type 1 Protected 1.2 U AOCR Undefined ABCL AHB MG MCB	Inprotected MC Undefined MC/T MC/MWL OC P/MWL C n feature s 278 rules for vehicle of the contains 278 rules, vehicle drivers making ng vehicle drivers are now required to learn the contains 278 rules.	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist Car driver Van driver HGV driver drivers. Since 1959, the ruerrors in interpreting	Motorcyclist Passenger Horserider Train driver Other Undefined Jules have increased and understandi at their knowledge driving licence. T	0-10	90. With this ssing proced	Individual Group Undefined Group Undefined s quantity of ures is regular crossings	An image of a level crossing from the Highway Code. 5. Error type
ef 82 Creation date 26 Sue ighway Code Level Crossing type 1 Protected 1.2 U AOCR Undefined ABCL AHB MG MG Description of issue / designe highway code currently contain User behaviour the current issue of the Highway Colles to remember, the influence on possible. In is is especially relevant considering tervals, and as a minimum are only the area where a learner vehicle december. Sources of information	Inprotected WC Undefined WC/T WC/MWL CC In feature s 278 rules for vehicle of the contains 278 rules, vehicle drivers making required to learn the converse trained may also	2. User details 2.1 Level crossing us Pedestrian Cyclist Cyclist HGV driver HGV driver Since 1959, the ruerrors in interpreting trequired to update ode to obtain a full influence their com	Motorcyclist Passenger Horserider Train driver Other Undefined Jules have increased and understandi at their knowledge driving licence. T	ed from just sing level crosson the highwith presence tity obeying le	90. With this ssing proced	Individual Group Undefined Group Undefined s quantity of ures is regular crossings	An image of a level crossing from the Highway Code. 5. Error type
ef 82 Creation date 26 Saue lighway Code Level Crossing type 1 Protected AOCR	Inprotected MC Undefined MC/T MC/MWL OC P/MWL C n feature s 278 rules for vehicle of the contains 278 rules, vehicle drivers making ng vehicle drivers are now required to learn the contains 278 rules.	2. User details 2.1 Level crossing us Pedestrian Cyclist Cyclist HGV driver HGV driver Since 1959, the ruerrors in interpreting trequired to update ode to obtain a full influence their com	Motorcyclist Passenger Horserider Train driver Other Undefined ules have increase g and understandi e their knowledge driving licence. T	ed from just ing level cros	90. With this ssing proced way code at rof any level evel crossing	Individual Group Undefined Group Undefined s quantity of ures is regular crossings	An image of a level crossing from the Highway Code. 5. Error type Error Violation
tef 82 Creation date 26 SSUE Iighway Code	Inprotected MC Undefined MC/T Undefined MC/T WC/MWL C P/MWL C P/MWL C P/MWL G	2. User details 2.1 Level crossing us Pedestrian Cyclist Van driver HGV driver HGV driver Since 1959, the ruerrors in interpreting trequired to update ode to obtain a full influence their com	Ser type Motorcyclist Passenger Horserider Train driver Other Undefined Jules have increase g and understandi e their knowledge driving licence. T ppetence in correct 6.3 Document source RAIL INDUSTRY HSE/HMRI	on the highy the presence thy obeying le	90. With this ssing proced vay code at refer of any level evel crossing	Individual Group Group Undefined Undefined Undefined Group G	An image of a level crossing from the Highway Code. 5. Error type Error Violation
ef 82 Creation date 26 SSUE lighway Code Level Crossing type 1 Protected AOCR Undefined ABCL MGBctv AMG F MGB MGB F MGB Description of issue / design the highway code currently contain the current issue of the Highway Cules to remember, the influence on ossible. his is especially relevant considering the area where a learner vehicle of th	Inprotected WC Undefined WC/T WC/MWL CC In feature s 278 rules for vehicle of the contains 278 rules, vehicle drivers making required to learn the control of the contains trained may also 6.2 Level crossing visit Milton Keynes Doncaster Hertford	2. User details 2.1 Level crossing us Padestrian Cyclist Car driver Van driver HGV driver Since 1959, the ruerors in interpreting to required to update ode to obtain a full influence their com	Motorcyclist Passenger Horserider Train driver Other Undefined Liles have increase g and understandi e their knowledge driving licence. T ppetence in correc 6.3 Document source RAIL INDUSTRY HSE/HMRI Network Rail	on the highwork per	90. With this ssing proced evay code at rest of any level crossing	Individual Group Undefined	An image of a level crossing from the Highway Code. 5. Error type Error Violation
Highway Code 1. Level Crossing type 1.1 Protected 1.2 U AOCR	Inprotected MC Undefined MC/T Undefined MC/T WC/MWL C P/MWL C P/MWL C P/MWL G	2. User details 2.1 Level crossing us Pedestrian Farmer Cyclist HGV driver drivers. Since 1959, the ruerrors in interpreting of trequired to update ode to obtain a full influence their com	Ser type Motorcyclist Passenger Horserider Train driver Other Undefined Jules have increase g and understandi e their knowledge driving licence. T ppetence in correct 6.3 Document source RAIL INDUSTRY HSE/HMRI	on the highy the presence thy obeying le	90. With this sing proced way code at a of any level evel crossing	Individual Group Group Undefined Undefined Undefined Group G	An image of a level crossing from the Highway Code. 5. Error type Error Violation

Level crossings: communication and user behaviour issues Ref 83 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Road descents 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL UWC Undefined Pedestrian 0-10 60+ Motorcyclist AOCR ABCL UWC/T UWC/MWL Passenger Undefined Group Undefined Farmer 11-15 Cvclist Horserider 16-20 Undefined ⊠ AHB ⊠ MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Level crossings located at the end of a descent may result in increased red-light running by vehicle drivers. Vehicle speed is easily increased when travelling downhill, and with increased speed a vehicles stopping distance is also greatly increased. The road industry report increased red-light running at traffic lights when situated at the end of a road descent. This is also an issue that could apply level crossings. Previous rail research suggested vehicle drivers may also be concerned at causing vehicle-vehicle collisions if they were to stop suddenly, which may further suggest why red-light running may be more prevalent at the end of a descent. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER pi/re ☑ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) DfT (road) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB Peterborough Independent Bedford RPC Railway GS Other dept Non-UK ○ OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 84 Creation date 31.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Signal box: camera angle 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR Undefined UWC/T 11-15 Undefined □ Farmer Passenger Group ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ☐ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Position of the camera at a level crossing influences the signallers ability to detect objects. 4. User behaviour The position of a CCTV camera varies from crossing to crossing. It may be located to the side of the crossing or positioned at one end. Various factors influence the effectiveness of the camera location, such as the direction of the sun (which could shine directly into the camera at certain times of the day or year). However, the angle at which the camera is positioned also affects the signaller's ability to assess whether the crossing is clear of vehicles, people or other objects 5. Error type Error Violation 6. Sources of information 6.4 Document details 6.2 Level crossing visit - areas 6.3 Document source 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford ☐ Independent☐ Non-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road)

Railway GS

Others

Other dept

Bedford

RPC

BTP

Ref 85 Creation of	mmunication and late 26.08.2004 Las	t modified 02.02.200				day
Issue Passenger compliance wit	th MWI					Issue at a level crossing
Passenger compliance wi	IN MWL					
. Level Crossing type .1 Protected	1.2 Unprotected	2. User detail		2.2 Age	2.3 On own	
AOCL MCBcctv AOCR Undefined ABCL AHB	UWC Undefin	Pedestrian [Farmer Cyclist Car driver	Motorcyclist Passenger Horserider Train driver	0-10		
MG MCB	FP/MWL		Other Undefined	35-50 50-60		
. Description of issue	design feature					
he red light of a MWL is as	sociated with the train the pa	assengers have aligh	ited from.			Familia was ali Nasilia dha sa basa
. User behaviour						Farnborough North: there have been near-misses for both touris and regular passengers when the
	station, the active red light ted from. Passengers contin					have crossed while the red light active.
etting home and not conce imes to make an assessme	passenger may also contribentrating on the immediate sont that a train is not schedule ave an impact on many use	urroundings. These do not be to be a so it is the	passengers may a erefore acceptable	so use their know to walk while the	vledge about train red light is on.	
rain companies are remindi	any train stations that have ng passengers via the train p					5. Error type
to an oncoming train on the	outer line(s).					☑ Error☑ Violation
6. Sources of informati						
i.1 Interview source RAIL INDUSTRY	6.2 Level crossing vi	sit - areas	6.3 Document source			6.4 Document details
	INDUSTRY Doncaster Hertford Vers Peterborough Bedford		HSE/HMRI Network Rail RSSB Railway GS Others	GOVERNMEN DfT (rail) DfT (road) Other dept.		Railtrack internal report (ra/ki)
	mmunication and late 26.08.2004 Lat	t modified 02.02.200				Issue at a level crossing
Frain enthusiasts						
. Level Crossing type		2. User deta	ils			
.1 Protected	1.2 Unprotected	2.1 Level crossing		2.2 Age	2.3 On own	
AOCL MCBcctv AOCR Undefined ABCL AHB MG	□ UWC □ Undefin □ UWC/T □ UWC/MWL □ OC □ FP/MWL	☐ Farmer ☐ Cyclist ☐ Car driver ☐ Van driver ☐	Motorcyclist Passenger Horserider Train driver Other	☐ 16-20 ☐ 20-35 ☐ 35-50	+	
☑ MCB 3. Description of issue	⊠ FC	☐ HGV driver	Undefined	50-60		
•	e undertake risky behaviour	at level crossings.				
						Woodcroft: a train enthusiast wer
4. User behaviour						track-side and refused to move to a position of safety, as he
	ccessible point onto rail infr unobstructed view of passin		ften used by train e	nthusiasts, stand	ing inside of the	believed he was not compromisn his own safety or those of others
	many train enthusiasts on a					The BTP were called to remove him. This crossing is used regularly by enthusiasts as it
	ten used by enthusiasts as tenthusiasts on the approache	·				provides a long clear view of approaching trains.
approaching the crossing.	antifusiasts of the approach	s to level crossings	also cause obstruc	tions for other ver	nicie unvers	
						5. Error type
						☐ Error ☐ Violation
6. Sources of informati						
3.1 Interview source RAIL INDUSTRY	6.2 Level crossing vi	sit - areas	6.3 Document source			6.4 Document details
OLDAN INDUSTRY						
	INDUSTRY Doncaster Hertford Peterborough Bedford		RAIL INDUSTRY HSE/HMRI Network Rail RSSB Railway GS Others	GOVERNMEN DfT (rail) DfT (road) Other dept.	☐ OTHER T ☐ TRL (rail) ☐ TRL (road) ☐ Independent ☐ Non-UK	

Ref 87	Creation date 26.08	3.2004 Last m	nodified 02.02.2005					davi
Issue							Issue at a level crossing	
School parking								
1. Level Cross 1.1 Protected	ing type 1.2 Unpr	otected	User detailsLevel crossing use		2.2 Age	2.3 On own		
AOCL MCB AOCR Unde ABCL AHB MG MG	Scctv UWC	Undefined C/T C/MWL	Pedestrian Farmer Cyclist Car driver Van driver	Motorcyclist Passenger Horserider Train driver Other Undefined	0-10 60+ 11-15 Undefi 16-20 20-35 35-50 50-60	☐ Individual		
	of issue / design 1	feature		Ondelined	30-00			
School drop-off a	and collection points of		gs affects the flow a	nd behaviour of	other vehicle drivers	approaching the		
rossing.								
. User behavi								
	n the vicinity of school opping on the crossing				on points for their ch	nildren, with		
rom the level cro down the centre l	ese parked cars causesing, to concentrate ine, resulting in conflites may be parked fro	on avoiding and mar	noeuvering around t	he parked vehicle	es. They are also for	rced to drive		
							5	
							5. Error type	
							Violation	
6. Sources of	information							
3.1 Interview source RAIL INDUSTRY		6.2 Level crossing visit -		3.3 Document source RAIL INDUSTRY		OTHER	6.4 Document details	
Network Rail RSSB HSE/HMRI RPC BTP	☐ ROAD INDUSTRY ☐ AA ☐ Bus drivers ☐ OTHERS	Doncaster Hertford Peterborough Bedford Redcar		HSE/HMRI Network Rail RSSB Railway GS Others	☐ DfT (rail) ☐ DfT (road)	TRL (rail) TRL (road) Independent Non-UK		
Ref 88 Ssue	Creation date 26.08	3.2004 Last m	nodified 02.02.2005				Issue at a level crossing	davi
1. Level Cross			2. User details					
1.1 Protected	1.2 Unpr	otected	2.1 Level crossing use		2.2 Age	2.3 On own		
□ AOCL □ MCB □ AOCR □ Unde □ ABCL □ AHB □ MG □ MCB	efined UWC	C/T C/MWL	☐ Farmer ☐ ☐ ☐ Cyclist ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Motorcyclist Passenger Horserider Train driver Other Undefined	□ 0-10 □ 60+ □ 11-15 ⋈ Undefi □ 16-20 □ 20-35 □ 35-50 □ 50-60	☐ Individual☐ Group☐ Undefined☐		
	of issue / design 1	feature				'		
High road speeds the crossing.	s in close proximity to	a level crossing on a	lower speed road in	nfluences the spe	eed at which vehicle	drivers approach	A	
4. User behavi	our						A manned crossing in Ridgm (Bedford to Bletchley line) is	
	eeds in close proximity in the following ways		ed at which vehicle o	drivers approach	a level crossing. Thi	is may influence	positioned on a low speed ro However, its proximity to the motorway means vehicle dri continue to pass the crossin	e M1 ivers
	er is conditioned to di ion in speed is percei						speed. The attendant at this crossing has been knocked on several occasions.	s
Γhe vehicle driver	may then continue to	cross over the level	crossing at a speed	which is inappro	ppriate.			
							5. Error type	
							Error Violation	
6. Sources of	information							
6.1 Interview source		6.2 Level crossing visit -		3.3 Document source		OTHER	6.4 Document details	
□ RAIL INDUSTRY □ Network Rail □ RSSB □ HSE/HMRI □ RPC	☐ ROAD INDUSTRY ☐ AA ☐ Bus drivers	☐ Milton Keynes ☐ Doncaster ☐ Hertford ☐ Peterborough ☐ Bedford		RAIL INDUSTRY HSE/HMRI Network Rail RSSB Railway GS	☐ DfT (rail) ☐ DfT (road)	☐ OTHER ☐ TRL (rail) ☐ TRL (road) ☐ Independent ☐ Non-UK		
☐ BTP	OTHERS	Redcar		Others				

Level crossings: communication and user behaviour issues

Level crossings: communication and user behaviour issues Ref 89 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Level crossing equipment 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ☐ MCBcctv UWC Undefined Pedestrian 0-10 Motorcyclist 60+ AOCR ABCL Undefined Undefined UWC/T Farmer 11-15 Group Passenger UWC/MWL Cvclist Horserider 16-20 Undefined AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature The reliability and/or perception of reliability of the level crossing equipment affects the risk taking behaviour of regular users. Operational feedback from experts indicates that level crossing warnings lose their effectiveness when they are not perceived as credible by crossing users. Regular users aware that a crossing has frequent reliability problems may choose to ignore an activated warning system, if they perceive the warning as false and want to avoid being kept at the crossing for a perceived unnecessary period of time. Certain conditions, combined with this perception may increase the chances of users crossing during an activated warning, such as having a clear view of the railway line and not seeing a train approach. The perception of reliability may also affect the behaviour of other users. For example, if people inform others of how unreliable they perceive the crossing to be, this may influence them to ignore the activated warning system. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER le/dr □ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB DfT (road) Peterborough Independent Bedford Non-UK RPC Railway GS Other dept OTHERS 🛛 BTF Redcar Others Level crossings: communication and user behaviour issues Ref 90 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Position of information 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Group Farmer ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ⋈ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Perception of a hazard is improved when information referencing the imminent danger are associated together. 4. User behaviour A user's detection of a hazard is improved when information about the danger is presented together with the imminent danger. Therefore, the position of information warning vehicle drivers of the level crossing should be presented while also in view of the crossing. An information 'void' that does not convey the message nor the danger together does not strongly reinforce the presence of the crossing. A vehicle driver is less likely to be aware and suitably prepared for the hazard if they cannot see together information about the crossing hazard and the actual level crossing The road industry has undertaken similar research on the position of information signs on motorways and the point at which an action is required by the vehicle driver. The response to a prompt was most evident when the sign and point of where the action was required were seen together. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) Independent RPC Railway GS ☐ Non-UK Bedford Other dept

Others

🛚 втр

Issue				davis
				Issue at a level crossing
Vehicle speed zones				
1. Level Crossing type	2. User details			
1.1 Protected 1.2 Unprotected		2.2 Age	2.3 On own	
AOCL		☐ 0-10 ☐ 60+ ☐ 11-15 ☐ Undefined	☐ Individual ☐ Group	
⊠ ABCL □ UWC/MWL	☐ Cyclist ☐ Horserider	□ 16-20	Undefined	
		20-35		
☐ MG ☐ FP/MWL ☐ FC		□ 35-50 □ 50-60		
3. Description of issue / design feature				
The position of incremental speed restriction signs influen	cas the speed of vehicle drivers when a	oproaching the crossin	a	
The position of moremental speed restriction signs influen	ses the speed of verlicit drivers when a	oprodoming the crossin	9.	
				Helpston CCTV: The 30mph zone
4. User behaviour				was positioned to take account of the amount of homes it had an
The position of incremental speed restriction signs on the	approach to a level crossing can have a	n effect on the speed a	at which	impact on. The crossing and
vehicle drivers approach and pass over the crossing.				potential approach speed of vehicle drivers was not considered
Towns or villages often have a low speed zone within the	entral residential areas and then apply	an incremental increase	in speed	as part of the decision process for
zones as the roads progress further from housing areas.				positioning the speed zones.
excluded from the lower speed zones, or positioned too c				Vehicles coming into the village are not encouraged to slow early
drivers slowing with sufficient time or gradually increasing	their speed above the specified limits, s	o when they are appro	aching the	enough.
crossing they are moving at fairly high speeds.				
The allocation of lower speed zones to incorporate a cros	sing on the outskirts of a town or village	would help encourage	the speed	
at which drivers approach and pass over the crossing, thu				5. Error type
				⊠ Error
				⊠ Violation
C. Carresa of information				
6. Sources of information 6.1 Interview source 6.2 Level crossing visi	- areas 6.3 Document source			6.4 Document details
	RAIL INDUSTRY		THER	0.4 Document details
 ☐ RAIL INDUSTRY ☐ Milton Keynes ☐ Network Rail ☐ ROAD INDUSTRY ☐ Doncaster 			THER RL (rail)	
☐ RSSB ☐ AA ☐ Hertford	☐ Network Rail	☐ DfT (rail) ☐ T	RL (road)	
☐ HSE/HMRI ☐ Bus drivers ☐ Peterborough ☐ RPC ☐ Bedford			dependent on-UK	
□ BTP □ OTHERS □ Redcar	Railway GS	□ Other dept. □ N	OII-OK	
Level crossings: communication and u Ref 92 Creation date 31.08.2004 Last	ser behaviour issues			dayl
	modified 02.02.2000			MCAA!
ssue				Issue at a level crossing
Double train lines				
1 Level Crossing type	2. User details			
1. Level Crossing type				
1.1 Protected 1.2 Unprotected		2.2 Age	2.3 On own	
1.1 Protected 1.2 Unprotected ☐ AOCL ☑ MCBcctv ☐ UWC ☐ Undefined	☐ Pedestrian ☐ Motorcyclist	□ 0-10 □ 60+	☐ Individual	
1.1 Protected 1.2 Unprotected □ AOCL	☐ Pedestrian ☐ Motorcyclist ☐ Farmer ☐ Passenger	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined	☐ Individual ☐ Group	
1.1 Protected	□ Pedestrian	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined □ 16-20 □ 20-35	☐ Individual	
1.1 Protected	□ Pedestrian	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined □ 16-20 □ 20-35 □ 35-50	☐ Individual ☐ Group	
1.1 Protected	□ Pedestrian	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined □ 16-20 □ 20-35	☐ Individual ☐ Group	
1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC Undefined AOCR Undefined ABCL AHB OCC MG MG MG MCB Description of issue / design feature	□ Pedestrian	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined □ 16-20 □ 20-35 □ 35-50	☐ Individual ☐ Group	
1.1 Protected	□ Pedestrian	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined □ 16-20 □ 20-35 □ 35-50	☐ Individual ☐ Group	
1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC Undefined AOCR Undefined ABCL AHB OCC MG MG MG MCB Description of issue / design feature	□ Pedestrian	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined □ 16-20 □ 20-35 □ 35-50	☐ Individual ☐ Group	
1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC Undefined AOCR Undefined UWC/T ABCL AHB COC PFP/MWL ACR UWC/TWL COC FFP/MWL FC 3. Description of issue / design feature The space between two sets of double train lines provided	□ Pedestrian	□ 0-10 □ 60+ □ 11-15 ⊠ Undefined □ 16-20 □ 20-35 □ 35-50	☐ Individual ☐ Group	
1.1 Protected 1.2 Unprotected AOCL MCBcctv UWC Undefined AOCR Undefined UWC/T ABCL AHB CCC MG FP/MWL FC 3. Description of issue / design feature The space between two sets of double train lines provides	Pedestrian Motorcyclist Farmer Passenger Cyclist Horserider Car driver Train driver Van driver Other HGV driver Undefined Cusers with a refuge point.	□ 0-10 □ 60+ □ 11-15 ⋈ Undefined □ 16-20 □ 20-35 □ 35-50 □ 50-60	☐ Individual☐ Group☐ Undefined☐	
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Level crossings: communication and user behaviour issues Ref 93 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Distance between gates 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ☐ MCBcctv ⊠ uwc Undefined Pedestrian 0-10 60+ Motorcyclist UWC/T UWC/MWL Passenger Undefined AOCR Undefined Farmer 11-15 Group ABCL Cvclist Horserider 16-20 Undefined __ AHB __ AHB __ MG OC FP/MWL Car driver Train driver 20-35 Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature The overall distance between UWC gates and the distance between the gate and first train line effects the risk taking behaviour of vehicle users. If the overall distance between the gates is fairly wide, this will greatly increase the overall time taken to undertake the correct procedure of crossing 5 times. This impacts on the users willingness to comply with the correct crossing procedure. If there is sufficient space to park a vehicle inside of the gate, but in front of the train track, users will prefer to do this to reduce the amount of crossings required to manoeuvre their vehicle across the tracks. Instead of following the correct procedure of crossing 5 times, the user only moves across the tracks once. Users benefit through a dramatic saving in time by choosing to park their vehicle inside of the gate. However, the user may not be aware that the front of their vehicle might be too close or even protruding over the tracks. UWC users may also use vehicles of different lengths when crossing, some which may clear the tracks when parked inside the gate, while 5. Error type others may not. Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER □ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) _ HSE/HMRI RSSB DfT (road) Peterborough Independent Bedford Other dept RPC Railway GS Non-UK OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 94 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Trespassers 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC □ Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR ☐ Undefined UWC/T Passenger 11-15 Undefined Farmer Group ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ☐ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Food and drink rubbish at a level crossing is often an indicator of young people using the crossing as a meeting place. 4. User behaviour Young people are often happy to congregate around train lines and level crossings. Food and drink leftovers, such as takeaway cartons and drink cans can indicate that the crossing is not only being used as access but as a meeting place for groups of friends. The use of crossings as a social area and over a continued period of time may lower the users' perception of how dangerous the crossing is, resulting in risk taking behaviour. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) Independent ☐ Non-UK RPC Railway GS Bedford Other dept

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Issue								Issue at a level crossing
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			ra ta dataat traina	at loval areasings				一种的技术
Noisy surrounding	gs may impair the per	formance of the user	rs to detect trains	at level crossings.				Fox Covert Road Footpath: the
4. User behavi	iour							crossing is positioned close to two roads which pass over the railway
	y on their hearing and/							line. The noise of passing road
	e warning lights. Nois of the user to listen fo rectly.							vehicles is further increased as they move over the bridges, dramatically reducing the users sense of hearing to check for
Although the issu protected level cr	ue of noise is most pre	evalent at unprotected	d crossings, it ma	ay also hinder the p	erformance of	other users at		oncoming trains.
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Level crossings: communication and user behaviour issues Ref 97 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Stereotypical crossing users 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL ☐ MCBcctv UWC Undefined Pedestrian 0-10 60+ Motorcyclist AOCR ABCL Passenger Undefined Group Undefined UWC/T Farmer 11-15 UWC/MWL Cvclist Horserider 16-20 Undefined ⊠ AHB ⊠ MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Users who violate crossing procedures are not always male and in their twenties. 4. User behaviour Users that fail to obey level crossing procedures are not always the stereotypical male in his twenties, sometimes referred to as the 'Boy Racer'. Other groups of users, often perceived as law abiders, are known to cross without obeying crossing procedures. The following have all been identified as prominent groups of users who fail to follow level crossing procedures: Middle-aged family women and men: People from 'upper-class' groups; Parents with children; Coach drivers with tourists: Taxi drivers with passengers; Salespersons: 5. Error type Ramblers; Error Cyclists & Motorcyclists. Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER ☑ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) DfT (road) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB Peterborough Independent RPC Bedford Railway GS Other dept Non-UK BTF Redcar Others Level crossings: communication and user behaviour issues Ref 98 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Train arrival 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR Undefined UWC/T 11-15 Undefined Farmer Passenger Group ABCL AHB UWC/MWL Cyclist Horserider 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ⋈ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Activation of the warning lights is used by passengers as a train arrival indicator. 4. User behaviour Passengers are using the activation of the warning lights as an indicator of their train arriving at the station. Because users are leaving their decision to progress to the platform on the light activation, users are dashing across the level crossing at the last Passengers walking on the approach to the level crossing know whether they need to run over the crossing to catch their train, by observing the warning lights. At one level crossing, a board has been positioned next to the station car park to block the view of the warning lights from passengers sitting in their cars. Passengers were waiting in the warmth and comfort of their cars and then rushing across the level crossing to the other platform once the lights were activated. 5. Error type Error Violation 6. Sources of information 6.4 Document details 6.2 Level crossing visit - areas 6.3 Document source 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford ☐ Independent☐ Non-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) RPC Railway GS Bedford Other dept

Others

BTP

Level crossings: communication and user behaviour issues Ref 99 Creation date 31.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Sightlines 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL MCBcctv ☑ UWC Undefined Pedestrian 0-10 Motorcyclist 60+ UWC/T UWC/MWL Passenger Undefined AOCR Undefined Farmer 11-15 Group ABCL Cvclist Horserider 16-20 Undefined AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Restricted or blocked sightlines may encourage users to move past a point of safety. 4. User behaviour At crossings that have restricted sightlines along the tracks, this may result in users moving beyond a position of safety to view for oncoming trains along the tracks. This may be a particular problem at AOCL's because of the lack of any physical barrier across the road. After waiting a period of time, vehicle drivers may creep forward past a point of safety to view along the tracks. Without the driver knowing, their vehicle may be positioned over the tracks and in the path of an oncoming train. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER trl/ar □ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB DfT (road) Peterborough Independent Bedford RPC Railway GS Other dept Non-UK OTHERS 🛛 BTF Redcar Others Level crossings: communication and user behaviour issues Ref 100 Creation date 26.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Communication with signaller 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Group Farmer ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC Car driver Train driver 20-35 MG FP/MWL Van driver Other 35-50 ☐ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature The dialogue between the level crossing user and the signaller may impact on the behaviour of the user. 4. User behaviour The type of dialogue used between the user and the signaller may affect the behaviour of the user at the level crossing. Rail specific terminology used by the signaller may be misunderstood and incorrectly interpreted by the user. Inconsistencies in information provided by the signaller from one call to another may also result in misinterpretation of instructions by the user. This may come about from heavy use of a crossing, with the signaller having to provide continued feedback to users, therefore affecting the depth and quality of information provided on each phonecall. The information provided by the user also affects the decisions and replies provided by the signaller. If the user provides inaccurate or false information, or through continued use of a crossing, provides insufficient detail during each phonecall, this may result in the signaller giving permission for the user to cross when in fact it is unsafe for them to do so. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford IndependentNon-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) RPC Railway GS

Other dept

Others

Bedford

BTP

Level crossings: communication and user behaviour issues Ref 101 Creation date 31.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Signal box: detection of objects 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL UWC Undefined Pedestrian 0-10 Motorcyclist 60+ UWC/T UWC/MWL Undefined AOCR Undefined Farmer Passenger 11-15 Group ABCL Cvclist Horserider 16-20 Undefined AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Certain conditions impair the signallers ability to detect objects on the level crossing. During rainy weather conditions, the signaller's ability to detect people or objects through the CCTV is impaired from: Rain directly hitting the lens of the CCTV camera (even with the use of lens wipers). Combination of rain and car headlights reflecting light up from the rubberised flooring toward the CCTV camera lens. The ability of the signaller to detect objects is also impaired by the following: Electric trains can interfere with the quality of the CCTV screen image; Cobwebs on the camera lens also impair the signaller from clearly seeing the full view of the crossing: Windy weather moves the camera position, omitting different sections of the crossing from the signallers view, as it sways from side to side. White and dark clothing can also be very difficult to detect. If a person is standing near the barrier in white clothing, the signaller can 5. Error type find it difficult to ascertain whether they are standing outside or inside the barrier. Dark clothing disguises people when standing on Error or walking over the rubber floor surfaces. Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER □ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster RSSB ☐ AA ☐ Bus drivers Hertford Network Rail DfT (rail) TRL (road) _ HSE/HMRI DfT (road) Peterborough **RSSB** Independent Bedford Non-UK RPC Railway GS Other dept OTHERS BTF Redcar Others Level crossings: communication and user behaviour issues Ref 102 Creation date 31.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Railway sidings 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Group Farmer ABCL AHB UWC/MWL Cyclist Horseride 16-20 Undefined OC Car driver Train driver 20-35 Other MG FP/MWL Van driver 35-50 ⋈ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature Alternative uses of railways sidings may alter the type of traffic using a level crossing. 4. User behaviour Many disused railway sidings are now being sold off to private companies, who utilise the sidings for holding and transporting large quantities of heavy goods by HGVs. Level crossings located on the access routes into and out of the sidings are often inadequate in their design and level of control measures in accommodating for large vehicles passing over the crossing on a regualr basis. The issue is further compounded by the nature of HGV drivers needing to work within strict delivery timescales, resulting in possible risk taking behaviour at level crossings to avoid being delayed. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) Independent ☐ Non-UK RPC Railway GS Bedford Other dept

Others

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Level crossings: communication and user behaviour issues Ref 103 Creation date 31.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing **Emergency services** 1. Level Crossing type 2. User details 1.1 Protected 1.2 Unprotected 2.1 Level crossing user type 2.2 Age 2.3 On own AOCL UWC Undefined Pedestrian 0-10 60+ Motorcyclist AOCR ABCL UWC/T UWC/MWL Passenger Undefined Group Undefined Farmer 11-15 Cvclist Horserider 16-20 Undefined AHB MG Car driver Train driver 20-35 FP/MWL Van driver Other 35-50 Undefined HGV driver 3. Description of issue / design feature Crossings located on routes used by emergency service vehicles may result in increased risk taking behaviour. 4. User behaviour No vehicles, including those of the emergency services, are legally permitted to pass the activated warning system at a level crossina. Level crossings located on roads used frequently by the emergency services may result in these vehicle drivers undertaking further risky behaviour to avoid having to wait at the lights. An emergency service driver's perception of risk (when on an emergency call) associated with passing the activated lights may be lower than the risk compared with not reaching their required destination in time. For example, going through the initial warning lights and knowing that they will probably miss the train if they go early enough, compared to arriving late at their required destination and knowing lives may have been lost. 5. Error type Level crossings may present a dilemma of 'work ethics' to some emergency service vehicle drivers. Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details RAIL INDUSTRY Milton Keynes RAIL INDUSTRY OTHER □ ROAD INDUSTRY HSE/HMRI GOVERNMENT TRL (rail) Network Rail Doncaster DfT (rail) DfT (road) RSSB ☐ AA ☐ Bus drivers Hertford Network Rail TRL (road) ☐ HSE/HMRI RSSB Peterborough Independent Bedford Other dept RPC Railway GS Non-UK OTHERS 🛛 BTF Redcar Others Level crossings: communication and user behaviour issues Ref 104 Creation date 31.08.2004 Last modified 02.02.2005 Issue Issue at a level crossing Weather: Fog 1. Level Crossing type 2. User details 2.1 Level crossing user type 1.1 Protected 1.2 Unprotected 2.2 Age 2.3 On own UWC Undefined AOCL MCBcctv Pedestrian Motorcyclist 0-10 60+ Individual AOCR UWC/T Passenger 11-15 Undefined Undefined Farmer Group ABCL AHB UWC/MWL Cyclist Horserider 16-20 Undefined OC 20-35 Car driver Train driver MG FP/MWL Van driver Other 35-50 ⋈ MCB FC HGV driver Undefined 50-60 3. Description of issue / design feature The effectiveness of visual information is impaired by fog. 4. User behaviour The ability of the vehicle drivers or other users to detect the presence of a level crossing, hazard information, warning lights or an approaching train is impaired by fog. The impact of fog on users behaviour may result in users undertaking risky behaviour, such as failing to take account of warning information or failing to see oncoming trains. 5. Error type Error Violation 6. Sources of information 6.2 Level crossing visit - areas 6.3 Document source 6.4 Document details 6.1 Interview source RAIL INDUSTRY RAIL INDUSTRY Milton Keynes mp/001 ☐ ROAD INDUSTRY GOVERNMENT Network Rail Doncaster HSF/HMRI TRI (rail) RSSB Network Rail DfT (rail) TRL (road) Hertford IndependentNon-UK HSE/HMRI ☐ Bus drivers Peterborough RSSB DfT (road) RPC Railway GS Bedford Other dept

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5 Validation

5.1 Objective

The validation exercise was carried out to assess the feasibility of assigning HF issues to level crossings. This is a precursor to the development of tools and approaches for Inspectors.

5.2 Method

5.2.1 Location

The area of Helpston (figure 15), near Peterborough, was selected for carrying out the validation exercise. The signal box in Helpston, quantity of level crossings, different road infrastructures and level crossing users within a relatively small geographical area, made it an ideal location.



Figure 15Helpston and the surrounding villages.

The following level crossings were used for the validation exercise;

Helpston: MCBMaxey: CCTV

Lolham: CCTV

Tallington: CCTV

Bainton Green: AHB

Fox Covert: FP

5.2.2 Timescale

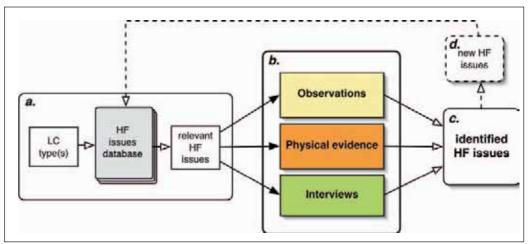
The exercise was conducted over a total of four days, 5th October and 19-21st October, 2004.

5.2.3 Process

The process used for assigning specific HF issues to level crossings is broken down into the following tasks; a, b, c, and d (figure 16).

- Task a: select level crossing types to be reviewed and extract relevant HF issues from database.
- Task b: issues relevant to each crossing type are assessed using 'Observations', 'Physical evidence' and 'Interviews'.
- Task c: a set of final HF issues are assigned to each crossing.
- Task d: new HF issues identified from task b are fed back into database.

Figure 16
Process used for assigning
HF issues to level crossings.



Three techniques were applied for assigning the human factors issues at each of the level crossings; Observations, Physical evidence and Interviews (task b).

5.2.3.1 Observations

During the validation exercise, observations were carried out at the level crossings. This involved spending periods of time at the crossing and observing the behaviour of users. Any issues from the database that were confirmed from observing users were recorded against a data sheet with issues relevant to that specific type of crossing.

All observations were video recorded.

5.2.3.2 Physical evidence

A review of the physical aspects of each crossing and its immediate surroundings were made.

This involved verifying the presence of issues from any physical evidence. For example, a nearby 'road junction', 'farm land' in the vicinity of the crossing, 'traffic calming system' or 'type of trains'. An assessment of the crossing from a user's perspective, both on foot and from a vehicle was also made to ensure all physical evidence was confirmed. Any issues established through this process were recorded on the data sheet.

Still photographs and video footage were taken to record each identified issue.

5.2.3.3 Interviews

Contact was made with key persons within the Helpston area. These contacts were used for the interview stages of the validation exercise.

The type of users sourced for the interviews were chosen to ensure that each of the following 'characteristics' were covered by at least one person;

- · Local to area
- Represented community

- Business user
- Rail industry member

Response from the local community and railway industry was forthcoming and the following users agreed to participate;

- Joe Dobson, Parish Councillor for Helpston
- Pc Dave Roberston, BTP
- Fred Mann, Warden of local Glinton College
- Mark Delaine-Smith, Delaine Buses (and drivers)
- Signallers at Helpston signal box

The use of local knowledge is a valuable method for gaining insights into the behaviour of level crossing users. However, correctly defining the boundaries of each interview is key to ensuring the discussion generates HF issues and the reasons behind user behaviour, and not on 'fault-finding' with individual users or any industry. Each interviewee was provided with a set of guidelines prior to the interview, which detailed some examples of HF issues. These examples provided a framework for the discussion and facilitated users to talk around the issues, ensuring maximum output from the interview.

Interviews were carried out with people either at their place of work, home or during visits to the local level crossings. The visits to crossings with users can assist in confirming many HF issues. The context-specific environment supported the user in their discussion of issues and helped uncover additional minor details about user behaviour relevant to each individual crossing.

During each interview, the HF issues previously confirmed as relevant to each level crossing were reviewed, as well as all HF issues relevant to the type(s) of crossing.

5.3 Findings

The following tables list the identified human factors issues for each level crossing. Each table gives the reference number, name and description for each issue. The issues are not ranked in terms of their level of risk, but are presented in numerical order.

Key:

O = Observations P = Physical evidence I = Interviews



An indication of how the human factors issues were identified is also provided. A colour-coding key has been used to show whether an issue was identified through Observation, Physical evidence or Interview. An issue may have been identified by one, two or all three of the techniques.

5.3.1 Generating information through interviews

The colour coding clearly shows that the interview technique identified the majority of issues for all level crossings, followed by physical evidence and then observations.

Not only did the interviews identify which issues were relevant, they also uncovered a breadth of knowledge about the resultant behaviour of users. This additional information on user behaviour has been included within the database.

Many of the issues and associated behaviours of users would not have been captured through using just evidence at the crossing or from observing users for interim periods of time. The inclusion of interviews with local users and those from the rail industry has generated extensive feedback on HF issues and user behaviour.

5.3.2 Assigned HF issues

Tables are provided for Helpston (table 3), Tallington (table 4), Maxey (table 5), Lolham (table 6), Bainton Green (table 7) and Fox Covert (table 8) level crossings. Photographic evidence of some of the issues are provided at the end of each table.

Table 3 *Helpston: MCB*

Ref	Issue identified	Description	0	P	1
03	Weather: Ice	lcy weather conditions on the approach, exit and on the crossing affects the behaviour of users.			
04	Users familiarity with a crossing	Regular users are more likely to undertake risky behaviour when crossing. Those living close to level crossings often behave less cautiously when using the crossing.			
07	Vehicle approach speed	The speed of the road traversing a level crossing is a factor in vehicle driver errors.			
11	Pedestrian access	Pedestrian and passengers are more likely to undertake risky behaviour at vehicular level crossings where bridges are not provided.			
13	Groups	People in groups may undertake more risky behaviour, than when on their own (figure 18).			
14	Time of day	Risk taking at level crossings increases during rush-hours, at midday and at the beginning and end of the school day.			
16	Presence of rail staff	The presence of rail staff in high-visibility clothing can have an undesirable impact on level crossing user behaviour.			
18	Closure time	The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.			
20	Audible alarm	Second audible warning tone is not detected and/or understood by level crossing users.			
22	Conspicuity of flashing lights	The effectiveness of flashing lights is limited be veiling glare, limited light output and their position.			
40	Type of trains	Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.			
42	Days of the week	Risk taking behaviour at level crossings increases on working days.			
45	Animals: Horses	Activated protected level crossings may result in undesirable behaviour by horses, and influence the behaviour of other road users.			
48	Observation of amber light	The length of activation of the amber light has little affect on the behaviour of vehicle drivers.			

53	Events	Events increase the amount of irregular users at level crossings.		
56	Location near major roads	The risk of vehicle drivers blocking-back over the level crossing or general risk taking behaviour is increased when the crossing is located on roads with direct access to major roads and motorways.		
57	Traffic calming systems	Road traffic calming systems on the approaches to a level crossing may increase the risk of vehicles blocking-back (figure 19).		
72	Location near farms	High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing.		
75	Public houses	Crossing located on-route to public houses may result in increased violations of crossing procedures.		
86	Train enthusiasts	To view trains closely, people undertake risky behaviour at level crossings.		
88	Proximity of different road speeds	High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing (figure 20).		
91	Vehicle speed zones	The position of incremental speed restriction signs influences the speed of vehicle drivers on approaching the crossing.		
92	Double train lines	The space between two sets of double train lines provides users with a refuge point.		
96	Straight roads	Straight roads increase the opportunities for vehicle drivers to undertake risky behaviour, to avoid having to wait at a level crossing.		
97	Stereotypical crossing users	Users who violate crossing procedures are not always male and in their twenties.		
104	Weather: Fog	The effectiveness of visual information is impaired by fog.		



Figure 18
13: many young children use the
Helpston crossing, before and after
school on cycles and by foot. Children
in groups undertake more risky
behaviour than children on their own.



Figure 19
57: The local traffic calming scheme can cause blocking-back problems over the crossing. Additional schemes on the other side of the crossing was considered inappropriate.



Figure 20 88: the 30mph zone is positioned very close to the crossing, after a 60mph straight road. It provides very limited time for vehicles drivers to adjust their behaviour.

Table 4 *Tallington: CCTV*

Ref	Issue identified	Description	0	Р	I
03	Weather: Ice	Icy weather conditions on the approach, exit and on the crossing affects the behaviour of users.			
04	Users familiarity with a crossing	Regular users and those living close to level crossings are more likely to undertake risky behaviour when using the crossing.			
10	Representation of HGV users	HGV drivers form a disproportionately high number of incidents at level crossings.			
14	Time of day	Risk taking at level crossings increases during rush-hours, at midday and at the beginning and end of the school day.			
15	Visual clutter	Superfluous information and roadside structures on the approach to the crossing may reduce user's detection of level crossing information and warning signs (figure 21).			
18	Closure time	The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.			
40	Type of trains	Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.			
42	Days of the week	Risk taking behaviour at level crossings increases on working days.			
48	Observation of amber light	The length of activation of the amber light has little affect on the behaviour of vehicle drivers (figure 22).			
72	Location near farms	High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing.			
75	Public houses	Crossing located on-route to public houses may result in increased violations of crossing procedures (figure 23).			
86	Train enthusiasts	To view trains closely, people undertake risky behaviour at level crossings.			
97	Stereotypical crossing users	Users who violate crossing procedures are not always male and in their twenties.			



Figure 21
15: the approach to Tallington is cluttered with yellow advertising signs and a yellow branded petrol station. These all make it very difficult for approaching vehicle drivers to identify the similar coloured crossing signage.



Figure 22
48: drivers have been observed ignoring the amber light, although they have had sufficient time to stop at the lights. The vehicle driver approaching the crossing continues to drive straight over.



Figure 23
75: some users of the local public house use the crossing while under the influence of alcohol. The BTP have been called to this crossing to clear it of nusiance users who jump the barriers.

Table 5
Maxey: CCTV

Ref	Issue identified	Description	0	Р	I
03	Weather: Ice	Icy weather conditions on the approach, exit and on the crossing affects the behaviour of users.			
04	Users familiarity with a crossing	Regular users and those living close to level crossings are more likely to undertake risky behaviour when crossing when using the crossing (figure 24).			
11	Pedestrian access	Pedestrian and passengers are more likely to undertake risky behaviour at vehicular level crossings where bridges are not provided.			
14	Time of day	Risk taking at level crossings increases during rush-hours, at midday and at the beginning and end of the school day.			
16	Presence of rail staff	The presence of rail staff in high-visibility clothing can have an undesirable impact on level crossing user behaviour.			
18	Closure time	The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.			
20	Audible alarm	Second audible warning tone is not detected and/or understood by level crossing users.			
22	Conspicuity of flashing lights	The effectiveness of flashing lights is limited be veiling glare, limited light output and their position.			
25	Users perception of train speed and distance	Train speed and distance is underestimated by users, which may result in increased decision making errors by users at level crossings.			
26	Foliage on roadside	The effectiveness of information on the approach to the level crossing is reduced by overgrown foliage (figure 25).			
40	Type of trains	Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.			
42	Days of the week	Risk taking behaviour at level crossings increases on working days.			
45	Animals: Horses	Activated protected level crossings may result in undesirable behaviour by horses, and influence the behaviour of other road vehicle users.			
48	Observation of amber light	The length of activation of the amber light has little affect on the behaviour of vehicle drivers.			
63	Housing developments	Housing developments increase road traffic and level crossing use.			
70	Road markings	The effectiveness of vehicle drivers stopping in the correct location is impaired by worn road markings.			
72	Location near farms	High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing.			
86	Train enthusiasts	To view trains closely, people undertake risky behaviour at level crossings.			
88	Proximity of different road speeds	High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing (figure 26).			
92	Double train lines	The space between two sets of double train lines provides users with a refuge point.			

97	Stereotypical crossing users	Users who violate crossing procedures are not always male and in their twenties.		
104	Weather: Fog	The effectiveness of visual information is impaired by fog.		



Figure 24
04: local users living next to the crossing have consistently undertaken risky behaviour when crossing at Maxey.



Figure 25
26: the level crossing sign, positioned on the left-hand side is obscured from the vehicle driver's view.



Figure 2688: the 30mph zone is positioned close to the crossing, after a 60mph zone on a long straight road.

Table 6 *Lolham: CCTV*

Ref	Issue identified	Description	0	Р	1
03	Weather: Ice	lcy weather conditions on the approach, exit and on the crossing			
		affects the behaviour of users.			
04	Users familiarity with a crossing	Regular users and those living close to level crossings are more likely to undertake risky behaviour using the crossing.			
18	Closure time	The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.			
26	Foliage on roadside	The effectiveness of information on the approach to the level crossing is reduced by overgrown foliage.			
40	Type of trains	Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.			
42	Days of the week	Risk taking behaviour at level crossings increases on working days.			
45	Animals: Horses	Activated protected level crossings may result in undesirable behaviour by horses, and influence the behaviour of other road users.			
48	Observation of amber light	The length of activation of the amber light has little affect on the behaviour of vehicle drivers.			
54	Narrow roads	Narrow roads before and after the level crossing may result in drivers slowing and stopping while on the level crossing (figure 27).			
64	Vehicle shortcuts	Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers (figure 28).			
70	Road markings	The effectiveness of drivers stopping in the correct location is impaired by worn road markings.			
72	Location near farms	High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing.			

74	Proximity of level crossings to another	Level crossings located in close proximity of another may influence the risk taking behaviour of vehicle drivers (figure 29).		
75	Public houses	Crossing located on-route to public houses may result in increased violations of crossing procedures.		
80	Cats-eyes	Deteriorated cats-eyes on the approach or on the level crossing may reduce the vehicle driver's ability to negotiate the road layout at night.		
86	Train enthusiasts	To view trains closely, people undertake risky behaviour at level crossings.		
97	Stereotypical crossing users	Users who violate crossing procedures are not always male and in their twenties.		
104	Weather: Fog	The effectiveness of visual information is impaired by fog.		



Figure 27
54: the approaches to both sides of Lolham bridges is very narrow. There is only room for one vehicle to pass at a time.



Figure 28
64: the Lolham bridges crossing is often used as a shortcut for vehicle drivers avoiding the busy A1 between Stamford and Peterborough.



Figure 29
74: the Lolham bridges crossing is positioned in close proximity to Bainton Green. After being held at Lolham, many vehicle drivers speed along the straight road to avoid being caught at the next crossing.

Table 7Bainton Green: AHB

Ref	Issue identified	Description	0	P	I
04	Users familiarity with a crossing	Regular users are more likely to undertake risky behaviour when crossing. Those living close to level crossings often behave less cautiously when using the crossing.			
06	Road junctions	Road junctions close to the level crossing may result in increased decision making, possible errors by vehicle drivers and blocking-back over the crossing (figure 30).			
07	Vehicle approach speed	The speed of the road traversing a level crossing is a factor in vehicle driver errors.			
16	Presence of rail staff	The presence of rail staff in high-visibility clothing can have an undesirable impact on level crossing user behaviour.			
23	Sunlight strobing	Sunlight passing through lines of trees positioned on the side of the road, imparts a strobing effect on the road which may impair the visibility of vehicle drivers.			

24	Half barrier	Automatic half barriers facilitate vehicle drivers to undertake risk taking behaviour (figure 31).		
25	User perception of train speed and distance	Train speed and distance is underestimated by users, which may increase the decision making errors of users at level crossings.		
26	Foliage on roadside	The effectiveness of information on the approach to a level crossing is reduced by overgrown foliage.		
38	Visitor parking	The position of visitor's parked vehicles at a level crossing may affect the behaviour of other road users.		
40	Type of trains	Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.		
42	Days of the week	Risk taking behaviour at level crossings increases on working days.		
45	Animals: Horses	Activated protected level crossings may result in undesirable behaviour by horses, and influence the behaviour of other road users.		
48	Observation of amber light	The length of activation of the amber light has little affect on the behaviour of vehicle drivers.		
64	Vehicle shortcuts	Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers.		
72	Location near farms	High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing (figure 32).		
74	Proximity of level crossing to another	Level crossings located in close proximity to another may influence the risk taking behaviour of vehicle drivers.		
75	Public houses	Crossing located on-route to public houses may result in increased violations of crossing procedures.		
96	Straight roads	Straight roads increase the opportunities for vehicle drivers to undertake risky behaviour, to avoid having to wait at a level crossing.		
97	Stereotypical crossing users	Users who violate crossing procedures are not always male and in their twenties.		
104	Weather: Fog	The effectiveness of visual information is impaired by fog.		



Figure 30
06: two road junctions cross before leading to Bainton Green crossing. The complexity of this junction leads to vehicle drivers having to focus on a variety of different information cues, especially during rush-hours when this is used as a shortcut route.



Figure 31
24: Bainton Green is a half barrier crossing. Zig-zagging has been observed by locals.



Figure 32
72: the route over Bainton is used heavily by local farmers. The straight road and shortcut route combined with slow farming traffic may influence some vehicle drivers to overtake while approaching the crossing.

Table 8Fox Covert: FP

Ref	Issue identified	Description	0	Р	I
04	Users familiarity with a crossing	Regular users and those living close to level crossings are more likely to undertake risky behaviour when using level crossings (figure 35).			
05	Frequency of trains	Crossing with a low frequency of trains are likely to increase the risk taking behaviour of regular users (figure 36).			
12	Regularity of trains	Variations in train schedules, such as engineering work, unexpected delays to train services, and line speed restrictions etc., all contribute to fluctuations in trains passing a point at a supposedly 'known' time.			
13	Groups	People in groups may undertake more risky behaviour, than when on their own.			
14	Time of day	Risk taking behaviour increases during rush-hours, at midday and at the beginning and end of the school day.			
21	Darkness	Unprotected crossings used during hours of darkness may lead to increased decision making errors by crossing users.			
25	User perception of train speed and distance	Train speed and distance is underestimated by users, which may increase the decision making errors of users at level crossings.			
30	Trespassing on rail structures	Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.			
32	Train speeds	Low train speeds may increase the risk taking behaviour of users.			
33	Sighting distance	Good sighting distance should indicate the crossing as high risk (figure 34).			
39	Crossing utilisation	Level crossings with high crossing utilisation increases the risks to users.			
40	Type of trains	Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.			
94	Trespassers	Food and drink rubbish at a level crossing is often an indicator of young people using the crossing as a meeting place (figure 33).			
95	Noise	Noisy surroundings may impair the performance of users to detect trains at level crossings (figure 34).			



Figure 33
30: railway construction material had been left alongside the crossing, with easy access for children.
94: evidence of food and drink rubbish indicated it was used as a meeting place.



33: the sighting distance is long in both directions, and from both sides of the crossing.
95: the local by-pass bridge in the

distance produces considerable noise from passing vehicles.



Figure 35
04: local school children use this crossing on a regular basis. This cycle rider failed to look when crossing.
05: the cyclist also commented on the low frequency of trains, and often never seeing a train when crossing in the morning or evening.

5.4 Feasibility of ranking issues

The human factors issues identified from the validation exercise have not been ranked in terms of their importance or by level of risk. The interview technique provides an excellent source for establishing what issues do exist, however some issues may have more of an impact on certain individuals. Therefore any system of ranking would be greatly dependent upon how important they were to a local user.

5.5 Value of the validation exercise

The application of Observations, Physical evidence and Interviews has been successful in assigning human factors issues to level crossings. This process will be used as a guide for developing the tools and approaches for Inspectors.

A matrix of all database issues is provided in appendix B. It provides an overview of those issues assigned at each crossing and the method by which is was confirmed.

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Appendices

A Level crossing visits

This appendix is supplementary to section 2.3, Level crossing visits at the beginning of this report. It provides photographs of 31 of the 45 level crossings visited.

B HF issues by level crossing type

This appendix contains a list of the HF issues relevant to each level crossing type.

Appendix A: Level crossing visits

Bedford

Kempston Hardwick: ABCL







Millbrook Station: MCG





Stewartby Brickworks: MCG, Private Crossing Keeper







Stewartby Green Lane Station: MCG







Wootton Broadmead: AHB





Doncaster

Creykes: AHB







Dockhills: MCB CCTV







Eggborough: FP





Fields Lane: AOCL







Hensall Station: MCG







Marsh Lane: FP







Snaith & Pontefract: MCB CCTV







Stainforth Road: MCB CCTV







Thorpe: AOCL







Hertford

Roydon Station: MCB CCTV







St.Margarets Station: MCB CCTV







Ware Station: MCB CCTV







Ware (a): FP







Ware (b): FP







Milton Keynes

Berry Lane: UWC+T





Bow Brickhill Station: AHB







Leighton Buzzard: National Heritage Railway, Open Crossing







Woburn Sands: FP







Woburn Sands Station: MCB







Peterborough

Bainton Green: AHB







Fox Covert: FP







Lolham Bridges: MCB CCTV







Lolham: FP







Maxey: MCB CCTV







Tallington: MCB CCTV







Woodcroft: MCG







Appendix B: HF issues by crossing type

The following pages contain a list of the Human Factors issues by level crossing type.

Driver distractions

Distractions on the approach to a level crossing may impair the performance of both vehicle and train drivers.

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

06 Road junctions

Road junctions close to the level crossing may result in increased decision making and errors by vehicle drivers, and blocking-back over the crossing.

07 Vehicle approach speed

The speed of the road traversing a level crossing is a factor in vehicle driver errors.

08 Age of drivers

Violations at level crossings may be influenced by the age of the local population.

10 Representation of HGV users

HGV drivers form a disproportionately high number of incidents at level crossings.

11 Pedestrian access

Pedestrian and passengers are more likely to undertake risky behaviour at vehicular level crossings where bridges are not provided.

12 Regularity of trains

Variations in train schedules, such as engineering works, unexpected delays to train services, and line speed restrictions etc., all contribute to fluctuations in trains passing a point at a supposedly 'known' time.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

14 Time of day

Risk taking at level crossings increases during rush-hours, at midday and at the beginning and end of the school day.

15 Visual clutter

Superfluous information and roadside structures on the approach to the crossing may reduce the user's detection of level crossing information and warning signs.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

17 Understanding of warning lights

The onset of the amber and proceeding red lights of the activated warning system lead to various vehicle driver behaviours at level crossings.

18 Closure time

The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.

20 Audible alarm

Second audible warning tone is not detected and/or understood by level crossing users.

22 Conspicuity of flashing lights

The effectiveness of flashing lights is limited by veiling glare, limited light output and their position.

26 Foliage

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

28 Position of warning lights

The effectiveness of warning lights is influenced by their position.

29 Quantity of information

The quantity of signage information that can be read and understood decreases with road speed.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

31 Location near rail stations

Level crossings adjacent to rail stations influence the risk taking behaviour of vehicle drivers and other users.

32 Train speeds

Low train speeds may increase the risk taking behaviour of users.

33 Sighting distance

Good sighting distance should indicate the level crossing as high risk.

34 Parked cars

Parked cars before and after the level crossing may result in drivers slowing and stopping while on the level crossing.

38 Visitor parking

The position of visitors parked vehicles at a level crossing may affect the behaviour of other road drivers.

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

42 Days of the week

Risk taking behaviour at level crossings increases on working days.

43 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

44 Automatic open crossings

Automatic open level crossings result in increased risk taking behaviour, later in the crossing cycle.

48 Observation of amber light

The length of activation time of the amber light has little affect on the behaviour of the vehicle driver.

49 Road access

Level crossings that provide the only access to routes either side of the crossing influences the risk taking behaviour of vehicle drivers.

50 Passenger drop-off points

Non-designated passenger drop-off points close to level crossings affects the flow and behaviour of traffic approaching a level crossing.

See-through effect

Level crossing located in a dip or on a brow of a long straight road may result in increases of red-light running.

52 HGV drivers using rail station facilities

The effectiveness of information is reduced by HGV drivers parking in front of signs and warning devices.

53 Events

Events increase the amount of irregular users at level crossings.

Marrow roads

Narrow roads before and after the level crossing may result in vehicle drivers slowing and stopping while on the level crossing.

Location near major roads

The risk of vehicle drivers blocking-back over the level crossing, or general risk taking behaviour is increased when the crossing is located on roads with direct access to major roads or motorways.

57 Traffic calming systems

Road traffic calming systems on the approaches to a level crossing may increase the risk of vehicles blocking-back.

59 Foreign vehicle drivers

Areas with high levels of foreign vehicle drivers may have increases in decision making errors at level crossings. This may be more evident during seasonal periods.

61 Crossing surface

Uneven and slippery level crossing surface may present a potential hazard to those using the crossing.

62 Roadworks

Roadworks positioned up to 3 kilometres from the level crossing may still impact on vehicles blocking-back.

63 Housing developments

Housing developments increase road traffic and level crossing use.

64 Vehicle shortcuts

Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers.

66 Another train approaching

The 'Another Train Coming if lights continue to show' sign has minimal impact in providing vehicle drivers with sufficient information.

69 Rural level crossings

The environmental context of a rural level crossing reduces the awareness of approaching vehicle drivers.

70 Road markings

The effectiveness of vehicle drivers stopping in the correct location is impaired by worn road markings.

71 Number of train lines

Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

72 Location near farms

High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing.

73 Commercial traffic

Level crossings with high volumes of commercial traffic may result in increased risk taking behaviour.

74 Proximity of level crossing to another

Level crossings located in close proximity to another may influence the risk taking behaviour of vehicle drivers.

79 Combined environmental features

Level crossings with a combination of environmental features, such as bends, hills, trees and hedges, may increase the decision making errors of vehicle drivers.

80 Cats-eyes

Deteriorated 'cats-eyes' on the approach or on the level crossing may reduce the vehicle driver's ability to negotiate the road layout at night.

81 Sign pictogram

The 'Puffer' sign does not convey any directly useful information to users.

83 Road descents

Level crossings located at the end of a descent may result in increased red-light running by vehicle drivers.

Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

87 School parking

School drop-off and collection points close to level crossings affects the flow and behaviour of other vehicle drivers approaching the crossing.

88 Proximity of different road speeds

High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing.

89 Level crossing equipment

The reliability and/or perception of reliability of the level crossing equipment affects the risk taking behaviour of regular users.

90 Position of information

Perception of a hazard is improved when information referencing the imminent danger are associated together.

91 Vehicle speed zones

The position of incremental speed restriction signs influences the speed of vehicle drivers when approaching the crossing.

95 Noise

Noisy surroundings may impair the performance of the users to detect trains at level crossings.

96 Straight roads

Straight roads increase the opportunities for vehicle drivers to undertake risky behaviour, to avoid having to wait at the level crossing.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

98 Train arrival

Activation of the warning lights is used by passengers as a train arrival indicator.

102 Railway sidings

Alternative uses of railways sidings may alter the type of traffic using a level crossing.

103 Emergency services

Crossings located on routes used by emergency service vehicles may result in increased risk taking behaviour.

104 Weather: Fog

The effectiveness of visual information is impaired by fog.

75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

45 Animals: Horses

Activated warnings at protected level crossings may result in undesirable behaviour by horses, and influence the behaviour of other road vehicle users.

23 Sunlight strobing

Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers.

99 Sightlines

Restricted or blocked sightlines may encourage users to move past a point of safety.

Driver distractions

Distractions on the approach to a level crossing may impair the performance of both vehicle and train drivers.

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

06 Road junctions

Road junctions close to the level crossing may result in increased decision making and errors by vehicle drivers, and blocking-back over the crossing.

07 Vehicle approach speed

The speed of the road traversing a level crossing is a factor in vehicle driver errors.

08 Age of drivers

Violations at level crossings may be influenced by the age of the local population.

10 Representation of HGV users

HGV drivers form a disproportionately high number of incidents at level crossings.

11 Pedestrian access

Pedestrian and passengers are more likely to undertake risky behaviour at vehicular level crossings where bridges are not provided.

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Variations in train schedules, such as engineering works, unexpected delays to train services, and line speed restrictions etc., all contribute to fluctuations in trains passing a point at a supposedly 'known' time.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

14 Time of day

Risk taking at level crossings increases during rush-hours, at midday and at the beginning and end of the school day.

15 Visual clutter

Superfluous information and roadside structures on the approach to the crossing may reduce the user's detection of level crossing information and warning signs.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

17 Understanding of warning lights

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18 Closure time

The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.

20 Audible alarm

Second audible warning tone is not detected and/or understood by level crossing users.

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34 Parked cars

Parked cars before and after the level crossing may result in drivers slowing and stopping while on the level crossing.

38 Visitor parking

The position of visitors parked vehicles at a level crossing may affect the behaviour of other road drivers.

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

42 Days of the week

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48 Observation of amber light

The length of activation time of the amber light has little affect on the behaviour of the vehicle driver.

49 Road access

Level crossings that provide the only access to routes either side of the crossing influences the risk taking behaviour of vehicle drivers.

50 Passenger drop-off points

Non-designated passenger drop-off points close to level crossings affects the flow and behaviour of traffic approaching a level crossing.

51 See-through effect

Level crossing located in a dip or on a brow of a long straight road may result in increases of red-light running.

52 HGV drivers using rail station facilities

The effectiveness of information is reduced by HGV drivers parking in front of signs and warning devices.

53 Events

Events increase the amount of irregular users at level crossings.

54 Narrow roads

Narrow roads before and after the level crossing may result in vehicle drivers slowing and stopping while on the level crossing.

56 Location near major roads

The risk of vehicle drivers blocking-back over the level crossing, or general risk taking behaviour is increased when the crossing is located on roads with direct access to major roads or motorways.

57 Traffic calming systems

Road traffic calming systems on the approaches to a level crossing may increase the risk of vehicles blocking-back.

59 Foreign vehicle drivers

Areas with high levels of foreign vehicle drivers may have increases in decision making errors at level crossings. This may be more evident during seasonal periods.

61 Crossing surface

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62 Roadworks

Roadworks positioned up to 3 kilometres from the level crossing may still impact on vehicles blocking-back.

63 Housing developments

Housing developments increase road traffic and level crossing use.

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Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

06 Road junctions

Road junctions close to the level crossing may result in increased decision making and errors by vehicle drivers, and blocking-back over the crossing.

07 Vehicle approach speed

The speed of the road traversing a level crossing is a factor in vehicle driver errors.

08 Age of drivers

Violations at level crossings may be influenced by the age of the local population.

10 Representation of HGV users

HGV drivers form a disproportionately high number of incidents at level crossings.

11 Pedestrian access

Pedestrian and passengers are more likely to undertake risky behaviour at vehicular level crossings where bridges are not provided.

12 Regularity of trains

Variations in train schedules, such as engineering works, unexpected delays to train services, and line speed restrictions etc., all contribute to fluctuations in trains passing a point at a supposedly 'known' time.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

14 Time of day

Risk taking at level crossings increases during rush-hours, at midday and at the beginning and end of the school day.

15 Visual clutter

Superfluous information and roadside structures on the approach to the crossing may reduce the user's detection of level crossing information and warning signs.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

17 Understanding of warning lights

The onset of the amber and proceeding red lights of the activated warning system lead to various vehicle driver behaviours at level crossings.

18 Closure time

The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.

20 Audible alarm

Second audible warning tone is not detected and/or understood by level crossing users.

22 Conspicuity of flashing lights

The effectiveness of flashing lights is limited by veiling glare, limited light output and their position.

24 Half barrier

Automatic half barriers facilitate vehicle drivers to undertake risk taking behaviour.

25 Users perception of train speed & distance

Train speed and distance is underestimated by users, which may result in increased decision making errors by users at level crossings.

26 Foliage

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

28 Position of warning lights

The effectiveness of warning lights is influenced by their position.

29 Quantity of information

The quantity of signage information that can be read and understood decreases with road speed.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

31 Location near rail stations

Level crossings adjacent to rail stations influence the risk taking behaviour of vehicle drivers and other users.

32 Train speeds

Low train speeds may increase the risk taking behaviour of users.

33 Sighting distance

Good sighting distance should indicate the level crossing as high risk.

34 Parked cars

Parked cars before and after the level crossing may result in drivers slowing and stopping while on the level crossing.

38 Visitor parking

The position of visitors parked vehicles at a level crossing may affect the behaviour of other road drivers.

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

42 Days of the week

Risk taking behaviour at level crossings increases on working days.

43 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

48 Observation of amber light

The length of activation time of the amber light has little affect on the behaviour of the vehicle driver.

49 Road access

Level crossings that provide the only access to routes either side of the crossing influences the risk taking behaviour of vehicle drivers.

50 Passenger drop-off points

Non-designated passenger drop-off points close to level crossings affects the flow and behaviour of traffic approaching a level crossing.

51 See-through effect

Level crossing located in a dip or on a brow of a long straight road may result in increases of red-light running.

52 **HGV drivers using rail station facilities**

The effectiveness of information is reduced by HGV drivers parking in front of signs and warning devices.

53 Events

Events increase the amount of irregular users at level crossings.

54 Narrow roads

Narrow roads before and after the level crossing may result in vehicle drivers slowing and stopping while on the level crossing.

56 Location near major roads

The risk of vehicle drivers blocking-back over the level crossing, or general risk taking behaviour is increased when the crossing is located on roads with direct access to major roads or motorways.

57 Traffic calming systems

Road traffic calming systems on the approaches to a level crossing may increase the risk of vehicles blocking-back.

59 Foreign vehicle drivers

Areas with high levels of foreign vehicle drivers may have increases in decision making errors at level crossings. This may be more evident during seasonal periods.

60 Bus stops

Unofficial bus stops in the level crossing lay-by, affects the behaviour of large or slow vehicle drivers.

61 Crossing surface

Uneven and slippery level crossing surface may present a potential hazard to those using the crossing.

62 Roadworks

Roadworks positioned up to 3 kilometres from the level crossing may still impact on vehicles blocking-back.

63 Housing developments

Housing developments increase road traffic and level crossing use.

64 Vehicle shortcuts

Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers.

66 Another train approaching

The 'Another Train Coming if lights continue to show' sign has minimal impact in providing vehicle drivers with sufficient information.

69 Rural level crossings

The environmental context of a rural level crossing reduces the awareness of approaching vehicle drivers.

70 Road markings

The effectiveness of vehicle drivers stopping in the correct location is impaired by worn road markings.

71 Number of train lines

Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

72 Location near farms

High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing.

73 Commercial traffic

Level crossings with high volumes of commercial traffic may result in increased risk taking behaviour.

74 Proximity of level crossing to another

Level crossings located in close proximity to another may influence the risk taking behaviour of vehicle drivers.

76 Pedestrians on vehicular crossings

Large volumes of pedestrians and cyclists using road level crossings ignore the activated warning information and barriers.

79 Combined environmental features

Level crossings with a combination of environmental features, such as bends, hills, trees and hedges, may increase the decision making errors of vehicle drivers.

80 Cats-eyes

Deteriorated 'cats-eyes' on the approach or on the level crossing may reduce the vehicle driver's ability to negotiate the road layout at night.

83 Road descents

Level crossings located at the end of a descent may result in increased red-light running by vehicle drivers.

86 Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

87 School parking

School drop-off and collection points close to level crossings affects the flow and behaviour of other vehicle drivers approaching the crossing.

88 Proximity of different road speeds

High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing.

89 Level crossing equipment

The reliability and/or perception of reliability of the level crossing equipment affects the risk taking behaviour of regular users.

90 Position of information

Perception of a hazard is improved when information referencing the imminent danger are associated together.

91 Vehicle speed zones

The position of incremental speed restriction signs influences the speed of vehicle drivers when approaching the crossing.

Noise

Noisy surroundings may impair the performance of the users to detect trains at level crossings.

96 Straight roads

Straight roads increase the opportunities for vehicle drivers to undertake risky behaviour, to avoid having to wait at the level crossing.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

98 Train arrival

Activation of the warning lights is used by passengers as a train arrival indicator.

102 Railway sidings

Alternative uses of railways sidings may alter the type of traffic using a level crossing.

103 Emergency services

Crossings located on routes used by emergency service vehicles may result in increased risk taking behaviour.

104 Weather: Fog

The effectiveness of visual information is impaired by fog.

75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

45 Animals: Horses

Activated warnings at protected level crossings may result in undesirable behaviour by horses, and influence the behaviour of other road vehicle users.

23 Sunlight strobing

Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers.

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

26 Foliage

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

42 Days of the week

Risk taking behaviour at level crossings increases on working days.

43 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

59 Foreign vehicle drivers

Areas with high levels of foreign vehicle drivers may have increases in decision making errors at level crossings. This may be more evident during seasonal periods.

61 Crossing surface

Uneven and slippery level crossing surface may present a potential hazard to those using the crossing.

63 Housing developments

Housing developments increase road traffic and level crossing use.

64 Vehicle shortcuts

Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers.

71 Number of train lines

Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

72 Location near farms

High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing.

74 Proximity of level crossing to another

Level crossings located in close proximity to another may influence the risk taking behaviour of vehicle drivers.

86 Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

88 Proximity of different road speeds

High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing.

90 Position of information

Perception of a hazard is improved when information referencing the imminent danger are associated together.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

102 Railway sidings

Alternative uses of railways sidings may alter the type of traffic using a level crossing.

103 Emergency services

Crossings located on routes used by emergency service vehicles may result in increased risk taking behaviour.

104 Weather: Fog

The effectiveness of visual information is impaired by fog.

75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

23 Sunlight strobing

Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers.

Driver distractions

Distractions on the approach to a level crossing may impair the performance of both vehicle and train drivers.

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

06 Road junctions

Road junctions close to the level crossing may result in increased decision making and errors by vehicle drivers, and blocking-back over the crossing.

07 Vehicle approach speed

The speed of the road traversing a level crossing is a factor in vehicle driver errors.

08 Age of drivers

Violations at level crossings may be influenced by the age of the local population.

10 Representation of HGV users

HGV drivers form a disproportionately high number of incidents at level crossings.

11 Pedestrian access

Pedestrian and passengers are more likely to undertake risky behaviour at vehicular level crossings where bridges are not provided.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

14 Time of day

Risk taking at level crossings increases during rush-hours, at midday and at the beginning and end of the school day.

15 Visual clutter

Superfluous information and roadside structures on the approach to the crossing may reduce the user's detection of level crossing information and warning signs.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

17 Understanding of warning lights

The onset of the amber and proceeding red lights of the activated warning system lead to various vehicle driver behaviours at level crossings.

18 Closure time

The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.

20 Audible alarm

Second audible warning tone is not detected and/or understood by level crossing users.

22 Conspicuity of flashing lights

The effectiveness of flashing lights is limited by veiling glare, limited light output and their position.

26 Foliage

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

28 Position of warning lights

The effectiveness of warning lights is influenced by their position.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

Location near rail stations

Level crossings adjacent to rail stations influence the risk taking behaviour of vehicle drivers and other users.

34 Parked cars

Parked cars before and after the level crossing may result in drivers slowing and stopping while on the level crossing.

38 Visitor parking

The position of visitors parked vehicles at a level crossing may affect the behaviour of other road drivers.

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

42 Days of the week

Risk taking behaviour at level crossings increases on working days.

43 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

48 Observation of amber light

The length of activation time of the amber light has little affect on the behaviour of the vehicle driver.

49 Road access

Level crossings that provide the only access to routes either side of the crossing influences the risk taking behaviour of vehicle drivers.

50 Passenger drop-off points

Non-designated passenger drop-off points close to level crossings affects the flow and behaviour of traffic approaching a level crossing.

51 See-through effect

Level crossing located in a dip or on a brow of a long straight road may result in increases of red-light running.

52 **HGV drivers using rail station facilities**

The effectiveness of information is reduced by HGV drivers parking in front of signs and warning devices.

53 Events

Events increase the amount of irregular users at level crossings.

54 Narrow roads

Narrow roads before and after the level crossing may result in vehicle drivers slowing and stopping while on the level crossing.

56 Location near major roads

The risk of vehicle drivers blocking-back over the level crossing, or general risk taking behaviour is increased when the crossing is located on roads with direct access to major roads or motorways.

57 Traffic calming systems

Road traffic calming systems on the approaches to a level crossing may increase the risk of vehicles blocking-back.

59 Foreign vehicle drivers

Areas with high levels of foreign vehicle drivers may have increases in decision making errors at level crossings. This may be more evident during seasonal periods.

61 Crossing surface

Uneven and slippery level crossing surface may present a potential hazard to those using the crossing.

S2 Roadworks

Roadworks positioned up to 3 kilometres from the level crossing may still impact on vehicles blocking-back.

63 Housing developments

Housing developments increase road traffic and level crossing use.

64 Vehicle shortcuts

Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers.

69 Rural level crossings

The environmental context of a rural level crossing reduces the awareness of approaching vehicle drivers.

70 Road markings

The effectiveness of vehicle drivers stopping in the correct location is impaired by worn road markings.

71 Number of train lines

Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

72 Location near farms

High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing.

73 Commercial traffic

Level crossings with high volumes of commercial traffic may result in increased risk taking behaviour.

74 Proximity of level crossing to another

Level crossings located in close proximity to another may influence the risk taking behaviour of vehicle drivers.

79 Combined environmental features

Level crossings with a combination of environmental features, such as bends, hills, trees and hedges, may increase the decision making errors of vehicle drivers.

80 Cats-eyes

Deteriorated 'cats-eyes' on the approach or on the level crossing may reduce the vehicle driver's ability to negotiate the road layout at night.

83 Road descents

Level crossings located at the end of a descent may result in increased red-light running by vehicle drivers.

86 Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

87 School parking

School drop-off and collection points close to level crossings affects the flow and behaviour of other vehicle drivers approaching the crossing.

88 Proximity of different road speeds

High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing.

89 Level crossing equipment

The reliability and/or perception of reliability of the level crossing equipment affects the risk taking behaviour of regular users.

90 Position of information

Perception of a hazard is improved when information referencing the imminent danger are associated together.

91 Vehicle speed zones

The position of incremental speed restriction signs influences the speed of vehicle drivers when approaching the crossing.

96 Straight roads

Straight roads increase the opportunities for vehicle drivers to undertake risky behaviour, to avoid having to wait at the level crossing.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

98 Train arrival

Activation of the warning lights is used by passengers as a train arrival indicator.

101 Signal box: detection of objects

Certain conditions impair the signallers ability to detect objects on the level crossing.

102 Railway sidings

Alternative uses of railways sidings may alter the type of traffic using a level crossing.

103 Emergency services

Crossings located on routes used by emergency service vehicles may result in increased risk taking behaviour.

104 Weather: Fog

The effectiveness of visual information is impaired by fog.

92 Double train lines

The space between two sets of double train lines provides users with a refuge point.

84 Signal box: camera angle

Position of the camera at a level crossing influences the signallers ability to detect objects.

75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

45 Animals: Horses

Activated warnings at protected level crossings may result in undesirable behaviour by horses, and influence the behaviour of other road vehicle users.

09 Signal box: track side workers

High-visibility clothing appears white on black & white monitors.

23 Sunlight strobing

Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers.

Driver distractions

Distractions on the approach to a level crossing may impair the performance of both vehicle and train drivers.

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

06 Road junctions

Road junctions close to the level crossing may result in increased decision making and errors by vehicle drivers, and blocking-back over the crossing.

07 Vehicle approach speed

The speed of the road traversing a level crossing is a factor in vehicle driver errors.

08 Age of drivers

Violations at level crossings may be influenced by the age of the local population.

10 Representation of HGV users

HGV drivers form a disproportionately high number of incidents at level crossings.

11 Pedestrian access

Pedestrian and passengers are more likely to undertake risky behaviour at vehicular level crossings where bridges are not provided.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

14 Time of day

Risk taking at level crossings increases during rush-hours, at midday and at the beginning and end of the school day.

15 Visual clutter

Superfluous information and roadside structures on the approach to the crossing may reduce the user's detection of level crossing information and warning signs.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

17 Understanding of warning lights

The onset of the amber and proceeding red lights of the activated warning system lead to various vehicle driver behaviours at level crossings.

18 Closure time

The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.

20 Audible alarm

Second audible warning tone is not detected and/or understood by level crossing users.

22 Conspicuity of flashing lights

The effectiveness of flashing lights is limited by veiling glare, limited light output and their position.

26 Foliage

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

28 Position of warning lights

The effectiveness of warning lights is influenced by their position.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

34 Parked cars

Parked cars before and after the level crossing may result in drivers slowing and stopping while on the level crossing.

38 Visitor parking

The position of visitors parked vehicles at a level crossing may affect the behaviour of other road drivers.

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

42 Days of the week

Risk taking behaviour at level crossings increases on working days.

43 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

48 Observation of amber light

The length of activation time of the amber light has little affect on the behaviour of the vehicle driver.

49 Road access

Level crossings that provide the only access to routes either side of the crossing influences the risk taking behaviour of vehicle drivers.

50 Passenger drop-off points

Non-designated passenger drop-off points close to level crossings affects the flow and behaviour of traffic approaching a level crossing.

51 See-through effect

Level crossing located in a dip or on a brow of a long straight road may result in increases of red-light running.

52 HGV drivers using rail station facilities

The effectiveness of information is reduced by HGV drivers parking in front of signs and warning devices.

53 Events

Events increase the amount of irregular users at level crossings.

54 Narrow roads

Narrow roads before and after the level crossing may result in vehicle drivers slowing and stopping while on the level crossing.

56 Location near major roads

The risk of vehicle drivers blocking-back over the level crossing, or general risk taking behaviour is increased when the crossing is located on roads with direct access to major roads or motorways.

57 Traffic calming systems

Road traffic calming systems on the approaches to a level crossing may increase the risk of vehicles blocking-back.

59 Foreign vehicle drivers

Areas with high levels of foreign vehicle drivers may have increases in decision making errors at level crossings. This may be more evident during seasonal periods.

61 Crossing surface

Uneven and slippery level crossing surface may present a potential hazard to those using the crossing.

62 Roadworks

Roadworks positioned up to 3 kilometres from the level crossing may still impact on vehicles blocking-back.

63 Housing developments

Housing developments increase road traffic and level crossing use.

64 Vehicle shortcuts

Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers.

89 Rural level crossings

The environmental context of a rural level crossing reduces the awareness of approaching vehicle drivers.

70 Road markings

The effectiveness of vehicle drivers stopping in the correct location is impaired by worn road markings.

71 Number of train lines

Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

72 Location near farms

High volumes of farm traffic impact on the speed and behaviour of other vehicles traversing the crossing.

73 Commercial traffic

Level crossings with high volumes of commercial traffic may result in increased risk taking behaviour.

74 Proximity of level crossing to another

Level crossings located in close proximity to another may influence the risk taking behaviour of vehicle drivers.

79 Combined environmental features

Level crossings with a combination of environmental features, such as bends, hills, trees and hedges, may increase the decision making errors of vehicle drivers.

80 Cats-eyes

Deteriorated 'cats-eyes' on the approach or on the level crossing may reduce the vehicle driver's ability to negotiate the road layout at night.

83 Road descents

Level crossings located at the end of a descent may result in increased red-light running by vehicle drivers.

86 Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

87 School parking

School drop-off and collection points close to level crossings affects the flow and behaviour of other vehicle drivers approaching the crossing.

88 Proximity of different road speeds

High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing.

89 Level crossing equipment

The reliability and/or perception of reliability of the level crossing equipment affects the risk taking behaviour of regular users.

90 Position of information

Perception of a hazard is improved when information referencing the imminent danger are associated together.

91 Vehicle speed zones

The position of incremental speed restriction signs influences the speed of vehicle drivers when approaching the crossing.

96 Straight roads

Straight roads increase the opportunities for vehicle drivers to undertake risky behaviour, to avoid having to wait at the level crossing.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

98 Train arrival

Activation of the warning lights is used by passengers as a train arrival indicator.

101 Signal box: detection of objects

Certain conditions impair the signallers ability to detect objects on the level crossing.

102 Railway sidings

Alternative uses of railways sidings may alter the type of traffic using a level crossing.

103 Emergency services

Crossings located on routes used by emergency service vehicles may result in increased risk taking behaviour.

104 Weather: Fog

The effectiveness of visual information is impaired by fog.

92 Double train lines

The space between two sets of double train lines provides users with a refuge point.

Signal box: camera angle

Position of the camera at a level crossing influences the signallers ability to detect objects.

75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

45 Animals: Horses

Activated warnings at protected level crossings may result in undesirable behaviour by horses, and influence the behaviour of other road vehicle users.

09 Signal box: track side workers

High-visibility clothing appears white on black & white monitors.

23 Sunlight strobing

Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers.

01 Phone box instructions

Unclear phone instructions provided within phone boxes at UWC may result in users failing to communicate with the signaller.

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

12 Regularity of trains

Variations in train schedules, such as engineering works, unexpected delays to train services, and line speed restrictions etc., all contribute to fluctuations in trains passing a point at a supposedly 'known' time.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

19 Open gates

Open gates increases the risk to approaching users.

21 Darkness

Unprotected crossings used during the hours of darkness may lead to increased decision making errors by crossing users.

25 Users perception of train speed & distance

Train speed and distance is underestimated by users, which may result in increased decision making errors by users at level crossings.

26 <mark>Foliage</mark>

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

27 Harvesting time

Harvesting time influences the risk taking behaviour of UWC users.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

32 Train speeds

Low train speeds may increase the risk taking behaviour of users.

33 Sighting distance

Good sighting distance should indicate the level crossing as high risk.

Telephone use

Level crossing users failure to use the telephone is a factor in incidents at UWC crossings.

37 Traffic moment

High levels of traffic moment at user worked crossings increase the chances of an incident.

39 Crossing utilisation

Level crossings with high crossing utilisation increases the risks to users.

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

43 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

46 Gate crossing procedure

The requirement to open and close the gate, following a procedure of crossing the tracks five times, is a factor in why gates are left open at UWC's.

55 Contractors

Landowners failure to inform new contractors of the procedures and restrictions for using their vehicles across the level crossing may increase the risk of an incident.

58 Diversification in farming

Diversification in farming increases public access to user-worked crossings.

61 Crossing surface

Uneven and slippery level crossing surface may present a potential hazard to those using the crossing.

64 Vehicle shortcuts

Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers.

65 Crossing instructions

Ambiguous crossing instructions may result in users failing to undertake the correct crossing procedure.

67 Animals: Dogs

Unrestrained dogs may impair their owners concentration while on the level crossing.

68 Contacting the signaller

Unclear 'user-type' information may result in users failing to contact the signaller prior to crossing.

71 Number of train lines

Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

73 Commercial traffic

Level crossings with high volumes of commercial traffic may result in increased risk taking behaviour.

77 Decision point

An obvious decision point is critical for users at unprotected level crossings.

78 Signal sections

Long signal sections increase the risk taking behaviour of users at UWC's.

86 Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

88 Proximity of different road speeds

High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing.

Level crossing type: UWC

93 Distance between gates

The overall distance between UWC gates and the distance between the gate and first train line effects the risk taking behaviour of vehicle users.

95 Noise

Noisy surroundings may impair the performance of the users to detect trains at level crossings.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

100 Communication with signaller

The dialogue between the level crossing user and the signaller may impact on the behaviour of the user.

104 Weather: Fog

The effectiveness of visual information is impaired by fog.

75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

23 Sunlight strobing

Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers.

99 Sightlines

Level crossing type: UWC+T

01 Phone box instructions

Unclear phone instructions provided within phone boxes at UWC may result in users failing to communicate with the signaller.

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

12 Regularity of trains

Variations in train schedules, such as engineering works, unexpected delays to train services, and line speed restrictions etc., all contribute to fluctuations in trains passing a point at a supposedly 'known' time.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

19 Open gates

Open gates increases the risk to approaching users.

21 Darkness

Unprotected crossings used during the hours of darkness may lead to increased decision making errors by crossing users.

25 Users perception of train speed & distance

Train speed and distance is underestimated by users, which may result in increased decision making errors by users at level crossings.

26 Foliage

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

27 Harvesting time

Harvesting time influences the risk taking behaviour of UWC users.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

32 Train speeds

Low train speeds may increase the risk taking behaviour of users.

33 Sighting distance

Good sighting distance should indicate the level crossing as high risk.

Telephone use

Level crossing users failure to use the telephone is a factor in incidents at UWC crossings.

37 Traffic moment

High levels of traffic moment at user worked crossings increase the chances of an incident.

Level crossing type: UWC+T

39 Crossing utilisation

Level crossings with high crossing utilisation increases the risks to users.

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

43 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

46 Gate crossing procedure

The requirement to open and close the gate, following a procedure of crossing the tracks five times, is a factor in why gates are left open at UWC's.

55 Contractors

Landowners failure to inform new contractors of the procedures and restrictions for using their vehicles across the level crossing may increase the risk of an incident.

58 Diversification in farming

Diversification in farming increases public access to user-worked crossings.

61 Crossing surface

Uneven and slippery level crossing surface may present a potential hazard to those using the crossing.

64 Vehicle shortcuts

Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers.

65 Crossing instructions

Ambiguous crossing instructions may result in users failing to undertake the correct crossing procedure.

67 Animals: Dogs

Unrestrained dogs may impair their owners concentration while on the level crossing.

68 Contacting the signaller

Unclear 'user-type' information may result in users failing to contact the signaller prior to crossing.

71 Number of train lines

Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

73 Commercial traffic

Level crossings with high volumes of commercial traffic may result in increased risk taking behaviour.

77 Decision point

An obvious decision point is critical for users at unprotected level crossings.

78 Signal sections

Long signal sections increase the risk taking behaviour of users at UWC's.

86 Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

88 Proximity of different road speeds

High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing.

Level crossing type: UWC+T

93 Distance between gates

The overall distance between UWC gates and the distance between the gate and first train line effects the risk taking behaviour of vehicle users.

95 Noise

Noisy surroundings may impair the performance of the users to detect trains at level crossings.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

100 Communication with signaller

The dialogue between the level crossing user and the signaller may impact on the behaviour of the user.

104 Weather: Fog

The effectiveness of visual information is impaired by fog.

75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

23 Sunlight strobing

Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers.

99 Sightlines

Level crossing type: UWC+MWL

Driver distractions

Distractions on the approach to a level crossing may impair the performance of both vehicle and train drivers.

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

08 Age of drivers

Violations at level crossings may be influenced by the age of the local population.

12 Regularity of trains

Variations in train schedules, such as engineering works, unexpected delays to train services, and line speed restrictions etc., all contribute to fluctuations in trains passing a point at a supposedly 'known' time.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

18 Closure time

The amount of time the user expects to wait at the level crossing may influence their risk taking behaviour.

19 Open gates

Open gates increases the risk to approaching users.

20 Audible alarm

Second audible warning tone is not detected and/or understood by level crossing users.

26 Foliage

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

27 Harvesting time

Harvesting time influences the risk taking behaviour of UWC users.

28 Position of warning lights

The effectiveness of warning lights is influenced by their position.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

32 Train speeds

Low train speeds may increase the risk taking behaviour of users.

33 Sighting distance

Good sighting distance should indicate the level crossing as high risk.

Level crossing type: UWC+MWL

Telephone use

Level crossing users failure to use the telephone is a factor in incidents at UWC crossings.

37 Traffic moment

High levels of traffic moment at user worked crossings increase the chances of an incident.

39 Crossing utilisation

Level crossings with high crossing utilisation increases the risks to users.

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

42 Days of the week

Risk taking behaviour at level crossings increases on working days.

13 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

46 Gate crossing procedure

The requirement to open and close the gate, following a procedure of crossing the tracks five times, is a factor in why gates are left open at UWC's.

47 Violations at MWL

Over estimation of warning time and underestimation of crossing leads to risk taking behaviour.

55 Contractors

Landowners failure to inform new contractors of the procedures and restrictions for using their vehicles across the level crossing may increase the risk of an incident.

58 Diversification in farming

Diversification in farming increases public access to user-worked crossings.

59 Foreign vehicle drivers

Areas with high levels of foreign vehicle drivers may have increases in decision making errors at level crossings. This may be more evident during seasonal periods.

61 Crossing surface

Uneven and slippery level crossing surface may present a potential hazard to those using the crossing.

64 Vehicle shortcuts

Level crossings on roads used as shortcuts result in increased risk taking behaviour by vehicle drivers.

65 Crossing instructions

Ambiguous crossing instructions may result in users failing to undertake the correct crossing procedure.

67 Animals: Dogs

Unrestrained dogs may impair their owners concentration while on the level crossing.

70 Road markings

The effectiveness of vehicle drivers stopping in the correct location is impaired by worn road markings.

71 Number of train lines

Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

Level crossing type: UWC+MWL

73 Commercial traffic

Level crossings with high volumes of commercial traffic may result in increased risk taking behaviour.

86 Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

88 Proximity of different road speeds

High road speeds in close proximity to a level crossing on a lower speed road influences the speed at which vehicle drivers approach the crossing.

89 Level crossing equipment

The reliability and/or perception of reliability of the level crossing equipment affects the risk taking behaviour of regular users.

93 Distance between gates

The overall distance between UWC gates and the distance between the gate and first train line effects the risk taking behaviour of vehicle users.

95 Noise

Noisy surroundings may impair the performance of the users to detect trains at level crossings.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

104 Weather: Fog

The effectiveness of visual information is impaired by fog.

75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

23 Sunlight strobing

Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers.

99 Sightlines

Level crossing type: OC

01 Phone box instructions

Unclear phone instructions provided within phone boxes at UWC may result in users failing to communicate with the signaller.

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

12 Regularity of trains

Variations in train schedules, such as engineering works, unexpected delays to train services, and line speed restrictions etc., all contribute to fluctuations in trains passing a point at a supposedly 'known' time.

13 Groups

People in groups may undertake more risky behaviour, than when on their own.

14 Time of day

Risk taking at level crossings increases during rush-hours, at midday and at the beginning and end of the school day.

16 Presence of rail staff

The presence of rail staff in high-visibility clothing can have an undesirable influence on level crossing user behaviour.

19 Open gates

Open gates increases the risk to approaching users.

20 Audible alarm

Second audible warning tone is not detected and/or understood by level crossing users.

21 Darkness

Unprotected crossings used during the hours of darkness may lead to increased decision making errors by crossing users.

25 Users perception of train speed & distance

Train speed and distance is underestimated by users, which may result in increased decision making errors by users at level crossings.

26 Foliage

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

27 Harvesting time

Harvesting time influences the risk taking behaviour of UWC users.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

32 Train speeds

Low train speeds may increase the risk taking behaviour of users.

33 Sighting distance

Good sighting distance should indicate the level crossing as high risk.

Level crossing type: OC

39 Crossing utilisation

Level crossings with high crossing utilisation increases the risks to users.

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

43 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

46 Gate crossing procedure

The requirement to open and close the gate, following a procedure of crossing the tracks five times, is a factor in why gates are left open at UWC's.

53 Events

Events increase the amount of irregular users at level crossings.

55 Contractors

Landowners failure to inform new contractors of the procedures and restrictions for using their vehicles across the level crossing may increase the risk of an incident.

61 Crossing surface

Uneven and slippery level crossing surface may present a potential hazard to those using the crossing.

63 Housing developments

Housing developments increase road traffic and level crossing use.

67 Animals: Dogs

Unrestrained dogs may impair their owners concentration while on the level crossing.

71 Number of train lines

Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

73 Commercial traffic

Level crossings with high volumes of commercial traffic may result in increased risk taking behaviour.

77 Decision point

An obvious decision point is critical for users at unprotected level crossings.

83 Road descents

Level crossings located at the end of a descent may result in increased red-light running by vehicle drivers.

86 Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

95 Noise

Noisy surroundings may impair the performance of the users to detect trains at level crossings.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

104 Weather: Fog

The effectiveness of visual information is impaired by fog.

Level crossing type: OC

75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

23 Sunlight strobing

Sunlight passing through lines of trees positioned on the side of the road imparts a strobing effect on the road which may impair the visibility of vehicle drivers.

99 Sightlines

Level crossing type: FC

03 Weather: Ice

Icy weather conditions on the approach, exit and on the crossing affects the behaviour of crossing users.

04 Users familiarity with a crossing

Regular users and those living close to level crossings are more likely to undertake risk taking behaviour when using the crossing.

05 Frequency of trains

Crossings with a low frequency of trains are likely to increase the risk taking behaviour of regular users.

12 Regularity of trains

Variations in train schedules, such as engineering works, unexpected delays to train services, and line speed restrictions etc., all contribute to fluctuations in trains passing a point at a supposedly 'known' time.

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19 Open gates

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Train speed and distance is underestimated by users, which may result in increased decision making errors by users at level crossings.

26 Foliage

The effectiveness of information on the approach to and at the level crossing is reduced by overgrown foliage.

28 Position of warning lights

The effectiveness of warning lights is influenced by their position.

30 Trespassing on rail structures

Rail structures located at the entrance and exit areas to crossings that appear suitable for climbing may result in undesirable risk taking behaviour by members of the public.

32 Train speeds

Low train speeds may increase the risk taking behaviour of users.

33 Sighting distance

Good sighting distance should indicate the level crossing as high risk.

35 Position of safety

Insufficient space between trackside gate and rail results in potential obstruction of track by bicycles and pushchairs.

39 Crossing utilisation

Level crossings with high crossing utilisation increases the risks to users.

Level crossing type: FC

40 Type of trains

Train lines with high frequency of both freight and passenger services may influence the risk taking behaviour of users.

43 Suicide

Level crossings are a potential target for use by persons attempting to commit suicide

59 Foreign vehicle drivers

Areas with high levels of foreign vehicle drivers may have increases in decision making errors at level crossings. This may be more evident during seasonal periods.

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Housing developments increase road traffic and level crossing use.

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Single train lines may increase the risk taking behaviour of both vehicle drivers and pedestrians.

77 Decision point

An obvious decision point is critical for users at unprotected level crossings.

86 Train enthusiasts

To view trains closely, people undertake risky behaviour at level crossings.

94 Trespassers

Food and drink rubbish at a level crossing is often an indicator of young people using the crossing as a meeting place.

Noise

Noisy surroundings may impair the performance of the users to detect trains at level crossings.

97 Stereotypical crossing users

Users who violate crossing procedures are not always male and in their twenties.

104 Weather: Fog

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75 Public houses

Crossings located on route to public houses may result in increased violations of crossing procedures.

99 Sightlines



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