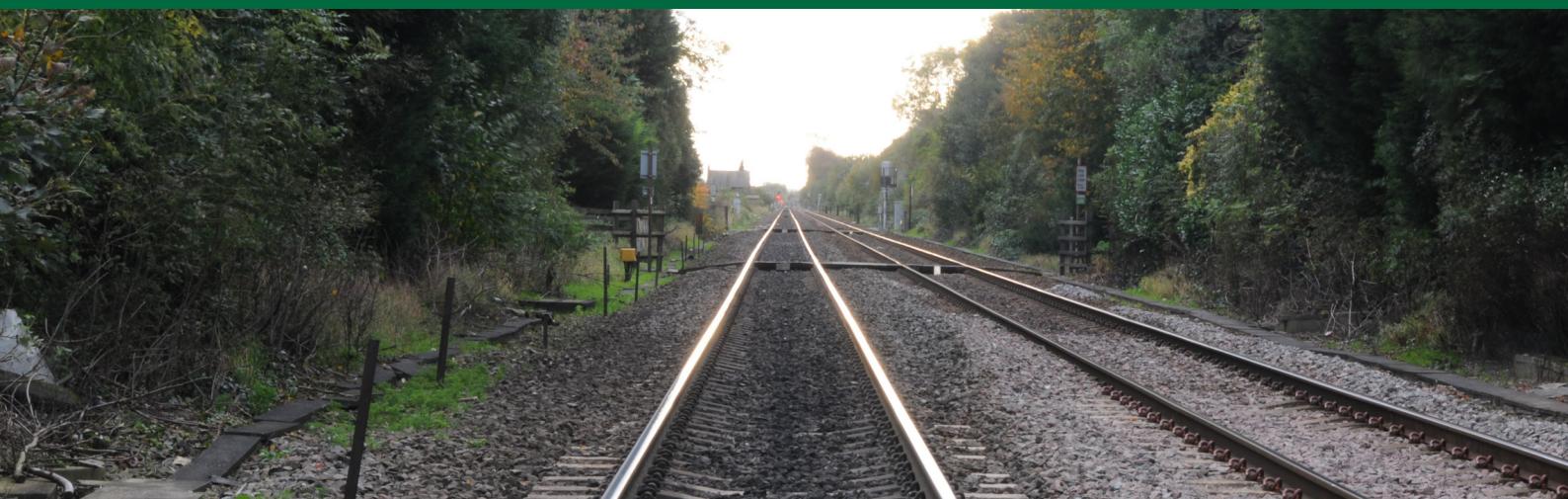




Rail Accident Investigation Branch

Rail Accident Report



Fatal accident at Barratt's Lane No.2 footpath crossing, Attenborough, Nottingham, 26 October 2013

Report 18/2014
August 2014

This investigation was carried out in accordance with:

- the Railway Safety Directive 2004/49/EC;
- the Railways and Transport Safety Act 2003; and
- the Railways (Accident Investigation and Reporting) Regulations 2005.

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Fatal accident at Barratt's Lane No.2 footpath crossing, Attenborough, Nottingham, 26 October 2013

Contents

Summary	5
Introduction	6
Preface	6
Key definitions	6
The accident	7
Background	8
The parties involved	8
The location	8
Management of the crossing	10
Sequence of events	11
Events preceding the accident	11
Events during the accident	11
Events following the accident	12
Identification of the immediate cause	12
Identification of causal factors	14
Network Rail's management of the crossing	16
Previous occurrences of a similar character	19
Summary of conclusions	20
Immediate cause	20
Causal factor	20
Actions reported as already taken or in progress relevant to this report	21
Learning point	22
Recommendations	23
Appendices	24
Appendix A - Glossary of abbreviations and acronyms	24
Appendix B - Glossary of terms	25

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Summary

At 14:48 hrs on Saturday 26 October 2013, a pedestrian was struck and fatally injured by a train on Barratt's Lane No.2 footpath crossing, at Attenborough near Nottingham.

The train was travelling from Nottingham towards Birmingham. At the same time, a London to Nottingham train was slowly approaching the crossing from the other direction. It is likely that the pedestrian had concentrated her attention on the London train and did not notice the train approaching from the Nottingham direction.

Both trains were fitted with forward facing closed circuit television equipment and the recording from the London to Nottingham train showed that the pedestrian approached the crossing and waited at the gate for 17 seconds before opening it; she started to cross the line 9 seconds later (the train was stopped at a red signal for part of this time). It is most likely that, having seen the London train stopped at the signal, she waited until she had determined that the train was not moving before deciding to cross the line. The sighting distances in both directions were adequate.

Network Rail had assessed the risk at the crossing, in accordance with its standard procedures, and, because the risk rating was relatively high, discussed the options for reducing this risk at a meeting with the highway authority. The chosen option was to divert the footpath and close the crossing. This had not been implemented at the time of the accident as the route of the proposed diversion was obstructed by an equipment room. The room contained signalling equipment that did not become redundant until completion of the Nottingham station resignalling project at the end of August 2013. The equipment room was demolished and the footpath diverted after the accident.

The RAIB has identified one learning point and has made no recommendations.

Introduction

Preface

- 1 The purpose of a Rail Accident Investigation Branch (RAIB) investigation is to improve railway safety by preventing future railway accidents or by mitigating their consequences. It is not the purpose of such an investigation to establish blame or liability.
- 2 Accordingly, it is inappropriate that RAIB reports should be used to assign fault or blame, or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.
- 3 The RAIB's investigation (including its scope, methods, conclusions and recommendations) is independent of the inquest, and all other investigations, including those carried out by the safety authority, police or railway industry.

Key definitions

- 4 The report contains abbreviations and technical terms (shown in *italics* the first time they appear in the report). These are explained in appendices A and B.

The accident

- 5 At 14:48 hrs on Saturday 26 October 2013, train reporting number 1G38, the 14:37 hrs passenger train service from Nottingham to Birmingham, struck and fatally injured an elderly female pedestrian on Barratt's Lane No.2 footpath crossing near Attenborough station, Nottingham (figure 1).

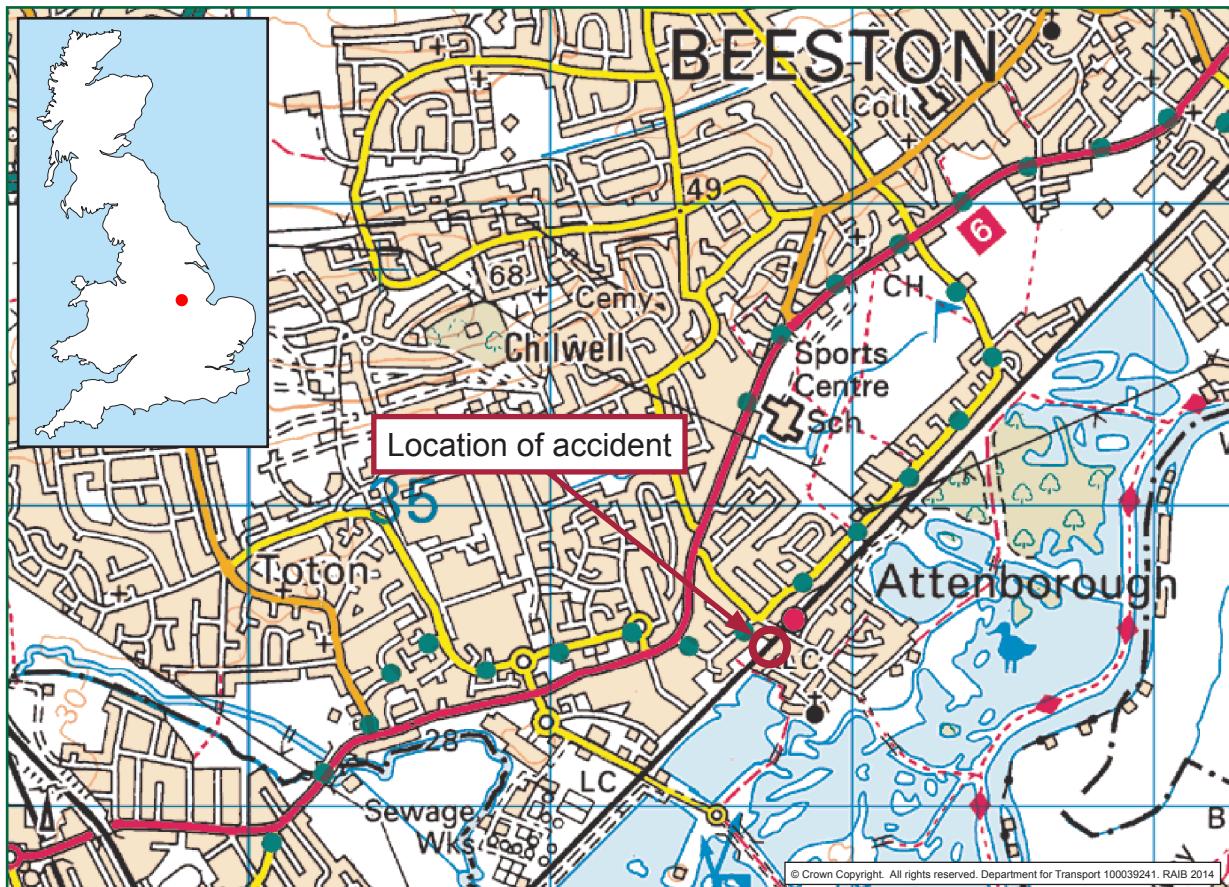


Figure 1: Extract from Ordnance Survey map showing location of accident

- 6 The pedestrian was crossing the line from an area of housing on the south side of the railway, where she lived, towards a bus stop on the main road to the north of the railway. The pedestrian was a regular user of the crossing.
- 7 Another train (reporting number 1D34), travelling from London to Nottingham, had been stopped at a signal near the crossing and was just starting to move when the pedestrian started to cross the line.

Background

The parties involved

- 8 Train 1G38 was operated by Cross Country Trains, who also employed the driver and conductor. The train was formed of a three-car class 170 *diesel multiple unit*.
- 9 The infrastructure was owned by Network Rail, who also employed the signaller and the staff who inspected and maintained the crossing.
- 10 The driver of train 1D34 witnessed the accident. East Midlands Trains operated this train and employed the driver.
- 11 The footpath over the crossing was part of a public footpath known as Beeston footpath no.66. Nottinghamshire County Council has a statutory responsibility for the management, maintenance and recording¹ of Nottinghamshire's public rights of way network, including Beeston footpath no.66.
- 12 Cross Country Trains, East Midlands Trains, Network Rail and Nottinghamshire County Council all cooperated freely with the investigation.

The location

- 13 Barratt's Lane No.2 footpath crossing was located approximately 7.1 km from Nottingham station, and 1.3 km from Attenborough Junction on the line from Nottingham to Trent Junction (figure 1). The railway is double track and is straight at this location. The maximum permitted speed for trains is 80 mph (128 km/h). The footpath crossing was 73 metres from a public road level crossing on Attenborough Lane which is a *full barrier crossing* controlled from the East Midlands Control Centre (EMCC) in Derby and is monitored by CCTV. The road over this crossing had a pedestrian footpath adjacent to it, in addition to a footbridge.
- 14 The line is signalled with *track circuit block* signalling controlled from the Trent workstation at the EMCC.
- 15 The footpath over Barratt's Lane No.2 footpath crossing ran from St. Mary's Close on the south side of the line to Attenborough Lane (figure 2). It provided a shorter route from St. Mary's Close to Attenborough station and Attenborough Lane than the route along the road using the road level crossing. At the time of the accident the crossing was provided with *kissing gates* on each side of the line and a timber deck across the tracks. The gates were sprung to meet and make the boundary fence in accordance with Network Rail standard NR/L2/SIG/30015². There were signs at the crossing instructing users to 'Stop Look Listen Beware of trains' (figure 3).

¹ These duties are defined by the Highways Act 1980 and the Wildlife and Countryside Act 1981.

² NR/L2/SIG/30015 Issue 1 – Specification for Station, Footpath, Bridleway and User-worked Level Crossings.

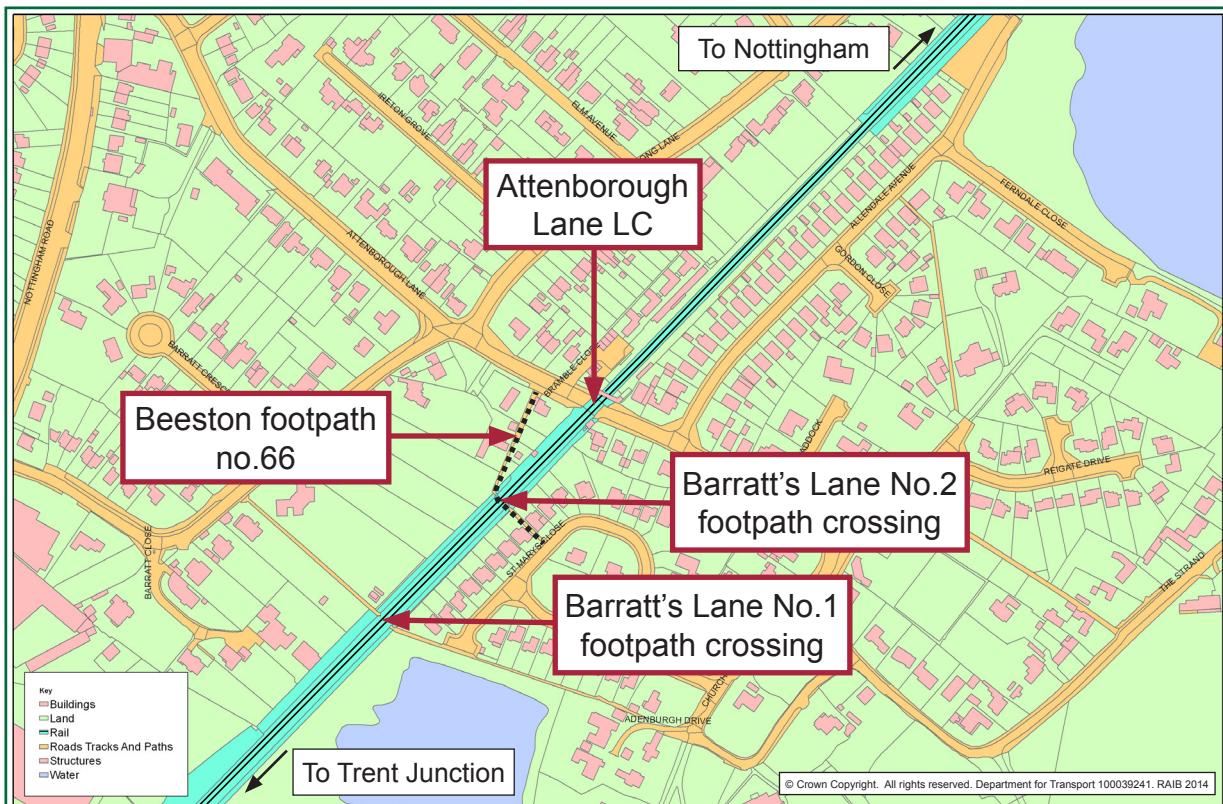


Figure 2: Plan showing route of Beeston footpath no.66 and Barratt's Lane No.2 footpath crossing



Figure 3: Barratt's Lane No.2 footpath crossing, viewed from the footpath on the south side

Management of the crossing

- 16 Network Rail's process for managing footpath crossings mandates the following activities:
 - (i) An inspection, by operations staff, of the crossing every 6 months (Network Rail standard NR/L2/SIG/19608 'Level Crossing Infrastructure: Inspection & Maintenance').
 - (ii) Periodic risk assessments of the crossing using the All Level Crossing Risk Model (ALCRM) (paragraph 18), supported as necessary by expert judgement or additional risk assessment processes where appropriate (Network Rail standard NR/L2/OPS/100). The Level Crossing Risk Management Toolkit³ can be used to supplement ALCRM by providing detailed information about the human factors issues underlying crossing risk, and suggesting appropriate risk reduction measures.
- 17 At the time of the accident the most recent 6-monthly inspection of Barratt's Lane No.2 footpath crossing was the one carried out by the level crossing manager on 27 August 2013. The level crossing manager noted that the sighting distances in both directions were greater than the minimum required and that vegetation growth was not likely to be a problem (paragraph 28).
- 18 At the time of the accident the most recent risk assessment of the crossing was the one carried out by the operations risk control coordinator (ORCC⁴) on 11 December 2012. This interval complied with Network Rail's contemporary requirement for a risk assessment to be completed at least every 3 years for footpath crossings. The risk assessment was based on data collected at the crossing and entered into the ALCRM. This is a computer-based application used by Network Rail to assist in the risk management of level crossings. It takes the features and usage of the crossing into account to calculate a risk score. This is made up of two parts, a collective risk and an individual risk. The collective risk is an estimate of the total risk generated by the crossing for all users of the crossing and the occupants of trains, whereas the individual risk is an estimate of the risk of death for a notional regular crossing user (this is an annual risk of death based on 500 transits of the crossing per annum). The risk score from ALCRM is intended to support and inform an assessor in considering the risk mitigation options for the crossing. The results of the risk assessments are discussed in paragraphs 41 to 45.

³ The level crossing risk management toolkit (www.lxrmkt.com) is an online resource provided by RSSB to support the level crossing risk assessment process.

⁴ The ORCC role was replaced by the level crossing manager in a Network Rail reorganisation on 1 April 2013.

Sequence of events

Events preceding the accident

- 19 The line normally used by trains between London and Nottingham was closed at Trent South Junction over the weekend of 26/27 October 2013 for scheduled maintenance work. This meant that London to Nottingham trains were being diverted via Toton sidings and were approaching Attenborough Junction on the line from there, rather than on the main line from Trent South Junction. The local trains between Derby and Nottingham do not use Trent South Junction and were able to run on their normal route through Attenborough Junction.
- 20 Train 2A43, the 13:38 hrs East Midlands Trains service from Matlock to Nottingham, arrived at Attenborough station, via its normal route, at 14:39 hrs, running early. Consequently, it had to wait in the platform until its scheduled departure time at 14:48 hrs.
- 21 At 14:45 hrs train 1D34, the 12:30 hrs East Midlands Trains passenger service from London St Pancras to Nottingham, passed Attenborough Junction, having been diverted from its normal route, while train 2A43 was still at Attenborough station. Since train 2A43 was still occupying the line ahead, train 1D34 was brought to a stand at signal TN4525, 137 metres from Barratt's Lane No.2 footpath crossing, at 14:48 hrs. During normal working it is uncommon for trains to be stopped at this signal.

Events during the accident

- 22 Forward facing CCTV (FFCCTV) on train 1D34 showed that the pedestrian approached the footpath crossing from the south side as train 1D34 was slowing to a stand at signal TN4525. She waited behind the gate for approximately 17 seconds before opening it. Train 1D34 was approaching from her left on the line furthest from the gate where she was standing (figure 4).

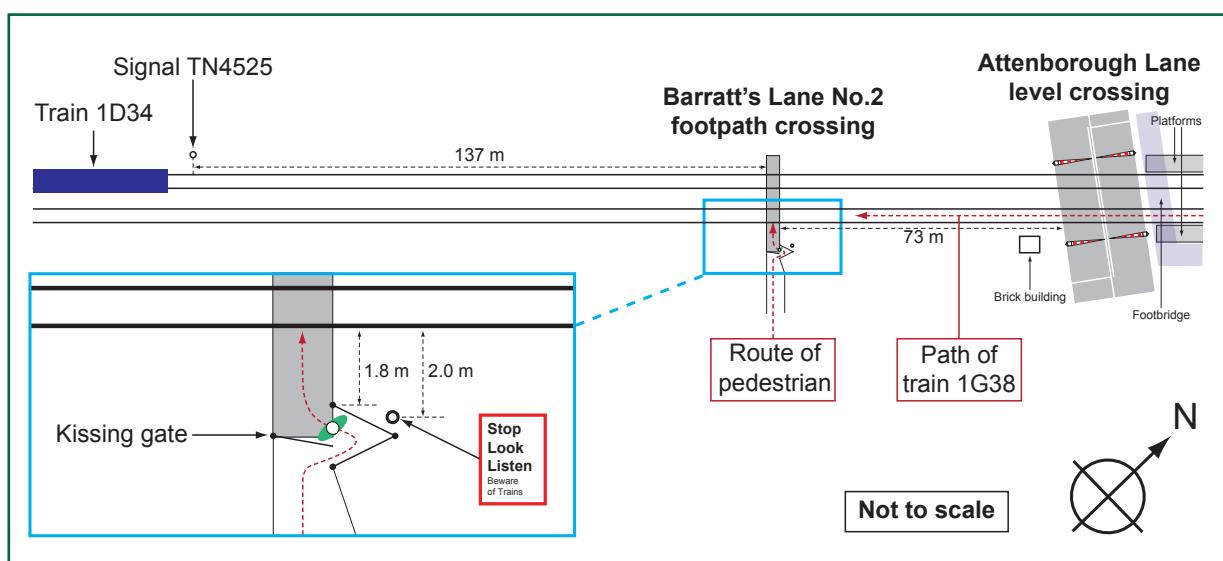


Figure 4: Plan of area showing direction of approach of train 1D34 and route of pedestrian at Barratt's Lane No.2 footpath crossing

- 23 Signal TN4525 cleared and train 1D34 started moving 6 seconds after the pedestrian had opened the gate. The pedestrian started to cross the line 3 seconds later, after the train had started moving; at this time train 1G38 was 73 metres away and travelling at 66.4 mph (106.2 km/h), approaching from the pedestrian's right.
- 24 The driver of train 1G38 saw the pedestrian starting to cross in front of him and sounded the horn. However, the CCTV fitted to this train showed that the pedestrian did not turn and look towards this train until the train was almost at the crossing. The pedestrian was struck by train 1G38 and fatally injured.

Events following the accident

- 25 The driver of 1G38 applied the emergency brake and the train came to rest 450 metres beyond the crossing. The driver called the signaller at the EMCC to report the accident. The signaller reported the accident to the Network Rail *control office* and called the emergency services.

Identification of the immediate cause⁵

- 26 The pedestrian started to cross the line as a train was approaching at speed from the Nottingham direction.**
- 27 Safety at footpath crossings requires pedestrians to make sure that no train is approaching before they start to cross. This normally requires that pedestrians are able to see far enough in each direction to establish that there is sufficient time for them to cross safely.
- 28 The Office of Rail Regulation (ORR) has published guidance on level crossings in 'Level crossings: A guide for managers, designers and operators. Railway Safety Publication 7'⁶. In accordance with the guidance, the required sighting distance for Barratt's Lane No.2 footpath crossing is 411 metres, including a 50% allowance for mobility impaired users. The sighting distance was measured by the ORCC and level crossing manager as part of their six-monthly inspections (paragraph 16). The sighting distances from the south side of the line towards Nottingham recorded on the inspection forms varied between 503 metres and 1.2 km. However, none of the inspections recorded a sighting distance less than the minimum required by Railway Safety Publication 7. As the sighting distance was greater than the minimum required, there was no routine requirement for train drivers to sound their horns when approaching.

⁵ The condition, event or behaviour that directly resulted in the occurrence.

⁶ This gives guidance on how to calculate the required minimum warning time of an approaching train, based on the walking speed of a pedestrian and the distance to be traversed at the crossing. The guidance states that the calculated time should be increased if the crossing is used by mobility impaired users, pushchairs, etc. Network Rail increased the calculated time by 50% to allow for this. The calculated crossing time is then used, along with the speed limit of the trains, to calculate how far along the line a crossing user needs to be able to see.

- 29 The variation in the sighting distances that were measured was likely to be due to small differences in the position where the inspector stood when taking the measurement. Although the track is straight, the visibility was limited by a brick building housing signalling equipment at the crossing. Therefore, the sighting distance increased significantly if the inspector moved close enough to the track to see past the building (the corner of the building was approximately 1.8 metres from the track). Network Rail's instructions to its level crossing inspection staff refer to a 'decision point' which is defined as the '*agreed safe position where it can be expected that the user makes the decision to cross*'⁷. Network Rail standard NR/L2/OPS/100 states that the decision point is usually where the stop sign is but must not be closer to the nearest rail than 2 metres for a line where the maximum speed of trains is less than 100 mph (as here).
- 30 The RAIB carried out a survey of the area around the footpath crossing and the track approaching it (figure 4). The survey showed that train 1G38 would have been visible to an observer standing at the kissing gate, the closest part of which was 1.8 metres from the nearest rail, when it was approximately 500 metres from the crossing, 17 seconds before it reached it. Figure 5 shows the view towards Nottingham from the kissing gate on the south side of the footpath crossing. At a point 2 metres back from the nearest rail, the survey showed that a train approaching from the Nottingham direction would have been visible approximately 450 metres from the crossing. This distance is greater than the minimum required by Railway Safety Publication 7.



Figure 5: View towards Nottingham from the kissing gate on the south side of the footpath crossing

⁷ RSSB published report T984 'Research into the causes of pedestrian accidents at level crossings and potential solutions: Research findings and conclusions' in December 2013. This examined the concept of a decision point and concluded that it was only understood within the railway industry; crossing users were unaware of it and the research found that crossing users do not actually make their decision to cross at a single consistent location.

- 31 The kissing gate at the crossing was hinged at the left-hand side, as viewed by a pedestrian approaching along the footpath. This would cause the pedestrian to first face towards a train approaching from the right, from where trains will generally approach on the nearest track (figure 6a), and then towards a train approaching from the left. Train 1G38 was too far away to be visible from the gate when the pedestrian was facing in this direction. The orientation of the kissing gate may have made it more likely that the pedestrian focussed her attention on train 1D34, which was on her left prior to stepping onto the crossing.
- 32 The RAIB observes that kissing gates hinged on the right (figure 6b), would normally cause pedestrians to face towards oncoming traffic on the line nearest them as they exit from the gates.

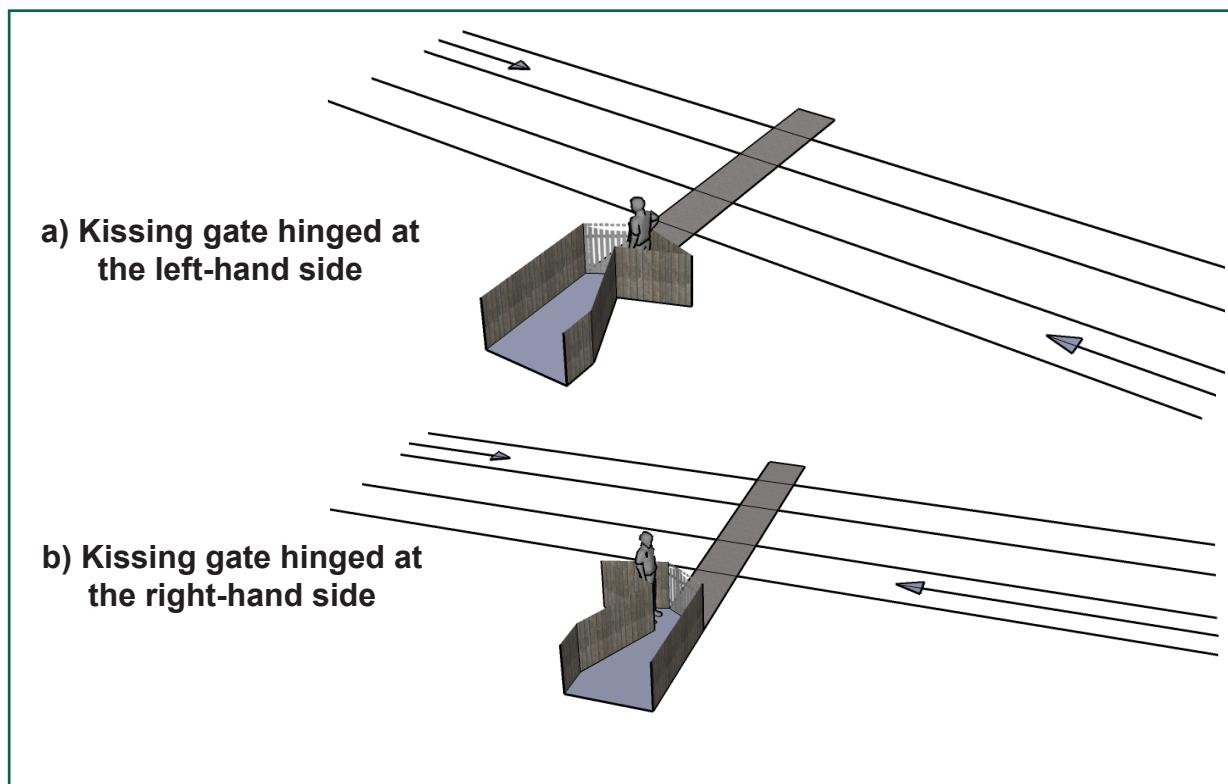


Figure 6: Effect of kissing gate orientation on pedestrian's direction of view

Identification of causal factors⁸

- 33 The pedestrian was probably distracted by the presence of train 1D34.**
- 34 When the pedestrian arrived at the crossing, train 1D34 was slowing down to stop at the red aspect of signal TN4525. The pedestrian waited at the crossing gate until 1D34 had stopped. It is probable that her attention was fully focused on this train.

⁸ Any condition, event or behaviour that was necessary for the occurrence. Avoiding or eliminating any one of these factors would have prevented it happening.

- 35 The detailed accident timeline is presented in table 1. This was constructed from the FFCCTV recordings from trains 1D34 and 1G38, a survey of the area by the RAIB (paragraph 30) and from the on-train data recorder on train 1G38. Table 1 reflects the resolution of the FFCCTV recording, which gives times to the nearest second.

Time (as recorded by EMT train FFCCTV)	Time before accident (seconds)	Event
14:48:41	37	Pedestrian emerges from alleyway leading up to the crossing
14:48:48	30	Pedestrian stops behind gate
	24	Earliest possible view of train 1G38 ⁹
14:49:01	17	Train 1D34 stops
	17	Majority of front of train 1G38 visible from pedestrian's position ¹⁰
14:49:05	13	Pedestrian opens gate
14:49:11	7	Train 1D34 starts to move, train 1G38 passing through Attenborough station
14:49:14	4	Pedestrian starts to cross the line, train 1G38 almost at Attenborough Lane level crossing
	2.5	Front of train 1G38 at exit from Attenborough Lane level crossing
	1.4	Driver of 1G38 sounds horn
14:49:18	0	Pedestrian struck by train 1G38

Table 1: Accident timeline (from FFCCTV recording and RAIB analysis)

- 36 The CCTV on train 1D34 shows the pedestrian arrived at the crossing 13 seconds before the train came to a stand at signal TN4525 (table 1). The pedestrian opened the gate four seconds later and was still at the gate line six seconds after this, when train 1D34 started to move, the signal having cleared. The FFCCTV shows the pedestrian waiting a further three seconds and then starting to cross. It is likely that she had seen the train and was watching it to establish whether it was moving before deciding to cross. It is also likely that she had satisfied herself that it was stationary, but did not notice when it started to move. Its speed would initially have been very slow, making movement difficult to detect.
- 37 It is not possible to discern from the FFCCTV on train 1D34 which direction the pedestrian was looking while she waited at the crossing, but it seems likely that she was concentrating on train 1D34 as it is likely that she would otherwise have crossed the line straight away.

⁹ Calculated on the assumption that the train does not become visible until the observer can see the part of its front between the right-hand rail (relative to the direction of travel of the train) and the right-hand side of the train.

¹⁰ Calculated on the assumption that the train is visible when the observer can see all of the front except the part of it between the left-hand rail and the left-hand side of the train.

- 38 Train 1G38 approached the crossing while the pedestrian was waiting to cross. The pedestrian was not visible on the forward facing CCTV on train 1G38 until she stepped out from behind the kissing gate and fencing¹¹. At this point the train was crossing Attenborough Lane level crossing, which was 73 metres or 2.5 seconds from the footpath crossing. The driver sounded the horn as soon as he noticed her. The RAIB has calculated from the OTDR evidence that the horn was sounded when the train was 40 metres or 1.4 seconds from the footpath crossing.
- 39 The FFCCTV on train 1G38 shows the pedestrian was looking away from this train towards train 1D34 as train 1G38 approached, supporting the likelihood that her attention was fully focused on train 1D34. She started to turn her head towards train 1G38 when the train was less than a second from her. It is likely that she turned in response to hearing the horn from train 1G38.
- 40 The safe use of footpath crossings relies on the crossing user looking both ways to see that no trains are approaching. The signs at the crossing remind the user to stop, look, listen and beware of trains. These signs were clearly visible to pedestrians using the footpath crossing (figure 3).

Network Rail's management of the crossing

- 41 Network Rail's management of the crossing was investigated, and no issues were found that are considered to be causal to this accident.
- 42 Network Rail had inspected and risk assessed the crossing at regular intervals. The risk assessments included the use of ALCRM to calculate the risk. One of the key inputs to ALCRM is census information regarding the number of users of the crossing. The ORCC gathered this information from a 'quick census' which recorded the number of users crossing in a 30 minute period. This figure was then factored up to estimate the total number per day. The RAIB has identified issues regarding the effectiveness of Network Rail's level crossing quick census in previous investigations. The report into a fatal accident at Gipsy Lane footpath crossing, Needham Market, on 24 August 2011 (RAIB report 15/2012) made a recommendation to improve the accuracy of data collected at crossings. Network Rail has since issued guidance on censuses to its level crossing managers (Level Crossing Guidance Document LCG02 'Census Good Practice', issue 1, Feb 2013).
- 43 The most recent assessment, in December 2012, determined that the crossing was crossed by 81 pedestrians and 239 trains each day. The key risk drivers were noted as the number of users, the number of trains and the risk of sun glare (sun glare was not a factor in this accident). The crossing was assessed as having a risk rating of C3.

¹¹ The CCTV camera is on the right-hand side of the train and so the view recorded by it is slightly different to that of the driver.

- 44 The ALCRM risk rating of C3 means that the risk to an individual user of the crossing was rated in third place on a scale of A (highest risk) to M and the collective risk was also in third place on a scale of 1 (highest risk) to 13. The previous ALCRM assessment, made in August 2011, rated the risk as C2. This was based on a census which indicated that there were 144 pedestrians and 246 trains per day. The higher usage estimate may have been due to the census being carried out in summer rather than winter.
- 45 The previous risk assessments also ranked the crossing relatively highly¹² and this risk rating meant that the crossing was one of several considered by Network Rail and the highway authority, Nottinghamshire County Council, at one of their regular road/rail partnership group meetings on 29 April 2009. At this meeting it was suggested that the crossing could be closed if the footpath was diverted to run parallel to the railway to the nearby Attenborough Lane level crossing. This diversion would require the demolition of a brick building which housed Network Rail signalling equipment. This equipment would become redundant after the resignalling of Nottingham station, expected to take place in August 2012.
- 46 The Nottingham resignalling project was subsequently put back a year to August 2013 in order that no major engineering work would be carried out during summer 2012, due to the Olympic Games being held in London.
- 47 Network Rail's Operations Risk Advisor (ORA) addressed a meeting of the Attenborough community action team, a local residents' group, at a public meeting in March 2012 to outline Network Rail's plans for the crossings in the area. In particular, the diversion of the footpath and closure of Barratt's Lane No.2 footpath crossing. There were no objections to this plan and Network Rail asked Nottinghamshire County Council to start the legal process of footpath diversion.
- 48 Nottinghamshire County Council's rights of way officer sent details of the proposed footpath diversion to the local residents who would be affected, for preliminary consultation. This consultation period ended on 26 November 2012 and there were several comments returned but no outright objections.
- 49 Network Rail appointed a Civil Engineering consultant to develop the scheme for the footpath diversion in November 2012. The consultant reported, in January 2013, that the route was obstructed by some of Network Rail's equipment and asked Network Rail whether this could be moved. In particular, the CCTV mast at Attenborough Lane level crossing restricted the width to less than the full width that Nottinghamshire County Council had specified for the diversion. Neither Network Rail nor the consultant asked Nottinghamshire County Council whether a narrower path was acceptable. The consultant suggested an alternative diversion route was possible, towards Barratt's Lane No.1 footpath crossing, where a footbridge had already been proposed.
- 50 Network Rail's legal liabilities negotiator sent an email to Nottinghamshire County Council on 28 January 2013 stating that it was no longer proposing to divert the footpath to Attenborough Lane level crossing. Instead, it stated that it proposed to divert the footpath to Barratt's Lane No.1 footpath crossing where a footbridge would be installed. This would be built in *control period 5*. Control period 5 runs from April 2014 to March 2019.

¹² The previous risk assessment was carried out in 2008 and rated the risk as B2, but this was before the ALCRM was recalibrated and this risk rating cannot be directly compared with the later, post-recalibration, values.

- 51 When Nottinghamshire County Council and Network Rail met at the next road/rail partnership meeting on 16 April 2013 the council expressed disappointment with Network Rail's decision and suggested that they re-examine the proposed diversion, as a local restriction of footpath width at the CCTV column would be acceptable to the council. The Network Rail Operations Risk Advisor (ORA)¹³ and a representative of Nottinghamshire County Council met on site on 8 May 2013 and on 24 May Network Rail issued the consultant with an instruction to resume work on the original footpath diversion scheme. The minutes of the 16 April 2013 meeting contain a post-meeting note which states '*Network Rail's contractor is carrying out a more detailed topographical survey, which will result in a more detailed scheme plan and estimate of the total cost before a decision is taken on whether to pursue the diversion*'. The consultant delivered the revised scheme details to Network Rail on 19 August but the preferred option was still diversion via Barratt's Lane No. 1 footpath crossing. No further progress had been made on the diversion prior to the accident.
- 52 Although Network Rail had identified that the crossing could be closed at the level crossing partnership meeting in 2009, the works had not taken place by the date of the accident (26 October 2013). This delay is largely attributable to the need for the brick building to become redundant before it could be demolished to make space for the planned diversion. The brick building would not be redundant until after the resignalling work at Nottingham in August 2013 and it was scheduled for demolition as part of the resignalling project.
- 53 In the period before the diversion became feasible, the crossing was assessed as having a risk rating of C3 (paragraph 42). A risk rating of 'C' for individual risk is no higher than was assessed for 3084 other level crossings (57.2% of the total¹⁴). The rating of '3' for collective risk placed this crossing in the top 4% of all crossings. However, this latter measure of risk is primarily driven by the number of crossing users and trains, not the risk to any individual user.
- 54 The RAIB observes that at Barratt's Lane No.2 crossing, during the period 2009-13:
 - substantive measures that could have been taken to reduce the risk at the crossing pending its closure (for example, the installation of *miniature stop lights*) were unlikely to have been justified on a cost-benefit basis, given the short time before the crossing was planned to be closed;
 - an alternative option to permit diversion and closure of the crossing was evaluated; and
 - sighting of approaching trains remained compliant with current legislation and guidance.

¹³ The operations risk advisor manages the Network Rail Route level crossing management team, among his other responsibilities.

¹⁴ Table 2 of Network Rail publication 'Safer Crossings – issue 4' available at <http://www.networkrail.co.uk/safety/safer-crossings-issue-4-april-2014.pdf>.

Previous occurrences of a similar character

- 55 A pedestrian was struck by a train and killed at Barratt's Lane No.1 footpath crossing in foggy conditions on 21 November 2005. The accident was investigated by the RAIB (report 13/2006). The investigation concluded that the causal factor was the pedestrian's decision to cross in weather conditions when it was not possible to see that it was safe to do so. No recommendations were made.

Summary of conclusions

Immediate cause

- 56 The immediate cause of the accident was that the pedestrian started to cross the line as a train was approaching from the Nottingham direction (**paragraph 26**).

Causal factor

- 57 It is likely that the pedestrian was distracted by the presence of another train standing at a nearby signal (**paragraph 33**).

Actions reported as already taken or in progress relevant to this report

- 58 The ORR wrote to Network Rail to recommend that it apply to the highway authority for an immediate closure of the crossing. Nottinghamshire County Council granted a temporary closure order on 1 November 2013.
- 59 Network Rail applied to Nottinghamshire County Council for a formal diversion order for Beeston footpath 66 on 22 November 2013. An order was made on 17 January 2014 and confirmed on 28 March 2014. This diversion was on the originally proposed route via Attenborough Lane level crossing. Construction of the diversion was completed in March 2014 (figure 7).



Figure 7: Diverted route via Attenborough Lane level crossing

- 60 RSSB¹⁵ is conducting research into the causes of pedestrian accidents at level crossings (project T984) and has told the RAIB that it will include findings relevant to the design and installation of kissing gates (the part of the T984 report containing these findings is to be published by the end of 2014). This research has identified a design principle that the alignment of a kissing gate (or chicane) should, if practicable, enable the user to look in both directions and encourage the user to look in the direction of oncoming trains on the nearest line. This information will also be included in the forthcoming update of the level crossing risk management toolkit for consideration as part of the ongoing assessment of risk at footpath crossings.

¹⁵ A not-for-profit company owned and funded by major stakeholders in the railway industry, and which provides support and facilitation for a wide range of cross-industry activities. The company is registered as 'Rail Safety and Standards Board', but trades as 'RSSB'.

Learning point

61 The RAIB has identified the following key learning point¹⁶ for the railway industry:

Learning point 1

For double track lines, kissing gates arranged with the hinge on the right-hand side encourage footpath users to face towards the oncoming traffic on the nearest line as they exit from the gate (paragraph 32). This is particularly relevant where the gate is close to the track. RSSB is shortly to provide advice on how the arrangement of gates and barriers at a crossing influences the behaviour of pedestrians (project T984), and will include this in a future update of the level crossing risk management toolkit (paragraph 60).

¹⁶ ‘Learning points’ are intended to disseminate safety learning that is not covered by a recommendation. They are included in a report when the RAIB wishes to reinforce the importance of compliance with existing safety arrangements (where the RAIB has not identified management issues that justify a recommendation) and the consequences of failing to do so. They also record good practice and actions already taken by industry bodies that may have a wider application.

Recommendations

62 There are no recommendations for the railway industry arising from this accident.

Appendices

Appendix A - Glossary of abbreviations and acronyms

ALCRM	All level crossing risk model
EMCC	East Midlands Control Centre
ORA	Operations risk advisor
ORCC	Operations risk control coordinator
ORR	Office of Rail Regulation
OTDR	On train data recorder

Appendix B - Glossary of terms

Control office	An office from which the operation of the railway is overseen and managed.
Control period	A five year time period set by the regulator (ORR) for the purpose of monitoring Network Rail's expenditure.
Diesel multiple unit	A type of train that is powered by diesel engines and can operate in conjunction with other similar trains.
Full barrier crossing	A type of road level crossing which has barriers which block the whole width of the road. These are often controlled by CCTV from a remote location.
Kissing gate	A gate which swings between two posts forming an enclosure which allows one person at a time to pass (see figure 6).
Miniature stop light	Small red and green lights provided at footpath crossings to indicate to pedestrians when it is safe to cross.
On-train data recorder	A device fitted to the train which records key operational information, such as speed and position of controls.
Track circuit block	The system of signalling the railway where safe operation of trains is achieved by allowing only one train at a time to occupy a section of track fitted with a device to detect the presence of a train.

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