RAIB

Rail Accident Investigation Branch

Rail Accident Report

Pedestrian struck by a train at Bourneview footpath crossing, London Borough of Croydon, 23 January 2025

Report 08/2025
November 2025

This investigation was carried out in accordance with:

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

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Preface

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. 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.

RAIB's findings are based on its own evaluation of the evidence that was available at the time of the investigation and are intended to explain what happened, and why, in a fair and unbiased manner.

Where RAIB has described a factor as being linked to cause and the term is unqualified, this means that RAIB has satisfied itself that the evidence supports both the presence of the factor and its direct relevance to the causation of the accident or incident that is being investigated. However, where RAIB is less confident about the existence of a factor, or its role in the causation of the accident or incident, RAIB will qualify its findings by use of words such as 'probable' or 'possible', as appropriate. Where there is more than one potential explanation RAIB may describe one factor as being 'more' or 'less' likely than the other.

In some cases factors are described as 'underlying'. Such factors are also relevant to the causation of the accident or incident but are associated with the underlying management arrangements or organisational issues (such as working culture). Where necessary, words such as 'probable' or 'possible' can also be used to qualify 'underlying factor'.

Use of the word 'probable' means that, although it is considered highly likely that the factor applied, some small element of uncertainty remains. Use of the word 'possible' means that, although there is some evidence that supports this factor, there remains a more significant degree of uncertainty.

An 'observation' is a safety issue discovered as part of the investigation that is not considered to be causal or underlying to the accident or incident being investigated, but does deserve scrutiny because of a perceived potential for safety learning.

The above terms are intended to assist readers' interpretation of the report, and to provide suitable explanations where uncertainty remains. The report should therefore be interpreted as the view of RAIB, expressed with the sole purpose of improving railway safety.

Any information about casualties is based on figures provided to RAIB from various sources. Considerations of personal privacy may mean that not all of the actual effects of the event are recorded in the report. RAIB recognises that sudden unexpected events can have both short- and long-term consequences for the physical and/or mental health of people who were involved, both directly and indirectly, in what happened.

RAIB's investigation (including its scope, methods, conclusions and recommendations) is independent of any inquest or fatal accident inquiry, and all other investigations, including those carried out by the safety authority, police or railway industry.

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Summary

At about 08:03 on Thursday 23 January 2025, an 11-year-old child was struck and fatally injured by a passenger train at Bourneview footpath crossing, near Kenley in the London Borough of Croydon. The train was travelling at about 50 mph (80 km/h) at the time of the accident. The pedestrian was walking to school when they entered the crossing as the train approached. The driver of the train sounded the train's horn and applied the emergency brake on realising that the pedestrian was starting to cross the railway. The pedestrian looked up in response to the horn but did not have time to react and move clear of the train before it reached the crossing.

The accident happened because the pedestrian did not perceive the risk associated with the approaching train, probably because they were distracted by their mobile phone.

RAIB found that the design and construction of the crossing did not change the pedestrian's perception in two respects. Bourneview footpath crossing is a passive crossing, which was not fitted with active warning systems at the time of the accident. This is a probable causal factor. It could also have been made more obvious to pedestrians that they were entering a potentially hazardous area. This is a possible causal factor.

Possible underlying factors in this accident were that access to information relating to safe use of level crossings for schools and parents is not sufficiently widespread and that Network Rail's guidance for risk assessments at level crossings did not recognise the different risk profile of younger people.

As a result of this accident, RAIB has made three recommendations, one to the curriculum setters for schools throughout the United Kingdom to work with railway infrastructure managers to introduce targeted and locally relevant railway safety lessons to pupils of all ages. There are two further recommendations, addressed to Network Rail, working with the Rail Safety and Standards Board. The first of these aims to make the dangerous area at level crossings more noticeable, particularly to people whose attention may be distracted. The final recommendation is to understand the risk profile of younger people and whether this warrants different approaches to risk mitigation at level crossings.

RAIB also identified a learning point to consider what action could be taken to alert users to the danger of individual level crossings where the provisions of its standards cannot be met, and to record these considerations in the crossing risk assessment.

Introduction

Definitions

1 Metric units are used in this report, except when it is normal railway practice to give speeds and locations in imperial units. Where appropriate the equivalent metric value is also given.

2 The report contains abbreviations and acronyms, which are explained in appendix A. Sources of evidence used in the investigation are listed in appendix B.

The accident

Summary of the accident

3 At about 08:03 on Thursday 23 January 2025, an 11-year-old boy, Jaiden Shehata, was struck and fatally injured by a passenger train at Bourneview footpath crossing, near Kenley in the London Borough of Croydon (figure 1). The train was recorded as travelling at about 50 mph (80 km/h) at the time of the accident.

4 The pedestrian was walking to school when the accident occurred, having begun to cross the railway as the train approached.

5 On realising that the pedestrian was crossing the railway immediately ahead, the driver of the train made an emergency brake application and sounded the train's warning horn. The pedestrian looked up in response to the horn but did not have time to react and move clear of the train before it reached the crossing.

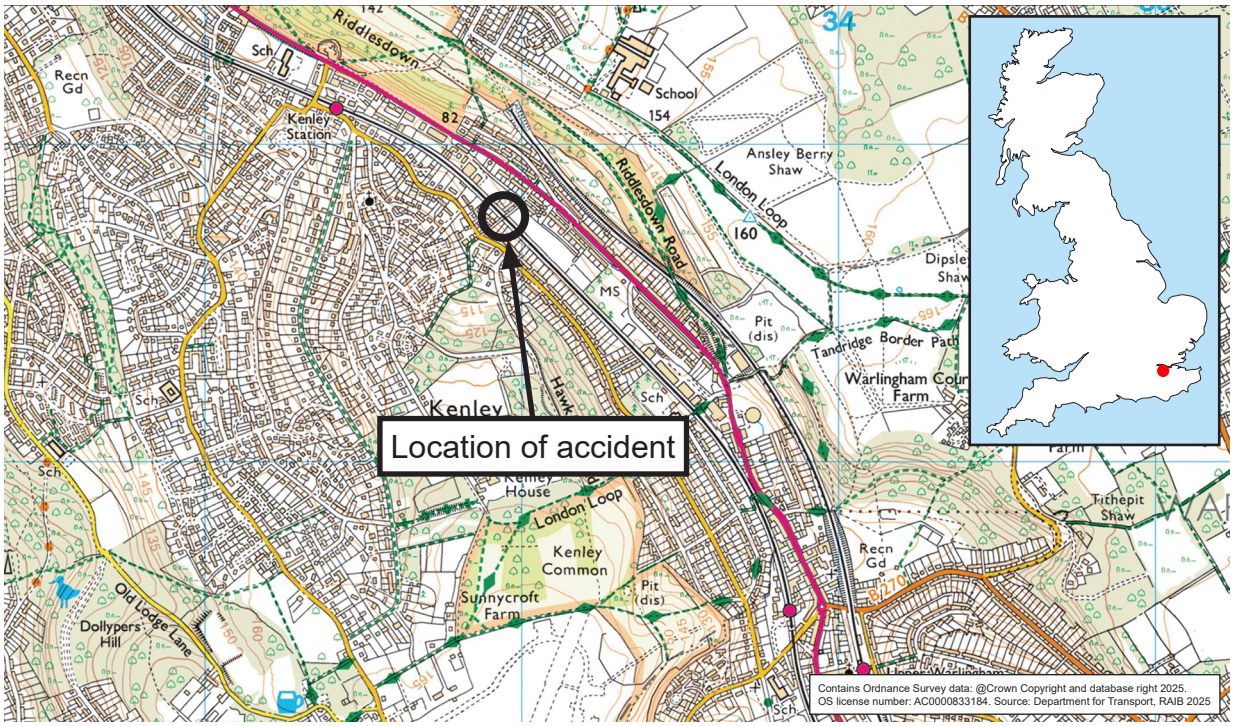

Figure 1: Ordnance Survey map showing location of the accident at Bourneview crossing, in the south of Greater London.

Context

Location

6 Bourneview crossing is situated in the London Borough of Croydon, between the stations at Whyteleafe (0.9 miles (1.5 km) away) and Kenley (0.5 miles (0.8 km) away). The line is used by Southern Railway trains running between London Bridge and Caterham. The crossing is 16 miles 61 chains (a unit of length of 22 yards or around 20 metres) from a datum point at London Charing Cross station.

7 The railway at this location runs broadly north-west to south-east and comprises two tracks, known as the Up and Down Caterham lines (towards and away from London respectively). A conductor rail, energised at 750 V DC, is located adjacent to each track to provide power to trains, although there is a gap in the conductor rail at the crossing and for about 3 metres either side of it. The maximum permitted speed for trains travelling in either direction over the crossing is 60 mph (97 km/h). Signalling in this area is by colour light signals, controlled from Three Bridges signal box.

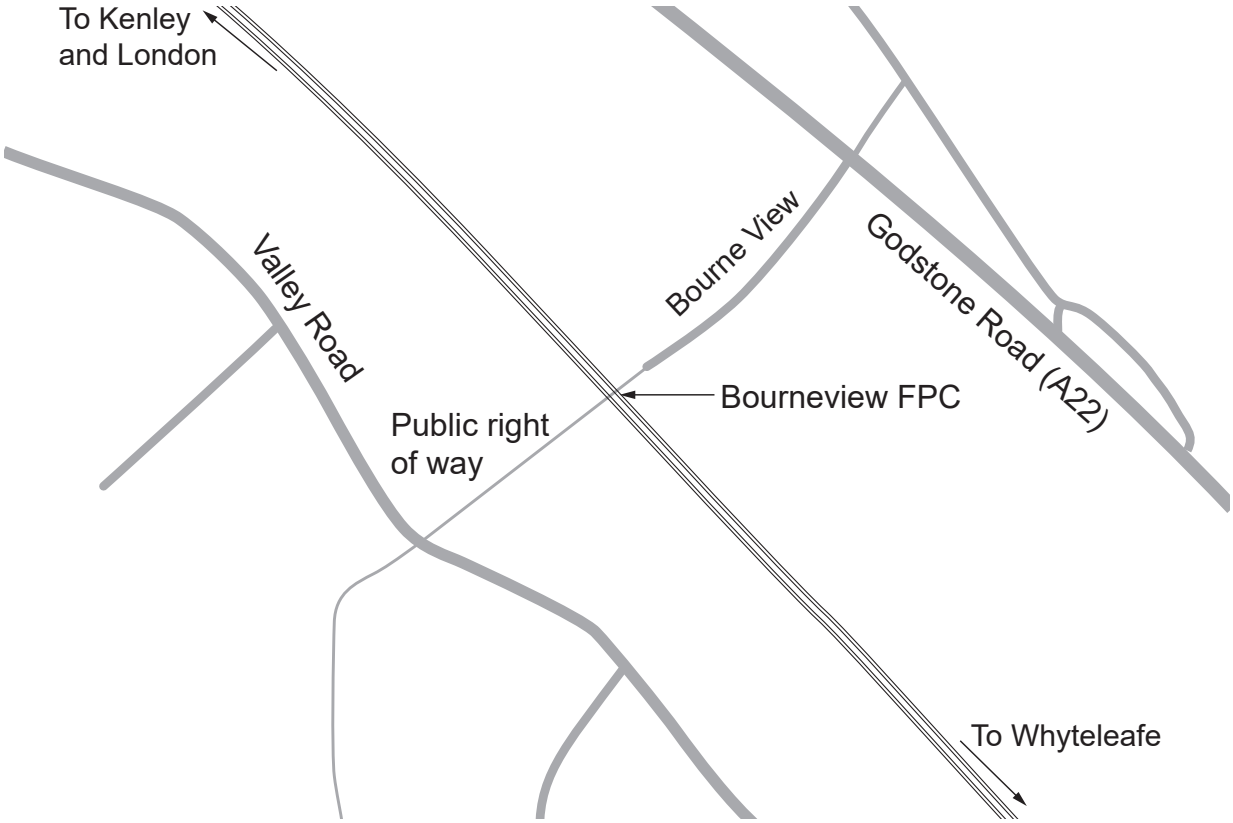

Figure 2: Diagram of the area around the crossing.

8 The crossing itself is part of a public right of way linking Valley Road in Kenley, around 90 metres to the south-west of the crossing, to Bourne View, a cul-de-sac on the north-east side of the crossing which leads to the A22 Godstone Road, around 125 metres away (figure 2).

Organisations involved

9 Network Rail is the owner and maintainer of the railway infrastructure at the location of the accident, which includes Bourneview crossing and the land up to and including the boundary fences. It also employed the staff responsible for gathering data about the crossing and for assessing and managing its safe use. Bourneview crossing falls within Network Rail's Sussex route, which is in its Southern region.

10 Govia Thameslink Railway, under its Southern brand, operated the train involved in the accident. It also employs the driver of the train.

11 Network Rail and Govia Thameslink Railway freely co-operated with the investigation.

The crossing

12 In common with many footpath crossings, Bourneview crossing does not have any active protection, such as lights, to warn users of approaching trains, or barriers, to restrict access over the crossing. Crossing users on foot are expected to stop, look and listen for approaching trains, and to make their own decision about whether or not it is safe to cross.

13 The approach to Bourneview crossing from Valley Road (the one used by the pedestrian) is down a footpath, approximately 80 metres long, which forms a public right of way (figure 3). Although this path has a solid surface, at the time of the accident this was encroached on and overhung by vegetation, giving it the general appearance of a muddy path. The path slopes down from the road to the railway, between two residential gardens.

Figure 3: Approach to Bourneview crossing from Valley Road.

14 On the far side of the crossing, Bourne View is a residential cul-de-sac with an asphalt footway to the left of the road, as users walk away from the crossing.

15 Nationally, at the time of writing, there are 1336 crossings of the same type as Bourneview on Network Rail's infrastructure. On the Sussex route, there are 111 such crossings, out of a total of 211 level crossings.

16 On each side of Bourneview crossing, users enter through a kissing gate (a gate which pivots between two posts) with the gate sprung to close towards the railway side of the enclosure (figure 4). Signs at the gate warn users of the following:

- to keep dogs on leads
- not to touch the live rail
- not to trespass on the railway.

Figure 4: The kissing gate on the Valley Road side of the crossing.

17 The gate leads users through the railway boundary into a corridor around 4 metres long, enclosed with metal fencing approximately 1.25 metres tall. RAIB has determined that the fenced corridor inside the gate on the Valley Road side of the crossing (the approach used by the pedestrian involved in the accident) is about 4.15 metres long, and that it ends about 2 metres from the nearest running rail of the Up Caterham line (figure 5).

18 The position where the fenced corridor ends is the 'decision point' for pedestrians crossing from this side (figure 6). This is the notional point at which pedestrian users are expected to decide whether it is safe to cross the railway. A decision point is also located 2 metres from the nearest rail on the Bourne View side of the crossing, for pedestrians crossing in the other direction.

19 Signs at the decision points warn users of the following:

- to 'Stop, Look, Listen – Beware of trains'
- not to touch the live rail
- not to trespass on the railway
- that oncoming trains can be hidden by other trains.

Figure 5: View of the crossing from inside the Valley Road side gate.

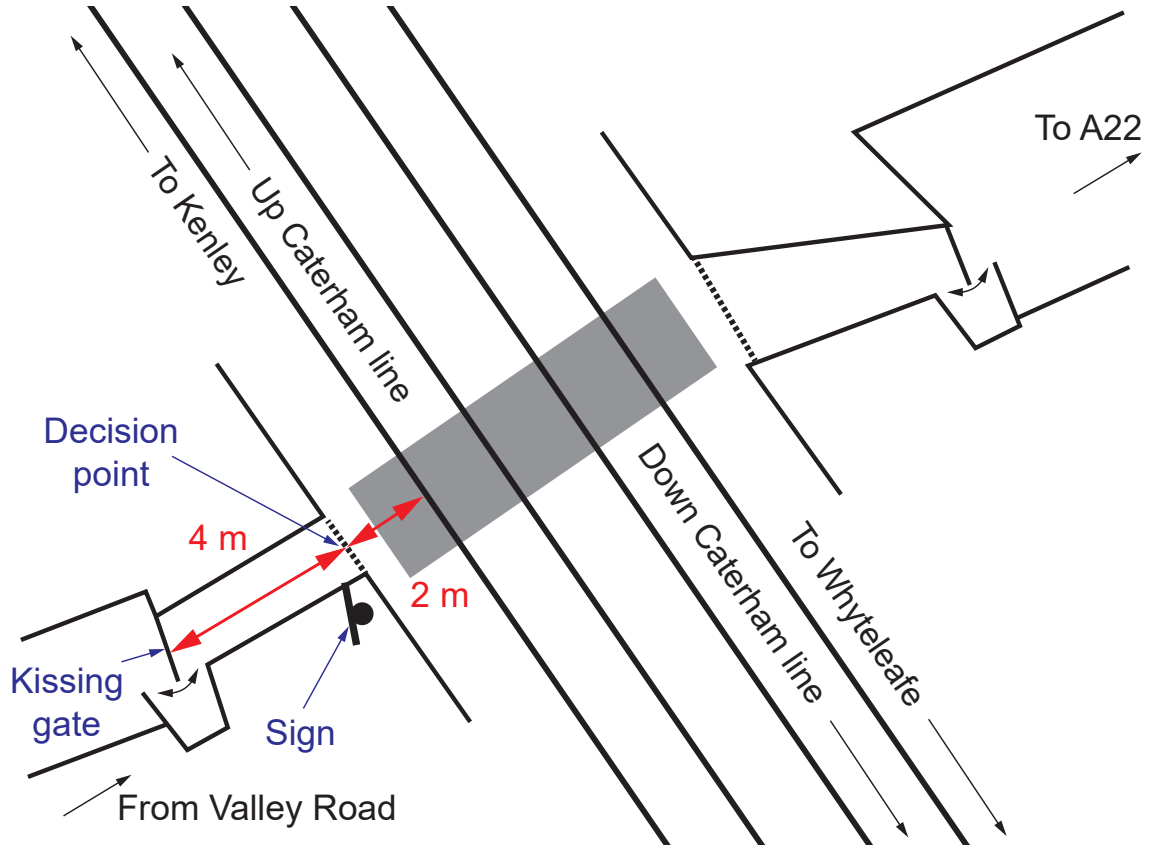

Figure 6: Layout of the crossing.

20 On the day of the accident, RAIB measured the sighting distances (the distances at which approaching trains can be seen by crossing users) in each direction from the decision points on each side of the railway. On the Valley Road side, a user standing at the decision point can see for around 850 metres towards Whyteleafe (the direction from which the train involved in the accident approached). Beyond this point, the railway passes under a bridge and curves to the right from the user's point of view (figure 7). Looking from this decision point in the other direction, the railway curves to the left and users can see for around 275 metres towards Kenley station.

Figure 7: View from the decision point of trains approaching from Whyteleafe.

21 The distance between the decision points on either side of the railway is known as the 'traverse distance'. RAIB measured this distance to be 9 metres (Network Rail's risk assessment placed the Valley Road side decision point 1.9 metres from the nearest rail, so calculated the traverse distance as 8.9 metres).

22 Network Rail uses the traverse distance to calculate the amount of time it takes a user to cross the railway. Network Rail uses a defined walking speed of 1.189 m/s for this calculation. At this speed, it would take 7.6 seconds to cover the 9-metre traverse distance, which Network Rail rounded up to 8 seconds in its risk assessment. This is, therefore, the minimum required sighting time in each direction for trains approaching the crossing at the maximum permitted speed of 60 mph (97 km/h). A train travelling at the maximum permitted speed will cover 215 metres in 8 seconds, so this is the minimum required sighting distance that users require to decide if it is safe for them to cross. There are signs placed on each railway approach to the crossing which indicate to maintenance staff the degree to which lineside vegetation must be cut back to achieve the minimum required sighting distance. RAIB found that these signs were visible from the crossing on the day of the accident.

23 Because the actual sighting distance exceeds the minimum required sighting distance on both sides of Bourneview crossing, there is no requirement for the crossing to be fitted with any additional protection. This could include lineside whistle boards instructing train drivers to sound their train's warning horn on approach to the crossing.

24 Network Rail's most recent risk assessment for Bourneview crossing before the accident (dated May 2023) noted that an average of 64 users and 78 trains per day passed over the crossing. Users were identified as being mainly local, and regular, with many people seen on several occasions during a nine-day survey.

25 Network Rail assesses the risk of all its level crossings on two criteria. These are:

- the risk to an individual user of the crossing (rated from A to M, where A is the highest risk)
- the total, collective risk of harm to crossing users and those on board trains (rated from 1 to 13, where 1 is the highest risk).

The May 2023 risk assessment for Bourneview crossing rated it as C4, ranking it the 13th highest risk footpath crossing on the Sussex route.

26 The May 2023 risk assessment documented six near misses at the crossing between 30 November 2018 and 9 February 2023 and one fatality in March 2020, which Network Rail recorded in the risk assessment as being due to a deliberate act.

Train involved

27 The train involved in the accident, reporting number 1P12, was the 07:55 Caterham to London Bridge service. It was a class 377 train formed of 5 coaches. The train was fitted with an on-train data recorder (OTDR) and forward-facing CCTV (FFCCTV) cameras.

People involved

28 The pedestrian was an 11-year-old local boy, Jaiden Shehata, who had regularly used the crossing as his route to and from school since starting secondary school in September 2024.

29 The driver of train 1P12 was based at London Bridge and had worked for Southern for 14 years. Their competence assessments were up to date with no reported training or development plans in place.

30 The Network Rail level crossing manager (LCM) with responsibility for Bourneview crossing had worked as an LCM in this area since 2018. Bourneview was one of 48 crossings that fell within their area of responsibility.

31 The community safety manager (CSM) for Network Rail's Sussex route joined Network Rail in this role in 2023. They had 15 years experience in other community facing roles in the railway industry. This role aims to increase the awareness of railway safety among the public, predominantly younger people, from around age 10 upwards, and educate them on the dangers of the railway and how to stay safe.

32 The Network Rail operational risk advisor (ORA) had worked in this role, which includes the responsibilities of route level crossing manager (RLCM) on Network Rail's Sussex route, since February 2022. Both the LCM and the CSM reported to the ORA.

33 The regional level crossing manager for Network Rail's Southern region, the professional head for level crossings within the region, joined Network Rail in 2003. At the time of the accident, they had around 20 years' experience managing level crossings as an LCM and RLCM.

External circumstances

34 The weather at the time of the accident was overcast, cold and damp, with a temperature of about 3°C. Sunrise was at 07:51, 12 minutes before the accident. The sun would not have been high enough to cause any glare at Bourneview crossing, which lies in a wooded suburban area.

35 It is possible that the cold and damp weather played a role in the accident (see paragraph 55).

The sequence of events

Events preceding the accident

36 The pedestrian used the crossing as their route to school, since it was the most direct route from their home. This walk was around 1.1 km and would take less than 20 minutes. Although two alternative routes existed, these would both significantly increase the walking time for the pedestrian.

37 The pedestrian had been using this route daily since September 2024, when they began secondary school, and occasionally before that. They had previously crossed alone and with others, and were accustomed to seeing trains at the crossing, occasionally having to wait for one to pass.

38 The pedestrian left their house at or just before 08:00, to begin the walk to school. They were alone and dressed in school uniform, with a hooded coat.

39 At 08:02, running around 1 minute late, train 1P12 departed from Whyteleafe Station. The driver accelerated to a speed of around 56 mph (90 km/h) before shutting off power and allowing the train to coast for around 350 metres. About 244 metres from Bourneview crossing, the driver applied the train's brake in step one, its least restrictive setting, to slow down for Kenley station, which is around 1090 metres beyond Bourneview crossing.

40 Although there was no whistle board fitted on the approach to the crossing (paragraph 23), the driver briefly sounded the train's warning horn around 126 metres from the crossing. This was because the driver was in the habit of sounding the horn on approach to Bourneview crossing (see paragraph 62). They had not identified the presence of the approaching pedestrian at this point, as the pedestrian was still within the fenced area.

Events during the accident

41 When the train was about 63 metres (around 2.5 seconds travel time) from Bourneview crossing, its FFCCTV shows the pedestrian to be in line with the post holding the 'Stop, Look and Listen' sign. Less than a second later, when the train was 46 metres away and travelling at 54 mph (87 km/h), OTDR data shows that the driver moved the train's brake control to step two, a higher brake application.

42 Shortly afterwards, when the train was about 35 metres from the crossing, the pedestrian can be seen between the end of the fence and the nearest rail (figure 8). The driver moved the train's brake control through step 3 (full service braking) and into the emergency braking position.

43 Images from the train's FFCCTV system show that the pedestrian was at this stage walking at a steady pace, looking ahead and down at a glowing object, almost certain to be the illuminated screen of a mobile phone in their hands. They had their coat hood pulled up over their head.

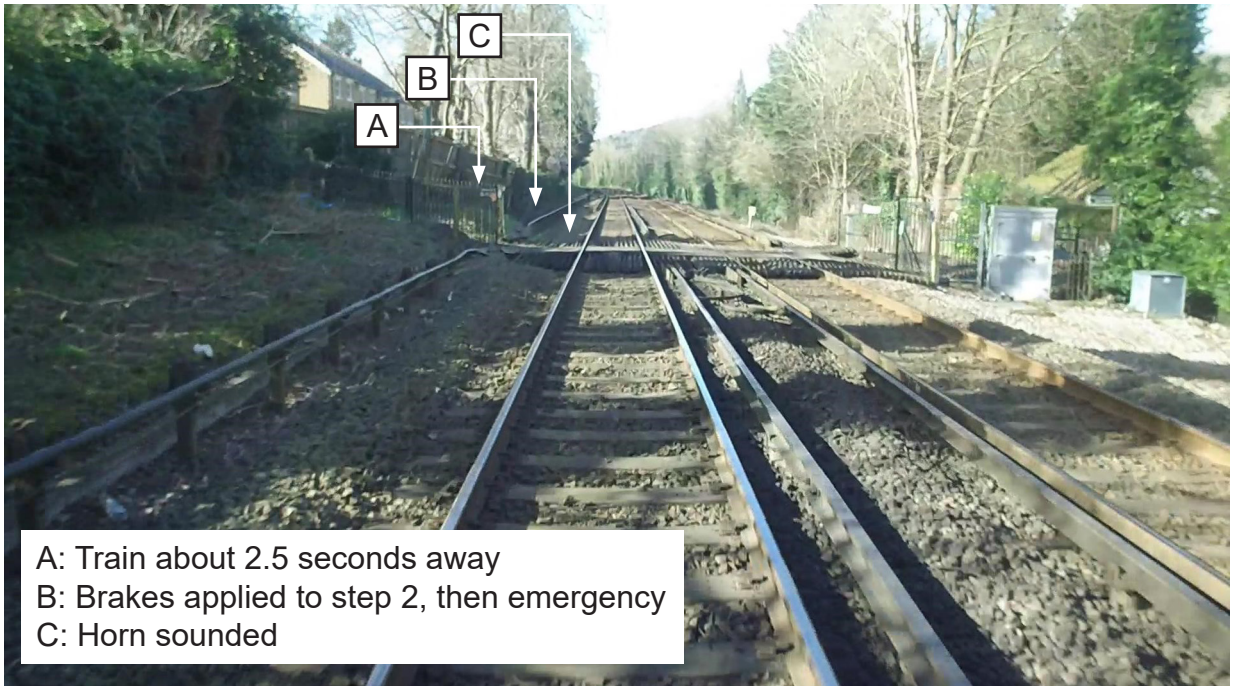

Figure 8: The positions of the pedestrian as the train approached.

44 The train driver began sounding the train's warning horn around 0.5 seconds after the emergency brake application, when the train was about 15 metres from the crossing and travelling at 53 mph (85 km/h). The pedestrian briefly looked up, apparently in response to the horn, but they did not have time to react or move out of the train's path. They were struck by the left-hand front corner of the train (in the direction of travel) and sustained fatal injuries. There is no evidence to suggest that the pedestrian was aware of the approaching train before the warning horn was sounded.

Events following the accident

45 The driver continued sounding the horn for around 3 seconds after the collision and kept the emergency brake applied until the train stopped about 207 metres beyond the crossing. The driver used the GSM-R (Global System for Mobile Communications - Railway) train radio system to report the accident to the signaller.

46 Emergency services and Network Rail staff attended the scene from around 08:11.

Analysis

Identification of the immediate cause

47 The pedestrian crossed into the path of train 1P12.

48 The FFCCTV images from train 1P12 show the pedestrian walking at steady speed into the path of the train. In the last few frames, a glow, almost certainly from the screen of a mobile phone, is visible in the pedestrian's hands. The pedestrian did not look towards the train until the driver sounded the warning horn, just before reaching the crossing (paragraph 44).

49 Train 1P12 reached a maximum speed of 58 mph (93 km/h) at a point 244 metres before Bourneview crossing, when the driver started braking for Kenley station, having shut off power and allowed the train to coast over the previous 350 metres (paragraph 39). There are no whistle boards on approach to the crossing (paragraph 23).

50 Unlike road vehicles, trains are not required to be able to stop within the area that their driver can see to be clear ahead. Therefore, at the vast majority of railway crossings in the United Kingdom, including all footpath crossings like Bourneview, there is no requirement for train drivers to check that a crossing is clear before proceeding over it.

51 Due to their weight and design, trains cannot stop as quickly as road vehicles. The shortest distance in which a train is mandated by standards[1] to be able to stop from 60 mph (93 km/h) on level track in normal conditions is 428 metres. As a comparison, this is nearly six times the typical stopping distance for road vehicles stated in the Highway Code. Although the driver had a view of Bourneview crossing for more than this distance, the pedestrian did not emerge onto the crossing area, beyond the decision point, until the train was about 60 metres from the crossing, meaning that a collision was unavoidable.

Identification of causal factors

52 The accident occurred due to a combination of the following causal factors:

a. The pedestrian did not perceive the risk associated with the train approaching the crossing, probably because they were distracted by their mobile phone (paragraph 53).

b. The design and condition of the infrastructure did not change the pedestrian's perception by alerting them to the risk from approaching trains (paragraph 58).

Each of these factors is now considered in turn.

[1] Railway Group Standard GMRT2045, 'Compatibility Requirements for Braking Systems of Rail Vehicles', RSSB, issue 4 dated March 2016.

Perception of risk

53 The pedestrian did not perceive the risk associated with the train approaching the crossing, probably because they were distracted by their mobile phone.

54 It is probably the case that, on approach to the crossing, the pedestrian was distracted from their surroundings by their mobile phone. FFCCTV shows that the pedestrian was looking down and appears to be looking at a mobile phone, and this was also supported by witness evidence from the train driver. Analysis of the pedestrian's mobile phone suggests that a video clip was playing at the time of the accident. The pedestrian's own headphones were later found at their home, and none were found at the accident site, and RAIB has concluded that they were not using headphones at the time of the accident.

55 The cold and damp weather meant that the pedestrian had the hood up on their coat (paragraph 38). This may have reduced their peripheral vision and hearing and affected their perception of the approaching train. As a child of 11 years of age, the pedestrian's general perception of risk and likelihood of reacting to visual cues may have been different to other users of the crossing (see paragraph 92).

56 The pedestrian was 158 cm tall (about 5 ft 2 in) so their view of the railway as they walked down the fenced corridor between the gate and the decision point may have been more limited than that available to a taller person. This meant that stopping and checking for trains at the decision point was more critical to creating an awareness of the presence of trains.

57 There were no other users present at the time the pedestrian was crossing, meaning that they had no active visual cues or warnings from the actions of others which could have prompted the pedestrian to stop or look for trains.

Design of the infrastructure

58 The design and condition of the infrastructure did not change the pedestrian's perception by alerting them to the risk from approaching trains.

59 This causal factor arose due to a combination of the following:

a. Bourneview footpath crossing is a passive crossing, which was not fitted with active warning systems at the time of the accident (paragraph 60). This is a probable causal factor.

b. The design and construction of the crossing could have made it more obvious to pedestrians that they were entering a potentially hazardous area (paragraph 75). This is a possible causal factor.

Each of these factors is now considered in turn.

The type of crossing

60 Bourneview footpath crossing is a passive crossing, which was not fitted with active warning systems at the time of the accident. This is a probable causal factor.

61 Historically, in common with a great number of footpath crossings, Bourneview was fitted with whistle boards requiring trains to sound their horns on approach. In line with calculations undertaken to modern standards by Network Rail as part of the risk assessment (paragraph 23), whistle boards were not required and were removed between 2008 and 2015. RAIB has been unable to determine the exact date of their removal from the available evidence.

62 Despite the removal of the whistle boards, some train drivers, including the driver of train 1P12, continued to routinely sound the warning horn on approach to this crossing. It is likely that this is because drivers on this route are aware of the history of, or have witnessed, people crossing in front of trains, and near misses, at this crossing.

63 Govia Thameslink Railway's driver managers stated that during driver assessments they had observed that this type of horn use was not unusual, particularly when approaching footpath crossings or locations with restricted visibility. They believed this to have been in line with the Rule Book, Module TW1, 'Preparation and movement of trains', issue 20, in force at the time of the accident, which stated to drivers: '*You must sound the horn … at any other time you consider necessary*'.

The risk assessment of the crossing

64 The Office of Rail and Road (ORR), the safety authority and economic regulator for Britain's railways, sets out guidance for managing level crossing safety in its document 'Principles for managing level crossing safety', which was published in June 2021. This document states that '*It is essential that decisions and options for level crossing control measures are informed by a suitable and sufficient assessment of the risks'*.

65 Under health and safety law, duty holders (in the case of this crossing, Network Rail) are required to reduce the level of risk so far as is reasonably practicable. Options for controlling the risk should be considered according to the hierarchy of prevention given in schedule 1 to The Management of Health and Safety at Work Regulations 1999. This requires that eliminating the risk (such as through closure of the level crossing) should be the first consideration, followed by engineering controls (for instance, technologies providing an active warning system), and finally administrative controls (such as signage and instructions).

66 Deciding what is reasonably practicable is a matter of judgement for each duty holder but, given the risks to railway staff, passengers and members of the public, the ORR guidance document states that risk control measures should be deemed reasonable unless the cost of the measure is grossly disproportionate to the risk. This can be determined by using a cost-benefit analysis as part of the risk management process.

67 The ORR guidance document also includes a principle which states:

> '*User Principle 6: Provide a suitable warning for users that a train is approaching to enable them to be in a safe place before a train passes. To help you achieve this, you should consider, at least, these factors:*
>
> *(a) an active warning system in preference to relying on the user to determine whether or not a train is approaching the level crossing;*
>
> *(b) user behaviours and actions in relation to the operation of the level crossing, e.g. to prevent them from being trapped within a closed crossing or starting to cross when it is unsafe to do so;*
>
> *(c) foreseeable actions of different users in a 'another train coming' scenario, these trains may be coming in the same or different directions; one may be inaudible and hidden from view.*'

68 Network Rail's process for managing risk at level crossings begins with an assessment by an LCM of the crossing. This includes measuring sighting distances and the traverse length and conducting a census of both users and trains over the crossing. The results of this assessment are entered into Network Rail's computer-based All Level Crossing Risk Model (ALCRM), which calculates a quantitative risk score for the crossing (paragraph 25).

69 The LCM uses the information from the site visit and the output from ALCRM to produce a written narrative risk assessment (NRA). The NRA documents their findings and, if the risks are deemed not to be as low as reasonably practicable, proposes options to mitigate the risk. The quantitative risk score from ALCRM is used to calculate a cost-benefit ratio for each of the proposed risk mitigations. The cost-benefit ratio is a whole-life calculation of how much each proposed measure costs and by how much it is expected to reduce the risk.

70 The LCM then uses their experience and professional judgement to supplement this calculation and determine whether the options are reasonably practicable to implement, considering qualitative factors associated with risk at the crossing as well as the results of any cost-benefit analysis. The LCM submits the NRA and their risk mitigation option proposals to the ORA, who reviews and (as appropriate) countersigns them.

71 In the May 2023 NRA, the LCM recorded their opinion that, as there was approximately one near miss per year at Bourneview (paragraph 26), changes should be made to improve safety at the crossing. They decided to move the level crossing signage closer to the fence and place it lower to make it more effective. This work was being planned at the time of the accident, with new signs being selected in December 2024.The LCM also recommended that a higher investment solution such as building a bridge or fitting miniature stop lights (MSLs) should be considered to provide a greater benefit to crossing safety.

72 MSLs consist of red and green lights. The green light indicates that no trains are approaching. When a train reaches the strike-in point the light automatically changes to red, and an audible alarm sounds to indicate that users must not cross. The strike-in point, where the approaching train activates the crossing, is set at a distance calculated to allow users a safe amount of time to cross when trains are travelling at the maximum speed permitted on the line.

73 Following the May 2023 NRA and an analysis of level crossing risk across the Southern region, Network Rail's level crossing management, including the ORA and regional level crossing manager met in late 2023 and recommended that Bourneview footpath crossing should be upgraded by fitting MSLs (figure 9, typical installation example). This was due to the high number of reported incidents at Bourneview, rather than a strict adherence to the cost-benefit analysis, which showed a relatively weak case for this level of safety investment at this crossing.

Figure 9: Lady Howard crossing in Surrey, fitted with MSLs and audible warnings.

74 In December 2023, the recommendation to fit MSLs at Bourneview received financial approval. The work was programmed for March 2026, as part of a rolling contract of crossing upgrades with Network Rail's contractor, ordered according to risk and geographical location.

Design of the crossing

75 The design and construction of the crossing could have made it more obvious to pedestrians that they were entering a potentially hazardous area. This is a possible causal factor.

76 The approach to Bourneview crossing along the path from Valley Road (paragraph 13) has a semi-rural appearance. On the slightly muddy and sloped surface, which has some protruding tree roots, the main risk that a pedestrian was likely to perceive was one of slips or trips. Although signs are fitted at the kissing gate which marks the railway boundary (paragraph 16), these are some distance to the left of a user's eyeline. The fence line and gate themselves are also old and unimposing and potentially do not give the user strong visual cues that they are entering a change of environment and approaching an operational railway.

77 Once through the kissing gate, the path continues for about 4 metres in a fenced corridor (paragraph 17). This part of the path is similar, being slightly muddy and sloping towards the railway. Although there is a signpost at the decision point (paragraph 18), there is no marking on the ground or substantial change of surface or colour as the path crosses the decision point and enters the area where a user is at risk from an approaching train.

78 Given the nature of the surfaces, it may be that users approaching the crossing would be looking downwards and watching their step, to avoid slipping or tripping, rather than looking up at the signs at the gate and decision point. In the case of the pedestrian involved in this accident, their gaze was probably downwards on approach to the crossing while looking at their phone (paragraph 54). In addition, their lower height (paragraph 56) meant that the level crossing signage would have been above their eyeline and so may not have been as obvious to them. As there are no markings on the ground, nor substantial changes in the colour, texture or surface of the path, there is nothing to alert a user who is distracted and looking down that they are approaching the railway or to prompt them to look up.

79 Network Rail standard NR/L2/XNG/30020 Module R03, 'Requirements for station, footpath, bridleway and user-worked level crossings', issue 1 dated June 2022, requires that, where the user is required to stop, look and listen to cross a railway, the surface between decision points should be coloured yellow (figure 10), where the type of crossing surface makes this reasonably practical.

Figure 10: The crossing at Synehurst in Hampshire, with white lines and yellow surface.

80 This requirement follows findings from the Rail Safety and Standards Board (RSSB) research project T984, 'Research into the causes of pedestrian accidents at level crossings and potential solutions', December 2013 (revised June 2015). This project found that a significant proportion of a user's time is spent looking at the ground when using passive crossings, as they are intent on looking where they are going and preventing slips, trips and falls. The amount of time users spent looking down varied and was apparently influenced by ground and surface conditions. The highest proportion of time looking down was recorded at crossings with the poorest surfaces.

81 The project resulted in a better understanding of decision points and the feasibility of marking these at crossings. It concluded that the use of well-designed and located ground markings and signs as cues was worthy of further consideration and that improving the condition of crossing surfaces would afford users greater opportunity to look for trains (as opposed to looking at the ground). Therefore, it would be better to clearly and consistently highlight the zone where there was a risk of being struck by trains, while minimising clutter from excessive fencing and signage. It also found that making gates stand out with reflective red and white stripes supports the user's mental model of a crossing as it is similar to the well-known barriers on road level crossings. Making changes such as these may serve to draw a pedestrian's attention to the transition from the safe approach to the more dangerous crossing area

82 This conclusion is further supported by British Standard BS8300:1, 'Design of an accessible and inclusive built environment. External environment - code of practice', issued in 2018. This standard states that a visual contrast between different surfaces can be helpful to signal a change of surface purpose and assist partially sighted people to determine where it is safe to walk and where it is not. Network Rail's Design Manual NR/GN/CIV/300/06, 'Tactile Paving & Wayfinding', issue 1 dated June 2024, states that such features are beneficial to most users, regardless of accessibility requirement.

83 The footways on other types of level crossing, such as those with half and full barriers (figure 11), and those on tramways (figure 12), are marked by a distinct type of tactile paving. This gives a sensory cue to users who are distracted, or cannot see, that they are approaching an area where a different level of vigilance is required.

84 At semi-rural crossings such as Bourneview, there is an evident risk that mud from the approaches could obscure colour and lines. However, there was no reason given in the May 2023 NRA as to why colour or lines had not been applied to the surface at this crossing.

Figure 11: A full barrier crossing, with tactile paving before the barriers.

Figure 12: A crossing on Manchester Metrolink, with tactile paving, low signage and distinct colours (courtesy of Google).

Identification of underlying factors

Education of users

85 Access to information relating to safe use of level crossings for schools and parents is not sufficiently widespread. This is a possible underlying factor.

86 There are a number of campaigns dedicated to providing information about, and raising awareness of, road safety issues for schools and parents. These include the Department for Transport's 'THINK!' campaign, which provides educational resources for teaching children and advice to road users. Other organisations such as Road Safety Scotland, Road Safety Wales, the Northern Ireland Department for Infrastructure, and the Royal Society for the Prevention of Accidents (RoSPA) also provide advice and information sheets for teaching children about road safety.

87 Network Rail undertakes regular rail safety campaigns, which aim to raise awareness of the dangers of the railway network. A campaign titled 'Beware the bubble' is particularly pertinent to the circumstances of this accident (figure 13) as it addresses the risk of losing awareness of the surrounding environment due to becoming distracted.

Figure 13: A still from the Network Rail 'Beware the Bubble' campaign film featuring mobile phone distraction on a level crossing.

88 Network Rail's CSMs (paragraph 31) and school engagement officers from train operating companies visit schools to give rail safety messages. They generally target pupils from the last year of primary school (around the age of 10) upwards and talk about how to stay safe on platforms and on trains, the dangers of the track, as well as education on the safe use of level crossings and footpath crossings, using materials including the 'Beware the Bubble' campaign. CSMs and school engagement officers rely on schools responding to their initial contact and good will to arrange visits. Relevant staff from Network Rail Sussex route and Govia Thameslink Railway stated that they had each managed to speak to around 15,000 pupils in the year leading up to the accident, but this represents less than 10% of the schoolchildren in their areas.

89 Network Rail has an online educational programme called 'Switched on',[2] which has a range of films, interactive games and classroom activities, targeted at three age groups. This material aims to teach pupils to be aware of risky behaviour and to develop hazard-spotting skills. The materials delivered in schools can be tailored to local issues and include the entire rail environment, including level crossings and the risks of becoming distracted.

90 RAIB asked schools local to Bourneview footpath crossing, including the school attended by the pedestrian, whether they had, before the accident, undertaken any railway safety training for pupils. None of the schools asked had held such training, but all were open to holding sessions on safety around the railways in the future.

91 At the time of the accident, there were no requirements from the Department for Education for schools in England to teach railway safety to any age group (this has now changed, see paragraph 103). The education departments in Northern Ireland, Scotland and Wales reported that they do not currently have policies that specifically address rail safety in schools, though schools are able to include this if it is considered locally relevant.

Risk profile

92 Network Rail's guidance for undertaking risk assessments at level crossings did not recognise the different risk profile of younger people. This is a possible underlying factor.

93 An Australian study[3] observing level crossing use and behaviours found that 41.9% of the people observed were either talking or looking at a portable electronic device when at a railway crossing. The study also found that 14 to 17-year-olds were more likely to be engaged in distracting behaviour than 9 to 13-year-olds. However, as 14 to 17-year-olds were more likely to carry phones at the time of the study than 9 to 13-year-olds, it was difficult to establish a direct link between age and distraction.

[2] https://switchedonrailsafety.co.uk.

[3] Larue G & Watling C, 'Prevalence and dynamics of distracted pedestrian behaviour at railway level crossings: Emerging issues', Accident Analysis & Prevention, volume 165, Feb 2022.

94 Another study[4] was undertaken in Italy comprising 922 children who were aged 10 to 14 which found that boys are more likely to travel independently at an earlier age than girls, and that an increase in risky behaviour and low risk perception is correlated to having increased independence.

95 As part of a continual safety campaign, a survey[5] of year 6 (around the age of 10) school children undertaken by East Sussex Fire and Rescue Service before and after providing safety lessons in schools found that of the various topics covered, railway safety had the lowest knowledge levels before safety visits, but the greatest improvement after the visit.

96 TRL (a transport research consultancy) analysed the statistics for road collisions in 2003 as part of its 2006 research 'Factors influencing pedestrian safety: a literature review' commissioned by Transport for London. It found that 35% of injuries were to children under 16, which is a higher rate than in the general population, as UK census data showed that 20% of the population was under 16. TRL also recorded that 60% of those injured were male.

97 This review of the research suggests to RAIB that, while young pedestrians tend to be less risk prone than teenagers and young adults, their behaviours, knowledge and risk perception are different to their older peers. Risk assessments for crossings in areas with schools, parks, playgrounds and other features that could attract younger people need to take account of this different risk profile.

98 In its level crossing guidance document LCG02, 'Census good practice' issue 2 October 2016, Network Rail details a vulnerable user allowance for users who are potentially slow to cross, but does not have any specific guidance for young people, who are capable of crossing quickly. People are naturally inclined to hurry over a crossing if they cannot see a train and to wait if they can. However, if they often see trains approaching for significantly longer than the minimum required sighting time (paragraph 22) this may increase the likelihood of people crossing while a train is approaching. This is made particularly hazardous as it is difficult for a user to judge how long is available to cross when a train is visible for a long time, as the visible rate of change of the size of rail vehicles as they approach is extremely slow (HSE Research report 359, Davis Associates Ltd, 2005). This means they do not appear to get closer until they are relatively near the crossing, a phenomenon known as visual looming (Tian K and others, 'Explaining unsafe pedestrian road crossing behaviours using a Psychophysics-based gap acceptance model', 2022).

[4] Salducco A and others, 'Young pedestrians' behaviours and risk perception: a pilot study with Italian early adolescents', Transportation Research Part F: Traffic Psychology and Behaviour, Volume 90, October 2022.

[5] East Sussex Fire and Rescue Service, 'Safety in Action Events in East Sussex, Brighton and Hove Autumn 2023 to Summer 2024 Evaluation report from children's interactive safety events in Rother, Hastings, Lewes, Wealden, Eastbourne, Brighton and Hove'.

99 RSSB launched an online tool in 2006 called the 'Level Crossing Risk Management Toolkit',[6] the development of which is detailed in their 2008 research project T335 'Improving road user and pedestrian behaviour at level crossings'. The toolkit was updated in 2010 and 2015, following further RSSB research (T863 and T1053 both named 'Updating the Level Crossing Risk Management Toolkit'). Training on the toolkit was provided to LCMs. The version current at the time of writing (October 2025) includes a 'risk influencing factor' (something that increases the probability of a specific risk occurring or having a negative impact) for crossing users aged 4 to 10, which has several suggestions to improve the safety for this age group. These include changes to signage, ground markings, and education. The toolkit has not been updated since May 2015 and witness evidence was that some LCMs rarely use it.

[6] http://lxrmtk.com/.

Summary of conclusions

Immediate cause

100 The pedestrian crossed into the path of train 1P12 (paragraph 47).

Causal factors

101 The causal factors were:

a. The pedestrian did not perceive the risk associated with the train approaching the crossing, probably because they were distracted by their mobile phone (paragraph 53), **Recommendations 1, 2 and 3**.

b. The design and condition of the infrastructure did not change the pedestrian's perception by alerting them to the risk from approaching trains. (paragraph 58). This causal factor arose due to a combination of the following:

   i. Bourneview footpath crossing is a passive crossing, which was not fitted with active warning systems at the time of the accident. This is a probable causal factor (paragraph 60), other reported actions, paragraph 105.

   ii. The design and construction of the crossing could have made it more obvious to pedestrians that they were entering a potentially hazardous area. This is a possible causal factor (paragraph 75), **Recommendation 2, Learning point 1**.

Underlying factors

102 The underlying factors were:

a. Access to information relating to safe use of level crossings for schools and parents is not sufficiently widespread. This is a possible underlying factor (paragraph 85), **Recommendation 1**.

b. Network Rail's guidance for undertaking risk assessments at level crossings did not recognise the different risk profile of younger people. This is a possible underlying factor (paragraph 92), **Recommendation 3**.

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

Actions reported that address factors which otherwise would have resulted in an RAIB recommendation

103 In July 2025 the Department for Education, responsible for children's services and education in England, released new statutory curriculum guidance for 'Relationships education, relationships and sex education (RSE) and health education', a subject which teaches life skills for relationships and safety. This required that schools in England teach how to '*keep safe around roads, railways, including level crossings, and water'* at both primary and secondary levels. This guidance comes into force in September 2026 and will be monitored by the Office for Standards in Education, Children's Services and Skills (OFSTED, the education regulator for England) during subsequent inspections.

Other reported actions

104 Govia Thameslink Railway has held rail safety talks with pupils of all classes (except year 11 who were in an exam period) at the pedestrian's school.

105 Bourneview crossing has been closed until Network Rail completes its upgrade with MSLs, which is expected to be in December 2025.

106 The Rail Safety and Standards Board is developing a tool, which is currently at trial stage, which records which schools have received rail safety training. This is intended to ensure that the limited resources of infrastructure owners and operators can try to reach as many schools as possible without overlap.

Recommendations and learning point

Recommendations

107 The following recommendations are made:[7]

1 *The intent of this recommendation is for the curriculum setters for schools throughout the United Kingdom to work with railway infrastructure managers to introduce targeted and locally relevant railway safety lessons to pupils of all ages.*

The Department of Education (Northern Ireland), Education Scotland and the Department for Education and Skills (Wales) should consider publishing guidance similar to that published by the Department for Education in England which introduces the requirement for rail safety education (including the safe use of level crossings) for school children.

As part of implementing this recommendation, education departments should co-ordinate with relevant non-governmental organisations (such as the PSHE Association in England) to make safety lessons available to schools which highlight the dangers of the railway which are most relevant to a particular school's area (paragraphs 101a and 102a).

2 *The intent of this recommendation is to make the area where there is a danger of being struck by trains at level crossings on Network Rail managed infrastructure more obvious, particularly to people whose attention may be distracted.*

Network Rail, working with the Rail Safety and Standards Board, should review the existing provisions for making visible the danger area at passive footpath and bridleway level crossings. As part of this review, Network Rail should consider whether there are ways to make these areas more prominent to users who may be distracted, particularly when the provisions of NR/L2/XNG/30020/R03 are deemed impractical. This review should take account of research and good practice from the rail industry as well as good practice from other relevant transport sectors, such as light rail and road.

[7] Those identified in the recommendations have a general and ongoing obligation to comply with health and safety legislation, and need to take these recommendations into account in ensuring the safety of their employees and others.

Additionally, for the purposes of regulation 12(1) of the Railways (Accident Investigation and Reporting) Regulations 2005, Recommendation 1 is addressed to the Department of Education (Northern Ireland), Education Scotland, and the Department for Education and Skills (Wales) and Recommendations 2 and 3 are addressed to the Office of Rail and Road (ORR) to enable them to carry out their duties under regulation 12(2) to:

(a) ensure that recommendations are duly considered and where appropriate acted upon; and

(b) report back to RAIB details of any implementation measures, or the reasons why no implementation measures are being taken.

Copies of both the regulations and the accompanying guidance notes (paragraphs 200 to 203) can be found on RAIB's website www.gov.uk/raib.

Network Rail should revise its standards and guidance as required following this review. It should also consider upgrading existing level crossings to incorporate any revised standards and guidance.

This recommendation may apply to other infrastructure managers whose networks include level crossings (paragraphs 101a and 101b.ii).

3 *The intent of this recommendation is for Network Rail to understand the risk profile of younger people and whether this warrants different approaches to risk mitigation at level crossings.*

Network Rail, working with the Rail Safety and Standards Board, should undertake research to understand the risk profile of children and young people using level crossings. This research should seek to establish whether these users are at increased risk when using crossings and what mitigation may be appropriate to address any identified increased risks. This research should also seek to identify any appropriate additional risk controls.

Following this research, Network Rail should develop a timebound programme to review and update as necessary its relevant procedures, guidance and processes relating to the assessment and control of risk at level crossings (paragraphs 101a and 102b).

Learning point

108 RAIB has identified the following important learning point:[8]

1 This accident demonstrates the importance of Network Rail level crossing managers reviewing the surface and environment at locations within their responsibility to understand if the provisions of NR/L2/XNG/30020 Module R03, requiring that the surface between decision points should be coloured yellow, can be met. If meeting these provisions is deemed impractical then it is important to record why this is the case in the narrative risk assessment and consider what other solutions may be available to alert users to the potential danger posed by the crossing (paragraph 101b.ii).

[8] 'Learning points' are intended to disseminate safety learning that is not covered by a recommendation. They are included in a report when RAIB wishes to reinforce the importance of compliance with existing safety arrangements (where 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.

Appendices

Appendix A - Glossary of abbreviations and acronyms

Abbreviation / acronym	Term in full
ALCRM	All Level Crossing Risk Model
CSM	Community safety manager
FFCCTV	Forward-facing CCTV
GSM-R	Global System for Mobile Communications - Railway
LCM	Level crossing manager
MSL	Miniature stop light
NRA	Narrative risk assessment
ORA	Operational risk advisor
ORR	Office of Rail and Road
OTDR	On-train data recorder
RAIB	Rail Accident investigation Branch
RLCM	Route level crossing manager
RSSB	Rail Safety and Standards Board

Appendix B - Investigation details

RAIB used the following sources of evidence in this investigation:

- information provided by witnesses
- information taken from the train's OTDR
- CCTV recordings taken from the train
- site photographs and measurements
- weather reports and observations at the site
- analysis of mobile phone download data
- a review of previous RAIB investigations that had relevance to this accident.

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