RAIB

Rail Accident Investigation Branch

Rail Accident Report

Fatal accident at West Lodge crossing, Haltwhistle 22 January 2008

Department for Transport

Report 01/2009
January 2009

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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Contents

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Introduction

1 The sole purpose of a Rail Accident Investigation Branch (RAIB) investigation is to prevent future accidents and incidents and improve railway safety.

2 The RAIB does not establish blame, liability or carry out prosecutions.

3 English, Welsh & Scottish Railway, Network Rail, and K&G Fuels gave free access to their staff, data and records in connection with the investigation.

4 Appendix A at the rear of this report contains a glossary that explains acronyms and abbreviations; Appendix B contains a list of key standards referenced in the report.

The Accident

Summary of the accident

5 At 17:13 hrs on 22 January 2008, a freight train struck and killed a young person using West Lodge crossing, Haltwhistle (Figure 1).

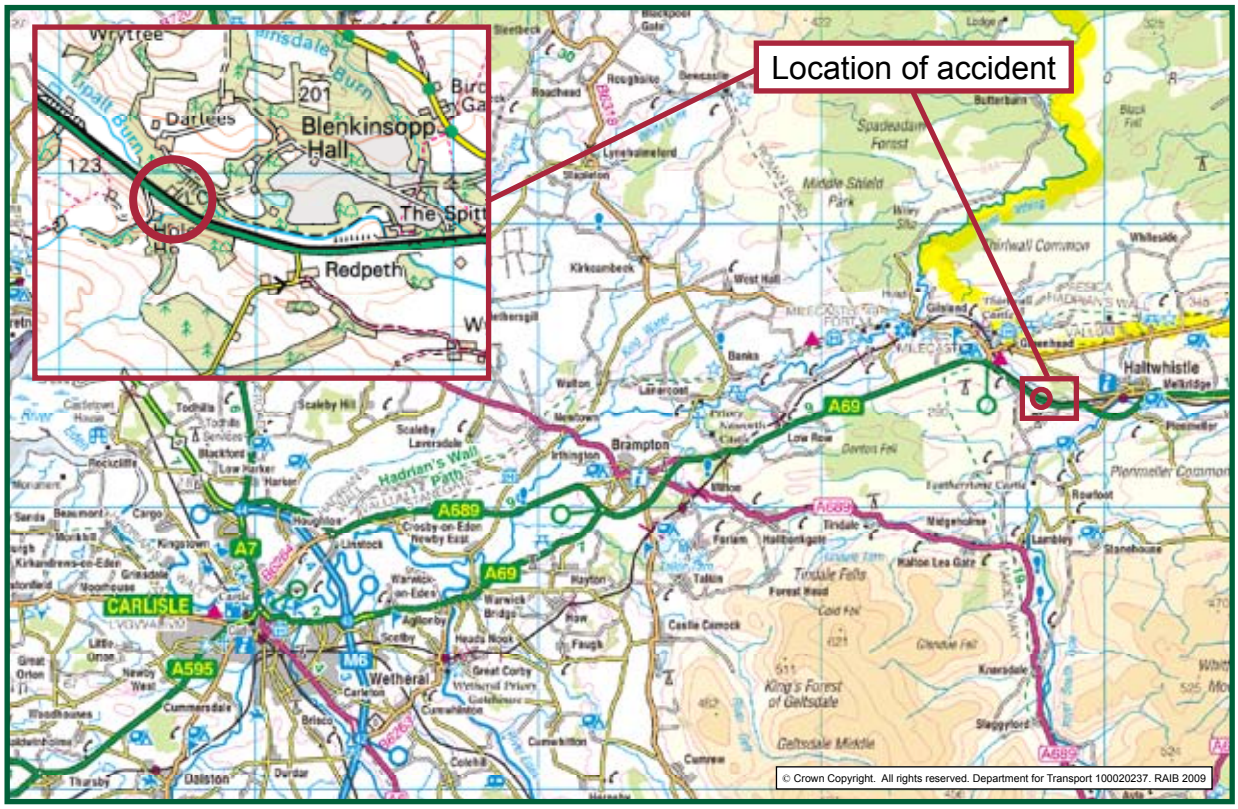


Figure 1: Extract from Ordnance Survey map showing location of accident

The parties involved

6 English, Welsh & Scottish Railway (EWS) was the operator of the freight train and the employer of the train driver.

7 The young person who lost his life in the accident, Christopher Walton, was an employee of K&G Fuels of Haltwhistle, a coal and solid fuel merchant. The RAIB has not considered the responsibilities of K&G Fuels to their employee, as the purpose of this investigation is to improve railway safety.

8 Network Rail is the infrastructure owner and the controller of the track on which the accident occurred.

Location

9 The main line between Carlisle and Newcastle upon Tyne is double track. The track on which trains normally travel towards Newcastle is known as the 'up' line; the track on which trains normally travel towards Carlisle is known as the 'down' line.

10 The railway and the A69 road converge at Bankfoot and run adjacent and aligned past West Lodge (Figure 2). At this location, the national speed limit of 60 mph (97 km/h) applies; on the railway, the line speed limit is 65 mph (105 km/h).

11 There is a user worked level crossing[1] at West Lodge that provides access from the A69 to West Lodge, Blenkinsopp Hall and other dwellings on the Blenkinsopp estate.

12 The crossing had pedestrian and vehicle gates and warning signs that stated 'always telephone before crossing with vehicles or animals to find out if there is time to cross' and 'stop, look, listen' and 'beware of trains'. It is not fitted with any system to give indication of a train's approach (Figures 3, 4 and 8).

13 The approach from the A69 is narrow and has no slip road. It is difficult to drive off the A69 when it is busy with traffic and correctly position a vehicle to drive over the crossing. A vehicle that is incorrectly positioned or longer than 3.5 metres may foul the vehicle gates that open 3.5 metres into an approach that is 7 metres long (Figures 3 and 6).

14 The crossing procedure for a vehicle going to or from West Lodge involves the user:

a) contacting the signaller;

b) waiting until it is safe to cross; and

c) crossing the tracks five times, as the user must open and close both sets of gates when a vehicle crosses.

15 This is inconvenient and time consuming compared with the procedure for pedestrian users who may use the crossing at any time it is safe to do so, and only cross the tracks once.

16 The nearest alternative route to West Lodge is via The Spittal, 0.93 miles (1.5 km) south-east along the A69, where the access road passes under the railway (Figure 2). This route involves a round trip of 2.8 miles (4.5 km) via the Spittal to West Lodge.

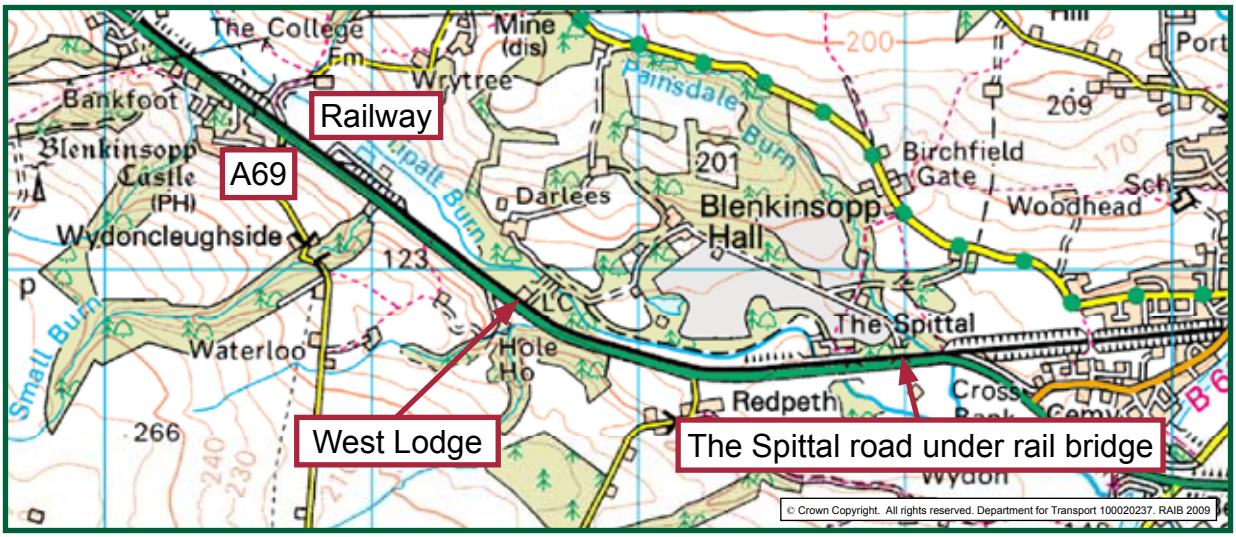


Figure 2: Access from the A69 to the Blenkinsopp estate and the alignment of the road and the railway

[1] A user worked crossing is the intersection of a road (and if present at the same location, a footpath and a bridleway) with one or more rail tracks. Crossing gates, operated by the user, are normally closed across the road.

Figure 3: West Lodge crossing viewed from the A69

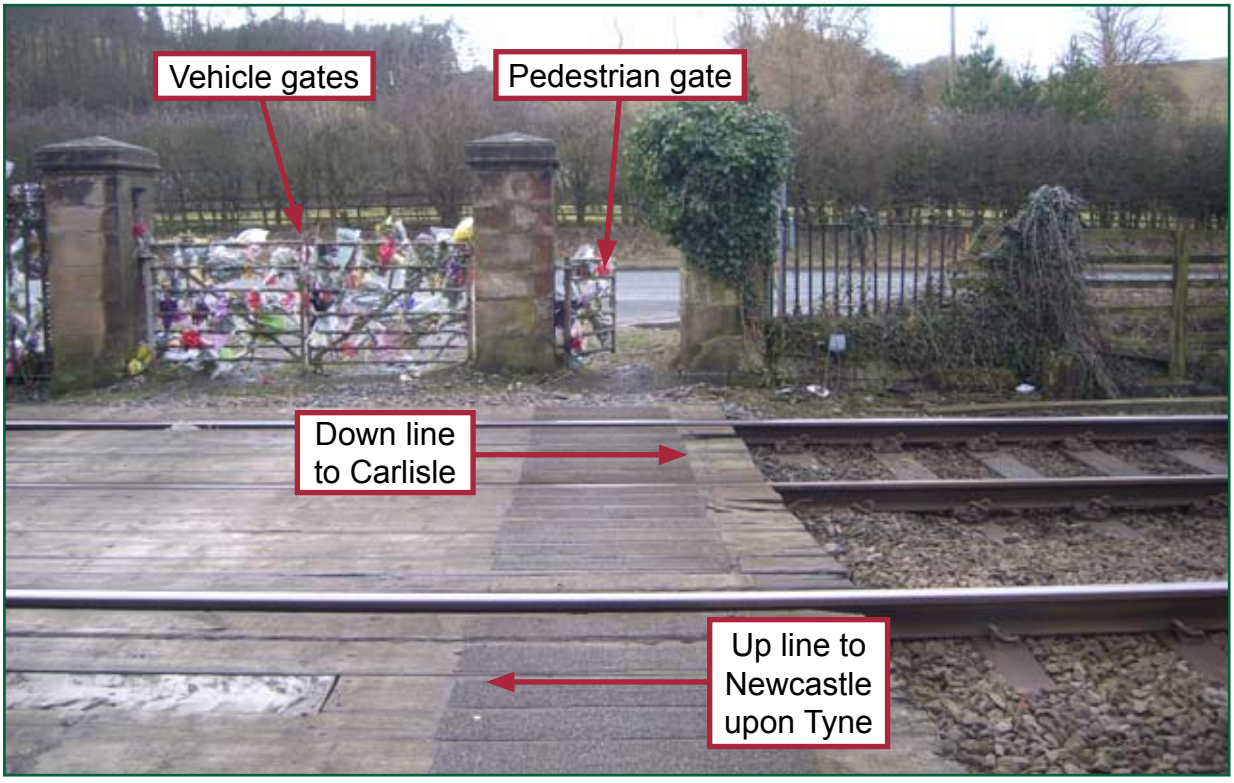


Figure 4: The crossing viewed from West Lodge

External circumstances

17 The accident occurred in darkness; there was rain and sleet falling and snow covered the ground. The wind was blowing at approximately 12 mph (19 km/h) from the south-west.

The train

18 Freight train reporting number 6E62 formed the 16:50 hrs service from Carlisle to Middlesbrough. The train consisted of locomotive number 66057 and four empty wagons.

Events preceding the accident

19 The young person, a 17 year-old male, began working for K&G Fuels in October 2007 before taking time off with an injury unrelated to his work. He returned to work at the beginning of January 2008, delivering coal with the company owner's son who drove a flat bed delivery truck. The two men began work at around 08:30 hrs on the morning of the accident. Since the New Year, the young person had delivered coal to West Lodge on two previous occasions, one of which was during the day.

20 The train driver reported for duty at EWS's Kingmoor depot, Carlisle, at 15:58 hrs. He collected his train and departed for Middlesbrough 32 minutes ahead of schedule at 16:18 hrs. His journey had been uneventful prior to the accident.

21 Shortly after 17:00 hrs, the truck driver parked his vehicle across the approach to West Lodge and then he and his colleague each carried a sack of coal over the crossing. They delivered the coal to West Lodge and returned to the truck with their empty sacks.

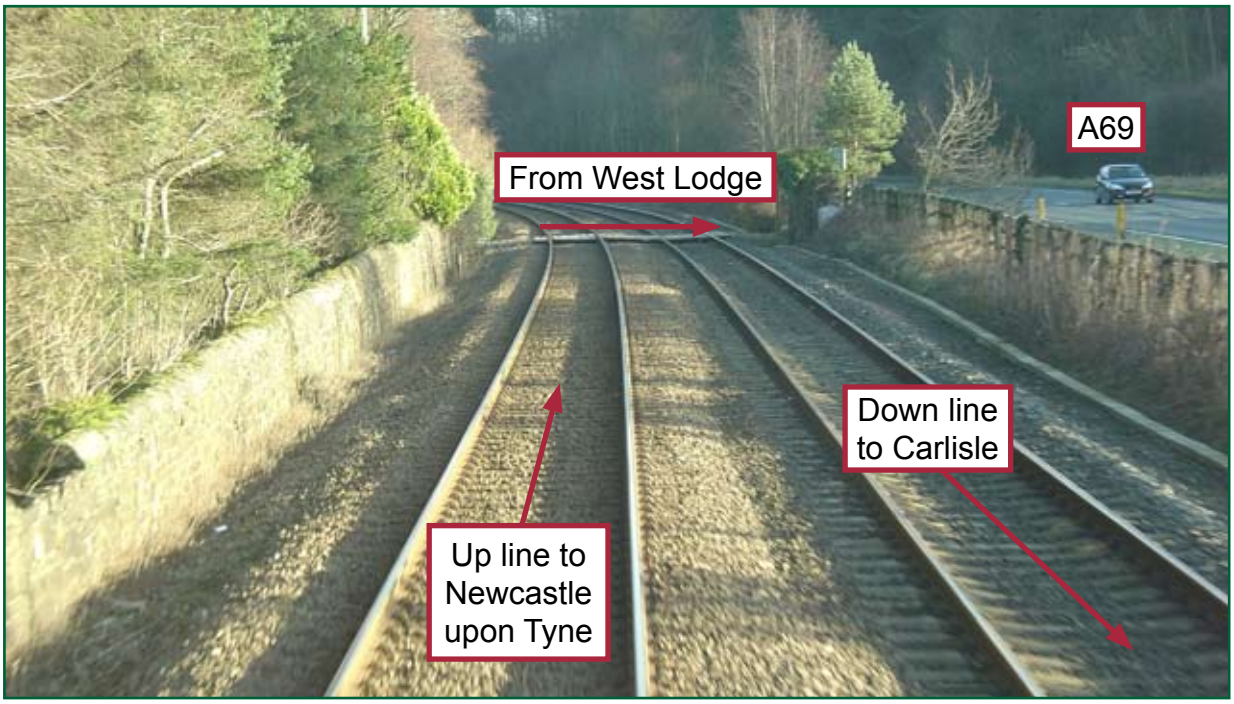


Figure 5: West Lodge crossing seen in daylight from the driving cab of a train

22 The truck driver made out the delivery paperwork at his vehicle while his colleague delivered a third sack of coal and walked back towards the truck. At this time, the train was approaching the crossing.

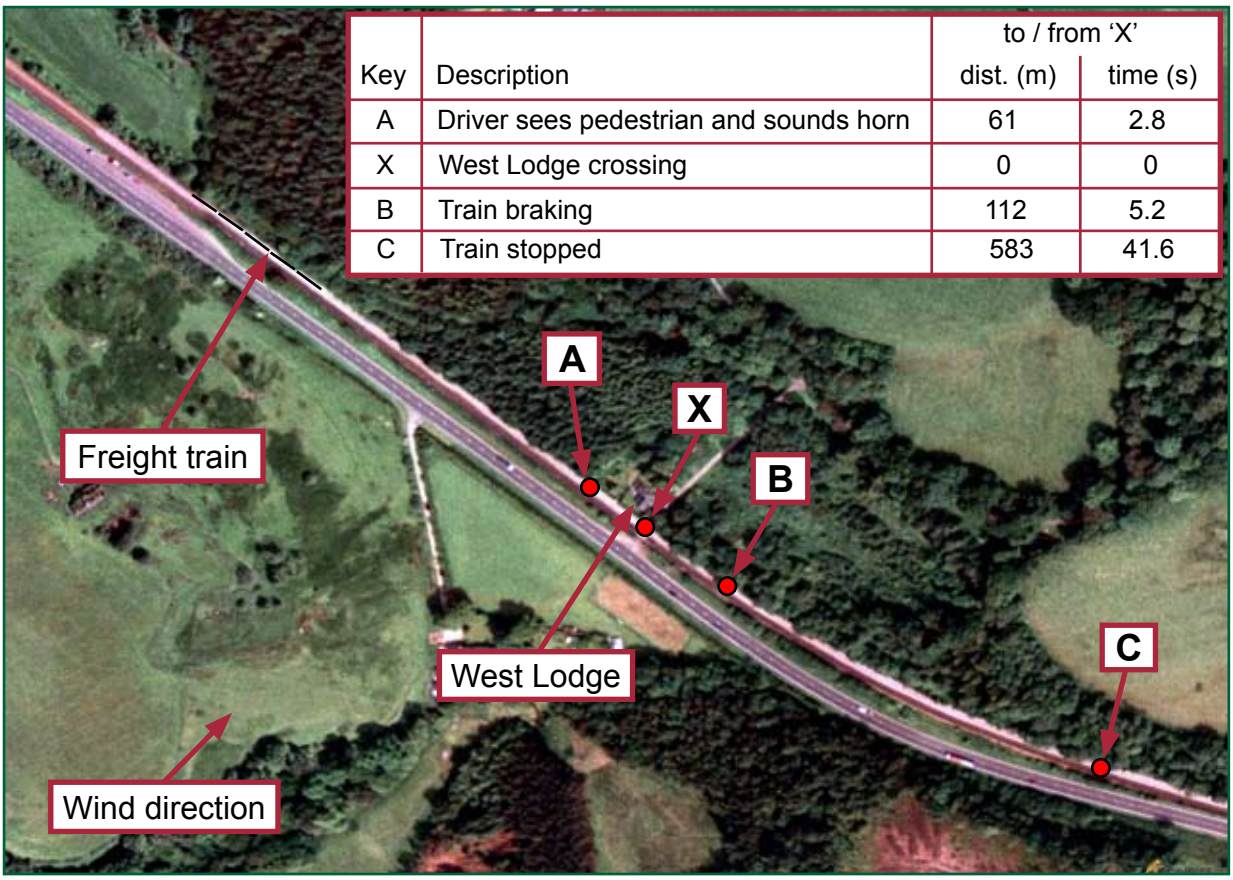
Events during the accident

23 At 17:13 hrs the train driver saw a person appear from trackside vegetation to his left (Figure 5); he sounded the warning horn immediately and continuously as the person walked the few steps to the crossing and onto the up line.

24 The truck driver heard the train's warning horn, looked up and saw his colleague walk onto the track, seemingly unaware of the train's approach. It may be that the person had attempted to look out for trains before he walked onto the track, although he was not observed to do so by either the train or truck driver.

25 The person was between the rails of the up line and had taken no avoiding action when the train struck him, at which time the train driver stopped sounding the warning horn and then applied the train brake.

26 The train came to a stand 583 metres beyond, and out of sight of, the crossing (Figure 6). From here, the train driver used his mobile phone to call the Network Rail signaller and report the accident. The signaller stopped all trains on the up and down lines and contacted the emergency services. The residents of West Lodge were aware of the accident and they too called the emergency services.



Key	Description	to / from 'X' dist. (m)	to / from 'X' time (s)
A	Driver sees pedestrian and sounds horn	61	2.8
X	West Lodge crossing	0	0
B	Train braking	112	5.2
C	Train stopped	583	41.6

Figure 6: Aerial view of the accident location (image courtesy of getmapping.com)

Consequences of the accident

27 The young person suffered immediately fatal injuries. The train driver was taken to hospital by ambulance where he was treated for shock. The truck driver, who had also witnessed the accident, was shaken as a result.

Events following the accident

28 Representatives of Network Rail and EWS attended the accident site along with members of Northumbria Police, British Transport Police, the residents of West Lodge and paramedics.

29 The emergency services had completed their work on site by 19:20 hrs, at which time British Transport Police handed back control of the railway to Network Rail. Service on the line resumed at 20:27 hrs.

Previous known occurrences at West Lodge

30 In October 1992, a train struck a car after its driver crossed without telephoning the signaller as required by the warning sign (paragraph 12); there were no injuries or damage to the train but the car was badly damaged;

31 In October 1998, there was a near miss with a car after its driver crossed without telephoning the signaller.

Analysis

Identification of the immediate cause

32 The immediate cause of the accident was the person walking onto the track as the train approached.

Discounted factors

The train and the train driver

33 As with most railway operations, trains run on this line at speeds that do not allow them to stop within the distance the driver can see. Sounding the warning horn and slowing the train are the only things a driver can do if he sees a person on a level crossing as the train approaches.

34 The train's data recorder confirmed that the train was 61 metres from the crossing and coasting at 49 mph (79 km/h) when the driver sounded the warning horn; he did not immediately apply the brake after seeing the person appear from trackside vegetation to his left.

35 In 2.8 seconds, the train had covered the 61 metres to the crossing and struck the pedestrian, at which time the train driver stopped sounding the warning horn and then applied the train brake.

36 The data showed that if the driver had applied the brake at the same time as he sounded the warning horn, the train would still have passed West Lodge crossing at the same time and at the same speed because of the time it would have taken the train's brake to start to slow the train. Therefore, there was no misjudgement on the part of the driver that contributed to the accident.

37 EWS had certified that the train driver was medically fit and competent for his job. Immediately after the accident, Northumbria Police breathalysed him for the presence of alcohol; the test result was negative.

38 The train had performed satisfactorily before the accident. Afterwards, it was the subject of post-incident testing with no faults found with its control and braking systems, the visibility of its exterior lights, its windscreen, washer and wiper, or the audibility of its warning horn.

The person

39 The young person was generally fit and healthy, with good eyesight and hearing. He was not wearing anything on or around his head to impair his sight or hearing and he was not using a mobile phone or any other device that could have distracted his attention.

40 The post mortem toxicological examination was 'unable to detect the presence of any drugs…nor a significant concentration of alcohol'.

41 Although snow and ice covered the ground, the train and truck drivers saw the person walk towards the road and onto the crossing without losing his footing; he did not slip or trip at any time.

Identification of causal factors

42 After considering and discounting factors that related to the train, its driver and the young person, the remaining causal factor was that the person was unaware of the approaching train.

The following are feasible explanations for why the person was unaware of the approaching train.

Sighting distance and warning time from the West Lodge side of the crossing

43 Sighting distance is the distance measured along the railway from the decision point[2] to the point at which an approaching train becomes visible.

44 Warning time is the shortest time for trains to travel the sighting distance. When calculating warning time, the highest permissible train speed is used. The Office of Rail Regulation (ORR) publication, Railway Safety Principles and Guidance on Level Crossings, states that warning time should be greater than the time a user takes to cross from one decision point to another at either end of a crossing.

45 Network Rail calculated that a user would take 8.2 seconds to cross 9.8 metres between decision points at either end of West Lodge crossing. They used a pedestrian crossing speed of 3.9 feet/second (2.7 mph or 1.2 metres per second) in their calculations, the maximum speed that the ORR guidance permits for the calculation.

46 Network Rail considered 8.2 seconds sufficient for a user to make the crossing from West Lodge to the A69 and did not increase the crossing time to take account of foreseeable circumstances, including use by people with impaired mobility (paragraph 85). They then required a sighting distance of 290 metres as this gave a warning time greater than the crossing time, as a train travelling at the maximum line speed of 65 mph (105 km/h) takes 10 seconds to travel this distance.

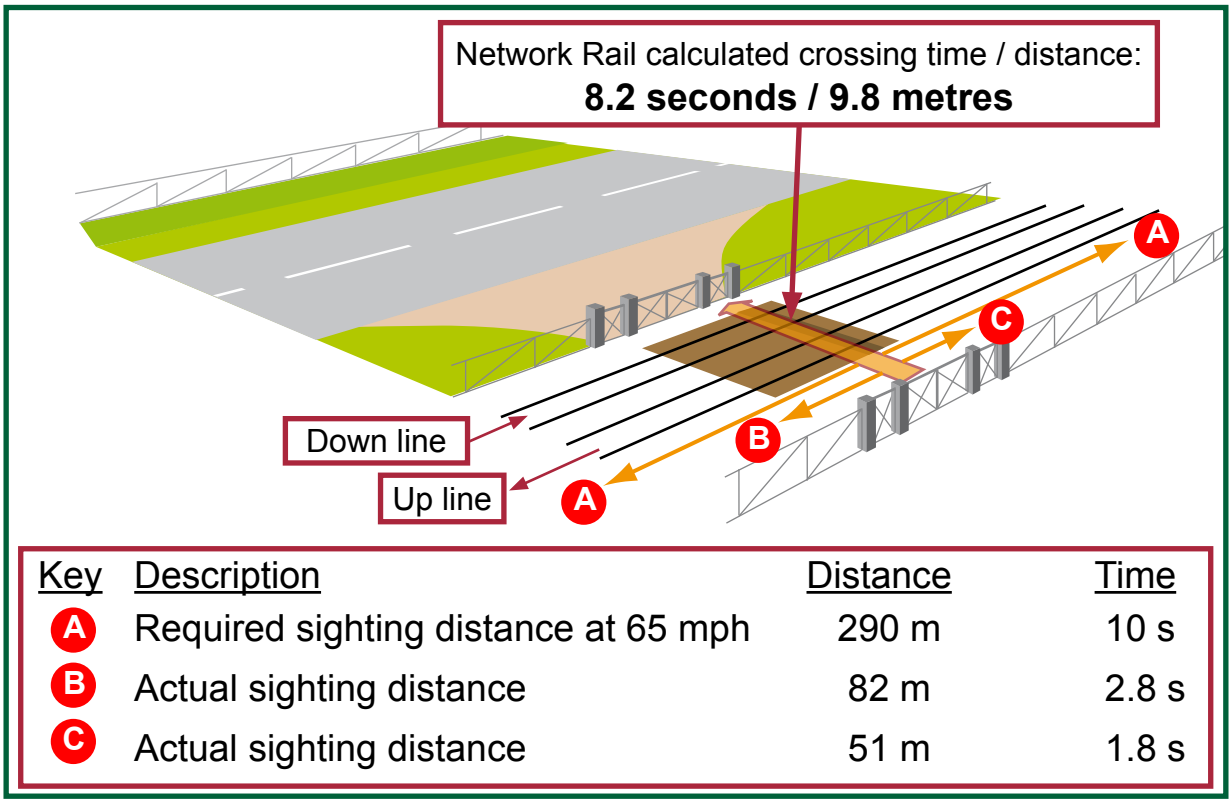
47 The RAIB measured sighting distances from the West Lodge side of the crossing in the presence of Network Rail representatives on the morning of 7 February 2008 and obtained the following results:

a. at 2 metres from the nearest rail (the minimum distance permitted for a footpath crossing decision point by ORR guidance) the sighting distance was 102 metres to the north-west (the direction from which the freight train came) and 130 metres to the south-east, giving warning times of 3.5 seconds and 4.5 seconds respectively;

b. at 2.4 metres from the nearest rail (the decision point defined in Network Rail's crossing assessments) the sighting distance was 51 metres to the north-west and 82 metres to the south-east, giving warning times of 1.8 seconds and 2.8 seconds respectively (Figure 7).

48 From the West Lodge decision point, a user's sighting distance, and thus warning time, were less than laid down in ORR guidance and required by Network Rail's inspection process (paragraphs 71 - 73). Sighting distance was reduced by track curvature and vegetation.

[2] A decision point is where guidance on crossing safely should be visible and at which a decision to cross or wait can be made in safety. For footpath crossings this should be not less than 2 metres from the nearest running rails or 3 metres where the line speeds are higher than 100 mph (160 km/h). For bridleway crossings and user worked crossings it should not be less than 3 metres from the nearest running rail.



Key	Description	Distance	Time
A	Required sighting distance at 65 mph	290 m	10 s
B	Actual sighting distance	82 m	2.8 s
C	Actual sighting distance	51 m	1.8 s

Figure 7: Sighting distances from the West Lodge decision point

Figure 8: Warning signs at West Lodge crossing

Warning sign instructions

49 Warning signs at West Lodge crossing state that users with vehicles or animals should always use the telephone to contact the signaller and find out if there is time to cross; pedestrians are required to stop, look and listen for trains and cross when it is safe to do so (Figure 8). The signs do not require pedestrians to contact the signaller.

Environmental conditions affecting visibility

50 At West Lodge crossing in daylight, a user can recognise an approaching train as its appearance is different from the vehicles on the A69; in darkness, the headlights of a train are not easily recognised among those of road vehicles.

51 The headlights of a train are most difficult to recognise among those of road vehicles when sighting north-west from West Lodge, the direction from which the freight train came, as the railway and the A69 run adjacent and aligned (Figure 9).

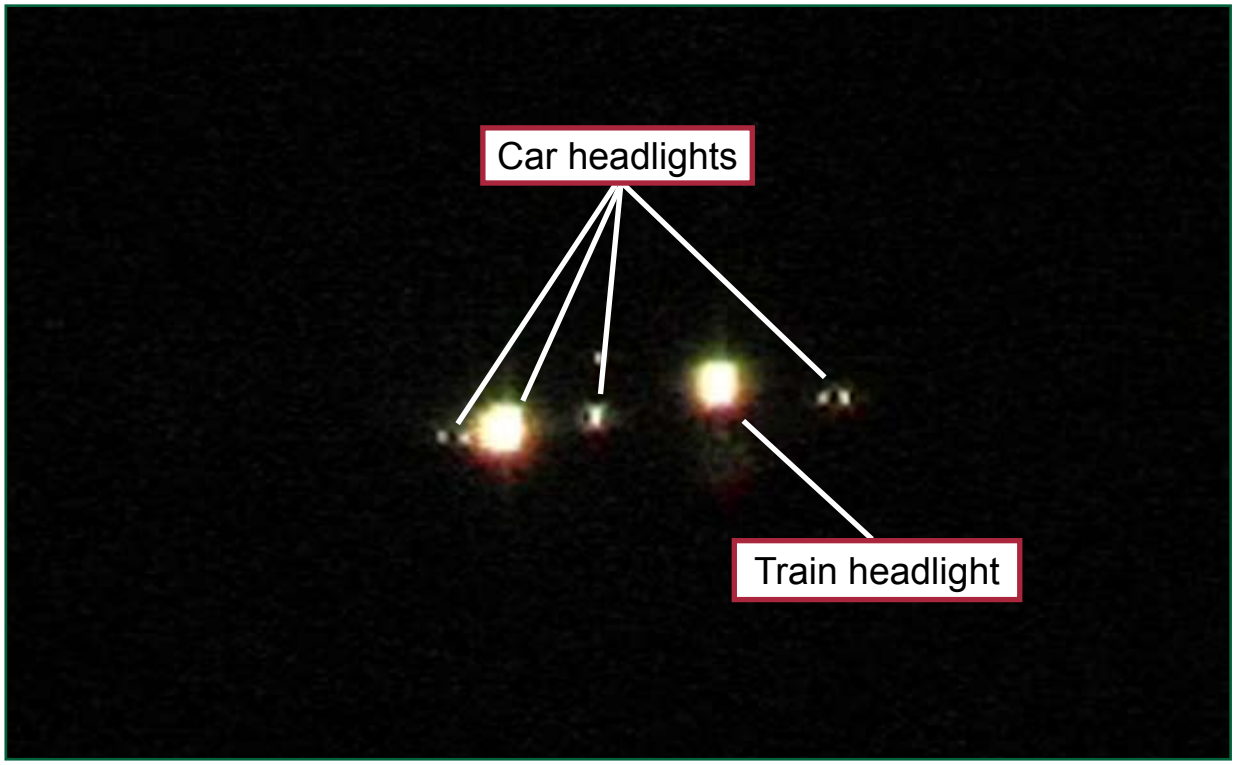


Figure 9: Train approaching West Lodge crossing in darkness

52 Sunset on Tuesday 22 January 2008 was at 16:25 hrs. At 17:13 hrs, the time of the accident, dense cloud obscured the sky, the crossing was in complete darkness and the road was busy with traffic.

53 The RAIB assessed sighting at the time the accident had occurred and in similar environmental conditions on the day after the accident. It was evident that in darkness and when the A69 is busy with traffic, a user would be unlikely to recognise a train's headlights among those of road vehicles until the train was within a second or two of the crossing.

Environmental conditions affecting audibility

54 When possible, pedestrians use their hearing as a way to detect a train as it approaches a crossing. Noisy surroundings and wind can impair a pedestrian's ability to hear clearly, mask the noise of the train as it approaches and any warning it may sound.

55 At the time of the accident, the A69 was busy with traffic that gave rise to relatively high levels of noise that the wind, blowing across the road at approximately 12 mph (19 km/h) from the south-west (Figure 6), would have carried in the direction of West Lodge crossing.

56 During the RAIB assessment described in paragraph 53, it was evident that relatively high levels of noise and wind impaired the ability to hear clearly and masked the sounds of approaching trains.

The train warning horn

57 Where warning time is insufficient (paragraph 48), Network Rail may install signs known as 'whistle boards' up to 400 metres from the crossing. These signs require that all drivers sound the train horn in warning at that location.

58 There are no whistle boards installed at West Lodge crossing. For a line speed of 65 mph (105 km/h), a train driver must sound the warning horn 316 metres from the crossing to give a warning time of 10 seconds. At this distance, the horn would be inaudible over the ambient noise from the A69 when it is busy with traffic.

59 The driver could not sound the train's warning horn earlier than he did because he did not see the person appear from trackside vegetation until the train was close to the crossing.

It is also feasible that the person was unaware of the approaching train because he was unaware that he was on the track at the time of the accident, and the following paragraphs may explain why:

Human factors

60 The Railway Safety and Standards Board (RSSB) has created a level crossing risk management toolkit[3] for the use of Network Rail and ORR. The toolkit associates human factors risks with level crossing types and provides guidance for the reduction of those risks. Human factors are 'the environmental, organisational and job factors and the human and individual characteristics that influence behaviour at work in a way that can affect health and safety'[4].

61 Human factors risk number 4 recognises that people who frequently encounter circumstances they recognise or perform familiar actions (e.g. using a level crossing) may generalise these circumstances and ignore vital cues from their surroundings and environment. The young person had used the crossing on at least two previous occasions since the New Year, as K&G Fuels made weekly deliveries to West Lodge. At the time of the accident, he was using the crossing for the fourth and last time that evening, having used it three times already going to West Lodge or back to the truck.

[3] The trial version is in use. The Rail Safety and Standards Board (RSSB) will publish this work as report number T335 Improving Road User and Pedestrian Behaviour at Level Crossings.

[4] Health and Safety Executive Guidance HSG48, Reducing Error and Influencing Behaviour.

62 Human factors risk number 42 recognises that risk taking behaviour increases on weekdays, as users are under pressure to reach destinations at specific times. At weekends, behaviour at crossings improves[5]. The accident happened at 17:13 hrs, the end of their working day on Tuesday 22 January 2008.

63 Human factors risk number 108 recognises that fatigued users are more susceptible to making errors. The young person was at the end of a day of work in which he and his colleague had delivered approximately 18 tonnes of coal in bags weighing 50 kg each.

64 In summary, the young person may have had reduced concentration because he:

a. had used the crossing frequently before the accident and may have missed vital cues from his surroundings and environment;

b. was using the crossing on a weekday, when risk taking behaviour is known to increase; and

c. was likely to have been fatigued at the end of a day's work.

Warning sign location

65 RSSB human factors risk number 90 recognises that a user's detection of a hazard improves when information is available in close proximity to the hazard itself. This is also recognised by the ORR guidance that states that the '[decision point]…is where guidance on crossing safely is visible and at which a decision to cross or wait can be made in safety.'

66 At the decision point on the West Lodge side of the crossing, the warning signs and guidance are not visible as they are 6.6 metres back from the track. The decision point itself is not physically marked or indicated to the crossing user (Figure 10).

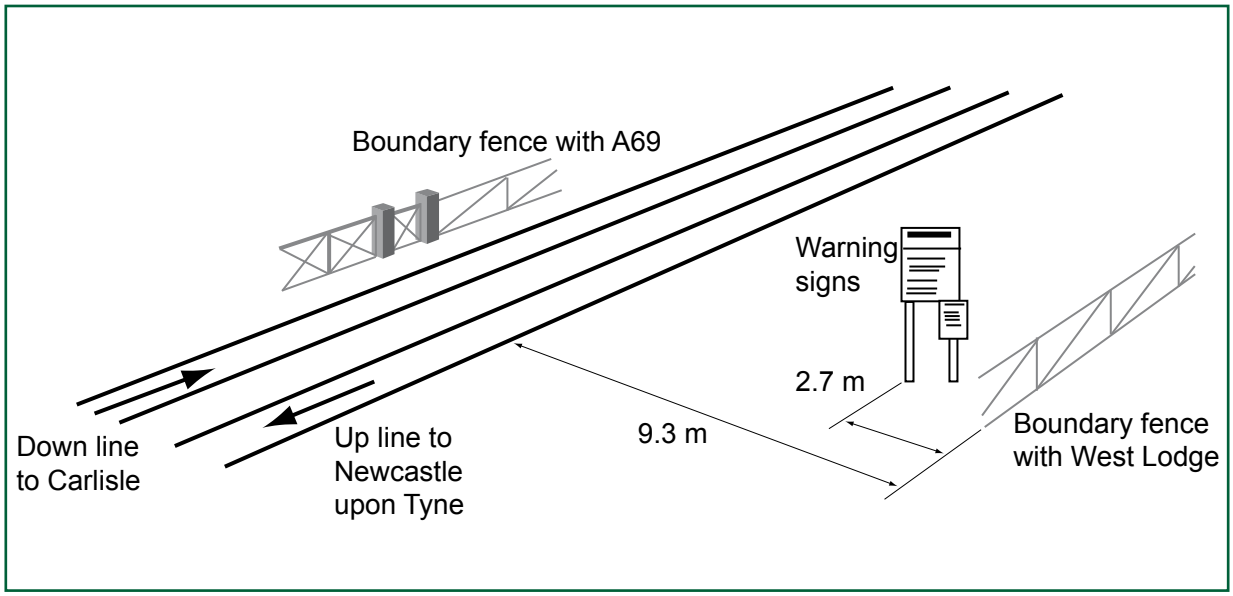


Figure 10: Warning sign location

67 Users are less likely to be aware of and prepared for a crossing if they do not see the warning signs at the decision point.

[5] Research accounted for reduced crossing use and frequency of trains at weekends and its effect on lower incident rates. Reduced exposure was not the main factor in the decrease in crossing accidents at weekends.

The crossing in darkness

68 After nightfall, the crossing is in complete darkness; stray light from West Lodge does not reach it because of dense vegetation and vehicles on the unlit A69 cast no light across it. With only the naked eye, a user cannot read the warning signs or the instructions for the use of the telephones.

69 During the RAIB assessment described in paragraph 53, it was evident that a user would have great difficulty discerning the crossing's features from its surroundings, even when their eyesight had adjusted to the dark. While a user would know they were on this crossing, they may not know where on it they were.

70 The young person's eyesight would not have adjusted to the complete darkness of the crossing as he walked from the lights of the delivery truck and the road vehicles to the floodlit garden at West Lodge and back. He would have had difficulty discerning the warning signs and the track from their surroundings and may have been unaware that he was on the up line at the time of the accident.

Identification of underlying factors

Crossing inspection and assessment

The inspection process

71 Network Rail carried out crossing inspections at six month intervals in accordance with NR/SP/SIG/19608, Level Crossing Infrastructure (Inspection and Maintenance) Handbook, to ensure that 'level crossing systems are safe, reliable and legally compliant'.

72 NR/SP/SIG/19608 includes a list of defects a Network Rail inspector may find, assigns each defect a priority from 1 through to 4 and a timescale for rectification. Network Rail aims to rectify priority 1 defects immediately and priority 2, 3 and 4 defects within seven weeks, three months and six months respectively.

73 Inadequate sighting at user worked and footpath crossings is a priority 2 defect that Network Rail should aim to rectify within seven weeks of detection.

The assessment process

74 Network Rail carried out crossing assessments at three year intervals in accordance with NR/CS/OPS/61, Provision, Risk Assessment and Review of Level Crossings; NR/SP/OPS/026, Inspection & Risk Assessment Methodology for User Worked, Footpath & Bridleway Crossings and RT/LS/S/012, Inspection & Risk Assessment Forms for User Worked, Footpath and Bridleway Crossings.

75 NR/SP/OPS/026 included a list of risk factors a Network Rail assessor may find, along with examples of control measures that may be applied. For example to increase warning time, it gave control measures including reducing train speed and providing an automatic warning of a train's approach. NR/SP/OPS/026 did not assign a priority or a timescale for rectification to any risk factor.

76 From 12 January 2007, Network Rail began assessing crossings using the All Level Crossing Risk Model in accordance with NR/SP/OPS/100, Provision, Risk Assessment and Review of Level Crossings. This specification superseded NR/CS/OPS/061, NR/SP/OPS/012 and NR/SP/OPS/026 to which this report refers.

West Lodge inspections and assessments

77 The West Lodge crossing file contains inspection and assessment information dating back to October 1991. British Rail, Railtrack and Network Rail have been the railway infrastructure owners and controllers during this time.

78 Railway personnel local to the area carried out crossing inspections and assessments. Their findings were passed on to regional level crossing co-ordinators and managers who were responsible for taking the necessary action to reduce identified risks to a level that was as low as reasonably practicable.

79 The crossing assessment of October 1991 identified deficient sighting distances and recommended the installation of whistle boards and telephones. Whistle boards were not installed (paragraph 58) but in 1992 British Rail installed telephones so that users with vehicles or animals could contact the signaller to find out if there was time to cross. Instructions for the use of the telephones are not legible at night, although ORR guidance states that they should be, and this is of long-standing: page 39 paragraph 11.11.2 of the 1981 Department of Transport Railway Construction and Operation Requirements for Level Crossings states 'All the wording must be legible at night'.

80 The Network Rail level crossing file for West Lodge includes the records of inspections and assessments undertaken in 2002, 2003, 2005 and 2007. All these records identified the defect of insufficient sighting distance and warning time due to track curvature; some records proposed improvements, for example:

a. the Network Rail employee who carried out the 2005 assessment concluded that the crossing was not safe if used properly as '…the warning time on the up [line] for pedestrians is inadequate due curvature of the line... [and measures to improve safety could be]…the provision of a whistle board or signs to advise all users to use the telephone before crossing'.

b. the Network Rail employee who carried out the inspection on 16 January 2007 concluded that they were 'unable to obtain sufficient sighting distance (due to curve of track)', marked it as defect status 'X' (item found incorrect – ACTION REQUIRED) and assigned it priority 'N/A'. The defect priority was wrong; it should have been priority 2 (paragraphs 71-73 refer).

81 Neither the regional level crossing inspectors and managers nor senior operational personnel could explain why Network Rail did not acknowledge the findings of local inspections and assessments, or act to reduce the identified risks.

The scope of Network Rail crossing assessments

82 Network Rail's inspectors and assessors considered West Lodge crossing in the conditions that prevailed at the time of their visits. They did not consider foreseeable environmental conditions, nor how those conditions could affect crossing safety. For this reason, Network Rail did not consider that:

a. in darkness, a user would be unlikely to recognise a train's headlights among those of road vehicles until the train was within a second or two of the crossing; or

b. at times when the A69 is busy with traffic, relatively loud levels of noise and wind impaired the ability to hear clearly and masked the sounds of an approaching train.

Other factors for consideration

User operated gates

83 The ORR guidance states that all gates should open away from the railway, and this is of long-standing: page 21, paragraph 59 of the 1950 Ministry of Transport Railway Construction and Operation Requirements for Passenger Lines and Recommendations for Goods Lines states '…field, private, and occupation road level crossing…gates … [should be] hung so as to open away from the railway'. The guidance also states that pedestrian gates should be self-closing, easy to open from either side and should not have latches that might prevent quick opening. This too is of long-standing: page 30 paragraph 9.4 of the 1981 Department of Transport Railway Construction and Operation Requirements for Level Crossings states 'at crossings where a bridleway or footpath exists but where the main carriageway is private…self closing wicket gates shall open away from the railway…'.

84 The West Lodge vehicle and pedestrian gates could open towards as well as away from the railway; additionally, the pedestrian gates were not self-closing and had latches that prevented quick opening (paragraph 95).

Crossing time

85 In their calculations, Network Rail did not increase the time allowed to traverse the crossing to take account of foreseeable circumstances, such as users with impaired mobility and those that may cross with prams or bicycles, as laid down in ORR guidance. This is most significant when crossing from West Lodge to the A69. The distance from the track to the boundary gate on the A69 side is 2.4 metres, which does not provide an adequate, safe area to wait with a bicycle or a pram etc as a train passes (paragraph 92).

Sighting distance and warning time from the A69 side of the crossing

86 The sighting distances from the West Lodge side of the crossing are given in paragraph 47. The RAIB also measured sighting distances from the A69 side of the crossing in the presence of Network Rail representatives on the morning of 7 February 2008:

a. at 2 metres from the nearest rail, the minimum distance for the decision point, the sighting distance was 90 metres to the north-west giving a warning time of 3.1 seconds;

b. at 2.4 metres from the nearest rail, the Network Rail defined decision point, the sighting distance was 63 metres to the north-west, giving a warning time of 2.2 seconds;

c. to the south-east, the sighting distance was greater than 290 metres in all cases.

87 From the A69 side of the crossing to the north-west, a user's sighting distance and warning time were less than laid down in ORR guidance and required by Network Rail assessments (paragraphs 93 and 94).

Conclusions

Immediate cause

88 The immediate cause of the accident was the person walking onto the track as the train approached (paragraph 32).

Causal factor

89 The causal factor was that the person was unaware of the approaching train (paragraph 42 and Recommendation 1), and the following are feasible explanations for why this was:

a. the sighting distance and warning time were less than required at the West Lodge side of the crossing (paragraph 48);

b. he was not required to contact the signaller (paragraphs 49 and 93);

c. he would be unlikely to recognise a train's headlights among those of road vehicles until it was within a second or two of the crossing (paragraph 53);

d. traffic noise and wind impaired his ability to hear clearly and masked the sounds of the approaching train (paragraph 56); and

e. the train driver could not sound the warning horn earlier than he did because he did not see the person until the train was close to the crossing (paragraph 59).

90 It is also feasible that the person was unaware of the approaching train because he was unaware that he was on the track at the time of the accident, and the following may explain why:

a. he may have had reduced concentration (paragraph 64);

b. he was less likely to be aware of and prepared for the crossing as the warning signs were not at the decision point (paragraph 67); and

c. he may not have discerned the warning signs and the track from their surroundings in darkness (paragraph 70).

Underlying factors

91 The underlying factors were that:

a. Network Rail's management systems did not acknowledge the findings of local inspections and assessments, and so they did not act to reduce the identified risks (paragraph 81 and Recommendations 2 and 3); and

b. Network Rail's methods of level crossing inspection and assessment did not consider foreseeable environmental conditions that resulted in users being unable to recognise a train's headlights among those of road vehicles, and its sounds masked by traffic noise and wind (paragraph 82 and Recommendation 4a).

Additional observations

92 Network Rail did not increase the time allowed to traverse the crossing to take account of foreseeable circumstances, such as users with impaired mobility and those that may cross with prams or bicycles, as laid down in ORR guidance (paragraph 85 and Recommendation 4b).

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

93 Under instruction from the ORR, Network Rail placed signs on the pedestrian gates on both sides of the crossing that required all users to use the telephone to contact the signaller.

94 The ORR issued an improvement notice to Network Rail that required them to:

a. improve sighting distances and give users sufficient warning time or, if this is not possible, to provide alternative control measures;

b. provide gates that comply with ORR guidance, in particular all gates should be prevented from opening onto the railway;

c. provide signs that are correctly worded (signs at West Lodge read 'Tell the signalman if the vehicle is large or slow moving' and not 'Tell the crossing operator…' etc; and

d. correctly attach the 'maximum penalty for not closing gates £1000' sign to the crossing gates.

95 Network Rail has fitted:

a. signs to the pedestrian gates that state 'STOP. You must always phone the signaller before crossing to ensure that it is SAFE to CROSS'. These signs, as with the existing signs and the instructions for the use of the telephones, are illegible in darkness (paragraph 90c);

b. vehicle and pedestrian gates that do not open towards the railway; and

c. pedestrian gates that are self-closing and do not use latches.

Recommendations

96 The following safety recommendations are made[6]:

Recommendations to address causal and underlying factors and observations

1 Network Rail should make adequate arrangements for the safe pedestrian use of West Lodge crossing. They should pay particular attention to the use of the crossing in darkness: the visibility of the relevant crossing features, the legibility of warning signs and the legibility of instructions for the use of the telephone (paragraph 89).

2 Network Rail should identify any footpath crossings that do not provide adequate arrangements to protect users, and draw up and implement a programme to improve them. The programme should prioritise the order in which the crossings are improved, with crossings presenting the highest risk improved ahead of those of lower risk (paragraph 91a).

3 Network Rail should revise its management systems so that the findings of level crossing inspections and assessments are acknowledged, prioritised and acted upon to provide arrangements that adequately protect users (paragraph 91a)

4 Network Rail should revise its methods of crossing inspection and assessment so that they confirm that arrangements to protect users and safeguard the railway:

(a) remain adequate in all normal and foreseeable operating conditions (paragraph 91b); and

(b) make allowance for the mobility of likely users (paragraph 92).

[6] 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, these recommendations are addressed to The Office of Rail Regulation to enable it to carry out its 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 167 to 171) can be found on RAIB's web site at www.RAIB.gov.uk.

Appendices

Appendix A - Glossary of abbreviations and acronyms

EWS	English, Welsh & Scottish Railway
ORR	Office of Rail Regulation
RSSB	Rail Safety and Standards Board

Appendix B - Key standards current at the time

NR/SP/SIG/19608	Level Crossing Infrastructure (Inspection and Maintenance) Handbook
NR/SP/OPS/026	Inspection & Risk Assessment Methodology for User Worked, Footpath & Bridleway Crossings
RT/LS/S/012	Inspection & Risk Assessment Forms for User Worked, Footpath and Bridleway Crossings
NR/SP/OPS/100	Provision, Risk Assessment and Review of Level Crossings

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