RAIB

Rail Accident Investigation Branch

Rail Accident Report

Near miss at Farnborough North footpath level crossing
19 May 2022

Report 04/2023
April 2023

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

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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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Near miss at Farnborough North footpath level crossing, 19 May 2022

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Summary

At 08:20 hrs on Thursday 19 May 2022, 144 people were waiting on the east side of the railway to use the footpath level crossing at Farnborough North station. Pedestrian gates on each side of the crossing were locked until a train had departed from the station. The crossing users had arrived on this train and were mostly young people. They were regular users of the station and normally had to wait before crossing the railway to continue their journey to school or college. There is currently no footbridge or subway at this station.

After the train departed, miniature stop lights at the crossing changed from red to green and an audible warning stopped, indicating that it was safe to cross the railway. A crossing attendant, located in a cabin next to the crossing on the east side of the railway, responded by turning a switch to remotely unlock the pedestrian gates at both ends of the crossing. The person at the front of the queue opened the gate and the group started to cross the railway. Each person held the gate open for the person following them.

When around half the group had crossed, the miniature stop lights changed from green to red and the audible warning started, indicating that another train was approaching. The crossing attendant turned the switch to lock the gates, but crossing users continued to pass through the gate until the crossing attendant left their cabin and directly intervened to close it. The driver of a train approaching from around a bend in the track saw people on the crossing ahead and applied the train's emergency brake and sounded the horn. The crossing was clear before the train passed over it.

Network Rail staff undertake regular inspections and risk assessments of level crossings on the national rail network. Farnborough North footpath crossing is considered a high-risk location because of the limited sighting of trains, the number of daily users and a history of safety incidents. In 2013, Network Rail installed additional 'back-to-back' miniature warning lights to help with user decision making. Network Rail subsequently provided a crossing attendant and lockable gates to manage the risk until it could permanently close the crossing and replace it with a footbridge.

RAIB's investigation found, however, that Network Rail had not developed a plan or training which would enable the crossing attendant to effectively manage the residual risks that remained at the crossing following the installation of lockable gates. RAIB also found that the project to construct an accessible footbridge had not obtained planning approval over a prolonged period because of land ownership issues and the need to design a compliant structure which was suitable for the constrained site.

RAIB has made two recommendations to Network Rail regarding improvements in the risk assessment process for footpath level crossings where there is a history of safety incidents occurring, and formalising competency requirements for temporary and interim crossing attendants. RAIB has also identified one learning point for railway organisations which are reminded that complex projects, or those requiring engagement with external stakeholders over an extended period, require managerial continuity.

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. These are explained in appendix A. Sources of evidence used in the investigation are listed in appendix B. Appendix C is a summary of accidents and incidents at the crossing.

The incident

Summary of the incident

3 At 08:22 hrs on 19 May 2022, train 1V38, the 07:02 hrs Great Western Railway service from Gatwick Airport to Reading was approaching Farnborough North station. There is a footpath crossing with an adjacent user worked crossing on the south (down-side) approach to the station.

4 Sighting of both crossings from trains on the down line is restricted to around 320 metres by a bend in the track. As the train rounded the bend, the driver observed a large group of people crossing the track, applied the train's emergency brake and sounded the horn.

5 The footpath crossing is equipped with miniature stop lights and an audible alarm. This equipment was operating correctly as train 1V38 approached, but crossing users continued to use the crossing. A crossing attendant was on duty and directly intervened to stop the flow of people by closing the pedestrian gate on the eastern side of the crossing. The crossing was clear of users six seconds before the train passed over it.

6 The driver was shaken by the incident but was fit to continue. There were no reported injuries to passengers or crossing users.

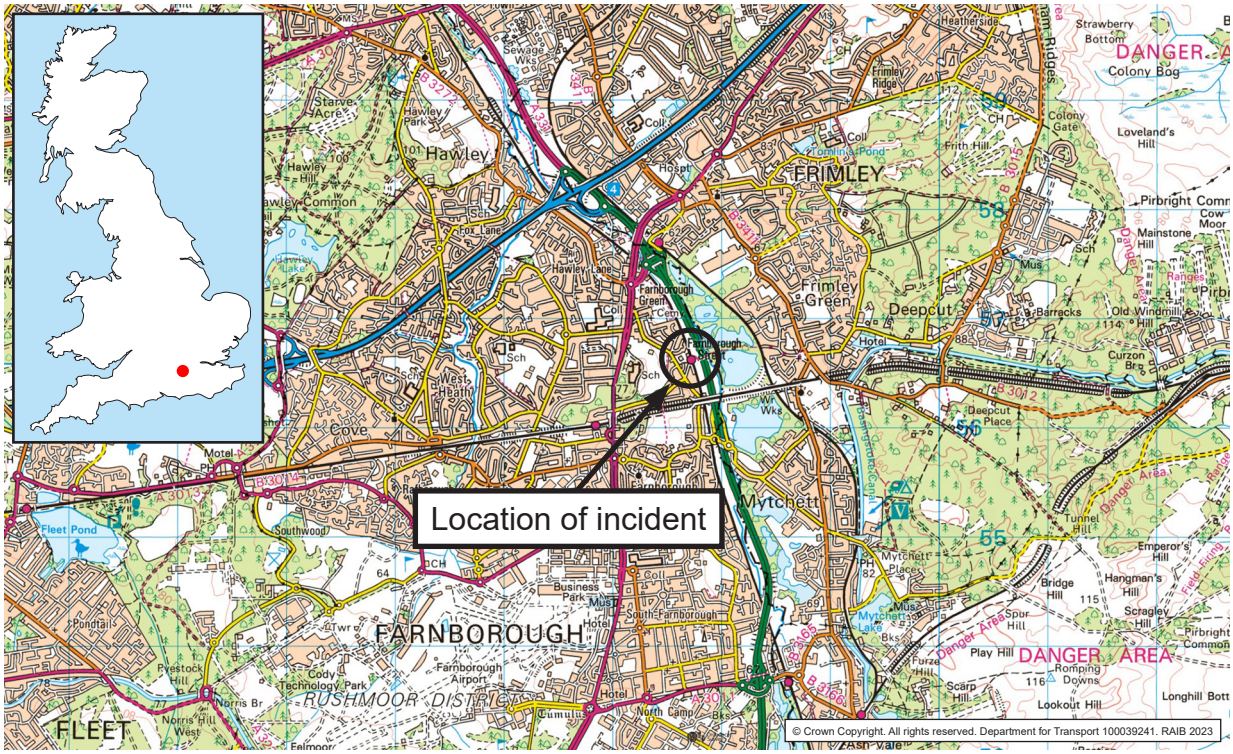

Figure 1: Extract from Ordnance Survey map showing location of the incident at Farnborough North footpath level crossing.

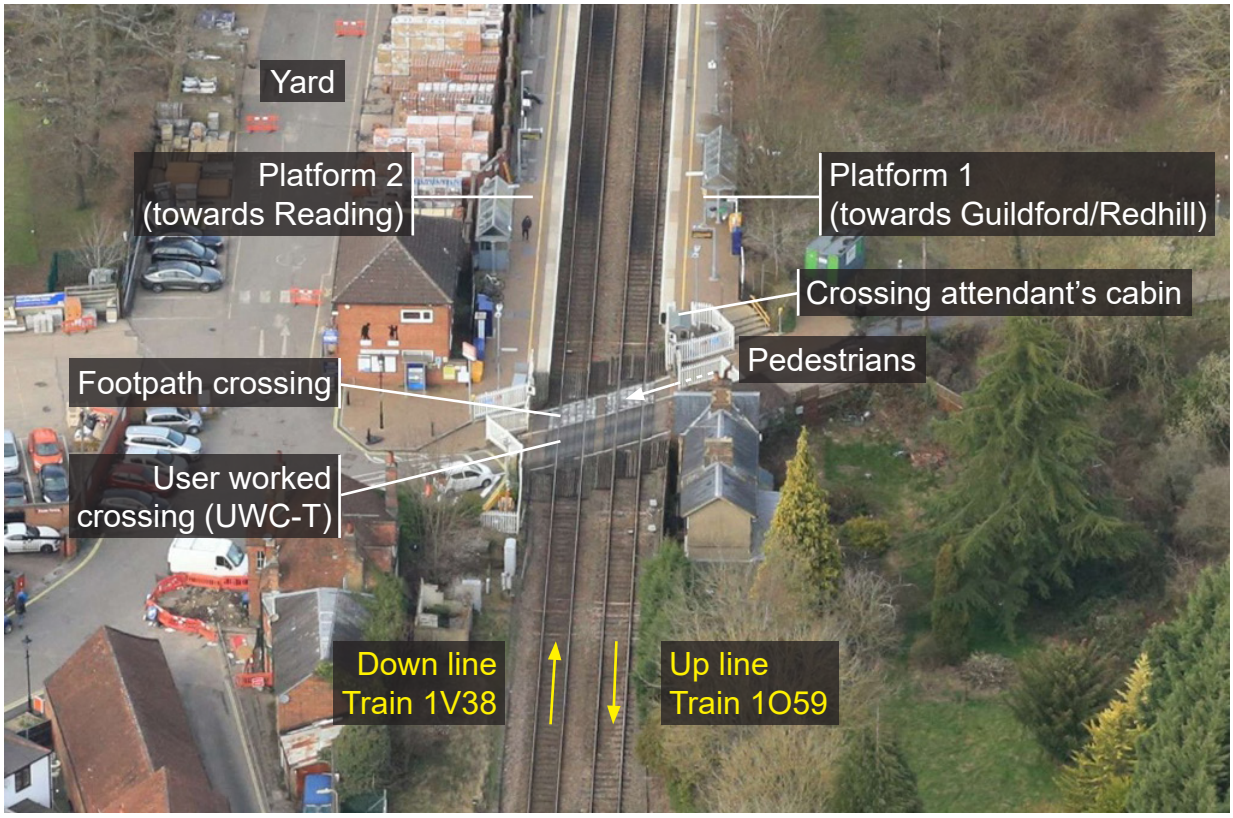

Figure 2: Aerial view of Farnborough North station looking north in 2019 (courtesy of Network Rail).

Context

Location

7 Farnborough North station is located on the double track railway between the stations of North Camp and Blackwater in north-east Hampshire (figure 1). The railway here forms part of the North Downs line connecting Redhill with Reading via Guildford. The station serves an area of Farnborough that includes local schools and a large sixth form college. It is located in the Farnborough Hill Conservation Area.

8 The up line at Farnborough North carries services south towards Guildford, Redhill and Gatwick Airport. The down line carries services north towards Wokingham and Reading. The line is non-electrified with a maximum permitted speed of 70 mph (113 km/h) on both tracks. The railway carries a mix of stopping and non-stopping passenger trains and a small number of freight trains. Signalling is controlled by Guildford area signalling centre.

9 Farnborough North footpath crossing is located at the south end of the station at 53 miles 11 chains.[1] The footpath crossing is immediately adjacent to a user worked crossing with telephone (UWC-T) used by vehicles (figure 2). The footpath crossing provides platform to platform access within the station and is also a public right of way linking Frimley Green and Farnborough. The right of way crosses railways at Farnborough North and at Hatches footpath crossing near Frimley Green (figure 3).

[1] Mileage is measured from London Charing Cross via Redhill. There is a change of mileage at the site of the former Ash Junction.

Figure 3: Map showing key locations (OpenStreetMap).

10 Farnborough North station is geographically 1 km distant from Farnborough Main station which serves the South West main line connecting London Waterloo and Weymouth. Farnborough Main and Farnborough North stations are on different lines and there is no direct rail connection between them.

Organisations involved

11 Network Rail owns and maintains the infrastructure, which lies within its Wessex route, part of Network Rail's Southern region. Network Rail is the employer of the level crossing manager (LCM) who is responsible for inspecting and risk assessing the footpath level crossing and adjacent UWC-T.

12 McGinley Support Services (Infrastructure) Ltd, (McGinley) provided crossing attendants under contract to Network Rail who were on duty at the crossing between 05:30 hrs and 00:30 hrs from Monday to Friday, with a slightly later start time on Saturdays and Sundays to reflect the normal train service. This role differs from a 'level crossing attendant',[2] who is appointed by the signaller following an equipment failure or during engineering works and can take local control of a level crossing (see paragraph 110).

13 Great Western Railway is the operator of the trains involved and employer of the train drivers. It also manages Farnborough North station which is leased from Network Rail as part of its franchise agreement. It is not responsible for funding major upgrades to the station, or for the level crossing.

14 Rushmoor Borough Council is the local planning authority. It has responsibility for determining planning applications, and a statutory duty to preserve or enhance conservation areas under the Planning (Listed Buildings and Conservation Areas) Act 1990.

15 The above organisations freely co-operated with the investigation.

[2] GE/RT8000/HB18 Rule Book Handbook 18 'Duties of a level crossing attendant', issue 4 Sept 2015.

Trains involved

16 Train 1O59 formed the 07:50 hrs Great Western Railway service from Reading to Gatwick Airport. It approached Farnborough North on the up line and was formed of unit 165116, a 3-car class 165 diesel multiple unit. It was running on time and called at Farnborough North at 08:19 hrs. The pedestrians involved in the incident alighted from this service at Farnborough North onto platform 1.

17 Train 1V38, the 07:02 hrs Great Western Railway service from Gatwick Airport to Reading, was formed by unit 165107, a 3-car class 165 diesel multiple unit. The train was not scheduled to stop at Farnborough North and was travelling on the down line at 69 mph (111 km/h), just under the maximum permitted speed. The train was travelling at 35 mph (56 km/h) when it passed over the crossing. It stopped 82 metres beyond the crossing near the north end of platform two, 390 metres after the emergency brake was applied. This is consistent with an average braking rate of 12.5%g, which is considered normal for an emergency brake application for this type of train. There was no wheel slip recorded by the train's on-train data recorder (OTDR). The braking performance of the train was therefore not a factor in this incident.

The footpath level crossing involved

18 The 'traverse distance' or length of a footpath level crossing is measured from the 'decision point', located a minimum of two metres from the nearest rail, to a point two metres beyond the furthest running rail. At Farnborough North footpath crossing, Network Rail's records show the traverse distance is 10 metres. LCMs use the traverse distance to calculate the amount of time it takes a typical user to cross. Network Rail uses a defined walking speed of 1.189 m/s for this calculation which, in some instances (including at Farnborough North crossing), is reduced by 50% to allow for vulnerable users such as children (unaccompanied or in groups), dog walkers, or the elderly, all of whom may walk more slowly. Including this 50% allowance results in a traverse time of 12.62 seconds. This is therefore the minimum required sighting time in each direction for trains approaching the crossing at the maximum permitted speed on the line. This gives a minimum sighting distance of 395 metres.

19 The footpath crossing has been repeatedly assessed by Network Rail as having a high risk relative to other footpath crossings. Identified risk factors included the high number of vulnerable users. Between 2008 and 2012, there were over 70 safety incidents recorded,[3] including cases of pedestrians crossing in front of trains. A list of reported near miss incidents since 2012 is included in appendix C.

[3] The Safety Management Intelligence System, known as SMIS, is the rail industry's online health and safety reporting and business intelligence software. It is managed by Rail Safety and Standards Board (RSSB) and collects and provides access to information on thousands of safety-related events that happen each year on the rail network in Britain.

20 Sighting of trains approaching the crossing on the down line is limited by the bend in the track. From the up side of the crossing, the actual sighting distance[4] (the distance at which approaching trains can be seen by crossing users) is 366 metres, closer than the minimum required sighting distance of 395 metres. Sighting is obscured by track curvature, a cutting slope and vegetation on the up side (inside of the curve). As crossing users have insufficient sighting to cross safely, they are warned of an approaching train by miniature stop lights (also known as miniature warning lights) changing from green to red. This equipment, installed after a fatal accident on the crossing in 1985, is activated when a train is detected by the signalling system.

21 On the down line, the detection equipment which activates the red miniature stop lights and audible alarm is positioned 985 metres from the crossing, giving crossing users 31 seconds warning time at the crossing for an approaching train travelling at the 70 mph (113 km/h) maximum permitted line speed. A similar warning time is provided by detection equipment fitted on the up line. The crossing was previously used as a bridleway until equestrian access was permanently prohibited in 2012. The warning time was reduced from 40 seconds to 31 seconds in 2013. This exceeds the 20 seconds normally provided at footpath crossings because of evidence that some users were taking longer than this to cross.

22 Signs at the crossing located underneath the miniature stop lights contain the following text (figures 4 and 5):

‘*1. Cross only when green light shows*

2. Cross quickly’

23 Additional miniature stop lights were installed at the crossing in 2013. The new lights were fitted ‘back-to-back’ with the existing lights, presenting users with a warning light on both the near and far sides of the crossing. The enhancement was intended to reduce risk to users by providing redundancy and to allow users to check the status of the crossing while they are traversing it. The audible alarm was also installed at this time.

Figure 4: View looking west from near platform 1 showing user worked crossing (left), footpath crossing (centre) and side of crossing attendant’s cabin (right).

[4] Narrative Risk Assessment, Farnborough North footpath (FP) level crossing, September 2021.

Figure 5: Footpath crossing gate near platform 1 with back-to-back miniature stop lights, visible on both sides of the railway.

Figure 6: View looking south along platform 1 (not on the day of the incident) showing passenger information screen, crossing attendant's cabin and footpath crossing.

24 A crossing attendant has been provided from early morning until late at night since November 2014, and is located in a cabin on the end of platform 1 near the crossing (figure 6). The original cabin, installed in 2014, was replaced with a more modern version in 2020. The attendant is instructed to turn a switch to operate electro-magnetic locks on each pedestrian gate when the red miniature stop lights illuminate and the audible alarm starts sounding at the footpath crossing. The miniature stop lights are visible from the cabin windows (figure 7). The gates are not linked directly to the signalling/crossing system, and the electro-magnetic locks will only be effective at holding closed a gate which is already closed. If a gate is held open by a user, the lock will be ineffective.

25 The gates are unlocked by the crossing attendant when the miniature stop lights revert to green. A push-button release is also provided at both gates which allows users to unlock the gate from within the crossing. This is to prevent a person becoming trapped on the crossing by a locked gate.

26 The footpath crossing is located adjacent to a UWC-T. This is operated either by the user (normally a vehicle driver) who contacts the signaller by telephone and requests permission to cross, or by the crossing attendant acting on the user's behalf. The user worked crossing provides vehicular access to land east of the railway and to ponds used by a local fishing club. This part of the crossing has a good safety record and was not associated with the incident on 19 May 2022.

Staff involved

27 A crossing attendant was on duty at the crossing at the time of the incident. Their shift started at 05:15 hrs and they were due to be relieved at 15:00 hrs. They were on the fifth day of a ten-day run of shifts and had covered this role on a relief basis for about nine months. As is noted at paragraph 39, the actions of the attendant may have avoided a serious accident.

28 The LCM is responsible for undertaking risk assessments and overseeing the safe operation of the crossing. They had been in post since April 2019 and were the second holder of the post since it was created in 2013.

29 The driver of train 1V38 had over ten years' experience. On first sighting the pedestrians on the crossing, the driver applied both the emergency brake and train horn around a second later. The response of the driver was prompt and their actions helped avoid a possible accident.

External circumstances

30 The incident occurred in daylight in an area with little external noise. The temperature was 13°C with a light westerly wind. External circumstances played no role in the incident.

Background information

Crossing user awareness

31 A sixth form college near to the crossing has around 4000 pupils aged between 16 and 19 years, drawn from Surrey, Hampshire and Berkshire. Some students travel daily by train to Farnborough North station which is 1 km from the college. Pupils from other schools in the local area also use the crossing.

32 As a result of safety incidents at the crossing, Network Rail's community safety manager for Wessex route and officers from British Transport Police have worked with the sixth form college and other local schools to raise awareness around level crossing and railway safety. They have provided information for newsletters, safety awareness sessions and short films.

33 After the incident, an on-site briefing about crossing safety was given to crossing users by the LCM. In September 2022 at the start of the new school year, the LCM gave further briefings to large groups while they waited for the crossing gate to be unlocked.

The sequence of events

Events preceding the incident

34 On 19 May 2022, the driver of train 1V38 had booked on duty at 05:00 hrs as required by their roster. On arrival at Guildford at 08:06 hrs, the train was running 18 minutes late due to an earlier incident elsewhere. The driver was therefore instructed that the train was to run non-stop from Guildford to Reading without calling at intermediate stations, including Farnborough North. Effectively this meant the train was cancelled as far as any passengers intending to board at Farnborough North were concerned.

35 Just after 08:18 hrs, train 1O59, the Reading to Gatwick Airport service arrived on the up line at platform 1 of Farnborough North. It was then slightly delayed in departing because of the time taken for the large number of passengers to alight.

36 After the train departed, the miniature stop lights at the crossing changed from red to green. A group of 144 people[5] was waiting behind the up-side pedestrian gate to cross from platform 1. In response to the green light, the crossing attendant turned the switch in the attendant's cabin to unlock the gates and allow the waiting users to cross the railway.

37 At this time, the attendant was unaware that train 1V38 was approaching on the down line. This train should have formed the 08:06 hrs service from Farnborough North to Reading, but the passenger information screen on Farnborough North platform 2 showed it had been cancelled as it was no longer due to call at the station (paragraph 34). The screen was visible from the attendant's cabin except when a train was in platform 1 and the attendant, having looked at the passenger information screen, understood the train had been cancelled (whereas, in fact, it was now due to run non-stop through the station). While the attendant was only required to observe the miniature stop lights when making the decision about when to lock the gates (paragraph 24), the passenger information screens provided an additional but informal source of information about approaching trains on which to inform any decision. Some attendants habitually looked at the screens, particularly when a large group needed to cross.

Events during the incident

38 After the large group had started to use the crossing, train 1V38 was detected by the signalling system. The miniature stop lights changed from green to red and the audible alarm at the crossing started to sound. The crossing attendant responded within a few seconds by turning the switch in the attendant's cabin to lock the pedestrian gates (figure 7). This activates the electro-magnetic locks fitted to the gateposts.

[5] Based on RAIB's analysis of the closed-circuit television (CCTV) recording. All users were crossing in the same direction.

Figure 7: Crossing attendant's cabin showing gate locking switch below the telephone (installed after the incident) with view of crossing and miniature stop light equipment.

39 Because crossing users were holding the gates open for the person following them, energising the locks had no effect on the flow of pedestrians (paragraph 24). The crossing attendant recognised the risk of users continuing to cross while the miniature stop lights and audible alarm were indicating the approach of a train and shouted a warning from the cabin window. This, however, had no effect and the flow of crossing users continued. The crossing attendant then left the cabin and directly intervened to close the gate, which prevented users entering the crossing from the platform 1 side at about the same time that train 1V38 came into view. The actions of the crossing attendant may have prevented a serious accident.

40 Train 1V38 approached Farnborough North on the down line at 69 mph (111 km/h). Forward-facing CCTV images show that the crossing was not visible until the train was about 320 metres away from it (figure 8). The driver observed a group of people on the crossing. Data from the on-train data recorder shows they quickly applied the emergency brake and sounded the horn continuously for the next 10 seconds. In a statement to their employer, the driver said, "The people slowly moved to the side of the track as I approached" (figure 9).

Figure 8: Forward-facing CCTV image from train 1V38 at 08:21:18 hrs. The crossing is 320 metres ahead and is just visible round a bend in the track.

Figure 9: Forward-facing CCTV image from train 1V38 at 08:21:23 hrs. The crossing is 175 metres (8 seconds) ahead and pedestrians are visible.

41 The users were clear of the crossing about six seconds before the train passed over it at 35 mph (56 km/h). The forward-facing CCTV equipment (figure 10) fitted to train 1V38 shows the crossing attendant standing behind the up-side gate with the remaining crossing users as the train passed.

Figure 10: Forward-facing CCTV image from train 1V38 at 08:21:30 hrs, one second before it passed over the crossing. The crossing attendant is visible (orange) behind the right-hand pedestrian gate.

Events following the incident

42 After the train passed over the crossing and the miniature stop lights turned from red to green, the crossing attendant released the gate locks. This allowed the remaining 36 pedestrians to use the crossing.

43 No one was hurt in the incident although the driver of 1V38 was shaken. They continued to drive 1V38 to Reading after around eight minutes of delay.

44 The miniature stop light system was tested by Network Rail signalling staff later on 19 May 2022 and no issues were reported.

Analysis

Identification of the immediate cause

45 Pedestrians were on the crossing as train 1V38 approached.

46 Forward-facing CCTV from train 1V38 and witness evidence show that pedestrians were on and continued to enter the crossing as the train approached Farnborough North station at just under the maximum permitted line speed.

Identification of causal factors

47 The incident occurred due to a combination of the following causal factors:

a. Pedestrians continued to use the crossing after the miniature stop lights turned red and the audible alarm activated (paragraph 48).

b. Network Rail did not adequately control the risk of a large group of users continuing to enter the crossing after the miniature stop lights turned red (paragraph 59).

These factors are now considered in turn.

48 Pedestrians continued to use the crossing after the miniature stop lights turned red and the audible alarm activated.

49 At 08:20 hrs, 144 people were waiting behind the up-side pedestrian gate to use the crossing (paragraph 36). This group comprised mainly school children and college students who had just alighted from train 1O59 onto platform 1.

50 At 08:20:10 hrs, after train 1O59 departed, the miniature stop lights changed from red to green and the audible alarm stopped. The crossing attendant turned the switch to unlock the gates and the waiting users started to cross the railway. The passenger timetable showed a gap of 18 minutes after the departure of train 1O59 before any further trains were due, so the attendants routinely released the gates straight away after this service left. Station CCTV images recorded at the down-side gate show that the first pedestrians started to exit the crossing 12 seconds later at 08:20:22 hrs. This is around the calculated traverse time of 12.6 seconds (paragraph 18).

51 After displaying a green light for 48 seconds, the miniature stop lights changed to red and the audible warning started. If the flow of pedestrians had stopped immediately, then the earlier flow of pedestrians suggest that the crossing would have been completely clear about 12 seconds later, around 22 seconds before the train passed over the crossing. However, on 19 May, it actually took 28 seconds to clear the crossing after the lights and alarm activated because pedestrians continued to enter and use the crossing after this point in time, stopping only when the crossing attendant left their cabin and physically intervened to close the up-side gate. This reduced the time between the crossing being clear and the train passing to six seconds (figure 11).

52 CCTV images show that users exited the crossing at an average rate of 1.6 people per second. Assuming a similar rate (and including 12 seconds crossing time), the 16 second additional delay in clearing the crossing indicates that around 25 people ignored the red lights and audible warning. It also suggests that the whole group of 144 users would have required about 102 seconds to use the crossing.

53 Network Rail standard NR/L3/XNG/308[6] defines using a footpath crossing to cross the railway when the miniature stop lights are red as misuse. At Farnborough North, the level crossing manager had recognised this risk and taken steps to understand and manage the behaviour of crossing users to improve safety.

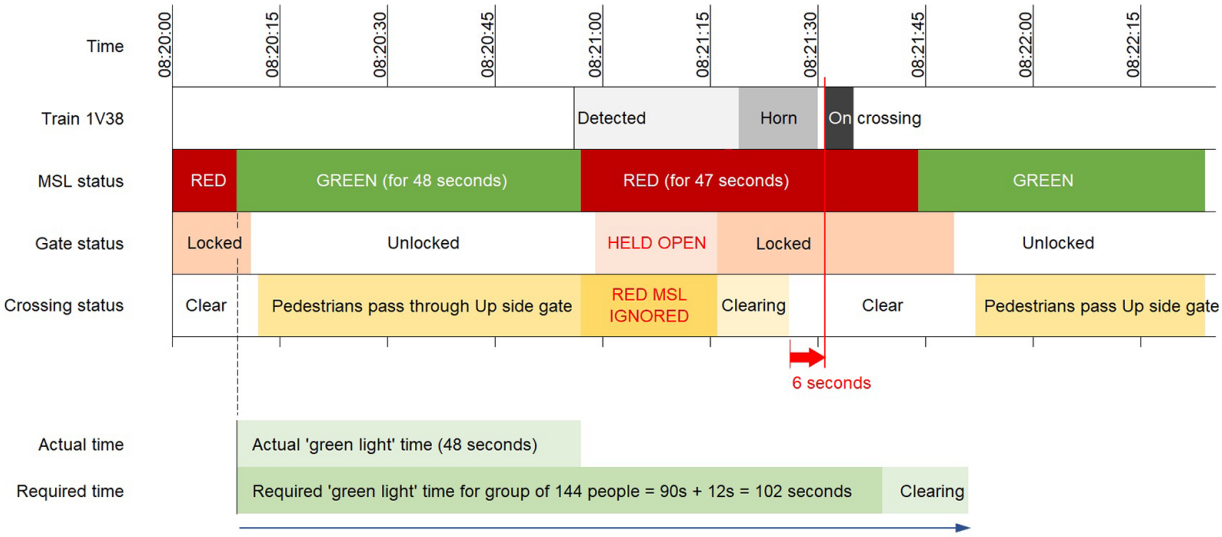

Figure 11: Diagram showing sequence of events.

Control of risk by Network Rail

54 In 2013, Network Rail commissioned a specialist human factors consultant to study user behaviour at Farnborough North footpath crossing. The purpose was to understand the effect of installing back-to-back miniature stop lights and audible warning equipment. Observations at the crossing were made before and after the new equipment was commissioned in September 2013 so user behaviour could be compared.

55 The study included interviews, observations and a census of crossing users. This was initially undertaken over a seven-day period before the new equipment was installed. The data identified that an average of 1798 general pedestrians and 164 cyclists used the crossing daily. It noted that a high number of crossings observed occurred between 08:30 hrs and 09:00 hrs, reflecting the close proximity of the crossing to schools and colleges.

[6] Network Rail standard NR/L3/XNG/308 issue 1, published September 2020, 'Risk assessing level crossings', Table 4.

56 The consultant published its interim report[7] in February 2014. It found:

a. approximately 50% of traverses were from users in groups queuing to use the crossing after leaving the train

b. head down, distracted and 'following' behaviours were very common

c. the majority of users were young people.

57 The final report[8] found that:

a. typical group behaviours were evident at the crossing, whereby users would fail to check the lights, even when unobscured, and instead choose to follow others in the group onto the crossing

b. a high proportion of users did not appear to check for trains before crossing

c. a sense of devolved responsibility is common in group situations, where users assume that others in the group are taking responsibility for the safety of the group and fail to check the lights for themselves.

58 The study concluded that the majority of the instances of incorrect use at Farnborough North footpath crossing appeared to be deliberate violations in that pedestrians had chosen to ignore the red warning lights rather than being unable to see them. Many of these incidents were associated with passengers using the crossing to reach platform 1 in order to join a southbound train which was already stationary in the platform. The study proposed the permanent provision of a crossing attendant at peak times of the day to manage user traffic at the crossing and to provide a presence that would help to discourage crossing violations.

Interim risk mitigation measures implemented by Network Rail

59 Network Rail did not adequately control the risk of a large group of users continuing to enter the crossing after the miniature stop lights turned red.

60 In May 2012, Network Rail produced an investment paper for works to improve the safety of the crossing following the prohibition of equestrian access (see paragraph 88). A feasibility study into options at the crossing had already ruled out other engineering solutions such as a bridge or underpass although permanent closure of the crossing remained Network Rail's long-term aspiration (see paragraphs 87 to 104). Work to modify the layout of the crossing and signage as a medium-term measure was completed by early 2013.

61 In early April 2014, the LCM sent an internal email expressing concern that despite the work already carried out, Farnborough North remained the most misused crossing on the Wessex route. A week later, the railway safety authority, the Office of Rail and Road (ORR) wrote to the LCM expressing concern about the continuing number of incidents, stating, '*In the event that closure cannot be achieved, then the provision of a CCTV crossing with gates that can be interlocked to the signalling should be considered.'*

[7] 'Farnborough North Level Crossing Trial of Back-to-Back Lights – Interim Findings', February 2014.

[8] 'Trial of Back-to-Back Lights at Farnborough North Level Crossing Summary of findings', October 2014.

62 In September 2014, a Network Rail Operations Risk Advisor (ORA) assessed Farnborough North footpath crossing and was concerned about the risk of crossing users 'blocking back' and obstructing the crossing at busy times. Blocking back, in this instance, is a term used to describe people waiting on the crossing while queuing to use the exit gate. They identified a risk that the volume of users at certain times would not clear the crossing between the time that the miniature stop lights activated and the arrival of a train.

63 The ORA imposed a 20 mph (32 km/h) temporary speed restriction (TSR) on both lines. This removed the risk of a fast (non-stop) train approaching but led to a significant increase in the warning time. The ORA reported anecdotal evidence that users were then crossing in front of non-stopping trains as they were travelling at significantly reduced speed due to the TSR.

64 The ORA, in an email to Network Rail's Route Infrastructure Maintenance Director dated 26/09/14, listed other options including locked gates, using a person trained as a Controller of Site Safety (COSS) as the crossing attendant, or amending the timetable to impose a minimum gap between trains. A COSS would be able to contact the signaller and take a line blockage when the crossing was busy which would prevent trains approaching. The ORA's email stated that they had already tried to involve the signallers with the revised method of working and there had been *'…strong opposition from the signallers and their managers'*. The ORA's email noted that there were further risks as the protecting signal on the up line was controlled by the signaller at Wokingham and the down line by the signaller at Guildford.

65 On 13 October 2014, Network Rail convened an interim risk mitigation workshop, later referred to as a HAZID (hazard identification and assessment) workshop. Its purpose was to investigate the measures that could reduce the risk at the crossing until it could be closed and replaced with a permanent footbridge. The HAZID workshop was attended by the ORA and LCM, together with representatives from the human factors consultant and the train operating company, now Great Western Railway.

66 A report of the workshop's findings identified 28 possible options, with associated benefits and risks of each option also being listed. The option for locking gates identified the benefit of controlling access over the crossing, against the risk of self-locking gates being held open. For crossing attendants, it identified the benefits of a visible presence on site and mitigating the risk of misuse when the lights change, against the possibility of the attendant being ignored.

67 The workshop recommended that a temporary footbridge with either ramps or steps be provided. Until this was in place, which was expected to take around six months, temporary crossing attendants and lockable crossing gates would be installed. This would allow the temporary speed restriction to be removed and reduce the risk of misuse.

68 In November 2014, a crossing attendant was provided at Farnborough North footpath crossing and lockable gates were introduced, allowing the TSR to be removed.

Temporary footbridge

69 Quotations for a temporary footbridge at Farnborough North were obtained following the workshop. In mid-November 2014, the Network Rail assistant commercial scheme sponsor, responsible for progressing the permanent closure of the level crossing, sent an email to the ORA and the works delivery manager responsible for procuring the temporary footbridge. The scheme sponsor stated they were '*unclear as to the benefits of implementing a temporary footbridge as well as a 'warden' and locking gates at Farnborough North*'. They requested further information to compare the options during a meeting planned for the following week.

70 This meeting was cancelled the day before it was due to be held as the works delivery manager was ill. The scheme sponsor sent an email stating that the programme '*will continue with the permanent bridge design under the assumption that no temporary bridge solution will be erected/constructed at Farnborough North.*' The ORA was requested to monitor the risk of crowded platforms and advise if there was an urgent need to put up a temporary structure.

71 RAIB has found no other evidence showing the basis on which the decision to overrule the HAZID workshop recommendation and cancel the temporary footbridge was taken. Its effect was to change what was supposed to be a short-term arrangement of appointing attendants, initially expected to last up to six months until the temporary bridge was in place, into one that would need to continue until a permanent footbridge was provided. By January 2015, an internal email sent by the assistant commercial scheme sponsor suggested the crossing would be closed and replaced by a footbridge by March 2016. The new footbridge is discussed further between paragraphs 87 and 104.

72 During 2015, emergency speed restrictions were occasionally imposed at short notice due to the absence of a crossing attendant. This required staff to go onto the track to place and remove speed restriction signs. On 4 June 2015, Network Rail convened a HAZOP (hazard and operability study) workshop, involving operations staff and the LCM, to review the ongoing situation. The workshop concluded that '*there are more risks involved in applying a speed restriction for a short period of time than waiting for* [a crossing attendant] *to arrive*'. This was based on the understanding that a member of railway staff could act as a replacement attendant and be in position in 30 minutes. It was accepted by the meeting that the crossing could operate without an attendant during the interim period.

73 On 1 July 2016, Network Rail's Head of Route Safety, Health and Environment for Wessex route convened a review meeting to re-evaluate the risks and controls assessed at the October 2014 HAZID workshop (paragraph 65) and to consider whether they were still relevant. This was attended by representatives from Network Rail and the train operating company, now Great Western Railway. The review identified 'High level of usage resulting in an increase chance of misuse and blocking back' as a key risk. It confirmed at this meeting that the crossing attendant should remain in place as a mitigation measure until the crossing was closed (see paragraph 87).

Narrative risk assessments

74 The frequency at which Network Rail requires a level crossing to be risk assessed is defined by its risk score. This is calculated by the All Level Crossing Risk Model (ALCRM)[9] based on information entered by the LCM. The ALCRM output is presented as a letter and a number, the letter denoting the individual risk per traverse of the crossing (where A is high and M is low), and the number denoting the collective risk (where 1 is high and 13 is low). Collective risk relates to the total risk generated by the crossing and takes into account the overall risk of death and injury for crossing users, train crew and passengers.

75 Standard NR/L2/XNG/001[10] covers the management of risk at level crossings. It states: '*An assessment of level crossing safety, performance and convenience shall consist of a signed off NRA* [narrative risk assessment]*, that is compliant with NR/L3/XNG/308, with supporting ALCRM calculations to generate a balanced assessment of risk for each level crossing.*' The standard requires the NRA to contain evidence of residual risks and hazards, including but not limited to, infrastructure, rail operations, environmental conditions, user behaviour and third-party interface.

76 Standard NR/L3/XNG/308[11] describes the process for risk assessing level crossing assets, including the production of an NRA. Section 9.2 of the standard refers to interim risk controls which might be needed in addition to short or long-term solutions. These interim risk controls should be evaluated in circumstances of deficient sighting or where a significant risk would exist pending delivery of short or long-term solutions. It includes a note: '*See guidance on Managing Interim Risk at Level Crossings.*'

77 This note refers to a document[12] available to LCMs and other staff on Network Rail's level crossing hub. The guidance document describes various immediate or interim risk mitigation measures for LCMs to consider. Examples include advance warning to train drivers, speed restrictions and improving sighting for crossing users, as well as a level crossing attendant to enhance safety for users. The document refers to misuse and blocking back which were recurring risks at Farnborough North (paragraph 62) but does not give guidance on how an LCM could assess or mitigate these risks.

78 At the time of the incident, Farnborough North footpath crossing had an ALCRM risk score of E2. The collective risk score of 2 put the crossing into ALCRM risk category 'red'. Standard NR/L2/XNG/19608[13] required crossings in this category to be inspected every 7 weeks, and standard NR/L3/XNG/308 required crossings in this category to be risk assessed every 1.25 years, normally by the LCM. Despite the presence of a level crossing attendant which reduced the ALCRM score, it still ranked as the fourth highest risk open footpath crossing of 143 such crossings on the Wessex route.

[9] ALCRM is Network Rail's quantitative safety risk modelling system which is used to assess the safety of individual level crossings as part of the risk assessment process.

[10] Network Rail standard NR/L2/XNG/001 issue 3, published December 2020, 'Provision and risk management of level crossings'.

[11] Network Rail standard NR/L3/XNG/308 issue 1, published September 2020, 'Risk assessing level crossings'.

[12] Level crossing guidance document LCRMIP - RM05 issue 1, published October 2012, 'Managing interim risk at level crossings'.

[13] Network Rail standard NR/L2/XNG/19608 issue 8, published September 2021, 'Inspection of level crossing systems', appendix A.

79 NRAs were produced for Farnborough North footpath crossing by the local LCM in August 2018, August 2019, June 2020 and September 2021. The crossing was assessed as having a high number of vulnerable users based on census evidence and observations at the crossing. Vulnerable users are defined[14] as people who are likely to take an extended time to traverse or might be at greater risk of harm, such as elderly people, unaccompanied children, groups, and dog walkers.

80 In March 2021, a nine-day census recorded that the footpath crossing was used by an average of 1863 pedestrians and 78 cyclists per day. There were 78 trains per day, made up of 48 passenger stopping services, 26 passenger non-stopping services and 4 freight trains.

81 The NRA issued in September 2021 was the most recent assessment created before the incident. Based on information provided by the LCM, ALCRM identified the main risk drivers as:

a. second train coming
b. [user] does not observe lights/barriers
c. slips, trips, falls or snagged on crossing
d. distracted/forced by dog (loss of control)
e. railway cause: slow moving/short warning
f. railway cause: train unexpected
g. unaware of crossing.

82 The NRA identified that the top two items accounted for the major part of the risk to pedestrians. It stated: '*This has been mitigated by the provision of attendants who operate the gate at the crossing controlling access to the railway.*' The NRA confirmed the importance of the crossing attendant role in the risk mitigation strategy for this crossing.

Crossing attendants

83 The location of the attendant's cabin was inside a fenced compound for security, but this also meant they had no direct access to the crossing gate if they needed to directly intervene as became necessary on 19 May 2022 (figure 2 and figure 12).

84 The crossing attendant's duties were described by a notice in the attendant's cabin. It stated '*The first duty of the crossing attendant is to ensure the safety of pedestrians over the miniature stop light footpath section of the crossing*.' Attendants were instructed to lock the gates when the miniature stop lights showed red, using a switch in the cabin, and to release the locks when the miniature stop lights showed green (paragraph 24). However, some crossing attendants also checked the platform information screens or mobile phone apps to avoid releasing the gates if another train was approaching or to decide when to take a personal needs break. Witness evidence indicates that this ad hoc method of working has arisen because crossing attendants thought that they had inadequate information to safely make the decision to release the gates, especially in the morning peak period when there were large groups of users.

[14] Network Rail level crossing guidance document LCG 02, published July 2017 'Census good practice'.

Figure 12: Crossing keeper's cabin within a fenced compound.

85 On 19 May 2022, the crossing attendant on duty was unable to control the flow of passengers on to the crossing and prevent the blocking back risk, which had previously been identified as far back as 2014 (paragraph 62). This was because:

a. They had released the gates when the green light illuminated as instructed, but had no knowledge that train 1V38 was approaching, meaning that the large group had insufficient time to cross and exit the railway safely.

b. The attendant had no way to prevent the users entering the crossing based on the method of working they had been instructed to use. While the attendant turned the switch to relock the gates when the miniature stop lights and alarm activated, the self-locking gates were held open by each user for the next person, rendering the locks ineffective. While the attendant also tried to prevent the flow of pedestrians by shouting a warning from the cabin window, they were ignored.

The introduction of crossing attendants and self-locking gates in November 2014 led to a significant reduction in reported safety incidents (appendix C). However although the residual risks of gates being held open and the attendant being ignored were recognised by the HAZID workshop in 2014 (paragraph 66), these residual risks were not effectively mitigated before this incident.

86 At the time of the 2016 review (paragraph 73), there was over a year of operational experience available, but no detailed task analysis had been carried out to determine how the crossing attendant would carry out their role. The NRAs did not assess the residual risk or consider whether the mitigation arrangements were fit for purpose. The circumstances of this incident were foreseeable, but the provision of an attendant without access to reliable information on train running did not adequately mitigate the risk.

Identification of underlying factors

Closure of the footpath crossing

87 Network Rail had not been able to close this crossing despite being aware of the risks associated with it.

88 The footpath crossing provides platform to platform access and accommodates a public right of way linking Frimley Green and Farnborough (paragraph 9). Although this is classified as a bridleway, the local highway authority, Hampshire County Council, made a permanent traffic regulation order[15] in 2012 to prohibit equestrian access. As a right of way, Network Rail is required[16] to maintain a route suitable for cyclists, pedestrians and mobility-impaired users, and not obstruct or endanger users.

89 The adjacent UWC-T provides vehicular access between Farnborough Street and ponds used by a fishing club east of the railway. Network Rail has sought to permanently close this crossing to improve safety. An alternative access route exists but has been closed to vehicles since 2015 because of a defective bridge supporting the roadway which is owned by Hampshire County Council. Closure of this alternative route to vehicles in 2015 has increased vehicular traffic over the crossing.

90 It is unclear when a permanent footbridge was first proposed, but in March 2015 Network Rail started the project to replace Farnborough North footpath crossing with a stepped footbridge, which would also have ramps. A diversity impact study issued in May 2015 stated that the project's aims were:

> '*To close the level crossing and provide a diversionary route for pedestrians by installing a stepped footbridge with ramps, with access made available for all users based on the outcome of this Diversity Impact Assessment (DIA). The project will provide safer access for the public, children, older and disabled people.*'

91 The study included an appendix which gave advantages and disadvantages for the following options at this location:

- Subway: '*Not suitable due to the long timescales to get the access to infrastructure and disruption it would cause to train services. At high level, this appears to be a non-starter due to the lack of land available and cost. There is the potential for the subway to flood, therefore the whole life cost is increased not just capital expenditure.*'

[15] Rushmoor BW 24: restriction on use by any horse, ridden or led from 11/07/12.

[16] Highways Act 1980 section 137.

- Footbridge with lifts: *'Unsuitable because the level crossing is not at a manned station, therefore the lifts cannot be monitored by station staff for any issues. Should the lifts break then people will not be able to cross the railway until it is resolved, and people may be trapped inside. This is not a safe option. The power upgrade alone could take 3-6 months to complete adding time risk into the solution.'*
- Stepped footbridge: '*This option is not suitable for Farnborough North because the provision of step-free access must be maintained.*'

92 In July 2015, representatives from the project team held a meeting with a local residents' association to explain the need for the scheme including the risks associated with the crossing and constraints governing the proposed replacement structure.

93 In January 2016, Network Rail made a pre-application submission to the local planning authority, Rushmoor Borough Council. Pre-application submissions are not in the public domain but allow a scheme proposer to start a dialogue with the planning authority. The submission included a drawing of a footbridge with steps and ramps. The bridge was to be located directly above the existing level crossing with ramps running north of the crossing behind the station platforms. Each ramp would have a total length of just over 100 metres to limit the maximum gradient to 1 in 16, and with landings every six metres. On the west side of the station, the scheme would require additional land to be purchased from a building materials supplier which is currently used as a yard (figure 2).

94 The following month Rushmoor Borough Council's principal planning officer responded to the proposal. Their letter, addressed to the Network Rail senior town planner responsible for the scheme, stated, '*The principle to close the pedestrian and vehicular crossing is welcomed*'. It went on to list concerns relating to the design and layout of the new structure including its encroachment on the highway and privacy for residents in neighbouring properties. Farnborough North station is located in a conservation area and a local planning authority has a statutory duty to preserve or enhance its conservation areas. The letter also suggested that a traditional or contemporary structure should be provided, not an 'off the shelf' solution.

95 In December 2016, Network Rail made a second pre-application submission for a stepped footbridge over the crossing. The amended design incorporated ramps running to the south of the crossing in an out-and-back configuration to minimise land-take. This arrangement would require demolition of a residential property located adjacent to the level crossing already owned by Network Rail. It avoided the need to purchase land from the building materials supplier which had proved difficult to negotiate.

96 In response, the principal planning officer raised further comments by letter addressed to the Network Rail senior town planner. They expressed concern about the scale of what was being proposed and requested justification as to why the lifts could not be supported and incorporated into the design. They noted that the scheme still encroached onto the highway, and the issue of privacy of local residents remained. They also stated that loss of the dwelling was against planning policy.

97 During 2017, the project team continued to develop the design for a ramped footbridge similar to the arrangement shown in the second pre-application submission but positioned slightly further from the crossing. In December 2017, Network Rail held a meeting with the local resident's association to discuss the proposals. Notes from this meeting, issued by the project's commercial scheme sponsor, indicate that there were questions raised about how Network Rail would prevent vandalism and misuse of the new bridge by skateboarders, and why the bridge design did not include lifts. The meeting notes also state: '*It was made clear that the association's view was that the bridge would not improve the area and would be strongly objected to at planning consultation.*'

98 On 18 May 2018, Network Rail submitted a planning application for a stepped footbridge south of the crossing with ramps running south of the bridge (figure 13 and figure 14). The principal planning officer responded three days later stating that the application was invalid for a number of reasons. For example, the required ecological survey was not referenced in the application pack and not all the existing buildings to be demolished were shown. They requested further information before the application could be considered. However, Network Rail did not provide further information in response to the issues raised.

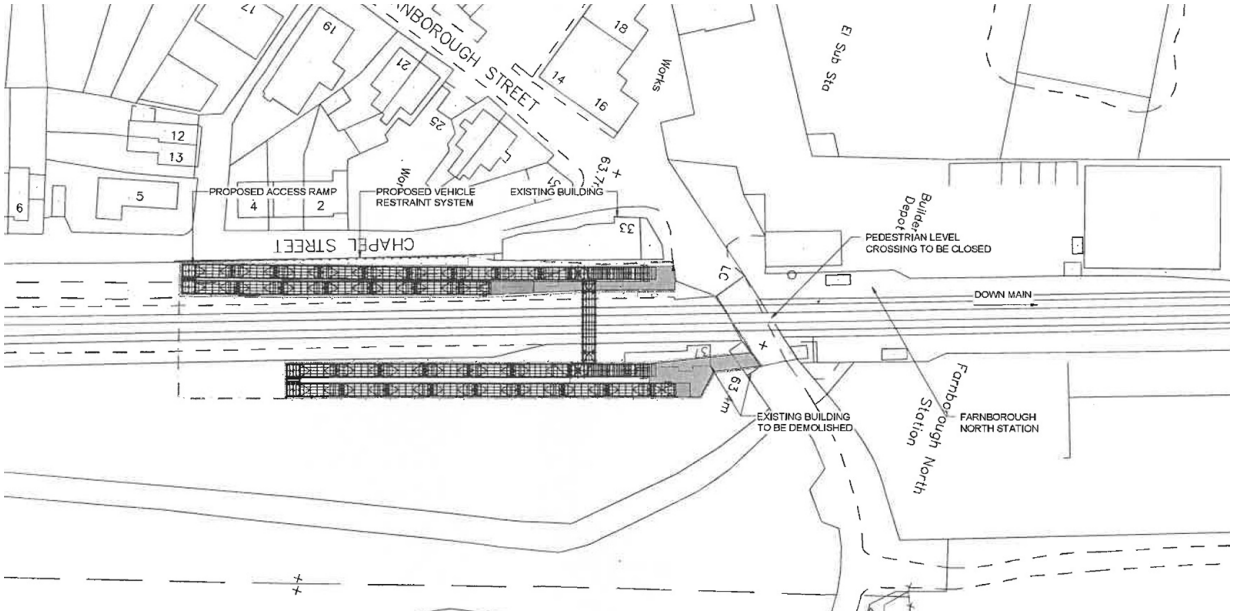

Figure 13: Diagram of proposed 2018 footbridge (extract from Network Rail drawing UA007617-20-01-ECV-DRG-ARC-104 revision P01 dated 09/03/18). Farnborough North station is on the right.

99 Network Rail's financial and planning arrangements are governed by control periods, each lasting 5 years. Control period 5 began in April 2014 and by May 2018 when the last application was submitted, it had less than 12 months to run. With planning approval appearing increasingly unlikely, Network Rail considered withdrawing the application on the understanding that an alternative scheme involving lifts could win the support of the planning authority. It was also reluctant to press ahead with the application in the light of strong opposition from local stakeholders. This would have risked damaging the delicate relationship which was important for progressing future improvements at this and other crossings in the area.

Figure 14: Visualisation of proposed 2018 footbridge looking south from near platform 2 (Network Rail).

100 Planning records show that Network Rail withdrew its planning application on 29 May 2018. The proposed scheme was therefore never formally considered by Rushmoor Borough Council.

101 Dialogue between Network Rail and Rushmoor Borough Council restarted in February 2021. In April 2021, Network Rail made a new pre-application submission for a proposed twin-tower footbridge with steps and lifts (figure 15). The principal planning officer's response noted that this scheme was significantly more compact and would comprise the use of sympathetic materials as to not detract from the character and appearance of the Conservation Area. It also noted that if the lifts were not to be in operation when the station was closed, this would alter the current 24/7 access to the station. It stated that these factors must be balanced against the safety needs of the crossing closure and the harm that would result from an alternative ramped bridge.

102 At the time of the incident, Network Rail was progressing this scheme under a Transport and Works Act Order[17] which will be made to the relevant Secretary of State. It will allow it to use a compulsory purchase order to obtain the extra land required. Planning consent will still be required for those parts of the scheme which are not situated on operational railway land.

103 Public meetings were held during 2022 with implementation planned in 2024, around the end of control period 6. A new bridge with steps and ramps will also be constructed at Hatches level crossing in Frimley Green (figure 3) as part of the same project. This is located on the same right of way but crosses a different railway.

[17] Transport and Works Act 1992.

Figure 15: Visualisation of proposed 2024 footbridge with stairs and lifts (courtesy of Network Rail).

104 There are a number of possible reasons why Network Rail has not been able to close the crossing despite being aware of the high level of risk. Witness and documentary evidence shows there has been a relatively high turnover of sponsors and project managers working on the footbridge scheme since 2015. One project manager was only in post for two months. Witness evidence suggests that this lack of managerial continuity delayed the project to replace the crossing because of the time required for staff to become familiar with the scheme, to implement dialogue with external stakeholders or to take action. Witness evidence also suggests that the scale of engagement and stakeholder management required has been regularly underestimated.

Observations

105 The introduction of a crossing attendant created a method of working at the crossing which was not supported by specific competencies or formal training for the staff involved in implementing it.

106 The crossing attendant at Farnborough North is responsible for operating the locking mechanism on the pedestrian gates and can assist with the operation of the user worked crossing. The post was introduced as a short-term measure and was seen by Network Rail as a mitigation measure until the footbridge arrived. Network Rail did not consider the crossing attendant role to be safety-critical because it worked with, and not instead of, a safety-critical system. On this basis, the role did not require a specific competency and the associated training.[18] If a crossing attendant is not present, the crossing will still operate until an attendant arrives (paragraph 72).

[18] Although crossing attendants are required to hold a Personal Track Safety (PTS) competency, the training for this competency does not encompass the control of crossings as undertaken at Farnborough North.

107 Although there is no formal training for this role, new crossing attendants are usually briefed by an existing attendant or the LCM. The briefing covers turning the switch to lock and unlock the pedestrian gates when the miniature stop lights change, and assisting users with the user worked crossing. However, crossing attendants were not provided with guidance on how to manage blocking back by pedestrians.

108 Some crossing attendants monitored train movements by looking at passenger information screens on the station or using mobile phone apps (paragraph 84). They did this as they thought that this information assisted them in deciding whether it was safe to unlock the gates or when it would be appropriate to take a personal needs break. However, some trains not due to call at the station (such as non-stopping passenger trains and freight movements) were not displayed on these screens. This meant that the attendants were taking decisions based on information about train movements that was potentially incomplete.

109 At some other footpath crossings, temporary attendants are occasionally provided during periods of high use to assist users. These temporary roles are also known as crossing attendants. The only other footpath crossing on the national rail network with a semi-permanent crossing attendant is at Wareham station crossing in Dorset where the powered pedestrian gates are closed via a remote switch 2 to 3 minutes before a train arrives. The gates are positioned more than 5 metres from the nearest rail. The attendant, known as a 'gate keeper', is not required to have PTS competency and is contracted to Dorset Council.

110 Neither of the above roles is the equivalent to the 'Level Crossing Attendant' role described in Handbook 18[19] of the Railway Rule Book. This role, which comes under the category of Auxiliary Other Duties, involves manually operating level crossing barriers which have failed or otherwise are required to be placed on local control. Because Level Crossing Attendants are regarded as controlling the movement of trains on a running line, and assist the signaller in the operation of the level crossing, the role is deemed safety-critical under the 'Railways and Other Guided Transport Systems (Safety) Regulations' 2006 (ROGS).[20]

111 Before undertaking a Level Crossing Attendant training course, an individual must hold PTS, and either the COSS or Individual Working Alone (IWA) competency.

[19] GE/RT8000/HB18 Rule Book Handbook 18 'Duties of a level crossing attendant', Issue 4 Sept 2015.

[20] ROGS Regulation 23(1)(a)(ii).

Summary of conclusions

Immediate cause

112 Pedestrians were on the crossing as train 1V38 approached (paragraph 45).

Causal factors

113 The causal factors were:

a. Pedestrians continued to use the crossing after the miniature stop lights turned red and the audible alarm activated (paragraph 48).

b. Network Rail did not adequately control the risk of a large group of users continuing to enter the crossing after the miniature stop lights turned red (paragraph 59, **Recommendation 1**).

Underlying factor

114 Network Rail had not been able to close this crossing despite being aware of the risks associated with it (paragraph 87, **Learning point 1**).

Additional observation

115 The introduction of a crossing attendant created a method of working at the crossing which was not supported by specific competencies or formal training for the staff involved in implementing it (paragraph 105, **Recommendation 2**).

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

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

116 Network Rail is continuing to progress a major scheme to install a footbridge which will allow the permanent closure of the crossing. Under a new management structure, the Network Rail Regional Level Crossing Manager is now both client and sponsor for the Farnborough North/Hatches scheme which may resolve some of the issues associated with the delivery of this project (paragraph 104).

Other reported actions

The role of the crossing attendant

117 The day after the incident, the LCM responsible for Farnborough North crossing issued a written instruction requiring the crossing attendants to contact the signaller by telephone before unlocking the pedestrian gate during peak hours or when more than 25 people (since reduced to 20 people) are waiting to cross. The Operations Manager issued an equivalent instruction (supplementary special instruction) to signallers at Guildford area signalling centre at the same time. Before authorising the gate to be unlocked, the signaller is required to make sure there is enough time available to prevent delay to trains. An internal railway telephone was installed in the attendant's cabin after the incident (figure 7).

118 The new operating instructions require the crossing attendant to communicate with the signaller and exchange safety-critical information to provide protection for crossing users and mitigate the risk of blocking back. Communication with the signaller is defined by the safety authority for railways in Great Britain, the ORR[21] as a safety-critical role under ROGS (paragraph 110). In accordance with ROGS,[22] persons undertaking safety-critical work have to be assessed as being competent and fit to carry out the work. RAIB does not consider the current arrangements at Farnborough North footpath crossing to be compliant with this requirement.

Briefing of users

119 Network Rail's community safety managers, with officers from the British Transport Police, continue to work with local schools and colleges to promote crossing safety. Student briefings have also been held at the level crossing at the start of the school year.

[21] Safety-critical tasks - Clarification of ROGS Regulations requirements, ORR, 2007.

[22] Regulation 24(1).

Recommendations and learning point

Recommendations

120 The following recommendations are made:[23]

1 *The intent of this recommendation is to improve the control of risk at footpath level crossings where there is known to be a history of safety incidents, and where timescales to implement long-term safety improvements are uncertain.*

Network Rail should review its processes associated with the risk assessment of footpath level crossings. Where mitigation measures have been implemented to control the risks associated with user behaviour (such as how groups of people behave), Network Rail should ensure that an effective method of identifying and managing any ongoing residual risk is provided and that this takes account of available operational experience and previous safety assessments. As part of this process, Network Rail should specifically consider what actions should be adopted to control risk during the period in which longer term mitigation measures are being implemented, and to review the situation if, and when timescales change (paragraph 113b).

2 *The intent of this recommendation is that temporary and interim crossing attendant roles are subject to suitable training and competency management.*

Network Rail should review the role of temporary and interim crossing attendants nationally, including that currently in use at Farnborough North. This review should consider the nature of the tasks undertaken by crossing attendants and whether these are safety-critical in nature. Based on this review, Network Rail should develop and implement appropriate requirements for developing and managing the competency of this role, in line with industry good practice and any applicable legislative requirements (paragraph 115).

This recommendation may apply to other comparable roles on Network Rail managed infrastructure.

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[23] 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 and Road 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 200 to 203) can be found on RAIB's website www.gov.uk/raib.

Learning point

121 RAIB has identified the following important learning point:[24]

1 Railway organisations managing projects to mitigate known safety risks are reminded of the importance of having managerial continuity if such projects are complex or involve engagement with external stakeholders over an extended period. They should also consider the level of engagement and stakeholder management likely to be necessary to effect change (paragraph 114).

[24] '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

ALCRM	All level crossing risk model
CCTV	Closed-circuit television
COSS	Controller of Site Safety
HAZID	Hazard identification
HAZOP	Hazard and operability study
IWA	Individual Working Alone
LCM	Level crossing manager
NRA	Narrative Risk Assessment
ORA	Operations Risk Advisor
ORR	Office of Rail and Road
OTDR	On-train data recorder
PTS	Personal Track Safety
ROGS	Railways and Other Guided Transport Systems (Safety) Regulations
RSSB	Rail Safety and Standards Board
UWC-T	User worked crossing with telephone

Appendix B - Investigation details

RAIB used the following sources of evidence in this investigation:

- information provided by witnesses
- documentary evidence associated with management of the level crossing
- a human factors study of user behaviour at this crossing
- documentary evidence associated with the proposed footbridge schemes
- CCTV recordings taken from Farnborough North station and footpath crossing
- forward-facing CCTV recording taken from train 1V38
- information taken from train 1V38's OTDR
- site photographs and measurements
- SMIS accident and incident data from RSSB
- weather reports and observations at the site
- a review of previous RAIB investigations that had relevance to this incident
- a review of other Network Rail footpath crossings with special operating arrangements.

Appendix C - Summary of accidents and incidents

Table showing accidents and near miss events, and changes to the crossing safety systems. Incidents of pedestrians recorded as 'crossing when unsafe' are excluded.

Historical events

Date	Event
May 1981	Near miss between elderly pedestrian and non-stop down train
April 1985	Fatal accident to 17-year-old who crossed from behind the train she had alighted from
Miniature stop lights fitted	
21 October 1993	Serious injury to pedestrian who had alighted from a train and followed a group of people across the crossing into the path of a non-stopping train
9 June 2002	Near miss when a passenger from one train crossed in front of the approaching train
11 January 2004	Near miss when passengers from one train detrained and crossed in front of another

2012 to May 2022

Date	Event
28 March 2012	Near miss with 6 pedestrians
6 August 2012	Near miss with pedestrian
22 November 2012	Near miss with pedestrian
23 December 2012	Near miss with pedestrian
Back-to-back miniature stop lights fitted	
4 October 2013	Near miss with pedestrian
25 March 2014	Near miss with pedestrian
Attendant in place and lockable gates fitted	
6 April 2015	Near miss with pedestrian
27 July 2016	Near miss with pedestrian
19 May 2022	Near miss with pedestrians

Since the introduction of a crossing attendant and lockable gates in November 2014, the number of recorded events is much lower, now fluctuating at between 1 or 2 per year. These are mainly reports of pedestrians crossing when unsafe.

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