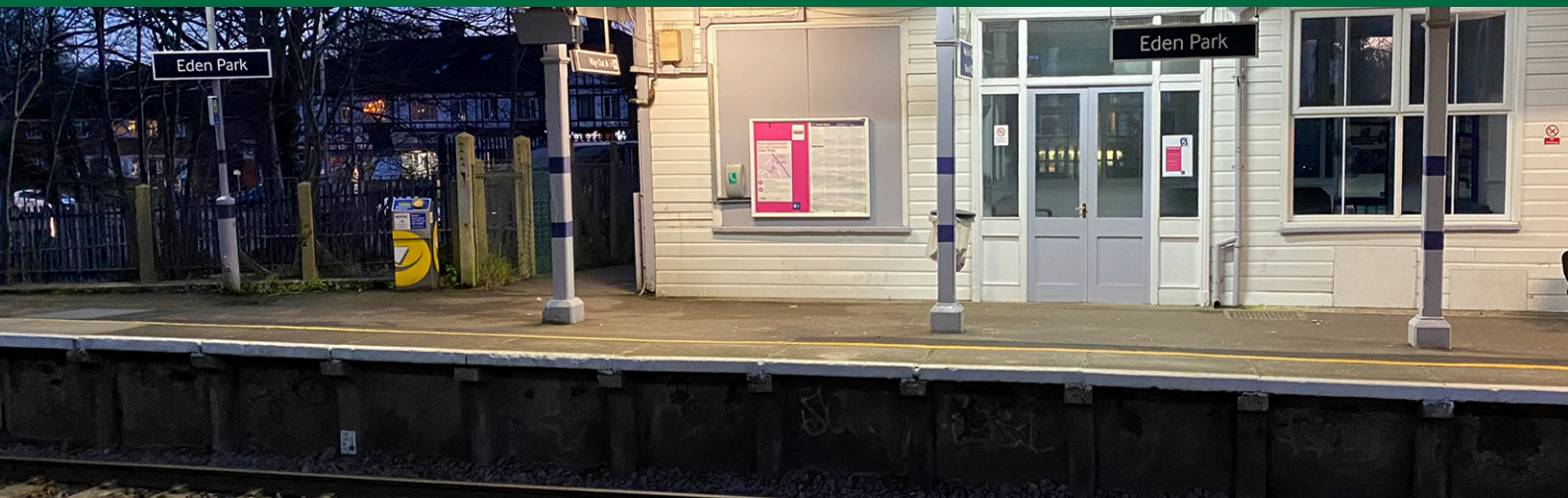




Rail Accident Investigation Branch

Rail Accident Report



**Person struck by a train at Eden Park station,
south-east London
26 February 2020**

Report 01/2021
February 2021

This investigation was carried out in accordance with:

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

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Preface

The purpose of a Rail Accident Investigation Branch (RAIB) investigation is to improve railway safety by preventing future railway accidents or by mitigating their consequences. It is not the purpose of such an investigation to establish blame or liability. Accordingly, it is inappropriate that RAIB reports should be used to assign fault or blame, or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

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

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

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

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

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

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

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

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

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Person struck by a train at Eden Park station, south-east London, 26 February 2020

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Summary

At around 19:05 hrs on Wednesday 26 February 2020, a passenger train struck and fatally injured a person who had just fallen from platform 1 of Eden Park station.

The person, who had impaired vision, moved near to, and fell from, the platform edge probably because his visual impairment meant he was unaware that he was close to this edge. The platform edge was not fitted with markings intended to assist visually impaired people.

Following the accident, emergency services staff were unable to determine whether the third rail traction power supply had been turned off until a member of Network Rail staff arrived on-scene. This resulted in a delay of over 12 minutes between London Ambulance Service staff arriving at the scene and accessing the track to provide medical care.

The combined effect of DfT, ORR, RSSB, Network Rail and Southeastern Railway guidance and processes meant that safety-based justifications for platform edge markings (including tactile surfaces) to aid visually impaired people, were not always effectively considered by the railway industry.

The report makes six recommendations. The first and second are addressed to DfT and Network Rail, firstly to seek improvements in the processes that govern when tactile surfaces at the edge of station platforms should be installed, and secondly to develop a plan for installing tactile surfaces at higher priority locations in a timely manner across the railway network. The third is addressed to the Rail Delivery Group to develop means of reducing the risk to visually impaired people using station platforms where tactile surfaces have not yet been installed. The fourth is addressed to ORR and seeks improvements in the information made publicly available to help visually impaired people to decide whether it is safe to travel. The fifth is addressed to RSSB, to develop processes to ensure that the rail industry has sufficient information, guidance and decision-support tools to fully address the safety risks associated with disabled people using the railway.

A sixth recommendation is addressed to the British Transport Police, National Fire Chiefs Council, Association of Ambulance Chief Executives, London Fire Brigade, London Ambulance Service and Network Rail to improve the processes associated with emergency services staff responding to incidents on the national rail network.

Introduction

Definitions

- 1 Metric units are used in this report, except when it is normal railway practice to give speeds and locations in imperial units. Where appropriate the equivalent metric value is also given.
- 2 The report contains abbreviations and acronyms. These are explained in Appendix A. Sources of evidence used in the investigation are listed in Appendix B.

The accident

Summary of the accident

- 3 At around 19:05 hrs on Wednesday 26 February 2020, a train struck and fatally injured a person who had just fallen from platform 1 of Eden Park station, in south-east London. The train was stopping at Eden Park station and travelling at around 25 mph (40 km/h) when the person was struck.

Context

Location

- 4 Eden Park station is approximately 3.2 miles (5.2 km) north-east of Croydon town centre (figure 1). It is 12.4 miles (20 km) from London Charing Cross on the Mid-Kent line, which terminates at Hayes.



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

Rail equipment involved

- 5 Eden Park station has two platforms with a subway running between them. Platform 1, which is used by trains travelling from Hayes towards London, can be accessed via stairs from the subway or from a ramped path leading up from the station car park (see figure 2). The accident occurred on platform 1 which has a left-hand curve when viewed in the London-bound direction. At the time of the accident the station was unstaffed.

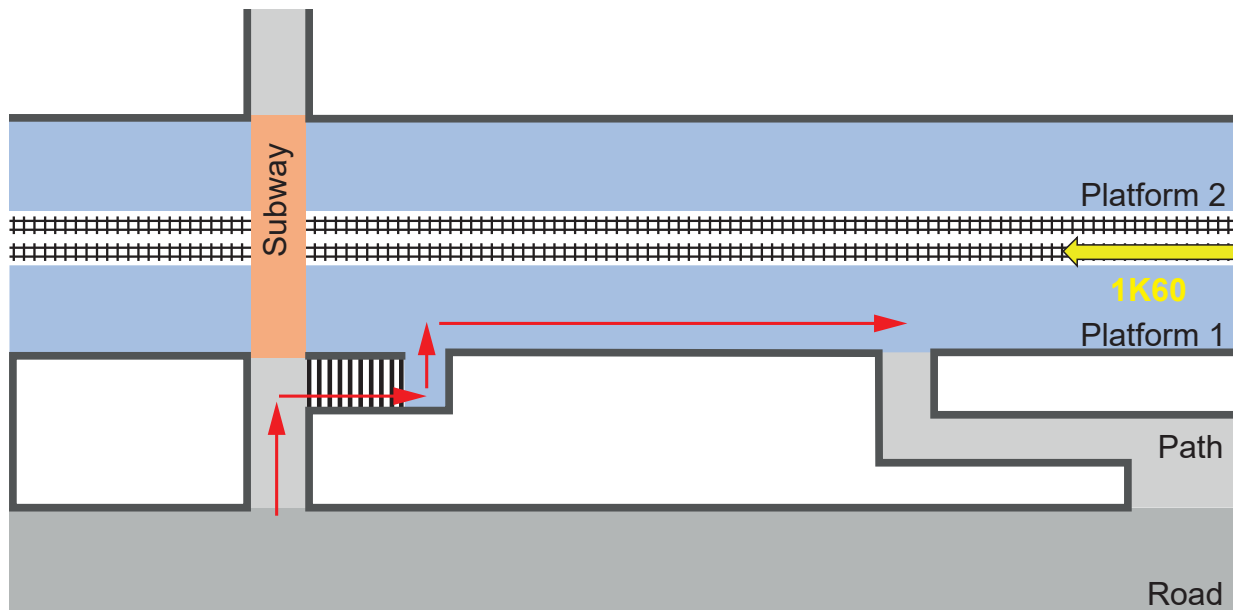


Figure 2: Schematic diagram of person's route to platform 1 (red arrow) within Eden Park station up to around one minute before the accident

- 6 The Mid-Kent line is electrified at 750 volts DC using the third rail (also known as the conductor rail) system. The electric power supply is controlled from the Lewisham electrical control room by an electrical control operator.

Organisations involved

- 7 Southeastern Railway is the train operating company (TOC) responsible for the train involved in the accident, and employed the train driver. It leased Eden Park station from Network Rail as part of its franchise agreement. As such, it was the leasehold owner of the station and is referred to as the Station Facility Owner and Station Facility Operator in other railway documentation. It is referred to as the station operator in this report.
- 8 Network Rail is the freehold owner of Eden Park station, including its buildings, platforms and station furniture. It employed the signaller, the electrical control operator and the manager who acted as Rail Incident Officer (RIO).
- 9 Both Network Rail and Southeastern Railway had safety and maintenance responsibilities relating to Eden Park station. These are discussed further at paragraph 56.
- 10 British Transport Police (BTP) is the national police force for British railways (including mainline railways, the London Underground, and some light rail and tram systems). London Ambulance Service (LAS) and London Fire Brigade (LFB) provide, respectively, emergency ambulance and emergency fire and rescue services in the Greater London region. All three organisations were involved in the emergency response to the accident (see paragraph 84).
- 11 All the organisations involved freely co-operated with the investigation.

Trains involved

- 12 The train, reporting number 1K60,¹ that struck the person was the 19:00 hrs Hayes to London Charing Cross service. It was a 10-car train formed of class 465 and 466 electric multiple units and was fitted with forward facing CCTV, which was not working at the time of the accident. The train was fitted with an on-train data recorder (OTDR) and information from this was available.
- 13 Southeastern Railway found no defects in the train's braking system following the accident. While it did not formally measure the sound pressure levels of the warning horn following the accident, it confirmed that the horn was functioning normally. There is no evidence that the condition or operation of the train contributed to this accident.
- 14 A second train stopped at platform 2 of Eden Park station shortly after the accident occurred. This was train reporting number 1V62, the 18:27 hrs London Charing Cross to Hayes service, and was an 8-car train, also formed of class 465 electric multiple units. It was not fitted with forward facing CCTV.

People involved

- 15 The person struck by the train, Cleveland Gervais, was 53 years old and regularly used public transport. He was visually impaired and registered as partially sighted. He was blind (light sensitivity only) in his right eye and had reduced acuity and tunnel vision in his left eye. Witness evidence suggests that, as with many visually impaired people, he had diminished light adaptation, where the time taken for vision to recover from a transition from dark to light, or from light to dark, is greater than for someone who is not affected.
- 16 Cleveland Gervais was also mobility impaired and used a walking aid. He had arranged for the walking aid to be painted white to help those around him identify him as visually impaired. Like most² visually impaired people travelling on the railway network, he did not use a cane to find and avoid obstacles (known as a '*guide cane*' or '*long cane*'). Evidence indicates (see paragraph 109) that he was not aware of staff assistance or alternative travel arrangements offered by station operators for disabled passengers using their services.

External circumstances

- 17 The accident occurred after dark. A site visit by RAIB on the day after the accident at about the same time as the accident found that there was a satisfactory level of lighting on both platforms.
- 18 Local weather records indicate that the temperature was around 5°C, there was a light breeze and it was not raining during the accident. Station CCTV evidence showed there was no standing water or ice on the platform in the area where the accident occurred.
- 19 No unusual lights or noises were noted by a witness who was on the platform. Other station sounds, such as the station announcements and arrival of 1V62 at platform 2, are discussed at paragraph 35.

¹ An alphanumeric code, known as the 'train reporting number', is allocated to every train operating on Network Rail infrastructure.

² Transport Research Laboratory (TRL) research project 082 'Accidents involving visually impaired people using public transport or walking', published in 1995.

The sequence of events

Events preceding the accident

- 20 The person entered the station at around 18:51 hrs (about 14 minutes before the accident). Witness evidence indicates that he intended to catch the train (1K60) that was due at Eden Park station at 19:05 hrs, and travel to Waterloo East station. From there he was intending to walk to Waterloo (Main) station and catch another train to his destination.
- 21 The person used the subway between the platforms, climbed the stairs up to platform 1 and walked along the platform (see figure 2). From around 12 minutes before the accident, he was standing near the top of the ramped entrance to platform 1.

Events during the accident

- 22 Around 56 seconds before the accident, a station announcement began, signifying the impending arrival of train 1K60 at platform 1. Eight seconds later the person began to move towards the edge of the platform, and subsequently stopped on the yellow line that indicates a safe distance to stand away from the platform edge, and looked up and down the track. He then stepped back around half a metre behind the yellow line.
- 23 Around 31 seconds before the accident, the announcement about train 1K60 ended and an announcement relating to the impending arrival of train 1V62 at platform 2 began.
- 24 Nine seconds before the accident, the person started to move towards the platform edge (see figure 3, positions 1 and 2). He turned left (facing up the track with his back towards train 1K60) and continued to move closer to the edge (see figure 3, positions 2 and 3). Six seconds later his right foot reached the white line (at the platform edge) as he walked along the platform at an acute angle to the edge (see figure 3, positions 3 and 4). He fell onto the track at the same moment as the driver of train 1K60 began to sound the train's warning horn (see figure 3, position 4), and one second later the train struck the person.

Events following the accident

- 25 Around 20 seconds after the accident train 1V62 arrived at platform 2. Station CCTV evidence indicates that it had neither stopped nor opened its doors at the time the person was struck by 1K60.
- 26 The subsequent response by the emergency services is considered in paragraphs 84 to 107.

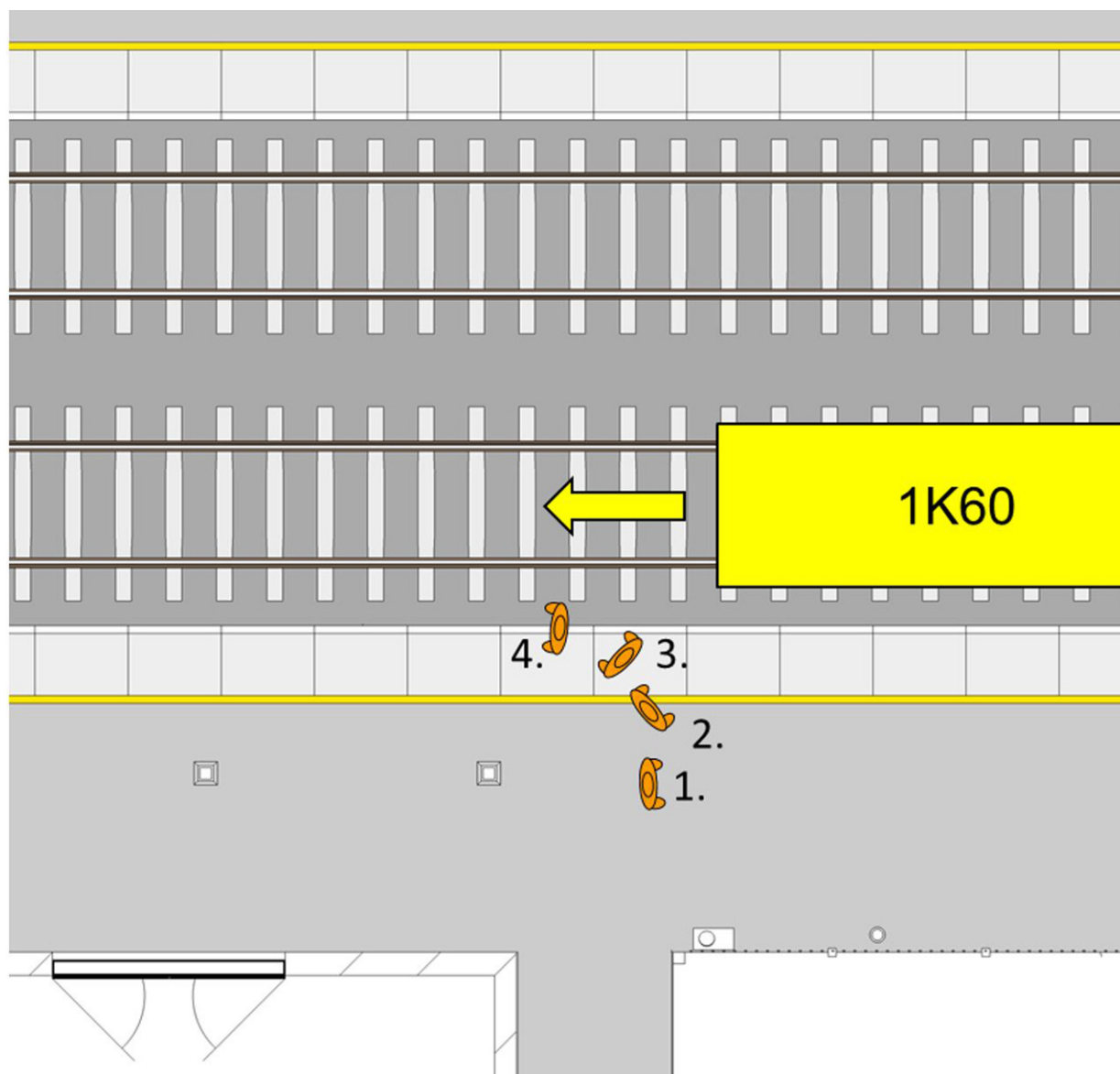


Figure 3: Schematic diagram of person's movements

Analysis

Identification of the immediate cause

27 The person fell from the platform edge as the train was arriving at the platform.

28 CCTV evidence shows that the person was struck by the train around one second after he fell from the edge of the platform.

Identification of causal factors

29 The most likely explanation for this accident is that the person moved near to, and fell from, the platform edge, because he was unaware that he was close to the edge (paragraph 30). It is possible that the absence of tactile surface markings intended to assist visually impaired people was also a factor (paragraph 36). These factors are now considered in turn.

The actions of the person

30 The person moved near to, and fell from, the platform edge, probably because he was unaware that he was close to this edge.

31 RAIB has considered four possible reasons why the person moved near to, and fell from, the platform edge. These were:

- a. because he was unaware he was close to it (probable)
- b. because of a loss of balance, slip or trip whilst on the platform (unlikely)
- c. because of impaired judgement due to drugs, alcohol or a sudden medical episode (unlikely)
- d. because he was trying to board 1K60 (unlikely).

32 Considering the first possibility, it is unclear when or why the person lost awareness of his position in relation to the platform edge before moving dangerously close to it. However, three seconds before the accident he was walking very near the platform edge with the track on his right (fully blind) side, and would have had limited peripheral vision from his left eye with which to judge his immediate position in relation to the platform edge. Additionally, in the period between 38 and 9 seconds before the accident, he was looking towards an area of relative darkness, and he then turned towards an area that was brightly lit. His diminished light adaptation (see paragraph 15) would probably have meant that his vision was further weakened at this point. It is therefore probable that he had very limited vision in the seconds immediately before he fell, and was unable to accurately judge his position relative to the platform edge.

- 33 Considering the second possibility, RAIB cannot fully discount a loss of balance associated with the person's impaired mobility. However, it is unlikely that he fell due to a loss of balance, slip or trip because:
- a. His movements in the seconds before he lost his footing were not consistent with this. Rather, he can be seen to be walking down the platform with a steady gait but at an acute angle to the platform edge. Just before he fell, he appeared to be about to put his right foot just off the edge of the platform and into the empty space above the track.
 - b. No trip or slip hazards were identified near where the person was walking.
 - c. The person can be seen to be walking steadily (without using his walking aid) up the stairs between the subway and the platform, and in a consistent direction along the platform before the accident.
- 34 Considering the third possibility, it is unlikely that the person fell because of impaired judgement due to alcohol, drugs or a sudden medical episode:
- a. There was no evidence identified in the post-mortem examination that might suggest that the person suffered a sudden medical episode immediately before the accident.
 - b. The post-mortem toxicology report recorded a blood alcohol concentration of 20 mg per 100ml, well below the legal limit for driving in the UK (80 mg per 100ml).
 - c. The post-mortem toxicology report recorded a blood tetrahydrocannabinol (THC, the primary psychoactive component of cannabis) concentration of 6.2 ng per ml, which was above the concentration that may be associated with impairment (3.5 ng per ml). However, the report also noted that for a regular user of cannabis, the concentrations of THC at post-mortem will be higher than at the time of death, and that concentrations associated with recreational cannabis use range up to over forty times higher (267 ng per ml) than the person's blood concentrations recorded at post-mortem.
 - d. No other prescription or non-prescription drugs were detected by the post-mortem toxicology screening.
 - e. The person's movements around the station and on platform 1 before the accident were inconsistent with someone suffering from impaired judgement (paragraph 33).
- 35 Considering the fourth possibility, following the accident it was reported in the media that witnesses had stated that the person had become confused after hearing a train arriving on a different platform. The audible cues associated with a train arriving at another platform, and its doors opening, can be similar to those associated with a train arriving at the platform a person is standing on. Because of this, visually impaired people may attempt to board a train that has not yet arrived because they have become aware of a train arriving at a different platform. However, it is unlikely that the person fell because he was trying to board train 1K60 for the following reasons:
- a. The person's movements on the platform are not consistent with someone attempting to board a train (paragraph 33).

- b. Although train 1V62 was approaching platform 2 at the same time as train 1K60 was arriving at platform 1, it had neither stopped nor opened its doors at the time when the person fell.
- c. The station announcements for both trains were made in the correct sequential order.

The platform edge

36 The platform edge was not fitted with tactile surface markings intended to assist visually impaired people. This is a possible causal factor.

37 The platforms at Eden Park station were not provided with tactile surfaces.

Tactile surfaces for station platforms

History and standards

- 38 When independently moving around in the general pedestrian environment, visually impaired people make use of non-visual cues, such as tactile information underfoot.³ Designers of pedestrian environments can make use of this by installing tactile surfaces to convey important information to visually impaired people about their environment, such as a hazard warning, directional guidance or to indicate the presence of an amenity. Transport Research Laboratory (TRL) research⁴ has shown that visually impaired people are able to reliably distinguish between different tactile surfaces and can remember their associated meanings.
- 39 In 1986⁵ the Department of Transport (now the Department for Transport (DfT)) introduced guidance on the use of tactile surfaces to help visually impaired people locate controlled road crossings. This guidance was subsequently expanded for other uses in 1998⁶ (referred to in this report as the 'DfT guidance'). This included guidance on the use of tactile surfaces at mainline stations to provide a warning to visually impaired people that they are approaching the edge of a station platform.
- 40 The DfT guidance requires tactile surfaces for use at the edge of station platforms (referred to as tactile surfaces in the remainder of this report) to be made up of 400 mm squares, each having rows of flat-topped domes (blisters, 22.5 mm outer diameter and 5 mm in height). The blisters are spaced at intervals of 66.5 mm and each row is off-set so a blister in the second row will appear halfway between blisters in the first row (figure 4). The guidance required the whole surface to be more than 500 mm from the platform edge, and of a colour that would provide a good contrast with the platform surface.

³ Department of the Environment, Transport and the Regions (now DfT) 'Guidance on the use of tactile paving surfaces', published 1998.

⁴ TRL research project 179 'Trials on platform edge tactile surfaces', published 1996.

⁵ Department of Transport (now DfT) Disability Unit circular 1/86, 'Textured footway surfaces at pedestrian crossings', published 1986.

⁶ See footnote 3.

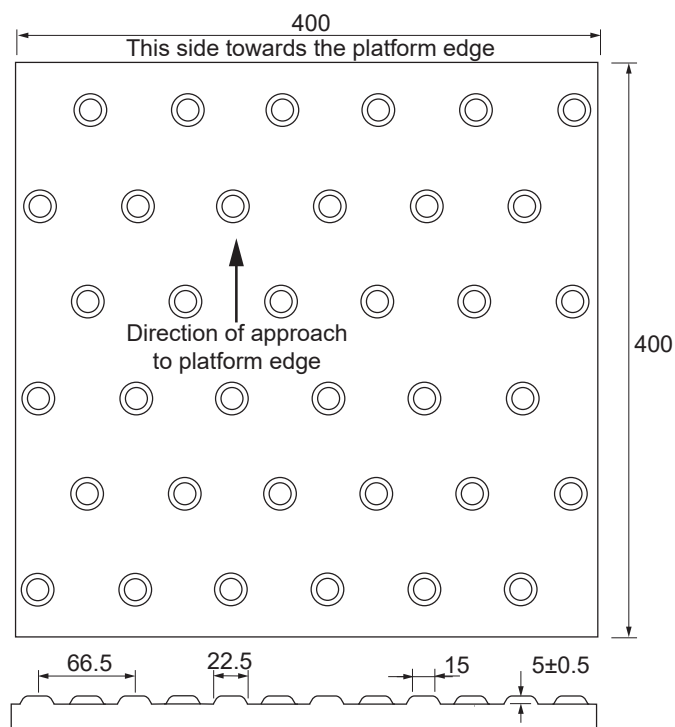


Figure 4: Profile and plan view of tactile surfaces at mainline stations

- 41 Prior to May 2018, some mainline railway platforms had tactile surfaces painted yellow and installed 760 mm from the platform edge (see figure 5). RSSB research⁷ recommended that this should become standard practice, where possible, to provide a high contrast between the platform surface and the track. The research noted that this contrast is important for both visually impaired people and the general population. Rail Industry Standard RIS-3703-TOM 'Passenger Train Dispatch and Platform Safety Measures' was updated (issue 4) to reflect this recommendation in March 2020.

Effectiveness of tactile surfaces

- 42 RSSB's safety risk model (SRM) v8.5.0.2, dated March 2018, expresses safety risk in terms of predicted fatalities and weighted injuries⁸ (FWI). SRM risk data is used by the railway industry to support safety-related decision making. SRM estimates the risk to passengers at the platform-train interface (PTI) to be 12.0 FWI per year, which represents around half of the total passenger risk on the mainline railway network.

⁷ RSSB's research project T1118 'Optimising the design and position of platform markings designed to keep people away from the platform edge', published May 2018.

⁸ Defined by RSSB as the aggregate amount of safety harm. One FWI is equivalent to one fatality, 10 major injuries or 200 minor injuries or shock/trauma events requiring hospital admission, or 1000 minor injuries or shock/trauma events not requiring hospital admission.



Figure 5: Platforms at Three Bridges station (left) and platform 1 at Eden Park station (right). Left image courtesy of RSSB.

- 43 RAIB has identified that the installation of tactile surfaces would affect the two hazard categories which underpin significant proportions of the overall PTI risk estimate:
- a. 4.7 FWI per year associated with people falling from or getting too close to the platform edge
 - b. 6.6 FWI per year associated with people having accidents when boarding and alighting trains.
- 44 The extent to which tactile surfaces will affect the overall PTI risk will depend on a number of factors, such as the proportion of visually impaired people involved in accidents at the PTI, and the effectiveness of tactile surfaces in preventing accidents.
- 45 Research has shown that visually impaired people are exposed to significantly higher levels of individual risk than the general public at mainline station platforms. This research includes:
- a. An analysis of Safety Management Intelligence System (SMIS, the national database for recording safety-related events) data showed that visually impaired people account for between 9⁹ and 15¹⁰ percent of people who fall from station platforms with no train present. The data probably undervalues the proportion of visually impaired people affected because:
 - i. SMIS does not systematically record, or require the person inputting the information to state, whether the person who has had an accident has a visual impairment.

⁹ RAIB commissioned RSSB analysis of SMIS data from 1 January 2015 to 31 December 2019.

¹⁰ RSSB's research project T158 'The use of tactile surfaces at rail stations', published in 2005. Includes SMIS data analysis from 1 January 2001 to 31 December 2003.

- ii. Heightened risk is not always detectable in accident reporting (including SMIS) data, as this does not account for visually impaired people who have self-regulated their behaviour and decided that it is unsafe to travel (hence making the railway inaccessible to them).
 - b. Research^{11,12} in the UK and the USA has shown that the proportion of visually impaired people falling from the edge of platforms without tactile surfaces is higher than indicated in the SMIS data.
- 46 Royal National Institute of Blind People (RNIB) research^{13,14} has shown that when standardised for age, visually impaired people are as likely to travel by train as the general population but around twice as likely to experience restrictions in accessing the railway system. Additionally, DfT research¹⁵ states that visually impaired people are less likely to possess a driving licence and hence would be generally more reliant upon public transport. As such, the proportion of visually impaired people in the UK population can be used as an approximation for the proportion of railway users who are visually impaired. Royal National Institute of Blind People (RNIB) documentation¹⁶ states that 360,000 people (0.5 percent of the total UK population¹⁷) are registered as either blind or partially sighted, and estimates there are currently around two million people (3 percent of UK population) living with sight loss which is severe enough to have a significant impact on their daily lives. Since SMIS data indicates that between 9 and 15 percent of people falling from platforms are visually impaired, it is reasonable to conclude that an individual visually impaired person is, on average, significantly more likely to fall off the platform edge than an individual in the general population.
- 47 The SMIS data does not indicate the presence or condition of platform markings (including tactile surfaces) in each case, and this makes it impossible to judge the effectiveness of tactile surfaces based on this data alone. However, research has shown that there is robust evidence that tactile surfaces provide a critical safety benefit for visually impaired people. This research includes:
- a. TRL research showing that between 92¹⁸ and 98¹⁹ percent of visually impaired people were able to detect the presence of tactile surfaces installed at the edge of mainline station platforms.
 - b. US operational data²⁰ showing that following the installation of tactile surfaces the rates of people falling from platforms reduced by around 65 percent for visually impaired people and around 45 percent for the general population.

¹¹ TRL research project 082 'Accidents involving visually impaired people using public transport or walking', published in 1995.

¹² US Department of Transportation research 'Tactile warnings to promote safety in the vicinity of transit platform edges', published 1987.

¹³ RNIB research 'Understanding society: comparing the circumstances of people with sight loss to the UK population', published 2018.

¹⁴ RNIB research 'Circumstances of people with sight loss', published 2012.

¹⁵ DfT research 'Disabled people's travel behaviour and attitudes to travel', published 2016.

¹⁶ 'RNIB's response to DfT's Transport Accessibility Action Plan' dated November 2017.

¹⁷ Office of National Statistics estimated the UK population to be 66.8 million in mid-2019.

¹⁸ TRL research project 317 'Tactile surfaces experiments in Wolverhampton' published 1992.

¹⁹ TRL research project 179 'Trials on platform edge tactile surfaces', published 1996.

²⁰ US Department of Transportation research 'Innovative solutions for disabled transit accessibility', published 1991.

- 48 There is also further evidence to suggest that tactile surfaces provide:
- a safety benefit to the general population²¹
 - a safety benefit to visually impaired people when boarding trains²²
 - an increase in visually impaired people's confidence and willingness to travel.^{23,24}

Southeastern Railway

- 49 As part of its safety responsibilities for the stations it manages (discussed further at paragraph 63), Southeastern Railway undertakes PTI risk assessments to help understand and manage the safety of passengers at its stations. PTI risks include those associated with the platform, the train doors and the gap between the train and the platform.
- 50 Southeastern Railway's PTI risk manager stated that she carried out a risk assessment for Eden Park station in June 2019. However, RAIB has been told that this was not available because of a software malfunction, and a second risk assessment was completed in March 2020 (after the accident). The PTI risk manager stated that this included the same information and recommendations as the June 2019 risk assessment.
- 51 The risk assessment noted the condition of platform markings on both platforms and recommended that tactile surfaces should be installed. The PTI risk manager believed that there was a Network Rail programme to install tactile surfaces at all Southeastern Railway's stations before April 2024, and in view of this she took no further action to address this recommendation. After the June 2019 risk assessment, she did not take any interim actions to address the risks associated with the absence of tactile surfaces. She stated that this was because she was unaware of any accident that had occurred on Southeastern Railway managed stations that were attributable to the absence of tactile surfaces at the platform edge.

Network Rail

- 52 Network Rail company standards (see paragraph 68) require tactile surfaces to be installed when there is a '*reasonable opportunity*' to do so, for example in conjunction with other significant station works. Network Rail records show that there was no work undertaken at Eden Park station that matched its definition of a '*reasonable opportunity*' in the twenty years prior to the accident.

²¹ RSSB's research project T1118 'Optimising the design and position of platform markings designed to keep people away from the platform edge', published May 2018.

²² See footnote 21.

²³ 'RNIB response to the Office of Road and Rail's Consultation on changes to guidance for train and station operators on Disabled People's Protection Policy', published January 2019.

²⁴ TRL research project 179 'Trials on platform edge tactile surfaces', published 1996.

- 53 However, following a passenger complaint in March 2019, an investigation by Network Rail found that, following platform extension works, Network Rail had only installed tactile surfaces on newly constructed parts of platforms at a number of stations managed by Southeastern Railway. This created an obvious risk to visually impaired passengers who would have no way of knowing that the tactile strip was missing on part of the platform. RAIB notes that RSSB research²⁵ states that *‘using tactile surfaces on only part of the platform creates more risk than not at all.’*
- 54 In September 2019, Southeastern Railway and Network Rail’s Southern region agreed to develop a plan to install tactile surfaces at all Southeastern Railway’s stations, prioritising platforms that had tactile surfaces partially installed. This initiative was funded using underspend from Southern region’s annual budget. Network Rail’s central buildings and architecture team has stated that this initiative is outside the scope of central policies and standards (see paragraph 69) and that there are no similar programmes in other Network Rail regions.
- 55 At the time of the accident (February 2020), installation of tactile surfaces at Eden Park station was not funded and no date for installation had been agreed. This was the case for the majority of station platforms on Network Rail’s Kent and Sussex routes that did not have tactile surfaces already installed. Surveys undertaken to support Southern region’s initiative (paragraph 54) identified that in August 2019, across all the platforms on Kent and Sussex routes, 145 platforms (16 percent of the total) had tactile surfaces that had not been installed over the platform’s entire length.

Risk management

- 56 The combined effect of DfT, ORR, RSSB, Network Rail and Southeastern Railway’s processes and guidance means that safety-based justifications for platform edge markings (including tactile surfaces) to aid visually impaired people are not always effectively considered.**

Safety and equality (accessibility) considerations

- 57 The installation of tactile surfaces on pre-existing stations on the British mainline railway is governed by a complex and interrelated series of obligations including legal duties, government guidance, railway standards and contractual (including franchise) arrangements. This section will consider the obligations of each organisation involved in relation to installing tactile surfaces at Eden Park station. Like the majority of stations on the British mainline network, it is owned (freehold) by Network Rail but operated and managed by a train operating company (TOC). As such, the obligations referenced below may not be representative of stations managed under other arrangements, for example stations managed under a *‘full repairing and insuring lease’*, where TOCs have more extensive asset management obligations than those considered in this report.

²⁵ RSSB’s research project T1118 ‘Optimising the design and position of platform markings designed to keep people away from the platform edge’, published May 2018.

- 58 Because of the complexities involved with these obligations, RAIB has sought clarification from ORR, which stated that: *‘There is a blurred divide between accessibility and safety matters, and tactile markings [... are considered as] an accessibility matter as well as a safety risk control.’* This is in line with the findings of available research that show that tactile surfaces are an important safety and accessibility feature for visually impaired people (paragraph 47). However, the obligations governing accessibility and safety stem from different legislation, and have different thresholds for what is considered reasonable in each context. RAIB has considered two pieces of guidance which outline the application of duties related to safety and accessibility.
- 59 Firstly, RSSB’s ‘Taking Safe Decisions’ (issue 3, dated August 2019) aims to help railway organisations to take safety into account when making decisions. This includes consideration of legal duties (including the Health and Safety at Work etc Act 1974). Organisations have a duty to control the safety risks to passengers, regardless of whether they have a disability, so far as is reasonably practicable (SFAIRP). To achieve this, organisations must demonstrate that the sacrifice (in money, time or trouble) of implementing a further safety measure is *‘grossly disproportionate’* to the safety benefits it affords. Additionally, following consideration of their legal duties, organisations will also consider their commercial (including, business reputation and corporate social) responsibilities, which may result in the implementation of measures that go beyond their legal duties. The document also states that Government (in this case DfT) can make policy decisions to regulate areas, which might not otherwise be applied by industry following their consideration of reasonable practicability and their commercial responsibilities. These decisions can be mandated upon the industry for a number of reasons including societal concern, or where a particular group is exposed to a high level of individual risk.
- 60 Secondly, the Equality and Human Rights Commission’s ‘Equality Act 2010 Statutory Code of Practice: services, public functions and associations’, dated January 2011 (EHRC Statutory Code of Practice) aims to help service providers to understand their responsibilities in relation to equality, which in this context relates to station accessibility. It states that service providers have a duty to make *‘reasonable adjustments’* where a physical feature puts disabled people at a *‘substantial disadvantage’* compared with people who are not disabled. Avoiding this disadvantage would include either:
- removing the physical feature in question;
 - altering it; or
 - providing a reasonable means of avoiding it.
- 61 The EHRC Statutory Code of Practice says that when considering which option to adopt, service providers must, as far as is reasonably practicable, approximate the access enjoyed by disabled persons to that enjoyed by the rest of the public. Where the substantial disadvantage cannot be avoided, service providers should consider whether there is a reasonable alternative method of making services available. This alternative method must be a *‘reasonable’* one (including consideration of potential offence to disabled people’s dignity and inconvenience) and should aim to provide access to a service as close as it is reasonably possible to get to the standard normally offered to the public at large.

62 Considering the safety and equality (accessibility) duties governing the installation of tactile surfaces, the required SFAIRP or ‘*reasonable adjustment*’ judgements would be expected to be heavily influenced by the number of people using a station. RAIB analysis of information provided by Network Rail (dated June 2020) found that around 60 percent of British mainline station platforms are fitted with tactile surfaces. However, there was no clear relationship between the estimated²⁶ passenger usage of the stations and whether tactile surfaces were fitted. For example:

- stations with very low comparative usage (such as Acklington, 320 passenger entries and exits per year, and Rannoch, 8894 passenger entries and exits per year) have tactile surfaces fitted
- some stations with very high comparative passenger usage do not have tactile surfaces fitted (including three of the major London termini: Charing Cross, Liverpool Street and Cannon Street)
- about 50 percent of platforms at stations with similar usage to Eden Park (which has around 617,000 entries and exits per year) have tactile surfaces fitted.

Southeastern Railway’s obligations and actions

63 Southeastern Railway has stated that while it identifies the presence and condition of platform markings (including tactile surfaces) in its PTI risk assessment, it is solely the responsibility of Network Rail to prioritise, fund and deliver tactile surfaces on platforms of stations which Southeastern Railway manages.

64 RAIB asked ORR for advice on the contractual arrangements governing which organisation has the responsibility for installing tactile surfaces (paragraph 57). ORR informed RAIB that:

- station operators are responsible for passenger safety, day-to-day management of the station and routine maintenance/repair
- Network Rail is responsible for structural safety and refurbishment/renewal of the station.

65 The contractual agreements between Southeastern Railway and Network Rail stated that Southeastern Railway is responsible for ensuring the presence and good condition of yellow and white markings on the platforms. Additionally, Southeastern Railway is responsible for installing tactile surfaces throughout other areas of the station (for example, near stairs and in the station car park) but not for installing tactile surfaces at the edge of platforms. ORR has stated that because installing tactile surfaces would include major physical works to the platform, this would fall to Network Rail to fund and install.

66 Additionally, Southeastern Railway’s franchise agreement explicitly prohibits it from spending funds that are provided by DfT to improve accessibility at stations on tactile surfaces at the edge of the platforms. Although Southeastern Railway had previously bid for external funding to improve accessibility at its stations from DfT’s ‘Access for All’ programme (see paragraph 76), which included the provision of tactile surfaces, these bids did not include Eden Park station because the bid focused on other stations that were considered to be a higher priority.

²⁶ ORR provides annual estimates of the number of entries/exits at each station in Britain. The latest estimates relate to 2018 to 2019 usage.

Network Rail obligations and actions

- 67 ORR’s advice to RAIB (paragraph 64) identifies Network Rail as being responsible for the funding and installation of tactile surfaces. Network Rail would therefore need to consider which stations justify installation of tactile surfaces in line with SFAIRP principles, and its own commercial considerations (paragraph 59). However, Network Rail’s central buildings and architecture team has stated that Network Rail staff are not required to assess the provision of tactile surfaces as a safety mitigation or as a ‘*reasonable adjustment*’. Rather, station operators may choose to fund the installation (which Network Rail may deliver) if they believe this is a safety or accessibility issue.
- 68 The central team also stated that Network Rail standards and central policies only require it to fund the installation of tactile surfaces in connection with:
- significant station works, primarily²⁷ platform extensions
 - the resurfacing of platforms, triggered by routine inspections and associated maintenance.
- 69 Network Rail standard NR/L3/CIV/162 ‘Platform extensions’ (issue 2, dated September 2011), gives guidance on the specific circumstances when the installation of tactile surfaces will be funded by Network Rail. It references the EU Technical Specification for Interoperability (PRM TSI),²⁸ Railway Group Standard GIRT 7016 and the DfT Code of Practice. Standard NR/L3/CIV/162 states:
- ‘The substantial lengthening of an existing platform shall therefore require the extension and the remainder of the platform to be equipped with tactile paving where it can be demonstrated that this is a “reasonable opportunity”.*
- *When an existing platform is rebuilt or resurfaced, over more than 75% of the useable platform length, this shall be considered a “reasonable opportunity” to install tactile paving.*
 - *When an existing platform is extended, without any work undertaken on the existing platform, this shall not be considered a “reasonable opportunity” to install tactile paving.’*
- 70 Network Rail’s central buildings and architecture team stated that the ‘*over 75 percent*’ guidance is used when considering whether tactile surfaces need to be installed due to platform resurfacing. However, the normal practice for maintaining platforms involves preventative maintenance and repairing damaged areas as required. This would mean that resurfacing more than 75 percent of a platform would rarely take place, and therefore it would be a very long time, if ever, before maintenance requirements prompted the installation of tactile surfaces. A review of the available records for Eden Park station showed that significant resurfacing work had been undertaken at various times between 2000 and 2020, but this had not resulted in tactile surfaces being fitted, as the individual resurfacing works did not reach the 75 percent area of the platform that would require tactile surfaces to be fitted. This would foreseeably be the case at a significant proportion of other British mainline stations.

²⁷ Other work, such as the installation of lifts or footbridges, that would result in reduction in platform width may require installation of tactile surfaces following a site-specific risk assessment.

²⁸ The PRM TSI includes a requirement to install visual and tactile warnings near the edge of new station platforms and existing station platforms subject to ‘renewal or upgrading’.

RSSB's actions

- 71 RSSB published the Rail Industry Standard (RIS) guidance RIS-3703-TOM 'Passenger Train Dispatch and Platform Safety Measures' (issue 3, dated September 2017), which was current at the time of the accident. This includes guidance on PTI risk assessments and related safety measures. It lists items to be considered in such risk assessments that can affect the likelihood and/or severity of hazardous events. Under a heading of passenger capabilities, it states: *'Is assistance available to passengers with impairments? For example, use of staff or companion programmes? [and] Are tactile surfaces provided?'* Additionally, the provision of tactile surfaces is identified as a factor that *'can be used to inform and guide passengers with visual impairments.'*
- 72 Generally, RIS-3703 referred to other documents including RSSB's 'Taking safe decisions' for guidance on how to consider implementing identified safety measures (including SFAIRP judgements). However, RIS-3703 also referred to railway group standard GIRT-7016 'Interface between Station Platforms, Track and Trains' (issue 5, dated March 2014) for requirements relating to mandatory signs, including platform markings. This stated:
- 'It is the intention of this document that alterations [...] to stations contribute to improving safety, and that alterations [...] to platforms contribute to improving safety by the eventual achievement of 'standard' platforms throughout Network Rail managed infrastructure (that is, platforms meeting the requirements of this document). However, this improvement in safety should be achieved without imposing unreasonable costs on the industry. [...] The [DfT Code of Practice] sets out requirements for the tactile surface'*
- 73 Network Rail standards (paragraph 69), which were issued in 2011, only refer to GIRT-7016 and not to RIS-3703. This possibly indicates why Network Rail mostly installs tactile surfaces in conjunction with other significant station work or (rarely) as part of pre-planned maintenance, rather than following consideration of whether it is reasonably practicable to install a tactile surface. Furthermore, the references to the DfT Code of Practice in both RSSB and Network Rail standards may have resulted in high reliance on accessibility (equality) related guidance (see paragraph 78), which does not explicitly cover safety obligations.

DfT's obligations and actions

- 74 DfT has a number of duties relevant to tactile surfaces:
- The Railways Act 1993, Section 71B, requires DfT to prepare and adopt a code of practice for protecting the interests of users of railway passenger services or station services who are disabled.
 - The Equality Act 2010, Section 22, provides a power for a Minister of the Crown to make regulations about the circumstances in which a particular step will be regarded as reasonable. This gives DfT the power to give railway undertakings guidance or direction relating to when they should make *'reasonable adjustments'*.

- EU Commission Regulation (EU) No 1300/2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility (referred to as the 'EU PRM TSI') required member states to progressively eliminate *'within a reasonable timescale, all identified barriers to accessibility by way of a coordinated effort to renew and upgrade subsystems and by deploying operational measures'*. To further this aim member states were required to adopt national implementation plans with a view to progressively eliminating all identified barriers to accessibility. The EU PRM TSI also specifies that visual and tactile warnings should be installed near the edge of new station platforms and existing station platforms subject to *'renewal or upgrading'*.
- 75 In November 2017 DfT issued the 'National Implementation Plan for the Accessibility of the UK Rail System for Persons with Disabilities and Persons with Reduced Mobility' (v0.8). The preamble to the document records that the plan was developed by the Department for Transport (DfT), Transport Scotland, the Welsh Government and the Department for Regional Development Northern Ireland in collaboration with a range of stakeholders including the Disabled Persons Transport Advisory Committee, ORR, Network Rail, train operators and user groups.
- 76 The plan stated that the UK was committed to improving the accessibility of the UK's trains and rail infrastructure. In particular, it highlights the funds made available since 2006 as part of three 'Access for All' schemes (around £600 million) and the National Stations Improvements Programme. It also identifies recent projects, such as Crossrail, which have been designed in accordance with current accessibility standards including the EU PRM TSI.
- 77 DfT has stated that the aim of the main 'Access for All' programme is to bring existing stations into broad alignment with current accessibility standards (see paragraph 78), and this would include installation of tactile surfaces at the edge of station platforms, where they are not already present. As of December 2020, more than 200 stations have been completed and around 98 further projects are at various stages of construction or development.
- 78 DfT publishes²⁹ 'Design Standards for Accessible Railway Stations' (referred to as the 'DfT Code of Practice'), version 4, dated March 2015. This states that its purpose is to *'[...] ensure that any infrastructure work at stations makes railway travel easier for disabled passengers'*, and that tactile surfaces must be installed when *'new work, upgrades or renewals'* are being undertaken on all station platforms on the British mainline network.

²⁹ Jointly with Transport Scotland.

79 A previous version (number 3, dated November 2011) of the DfT Code of Practice stated that its purpose is to ‘[...] assist [station operators] in making railway travel easier for disabled passengers’ and introduces the following (strongly recommended) national guidance:

‘the appropriate tactile surface should be installed along the entire length of a platform when any rebuilding or resurfacing takes place’; and

‘[...] Station operators have a responsibility to make reasonable physical adjustments at the stations they operate, even if they are not the site’s owner [...] For instance, this may include [...] costing (and considering the provision of, where reasonable) appropriate warning surfaces [...] at platform edge to alert people with visual impairments [...]’

80 The need to consider tactile surfaces as a ‘reasonable adjustment’ was removed between the 2011 and 2015 versions of the DfT Code of Practice. DfT has explained to RAIB that:

‘The target audience for the 2015 [version] was principally project managers and [therefore DfT] removed most of the more operational guidance (including guidance around ‘reasonable adjustments’) that was in the beginning of the previous version. The 2015 Code of Practice does not attempt to outline wider duties (ie under health and safety or equality legislation) for rail operators or Network Rail as these should be followed by them in addition to the DfT Code of Practice. Rather, it seeks to outline their duties under the EU TSI (alongside associated domestic standards and DfT guidance).’

‘[DfT] expect [tactile surfaces] to be costed into all projects. However, even though the rules have been around since 1993 many parts of Network Rail still see accessibility as an optional extra. We do not see this as a cost benefit issue. This is about [increased accessibility] and in the case of tactiles a safety issue.’

81 As such, the current (2015) version of the DfT Code of Practice guidance only considers accessibility obligations associated with the EU PRM TSI and not wider accessibility obligations such as ‘reasonable adjustments’ (as was the case in the 2011 version). Neither version considers the railway’s safety obligations. However, RSSB and Network Rail standards primarily refer to the DfT Code of Practice for determining when to install tactile surfaces.

ORR’s obligations and actions

82 The Railways Act 1993, Section 4, states that: ‘[...] ORR [shall] exercise the functions assigned to it [...] in the manner which [it] considers best calculated [...] to protect the interests of users of railway services [...] in particular, [...] persons who are disabled’. One of the ways ORR achieves this is by requiring station and train operators to establish an Accessible Travel Policy (ATP), previously referred to as Disabled People’s Protection Policy, as a condition of their operating licence (which is issued by ORR). ORR’s guidance ‘Accessible Travel Policy: Guidance for Train and Station Operators’, first published in July 2019, and subsequently updated in September 2020, is designed to be applied by station operators alongside the DfT Code of Practice and the EHRC Code of Practice.

- 83 ORR has stated that when it approves an operator's ATP it expects the operator to have considered making '*reasonable adjustments*' and, for a visually impaired person, this could include the provision of staff assistance (see paragraph 108). ORR also advised that the installation of tactile surfaces is only triggered when work is carried out at a station (as described in the DfT Code of Practice).

Factors associated with the emergency service response

84 Provision of medical care to the person was delayed because emergency services staff were unable to confirm that it was safe to access the track until a Rail Incident Officer had arrived at the scene.

Background

- 85 When the emergency services need to go on or near the railway, Network Rail sends a Rail Incident Officer (RIO) to the scene as part of its incident response. The RIO will act as Network Rail's operational commander during an incident and can make arrangements (such as stopping trains and ensuring that traction current power is switched off) to enable emergency services staff to safely go on or near the railway.
- 86 In some cases, for example where there is a need to preserve life, emergency services staff need immediate access to the tracks. In such circumstances, if a RIO has not arrived at the scene, Network Rail procedures (see paragraph 90) allow this access to be authorised remotely, by communication between Network Rail and emergency services control rooms. However, during the emergency services response to this accident, ambulance service staff did not go onto the track to treat the person who had been struck by the train until after the RIO had arrived at the scene. This was around 12 minutes after LAS staff had first arrived on the platform and identified where the person was on the track.
- 87 The post-mortem report stated that the cause of death was multiple traumatic injuries. In response to a question from RAIB, the pathologist who wrote the report stated that the mechanism of death was blood loss. During LAS's investigation into the incident response, LAS clinical staff stated that the delay in gaining access to the person was unlikely to have affected his chances of survival. However, RAIB notes that any delay in these circumstances is likely to be detrimental and should be avoided in any future incident response.

Sequence of events

- 88 The post-accident events and the actions taken around traction power being turned off and emergency services staff accessing the track, are set out in table 1. The timings are given to the nearest minute and have been determined using information obtained from station CCTV, incident logs, voice recordings of conversations and witness statements.

Time	Event
19:05	Train 1K60 strikes the person.
19:06	The driver of train 1K60 makes an emergency call to the signaller requesting traction current power to be switched off and emergency services to attend the accident.
19:08	A second person on the platform calls 999. She reports that the person is directly underneath train 1K60 and is talking to her.
19:09	The signaller arranges for the power to be switched off, via the electrical control operator.
19:12	The 999 caller tells the LAS call handler that the train driver has stated that the power is off. This is noted on LAS incident logs.
19:13	LFB control calls Network Rail control to inform them that its staff are travelling to the scene. Network Rail control informs LFB that the power has been switched off.
19:15	BTP control room staff note the limits of the electrical isolation on Network Rail's incident log (which they have online access to) and record this on the BTP log.
19:16	LFB control tells LFB on-scene staff (who are in transit) that the power is off and that the estimated time of arrival of the RIO is 10 minutes.
19:17	LFB and LAS staff arrive on the platform. LAS staff can be seen kneeling next to the train around the location of the person. The LAS staff find the person is unconscious.
19:18	Driver of 1K60 calls the signaller again to confirm that power is off and can be heard communicating this to emergency service staff on-scene.
19:18	BTP staff arrive on the platform.
19:19	LFB on-scene call LFB control staff to request the name of person who states that the power is off.
19:20	BTP on-scene ask BTP control staff if power is off and BTP control state there is nothing on their logs.
19:22	LAS operational commander on site calls LAS control asking whether they could confirm that the power is off but is told that this needs to be confirmed by staff on scene.
19:22	RIO arrives at station car park and calls Network Rail control to report his arrival.
19:22	LFB control calls Network Rail control to request the name of the person who states that the power is off and is told that the RIO is arriving on site and will be best placed to speak to on-scene staff.
19:25	LFB control call LFB on-scene to advise them that the RIO is on-scene and they should liaise with him directly.
19:25	The Network Rail RIO arrives on platform 1 and begins talking to BTP and LAS staff.
19:26	LAS staff on-scene observe that the person's breathing has stopped.
19:29	The RIO calls Network Rail control to request confirmation that power is off and receives this. LAS and LFB staff begin accessing the track after this point to treat and evacuate the person to the platform.
20:00	The person is declared deceased by a doctor on scene.

Table 1: Timings for sequence of events relating to the emergency service response after the accident

- 89 Witness evidence indicates that in the period between the arrival of the emergency services on the platform at around 19:17 hrs, and them beginning to access the track at 19:29 hrs, none of the people present took the lead in establishing whether it was safe for them to go onto the track. This was probably because some on-scene staff were expecting the Network Rail RIO to arrive very soon and were prepared to wait for him to confirm the access arrangements.
- 90 Emergency service training and procedures are reliant upon a mix of current and superseded (dated 2004) versions of Network Rail procedures. Network Rail's current National Operational Procedure 4.10 'Emergency services personnel on or near the line' (issue 2, dated June 2018) includes an appendix 'Emergency services rail incident protocol' which is shared with the emergency services. This outlines the arrangements if the RIO has not arrived on site (paragraph 86) and also references Network Rail's document 'Railway Safety for the Emergency services' (dated 2017), which is also shared with the emergency services. This document states '[...] *the safest option is to ask Network Rail control to switch off the power, which can be done within a few minutes but in practice will not be done until a railway person arrives on site*'. Witness evidence indicates that emergency service staff had become accustomed to waiting for a 'railway person' to arrive.
- 91 A RIO is not a 'blue light' emergency responder and, as such, their response times will almost certainly be slower than those of the emergency services. It is therefore critical to ensure that robust and jointly understood procedures are in place to ensure timely access to the track by emergency services personnel, to preserve life when a RIO is not present.

BTP operational response and procedures

- 92 At around 19:20 hrs BTP on-scene staff told their control room that the signaller had stated that the power was off and asked the control room to confirm this. The information from the signaller had possibly been passed to BTP on-scene staff by the driver of train 1K60 at 19:18 hrs. BTP control room staff replied that there was nothing on their logs about power off. However, BTP control room staff had identified (from Network Rail logs) that the emergency switch-off had been confirmed at 19:10 hrs, and this was recorded on the BTP logs at 19:15 hrs.
- 93 The BTP operational commander stated that he had frequently been to incidents involving people under trains who needed urgent medical care. However, he could not recall any instance where emergency services staff had deployed under a train without a RIO being present.
- 94 Witness evidence indicates that other emergency services staff generally rely on advice from BTP staff when seeking confirmation that power is off. BTP does not have procedures or guidance relating to accessing the track when a RIO is not present. However, operational staff training includes what to do when there is an 'imminent danger of death' and a RIO is not present. In this situation BTP staff are trained to seek confirmation that it is safe to access the track (including whether power is off) from either:
- BTP control (who will arrange switch off via Network Rail control); or
 - by directly contacting a Network Rail signaller (via, for instance, a lineside telephone or a train driver).

LFB operational response and procedures

- 95 During the call between LFB and Network Rail control staff at 19:13 hrs, when LFB control were told that the power was off they stated *'Ok, I'll let them know but we'll [...] need confirmation from your RIO don't we, on arrival?'*. Network Rail control staff then explained that if there was a risk to life staff could access the track without a RIO being present. LFB control room staff did not then ask for the name of the person who stated that the power was off (see paragraph 97) and there is no evidence to suggest that Network Rail was aware of the need to provide this, as it is not required in Network Rail's emergency procedures.
- 96 The LFB operational commander recalled hearing a message sent by LFB control at 19:15 while she was travelling to the scene. She initially understood the message to mean that the traction power was off. However, there was subsequently confusion between LFB staff on-scene about the meaning of the message. Given this confusion, conflicting information received from other emergency services staff on-scene and the *'imminent'* arrival of the RIO (estimated by LFB control to arrive at 19:25 hrs), she judged it safest to await his arrival. She was unaware of subsequent communication between LFB staff on-scene and control requesting the *'name of the person who states the power is off'*.
- 97 LFB policy is unclear whether the name of a person is needed when a RIO is not on-scene. LFB policy, dated October 2019, stated *'Only the named officer of the Brigade and the rail controller who agreed traction current isolation can agree the restoration of the traction current.'* LFB has stated that this indicated that the name of the person stating that the power is switched off was required. LFB has told RAIB that this was 'legacy wording' and would be updated as part of its 'continuous review of policy', which would make the requirements clearer. However, although LFB policy has been rewritten since the accident, in March 2020, it still contains this unclear wording.
- 98 An email to all staff from the LFB Assistant Commissioner (Operational Resilience and Special Operations Group) sent in August 2019, but not included in the policy document dated October 2019, stated that: *'There have been a number of occasions recently where actions have been delayed when attending incidents on the rail network [...] As soon as the [RIO] confirms power off [...] and all trains stopped, crews can go trackside and not wait for the message to be sent to Control, as this could delay lifesaving actions.'* However, this interim guidance did not state whether the name of the person was required when a RIO was not on-scene. The March 2020 re-write of the policy does include this guidance.
- 99 The subsequent confusion between LFB staff on-scene around whether LFB control had stated the power was off may be explained by different interpretations of LFB policy.

100 LFB policy relies upon National Operational Guidance from the National Fire Chief's Council (NFCC) which states *'If the [RIO] is not at the scene of the incident, they will need to be contacted via the fire control room, requesting proportionate control of the railway – the incident commander should await confirmation of the permit to work³⁰ before commencing the rescue activity'*. RAIB notes that this is not in accordance with Network Rail emergency procedures, and LFB control would need to contact Network Rail control, not the RIO.

LAS operational response and procedures

101 The LAS operational commander attempted to request confirmation of whether power was off from his control at 19:22 hrs, but he was told that this needed to be confirmed by staff on-scene. The LAS control room staff did not follow LAS procedures for 'Responding to Railway Incidents', dated March 2019, that states *'In the absence of a RIO, [the LAS control room staff] should contact the Network Rail Control Centre directly to confirm power is off/isolated and trains are stopped'*. The LAS operational commander did not challenge control room staff on this as he assumed that they would understand LAS procedures better than himself.

Joint working, information sharing and safety critical communications

102 In reviewing the voice recordings of communications between emergency services staff, RAIB noted a poor standard of safety critical communications throughout. This possibly contributed to the uncertainty about the status of the electrical power during the response to this accident. Good safety critical communications will clarify understanding and subsequent actions, which is particularly important when considering procedures that rely upon joint working between different organisations.

103 It is clear that the staff at the scene all understood that the person was in a life-threatening situation, and their main priority was to obtain confirmation that they could access the track to assist. Each service attempted individually to confirm that the power was off prior to the RIO's arrival but were unable to do so.

104 The LAS operational commander stated that he would commit staff trackside if given information that it was safe to do so by LFB or BTP staff (via their control rooms). However, both BTP and LFB operational commanders stated that they would only rely upon information received directly from their own control room. Each emergency service procedure does not cover how operational commanders should treat information received from other services. If each service relies on its own information only, this could result in multiple calls to Network Rail control room staff and avoidable delays in accessing the track.

³⁰ The NFCC guidance references the RSSB standards catalogue. The catalogue includes the railway rulebook (GE/RT8000) which includes key points summary booklets to cover safety requirements in certain track safety areas. Network Rail's 'Working near or adjacent to a DC conductor rail' includes a requirement to complete a 'conductor rail permit' (a physical form) in non-emergency situations if the risk of making contact with the conductor rail cannot be reduced to a tolerable level. However, the booklet also states that in emergency situations switch off should be achieved via a call to the ECO.

- 105 An important element of the emergency services' response to this accident is that information (that the power had been turned off at Eden Park station) was not successfully transferred between Network Rail and emergency services staff on scene. For this information to be successfully transferred, emergency services staff needed to have high levels of assurance (in terms of both clarity and certainty) that the information they were provided with could be acted upon.
- 106 The Joint Emergency Services Interoperability Principles (JESIP) sets out a joint doctrine that seeks to improve interoperability between the UK emergency services. Although it is often referred to in relation to responses to major incidents, JESIP is scalable and can be applied to any type of multi-agency incident. As a category 2 responder the principles within JESIP will also apply to Network Rail.
- 107 The Joint Decision Model (figure 6) is a key principle underpinning JESIP. This seeks to resolve how commanders from different responder agencies can bring together available information, reconcile different priorities and make effective decisions together. The pentagon at the centre of this model reminds commanders that all joint decisions should be made with reference to the overarching aim to save lives and reduce harm. The first and second steps, to gather information and assess risks, are reliant upon staff sharing information, establishing shared situational awareness and a sustained effort to reach a common understanding of risks between organisations.

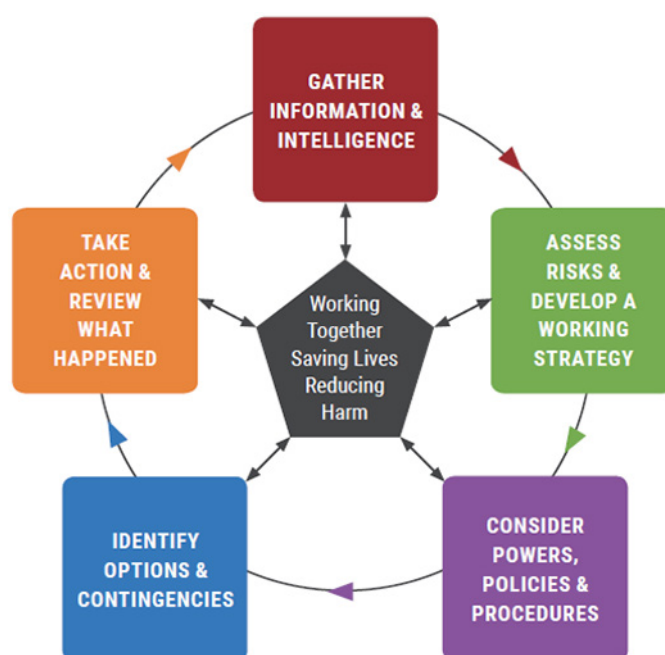


Figure 6: The Joint Decision Model, extracted from 'Joint Doctrine, the interoperability framework', edition 2 dated July 2016.

Observations

Passenger assistance and alternative travel provision

108 The low awareness and satisfaction levels linked to the railway's arrangements for the assistance of disabled passengers and alternative travel provision means that these measures should not solely be relied upon as an interim or permanent alternative to the installation of tactile surfaces.

109 As required by ORR, Southeastern Railway's Disabled People's Protection Policy includes arrangements to provide staff assistance or alternative travel for disabled people if they cannot access stations. Southeastern Railway has stated that, as Eden Park station was unstaffed at the time of the accident, if the person had requested staff assistance he would have been provided with alternative transport, in this case a taxi to his destination. However, Southeastern Railway could find no records of the person requesting such assistance previously, and witness evidence suggests that the person was unaware of this option.

110 The person is known to have travelled by train regularly, both on his own and assisted by friends and family. RNIB and ORR documentation^{31,32} suggests that the majority of visually impaired people wish to travel independently and spontaneously and 'turn up and go', without the need for pre-booking assistance or alternative travel, in the same way as the general population. There is no evidence that the person would have chosen to arrange to travel via a taxi (provided by Southeastern Railway) had he been aware of the option.

111 Passenger assistance is listed in a safety context in RSSB's PTI risk standards alongside tactile surfaces (paragraph 71). Additionally, ORR has stated that where station operators do not have the contractual authority to implement an identified mitigation, such as with tactile surfaces, they must implement other mitigations, such as additional staffing, to manage the risk in the interim. RAIB has been unable to locate any relevant industry guidance covering what interim mitigations should be considered in the absence of tactile surfaces.

112 However, ORR documentation³³ on passenger assistance states that 70 percent of potential users knew nothing about it. Additionally, although ORR research³⁴ found that when passenger assistance was provided as planned, users were '*overwhelmingly positive*' about the experience, it also found that almost all users had experienced an occasion when pre-booked staff assistance had not turned up. As such, many disabled people had reduced confidence in the service and the research concluded that this confidence needed to be rebuilt. RNIB research³⁵ found that only 13 percent of visually impaired people reported their booked assistance arriving as planned. Additionally, a third of visually impaired people (who knew about passenger assistance) said they could not travel by rail as frequently as they wanted to because they had found booked passenger assistance did not turn up, and a fifth said that railway staff who were available were not helpful.

³¹ Assisted Travel Advisory Group (ATAG) terms of reference, dated 2018.

³² 'RNIB response to the Office of Road and Rail's Consultation on changes to guidance for train and station operators on Disabled People's Protection Policy', published 2019.

³³ See footnote 31.

³⁴ ORR research 'Passenger assistance – deep-dive qualitative research', dated December 2017.

³⁵ 'RNIB response to the Department for Transport's Transport Accessibility Action Plan', published 2017.

Information

113 Information about the presence of tactile surfaces at station platforms, to enable visually impaired people to make decisions about safe independent travel on the mainline railway, is not made publicly available by station operators.

- 114 Disabled people need information about accessibility features at stations to plan safe independent travel. Information (for example, about step-free access and assisted travel) is made publicly available by station operators to achieve this, but information relating to the presence of tactile surfaces at station platforms is not.
- 115 Unlike other accessibility features such as step-free access, the absence of tactile surfaces at the edge of platforms would not physically prevent access. However, not making information about the presence of tactile surfaces at platforms publicly available means that visually impaired people (when travelling independently) may be unsure whether the platform they are on is fitted with tactile surfaces, which could increase their risk of falling from the platform.
- 116 ORR's Accessible Travel Policy dictates the information that station operators are required to make publicly available about the accessibility of their stations. During its consultation for the July 2019 version of the guidance on the policy, ORR received comments from a number of organisations relating to this issue including:
- DfT stated: *'There is [...] scope for wider coverage of features which support the needs of people [...] such as sight loss, including provision of tactile paving in and around stations [...] Providing this additional information would help people with sight loss make informed travel decisions and improve safety. As a minimum, this document should make passengers with sight loss aware of platform edges where there is no tactile paving.'*
 - RNIB stated: *'ORR should require as a minimum that information on platform edges with and without warning tactile is included in any station accessibility classification, so to ensure parity of blind and partially sighted people's safety and independence when travelling by train.'*
- 117 ORR has told RAIB that its work on publishing the revised 2019 version of the guidance, and subsequently updating it in 2020, focused on improvements in a series of specific areas, including the quality and reliability of existing station accessibility information. ORR confirmed that it was not its intention to undertake a fundamental review of the station information provided. As such, consultee comments about the provision of tactile information were considered to be beyond the scope of the update.

RSSB's risk management tool

118 The RSSB tools used to manage risk at the platform-train interface do not include adequate consideration of the risk to disabled passengers.

- 119 When conducting PTI risk assessments, station operators (including Southeastern Railway) use a risk assessment tool provided by RSSB to help them collect and analyse relevant data. The primary aim of the tool is to support assessors in their consideration of effectiveness of the risk controls, and identify areas where further safety mitigation measures are required.

- 120 To achieve this aim, the assessor is asked to consider a set list of risk controls and score their effectiveness. The tool then weights each score to reflect the relative importance of each control, and these weightings have been developed by RSSB in collaboration with railway industry experts. The tool then amalgamates the weighted risk control scores by thematic (or hazard) area and provides a percentage risk control for each area. It also lists each risk control area where the weighted score reflects the biggest scope to improve the overall risk control percentage score.
- 121 RAIB has found that a platform not fitted with any platform markings (including painted yellow/white lines or tactile surfaces) could obtain a 'risk control score' of 92 percent for the hazard 'fall from platform to track'. However, research has shown that visually impaired people are exposed to significantly higher levels of individual risk than the general public, and that tactile surfaces provide a critical safety benefit for these people (paragraphs 45 and 47). As such, this score does not reflect the extent to which the safety of visually impaired passengers is affected by platform markings, including tactile surfaces.
- 122 The RSSB risk assessment tool includes a free text box for the assessor to complete titled 'Passenger type[s] that use the station' and this was left blank in Southeastern's (post-accident) risk assessment for Eden Park station (paragraph 51). The tool's user guide does not specify what information should be included in this section, but highlights that while the information provided does not affect the risk control scores (calculated by the tool), it can be an important source of information for assessors and decision makers. The user guide does not include any guidance relating to managing the risks that disabled people are exposed to at the platform-train interface.
- 123 Under a heading of typical passenger groups, 'RIS-3703-TOM'³⁶ 'Passenger Train Dispatch and Platform Safety Measures' asks:
- who are the main passenger groups and what behaviours take place?
 - who are the 'at risk' passengers?
 - what arrangements are in place to help manage and support passengers?
- 124 The SMIS data considered in this report does not indicate the presence or condition of tactile surfaces, making it impossible to judge their effectiveness solely on this basis (see paragraph 47). Additionally, RAIB's investigation into accidents at Southend and Whyteleafe stations involving a wheelchair and a pushchair rolling onto the track ([RAIB Report 17/2014](#)), identified that incidents and accidents recorded on SMIS were not usually subject to detailed investigation, and only one investigation identified the slope of the platform as a possible causal factor. This resulted in a lack of awareness in the industry about the extent of the risk.
- 125 RAIB's investigation into an accident at Twyford station involving a wheelchair contacting a passing train, due to aerodynamic forces generated by the train ([RAIB Report 01/2017](#)), identified that RSSB's research and subsequent guidance did not address the risks posed by the aerodynamic effects of passing trains to wheelchair users on station platforms.

³⁶ Both version 3 (dated September 2017) which was current at the time of the accident, and version 4 which was updated in March 2020.

Summary of conclusions

Immediate cause

126 The person fell from the platform edge as the train was arriving at the platform (paragraph 27).

Causal factors

127 The causal factors were:

- a. The person moved near to, and fell from, the platform edge, probably because he was unaware that he was close to this edge (paragraph 30).
- b. The platform edge was not fitted with tactile surface markings intended to assist visually impaired people. This is a possible causal factor (paragraph 36, **Recommendations 1 and 2**).

Risk management

128 The combined effect of DfT, ORR, RSSB, Network Rail and Southeastern Railway's processes and guidance means that safety-based justifications for platform edge markings (including tactile surfaces) to aid visually impaired people are not always effectively considered (paragraph 56, **Recommendations 1 and 2**).

Factors associated with the emergency service response

129 Provision of medical care to the person was delayed because emergency services staff were unable to confirm that it was safe to access the track until a RIO had arrived on-scene (paragraph 84, **Recommendation 6**).

Additional observations

130 The low awareness and satisfaction levels linked to the railway's arrangements for the assistance of disabled passengers and alternative travel provision means that these measures should not solely be relied upon as an interim or permanent alternative to the installation of tactile surfaces (paragraph 108, **Recommendation 3**).

131 Information about the presence of tactile surfaces at station platforms is not made publicly available by station operators to support visually impaired people in planning their journeys and travelling safely (paragraph 113, **Recommendation 4**).

132 The RSSB tools used to manage risk at the platform-train interface do not include adequate consideration of the risk to disabled passengers (paragraph 118, **Recommendations 1 and 5**).

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

- 133 Following the accident, Southeastern Railway explored options for interim mitigations for platforms where tactile surfaces had not been installed. Subsequently, it stated to the People on Trains Stations Risk Group (PTSRG³⁷) that the only available interim mitigation (pending installation of tactile surfaces) at unstaffed stations was 'pre-booked assistance'. There is no evidence to suggest that this conclusion was challenged at the meeting.
- 134 Network Rail Southern region funded the installation of tactile surfaces at the edge of station platforms throughout the Kent and Sussex routes in May 2020, and this work is scheduled for completion by April 2022. Eden Park station has now been fitted with platform markings to assist visually impaired people (including tactile surfaces).
- 135 In October 2020, LAS issued a safety bulletin to remind all staff of the procedures associated with confirming that power is off when responding to incidents on the mainline railway.
- 136 LFB reports that it has updated its policy on confirming that power is off, to remove ambiguity, and reinforced its procedures that control room staff use when contacting Network Rail.

³⁷ The PTSRG is a cross-industry group (facilitated by RSSB) whose remit includes collaboration on risks to passengers in stations on the mainline railway.

Previous RAIB recommendations relevant to this investigation

137 The following recommendations, which were made by RAIB as a result of its previous investigations, have relevance to this investigation.

Recommendations that are currently being implemented

[Accidents involving a wheelchair rolling onto the track at Southend Central, 28 August 2013, and a pushchair rolling onto the track at Whyteleafe, 18 September 2013 \(RAIB Report 17/2014\), Recommendation 4](#)

138 The following recommendation relates to the recording and investigation of incidents and accidents involving disabled people and identification of features of railway infrastructure as potential causal factors.

Network Rail, in consultation with Station Facility Operators and RSSB, should implement a process to improve the investigation and recording of roll-off incidents and the way in which data is shared. Particular attention should be paid to the following areas:

- *improvements in capturing and recording incidents involving roll-off type events, including the identification of the key factors that caused the roll-off such as the presence of a slope towards the railway on the platform;*
- *a review of previous roll-off incidents and accidents (covering at least the last five years) to identify those that may have been solely attributed to 'user error' or 'trespass', including establishing whether there may have been other causal factors such as a slope at the location concerned; and*
- *a review of how intelligence on roll-off incidents should be shared within and between SFOs and Network Rail as an input to decisions on the nature and content of improvement works at stations.*

139 ORR reported to RAIB on 10 August 2015 that Network Rail had outlined the actions to be taken in response to the recommendation. ORR stated it would advise RAIB when actions to address this recommendation had been completed and RAIB has subsequently received no further update.

Recommendations that are reported to have been implemented

[Accidents involving a wheelchair rolling onto the track at Southend Central, 28 August 2013, and a pushchair rolling onto the track at Whyteleafe, 18 September 2013 \(RAIB Report 17/2014\)](#), Recommendation 3

140 The following recommendation relates to the consideration of interim measures associated with improving the safety of disabled people on station platforms.

As an interim measure, pending the outcome of the research identified in recommendation 2,³⁸ the Association of Train Operating Companies should, in consultation with passenger groups including those representing the interest of disabled passengers, review the findings of this report and seek to understand the ways in which the risk of wheelchairs and pushchairs rolling onto the track can be more effectively managed by operators. This review should include consideration of:

- *locations where passengers may need to remove both their hands from a pushchair or wheelchair because of the nature of another task to be performed (eg at a ticket machine or shop/kiosk);*
- *reference to any existing good practice in this area; and*
- *measures that could most effectively influence the behaviour of passengers using wheelchairs and pushchairs on station platforms.*

The output of the review should be consolidated into suitable guidance for train operators.

³⁸ Recommendation 2 (of [RAIB report 17/2014](#)) intended that the rail industry should understand the point at which platform slope becomes sufficiently steep for it to be more likely than not that an occupied wheelchair or pushchair without a brake applied would roll away. Additionally, that the rail industry should consider the most appropriate methods of influencing the behaviour of passengers to minimise this risk. ORR reported to RAIB on 10 August 2015 that Network Rail had outlined the actions to be taken in response to the recommendation and that ORR will continue to monitor implementation.

Background to RAIB's Recommendations 1 and 2

- 141 The evidence reviewed in this report suggests that visually impaired passengers who wish to travel by train are exposed to substantially greater risk at station platforms than the general population. Additionally, research has shown that tactile surfaces are effective at reducing this risk and provide a crucial aid to visually impaired people. Despite this, the overall result of the railway's current practices is a patchwork of different approaches and conflicting understanding about when tactile surfaces should be installed. Network Rail's central buildings and architecture team saw no need to move beyond the wording of their standards unless external funding (for example from a TOC or DfT) was made available. This resulted in tactile surfaces primarily only being installed in conjunction with other major station work across the mainline rail network. In comparison, Network Rail's Southern region had committed to installing tactile surfaces at all of its stations (where not already installed), which goes beyond this central standard and is currently the only instance of this type of programme.
- 142 Although it is good practice to look for opportunities to make safety improvements when undertaking changes, the railway must also systematically assess measures to increase safety and accessibility based on their own cost-effectiveness. As such, the installation of tactile surfaces should also be considered as a specific activity at locations where this is justified in terms of safety risk reduction and accessibility improvements.
- 143 There is a strong case for reviewing the current policy on the installation of tactile surfaces for the following reasons:
- they help protect a significant population of passengers, visually impaired people, who are more reliant upon the railway but are placed at greater risk than the general population
 - enabling safe travel by the visually impaired improves accessibility to public transport in line with government policy
 - tactile surfaces are known to be an effective way of demarking the platform edge, so providing a safety benefit to all passengers.
- 144 Given the large number of other stations without tactile surfaces, it is not possible to say whether a more proactive approach to the assessment and management of risk to the visually impaired would have led to the installation of a tactile surface on the platform edge at Eden Park station before the accident. However, a greater focus on managing the safety of passengers placed at higher risk, and a greater willingness to consider the adequacy of existing measures, has the potential to significantly improve the safety of visually impaired people when accessing the railway.

Recommendations

145 The following recommendations are made:³⁹

- 1 *The intent of this recommendation is to ensure that the rail industry has an improved process for considering when to install tactile surfaces at the edge of station platforms. Implementation of this recommendation is expected to be based on information already available to the UK rail industry and not delayed while information is collected by implementation of Recommendation 5.*

The Department for Transport and Network Rail (in consultation with Rail Delivery Group and RSSB) should create a coherent policy and associated process (including effective risk management) for establishing when tactile surfaces should be provided at the edge of station platforms. This process should include:

- explicit consideration of safety and accessibility for all passengers;
- determining when installation of tactile surfaces is justified at particular locations, taking account of total passenger usage and any location-specific circumstances likely to affect usage by passengers at greater risk (including visually impaired people);
- identifying stations where installation of tactile surfaces would give greatest benefit;
- identifying and remedying locations where tactile surfaces have been installed incorrectly (including where they have been installed partially along the length of a platform); and
- ensuring that analysis tools used to determine risk levels at the platform-train interface include adequate consideration of passengers at greater risk (including visually impaired passengers).

This recommendation may also apply to train operating companies with franchise agreements that include 'full repairing and insuring lease' asset management arrangements (paragraphs 127b, 128, 132).

³⁹ 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, Recommendations 1 and 2 are addressed to the Department for Transport; Recommendations 1, 2, 3, 4, 5 and 6 are addressed to the Office of Rail and Road; and Recommendation 6 is addressed to The British Transport Police, National Fire Chiefs Council, Association of Ambulance Chief Executives, London Fire Brigade and London Ambulance Service, to enable them to carry out their duties under regulation 12(2) to:

- (a) ensure that recommendations are duly considered and where appropriate acted upon; and
- (b) report back to RAIB details of any implementation measures, or the reasons why no implementation measures are being taken.

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

- 2 *The intent of this recommendation is to ensure that tactile surfaces justified by work done to implement Recommendation 1 are installed in a timely manner across the UK rail network. It is not expected that the installation programme will rely on data collected by implementation of Recommendation 5.*

Network Rail and the Department for Transport (in consultation with train operators) should develop and progress a time-bound programme to install tactile surfaces at stations where justified by safety benefits. The programme should take account of priorities based on identification of locations where installation would give greatest benefit (paragraphs 127b, 128).

This recommendation may also apply to train operating companies with franchise agreements that include ‘full repairing and insuring lease’ asset management arrangements.

- 3 *The intent of this recommendation is to ensure that the rail industry identifies and implements appropriate mitigations to manage the risk of visually impaired people falling from the edge of station platforms that are not yet fitted with tactile surfaces.*

The Rail Delivery Group, assisted where necessary by RSSB, train operating companies and passenger groups representing visually impaired people, should research and develop means of reducing the risk associated with visually impaired people using station platforms where tactile surfaces have not yet been installed (paragraph 130).

- 4 *The intent of this recommendation is to ensure that visually impaired people have access to the information they need for safe independent travel.*

The Office of Rail and Road should amend its ‘Accessible Travel Policy’ guidance for station operators, to ensure operators publish information on whether station platforms they manage are fitted with tactile surfaces (paragraph 131).

- 5 *This recommendation is intended to ensure that, in the long term, the UK rail industry has sufficient information, guidance and decision-support tools to fully assess and manage safety risks associated with use of the railway by disabled people.*

RSSB, assisted where necessary by train operating companies, Network Rail and passenger groups representing disabled⁴⁰ people, should develop and implement means of collecting and analysing the data needed to properly understand and manage the safety risks associated with disabled people travelling on the UK railway. This information should be used to improve railway guidance and decision-support tools to better understand and manage the risks associated with use of the railway by disabled people (paragraph 132).

⁴⁰ As defined in section 6 of the Equality Act 2010.

- 6 *The intent of this recommendation is to ensure that the emergency services have improved processes for requesting and confirming safe access to railway infrastructure where this is urgently needed to preserve life, but appropriate Network Rail staff are not present on-site to facilitate this access.*

The British Transport Police, National Fire Chiefs Council, Association of Ambulance Chief Executives, London Fire Brigade and London Ambulance Service (facilitated, co-ordinated and informed by Network Rail) should review and improve their processes for requesting and confirming that no trains are moving and electrical power supplies are switched off when Network Rail staff are not present on-site. This should include the consideration of:

- individual service procedures, guidance and training;
- joint working arrangements that align with Joint Emergency Services Interoperability Principles, including the Joint Decision Model; and
- procedures and training to promote high standards of safety critical communication and decision making.

(paragraph 129)

Appendices

Appendix A - Glossary of abbreviations and acronyms

BTP	British Transport Police
CCTV	Closed-circuit television
DfT	Department for Transport
LAS	London Ambulance Service
LFB	London Fire Brigade
ORR	Office of Rail and Road
OTDR	On-train data recorder
PTI	Platform-train interface
RAIB	Rail Accident Investigation Branch
RIO	Rail Incident Officer
RNIB	Royal National Institute of Blind People
RSSB	A not-for-profit company owned and funded by major stakeholders in the railway industry, and which provides support and facilitation for a wide range of cross-industry activities. The company is registered as 'Rail Safety and Standards Board', but trades as 'RSSB'.
SFAIRP	So far as is reasonably practicable
SMIS	Safety Management Intelligence System
TOC	Train operating company
TRL	Transport Research Laboratory

Appendix B - Investigation details

RAIB used the following sources of evidence in this investigation:

- information provided by a witness
- information from the data recorder fitted to the train
- CCTV recordings from cameras at Eden Park station
- site photographs, videos and measurements
- weather reports near the site
- the platform-train interface risk assessment for Eden Park station
- accident statistics for the mainline railway
- information provided by BTP, DfT, LAS, LFB, ORR, Network Rail, and Southeastern Railway staff
- recordings of post-accident voice communications between Network Rail and the emergency service staff
- signalling data
- guidance, standards, research and other documentation relating to managing safety and accessibility at mainline rail stations
- a review of previous RAIB investigations that had relevance to this accident.

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