

Rail Accident Report



Dangerous occurrence involving a portable access ramp at Norwood Junction station 1 July 2025

Report 09/2026
June 2026

This investigation was carried out in accordance with:

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

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Preface

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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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Dangerous occurrence involving a portable access ramp at Norwood Junction station, 1 July 2025

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Summary

At around 09:52 on Tuesday 1 July 2025, a London Overground passenger train departed from Norwood Junction station with a portable access ramp attached. The ramp collided with the end-of-platform barrier and fell beside the track. No injuries were caused, although a member of station staff and a passenger needed to take action to avoid the ramp as it travelled down the platform. The portable access ramp was damaged beyond repair, and minor damage was caused to the train as a result of the accident.

RAIB's investigation found that a portable access ramp being attached at a doorway did not prevent the train's doors from closing or from traction power being taken, because the ramp was of the incorrect type. Platform staff were unaware that the ramp they were using was of the incorrect type for the train involved. The correct ramp had not been available since September 2021 and none of the station checks in the period up to the accident had identified this.

The train driver departed from Norwood Junction station with the ramp still attached as they believed it was safe to dispatch the train. The driver's safety checks during dispatch were ineffective. Although some other factors may have been present, this was probably because the driver was distracted as they were making a mobile phone call at the time the train departed.

Efforts by platform staff to stop the train were ineffective because the warning signals they were using could not be seen by the driver, due to the cropped image presented to them on their in-cab monitor.

There were three underlying factors. Arriva Rail London, the operator of the London Overground concession at the time of the accident, had not identified the risks associated with using portable access ramps. Processes for checking portable access ramps at stations did not identify the appropriate ramp for the relevant rolling stock. Arriva Rail London's processes for mitigating the risk of driver inattention caused by the use of mobile devices had also not been sufficiently effective.

RAIB has made six recommendations. The first two recommendations are addressed to First Rail London, the current operator of the London Overground concession, and aim to better manage the use of portable access ramps. The third and fourth recommendations, addressed respectively to the Department for Transport and the Rail Safety and Standards Board, aim to address the legislation and regulations around portable access ramps. The fifth and sixth recommendations, addressed respectively to the Rail Safety and Standards Board and the Office of Rail and Road, aim to address the use of mobile devices by drivers.

RAIB also identified two learning points. The first is that railway staff are reminded of the risks presented by distracting personal issues, and the importance of seeking help from their employer. The second is to remind train drivers that mobile devices are a major source of distraction and that their use is not permitted during operations.

Introduction

Definitions

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

The accident

Summary of the accident

- 3 At around 09:52 on Tuesday 1 July 2025, train reporting number 9D18, the 09:46 passenger service from West Croydon to Highbury & Islington, departed from Norwood Junction station (figure 1) with a portable access ramp still attached to it. The ramp was subsequently dragged along the platform by the train and a member of station staff and a passenger needed to take action to avoid it. The ramp collided with the end-of-platform barrier (figure 2) and came to rest beside the track.
- 4 A member of staff on the platform was very close to the ramp as it began to move, but no injuries were reported as a result of the accident. Minor damage occurred to a door and the outer bodywork of train 9D18 and the portable access ramp was damaged beyond repair (figure 3). Platform 1 at Norwood Junction was closed for approximately 25 minutes to allow the ramp to be recovered.

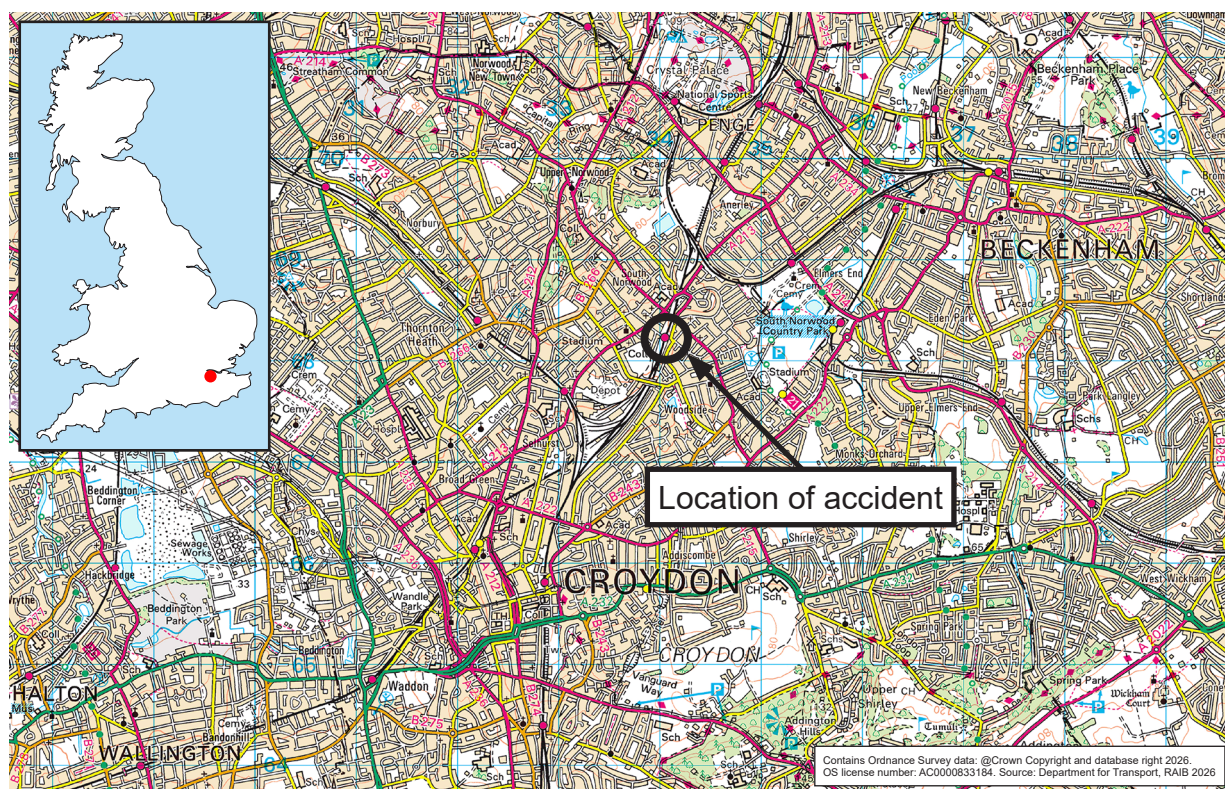


Figure 1: Extract from Ordnance Survey map showing location of the accident at Norwood Junction.



Figure 2: Portable access ramp attached to train 9D18 as it departed Norwood Junction station (left), ramp (circled in red) impacting the barrier at the end of the platform (right). Images are derived from the bodyside CCTV cameras fitted to the train (courtesy of ARL).



Figure 3: Damage (circled) to a door on train 9D18 (left), to side panelling (middle) and the portable access ramp (right) (courtesy of ARL).

Context

Location

- 5 Norwood Junction station is located 8 miles and 55 chains (a chain is 22 yards or around 20 metres in length) south from London Bridge station, in the London Borough of Croydon. The station is served by London Overground's Windrush line, as well as Southern and Thameslink trains. The Windrush line primarily operates from West Croydon or Clapham Junction to Highbury & Islington. The railway at Norwood Junction station is provided with traction power by third rail conductor equipment electrified to 750 V DC.

Organisations involved

- 6 Network Rail is the owner and maintainer of the track and station infrastructure. Signalling in the Norwood Junction area is controlled from the Three Bridges rail operating centre.

- 7 Transport for London (TfL) is the integrated transport authority for London and is responsible for managing the day-to-day operation of most of its transport network. Operation of London Overground services is carried out under the terms of a concession agreement. TfL lets this London Overground concession and is the owner of London Overground's trains.
- 8 At the time of the accident, the operator (under the terms of the TfL concession) was Arriva Rail London (ARL). ARL had operated London Overground trains since November 2016. ARL was also the station operator of Norwood Junction. It employed the driver of train 9D18 and the platform staff member who fitted the portable access ramp.
- 9 On 3 May 2026, TfL transferred the London Overground concession from ARL to First Rail London Limited.
- 10 Carlisle Support Services (CSS) provided contract station staff to ARL and was the employer of the contract staff who was assisting on the platform when the accident occurred.
- 11 Portaramp UK Limited is the designer and manufacturer of the portable access ramps, including the ramp involved in the accident.
- 12 All the above organisations freely co-operated with the investigation.

Train involved

- 13 The train involved was a London Overground five-car class 378 electric multiple unit (figure 4), unit number 378148.



Figure 4: A class 378 London Overground train similar to that involved in the accident.

Staff involved

- 14 The driver of train 9D18 joined ARL and began their training in July 2019, qualifying in January 2021. They were authorised to drive trains on the Windrush line and were regularly rostered on the route between West Croydon and Highbury & Islington. The status of the driver's managed competency is dealt with from paragraph 76.
- 15 There were two members of staff on the platform at the time of the accident, a station assistant dispatcher (SAD) employed by ARL, and a train dispatcher (TD) employed by CSS. The SAD had 15 years of experience in the rail industry, with 13 years working at various stations (12 of which were at Norwood Junction). All their competencies associated with train dispatching were up to date at the time of the accident.
- 16 The TD had 2 years of experience at various stations. After initially working on station gate lines, they had spent the last 10 months working as a dispatcher at West Croydon and Norwood Junction. All their competencies associated with train dispatching were up to date at the time of the accident.

External circumstances

- 17 The weather at the time of the accident was sunny and very warm, about 30°C, with clear visibility. There is no evidence that external circumstances played any part in the accident.

The sequence of events

Events preceding the accident

- 18 The driver had been on 3 rest days before the day of the accident but described themselves as having had a broken night's sleep before their shift that day, due to the hot summer weather. On the morning of the accident, they drove from their home to New Cross Gate depot, signed in for work at 06:44, and walked to New Cross Gate station.
- 19 At New Cross Gate station, the driver took over a service from Highbury & Islington to West Croydon, which departed at 07:15. They worked this service to West Croydon where it turned around to become train 9D10, the 07:45 service to Highbury & Islington, which departed on time. At Highbury & Islington, this in turn became train 9C14, the 08:47 service to West Croydon. The final turnaround before the accident occurred at West Croydon, where the unit became train 9D18, the 09:46 service to Highbury & Islington. The service departed from West Croydon on time.
- 20 The passenger for whom the portable access ramp was fitted is a resident of Norwood. They use the train regularly for work and personal appointments and have previously boarded trains at Norwood Junction and other stations. They have reduced mobility¹ and use a mobility scooter, which means that they require a portable access ramp to board and alight from trains at some platforms. The passenger arrived at Norwood Junction station approximately 10 minutes before train 9D18 was due. On arrival, they passed through the ticket gates and requested assistance from the SAD, making use of the TfL 'turn up and go' service (see paragraph 33).
- 21 The SAD phoned ARL's passenger assistance team with the details of the passenger's destination and intended train. The SAD then unlocked a portable access ramp from its secure location and waited with the passenger at the back of the platform.
- 22 Train 9D18 arrived at platform 1 at Norwood Junction station at 09:51:35. After allowing passengers to disembark, the SAD made their way to the accessible door on the third vehicle (located in the centre of the train adjacent to the designated wheelchair space) and fitted the portable access ramp. The SAD then stood on the ramp to test that it was securely fixed to the train (figure 5).

¹ 'National Technical Specification Notice – Accessibility', May 2025, Department for Transport, defines a 'person with disabilities and person with reduced mobility' as any person who has a permanent or temporary physical, mental, intellectual or sensory impairment which, in interaction with various barriers, may hinder their full and effective use of transport on an equal basis with other passengers or whose mobility when using transport is reduced due to age.



Figure 5: SAD testing fitment of the portable access ramp (courtesy of ARL).

Events during the accident

- 23 At 09:52:05, the driver closed the doors of train 9D18. This occurred while the SAD was still testing the portable access ramp, and while the passenger in the mobility scooter was still on the platform. The SAD tried to use a railway emergency hand signal (raising both arms) to stop the driver from moving the train (figure 6). As the doors were closed and door interlock had been achieved (see paragraph 85), the driver was able to take traction power. At 09:52:13 the train began to move off from the platform with the portable access ramp still attached.
- 24 As the train started to move, the SAD stepped off the portable access ramp and attempted to use their dispatch baton to send a further visual emergency signal to the driver to stop the train.
- 25 The TD was positioned further along the platform in the direction of departure. They noticed a passenger, sat on a bench along the platform, and blew their whistle to warn the passenger of the ramp being dragged by the train (figure 7). The passenger moved their legs out of the way before the ramp reached their location (figure 8).



Figure 6: SAD signalling to the driver to stop train 9D18 (courtesy of ARL).



Figure 7: TD using their whistle to warn a passenger further along the platform in the direction of travel of the approaching ramp (courtesy of ARL).

- 26 The ramp collided with the end-of-platform barrier and landed in the cess (the area between the running lines and the railway boundary) beyond the platform end.



Figure 8: Member of public having moved their legs out of the way of the moving portable access ramp (courtesy of ARL).

Events following the accident

- 27 After train 9D18 had departed from Norwood Junction station, the SAD called the signaller. There was initial uncertainty of the final location of the ramp, and the SAD requested the closure of platform 1. The signaller blocked the line through platform 1 to rail traffic and requested that a Network Rail mobile operations manager attend Norwood Junction station. Upon arrival, they recovered the ramp, and the station was fully reopened at approximately 10:15.
- 28 The driver of train 9D18 was initially unaware that an accident had occurred. The signaller messaged the driver for a call back via the GSM-R (Global System for Mobile Communications - Railway) in-cab radio at approximately 10:05, by which time the train was between Honor Oak Park and Brockley stations. Train 9D18 arrived at Brockley at 10:06 where the driver called the signaller back on the in-cab radio. The driver was told to proceed to New Cross Gate station where they would detrain the passengers and terminate train 9D18, after which the empty train would proceed to the nearby Silwood sidings.

- 29 Train 9D18 arrived in Silwood sidings at approximately 10:20. The driver contacted ARL operations control using their personal mobile phone. The driver was told by operations control that they would be met by the on-call driver manager. Upon meeting the driver, the driver manager informed them of the details of the accident, took an initial account of events, did mobile phone checks, and arranged a drugs and alcohol screening. Drugs and alcohol screening is a standard requirement following certain types of incidents and accidents on the railway, and the driver's tests later returned clear results.
- 30 The passenger on the mobility scooter was assisted onto a later train by railway staff once platform 1 had reopened and they were able to complete their journey. They stated to RAIB that since the accident they are using trains less often and that they experience severe anxiety when doing so.

Background information

The use of access ramps on TfL's London Overground services at Norwood Junction station

- 31 Norwood Junction station has been in operation since 1859 and has six platforms (figure 9). The accident occurred on platform 1, which is the only platform accessible without the need to use stairs. The design of platform 1 does not allow for level boarding with a class 378 unit and a portable access ramp is used to allow passengers with reduced mobility to board and alight from trains, where they would otherwise be unable to do so. At Norwood Junction station, portable access ramps are used on a limited number of occasions per day and there is no pattern to how often a driver will experience ramps being used on trains at that station.
- 32 Platform 2 is not normally used (figure 10). Platforms 3, 4, 5 and 6 can only be accessed via stairs and an underpass and therefore may not be readily accessible to some people with reduced mobility. Station improvements to provide access to all the platforms for persons with reduced mobility were proposed in 2019 but have not progressed further.
- 33 TfL operates a turn up and go service for persons with reduced mobility who need assistance with boarding trains (referred to by TfL as 'mobility impaired passengers'). The service requires such passengers to advise station staff on arrival of their intended destination. At Norwood Junction station, platform staff will then contact ARL's passenger assistance team who will advise the destination station, so that any assistance (such as a ramp, if the destination station requires it) is available on arrival. Requests will be accommodated if a mobility impaired passenger arrives in sufficient time for their train at a departure station, and it is confirmed that the destination station is equipped to handle their needs.
- 34 Portable access ramps are located on platform 1 for use when requested by mobility impaired passengers. They are securely stored on the platform and platform staff have a key to release them when required. Portable access ramps can be applied to any of the services arriving at Norwood Junction station by any member of platform staff working on platform 1. Once a train is stationary at a platform, and the train's doors are opened, the portable access ramp is manually located via lugs on its underside. These fit into slots at the bottom of the door opening, on the step board. A member of staff then needs to test that the ramp is safe by stepping on it. Once the mobility impaired passenger has boarded, the portable access ramp is removed from the train and securely stored again on the platform.

Train dispatch processes used at Norwood Junction station

- 35 All London Overground services operated using class 378 trains are run under driver only operation (DOO). The train driver is entirely responsible for the safe dispatch of the train from a station and station platform staff have no role in the dispatch process.

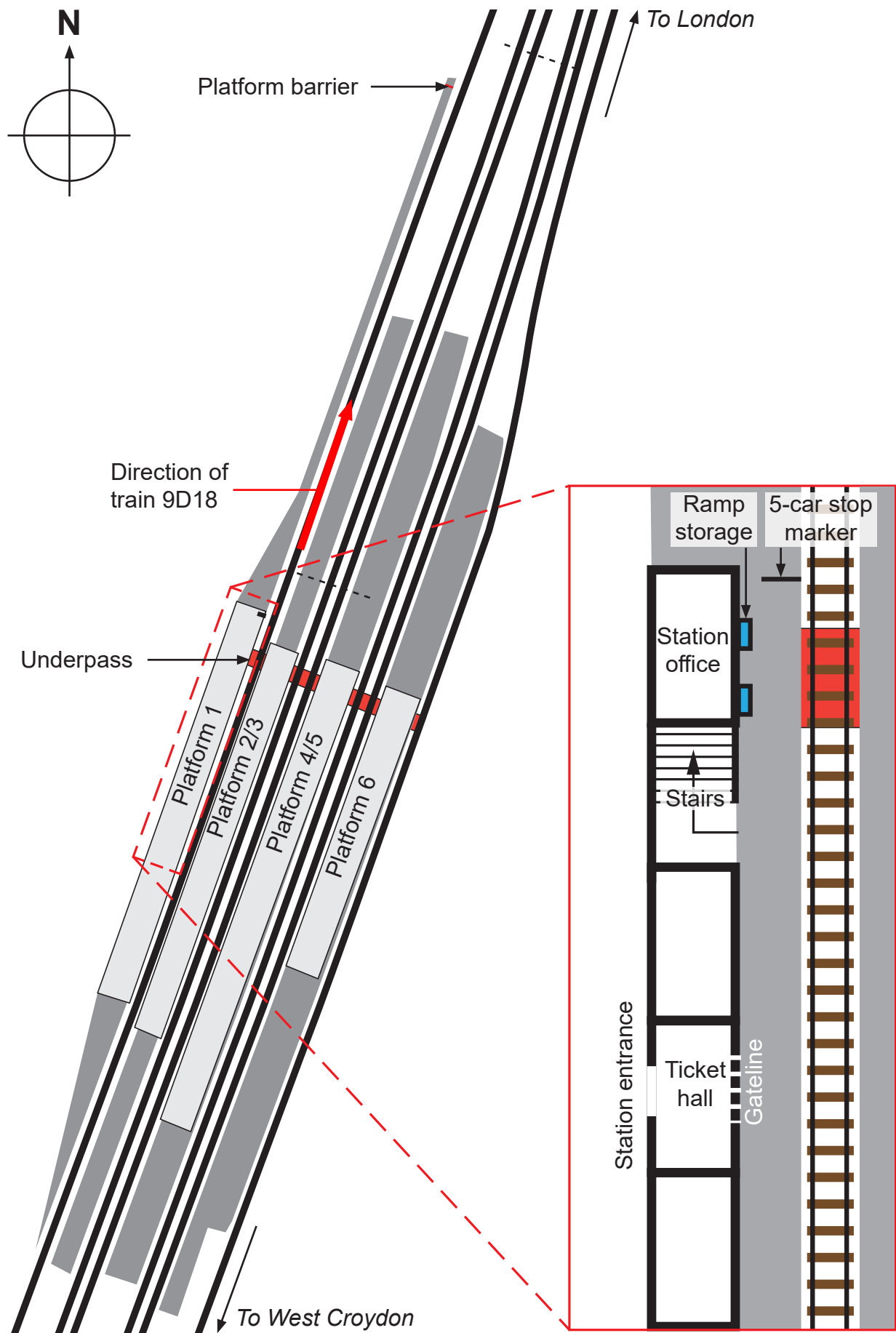


Figure 9: Norwood Junction station layout.



Figure 10: Platform 1 with view across to platform 2.

- 36 The layout of a class 378 cab is shown in figure 11 with the in-cab monitor display in figure 12. This display provides five images, one for each coach, showing an external view of the doors and the immediate platform area. The monitor displays switch on when a train is stationary at a platform, and the doors (on the platform side) are enabled by the driver. The displays switch off when the train reaches a speed of 4 mph (6 km/h).
- 37 The process for station dispatch under DOO is covered by Rule Book GERT8000 Module SS1, 'Station duties and train dispatch', issue 9 dated September 2023 which was in force at the time of the accident. ARL had incorporated the requirements of this module into their internal document SQE 20.6 'Train operations in stations', issue 2 dated January 2025.
- 38 SQE 20.6 required drivers to undertake the following actions during a station stop:
- Stop the train at the appropriate stop position marker on the platform.
 - Confirm the side of the train the platform is on and open the doors on that side.
 - While the doors are open, z-scan² the in-cab monitor display for platform movements. Also check that the time stamp is moving to ensure the image is being updated and is not 'frozen'.
 - Check the departure signal for its aspect. Confirm whether the signal aspect permits departure once passengers are on board and the doors are closed.
 - Cycle between checking the monitors and the signal.
 - Once it is considered that the platform conditions are safe, close the doors.
 - Check that door interlock has been gained, then carry out the train safety check.
 - Recheck the signal aspect so that it is permitted to depart.
 - Recheck the monitors with a z-scan for any station movements or objects that could be attached to the train.
 - If all checks are passed, take traction power to a maximum of notch 2 (out of 4).
 - Once moving, recheck the monitors (with a z-scan) and signal aspect (cycling between the two) until the displays turn off.

² Z-scan is a technique taught for effectively monitoring multiple display screens, such as those providing imagery of a train's doors. The images should be scanned top row left to right, followed by bottom row left to right.



Figure 11: Cab layout of a London Overground class 378 unit.

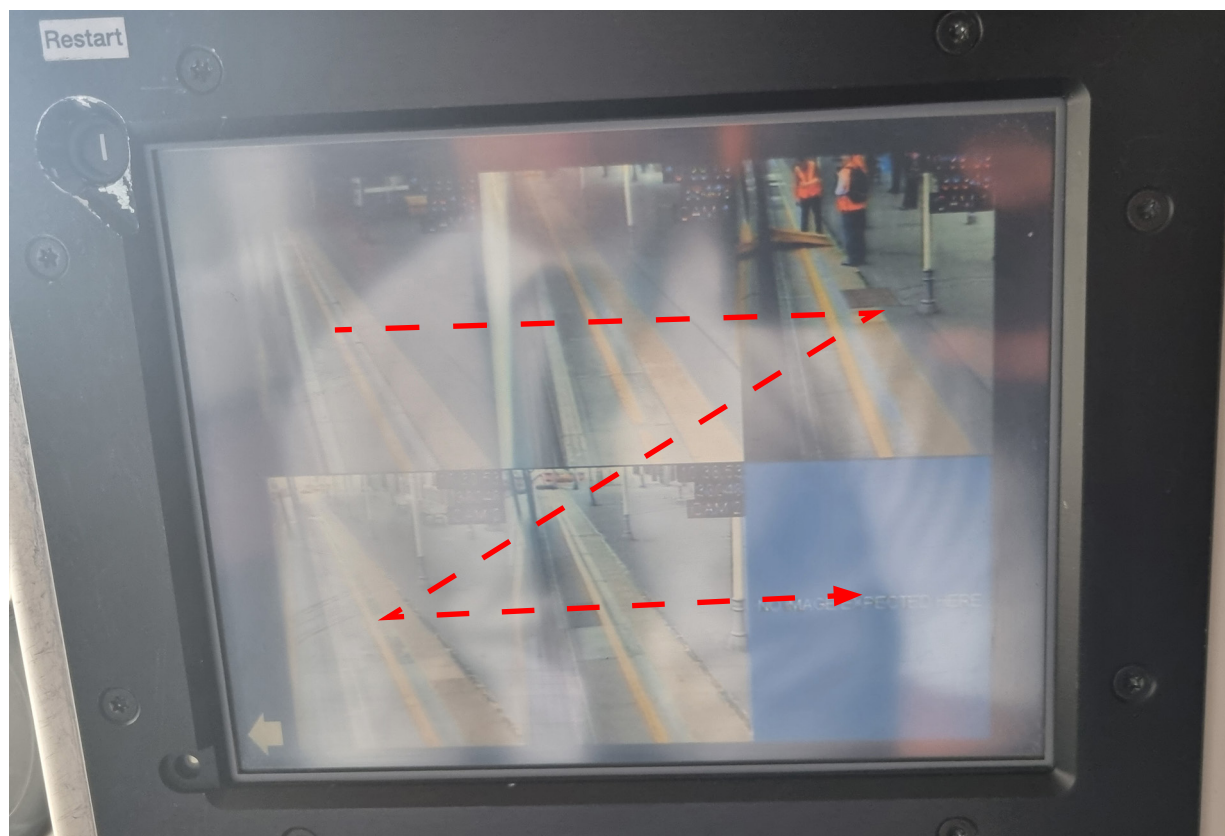


Figure 12: DOO in-cab door monitor z-scan pattern of the five bodyside camera images during reconstruction (see paragraph 89).

- 39 SQE 20.6 emphasised the importance of a driver undertaking effective train safety checks before departure due to several factors:
- Objects up to 30 mm thick could be trapped in the doors and interlock could still be gained. Drivers were instructed to *'never rely only on the interlock light as confirmation doors are not obstructed'*.
 - Drivers, therefore, needed to *'check initially that the white platform edge line in each of the CCTV images is not broken by any person or object'*. Examples may have included *'objects connected to the train'*.
 - Drivers had to *'check as far as reasonably practicable all persons are standing behind the yellow platform line. If not, ask yourself if they present a risk to safe dispatch?'*. This allowed for dispatch on busy platforms where passengers were standing between the yellow and white lines, a space also known as the 'dispatch corridor'.
- 40 Govia Thameslink Railway (GTR) operates Southern services with class 377 electric multiple unit trains, which also stop at Norwood Junction station. At Norwood Junction, these services are dispatched by platform dispatch staff rather than by the driver. For this reason, each platform at Norwood Junction station requires a member of staff who is trained in the safety-critical task of dispatching trains. ARL staff or contractors who were dispatchers were all assessed under ARL's competency management system. The dispatch process employed by such staff at Norwood Junction involves staff using a hand-held dispatch baton to indicate to train drivers that trains may depart.
- 41 GTR also operates Thameslink services with class 700 electric multiple unit trains. These are DOO and driver dispatched at Norwood Junction in a similar fashion to the London Overground class 378 trains.

Analysis

Identification of the immediate cause

42 Train 9D18 departed with a portable access ramp attached.

- 43 A portable access ramp was attached to the side of train 9D18 by platform staff to allow a person with reduced mobility to access the train (paragraph 22).
- 44 The portable access ramp, when attached to a train, is secured by lugs that fit into slots on the train's step board, meaning that it will move with the train as it departs if not removed beforehand (paragraph 34). A portable access ramp attached to a train is significantly outside the permissible swept envelope for a train. This means that the risk of the ramp colliding with people and/or furniture on the platform, or items of infrastructure (as happened in this case) is very high.

Identification of causal factors

- 45 The accident occurred due to a combination of the following causal factors:
- a. The portable access ramp used did not prevent the doors from closing and door interlock being achieved on class 378 units (paragraph 46).
 - b. The driver believed it was safe to dispatch the train (paragraph 62).
 - c. Platform staff were unable to stop the train dispatch (paragraph 96).

Each of these factors is now considered in turn.

An incorrect portable access ramp was used

46 The portable access ramp used did not prevent the doors from closing and door interlock being achieved on class 378 units.

- 47 The door control system of a class 378 unit can detect objects down to 30 mm thickness which are trapped in closing doors. If an object of this size or greater is detected, the doors cannot close and lock, and the door interlock (see paragraph 85) cannot be obtained. This means that traction power cannot be taken, and the train will not be able to move.
- 48 Portable access ramps are specified and designed for a particular type of rolling stock. This is required because different train types have varying door mechanisms and relative heights of the train floor to the platform. Three types of rolling stock regularly stop at Norwood Junction station (paragraphs 35, 40 and 41) and each has a different portable access ramp (figure 13). The ramps are hinged to fold along their length for ease of storage.
- 49 The ramp specified for a class 378 unit has location lugs that are designed to fit in holes cut in the train's step boards. As the class 378 unit has doors that open by sliding into pockets in the train's bodyside, the class 378 portable access ramp has been specified with extended arms that prevent the doors from closing if the ramp remains in place (figures 13 and 14).



Figure 13: Portable access ramps shown stored in their folded condition, on the left for a class 377 (which was also designed to work on class 455 trains that are now out of service), in the middle for a class 700 (door closure prevention arms circled), and on the right for a class 378 (door closure prevention arms circled).



Figure 14: Door closure prevention on a class 378 electric multiple unit with correctly specified portable access ramp (courtesy of ARL).

- 50 Class 377 trains, which also call at Norwood Junction (paragraph 40) have a door system where the doors move outside of the train's body when opened and then arc back in to 'plug' the door void when the doors are closed. While the portable access ramps specified for a class 377 have the same lug and hole fixture mechanism as for those used on a class 378, they do not require the extended arms to prevent door closure and so are not fitted with them. This is because their fitment to the train naturally prevents door closure as they sit in the swept path of the closing doors.
- 51 Although GTR, the operator of class 377 units, confirmed that ramps for a class 377 should not be used on a class 378 unit, the portable access ramp specified for a class 377 can nevertheless be physically attached to a class 378 using its location lugs. This means that a person of reduced mobility can be assisted to board a class 378 train using a class 377 ramp. However, as in the case of this accident, the use of a class 377 ramp on a class 378 train introduces the risk that the doors can be closed with the ramp still in place because the class 377 ramp lacks the extended arms needed to prevent this (figure 15). The train will, therefore, be able to gain door interlock and depart from the station.



Figure 15: Reconstruction of the fitment of a class 377 portable access ramp to a class 378 unit (courtesy of ARL).

- 52 The specification and use of portable access ramps are covered by several rail industry documents:
- The National Technical Specification Notice (NTSN, one of a set of standards for the interoperability requirements for railways in the UK) relating to accessibility (ACC), issue 1 dated 2 May 2025, specifies that portable access ramps must be secured to a train, but it does not cover the prevention of door closure with a ramp in place.
 - 'Accessible travel policy', dated September 2020, issued by the Office of Rail and Road (ORR, the independent economic and safety regulator for Great Britain's railways) states that ramps must always be available with notice and staff should be trained to use them.

- The Rail Safety and Standards Board's (RSSB³) 'Key train requirements', version 7 dated July 2023, is a guidance document intended to assist those responsible for setting specifications for new-build and refurbished trains. This guidance recommends that ramps should prevent door closure when they are in place.
- 53 The recommendation that ramps should prevent door closure when in place is not included in the Rail Industry Standard on passenger train dispatch, RIS-3703-TOM, 'Passenger Train Dispatch and Platform Safety Measures', issue 6 dated September 2025.
- 54 Portaramp UK Limited is the manufacturer of all the ramps which were in use at Norwood Junction station. It confirmed that compliance is achieved with the NTSN ACC by providing the mechanism which attaches the ramp to trains. Any extended arms to prevent door closure are specified by the designers of the vehicle or the train operator. In 2014, the predecessor to ARL, London Overground Rail Operations Limited, which operated the London Overground concession until November 2016, specified extended arms on the portable access ramps to be used with class 378 trains.
- 55 This causal factor arose due to a combination of the following:
- a. The correct portable access ramp for class 378 trains had been removed from the station (paragraph 56).
 - b. Station staff were unaware that the portable access ramp provided at Norwood Junction station was of the incorrect type for class 378 trains (paragraph 60).
- Each of these factors is now considered in turn.

Correct portable access ramp removed

56 The correct portable access ramp for class 378 trains had been removed from the station.

- 57 Norwood Junction station was operated by ARL (paragraph 8). Through a contractual arrangement, GTR provides the station's portable access ramps. On platform 1 at Norwood Junction before September 2021, there was a ramp compatible with a class 377 and another compatible with a class 378. In September 2021, GTR updated the portable access ramps on platform 1 and in doing so unintentionally replaced both with ramps that were only compatible with class 377 trains. This went unnoticed until the accident.
- 58 ARL was responsible for ongoing planned general inspections (PGIs) to ensure that the station was in a suitable condition. These are carried out by station managers. The nature and depth of the PGI checks have varied since 2020. The records of the PGI checks over this period show varying levels of detail of the portable access ramps on platform 1 at Norwood Junction at the time of inspection (figure 16):
- 16 July 2020: three different ramp types are shown and noted: ramp 1 for Overground trains, ramp 2 for Southern trains, and ramp 3 for Thameslink trains. Door closure prevention arms can be seen on ramp 2 and ramp 3.

³ RSSB is a not-for-profit company owned by major industry stakeholders. It is the independent safety, standards and research body for Great Britain's rail network.

- 14 January 2022: two similar ramps without door closure prevention arms are shown, but their types were not noted.
- 16 February 2023: two pictures of ramps without door closure prevention arms are shown, but their types were not noted. More thorough checks of condition were carried out, along with a check of the label on a ramp. The details of the label were not noted.

59 An example of the label documented for the ramp in the PGI is shown in figure 17. This is for a class 377 ramp. It shows the serial number and the model number. The model number shows the dimensions of the ramp. This example label does not explicitly show the type of train it is compatible with.

16 July 2020		16 February 2023																	
PLATFORMS Is there a wheelchair ramp located on the platforms? Yes 3 Ramps on platform 1. No ramps on other platforms as they are not wheelchair accessible Ramp 1 for Overground trains Ramp 2 for Southern Trains Ramp 3 for Thameslink trains		WHEELCHAIR RAMPS 100% Are there Wheelchair Ramps at this station?   Yes																	
 Appendix 9  Appendix 10  Appendix 11		Photo 24 Photo 25																	
Is it secure and in good condition? Yes		Is there a T-Key available at the location to operate the wheelchair ramp? Yes																	
14 January 2022 PLATFORMS Is there a wheelchair ramp located on the platforms?  Yes		PLEASE REMOVE THE RAMP & CHECK THE FOLLOWING: <table border="1"> <tbody> <tr> <td>The slip resistant surface is undamaged, clean and free from grease or heavy soiling and is still offering a resistance to slip.</td> <td style="background-color: #00ff00; text-align: center;">Safe</td> </tr> <tr> <td>The ramp is free from dents, knocks/ holes to the surface that might cause a hazard.</td> <td style="background-color: #00ff00; text-align: center;">Safe</td> </tr> <tr> <td>The hinge for significant wear or damage.</td> <td style="background-color: #00ff00; text-align: center;">Safe</td> </tr> <tr> <td>The rubber contact mats are securely attached to the end plates.</td> <td style="background-color: #00ff00; text-align: center;">Safe</td> </tr> <tr> <td>The locating pins are damage free and not bent or distorted.</td> <td style="background-color: #00ff00; text-align: center;">Safe</td> </tr> <tr> <td>The carrying handle is properly secured and ensure that the locking clip and catch are working correctly.</td> <td style="background-color: #00ff00; text-align: center;">Safe</td> </tr> <tr> <td>The Train Class identification label is clearly displayed.</td> <td style="background-color: #00ff00; text-align: center;">Safe</td> </tr> <tr> <td>The Safe Working load (SWL) is clearly displayed on the ramp</td> <td style="background-color: #00ff00; text-align: center;">Safe</td> </tr> </tbody> </table>		The slip resistant surface is undamaged, clean and free from grease or heavy soiling and is still offering a resistance to slip.	Safe	The ramp is free from dents, knocks/ holes to the surface that might cause a hazard.	Safe	The hinge for significant wear or damage.	Safe	The rubber contact mats are securely attached to the end plates.	Safe	The locating pins are damage free and not bent or distorted.	Safe	The carrying handle is properly secured and ensure that the locking clip and catch are working correctly.	Safe	The Train Class identification label is clearly displayed.	Safe	The Safe Working load (SWL) is clearly displayed on the ramp	Safe
The slip resistant surface is undamaged, clean and free from grease or heavy soiling and is still offering a resistance to slip.	Safe																		
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The carrying handle is properly secured and ensure that the locking clip and catch are working correctly.	Safe																		
The Train Class identification label is clearly displayed.	Safe																		
The Safe Working load (SWL) is clearly displayed on the ramp	Safe																		
Is it secure and in good condition? Yes																			
Is there a T-Key available at the location to operate the wheelchair ramp? Yes																			

Figure 16: Variation in ARL station PGIs from 2020, 2022 and 2023.

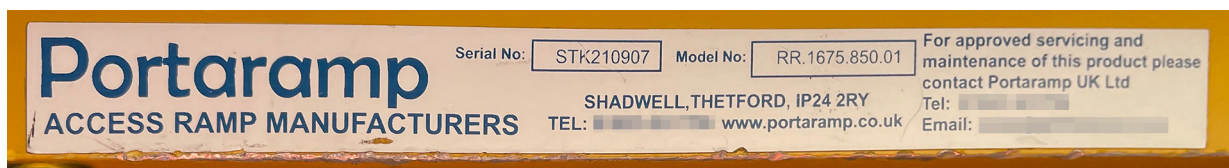


Figure 17: Identification label on a class 377 portable access ramp at Norwood Junction.

Knowledge of ramp type to be used

60 Station staff were unaware that the portable access ramp provided at Norwood Junction station was of the incorrect type for class 378 trains.

61 Station staff were not trained to identify the correct ramp to be used on each type of rolling stock (see paragraph 102). Because the portable access ramp compatible with class 377 trains was also functionally compatible with the class 378 trains (paragraph 51), the station staff did not recognise that the incorrect ramp was in use and therefore had no reason to raise this matter further with their managers.

The driver's perspective

62 The driver believed it was safe to dispatch the train.

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

- a. The driver did not know that a portable access ramp was going to be used during this station call. This is a possible factor (paragraph 64).
- b. The driver's safety checks when dispatching the train did not detect that the portable access ramp remained attached (paragraph 69).

Each of these factors is now considered in turn.

Knowledge of ramp use

64 The driver did not know that a portable access ramp was going to be used during this station call. This is a possible factor.

65 The SAD or TD did not approach the driver to let them know that a mobility impaired passenger was boarding the train. Witness and documentary evidence shows that, at the time of the accident, platform staff were not expected to do this. RAIB's investigation established that warning a driver had previously been an accepted practice at stations operated by ARL but had diminished over time, most likely as the class 378 trains were lengthened from their original three coaches to the current five coaches.

SAD positioning

66 After the SAD had released the portable access ramp from its storage position at the back of the platform, they remained with the passenger on the mobility scooter (paragraph 21). The SAD stated that this was to provide answers to the passenger's questions about train services. As a result, when train 9D18 arrived at the platform, the SAD was not in full view of the driver and was partially obscured by other passengers and the platform canopy structure (figure 18).

67 Following an earlier accident at Edmonton Green station in 2020, where a train departed from the station with a portable access ramp attached, ARL updated its requirements on the use of portable access ramps and created an associated 'Safe Every Time' briefing for staff. This briefing stated that, when using a portable access ramp, platform staff should be wearing a high-visibility vest and be stood on the platform where they can be seen by the driver (figure 19). The briefing was distributed to all platform staff via email, including the SAD involved in this accident, although no evidence could be found to demonstrate that the SAD had ever read this email.

68 RAIB could find no evidence that these requirements were rebriefed to platform staff following this initial briefing until February 2025, when ARL started to brief an updated set of step-by-step procedures around portable access ramp use (figure 20). These updated procedures stated that platform staff should be holding the portable access ramp when a train arrives at a station and '*You should position yourself on the platform prior to the arrival of the train and in view of the driver*' (figure 21). At the time of the accident, 261 out of 291 station staff employed directly by ARL had received the briefing. However, the SAD involved in this accident had not yet attended it.

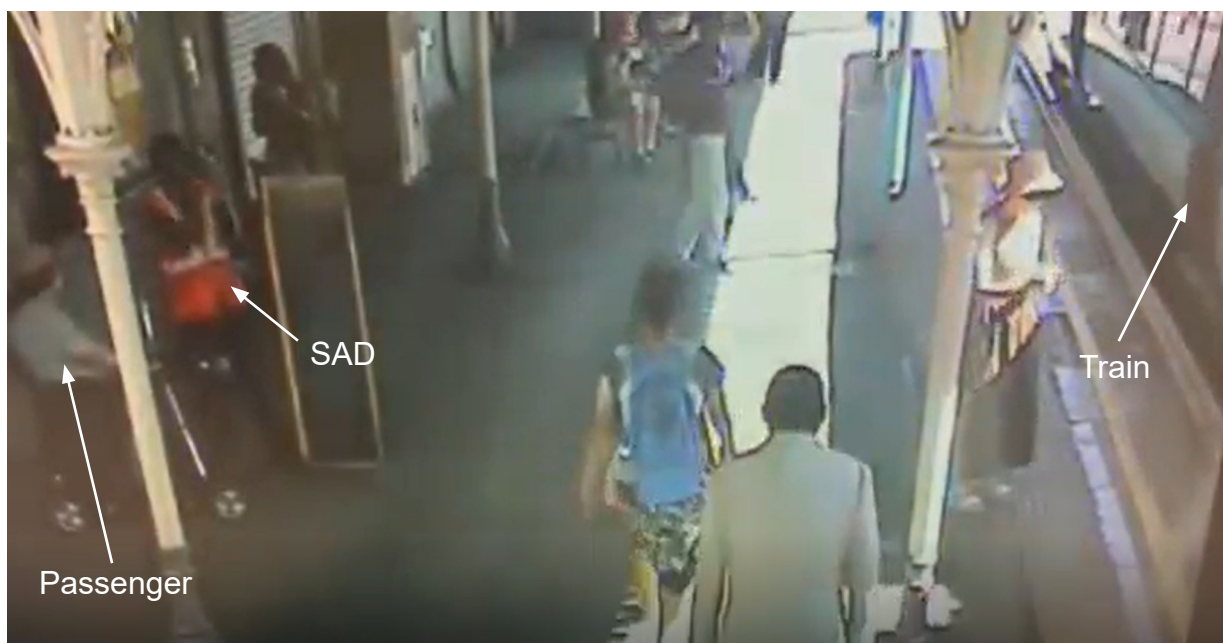


Figure 18: Position of the SAD and passenger as train 9D18 arrived at platform 1 at Norwood Junction station (courtesy of ARL).



Figure 19: An image from the 2020 'Safe Every Time' briefing showing a member of platform staff (not involved in the accident) with a portable access ramp and wearing a hi-visibility vest (courtesy of ARL).

BOARDING THE CUSTOMER

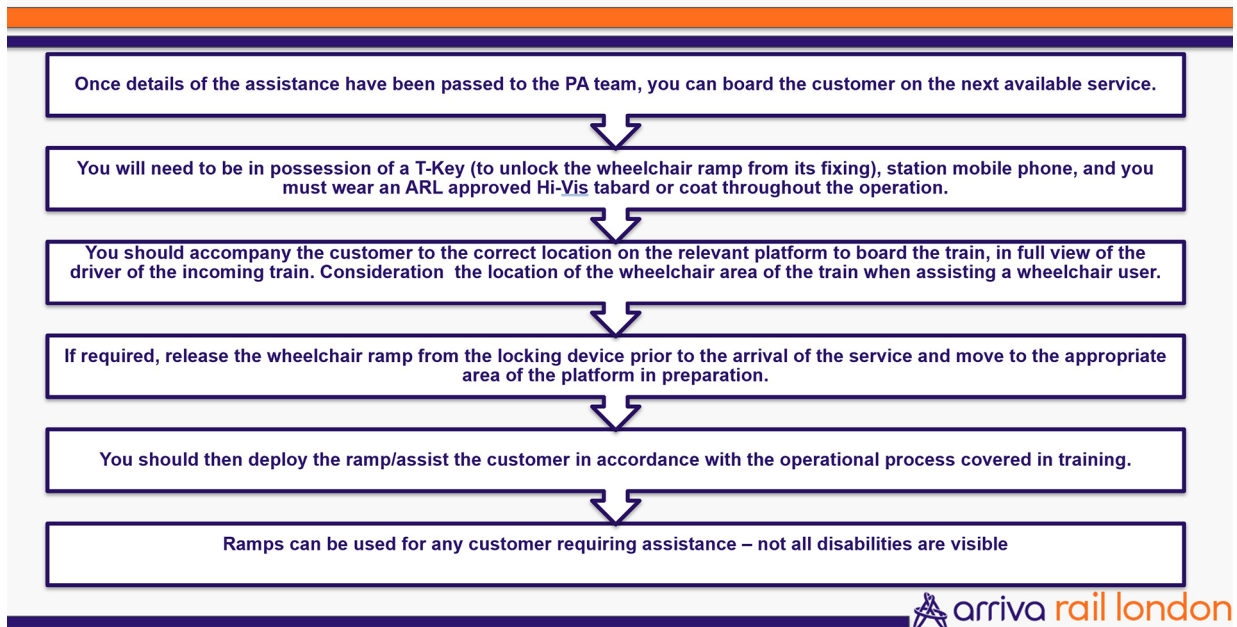
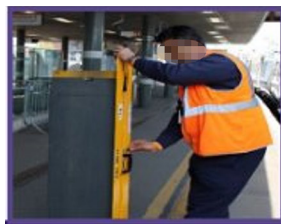


Figure 20: ARL's portable access ramp procedure at the time of the accident (courtesy of ARL).



You should position yourself on the platform prior to the arrival of the train and in view of the driver

arriva rail london

Figure 21: Extract from ARL's 2025 briefing on portable access ramp use. The member of staff in the image was not involved in the accident (courtesy of ARL).

The driver's dispatch checks

69 The driver's safety checks when dispatching the train did not detect that the portable access ramp remained attached.

70 This was due to a combination of:

- a. The driver was probably distracted by the use of their mobile phone and may have been distracted by ongoing personal issues (paragraph 71).
- b. The driver's belief that nothing was attached to the train was probably reinforced as door interlock was gained (paragraph 85).
- c. The presence of platform staff possibly reinforced the driver's belief that it was safe to depart (paragraph 86).
- d. The image of the portable access ramp was possibly not conspicuous to the driver on the monitor (paragraph 88).
- e. The driver was possibly fatigued (paragraph 93).

Driver distraction

71 The driver initially stated in interviews with ARL that their personal mobile phone was off for the entire shift and had been placed in their bag. Inspection of the driver's phone by the ARL on-call driver manager showed no records of phone calls or the use of communications applications.

- 72 However, phone records obtained by RAIB established that the driver's personal mobile phone was switched on for the duration of their shift and that five phone calls of lengths from 33 seconds up to 25 minutes were made or received while they were driving various trains (paragraph 19, figure 22).
- 73 The last call received covered the journey of train 9D18 from West Croydon, including during the station stop at Norwood Junction when the accident occurred. This call ended immediately before the GSM-R radio call which the driver made to the signaller when the train was at Brockley station. The same mobile phone was later used to call ARL control after the driver had stabled train 9D18 at Silwood sidings (paragraph 28).
- 74 RAIB determined that these phone calls were being used by the driver to deal with personal issues of a potentially distressing nature. Research⁴ has found that using a mobile telephone can result in a decrease in situational awareness, slower reaction times and a reduction in hazard perception. This research, and the potentially distracting nature of the issues being discussed, support that the use of their mobile phone is likely to have distracted the driver from the task of driving the train during the dispatch from Norwood Junction station.
- 75 ARL had a policy covering the use of mobile devices in train cabs. It said that mobile devices must not be used, be switched off and be out of sight (see paragraph 114). The driver had been briefed on, and had signed an acknowledgement for, the contents of this policy. The driver was aware of this policy.
- 76 The driver was involved in two incidents in the year preceding the Norwood Junction accident that also could be attributed to distraction.
- 77 The driver had their first incident in July 2024 when they passed a signal at danger (SPAD). ARL's investigation found that the driver was habitually cancelling warnings issued by the automatic warning system (AWS, which provides an audible and visual warning to a driver on the approach to certain infrastructure features, such as signals and selected speed restriction changes) and not modifying their driving behaviour in response to the warnings received. In this case, the driver cancelled a warning approaching a yellow (caution) signal and had not realised the next signal was at red (danger). The Train Protection and Warning System (TPWS, a safety system that automatically applies a train's brakes if it approaches a signal or speed restriction at too high a speed) triggered an emergency brake application as the train approached the red signal, with the final stopping point of the train being beyond the signal post. ARL's investigation concluded the driver was distracted by a water bottle that they were having difficulty using and had not seen the red signal.
- 78 The driver's second incident occurred in May 2025 where they had a 'failed to call' (FTC) incident at a station. The ARL investigation showed that the driver had lost concentration due to personal issues and had not slowed the train sufficiently for the station stop.

⁴ While research in this area primarily focuses on the risk to road users, such as that summarised by ROSPA at <https://www.rospace.com/road-safety/road-safety-information/driver-safety/driver-distraction>, RSSB projects T904 and T989 have sought to establish good practice for the education of train drivers regarding the risks involved.

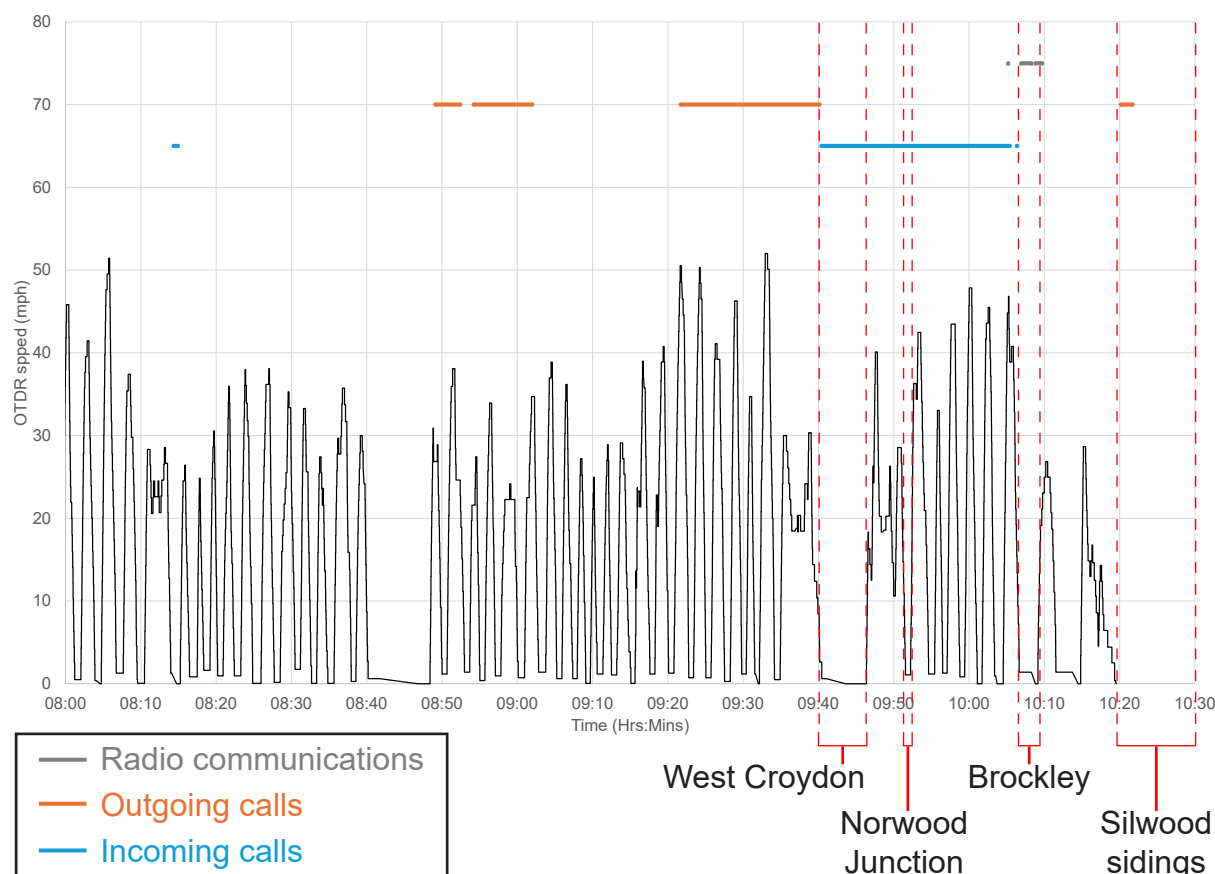


Figure 22: Train speeds from left to right for train 9D10 (07:45 from West Croydon), train 9C14 (08:48 from Highbury & Islington), and train 9D18 (09:46 from West Croydon). Overlaid are incoming and outgoing calls made from the mobile phone and radio messages and calls with the signaller.

- 79 ARL had two processes to help drivers who had incidents or accidents. The primary method was described in SQE 08.09 'Driver competence development' (DCD), issue 2.0 dated January 2023. This had been produced to meet the requirements of ORR's 'Developing and Maintaining Staff Competence', dated November 2016, and the RSSB RS/100 'Good Practice Guide on Competence Development', issue 1 dated March 2013.
- 80 SQE 08.09 made it explicit that the DCD process was not a disciplinary tool and that it was in place to help prevent drivers having repeat incidents. The process identified the level of plan required for the type of incident. A driver on a DCD plan would receive specific briefings (on aspects that were causal to the incident) a practical driving assessment and could be monitored on up to 156 subsequent driving turns. The level of plan implemented reflected the severity of the incident or if a repeat incident had occurred. The length of the plan was set by the number of monitored driving turns as follows:
- A 'proactive' plan had a default of 1 monitored driving turn, up to a maximum of 16.
 - A 'short' plan had a default of 4 monitored driving turns, up to a maximum of 16.
 - A 'medium 1' plan had a default of 16 monitored driving turns, up to a maximum of 39.
 - A 'medium 2' plan had a default of 52 monitored driving turns, up to a maximum of 78.

- A 'long' plan had a default of 78 monitored driving turns, up to a maximum of 156.
- 81 The DCD identified whether a driver required any additional support through a second process, SQE 12.08 'Train driver care and support system' (DCASS), issue 2 dated 20 June 2023. This was intended to be a proactive system which provided drivers with wide-ranging support on personal issues. As well as being identified as part of a DCD, the DCASS process could have been triggered by a driver self-presenting with circumstances they may have felt impacted their ability to drive a train or by driver managers who had identified a potential issue.
 - 82 Following the July 2024 SPAD, the driver was placed on a medium 2 DCD which consisted of an assessment and 52 monitored driving turns. This was completed by November 2024. Although background personal issues were discussed at the time with their line manager, the driver was not given a DCASS plan following this incident.
 - 83 Following the May 2025 FTC incident, the driver was placed on a medium 1 DCD plan. Because of the previous incident in July 2024, this was a higher level of monitoring than would normally be implemented for an FTC incident. As well as 16 monitored driving turns, the DCD involved various briefings around cab discipline and driving days with an instructor. A category 1 (low assistance programme) DCASS was implemented after discussion of personal background issues and involved extra support from the driver manager. The driver had completed their assessments for the DCD and was part way through their monitored driving turns when the accident occurred at Norwood Junction.
 - 84 Phone records were no longer available for the period covering the July 2024 SPAD. However, records obtained by RAIB show that the driver's phone was on for the duration of their shift when the FTC incident occurred in May 2025. Although no records of phone calls being made during the incident were found, records show that the phone was switched off immediately before the driver was met by their manager.

The door interlock

- 85 The door interlock was made because the doors were able to fully close with the wrong type of ramp still in place (paragraphs 46 to 54). Witness evidence was that the driver believed that it was not possible to obtain door interlock with a portable access ramp in place or any other object stuck in the doors and this probably supported the driver's belief that it was safe to start the train.

The presence of staff on the platform

- 86 In very busy stations, platform staff will often stand next to train doors to prevent passengers touching the train. In such circumstances, a driver may choose to dispatch their train with platform staff in the dispatch corridor (paragraph 39), seeing the presence of such staff as an indication that it is safe to move their train.
- 87 Platform 1 at Norwood Junction station was not busy at the time of the accident, and the bodyside CCTV shows that the SAD was the only person in the dispatch corridor. Witness evidence indicates that it is possible that the driver may have seen the member of platform staff's close proximity to the train as an indication that it was safe to depart from the station.

Conspicuity of the ramp on the monitor

88 DOO relies on a driver being able to clearly see people and objects on the station platform during the dispatch process (paragraph 36). Rail Industry Standard RIS-2703-RST 'Driver Controlled Operation (DCO) On-Train Camera/Monitors (OTCM)', issue 2 dated December 2018, defines the expectations for the size of images on a DOO in-cab monitor, and the angle of monitor screens relative to a seated train driver. RIS-2703-RST states that:

- *'The DCO OTCM system shall automatically control the angular size, resolution, brightness, contrast, shape distortion, refresh rate and the speed of adaptation to brightness and contrast of each image displayed.'*
- *'The visual detection of the target object shall include a minimum angular size of the height of the target object as displayed on the DCO OTCM system monitor and subtended at the observer's eye. This minimum angular size shall be 20 minutes of arc.'⁵*
- *'It is good practice for the monitors to be within 60° of the driver's visual field of view' (figure 23).'*

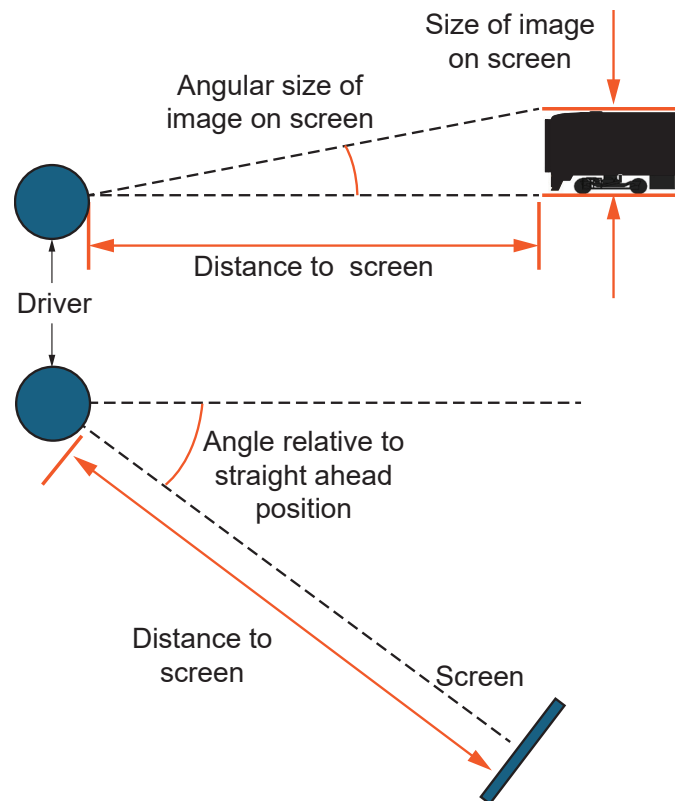


Figure 23: Angular measurements of image size and screen angle from RIS-2703-RST.

⁵ A minute of arc is a measure of angle. One minute of arc is 1/60 of a degree. There are therefore 21,600 minutes of arc in a complete circle.

- 89 With assistance from ARL, RAIB undertook a reconstruction using a class 378 unit and a portable access ramp of the type involved in the accident. A ramp and staff in high-visibility vests can be seen on the monitors (figure 24) as they would have been during the accident. Reflections can be seen on the screens from the driver's shirt reflecting sunlight entering the driving cab. Operational drivers wear darker shirts (which the driver was wearing at the time of the accident) to combat this effect, but reflections of clothing can still be evident. There was, however, no evidence to suggest that any such reflections were a factor in this accident.



Figure 24: DOO monitor in cab of a class 378 unit from a reconstruction at Norwood Junction station showing a portable access ramp attached to car 3 and platform staff.

- 90 Measurements taken by RAIB showed that the screen was between 34° and 51° from a driver's centreline. The exact angle was dependent upon the driving seat, which could be adjusted fore and aft, and was compliant to the RIS-2703-RST criteria.

- 91 The angular requirement of 20 minutes of arc can be converted (using trigonometry and the distance to the screen) to a minimum size of image on the screen. The distance to the screen from a driver's head varies between 0.45 metres with the seat fully forward to 0.62 metres with the seat fully back. The equivalent minimum image size on the screen is calculated as 2.6 mm, with the seat fully forward, and 3.6 mm, with the seat fully back.
- 92 Measurements were taken of images on the screen. The image size of the portable access ramp on the screen was compliant in the horizontal plane, measuring 15 mm. However, the image was found to be marginally non-compliant in the vertical plane, measuring between 2 mm and 3 mm (figure 25). While it is possible that this reduced the conspicuity of the ramp, it was found to be clearly visible in the monitors during the reconstruction. Individuals wearing high-visibility clothing were present adjacent to the ramp, as they were during the accident, and RAIB observed that this drew further attention to the ramp.

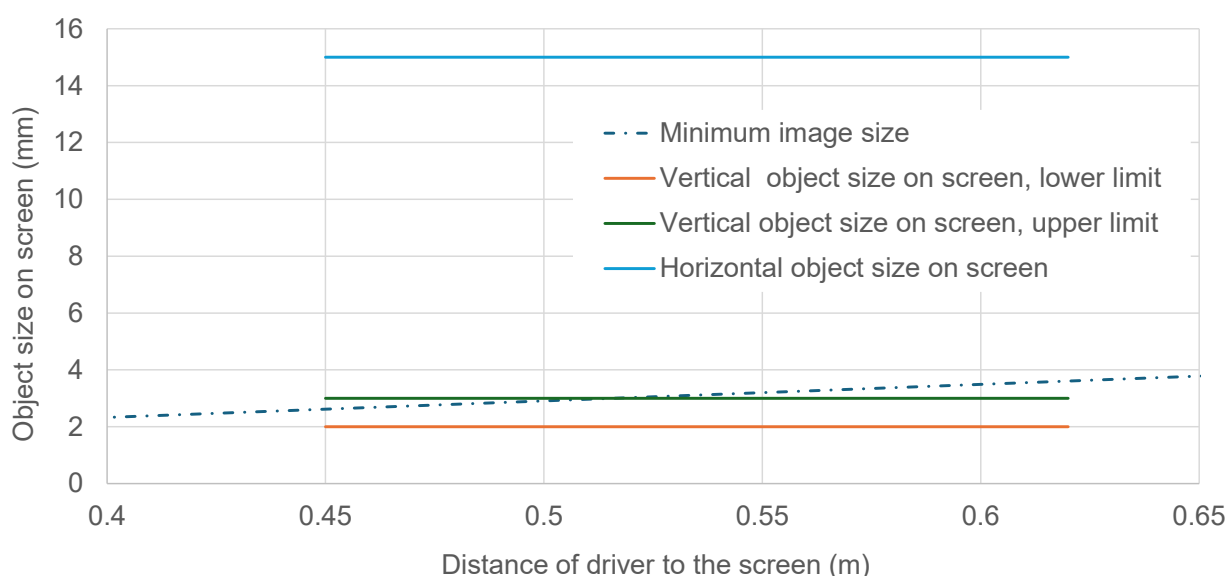


Figure 25: Dimensions of portable access ramp in the horizontal and vertical directions for seating position limits relative to limits from RIS-2703-RST.

The driver was possibly fatigued

- 93 The weather had been hot during the night before (paragraph 18), and the driver was dealing with underlying personal issues (paragraph 74). Both factors may have affected the quality of the driver's sleep during the night before the accident. However, the driver declared that they were fit to drive when they presented at work, and being free of fatigue is part of this declaration. Although subsequent witness evidence was that the driver did not regard themselves as suffering from fatigue, they possibly were.

- 94 In August 2024, ORR issued a guidance document called 'Managing rail staff fatigue - Guidance for companies in the rail industry'. ORR updated this guidance in January 2025 and it now states:

'Fatigued staff may not adequately perceive risk, and may tolerate risks they would usually find unacceptable, accepting lower standards of performance and safety. Staff communication, monitoring and co-ordination activities are adversely affected by fatigue. People can often be completely unaware of the extent to which their performance is being reduced by fatigue and may be unaware of lapses in attention or even briefly 'nodding off'.

It is, therefore, possible that the driver was fatigued, but did not recognise that they were in such a condition.

- 95 The accident occurred after the driver had 3 full rest days. This was the seventh shift the driver had worked after over a month off normal driving duties following the FTC incident (paragraph 83). It is, therefore, unlikely that the roster which the driver had been working significantly affected their fatigue levels.

Preventing dispatch from the platform

96 Platform staff were unable to stop the train dispatch.

- 97 The DOO monitors of a class 378 unit remain on as a train leaves a station until the train's speed is approximately 4 mph (6 km/h). Drivers are expected to continue their z-scan of these monitors (paragraph 38) until the monitors turn off. During this time, drivers are looking for members of the public or objects trapped in the train doors, any objects attached to the train, or hand signals from station staff.
- 98 As the doors of train 9D18 closed, the SAD attempted to use an emergency hand signal. This is to raise both hands directly above the head. The SAD's hand signal does not exactly accord with the requirements of their training and operational rules, as their arms are bent at the elbow. RAIB considers that it is likely that this hand signal was not seen by the driver as the image on the in-cab monitor cropped the view of the SAD towards the top of their torso, meaning their raised arms were not visible (figure 26).

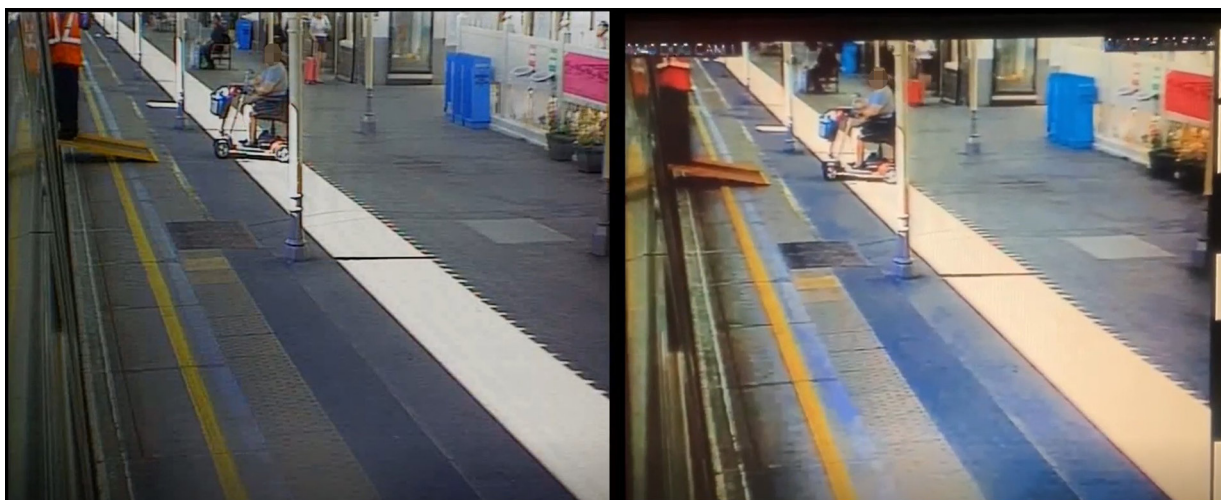


Figure 26: SAD attempting to use hand signals to stop train 9D18: to the left is the full image, to the right is the cropped image with time stamp as would be seen on the in-cab monitor (courtesy of ARL).

- 99 As train 9D18 began to move, the SAD stepped off the moving portable access ramp and attempted to use their dispatch baton (paragraph 40) to attract the driver's attention. This action was also cropped in the image presented to the driver (figure 27). Because ARL class 378 trains are driver dispatched, drivers are not trained to recognise a warning provided by a dispatch baton in this way and so this was also not effective in alerting the driver to the unfolding accident.

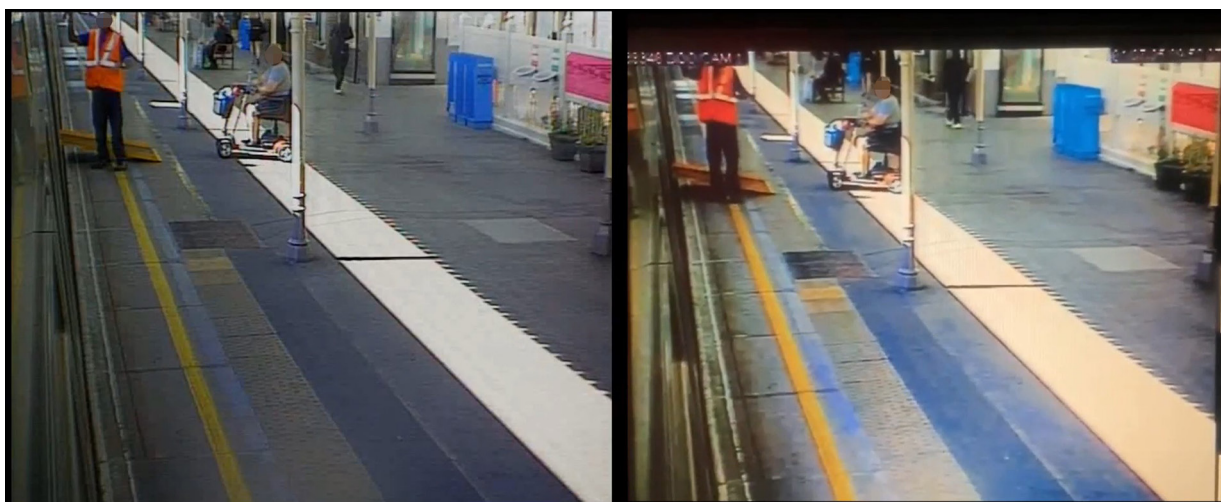


Figure 27: SAD attempting to use their dispatch baton to stop train 9D18: to the left is the full image, to the right is the cropped image with time stamp as would be seen on the in-cab monitor (courtesy of ARL).

Identification of underlying factors

Quantification of risks

100 ARL had not identified and effectively controlled the risks associated with using portable access ramps.

- 101 ARL document SQE 04.11-C 'Instructions for the dispatch of trains', issue 1 dated January 2017, covered dispatch actions at each of the platforms at Norwood Junction station and was last authorised in May 2025. For platform 1, it emphasised that the driver was solely responsible for the safe dispatch of a class 378 or class 700 unit. There was nothing specific in this document about portable access ramp use, or how platform staff were to interact with the DOO dispatch process. This was also the case for all the other platforms at Norwood Junction station discussed in the document.
- 102 Wider documented procedures for the fitting of ramps by ARL platform staff could only be found in a safety bulletin dating from 2020 (paragraph 67). In early 2025, ARL began providing updated procedures for the use of portable access ramps (paragraph 68). Neither demonstrated how platform staff could identify ramp types appropriate for specific rolling stock.
- 103 ARL guidance on general train driving was given in SQE 20.01 'Drivestyle', issue 2 dated January 2025. SQE 20.01 did not cover portable access ramp use. Further guidance on train driving was given in SQE 20.06 'Train Operations in Stations', issue 2 dated January 2025. This guidance covered possible obstructions in doors but also did not explicitly cover the use of portable access ramps.

- 104 The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS) include provisions for the management of the competence, fitness and fatigue of safety-critical workers. It is a requirement under these regulations that railway companies ensure that persons carrying out safety-critical work have been assessed as being competent and fit to undertake the work. Guidance on the application of these regulations⁶ states railway staff responsible for driving and dispatching trains, and those who assist in dispatching trains, are safety-critical workers, although this guidance does not specifically mention the fitting and use of access ramps as a safety-critical activity.
- 105 After considering the guidance in ROGS, portable access ramp use was not considered a safety-critical activity by ARL and this task was therefore not assessed using ARL's competency management system. RAIB found that an informal arrangement at stations operated by ARL was that any member of station staff, who had been trained by being shown practically how to use a portable access ramp, could then fit one. Contracting staff employed by CSS received separate training in the use of portable access ramps at Crystal Palace station.
- 106 Procedures around portable access ramps were not covered explicitly during driver training, nor were they monitored during post-qualification assessments. Witness evidence also shows that drivers were not aware of the procedures that platform staff followed for ramp use. They were also unaware that a previous practice where platform staff spoke directly to drivers when a portable access ramp was to be used was no longer a current ARL procedure (paragraph 65).
- 107 Under the requirements of health and safety legislation, ARL was required to undertake risk assessments of its train dispatch operations at Norwood Junction and the other stations it manages, and to consider the measures intended to manage the safe behaviour of passengers at the platform-train interface. Appendix A of RIS-3703-TOM specifically identified '*putting down and lifting up ramps*' as a hazardous event which might arise at the platform-train interface, although only from the point of view of workforce musculoskeletal disorders.
- 108 ARL carried out station risk assessments using SQE 04.11-A 'Train Dispatch and Platform Train Interface Risk Assessment', issue 2 dated January 2024. The specific risk assessment for Norwood Junction station, dated 10 December 2024, did not consider the risks of portable access ramp use. RAIB found no other risk assessments of this task.

⁶ 'Railway Safety Publication 4 - Safety critical tasks - clarification of ROGS regulations requirements', 2007, Office of Rail Regulation, available from https://www.orr.gov.uk/sites/default/files/2021-11/rsp004-rogs-crtcl_tasks-new.pdf.

Industry processes

109 ARL's processes for managing portable access ramps at stations did not identify if the appropriate ramp was available for the relevant rolling stock which would be calling at stations.

- 110 ARL's PGIs (paragraph 58) followed the criteria laid out in RIS-3703-TOM (paragraph 53). Appendix B of this standard provides guidance on items that can form elements of the risk assessment (paragraph 107). Relevant elements included within appendix B are '*Are the boarding ramps secured appropriately?*' and '*Are the boarding ramps in good condition and compatible with the rolling stock that calls on the platform?*'. RIS-3703-TOM does not expand on the intent of '*compatible with the rolling stock*'. In the case of the portable access ramp for a class 377 (such as that used during the accident), the ramp was compatible with a class 378 unit in terms of its boarding function, but not in terms of preventing door closure (paragraph 51).
- 111 ARL's PGI did not explicitly require those undertaking the inspection to check what ramps were required for a particular station with consideration of the types of trains due to call there. Because the PGI was following the criteria in RIS-3703-TOM, it did not require a check on the functionality of the ramps in terms of their ability to prevent door closure (paragraph 58).

Mobile device use

112 Railway industry processes for mitigating the risk of driver inattention caused by the use of mobile devices have not been sufficiently effective.

- 113 RAIB has investigated several accidents where mobile devices use has been a causal factor. These have included:
- At Hayes & Harlington station in July 2015, a passenger was dragged along the platform while their hand was trapped in a train door ([RAIB report 12/2016](#)). RAIB found that the driver had been using their mobile phone to send and receive messages while in charge of their train, before the accident, and that they may have been distracted by what was discussed when the accident occurred. The train driver's manager had not previously identified any use of a mobile phone by the driver and had no grounds for thinking that the driver might be contravening company policy, which prohibited mobile phone use while driving, and required devices to be switched off.
 - In March 2020, a locomotive derailed when it ran through a buffer stop south of Bromsgrove station. A passing passenger train then collided with the locomotive ([RAIB report 14/2020](#)). The driver had been distracted from the driving task due to family issues and had been sending and receiving text messages about this immediately before the accident. This contravened their company policy which also prohibited the use of mobile phones in the driving cab, or when on or near railway lines.
 - At Kirkby in March 2021, a passenger train hit a buffer stop at 29 mph (47 km/h) ([RAIB report 07/2022](#)). RAIB found that the driver did not apply the brakes in time to avoid the collision because they were distracted from the driving task, in part due to using their mobile phone. This contravened their company policy, which required mobile phones to be switched off when driving trains.

- 114 ARL had two internal standards covering the use of mobile phones while undertaking safety-critical tasks. SQE 20.9 'Mobile Phone & Portable Media Device Policy', issue 2 dated February 2021, explicitly said '*you must not use a mobile device when carrying out any safety critical task*'. It also said '*mobile devices must be switched off and out of sight when you are in the driving cab*'. SQE 20.1 'Drivestyle' (paragraph 103) referred to this mobile phone policy. It also stated that drivers should not be distracted by devices and that distraction can continue after a call due to ongoing mental processing about the conversation. Drivers were expected to be familiar with these documents and to confirm they had received them.
- 115 Companies which operate trains have limited means of checking on compliance with such policies, particularly mobile phone use in driving cabs. The accidents listed above have shown that the existing devices fitted to trains that are intended to monitor driver awareness and vigilance are unlikely to detect the use of mobile devices, and driving cabs are not covered by the internal CCTV systems fitted to trains. While other CCTV systems, such as those in station platforms, provide a limited opportunity to check compliance, these systems do not cover most of the railway network and may not pick up calls made via the use of headphones, or via devices such as smartwatches. ARL instead relied on spot checks by managers or looking at call logs on devices themselves (which can be easily deleted) after an incident. Unlike RAIB and other agencies, such as the police, who have legal powers to obtain communications data from mobile phone providers, operators such as ARL have no means to obtain such data where it relates to personal devices belonging to staff.
- 116 Industry-wide documents provide guidance to train operators to help form their mobile phone policies. Rail Industry Standard RIS-3776-TOM 'Rail Industry Standard on Control of Mobile Communication Equipment Use in Driving Cabs', issue 1 dated December 2009, states that an outright ban is undesirable as mobile phones are useful in an emergency if all other forms of communication have failed. It also refers to ORR's guidance for its inspectors RIG-2009-06 'Guidance to Inspectors regarding the use of mobile phones/hand-held electronic communication devices by train drivers', dated 23 July 2010, which states that phones should be off and out of sight. Rule Book GERT8000 Module G1, 'General safety responsibilities and personal track safety for non-track workers', issue 15 dated March 2025, also states that anyone entering a cab should '*check with the driver if any mobile electronic devices are to be switched off before entering the cab*'.
- 117 The industry, through RSSB, has undertaken research programmes to understand mobile phone use and the attitudes of drivers towards them. RSSB's 2010 research report T904 'Development of a train driver education programme on mobile phone risk' was undertaken following the 2008 accident in Chatsworth, USA, where a driver was distracted by their mobile phone and the resulting collision led to the death of 25 people. Of the surveyed drivers, almost 20% thought mobile phone use was '*not detrimental to performance*'. The proposal from the research was for an industry-wide education programme, as enforcement was not enough of a deterrent. An education programme was piloted and was briefed to the wider industry. Tracking of the use of the education programme was discontinued as mobile phone awareness training in most railway undertakings moved from being a standalone subject to being embedded in other more general topics.

- 118 In 2024, RSSB published the report from an updated research programme, T1280 'Evaluating the effectiveness of control measures for unauthorised presence of mobile smart devices within the driving cab'. Updated surveys revealed nearly 40% of drivers did not think they would be caught using a mobile device while driving, and 18% of drivers thought mobile devices do not affect performance. The report also shows that drivers and managers do not want any form of in-cab monitoring, instead preferring to influence behaviour through education. The recommendations made in the report were to have better policies and risk assessments focusing on more checks and monitoring and updating training and awareness processes. Currently, this has not filtered out to the wider industry beyond awareness of the recommendations.
- 119 Recognising that mobile devices issued by train operators are increasingly prevalent in driving environments, in 2025 RSSB published T1332 'Agreed industry standards for mobile electronic devices'. It concluded that integrating mobile devices, through such systems as connected driver advisory systems, offers great opportunities for enhanced capabilities, safety improvements and better service. However, the report found there is variability in mobile device policies and acceptance of use across the industry. The report concluded that there needs to be a more standardised approach in terms of risk assessing the devices and understanding the risk of distraction balanced against the benefits.
- 120 In response to a recommendation made in RAIB's report into the fatal tram accident at Sandilands Junction in 2016 ([RAIB report 18/2017](#)), the UK's light rail operators trialled a number of technologies monitoring driver alertness and attention. ORR asked the mainline railway in Great Britain to apply the lessons learnt in other sectors. In 2021, RSSB published research report T1193 'Understanding the functional requirements for train driver attention and alertness monitoring devices'. The work highlighted the overall benefits of such systems, and that a trial of these systems was required (see paragraph 125).

Summary of conclusions

Immediate cause

121 Train 9D18 departed with a portable access ramp attached (paragraph 42).

Causal factors

122 The causal factors were:

- a. The portable access ramp used did not prevent the doors from closing and door interlock being achieved on class 378 units (paragraph 46). This causal factor arose due to a combination of the following:
 - i. The correct portable access ramp for class 378 trains had been removed (paragraph 56), **Recommendations 3 and 4**.
 - ii. Station staff were unaware that the portable access ramp provided at Norwood Junction station was of the incorrect type for class 378 trains (paragraph 60), **Recommendations 1, 2, 3 and 4**.
- b. The driver believed it was safe to dispatch the train (paragraph 62). This causal factor arose due to a combination of the following:
 - i. The driver did not know that a portable access ramp was going to be used during this station call. This is a possible factor (paragraph 64), **Recommendations 1 and 2**.
 - ii. The driver's safety checks when dispatching the train did not detect that the portable access ramp remained attached (paragraph 69), **Recommendations 5 and 6, Learning points 1 and 2**.
- c. Platform staff were unable to stop the train dispatch (paragraph 96), **Recommendations 1 and 2**.

Underlying factors

123 The underlying factors were:

- a. ARL had not identified and effectively controlled the risks associated with using portable access ramps (paragraph 100), **Recommendations 1 and 2**.
- b. ARL's processes for managing portable access ramps at stations did not identify if the appropriate ramp was available for the relevant rolling stock which would be calling at stations (paragraph 109), **Recommendations 1, 2, 3 and 4**.
- c. Railway industry processes for mitigating the risk of driver inattention caused by the use of mobile devices have not been sufficiently effective (paragraph 112), **Recommendations 5 and 6, Learning point 2**.

Previous RAIB recommendation and learning points relevant to this investigation

124 The following recommendation, which was made by RAIB as a result of its previous investigations, has relevance to this investigation.

Recommendation that is currently being implemented

[Buffer stop collision at Kirkby, Merseyside, 13 March 2021, RAIB report 07/2022, Recommendation 1](#)

125 The above recommendation addressed one of the factors identified in this investigation (paragraph 70a). To avoid duplication, it is not remade in this report. However, shown below is a summary of its wording and its current status.

Recommendation 1

The intent of this recommendation is that additional research be undertaken into systems which can detect and monitor driver alertness and awareness, and how these could be trialled in the industry.

RSSB, in consultation with relevant stakeholders and bodies representing staff, should undertake further research into how the detection and mitigation of a loss of alertness or attention in train drivers can be improved. This research should specifically consider the effectiveness of systems currently in operation and build on work already completed, such as the functional specification and proposed trials set out in the T1193 research report. It should also take into account relevant practice from other transport systems.

126 In August 2023, ORR reported to RAIB that, in response to this recommendation, RSSB had launched research project T1193 ‘Understanding the functional requirements for train driver attention and alertness monitoring devices’ to consider the technology that could improve the detection and mitigation of a loss of alertness or attention in train drivers. Two train operating companies and a freight operating company have agreed to pilot technology based on the findings of T1193; the formal procurement process for equipment is complete and contract negotiation with the preferred supplier is under way.

127 At the time of writing this report (May 2026) RSSB has informed RAIB that this trial is currently being conducted.

Learning points raised in previous reports

128 A number of previous RAIB investigations have highlighted learning points around the distractions caused by the use of mobile phones by train drivers (paragraph 71) and their responsibilities to comply with company regulations (paragraph 114).

- Passenger trapped and dragged by a train at Hayes & Harlington station 25 July 2015, Learning point 2

This investigation has revealed that the driver concerned made use of his personal mobile telephone to send and receive text messages while in charge of his train. Such behaviour creates an unacceptable risk of distraction and is therefore dangerous. It is for this reason that company instructions state that mobile electronic devices should never be used by staff in charge of trains except in emergencies.

- Passenger train collision with a derailed locomotive at Bromsgrove 23 March 2020, Learning point 1

This accident demonstrates the importance of train drivers complying with their employer's mobile phone usage policy so as to avoid unnecessary distractions while driving.

- Buffer stop collision at Kirkby, Merseyside 13 March 2021, Learning point 1

Train drivers are reminded that using a mobile phone while in control of a train in situations other than where this is permitted by the relevant operating rules carries a significant risk of distraction from the driving task and could lead to a serious accident or incident occurring.

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

- 129 ARL undertook a risk assessment for the fitting and use of portable access ramps. This assessment detailed updated control measures with a particular focus on increasing the frequency of staff training and an improved ongoing maintenance regime. As a result of this, ARL reported that it was working with the ramp manufacturer, Portaramp UK Limited, to develop a programme of proactive ramp maintenance and inspections.
- 130 ARL undertook an audit of portable access ramps at stations where London Overground trains call, to ensure that the correct ramp types are in place for these trains. At locations where there are multiple types of portable access ramp, labels have been added indicating which class of train a ramp can be used on. Additionally, tags have been added to the handles of portable access ramps which are incompatible with a class 378 train, explaining that they cannot be used on class 378 trains.
- 131 ARL cascaded a portable access ramp refresher to its drivers using the 'Safety training update day' process. Refresher training has been provided to platform staff at stations where multiple ramp types are used. This has also been passed to stations not operated by ARL, but which are used by London Overground class 378 trains.
- 132 The driver of train 9D18 ceased driving trains for ARL.
- 133 First Rail London, the current operator of the London Overground concession, is currently reviewing its mobile electronic equipment policy.

Recommendations and learning points

Recommendations⁷

134 The following recommendations are made:⁸

- 1 *The intent of this recommendation is that the risks associated with the fitting and use of portable access ramps are effectively mitigated.*

First Rail London Limited should continue to review and update its risk assessments covering the use of portable access ramps to ensure that any hazards have been identified and appropriate risk controls put in place. This review should specifically consider how management processes will confirm the availability of portable access ramps which are fully compatible with the trains that call at specific stations.

First Rail London Limited should develop a timebound plan for the implementation of any appropriate changes to standards and processes identified by this review.

This recommendation may apply to other transport operators who use portable access ramps (paragraphs 122a.ii, 122b.i, 122c, 123a and 123b).

- 2 *The intent of this recommendation is to ensure that appropriate portable access ramps are used correctly by railway staff.*

First Rail London Limited should continue to review and update its competency management system for drivers, and its training management system for station staff, to ensure that drivers and station staff have the necessary knowledge and skills to safely use portable access ramps. This review should specifically consider both initial and ongoing training and assessment.

First Rail London Limited should develop a timebound plan for the implementation of any appropriate changes to its competency and training management systems identified by this review.

⁷ Arriva Rail London was the duty holder at the time of the accident for the London Overground concession. First Rail London Limited took over the concession on 3 May 2026 and is now the duty holder. Recommendations relating to London Overground are as such referenced to First Rail London Limited.

⁸ 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, 2, 4, 5 and 6 are addressed to the Office of Rail and Road, and recommendation 3 is addressed to the Department for Transport, 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.

This recommendation may apply to other transport operators who use portable access ramps (paragraphs 122a.ii, 122b.i, 122c, 123a and 123b).

- 3 *The intent of this recommendation is to formalise the requirement that portable access ramps prevent train doors from closing when they are attached to a train.*

Taking account of the safety learning identified in this report, the Department for Transport should review the National Technical Specification Notice for Accessibility to consider if it should include a specific requirement that passenger doors of trains must not be able to close, or traction power obtained, once a portable access ramp has been attached to a passenger train (paragraphs 122a.i, 122a.ii and 123b).

- 4 *The intent of this recommendation is to align the current rail industry standard on train dispatch with rail industry guidance on the requirements for new and refurbished trains.*

Taking account of the safety learning identified in this report, the Rail Safety and Standards Board should review issue 6 of Rail Industry Standard RIS-3703-TOM 'Passenger Train Dispatch and Platform Safety Measures' to ensure that it reflects the risk of trains departing with portable access ramps attached and discusses appropriate control measures to prevent this.

This review should specifically consider if this standard should incorporate the requirements of clause 3.31.2.9 of the Rail Safety and Standards Board 'Key Train Requirements' document that a portable access ramp or other installation shall prevent the train doors from closing when in position.

The Rail Safety and Standards Board should revise as necessary any relevant programmes, guidance and training material following this review (paragraph 122a.i, 122a.ii and 123b).

- 5 *The intent of this recommendation is to update rail industry education of drivers on the dangers of mobile device use in the cab.*

The Rail Safety and Standards Board, working with train operators and the relevant rail industry stakeholders, should review the current programmes, guidance and training material intended to educate train drivers as to the negative consequences of inappropriate use of mobile devices.

This review should consider accidents and incidents, both in the UK and abroad, updates in communications technology, changes in the patterns of mobile device usage, and research on the possible effects of distraction within safety-critical functions due to inappropriate use of mobile devices.

The Rail Safety and Standards Board should revise as necessary any relevant programmes, guidance and training material following this review (paragraphs 122b.ii and 123c).

- 6 *The intent of this recommendation is that the risks caused by train drivers being distracted by mobile devices are minimised.*

The Office of Rail and Road should undertake a review to ensure that train operators have suitable arrangements in place to identify, assess and control the risks to safety caused by train drivers becoming distracted by the inappropriate use of mobile devices, particularly mobile phones (paragraphs 122b.ii and 123c).

Learning points

135 RAIB has identified the following important learning points:⁹

- 1 This accident demonstrates the impact that personal issues may have on staff working in a safety-critical role and highlights the importance of staff in such roles both understanding the effect personal issues might be having on them, and considering informing their employer so they can be supported and managed appropriately (paragraph 122b.ii).
- 2 Train drivers are reminded that using a mobile phone while in control of a train in situations other than where this is permitted by the relevant operating rules carries a significant risk of distraction from the driving task and could lead to a serious accident occurring (paragraphs 122b.ii and 123c).

⁹ 'Learning points' are intended to disseminate safety learning that is not covered by a recommendation. They are included in a report when RAIB wishes to reinforce the importance of compliance with existing safety arrangements (where RAIB has not identified management issues that justify a recommendation) and the consequences of failing to do so. They also record good practice and actions already taken by industry bodies that may have a wider application.

Appendices

Appendix A - Glossary of abbreviations and acronyms

Abbreviation / acronym	Full term
ARL	Arriva Rail London
CSS	Carlisle Support Services
DCASS	Driver care and support system
DCD	Driver competence development
DCO	Driver controlled operation
DOO	Driver only operation
FTC	Failed to call
GSM-R	Global System for Mobile Communications-Railway
GTR	Govia Thameslink Railway
NTSN ACC	National Technical Specification Notice for Accessibility
ORR	Office of Rail and Road
OTCM	On-train cameras/monitors
PGI	Planned general inspection
RAIB	Rail Accident Investigation Branch
ROGS	The Railways and Other Guided Transport Systems (Safety) Regulations 2006
RSSB	Rail Safety and Standards Board
SAD	Station assistant dispatch
SPAD	Signal passed at danger
TD	Train dispatcher
TfL	Transport for London
TPWS	Train Protection and Warning System

Appendix B - Investigation details

RAIB used the following sources of evidence in this investigation:

- information provided by witnesses
- information taken from the train's on-train data recorder
- CCTV recordings taken from the station and train bodyside cameras
- voice communications during and after the accident
- site photographs and measurements
- weather reports at the site
- railway industry standards
- phone records of the driver obtained from the network operator
- a review of previous industry investigations into similar incidents
- a review of previous RAIB investigations that had relevance to this accident.

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