

Passenger trapped in tram doors and dragged at Bury tram stop, Greater Manchester, 30 May 2018

Important safety messages

This incident demonstrates:

- the importance of tram drivers not relying on tram doors closed and locked indications (interlock system) as an assurance that nothing is trapped in the doors; and
- the need for managers to provide comprehensive and consistent safety messages to their staff in response to safety incidents.

Summary of the incident

At around 13:33 hrs on 30 May 2018, a passenger was dragged by a departing tram after his hand became trapped in a pair of closed and locked doors. The tram was stopped by the driver after travelling about 15 metres, reaching a maximum speed of 10 km/h (6 mph). Fortunately the passenger was able to stay on his feet during this time. After the tram stopped, the driver reopened the doors and the passenger boarded the tram which then departed.

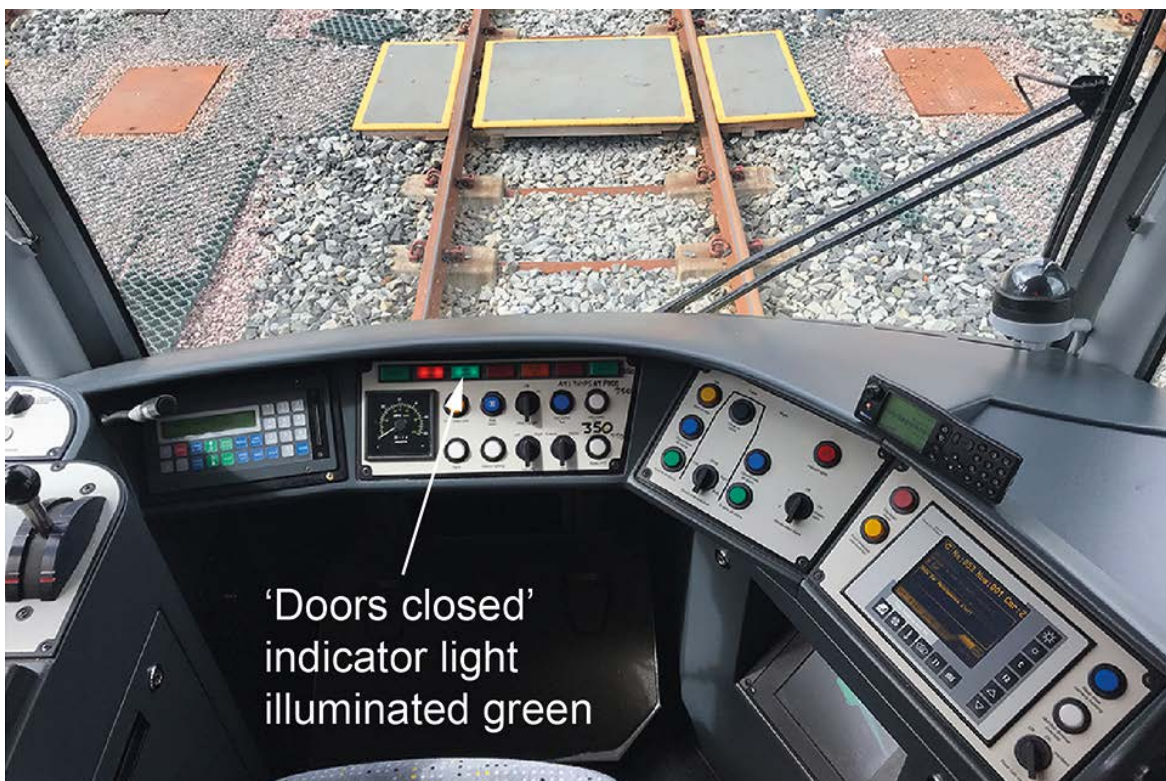
The passenger had entered the platform just before the tram driver initiated the door closure sequence by operating a push-button in his cab. As the doors were closing, the passenger hurried to the tram and put his hand between the rearmost pair of double doors. His hand became trapped when the doors reached the fully closed position, and then locked.

After the doors were fully closed and locked, the driver undertook his final door visual check using a CCTV monitor in his cab showing the tram doors viewed through an external camera mounted on the front of the tram and looking backwards. The monitor showed the passenger and a group of other people close to the tram at the rearmost set of doors. The driver believed that the passenger was part of this group whose earlier actions had led him to conclude that they did not intend to board the tram.

The driver then checked that the green 'doors closed' light in the cab had illuminated and started to depart. He kept looking at the left-hand CCTV monitor as the tram departed because he was aware of the people near the rear of the tram. When he saw the passenger moving alongside the tram he decided to stop because he was concerned by the developing situation.



Platform CCTV at Bury station showing tram departing (image courtesy of Metrolink)



Doors closed indicator light in the driving cab of a tram (image courtesy of Metrolink)

Cause of the incident

This incident occurred because the driver believed that the illuminated 'doors closed' light, shown in the driving cab, meant nothing was trapped in the closed and locked doors, so the tram was safe to depart. The light actually means that no object has been detected between the closed doors by the door obstacle detection system. This system is designed to automatically reopen the doors if objects which are at least 30 mm thick are detected. Objects thinner than 30 mm are not necessarily detected.

The driver stated that he was not aware that thin objects could be trapped in the closed doors and not detected by the door obstacle detection system. He was aware that the final door visual check was important to monitor passenger behaviour, but not aware of its role in avoiding departure with an object trapped between closed doors.

The RAIB issued [urgent safety advice](#) on 7 February 2018 to all UK tramways following an incident on 15 December 2017, when an empty pushchair was dragged after becoming trapped in the closed doors of a tram in Nottingham. This advised tram operators to take urgent steps to confirm or ensure that tram drivers:

- perform a thorough check after obtaining door interlock and before moving the tram to confirm that nothing outside the tram is trapped in the doors;
- do not place sole reliance on the door interlock system when deciding whether anything outside the tram is trapped in the doors; and
- are provided with the means to achieve the above.

In response to the urgent safety advice, Manchester Metrolink issued a safety brief to its drivers on 9 February 2018. Each driver was verbally briefed face-to-face and given a copy of the briefing document. This briefing included both reference to checking the CCTV monitor to make sure that it is safe to start the tram, and not to rely on the door interlock system (the green 'doors closed' indicator light) to indicate that nothing is trapped in the closed doors. However, a revised version of the briefing document (to clarify the requirements of Metrolink's rule book) was briefed and issued to drivers on 19 February 2018. In the second version, the issue of reliance on the door interlock system was omitted. Metrolink has stated that this was an unintentional error.

Manchester Metrolink has stated that, after the incident, it briefed its drivers to undertake the final door visual check with the CCTV monitor in 'split-screen' mode showing the view of the tram doors obtained from an external camera mounted on the rear of the tram in addition to the front camera view used at the time of the incident. It has also stated that this method of working is being embedded into its driver training programme.

Previous similar occurrences

RAIB investigations have shown that trap and drag events are a potential risk on both tramways and railways, with some resulting in serious injuries, and some with the potential to cause fatal injuries. Previous events with similarities to the Bury incident and investigated by the RAIB include:

- At Wellesley Road, Croydon on 15 June 2007 ([RAIB report 40/2007](#)), a passenger was dragged after their hand or clothing became trapped in the closed and locked doors of a departing tram. The investigation found that the door detection system did not detect the passenger's trapped hand or clothing in the closed and locked doors, and that neither the trainee nor instructor driver completed a final visual door check.
- At Hayes & Harlington station on 25 July 2015 ([RAIB report 12/2016](#)), a passenger was dragged by a train when the train driver did not identify her hand was trapped in the closed and locked doors. The investigation found that the door detection system did not detect the passenger's hand in the closed doors and that the train driver and other train company staff believed that the door interlock system would detect the presence of an object such as a hand.
- At Radford Road, Nottingham on 15 December 2017 ([RAIB report 15/2018](#)), an empty pushchair was dragged between tram stops after its plastic rain cover became trapped in the closed and locked doors of a tram on the Nottingham tramway. The tram driver, and other tramway staff, were not aware that small objects could be trapped but not detected by the door obstacle detection system.
- At Bushey station on 26 March 2018 ([RAIB safety digest 07/2018](#)) a passenger was dragged when their wrist became trapped in the closed and locked doors of a departing train. The guard incorrectly believed that he could rely on the door interlock (object detection system) to determine whether anyone was trapped in closed doors.