

Oliver Stewart
RAIB Recommendation Handling Manager



5 February 2026

Mr Andy Lewis
Deputy Chief Inspector of Rail Accidents

Dear Andy,

RAIB Report: Trap and drag accidents at Archway and Chalk Farm on 18 February 2023 and 20 April 2023

I write to provide an update¹ on the action taken in respect of recommendation 3 addressed to ORR in the above report, published on 27 June 2024.

The annex to this letter provides details of actions taken in response to the recommendations and the status decided by ORR. The status of recommendation 3 is **'Closed'**.

We do not propose to take any further action in respect of the recommendation, unless we become aware that any of the information provided has become inaccurate, in which case I will write to you again.

We will publish this response on the ORR website.

Yours sincerely,

Oliver Stewart

¹ In accordance with Regulation 12(2)(b) of the Railways (Accident Investigation and Reporting) Regulations 2005

Recommendation 3

The intent of this recommendation is to provide sufficient time for people to be able to alight safely from trains at stations where automatic train operation is in use.

Considering the sequences of events detailed in this investigation along with relevant industry guidance and good practice, including from other railway operators, London Underground Limited should review the current minimum automatic train operation station dwell times to determine if passengers have sufficient time to safely alight or board trains.

Based on this review, London Underground should determine the minimum time needed for train doors to be open and available for use, and the effect which this will have on the associated minimum automatic train operation station dwell times. London Underground Limited should produce a timebound plan and make any appropriate changes to automatic train operation station dwell times on any of its lines using this mode of operation.

ORR decision

1. London Underground Ltd (LUL) has reviewed current minimum stations dwell times for Automatic Train Operation (ATO). The minimum dwell time programmed into the signalling system on the Northern line was found to be 17 seconds, which is consistent with other similar metro systems worldwide. A separate human factors review considered the factors that influence the time required to board and alight a train. LUL also took into consideration the number of incidents at the platform-train interface involving passengers boarding and alighting from the train.

2. LUL concluded that existing minimum dwell times for the Northern line and other ATO lines are appropriate. We consider the work done by LUL demonstrates that the recommendation has been appropriately taken into consideration.

3. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, London Underground Ltd has:

- taken the recommendation into consideration; and
- has taken action to close it.

Status: Closed.

Previously reported to RAIB

4. On 3 June 2025 ORR reported the following:

LUL has undertaken a project to review dwell times for trains at stations where automatic train operation is in use. The project was originally expected to be completed in January 2025, but the remit has since been extended to incorporate feedback from metro systems in other countries. The review is now planned to be completed in June 2025.

Update

5. On 17 December 2025 LUL provided the following update:

In June 2025, we completed a review of our minimum Automatic Train Operation (ATO) dwell times along with relevant industry guidance and good practice, including from other railway operators both within the United Kingdom and with other Metros from across the world via the Community of Metros (CoMET) network. We also undertook a Human Factors review to consider the provision of a suitable time for people to alight safely from trains where ATO is in use. We have previously shared a copy of this review with you.

Since this work was completed, we have undertaken some further work to determine the minimum dwell time programmed into the signalling system on the Northern line – this is a minimum of 17 seconds. The door open / close cycle can range from between 6 – 10 seconds, allowing an opportunity for boarding and alighting of between 11 and 7 seconds with a mid-point of 9 seconds. This was shared with you when you met [names redacted] on 14 November 2025.

We compared our dwell times with other railway operators and London Underground is broadly aligned with other metros across the world of a similar size and operation.

The 17 seconds minimum dwell time is historical and based on historic data which we have not been able to locate. However, following further discussion with Engineering and Operational Upgrades colleagues it is likely that this was based on:

- *The number of boarders and alighters at each station*
- *Train design*
- *Platform entrance and exit characteristics (for example platforms with entrances / exits only at one end will have higher dwells than those with entrances and exits spread along the platform as a result of customer bunching)*
- *Train design and layout for example the number of doors, the width of the doors and the dimensions of the vestibule standback*

These factors are then likely to have been considered, and a formula applied which calculates the dwell times.

We have considered whether this dwell time remains sufficient for today's railway along with the output of the Human Factors review which found that there are many different factors that influence the time required to board and alight a train which include:

- *Train design (i.e. door and aisle width, seating design and density, vestibule and stand back size and design)*
- *Platform design (i.e. vertical step and horizontal gap between train and platform, platform access point location where customers tend to cluster)*
- *Levels of customer traffic (i.e. peak vs off-peak, central vs outer zones, special events etc)*

- *Individual difference in terms of customer performance (i.e. familiarity, mobility impairments, the impact of luggage, buggies and travelling with small children, or in large groups)*
- *From a customer's perspective, one or several of these factors may be present throughout their train journey which can impact the time they require from station to station*
- *If minimum door open time was to be specified across the network or per line, it would need to account for the worst-case scenario i.e. the impact in terms of timing of all factors would need to be considered*
- *This would most likely have a negative impact on service performance as not all influencing factors apply at all locations, resulting in inefficiencies and possible customer frustrations.*

In addition, we reviewed the number of caught in door incidents on the Northern line per million customer journeys between 2022 and 2024. As outlined in the table below this shows that the number of such incidents per million customers crossing the platform train interface on the Northern line is low. This indicates that for the majority of customers dwell times are appropriate.

<i>Year</i>	<i>Incidents</i>	<i>Boarders and alighters</i>	<i>Incidents per million boarders and alighters</i>
<i>2022</i>	<i>39</i>	<i>557,638,303</i>	<i>0.07</i>
<i>2023</i>	<i>93</i>	<i>595,232,117</i>	<i>0.16</i>
<i>2024</i>	<i>101</i>	<i>600,869,963</i>	<i>0.17</i>

We have therefore concluded that due to the low number of incidents per million customer journeys and the significant variability and number of potential permutations involved, the broad consistency and alignment between our minimum times and those applied by other metro operators and the role that a train operator plays in determining when it is safe for a train to depart a platform it is considered that the current minimum dwell time on the Northern line remains appropriate. This is also the case for other ATO lines on the LU network.

Previously reported to RAIB

Recommendation 3

The intent of this recommendation is to provide sufficient time for people to be able to alight safely from trains at stations where automatic train operation is in use.

Considering the sequences of events detailed in this investigation along with relevant industry guidance and good practice, including from other railway operators, London Underground Limited should review the current minimum automatic train operation station dwell times to determine if passengers have sufficient time to safely alight or board trains.

Based on this review, London Underground should determine the minimum time needed for train doors to be open and available for use, and the effect which this will have on the associated minimum automatic train operation station dwell times. London Underground Limited should produce a timebound plan and make any appropriate changes to automatic train operation station dwell times on any of its lines using this mode of operation.

ORR decision

1. LUL has undertaken a project to review dwell times for trains at stations where automatic train operation is in use. The project was originally expected to be completed in January 2025, but the remit has since been extended to incorporate feedback from metro systems in other countries. The review is now planned to be completed in June 2025.

2. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, LUL has:

- Taken the recommendation into consideration; and
- Is taking action to close it.

Status: Open.

Information in support of ORR decision

3. On 10 October 2024 London Underground Limited provided the following initial response:

TfL recognises the importance of giving our customers enough time to alight and board trains safely, in particular those customers who may need more time to do this.

We are delivering a project which considers a suitable minimum 'door dwell open time' from a human factors perspective, and how this may be incorporated into future rolling stock (including automated systems). This will consider the minimum time which must lapse between doors opening and doors being permitted to close, to

enable safe boarding and alighting for customers behaving predictably under normal conditions. This project will undertake the following:

- 1. Literature Review: this will consider the findings of user trials undertaken at the University College London (UCL) Mock-up Facility to identify train design features that affecting boarding and alighting, a review of the passenger boarding times for High Speed 2, a review of work undertaken regarding customer boarding and alighting times on the Dutch Railway System and the Berlin Public Transport System.*
- 2. Review train operator trained behaviours around train door opening and closing habits (specifically related to dwell times).*
- 3. Undertake observations of typical customer behaviour boarding and alighting trains particularly in relation to Persons of Restricted Mobility, customers travelling with luggage and those travelling with children. This will also consider any further gaps or questions arising from the literature review.*

This project is due to be completed by January 2025. The project report will consider whether a minimum door open time is required on LU lines. Recommendations will be incorporated into the TfL Rail PTI Plan, along with timescales for delivery.

- 4. On 17 March 2025 London Underground Limited responded as follows:*

You asked about our review of minimum ATO dwell times. We had planned to complete this work in January 2025. However, having started the review, this work has been expanded to incorporate feedback from other Metros from across the world via the Community of Metros (CoMET) network. In order to provide sufficient time for responses to be received and any follow meetings to be arranged, we now plan to complete this review in June 2025 but will provide an update on progress to you in May 2025.