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31 January 2017



Mr Andrew Hall  
Deputy Chief Inspector of Rail Accidents  
Cullen House  
Berkshire Copse Rd  
Aldershot  
Hampshire GU11 2HP

Dear Andrew,

**RAIB Report: Collision between a train and a fallen bridge parapet at Froxfield, Wiltshire, 22 February 2015**

I write to report<sup>1</sup> on the consideration given and action taken in respect of recommendations the four recommendations addressed to ORR in the above report, published on 20 January 2016.

The annex to this letter provides details in respect of each recommendation.

The status of recommendations 1 is '**implementation on-going**' with regard to Network Rail, Transport for London and Nexus. For the Heritage Rail Association, the status is '**progressing**'.

Recommendation 2 was addressed directly by RAIB to DfT.

The status of Recommendation 3 is '**progressing**' for all infrastructure managers as it is subject to implementation of recommendation 2 by DfT.

Recommendation 4 was directed to RSSB. The status of the recommendations is '**progressing**'.

ORR will advise RAIB when further information is available regarding actions being taken to address these recommendations.

We will publish this response on the ORR website on 1 February 2017.

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

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Oliver Stewart', with a stylized, cursive script.

Oliver Stewart

## Initial consideration by ORR

1. All 4 recommendations were addressed to ORR when the report was published on 20 January 2016.
2. After considering the recommendations ORR passed recommendations 1 and 3 to infrastructure managers (Network Rail, TfL and Nexus) and the Heritage Railway Association; and recommendation 4 to RSSB asking them to consider and where appropriate act upon them and advise ORR of their conclusions. The consideration given to each recommendation is included below.
3. Recommendation 2 was addressed directly to DfT by RAIB.
4. This annex identifies the correspondence with end implementers on which ORR's decision has been based.

## Recommendation 1

*The intent of this recommendation is that members of the public have immediate access to the contact details for the railway in the event of an accident on an overline bridge that endangers the railway.*

Network Rail should develop and implement a programme for the timely installation of identification plates on all overline bridges with a carriageway for which it is responsible (unless the consequence of a parapet falling onto the tracks or a road vehicle incursion at a particular bridge are assessed as likely to be minor). Installation should be prioritised so that those bridges assessed as being at highest risk are fitted first. Network Rail should also modify its standards relating to the installation of identification plates accordingly.

This recommendation may also apply to other infrastructure managers.

## ORR decision and supporting information

### Network Rail

5. On 3 May 2016, Network Rail provided the following initial response:

*Network Rail will review and revise standard NR/L3/CIV/076 issue 4 'Management of the Risk of Bridge Strikes from Road Vehicles and Waterborne Vessels' to mandate a requirement to install identification plates at overline bridges where the consequence of a parapet falling or vehicle incursion would be classed as significant (i.e. greater than minor).*

*A methodology for defining sites with significant consequence and establishing a risk prioritised programme for signage installation will be developed with due consideration for such risk factors as: -*

- *Parapet Construction Type/ Material*
- *History/Evidence of previous bridge strike*

- *Verge make up/ width*
- *Road alignment/ Classification (volume, speed type of road traffic)*
- *Permissible Linespeed, track alignment, type/volume of rail traffic*
- *Current RVI Score*
- *Other installed mitigation.*

*A milestone programme of the delivery of the above actions is as follows: -*

*1) Produce remit for standard change and draft prioritisation methodology by 26 August 2016*

*2) Produce Draft revision to NR/L3/CIV/076 issue 4 for Stakeholder Consultation and/ or equivalent Business Process documentation produced as part of the Business Critical Rules Programme (BCRP) – 25 November 2016*

*3) Publish Revised Management Standard NR/L3/CIV/076 issue 4 and/or BCRP Business Process incorporating Stakeholder Revisions and agreed prioritisation methodology – 31 March 2017*

*4) Publish guidance to accompany standard revision on revised mandated requirements for signage installation – 31 March 2017*

*5) Installation Phase – Implement and complete a risk prioritised programme of bridge identification signage installation April 2017 – 29 March 2019\*\*.*

*\*\* Programme for installation of identification signage is currently indicative and is dependent on the number of identified sites and the adopted risk prioritisation. Review and refinement of the installation programme will continue through the completion of the action plan.*

6. We are satisfied Network Rail has an appropriate time-bound plan in place to review and update the necessary standard; publish appropriate guidance on using the standard; and a prioritised programme to install signs on over bridges. ORR has three-monthly meetings with the Network Rail lead on RVI which will provide an opportunity for regular updates on implementation of the plan.

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

- taken the recommendation into consideration; and
- is taking action to implement it by 29 March 2019

**Status: Implementation on-going**

**Transport for London**

8. On 12 April 2016 TfL wrote to ORR providing separate responses for London Underground, Docklands Light Railway, London Overground, Crossrail and London Trams.

### **London Underground**

*It is a requirement from LU Standards to fix strike plates to overbridges for which it is responsible. LU Standard S1004 "Signage for Operational Purposes" Version A5 was revised in June 2011 to include the requirement to fix bridge strike notification plates to the parapets of bridges that carry roads over the railway.*

*The purpose of the Bridge Strike Information Plate 7- 01406 – 265 from LU Standard S1004 "Signage for Operational Purposes" is to allow LU to be contacted in the event of a vehicle strike to an underbridge or overbridge and ensure the structure is inspected by a Safety Critical licensed Bridge and Structures Inspector and certify the structure remains safe to trains to run..*

*All LU BCV and SSL owned overbridges have bridge strike plates fitted.*

*Currently 28% of LU JNP owned overbridges have bridge strike plates fitted. It is planned have bridge strike plates fitted to all JNP (LU owned) overbridges in the next financial year (2016-17) i.e. by March 2017.*

*The LU Head of Infrastructure Protection will also arrange for the fixing of strike plates to non- LU owned (e.g by Local Authorities) overbridges above the railway to allow LU to be contacted directly in the event of a vehicle strike that endangers the railway.*

### **Docklands Light Railway**

*In 2012, DLRL commenced a project to install Bridge Identification Plates on overline and underline bridges including bridges shared with other companies. The main purpose of the Identification Plates is to provide contact details for the DLRL Control Room in the event of a bridge strike or an emergency and subsequently ensure the affected structure is inspected by a Bridge Strike Nominee.*

*To date the only outstanding assets without identification plates are 5 overline bridges which are owned by the London Borough of Newham and 4 overline bridges transferred from Network Rail as part of the Stratford International Extension Project. The existing DLRL project scope has been extended to install identification plates on these 4 overline bridges and on a series of masonry boundary walls which parallel to a railway cutting between Star Lane and West Ham. Discussions will be held with London Borough of Newham to seek their permission to install identification plates on their 5 overline bridge assets.*

*It is planned to complete installation of all identification plates by the end of this Financial Year (i.e. March 2017).*

### **London Overground**

*All bridges on East London Railway of London Overground (the bit which Rail for London are Infrastructure Manager of) had bridge plates fitted during the East London Line Project. We have asked the inspectors to check that they are still in place at their next 10 week Infrastructure Protection walk.*

*All other bridges on the London Overground network are on Network Rail Managed Infrastructure.*

## **Crossrail**

*Crossrail does not yet exist as a Railway and has, as yet, no duties as an Infrastructure Manager under RoGS. The railway that does exist under the TfL Rail banner falls to Network Rail to consider who will respond in their own right.*

## **London Trams**

*London trams are initiating a programme to install identification plates on all overline bridges that they own. The change assurance paperwork has just been approved and the creation of the plates, identification of the appropriate locations and installation should be complete by the end of September 2016.*

9. ORR is satisfied that London Underground have a plan in place to fit strike plates to all over bridges by March 2017. In addition they have made arrangements to fit strike plates to over bridges not owned by London Underground. Docklands Light Railway have identified bridges that cross their infrastructure that don't have strike plates and have made arrangements with the owners of those bridges to fit them by the end of March 2017. London Overground have strike plates fitted to all over bridges for which they are infrastructure manager and will check that they are still in place as part of their usual inspection regime. London Trams had planned to fit strike plates to over bridges they are the infrastructure manager for by the end of September 2016, but this was subsequently recast to March 2017.

10. On 6 January 2017 TfL confirmed that the programmes for London Underground, Docklands Light Railway and London Trams were still on target to be completed by March 2017. With regard to London Overground, a number of sites have been identified where TfL have decided to re-sight the existing sign. This work is expected to be completed by March 2017. TfL provided the following update:

*The inspectors have checked that signage was still in place at their 10 week Infrastructure Protection walk – this was confirmed to be the case, however they have identified ten locations where the signage presently installed could be better located thus it is more noticeable to members of the public. Re-sighting of these signs is due to be completed by the end of March 2017.*

11. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, the organisations that make up Transport for London have:

- taken the recommendation into consideration; and

- have either taken action to implement it by March 2017,

**Status: Implementation on-going**

## Nexus

12. On 4 August 2016 Nexus provided the following initial response:

*The report in question was considered at the Nexus Recommendations Review Panel (RRP), which determined the following course of action in respect of each of the 4 recommendations made:*

*(1) Provision of identification plates on overbridges: this recommendation was accepted. A project to implement it is being led by our Principal Engineer (Civils), and is due to be completed by March 2017.*

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

- taken the recommendation into consideration
- have taken action to implement it by March 2017

**Status: Implementation on going**

## Heritage Railway Association

14. Although it is not an infrastructure Manager, the recommendation was passed to the Heritage Railway Association (HRA) as it is the representative body for heritage railways, which may have responsibility for road bridges that cross the railway.

15. The HRA initially considered a special message to its member organisations, but felt that the Froxfield RAIB report raised more general questions around Road Vehicle Incursion (RVI) and required a more formal communication. Therefore the HRA has put together a Guidance Note on RVI which covers boundary security and identification of bridges/viaducts.

16. The HRA wrote to ORR on 12 August 2016 with a copy of the guidance. The section on roadside structure identification states:

- A) *All structures should be identified by a clear sign such that they can be read from ground level at the road side.*
- B) *The sign should contain a unique identifier for the structure, the location, the name of the railway and a phone number for drivers to contact the railway on a 24 hour basis in the event of an incident.*

- C) *Signs for road over bridges should be fixed to posts facing drivers at the opposite end of the bridge such that in the event of the parapet being knocked onto the railway below at least one of the signs can still be read by the driver.*
- D) *Any unidentified structure which presents a risk to road users or the railway should be fitted with a prominent ID plate as soon as practicable, with priority given to the highest risk locations.*

### **ORR decision**

17. ORR will seek assurance that the major heritage railways are aware of the HRA Guidance Note by writing to them asking what they think the implications for them are and what actions they have taken.

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

- taken the recommendation into consideration and communicated with their member organisations on how best to address it.
- We will seek assurance from major heritage railways on how they have addressed this recommendation using the HRA guidance

**Status: Progressing. ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.**

### **Recommendation 2**

*The intent of this recommendation is that the RVI assessment process should include specific consideration of the risk of road vehicles on an overline bridge knocking a parapet onto the tracks below.*

The Department for Transport should include in its guidance for assessing the risk of road vehicle incursion (RVI), a method for specifically assessing the risk of road vehicles damaging a bridge parapet and knocking debris onto the track below, so that proportionate mitigation can be considered by both railway and highway RVI assessors.

### **ORR decision**

19. The recommendation has been directly addressed by RAIB to DfT. We will keep in contact with RAIB regarding the latest position with this recommendation as the implementation of recommendation 3 is dependent on it.

**Status: N/A**

### **Recommendation 3**



*The intent of this recommendation is that Network Rail's RVI assessment procedures take into consideration the risk of a large vehicle on an overline bridge knocking over a parapet onto the tracks below.*

Network Rail should:

- a) include a requirement (aligned with any revised DfT guidance arising from recommendation 3) in its RVI assessment procedures for overline bridges, to specifically assess the risk of road vehicles damaging a bridge parapet and knocking over debris onto the track below so that proportionate mitigation (eg road signage) can be considered by its RVI assessors; and
- b) brief its RVI assessors accordingly

## **ORR decision and supporting information**

### **Network Rail**

20. On 3 May 2016, Network Rail provided the following initial response:

*DfT to complete the works required to address Recommendation No 2, culminating in the republication of the Guidance Note 'Managing the accidental obstruction of the railway by road vehicles' first published in 2003 – by 30 September 2016. (Milestone estimated to allow for follow on actions below to be time bound)*

*Upon publication of revised DfT guidance, Network Rail will review current processes against the revised guidance and issue draft revised standards/BCRP process documents for stakeholder consultation – by 31 March 2017. (i.e. Publication of DfT Guidance + 6 months) ##*

*Upon completion of stakeholder consultation, formally issue revised standards /process documents and associated guidance to implement revisions to the processes used to manage vehicle incursions – by 30 June 2017. (i.e. Publication of DfT Guidance + 9 months) ##*

*## Closure of this recommendation will be sought on publication of revised standards (and associated guidance) mandating the requirements of a revised RVI process in line with new DfT guidance, and the briefing of its revised requirements to Network Rail's RVI assessors.*

*Management of the revised RVI process will follow publication of standards and the formal closure of this recommendation as business as usual.*

21. Implementation of recommendation 3 by Network Rail is dependent on DfT revising their guidance for assessing RVI risk to include a method for assessing the risk of a bridge parapet being displaced onto the railway by a road vehicle. Network Rail has produced a time bound plan to review their processes against the revised DfT guidance.

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

- taken the recommendation into consideration; and
- has a plan in place to implement it, subject to the publication of revised DfT guidance on assessing the risk of a bridge parapet being displaced onto the railway by a road vehicle.

**Status: Progressing. ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.**

### Transport for London

23. On 12 April 2016 TfL wrote to ORR providing separate responses for London Underground, Docklands Light Railway, London Overground, Crossrail and London Trams.

#### London Underground

*Following publication of the Department for Transport (DfT) document in February 2003 entitled 'Managing the accidental obstruction of the railway by road vehicles' London Underground complied with the guidance through:*

- a) *Comprehensive review of the system to identify potential Road Vehicle Incursion (RVI) sites whether or not these are owned by LU. The present list numbers 662 sites.*
- b) *Application of the relevant form from the DfT guidance (form 1a - single carriageway road passing over a railway on an overbridge; form 1b - dual carriageway road passing over a railway on an overbridge; form 2 - neighbouring (or parallel) site) to identified sites to generate a risk rating score.*

*The above work was completed to ensure compliance and consistency with DfT guidance. This work has been subject to ongoing review and update. However, from an early stage LU acknowledged certain features of the DfT method considered to be approximations in application to RVI sites on the LU system, specifically:*

- (i) *The method does not explicitly evaluate likelihood or impact; although particular factors in the rating scheme do relate in a general sense to either or both of these parameters.*
- (ii) *The method does not include consideration of human behaviour of road users. Evidence from incidents (lorry incursion at near Oxshott station; parapet demolition at Froxfield) and near misses show human*

*behaviour to be a significant, possibly dominant, contributor to RVI likelihood.*

- (iii) *Certain parameters in the method are bounding from the perspective of the LU railway; specifically the f12 (Permissible Speed and Track Alignment), f13 (Type of Rail Traffic) and f14 (Volume of Rail Traffic) which always score at the highest scale point when applied to LU.*

*LU operates a safety and performance risk assessment method to Civil Engineering assets (STRATA). This is based on each asset being assigned a status of 'Strategic Risk Assessment' (SRA - fully compliant with standards; no specific issues that give rise to a need for detailed risk assessment) or 'Tactical Risk Assessment' (TRA - issues such as condition, location or environment indicate that site specific risk assessment will support management of the asset and/or environment). SRA assets are assessed on a whole line basis and the likelihood apportioned across compliant sites; TRA assets are subject to specific site risk assessment.*

*STRATA defines risk as arising through a number of asset behaviours. This is on the basis that Civil Engineering assets present risk only through potential to behave outside their stable state. The behaviour relevant to RVI sites is Partial Collapse (PC) which is interpreted in this context as the potential for any item or body (road vehicle, debris from structural damage) to come to rest on or near to the railway.*

*LU considers that to fully understand the safety and performance risk presented at RVI sites (due to RVI and due to other asset factors) it is necessary to complete a numerical evaluation of risk consistent with that for all Civil Engineering assets. To achieve this LU have:*

- a) *Used the prioritisation from application of the DfT method as a coarse screen to shortlist the highest priority RVI sites.*
- b) *Assigned TRA status to the highest priority RVI sites hence triggering a site specific risk assessment. At present TRA status is applied to all RVI sites with a DfT rating score greater than or equal to 80. This encompasses 200 of the 662 total sites.*
- c) *Evaluated the safety and performance risk for each of the 80 sites. This is achieved through:*
  - *Assigning a specific Partial Collapse scenario to each shortlisted RVI site (as an analogy to a RVI event) so as to understand RVI risk specifically and in context with other risks that may be presented by the asset.*
  - *Estimating likelihood for the PC scenario. This is based on an overall estimate from historic events (including near misses) apportioned in accordance with DfT score.*

- *Assigning safety impact depending on the potential outcomes (derived from the LU QRA and the chance that the safety outcome would be realised), and performance impact depending on the unit cost of service disruption and the associated duration.*

*The approach described above generates a numerical safety and performance risk profile for the highest priority RVI sites on LU (as determined from the DfT method). This allows safety risk tolerability and reasonable practicability assessment; and also informs asset management planning through support to business case evaluation of mitigation measures.*

*In response to recommendation 03 LU propose to:*

- Continue with the existing process of incorporation of RVI risk into the general Civil Engineering asset risk assessment framework.*
- Identify any of the current higher priority sites in terms of potential for debris to affect the railway; and to modify or update the TRA as necessary.*

*LU considers that the risk process it currently has in place for RVI sites identifies and is capable of evaluating the full range of railway obstruction outcomes from such an event.*

*LU would be pleased to actively participate in ongoing development of the DfT RVI method to ensure that the guidance is equally appropriate to our infrastructure and will fully adopt recommendations that emerge from such development. However to date LU has not received an invitation from the DfT to participate in the working group tasked with revising the current guidance for assessing RVI.*

## **Docklands Light Railway**

*There are 18 overline bridges on the DLR Network which are maintained by DLRL, London Borough of Newham and London Borough of Tower Hamlets. Out of these 18 bridges, the four located on the Stratford International Extension were risk assessed in accordance with the Department for Transport (DfT) 2003 document 'Managing the accidental obstruction of the railway by road vehicles'. These were deemed to not require any further remedial measures as they had a score of 70 or less. Of the remaining 14 bridges, a high-level RVI assessment has been carried out and the appropriate mitigation measures put in place in a number of locations. This includes signage and the installation of measures such as trief kerbs.*

*In addition to the above our intention is to initiate a programme of RVI assessments for the DLR Bridges in accordance with the revised DfT*

*guidance arising from the above recommendation. The assessments will be complete by the end of December 2016.*

### **London Overground**

*Rail for London utilise the Railway Group standard or Network Rail Company Standards for bridge strikes so will await their update by RSSB or Network Rail and then adopt them.*

### **Crossrail**

*Crossrail does not yet exist as a Railway and has, as yet, no duties as an Infrastructure Manager under RoGS. The railway that does exist under the TfL Rail banner falls to Network Rail to consider who will respond in their own right.*

### **London Trams**

*London Trams are initiating a programme of RVI assessments. These will be carried out by our Civil Engineer who has been briefed on paragraph 103c. The assessments will take into consideration the risk of a large vehicle on an overline bridge knocking over a parapet onto the tracks below. The assessments will be complete by the end of September 2016.*

24. TfL have processes in place to identify and assess the risks associated with potential RVI sites based on the 2003 DfT guidance. TfL will respond to any revised guidance once it is published.

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

- taken the recommendation into consideration; and
- will take steps to implement it, subject to the publication of revised DfT guidance on assessing the risk of a bridge parapet being displaced onto the railway by a road vehicle.

**Status: Progressing. ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.**

### **Nexus**

26. On 4 August 2016 Nexus provided the following initial response:

*Amend RVI assessment to include any modified guidance issued by DfT: this recommendation was accepted, but at the time of writing we are unaware of any modified guidance having been issued by the DfT.*

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

- taken the recommendation into consideration; and
- will take steps to implement it, subject to the publication of revised DfT guidance on assessing the risk of a bridge parapet being displaced onto the railway by a road vehicle.

**Status: Progressing. ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.**

#### **Recommendation 4**

*The intent of this recommendation is that when trains are permitted to run following a collision, there is a mandated requirement to consider the circumstances of the collision carefully, and impose an appropriate speed restriction for the onward movement, especially when there are passengers on board.*

RSSB, in consultation with industry, should propose, and then promote, the introduction of an additional specific requirement in an appropriate Railway Group Standard, so that in the event a train is damaged in an incident (including striking objects on the track) and is to be moved (with or without fitter attention), the conditions of any such movement, including the maximum permissible speed, are subject to a full consideration of:

- a) the circumstances of the incident (including the train speed and nature of any obstacle struck);
- b) the limitations of any on-site assessment of damage; and
- c) whether or not there are passengers on board

#### **ORR decision**

28. RSSB have stated that the RGS relevant to post incident testing of rail vehicles (GM/RT2273) has been withdrawn as a group standard but retained as a RIS (i.e. guidance). The Rolling Stock Standards Committee will now decide if any changes need to be made to the RIS before publication

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

- taken the recommendation into consideration; and
- is taking action to implement it, but ORR has yet to be provided with a time bound plan.

**Status: Progressing.** ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.

### Information in support of ORR decision

30. On 11 April 2016, RSSB provided the following initial response:

*RSSB is intending to respond to Recommendation 4 of the above RAIB report as follows:*

- *RSSB will submit a proposal to Rolling Stock Standards Committee (RSSC) to amend GM/RT2273 (Post-incident and post-accident testing of rail vehicles). This standard currently sets out requirements for post-incident and post-accident examination and testing of rail vehicles, with particular requirements for testing of brakes, speed indicating systems, exterior doors and warning horns.*
- *The proposal will aim to take into account Recommendation 4 of the RAIB report. It will propose to include new requirements and guidance on assessing any damage that may have occurred following an incident, and require the duty holder to define the conditions in which the vehicle(s) can be moved safely (if at all). Such a requirement will most likely require an on-site risk assessment to be conducted by a competent person and controls to be implemented. Guidance will include the considerations that the duty holder should take into account when setting out these conditions, and is expected to include at least those set out in the recommendation. It is expected that the new requirements and guidance can be included in section 2.2 of GM/RT2273 (Actions following a derailment or collision).*

*The proposal is expected to be submitted to RSSC at its 20 May 2016 meeting. We will keep ORR informed of progress.*

31. RSSB provided a further update on 22 August 2016:

*The above proposal was presented to the RSSC at its 22 July 2016 meeting. The discussion reiterated that the Railway Group Standard is now a Rail Industry Standard and that section 16 of GO/RT3437 (Defective on-train equipment) may require changing. Given these points, the Committee accepted the proposal, on which RSSB will now start work.*