



Response to a Bridge Strike over the Railway

A Protocol for Highway and Road Managers, Police and Bridge Owners

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Feedback

Any comments on the content of this document or management of bridge strikes at bridges over the railway should be made in writing to:

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Response to a Bridge Strike over the Railway

A Protocol for Highway and Road Managers, Police and Bridge Owners

Purpose: To give guidance and advice to highway and road managers, bridge owners and others involved in the response to a bridge strike at a bridge over the railway to maintain the safety of the railway and public highways and roads.

Scope: This guidance:

- is intended for Network Rail, Highway and Road Authorities, Police Authorities and all owners of bridges that carry highways or roads over the railway
- applies to bridges owned by Network Rail, local authorities, transport authorities, other public authorities and private companies carrying public highways and roads over the railway operated by Network Rail
- is intended to provide advice to minimise the risk to the operational railway and to highway or road users following a bridge strike when damage is caused to a bridge over the railway, and to enable train services and road traffic movements to be restored safely.

This guidance does not apply to the response to a bridge strike at a bridge carrying the railway over a public highway or road, for which different procedures apply.

Guidance and advice for highway managers and bridge owners to minimise bridge strikes at bridges that carry the railway over public highways or roads is given in 'Prevention of Strikes on Bridges over Highways: A Protocol for Highway Managers and Bridge Owners'.

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1.0 Introduction

- 1.1 There are approximately 8,000 bridges that carry public highways and roads over the railway. In any one year approximately 150 bridge strikes are reported at these bridges. In addition to the damage to the vehicle, these strikes can cause significant damage to bridge parapets and delays to the railway.

The location of these strikes is generally random with no one particular bridge significantly more at risk than others, although bridges on minor roads with poor alignment may be at a greater risk than others. The bridge over the railway at which strikes are most frequently reported is struck on average once a year. Many bridges have however only been struck once.

In some cases the damage is significant with the vehicle ending up on the railway tracks or at risk of falling onto the tracks. Vehicle drivers and occupants may be fatally or seriously injured.

- 1.2 Network Rail incurs high costs from disruptions to train movements due to bridge strikes at bridges over the railway, and for structural repairs following impacts on Network Rails' bridges. A derailment due to debris from a damaged parapet is an ever present danger.
- 1.3 When a bridge parapet is significantly damaged or even totally demolished in a bridge strike, urgent action is required to put interim arrangements in place to enable train services to be restored with minimum delay whilst maintaining the safety of the railway and the highway or road pending reconstruction or repairs.

Interim arrangements which include traffic management and temporary safety barriers and fencing, must be sufficient to prevent an errant vehicle from landing on the railway. There has been an occurrence of a second bridge strike before damage from a previous strike has been reconstructed or repaired resulting in a vehicle on the railway, when the robustness of the interim arrangements was insufficient.



- 1.4 This protocol identifies these issues and recommends practices and procedures which will assist in rail services and road traffic being restored with suitable protection in place until the parapets can be repaired or reconstructed, thereby ensuring safety for all travellers.
- 1.5 Network Rail has produced this protocol in collaboration with the Highways Agency, Transport Scotland, the County Surveyors Society's (CSS), SCOTS Bridges Working Group and the Association of Chief Police Officers, and strongly urges all Highway and Road Authorities and bridge owners to adopt the recommended practices. In this way a prompt and consistent approach can be applied to the response and management of bridge strikes incidents at bridges over the railway.

2.0 Summary of responsibilities

2.1 A summary of the responsibilities of the various organisations and individuals involved in the management of a bridge strike incident at a bridge over the railway is shown in Table 1. Further details of these responsibilities are given in the subsequent clauses.

Organisation/Person	Responsibility
Network Rail	
Operations Control	<ul style="list-style-type: none"> Safety of railway Incident management on behalf of Network Rail Notifying BSN, BSE, Police, Highway or Road Authority and On-call Engineer Reopening lines to rail traffic
Bridge Strike Nominee (BSN)	<ul style="list-style-type: none"> Examination of bridge against defined limits of damage Notifying Operations Control
Bridge Strike Examiner (BSE)	<ul style="list-style-type: none"> Examination of bridge to maintain the safety of train operations Notifying Operations Control Consultation with Network Rail On-call Engineer
Rail Incident Officer (RIO)	<ul style="list-style-type: none"> Managing interface at site between Network Rail Operations Control, Emergency Services and other parties involved
On-call Engineer	<ul style="list-style-type: none"> Instruction of Minor Works contractor Acceptance of interim arrangements as safe for rail operations
Minor Works contractor	<ul style="list-style-type: none"> Clearing track of debris Implementation of repairs to Network Rail structures
Highway and Road Authorities	<ul style="list-style-type: none"> Safety of road users Road closure and maintenance of safe road traffic management Specification and ensuring temporary safety barriers are installed when necessary Acceptance of interim arrangements as safe for road traffic and pedestrians Traffic management and reopening of road
Police	<ul style="list-style-type: none"> Closure of road or implementation of other traffic management measures Hand back to RIO following completion of investigations
Bridge owner	<ul style="list-style-type: none"> Examination of bridge Recovery of costs from vehicle owner/driver Reconstruction or repair of parapet/bridge damage

Table 1: Responsibilities

3.0 Reporting of bridge strikes at bridges over the railway

- 3.1 Network Rail is carrying out a programme to install identification plates at all bridges over the railway. These plates give contact details to enable a bridge strike to be promptly reported to Network Rail Operations Control.
- Generally, two identification plates are installed on each bridge, in positions where the public should be able to read the instructions.
- The principle that identification plates as shown in Appendix A may be erected by Network Rail on bridges over the railway not owned by Network Rail has been accepted. The agreement of the bridge owner to the location of the plates, the method of fixing, and arrangements for their installation and maintenance is to be obtained.
- Identification plates should record the ownership of the bridge.
- 3.2 Information to be initially reported to Network Rail should include:
- location of the reported bridge strike
 - bridge identification (as shown on the identification plate)
 - date and time of incident.
- Where available, details of the vehicle and driver should also be provided.
- 3.3 If a report of a bridge strike is received, the person reporting a bridge strike should be asked if Network Rail has been informed. If not, Network Rail should be notified of the strike immediately using the telephone number on the identification plate or the 24 hour number held by the authority.
- The information on the identification plate and the date and time of the incident should be confirmed.
- 3.4 If the incident is current, the Civil Police should then be contacted using the 999 system.

4.0 Network Rail's response to maintain the safety of the railway

- 4.1 On receipt of a report of a bridge strike, the first priority of Network Rail's Operations Control is to maintain the safety of the railway. Ownership of the bridge is not taken into account when implementing actions to maintain the safety of the railway.
- 4.2 Network Rail's Operations Control will notify the Signaller and other key staff of the incident.
- Generally, the Signaller will stop the first train, and instruct the driver of the first train on each track to approach the bridge slowly, and to report whether or not there is any debris on the line or any obstruction.
- If the train driver reports debris on the tracks or any obstruction, train movements are stopped. If no debris is reported, the Signaller may permit train movements at a reduced speed until confirmation is provided that the bridge has been examined, and that it is safe for train services to resume.
- 4.3 Procedures are in place for notification to be provided to:
- Bridge Strike Nominees and Bridge Strike Examiners (see 4.4 and 4.5)
 - Civil Police using the 999 system (irrespective of whether the strike causes damage only – see 5.4 below)
 - British Transport Police (using the non-urgent BTP MICC phone number in the event that contact is required)
 - Highway Authority (Road Authority in Scotland) and bridge owner if different
- The Highways Agency considers that Network Rail Operations Control should not be provided with telephone numbers of Highways Agency control centres, but that the 999 system should be used. Police will forward the call to the appropriate control centre.
- For bridges owned by Transport Scotland, the authority should be advised using their 24 hour defects reporting telephone number.
- 4.4 The first response is for the bridge to be examined by a Bridge Strike Nominee (BSN), who determines the extent of any damage to the parapets.
- If the integrity of the parapets is not compromised, the BSN permits train movements at normal speed.
- 4.5 The parapet is subsequently examined by a Bridge Strike Examiner (BSE) to:
- confirm the BSN's decision
 - authorise train movements or take other actions as necessary to maintain the safety of the railway when the BSN is not able to permit train movements.

- 4.6 If the damage resulting from the bridge strike is such that a BSE is not able to authorise train movements, Network Rail Operations Control will be advised. In such cases, it is likely that debris will be required to be removed from the track and temporary repairs made to the bridge before train services may be resumed. Safe road traffic management may be necessary.
- 4.7 If the parapet is significantly damaged or demolished such that the safety of the railway may be compromised if the road remains open, Network Rail's response staff will request the Police to close the road.
- 4.8 When there is debris on the track or the damage caused to the bridge necessitates repairs, including repair of loose masonry or coping stones to a parapet, Network Rail's Operations Control will contact the Network Rail Engineer on-call to request that Network Rail's Minor Works Contractor, who is on 24 hour call out, is instructed to attend the incident.
- As an alternative, Network Rail's track maintenance staff may be called out to clear track of debris.
- For a serious incident a Rail Incident Officer (RIO) will be appointed, this may be an Operations BSN or another qualified Network Rail Operations employee who would remain on site until the incident was resolved.
- When the Minor Works Contractor arrives on site it is expected that both BSN and BSE will still be on site. The BSE will hand over to the Network Rail on call Engineer for onward management of the incident.

5.0 Police response

- 5.1 Safety is considered first priority, and therefore the Police will close a road to protect the safety of the railway and the road user. This includes if significant damage is caused to a parapet.
- 5.2 Police may also close a road on a bridge over the railway for police purposes (chemical spillage, crash investigation procedures, vehicle recovery etc.).
- Should the Police deem the location to be a 'scene of crime' and implement crash investigation procedures, contact should be made with the Senior Investigating Officer or the Police Control room to establish when the bridge may be examined or installation of interim arrangements or remedial work to parapets will be able to commence.
- 5.3 If Police or other emergency services require access to the tracks, the procedures in the Emergency Services Rail Incident Protocol are to be followed.
- 5.4 Police consider bridge strikes to be road traffic collisions, and may not attend damage – only road traffic collisions.
- There is a statutory duty under the Road Traffic Act to report damage to roadside property caused in a road traffic collision. Thus the name and address of the driver(s), details of the vehicle owner(s), and the registration number(s) of the vehicle(s) involved in a bridge strike incident should be obtained and reported to the Police.

6.0 Highway or Road Authority's response to maintain the safety of the highway or road

- 6.1 Highway and Road Authorities are responsible for the safety of road users and safe road traffic management, and should be contacted through their emergency response call out system whenever a bridge strike occurs.
- 6.2 The following are options for safe road traffic management to prevent incursion of road vehicles on to the railway after a bridge strike prior to installation of an acceptable temporary safety barrier (See Section 7):
- road closure
 - a carriageway closure, and use of traffic light controlled single lane working on the opposite side of the bridge to the damaged or missing parapet
 - closure of hard shoulder and adjacent lane(s) on a motorway or trunk road.
- The option(s) to be implemented should be selected following an assessment of the risk to both the road user and the railway by the Police or Highway or Road Authority.
- 6.3 Implementation of safe road traffic management should be requested by Network Rail following a bridge strike whenever there is a risk of further debris or another vehicle falling on to the railway should the parapet be struck again. This includes when a parapet is partially demolished or damaged sufficiently to compromise the integrity of the parapet.
- 6.4 The Highway or Road Authority should arrange for safe road traffic management to be implemented and maintained over the bridge until an acceptable temporary safety barrier is in place or the parapet is repaired or reconstructed.

Except for motorways and trunk roads, Network Rail's Minor Works contractor may implement (and subsequently remove) traffic lights, cones etc as part of safe road traffic management provided that the contractor is certificated under the Roads and Street Works Act. In such cases the agreement of the Highway or Road Authority is necessary prior to their installation.

6.5 A road may be closed by:

- Police, both civil and British Transport Police (BTP)
- Fire and Rescue Service
- Highway and Road Authorities.

Highway Agency traffic officers who attend incidents on motorways and trunk roads work in close liaison with the Police, and in some cases, there is a common control centre. These officers are authorised to close a road and stop traffic on motorways and trunk roads in England (not Scotland or Wales), but before they do so they assess the risk of closing the road.

Although Police close roads, a road closure notice has to be issued by the Highway or Road Authority.

6.6 Rail services may resume prior to installation of a temporary safety barrier when the Police or Highway or Road Authority confirm that safe road traffic management over the bridge is in place. If the safe road traffic management becomes ineffective prior to the installation of a temporary safety barrier or completion of a repair or reconstruction of a damaged parapet, the safety of continued train movements will need to be re-evaluated.

6.7 Generally the bridge owner should arrange for the installation of the temporary safety barrier pending reconstruction or repair of the parapet.

Except for motorways and trunk roads, Network Rail's Minor Works contractor may implement (and subsequently remove) a temporary safety barrier and fencing provided that the contractor is certificated under the Roads and Street Works Act. In such cases the agreement of the Highway or Road Authority is necessary prior to their installation.

Otherwise this work should be carried out by the Highway or Road Authority's emergency response contractor.

Prior to installation of a temporary safety barrier, confirmation should be obtained by the contractor from the bridge owner that the bridge has sufficient load capacity for the installation of the proposed barrier.

Arrangements may need to be put in place by the RIO to stop train services temporarily to enable installation of the barrier.

Not all Highway or Road Authorities may have immediate access to acceptable temporary safety barriers units, particularly at night or weekends. In such cases unless Network Rail's Minor Works Contractor is able to provide these barriers, safe road traffic management should remain in place.

6.8 Any installation of temporary safety barriers should allow sufficient working space for the repair or reconstruction of the parapet as agreed with the bridge owner.

6.9 If a road closure is in place, consideration may need to be given to an alternative route to permit pedestrians to cross the bridge. In such cases, any gap in a parapet will need to be closed with temporary fencing (see Section 7). The fencing should be securely fixed to prevent overturning, or vandals loosening the fence.

6.10 Following a bridge strike at a bridge over the railway, the Highway or Road Authority should repair or replace any damage to road signs, markings and lighting to maintain the safety of the road for road users.

6.11 Following a bridge strike at a bridge over the railway, the Highway or Road Authority should establish whether any improvements could be made to the signing on the approaches or other appropriate action taken to minimise the risk of another similar incident occurring at the bridge.

7.0 Acceptable temporary safety barriers and fencing

7.1 Temporary safety barriers are necessary to enable removal of safe road management and both road traffic and train movements to continue when a parapet to a bridge over the railway is demolished or otherwise significantly damaged in bridge strike such that there is a risk to the road user.

7.2 The Highways Agency maintains a list of temporary safety barriers which have been successfully tested to confirm compliance with BS EN 1317 - 1 and - 2 and which have been approved for use on the Highways Agency trunk road network.

The listing and details of manufacturers of each approved barrier may be found in:

www.highways.gov.uk/business/8720.aspx

Copies of documents, drawings and more information about products are available from the individual product promoters.

Such temporary barriers are acceptable for installation following a bridge strike.

- 7.3 Fencing erected to temporarily infill a gap in a demolished or damaged parapet to permit pedestrians to cross the bridge, if the road is closed, should be:
- not less than the height of the existing parapet
 - unclimbable
 - constructed using non – metallic materials on bridges over lines with overhead electrification.

8.0 Actions to be taken before train movements under the bridge can recommence

- 8.1 Debris from the parapet or vehicle involved is to be removed from the track, and stacked securely clear of trains.
Loose masonry and coping stones that might fall on to the track should be removed from the damaged parapet, and placed where the debris will not be at risk of falling on to the tracks below.
- 8.2 Whenever it is reported that part of a parapet has been demolished or damaged, Network Rail Operations Control should only permit train movements to recommence in the following circumstances:
- a BSN authorises train movements
 - a BSE or the Network Rail on-call Engineer confirms that the condition of the parapet does not compromise the integrity of the parapet sufficiently to endanger the safe movement of trains or road vehicles
 - safe road traffic management has been implemented, and there is no risk of parapet debris, road vehicles or pedestrians falling onto the track
 - an acceptable temporary safety barrier and fencing (See Section 7) has been put in place to prevent road vehicles and pedestrians falling over the edge of the bridge, and there is no risk of parapet debris falling onto the track
 - the parapet is reconstructed or repaired.

9.0 Actions to be taken before a road can be opened safely to vehicles

- 9.1 The Highway or Road Authority and Network Rail engineers should agree which interim arrangements are acceptable for both safe rail operations and protection of road traffic and pedestrians.
- 9.2 The Highway or Road Authority determines if a road is safe, and will open the highway or road over the bridge to road traffic in the following circumstances:
- safe road traffic management has been implemented, and there is no risk of road vehicles or pedestrians falling onto the railway below
 - an acceptable temporary safety barrier and fencing (See Section 7) has been put in place to prevent road vehicles and pedestrians falling over the edge of the bridge
 - the parapet is reconstructed or repaired.

10.0 Reconstruction or repair of parapets

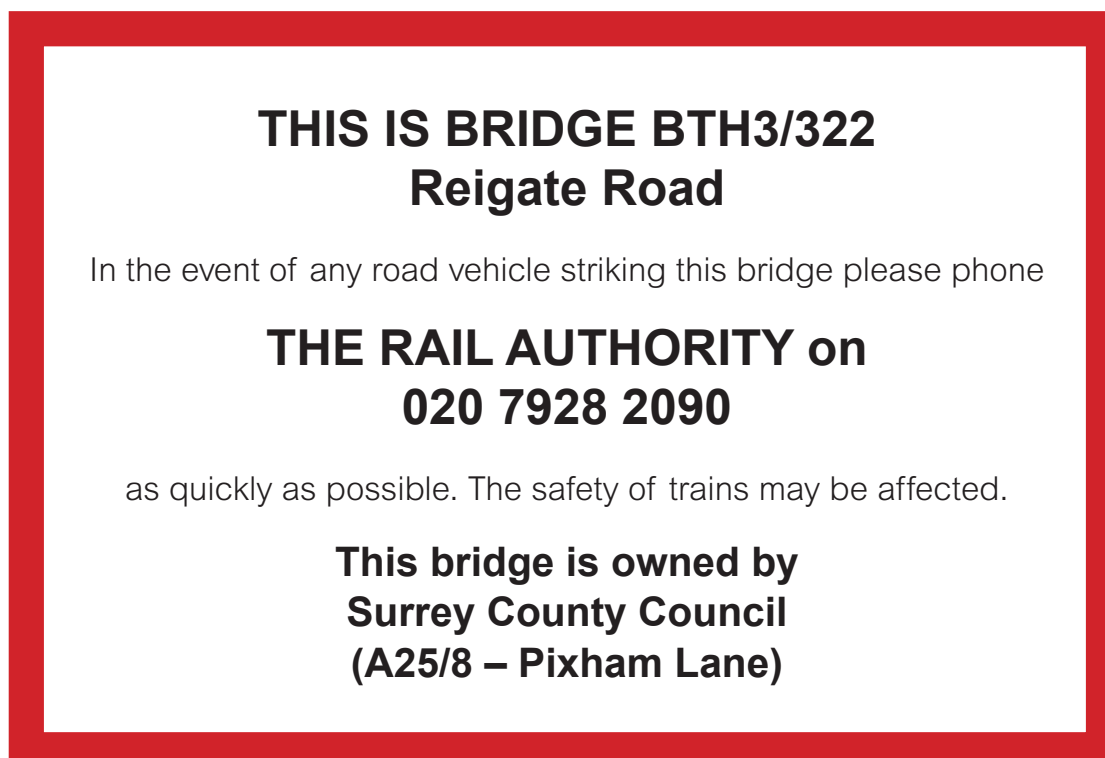
- 10.1 The Highway or Road Authority and Network Rail will need to agree the method of work for the reconstruction of or repairs to a parapet damaged in a bridge strike. The agreed method should define when the works are complete to permit the road to be opened safely to road vehicles. Any requirements for track possessions and/or electrical isolations may have programming implications as track possessions and/or electrical isolations may not be immediately available.

Appendix A: Example bridge strike identification plates for bridges over the railway

Bridge owned by Network Rail



Bridge not owned by Network Rail



Appendix B: Prevention of bridge strikes at bridges over the railway

B.1 Although the occurrence of a bridge strike at any one bridge may be considered to be a random event, there are generally some common factors to these incidents not directly related to the vehicle driver. These factors, the risk of which should be assessed at each location, and if necessary mitigation implemented include:

- insufficient or no warning of bend on approach immediately before bridge
- road narrows over bridge and there is insufficient width for two vehicles to pass.

B.2 Options for mitigation of these risks include:

- provision of road traffic signs giving warning of the approaching bend and speed warning or restrictions
- traffic lights and single lane working over the bridge
- improving the visibility of parapets to the bridge.

Guidance on the maintenance of road traffic signs is given in Prevention of Strikes on Bridges over Highways: A Protocol for Highway Managers and Bridge Owners.

B.3 In addition, advertisements distract drivers' attention. They should not therefore be allowed adjacent to bridges spanning over the railway. This includes bridges owned by Network Rail and others. Guidance on recommendations to minimise distractions from advertising is also given in Prevention of Strikes on Bridges over Highways: A Protocol for Highway Managers and Bridge Owners.

References

Prevention of Strikes on Bridges over Highways: A Protocol for Highway Managers and Bridge Owners: CSS (County Surveyors' Society) on behalf of the Bridge Strike Prevention Group (October 2007)

Network Rail Document NR/CM/SO/P/305: Emergency Services Rail Incident Protocol (March 2004)