



**Response to a Bridge Strike
at a Bridge carrying the Railway
over a Road**

**A Protocol for
Highway and Road Managers, Emergency Services
and Bridge Owners**

NR/GPG/CIV/008

Transport for London



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Feedback

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

Head of Engineering (Building and Civils)
Network Rail
40, Melton Street
LONDON
NW1 2EE

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Response to a Bridge Strike at a Bridge carrying the Railway over a Road A Protocol for Highway and Road Managers, Police and Bridge Owners

Purpose: To give guidance and advice to those involved in the response and subsequent actions necessary to maintain the safety of the railway and public highways and roads following a bridge strike at a bridge carrying the railway over a highway or road.

Scope: This guidance:

- ◇ is intended to be followed by Rail Authorities, Highway and Road Authorities and Emergency Services
- ◇ applies to bridges carrying a railway over highways and roads maintained by Highway and Road Authorities.
- ◇ is intended to provide advice on the actions to be taken to maintain the safety of the operational railway and public highway or road following a bridge strike so that train services and road traffic movements under the bridge may be restored safely.

This guidance although written for Network Rail may be adapted by other Rail Authorities that own bridges carrying a railway over a highway or road.

This guidance does not apply to the response to a bridge strike at a bridge that carries highways or roads over the railway, for which different procedures as described in NR/GPG/CIV/007: *Response to a Bridge Strike over the Railway - A Protocol for Highway and Road Managers, Police and Bridge Owners* apply.

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

Network Rail has produced this protocol in collaboration with:

Association of Directors of Environment and Passenger Transport
Highways Agency
Transport Scotland
Transport for London (Streets)
Association of Chief Police Officers
British Transport Police
Chief Fire Officers' Association

Network Rail strongly urges all Highway and Road Authorities 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 railway bridges over highways and roads.

Contents

		Page No.
1	Introduction	5
2	Summary of responsibilities	6
3	Reporting a bridge strike at a railway bridge over a road	7
4	Network Rail's response to maintain the safety of the railway	7
5	Police response	9
6	Highway or Road Authority's response to maintain the safety of the highway or road	10
6.1	Notification and response generally	10
6.2	Emergency response	11
6.3	Repairs to road infrastructure	11
6.4	Review of road traffic signs and other methods to prevent bridge strikes ..	12
7	Safe traffic management for repairs to the Bridge	13
Appendix A:	Flow chart for recommended response to a Bridge Strike	15
Appendix B:	Example bridge strike identification plates for bridges over the railway	16

1 Introduction

- 1.1 There are approximately 25,000 bridges that carry the railway over public highways and roads. In 2010 more than 1750 bridge strikes were reported at these bridges. In addition to the damage to the vehicle, these strikes can cause significant damage to the bridge and delays to the railway.
- The frequency of these strikes varies according to the location. Several railway bridges over roads are struck on average at least once a month.
- The risk to the railway also varies according to the form of construction and the type of vehicle involved in the strike.
- A derailment due to a bridge strike by a robust vehicle causing a railway bridge to move sideways with consequential distortion in the track alignment is an ever present danger.
- The greatest risk to road users occurs at skew bridges, where a vehicle can be overturned following the collision with the bridge. Vehicle drivers and occupants of vehicles travelling in the opposite direction have been fatally or seriously injured by the overturning vehicle.
- The vehicle involved in a bridge strike can be seriously damaged and the driver injured. When double deck buses are involved the roof may be removed which may result in serious injuries to the persons on the upper deck.
- 1.2 Rail Authorities incur costs from disruptions to train movements and to examine and repair the structure following impacts on their bridges.
- Highway and Road Authorities may also incur costs to inspect and repair damage to road infrastructure.
- A bridge strike also results in costs to the community and the local economy. These costs arise from the disruption resulting from road closures consequential of a bridge strike.
- Such costs incurred due to a bridge strike should be recoverable through an insurance claim against the vehicle driver or owner.
- 1.3 When a bridge strike at a railway bridge over a road is reported, urgent action is required to maintain the safety of the railway, and for the bridge to be examined to enable train services to be restored with minimum delay pending reconstruction or repairs.
- Rail Authorities may either stop train movements or continue to run trains over the bridge. In all cases the bridge is examined.
- Urgent action may also be necessary to maintain the safety of the road.
- Road closures may be necessary for repairs to the bridge to be carried out before train services may be restored at normal speed and for any damaged road traffic signs to be made safe or other road infrastructure to be repaired.
- Arrangements may also need to be put in place for damaged road traffic signs to be replaced or repaired.
- 1.4 This protocol identifies these issues and recommends practices and procedures which will assist in rail services and road traffic being safely restored thereby ensuring continuing safety for all travellers.
- A flow chart showing the recommended actions to be taken by the various stakeholders is shown in Appendix A.
- 1.6 This protocol is intended to complement the protocol Prevention of Strikes on Bridges Over Highways: A Protocol for Highway Managers and Bridge Owners.

2 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 carrying the railway over a highway or road is shown in Table 1. Further details of these responsibilities are given in the subsequent clauses.

Organisation/ Person	Responsibility
Rail Authority (Network Rail)	
Operations Control	Safety of railway Incident management on behalf of Rail Authority Notifying BSN, BSE, Police (Civil and British Transport Police), on call Engineer and Maintenance Recording event to facilitate recovery of costs from vehicle owner/driver Managing train movements Notifying Highway or Road Authority
Signaller	Authorising train movements
Bridge Strike Nominee (BSN)	Examining of bridge against defined limits of damage Notifying Operations Control and Signaller
Bridge Strike Examiner (BSE)	Examining of bridge to maintain the safety of train operations Notifying Operations Control and Signaller Consulting with On-call Engineer
Rail Incident Officer (RIO)	Managing interface at site between Operations Control, BSE, emergency services and other parties involved
On-call Engineer	Providing engineering support to BSE Instructing Minor Works contractor
Minor Works contractor	Implementing repairs to bridge including provision of safe road traffic management
Maintenance	Repair and reinstatement of damaged track formation
Highway and Road Authorities	Safety of road users Approval of safe road traffic management for repairs to bridge and road infrastructure Advising emergency services of road closures Making damaged road infrastructure safe Repairing damaged road infrastructure Recovery of costs from vehicle owner/driver
Police	Closure of road or implementation of other traffic management measures Notifying Highway or Road Authority when emergency action is required to maintain the safety of the road Liaising with Highway or Road Authority Notifying other emergency services Facilitation of recovery of road vehicle and load Reopening of road Handing back to RIO after completion of investigations

TABLE 1: RESPONSIBILITIES

3 Reporting a bridge strike at a railway bridge over a road

- 3.1 If a report of a bridge strike is received by a Highway or Road Authority, the person reporting the bridge strike should be asked if the Rail Authority has been informed. If not, the Rail Authority 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.

- 3.2 Information to be initially reported to the Rail Authority 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.

For Police, guidance on the particular matters to be reported to Network Rail is given in the Network Rail document 'Police bridge strike protocol – initial actions'.

- 3.3 If the incident is current, after the Rail Authority has been informed the Civil Police should be contacted using the 999 system.

- 3.4 Network Rail has erected or is in the process of carrying out a programme to erect identification plates at all bridges carrying the railway over roads. These plates give contact details to enable a bridge strike to be promptly reported to the Network Rail Operations Control.

Generally, two identification plates are installed at each bridge, in positions where the public should be able to read the instructions (See Appendix B for example plates erected at Network Rail bridges).

- 3.5 Highway and Road Authorities should be contacted by:

- the Civil Police through their emergency response call out system whenever a bridge strike occurs which affects the safety of the road or traffic flows;
- Rail Authority's Operations Control for any bridge strike which does not affect the safety of the road.

4 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.

The actions taken will however depend upon the robustness of the bridge, the type of vehicle involved, and promptness of the report.

- 4.2 Network Rail's Operations Control will notify the Signaller and other key staff of the incident.

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 **5.8**);
- British Transport Police (using the force contact number).

4.3 Prior to the bridge being examined the Signaller will take action in accordance with Operational Instructions to either.

- stop train movements;
- authorise train movements at reduced or normal speed according to the robustness of the bridge;
- continue to run trains.

4.4 Normally, the bridge is examined first by a Bridge Strike Nominee (BSN), who determines the extent of any damage to the bridge against defined damage limits.

If the damage limits are not exceeded, and thus the integrity of the bridge is not compromised, the BSN permits train movements at normal speed.

4.5 The bridge 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.

The BSE may request provision of safe road traffic management (see **7.2**) to:

- facilitate the examination of the bridge;
- remove loose debris to remove the risk of it falling on a passing road vehicle.

4.6 Until a vehicle is confirmed as wedged, train movements may be permitted.

If a vehicle is confirmed as wedged, train movements will be stopped until the vehicle is removed if:

- the vehicle is substantial (e.g. container vehicle) and the BSN is not able to examine all the bridge;
- persons are trapped in the wedged vehicle;
- the vehicle is carrying a dangerous load.

If none of the above conditions apply, such as when the vehicle is insubstantial (e.g. a curtain sided lorry, double deck bus) provided the damage to the bridge is not significant train movements may continue.

Network Rail Operations Control will liaise as necessary with the vehicle recovery companies during the removal of a wedged vehicle, and if necessary will instruct the Signaller to stop train movements whilst the vehicle is removed from under the bridge.

Train movements may also be stopped if the vehicle is reported to be on fire.

4.7 If the damage 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 repairs to the bridge will be necessary before train services may be resumed. Safe road traffic management may be necessary (see **7.2**).

4.8 If the bridge is damaged such that repairs are necessary before trains can be resumed Network Rail Operations Control will:

- request the Civil Police to close the road - this request may also be made locally by the response staff at the bridge;
- 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.

Train movements may also be stopped over arch bridges if the response staff considers that there is a risk of loose brickwork in an arch bridge or other debris on the bridge falling on to road traffic or pedestrians should train movements be restored. In such cases a road closure will be requested and arrangements made for the damaged brickwork or debris to be removed.

For a serious incident a Rail Incident Officer (RIO) will be appointed. This is normally a qualified Network Rail Operations employee who would remain on site until the incident was resolved. The BSN might carry out this role.

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.

4.9 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 bridge does not affect the ability of the structure to carry trains, and that train movements over the bridge do not compromise the safe movement of road vehicles or pedestrians under the bridge;
- the Minor Works Contractor or Network Rail on-call Engineer confirms that damage caused in the bridge strike which affected the ability of the structure to carry trains has been repaired (see 7).

4.10 Procedures are in place for Network Rail Operations Control to advise Highway and Road Authorities when a bridge strike occurs which does not affect the safety of the road.

It is assumed that Highway and Road Authorities will be aware of bridge strikes that affect the safety of the road, in which a road closure was necessary to repair road surfacing or make safe road traffic signs or other road infrastructure.

5 Police response

5.1 The initial response of the police is described in the Network Rail document 'Police bridge strike protocol – initial actions'.

5.2 Safety is considered first priority, and therefore the Civil Police will close a road to protect the safety of the road user. This includes if significant damage appears to have been caused to a bridge.

5.3 As well as the Civil Police, a road may also be closed by:

- 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 Civil 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 a road closure is generally effected by the Civil Police, a closure notice has to be issued by the Highway or Road Authority.

5.4 Civil Police may also close a road under a bridge for police purposes (chemical spillage, crash investigation procedures, vehicle recovery etc.).

Should the Civil 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 repairs work to the bridge will be able to commence.

5.5 Civil Police will liaise with the local Fire and Rescue Service if it is necessary to:

- isolate vehicle power;
- remove or make safe a hazardous load.

5.6 If a vehicle involved in a bridge strike has overturned or is wedged under the bridge, the Police will contact a vehicle recovery company or the Highway or Road Authority for motorways and trunk roads (see 6.2.4) to arrange for the removal of the vehicle.

5.7 It is not expected that Civil Police will require access to the tracks as a consequence of a bridge strike at a bridge carrying the railway over a highway or road, but if access to the tracks by the Civil Police is necessary, the procedures in the Emergency Services Rail Incident Protocol are to be followed.

5.8 Civil Police consider bridge strikes to be road traffic collisions, and may not attend damage - only road traffic collisions.

The Road Traffic Act 1988 (Section 170) states that if damage is caused to any property attached to land on which a road is situated, the driver is legally obliged to report the damage. Accordingly 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.

Civil Police should thus attend when notified of damage to a bridge carrying a railway line.

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

6.1 Notification and response generally

6.1.1 Highway and Road Authorities are responsible for the safety of road users and that safe road traffic management is implemented.

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.

Similarly when the safety of the public is affected and an emergency response by the Highway or Road Authority is necessary, the Highway or Road Authority will be notified by the Civil Police.

For bridges over roads managed by Transport Scotland, the Authority should be advised using their 24 hour defects reporting telephone number (0800 028 1414).

Nevertheless, procedures are in place for Network Rail to also notify the Highway or Road Authority of all strikes on railway bridges over a road so that the Highway or Road Authority is aware of the frequency of strikes reported at particular bridges.

- 6.1.2 Following a bridge strike at a railway bridge over a road, the following actions may be necessary:
- inspection of road traffic signs and street furniture at and in the vicinity of the bridge;
 - repair of damaged road traffic signs, road markings and street furniture;
 - repair of damaged road surfacing;
 - provision of safe traffic management to facilitate repairs to the bridge (see 7).

6.2 Emergency response

- 6.2.1 A Highway or Road Authority will instigate an emergency response to.
- provide road closed and diversions signs;
 - repair damaged road surfacing;
 - make damaged road traffic signs safe including electrical isolation if necessary;

When an emergency response has been necessary, the Emergency Officer will notify the relevant Highway Engineer.

- 6.2.2 The Highway or Road Authority may delay the initial response to open a road closed by the Civil Police when there is an alternative route available until a more appropriate time for the community.
- 6.2.3 The Highway or Road Authority determines if a road is safe, and will open the highway or road under the bridge to road traffic in the following circumstances:
- the Rail Authority confirms that the bridge is safe;
 - the vehicle has been removed from under the bridge;
 - any necessary repairs to the road surface, road traffic signs and lighting have been completed;
 - safe traffic management has been implemented;
 - any Police investigation has been completed.
- The road may be partially or fully opened to road traffic.
- 6.2.4 The Highways Agency has their own vehicle recovery arrangements for motorways and trunk roads in England.

Transport Scotland's Operating Companies may arrange their own recovery vehicles, however the Police can, and do, intervene (in agreement with the Operating Company) to expedite vehicle removal and keep the delay to a minimum.

6.3 Repairs to road infrastructure

- 6.3.1 Works to repair or replace damaged road traffic signs and markings and lighting may be necessary to maintain the safety of the road for road users following a bridge strike at a railway bridge over a road.
- Generally repairs are not carried out before the road is reopened unless the surfacing is damaged. Repairs to road infrastructure are carried out:

- usually within 28 days if non-critical;
- in other cases within 1 – 2 weeks.

6.3.2 As soon as it is reasonably practical, the Highway Engineer should arrange for the site to be inspected to determine any requirements for repair or replacement of damaged road signs, road markings and lighting.

The inspection should include a check of the minimum headroom so as to confirm or amend any signed maximum safe vehicle height.

6.3.3 Damaged road traffic signs must be repaired or replaced at the earliest opportunity.

The Highway or Road Authority and Rail Authority will need to agree the method of work and programme for the repair or replacement of damaged signs attached to the bridge.

6.3.4 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.

The lack of immediate implementation of access arrangements for safe working (track possessions and/or electrical isolations or safe traffic management), should not prevent a road traffic sign from being attached to a bridge if that is what is necessary.

In these circumstances, the Highway or Road Authority and the Rail Authority should agree who is best placed to carry out the work and the protocol for so doing.

If the work is carried out by other than the Highway or Road Authority, the approval of the authority as asset owner should be obtained.

6.4 Review of road traffic signs and other methods to prevent bridge strikes

As soon as is reasonably practicable following a bridge strike at a railway bridge over a road, the Highway or Road Authority in conjunction with the Rail Authority should review and establish whether any improvements could be made to:

- the road traffic signs on the approaches to, and at, the bridge;
- visibility of existing signs by removal of vegetation.

The Highway or Road Authority should review the provision of road traffic signs and consider implementation of other mitigation measures to minimise the risk of another similar incident occurring at the bridge. This is particularly relevant when a bridge is struck often.

The review of road traffic signs should be undertaken in a joint site visit with the Rail Authority and other interested stakeholders.

The provision and implementation of road traffic signs should be in accordance with the Traffic Signs Manual Chapter 4.

Further guidance on the options for other mitigation measures is given in 'Prevention of Strikes on Bridges Over Highways: A Protocol for Highway Managers and Bridge Owners'.

7 Safe traffic management for repairs to the Bridge

- 7.1 In addition to safe road traffic management for an examination of the bridge (see 4.4), safe road traffic management will also be requested by the Rail Authority when:
- repairs to the bridge are necessary before train services may be permitted to run at normal speed;
 - train services are permitted to run following a bridge strike, but repairs are necessary as another bridge strike is likely to necessitate repairs to the bridge before train services will be permitted to run.

- 7.2 The following are options for safe road traffic management to facilitate repairs to a railway bridge over a road after a bridge strike:

- road closure;
- temporary traffic controls;
- a carriageway closure, and use of traffic light controlled single lane working on the opposite side of the road from the damaged part of the bridge;
- closure of hard shoulder or 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.

- 7.3 The bridge owner should arrange for a traffic management plan to be submitted to the Highway or Road Authority for approval.

The traffic management plan should specify the safe road traffic management to be implemented and maintained under the bridge until the repairs are completed.

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 New Roads and Street Works Act. In such cases the agreement of the Highway or Road Authority is necessary prior to their installation.

It is noted that the normal notice for planned street works closures is 3 months, but this may be able to be reduced if an early start is requested.

For motorways and trunk roads, the traffic management arrangements shall be agreed with the Highway or Road Authority and installed, maintained and removed by the Authority's appointed service provider for the location.

- 7.4 If a road closure is necessary to carry out repairs to enable train services to be restored at normal speed, a short term notice for closure should be made.

The traffic management plan should be submitted by telephone if an emergency road closure is considered necessary.

7.5 Safe road traffic management implemented for repairs to the bridge should not:

- cause traffic to pass under a section of bridge with less headroom than the area being obstructed for the repair without careful assessment of any potential adverse effects;
- force vehicles to mount kerbed footways which might result in another impact.

It is imperative that safe road traffic management which reverses the direction of flow along a road or diverts traffic onto contra-flow working on another carriageway for the duration of the repair includes provision of proper signing to reflect the directional change.

If a road closure is implemented as part of the safe road traffic management, the traffic management plan should include an alternative route for pedestrians to pass under the bridge.

Appendix A: Flow chart for recommended response to a Bridge Strike

Network Rail	Highway or Road Authority	Civil Police
Report of bridge strike received by Network Rail Operations Control		
Implement action to maintain safety of railway		
Report incident to Police		Take action to maintain safety of road including road closure if necessary
Report incident to Highway or Road Authority	Emergency response by Highway or Road Authority	Advise Highway or Road Authority if necessary
Arrange examination of bridge		Arrange vehicle recovery if necessary
Examination by BSN	Repairs to highway/road infrastructure	
Examination by BSE		Facilitate road closure for bridge examination
Repairs to bridge required before trains can run at normal speed	Approval of road closure or other safe road traffic management	
Train services restored at normal speed	Road traffic restored	
Advise Highway or Road Authority Champion of strike		
Joint inspection of road traffic signs and review of other methods of bridge strike prevention		
Repairs to bridge required		
Implement repairs	Approval of road closure or other safe road traffic management	

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



References

Traffic Signs Manual Chapter 4 'Warning Signs', (11 June 2004), London: TSO for DfT, the Scottish Executive, the Welsh Assembly Government and the Department for Regional Development NI

NR/GPG/CIV/007: Response to a Bridge Strike over the Railway - A Protocol for Highway and Road Managers, Police and Bridge Owners: Network Rail (February 2008)

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 'Police bridge strike protocol – initial actions' (July 2008)

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

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