

Bridge Strikes

Mark Wheel CEng MICE

Senior Engineer.



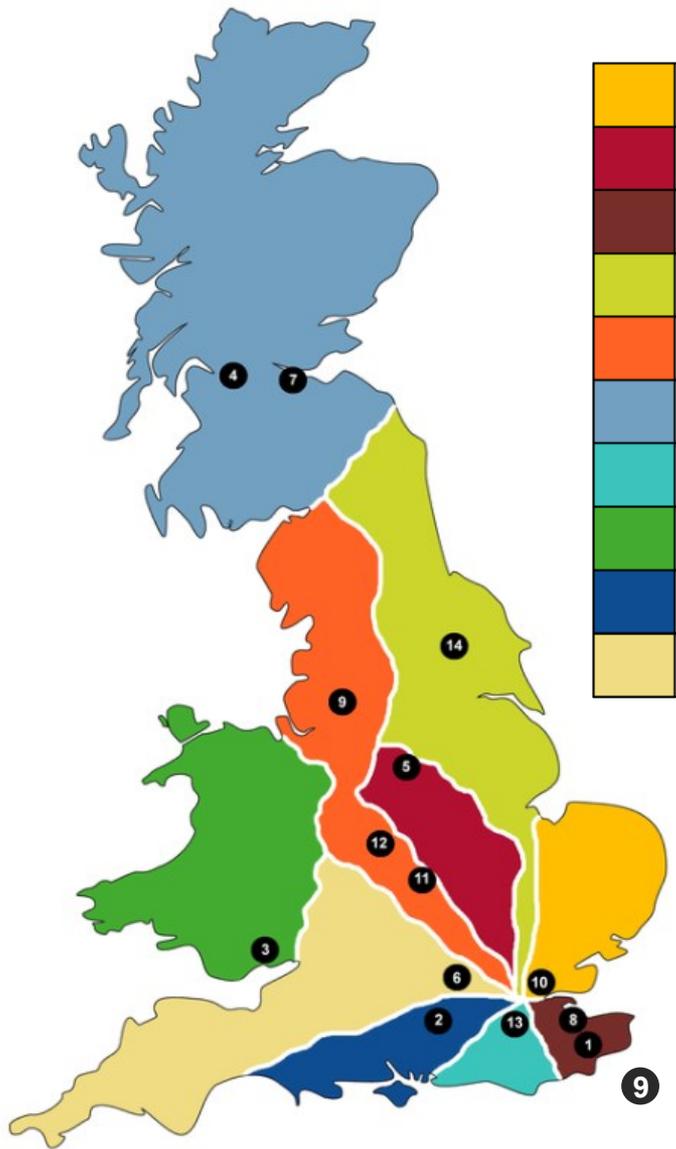
Objective - Raise the Profile of Bridge Strikes

- Explore the development of a sustainable approach to Bridge Strike Prevention.
 - *Can we do anything better or different?*
- Reduce the Safety Risks, Delays and Compensation (Schedule 8) Payments associated with Bridge Strikes.

Schedule 8 – Compensation paid by Network Rail to Train Operating Companies.



A bit about Network Rail & TOCs / FOCs



Anglia
East Midlands
Kent
LNE (London North Eastern)
LNW (London North Western)
Scotland
Sussex
Wales
Wessex
Western

- Network Rail maintains and operates the Railway Network.
- Reclassified as “An Arm’s-Length Central Government Body” in 2014. Covered by Framework Agreement with DfT.
- Train Operating Companies (TOC’s) and Freight Operating Companies (FOC’s) maintain and run the trains and most Stations.
- For purpose of Management Network Rail divides the Country in to 10 Strategic Routes.
- Each with Bridge Strike Champion.

9 Rail Operating Centres (ROCs)

A bit about Me..

- Joined British Rail in 1981.
- Professional Railway Civil Engineer.
- Managed Structures In Manchester and on the East and West Coast Main Lines.
- Now at Network Rail HQ in Milton Keynes.
- Working on Bridge Strike Prevention since 2008.
- Passion for Structures / Heritage.
- Enjoy a challenge....



When it all goes wrong!!



- Typically 5 Strikes per day nationally.
- Rises to 10 strikes per day at certain points in the year.
- Approximately 2000 per year nationally.
- 1.5% to 2% of all Train delays.
- Significant Safety Issue.
- Affects both underline and overline bridges.
- Costs Network Rail circa £12.7m p/a in compensation



Consequences



- Safety risk
 - ▶ Vehicle Drivers
 - ▶ Members of Public
 - ▶ Trains / Travelling Public
- Cost
 - ▶ Repairs to Vehicles
 - ▶ Repairs to Bridges
 - ▶ Insurance Premiums
 - ▶ To the Community
 - ▶ To UK plc
- Road Congestion
- Delays to Train Services

Double Decker Busses are a particular issue..

- Typically circa 40 Bus / Coach Strikes Nationally per year.





Bus crash toll rises to five as girl dies

WILLIAM TINNING – Wednesday 28 September 1994

The death toll in last week's crash involving a bus carrying a party of Girl Guides and their leaders has risen to five.

Ten-year-old Laura Cullen of Belsyde Avenue, Drumchapel, Glasgow, died on Monday in the city's Southern General Hospital.

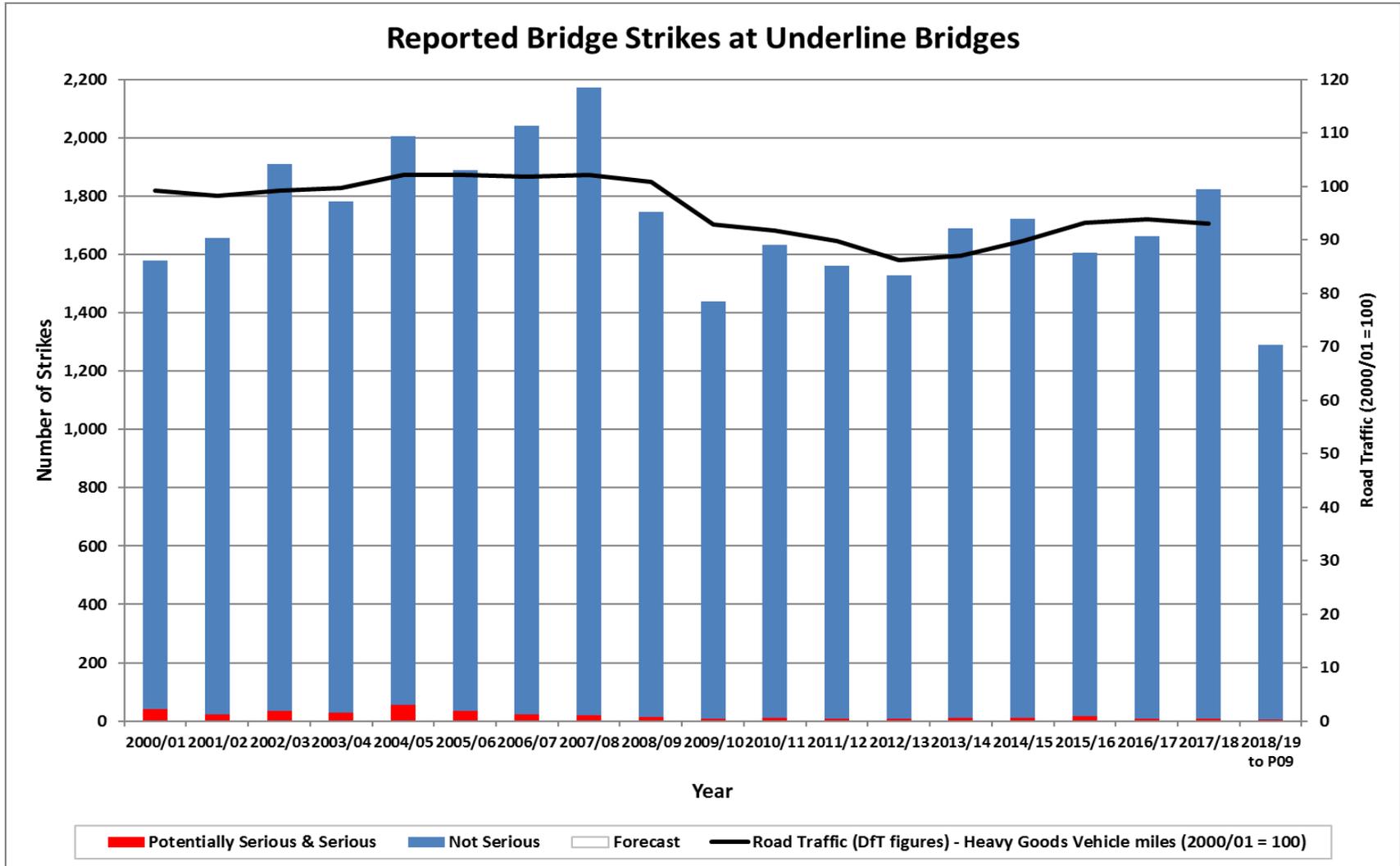
She was one of six girls who were seriously injured when a double-deck bus, carrying Guides from Drumchapel back from Butlins Wonderwest World in Ayr on Sunday, September 18, smashed into a low rail bridge in Glasgow, ripping off its roof. Laura had suffered massive head injuries and had been on a life-support machine since the accident.

Guides Catherine McKnight, 10, and Margaret Riddick, 10, were killed along with Guide leaders Mary McGreskin, 39, and Rena Dougall, 47, when the bus smashed into the bridge in West Street, Glasgow, near the approaches to the Kingston Bridge.

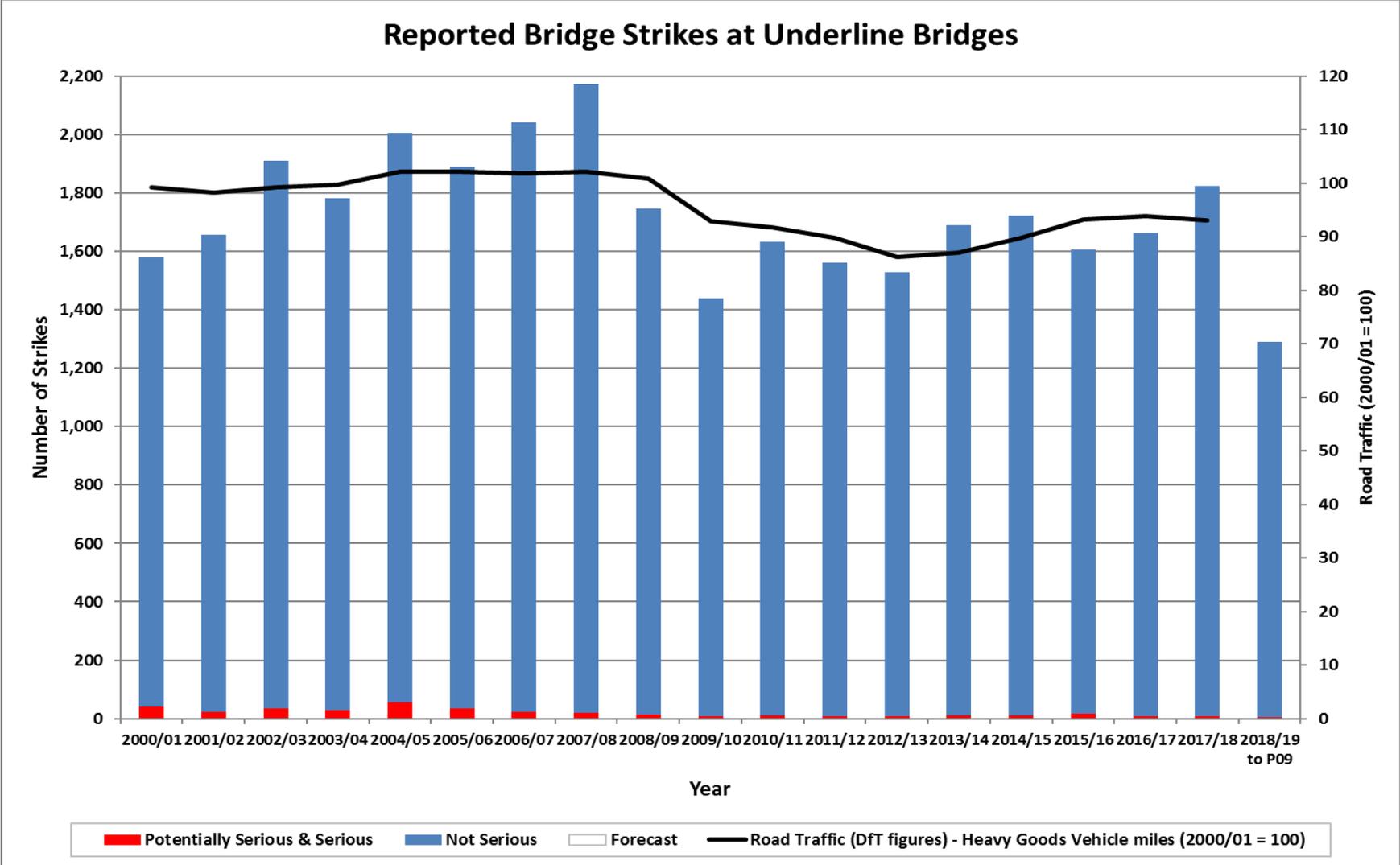
Of the seriously injured Guides, only Denise McAlease, 14, of Drummore Road, Drumchapel, is still in hospital. Her condition was improving and stable in the Southern General yesterday.

The Bad News

- Strikes are on the rise. 2017/18 was the worst year since 2007/08.
- 2018/19 is not looking any better....



It's the same story with Over Line Bridges

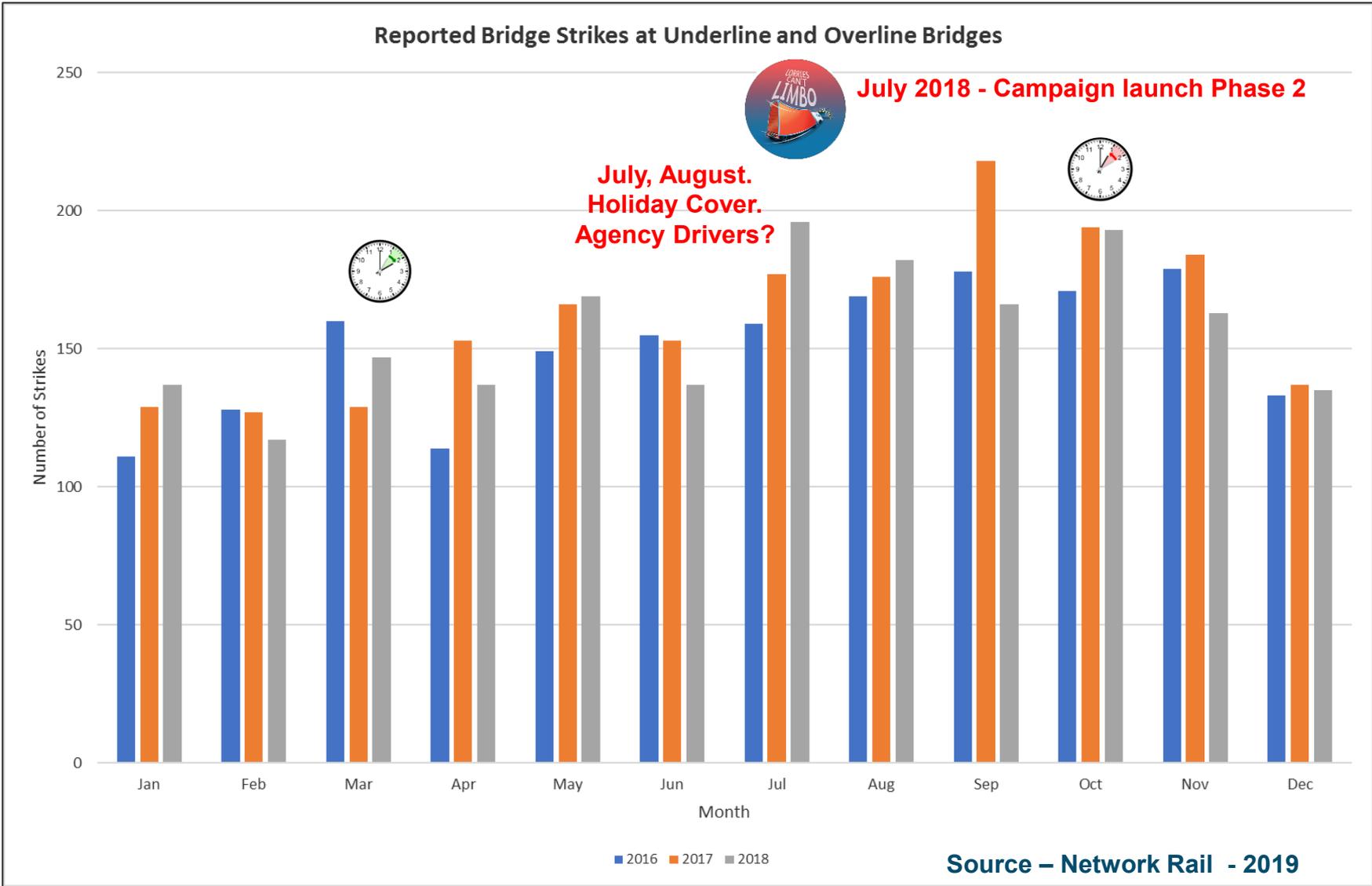


- Other Bridge owners are also seeing a rise in frequency of strikes....

Bridge Strike Trends – Reported strikes

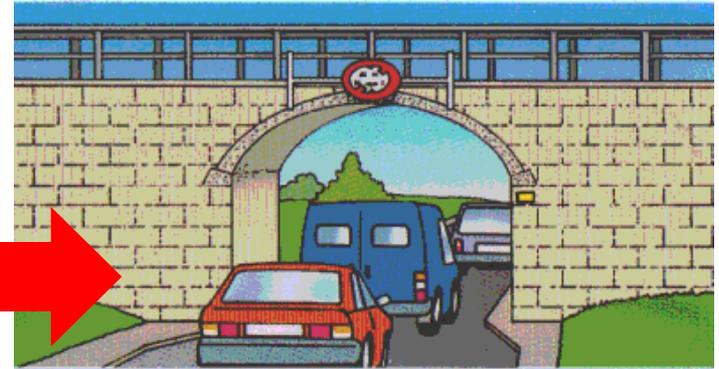


- Less strikes in Jan, Feb, April, June and December



What Network Rail Does.

Each Route has a nominated Bridge Strike Champion within the Route Structures Team.



Theoretically drives a lorry into a bridge at a certain speed and assesses the Bridge Robustness. What will happen?

Output of this assessment defines what actions are to be taken.



Red – Stop trains

Amber – First train examines track at 5mph.

If track alignment not affected and no debris trains permitted at 20 mph until bridge examined

Double Amber – As for Amber but subsequent trains at Normal Speed

Green – Continue to operate at Normal Speed

• Fit these signs to Bridges.

Typical chain of events.



- Bridge Strike reported to Network Rail Control Centre.
- Control contact Signaller who implements Operating Instructions

- Signal box special instructions.
- Special instruction for light vehicles
- Special instructions when people are trapped in vehicles.
- Rules for late reported bridge strikes



- Control arranges for bridge examination.
 - Bridge Strike Nominees (BSN)
 - Bridge Strike Examiners (BSE)
- Control advises Highway Authority and Emergency Services as required.
- Decisions are communicated to Signaller from site and trains signalled accordingly.
- Report Produced. Data captured. Claims Team advised.

At what point does it go wrong?

- Bridge 15' 3"
- Height on Trailer Headboard 15' 10"
- Height displayed in cab 15' 10"
- So was it due to poor route planning?
- Was the driver taken off Route?
- Was the driver distracted?



Rail Safety and Standards Board (RSSB) - Reducing the number and impact of vehicle strikes on railway underline bridges. **Key results:**

- Errors or violations during load stowing
- Errors in measuring the height of vehicles
- Errors in Route Planning.
- Failure to notice or interpret signs relative to vehicle height
- **Poor Signage at low bridges.**
- Poor vehicle alignment at low bridges.
- 32% of Drivers did not know their vehicle height
- 43% of Drivers do not use anything to measure vehicle heights.
- Drivers tend to use maps with no bridge heights marked
- 56% of Drivers didn't think about Low Bridges when Route Planning.
- 31% of Drivers received no information or guidance from their employer regarding Bridge Strike prevention.
- About 10% of Drivers used Sat Nav's.

Rail Safety and Standards Board (RSSB) - Reducing the number and impact of vehicle strikes on railway underline bridges. **Conclusions:**

- Development, provision and use of height measurement tools, route planning tools and in cab low bridge warnings.
- Improvements to the bridge environment, traffic signs turning locations etc.
- Improvements to vehicle operators' policies and practices to ensure drivers are supported in vehicle height measurement and route planning.
- Training to prevent bridge strikes and raise awareness of their consequences and what to do in the event of a bridge strike.
- Engagement and co-ordination between the Rail Authority, product manufacturers, vehicle operators and highway authorities.
- Improved incident reporting and data gathering.
- Trial different bridge strike prevention measures.
- Effective enforcement of current regulations; for example: spot checking vehicle height indicators, detection and punishment of those who have been involved in a bridge strike incident.

There is some really good Guidance.

- Available through the GOV.UK Web site.
- Also the Network Rail Web site. Search Bridge Strikes.

Prevention of bridge strikes

A good practice guide for passenger transport operational staff

Logos: ACPOS, National Express, Arriva, London Buses, Stagecoach, CPT, First, Unite

MHC/SGP/003 Issue 2 April 2012

Training Course

Prevention of bridge strikes

Name of presenter here
May 2014

Police bridge strike protocol – initial actions

Logos: ACPOS, British Transport Police, Network Rail

Prevention of bridge strikes

A good practice guide for transport managers

Logos: CPA, RITA, Unite, NFU, HTA, Department for Transport, ACPOS, RFL

MHC/SGP/003 Issue 2 April 2012

PREVENTION OF STRIKES ON BRIDGES OVER HIGHWAYS

A PROTOCOL FOR HIGHWAY MANAGERS & BRIDGE OWNERS

ISSUE 2

Logos: Department for Transport, ADEPT, Transport for London, Network Rail

Evitare la collisione con i ponti

Unikanje kolizij z mostami

Brückenkollisionen vermeiden

Preventing bridge strikes

Предотвращение столкновения с конструкциями мостов

Prévention des collisions avec les ponts

Underwriting and Risk Management - Insurance

- Historically Network Rail struggled to claim Back Schedule 8 payments from Insurers.
- Following Court cases: Network Rail v Conarken and Farrell Transport (2010), Court of Appeal (2011) and Network Rail v Handy & Others (2015). Network Rail is now in a stronger position.
- Network Rail now seeks to claim 100% of all costs including Schedule 8.
- Hauliers are required to declare accident history – typically the last 5 years.
- No doubt this will affect premiums.....
- Typically Network Rail claims back circa £7m per annum through insurance claims.

Briefing
Rail
June 2015

BURGES SALMON

Conarken reaffirmed: negligent drivers liable to pay for rail network delays

Schedule 8 of a Track Access Contract is "logical, well-researched, carefully constructed, and well supported". Those are the words of Mr Justice Awarhead in *Network Rail v Handy* and others meaning drivers (namely insurers) of road vehicles are liable for Network Rail's TAC Schedule 8 loss if they negligently damage rail track or other installations and cause consequential TOC delays.

Background

According to Network Rail, in 2012/14 road vehicles struck overhead railway bridges on 1,700 occasions. A further 101 strikes occurred on road bridges crossing railway lines.

Bridge strikes and line incursions (where a vehicle is driven onto or over line and damages the track and/or collides with a train) have obvious potential consequences, including damaged and destroyed tracks, structures, and vehicles and the serious injury or death of a train or vehicle's driver and/or passengers. The industry is alert to safety risks in this respect and generally takes all necessary steps to minimise them.

The secondary consequences of bridge strikes and line incursions are that the track is temporarily unusable and later trains on the same line will be delayed, causing knock-on effects around the rail network. This causes delay to passengers and financial losses to operators.

In the Track Access Contracts (TAC) between Network Rail and TOCs, one party will have to make payments to compensate for any delay. Network Rail is generally liable for any delay arising from the track not being available through no fault of the relevant TOC. The amount it pays to the TOC is calculated in accordance with Schedule 8 of the relevant TAC.

Network Rail is therefore on the hook to TOCs for delay caused by negligent drivers who hit bridges, level crossing incidents and other road related interference with the rail network. The recoverability from negligent drivers of the amount NR pays to the affected TOCs under Schedule 8 was the subject of a landmark ruling in 2011 (*Conarken*) and has recently been the subject of further Court scrutiny and judgment.

Conarken v Network Rail

The Court of Appeal decision in *Conarken Group Ltd v Network Rail Infrastructure* in 2011 stated that where a third party had negligently damaged the track – such as a car or lorry striking a railway bridge – and caused a delay on the rail network, Network Rail's liability to TOCs under the TAC (Schedule 8) was recoverable as damages from the negligent driver (unless there are exceptional or unreasonable circumstances).

All drivers must carry insurance, which at a minimum must include cover for damage to a third party's property. Conarken therefore ultimately makes a negligent driver's insurer liable to pick up Network Rail's Schedule 8 payments to TOCs under the TAC. There can in some circumstances be very large. If disruption across the network is significant (e.g. when a bridge supporting a main inter-city line is struck), insurers therefore are concerned about the potential financial impacts of such incidents.

continued over

Schedule 8 – Compensation paid by Network Rail to Train Operating Companies.

So how much does a Bridge Strike Cost?



- Depends on location and extent of any damage.
- Routes into / around London cost most...

Schedule 8 (Compensation)	= £690,599.44
Repairs.	= £ 13,439.99
Bridge Examiner call out.	= £ 193.19
Total Monies recovered by Network Rail.	= £ 704,231.63

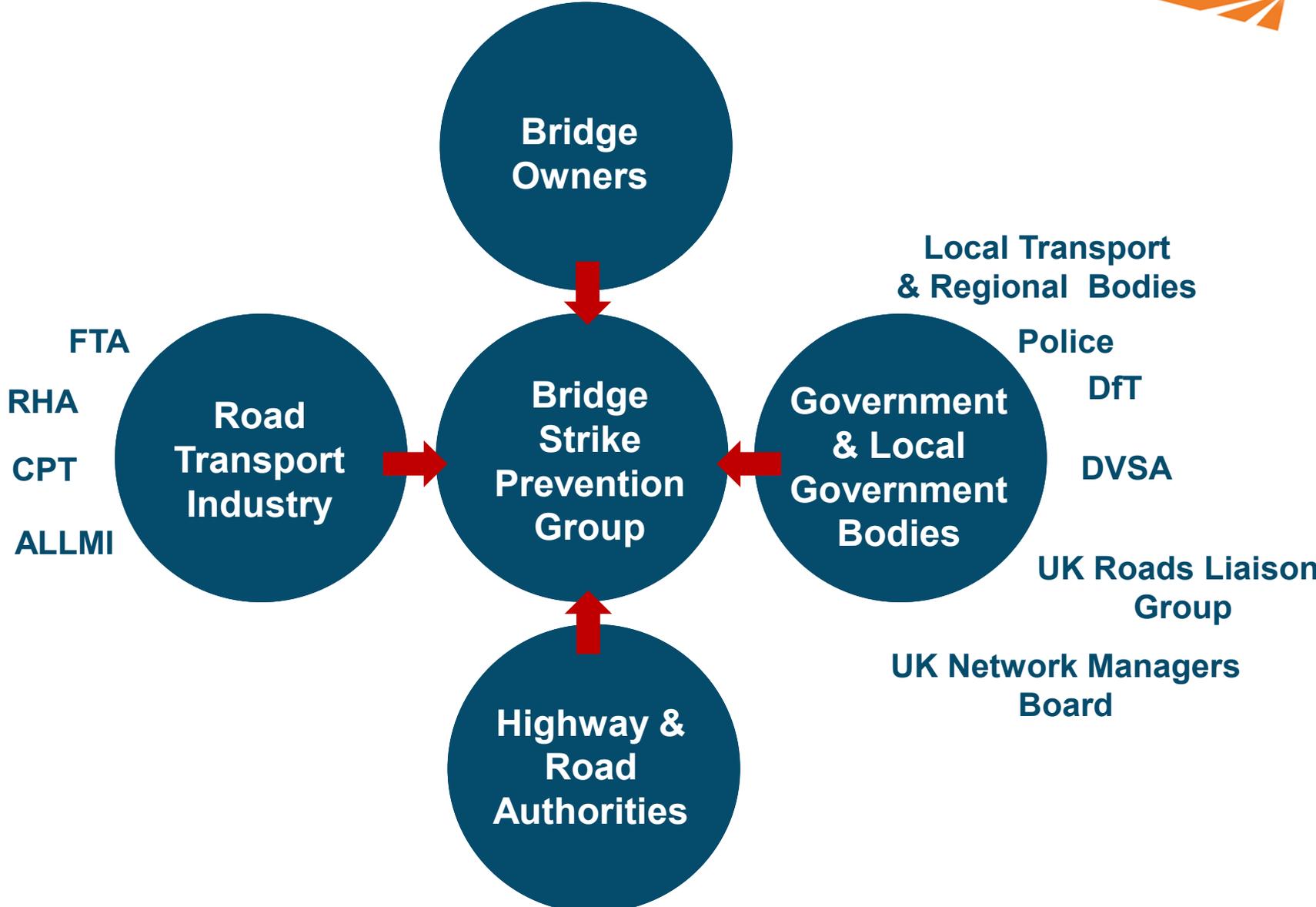
Impact on the Driver / Operator



- 29th March 2016 - Bridge 2/79 near Byfleet in Surrey.
- Delayed Trains for 41 minutes. At a cost of £3,069.
- Driver received 5pts & £454 fine for Careless Driving.

Enforcement Legislation available: Failure to comply with road traffic sign & Careless Driving – Section 3 RTA 1988 Max £2,500 + 3-9 penalty points

The Bridge Strike World - High Level Structure



Purpose:

- BSPG seeks to influence the management of all bridges over roads in Great Britain so the risk of vehicular strikes is as low as reasonably practicable and the safety and reliability of both the road and rail networks is maintained.

Through its activities the Group seeks to:

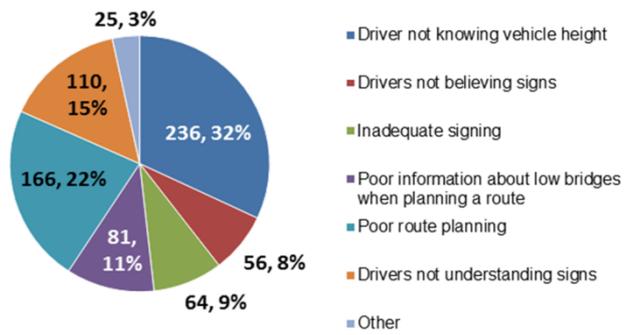
- Drive policy and promote changes in legislation to reduce the risk of bridge strikes
- Monitor the size and trends of the hazard of bridge strikes, and identify areas where the risk is increasing.
- Raise awareness, and clarify responsibilities
- Promote the adoption of affordable solutions for the prevention and mitigation of bridge strikes.
- Support the development of cost effective measures for the prevention and mitigation of bridge strikes, and monitor their effectiveness.
- Be a source of information and guidance
- Provide support and encourage collaboration between stakeholders affected by bridge strikes

Formal meetings are held by the Group twice a year, typically in April and October. Additional meetings of specialist or working groups may occur in between these sessions.

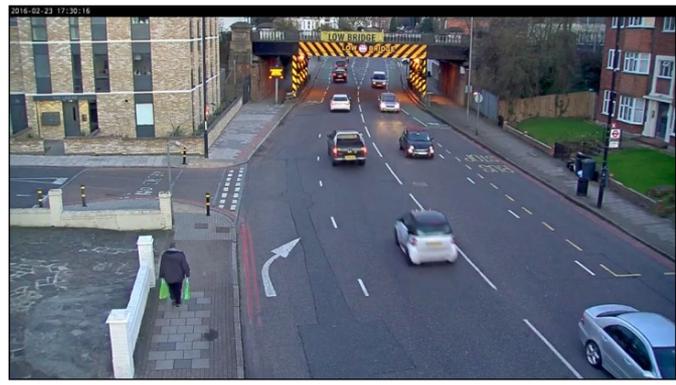
Bridge Strike Prevention Group has:



- Undertaken research.



- Supported innovation (e.g. TfL Six Sigma project reviewing bridge strike sites in London)



- Developed the existing on line Guidance.
- Raised the profile of the issue - Endorsed the recent Media Campaign / Activities.
- Recommended changes to traffic signage – The Traffic Signs Regulations and General Directions – TSRGD.
- Created the Protocol for Highway Managers and Bridge Owners.

PREVENTION OF STRIKES ON BRIDGES OVER HIGHWAYS
 A PROTOCOL FOR HIGHWAY MANAGERS & BRIDGE OWNERS
 ISSUE 2

The collage includes various traffic signs such as 'Lampton Axtley A11' with a 4.4m headroom warning, 'ARCH BRIDGE High vehicles use middle of road', 'Unsuitable for heavy goods vehicles', 'Wilson Green A321 Beckwood (A328) avoiding low bridge', 'Low bridge 2 miles ahead', 'Low bridge south of Maplebeck Alternative route via A123', and 'BRIDGE HEADROOM REDUCED TO 12'-9" (3.8m)'. It also features logos for the Department for Transport, ADEPT, Transport for London, and NetworkRail.



Network Rail Initiative: – The Four E’s



Driving bridge strike prevention - Changing behaviours of Coach, Bus and Freight Logistics Drivers & Operators through:

Education

- HGV and Bus Drivers & Operators
- MP’s and decision makers
- Insurance Industry.

Engineering

- Traffic signs – Highway Authority
- National Bridge Strike Initiative
- Removing driver distractions

Enablement

- Route planning Tools
- Truckers’ Atlas
- Satellite navigation / Fleet Telematics.

Enforcement

- Route 1: Police and Courts
- Route 2: DVSA and Traffic Commissioners

To achieve:

Safe HGV, Bus movements
10% Reduction in frequency

Education - Phase one



Media

- We Kick-started the campaign in late October 2017
- Released Bridge Strike footage on our website
- Network Rail Chairman Peter Hendy to act as core spokesperson
- Work with Eddie Stobart as initial partner.
- Commissioned Market Research and Media Partners.
- Articles appeared in printed News and publications.
- TV News.

Digital and Social Media

- Updated the Network Rail bridge strike pages on the website
- Infographics produced

Stakeholder Engagement

- Initial conversations with potential partners.
- Letters out to MPs in Bridge Strike hotspots.
- Direct contact with Haulage / Bus & Coach companies.
- Discussions with Insurance Companies.



Market Research Findings

- Lorry drivers typically aged around 55 years old on average.
- Truck driver population remains largely male dominated, with 92% made up by men and just 8% women.
- Feel they are a closed club with their own jokes.
- Drivers feel their industry isn't viewed as professional and they aren't respected as professionals. They put themselves in the same bracket as cyclists as hated road users.
- Qualitative research has highlighted that seeing bridge strikes on the news agenda would help to influence drivers.
- 43% admit they do not use anything to measure the height of their vehicle.
- 56% of truck drivers either rarely or never took account of low bridges during route planning.
- 31% of respondents report they receive no information on bridge strikes from the employer.
- Main interactions are through employers and in cab.
- They do have additional touch points such as services stations and vehicle washing stations and loading points.



Education - Phase two

- Phase two Marketing & Media Campaign launched in early July 2018
- Focusing on: Complacency, Professional Pride, Journey Preparation and Consequences.
- Signed up 12 key players in the Haulage Industry to the campaign
- Digital "Toolkit" produced.
- Articles / advertising appeared in over 150 publications.
- Co-Branded media & in cab materials produced.



Reusable coffee cup Red lid Reusable coffee cup Blue lid Key ring (85x55mm) Front Key ring (85x55mm) Back

Ft/in	M	Ft/in	M
16'-0"	5.02	13'-3"	4.04
16'-3"	4.95	13'-0"	3.96
16'-0"	4.88	12'-9"	3.89
15'-9"	4.80	12'-6"	3.81
15'-6"	4.72	12'-3"	3.73
15'-3"	4.65	12'-0"	3.66
15'-0"	4.57	11'-9"	3.58
14'-9"	4.50	11'-6"	3.51
14'-6"	4.42	11'-3"	3.43
14'-3"	4.35	11'-0"	3.35
14'-0"	4.27	10'-0"	3.05
13'-9"	4.19	9'-0"	2.75
13'-6"	4.11	8'-0"	2.44



LORRIES CAN'T LIMBO

Wise up
Size up

Around 1,800 vehicles crash into rail bridges every year. Nobody wants to be a bridge basher. As a professional driver, plan your route and make sure you know the size of your vehicle before every journey.

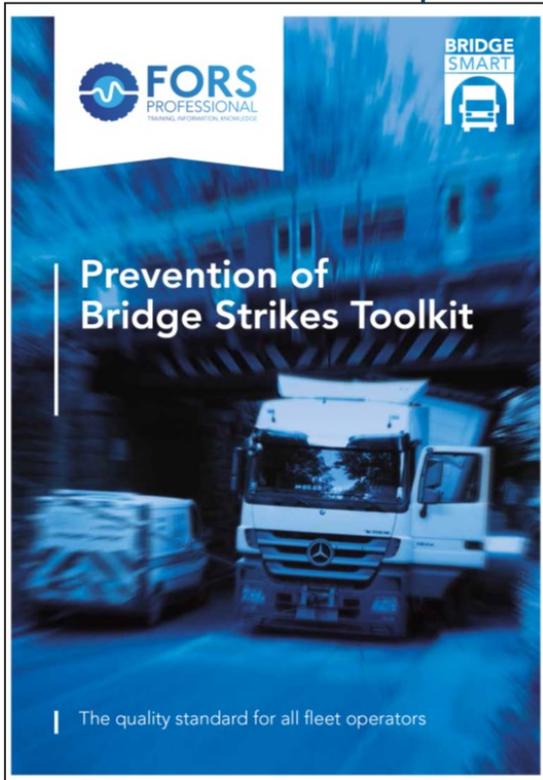
Visit networkrail.co.uk/wiseupsizeup for more information

Working in partnership
Eddie Stobart **NetworkRail**

Working with Transport for London:

TfL HGV Bridge Strike Toolkit & E-Learning Module launched November 2018. Linked to FORS. Toolkit contains:

- Classroom based group learning module
- E-learning module accessible by FORS members and non-members
- Advice and guidance for operators
- Posters for display on company premises
- Toolbox talks for Supervisors/Managers



Engineering

- Engage Highway Authorities.
- Target high frequency / high cost Bridges - 380 identified.
- Improve road traffic signs and markings.
- Improve bridge visibility.
- Install bridge protection beams
- Increase headroom – where possible.
- CCTV (widely trialled but limited business case)



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BRIDGE HEADROOM REDUCED TO 12'9" (3.8m)

ARCH BRIDGE
High vehicles use middle of road

Low bridge 2 miles ahead

Unsuitable for heavy goods vehicles

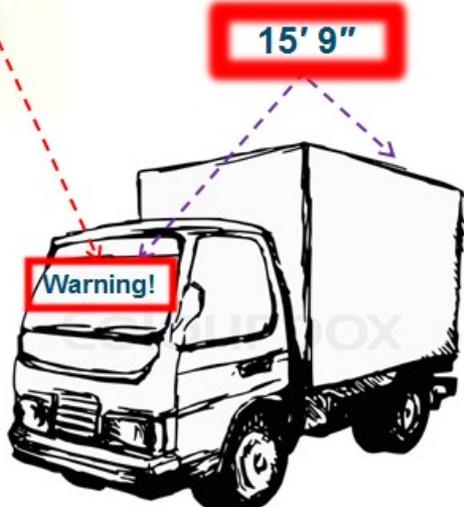
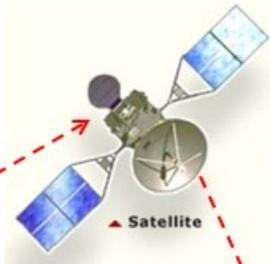
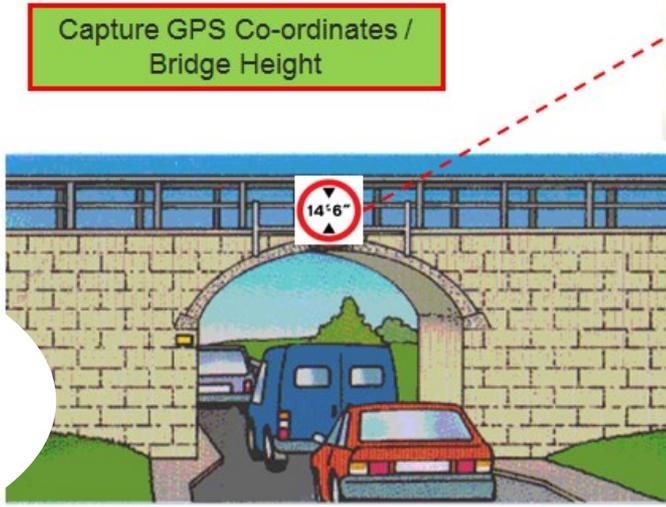
Low bridge south of Framework
Alternative route via A123

Logos: Department for Transport, ADEPT, Transport for London, Network Rail



Enablement

- 3 primary data sources.
 - Here (formally Nokia / Navteq),
 - Tele Atlas (owned by TomTom)
 - Ordnance Survey.
- + Google / Apple Maps.
- AA Road Atlas has been re-issued.
- Meetings held with the Here, OS and Microlise.



Enforcement

- High Level Campaign Support from Peter Hendy.
- Positive discussions with:
 - Senior Traffic Commissioners
Beverley Bell and Richard Turfitt.
 - Gareth Llewellyn Chief Executive – DVSA.
- Discussions ongoing regarding Network Rail providing Strike information directly to the TC's & DVSA.
- Positive discussions with The Met and East Midlands Police forces. (Nottinghamshire, Leicestershire, Lincolnshire & Derbyshire)
- Positive discussions with the British Transport Police.
- Further plans under discussion with Peter Hendy regarding a meeting of enforcement agencies in London.



Peter Hendy



Beverley Bell



Richard Turfitt



Gareth Llewellyn

So how can you help to prevent Bridge Strikes?

- Join us in our Campaign. It's not just a problem for Network Rail.
- Collect information regarding strikes to your bridges.
- Forward high level data these to me or your representative on the Bridge Strike Prevention Group.
- Raise the issue with Enforcement Agencies and other national forums.
- Support / promote an initiative with the DVSA to "Stop and measure" Vehicles.
- Support the prosecution of offending drivers.



Questions....

