

BRIDGE OWNERS FORUM

BOF 73: TUESDAY 13 June 2023

**via MS Teams and in THE BEVES ROOM,
KINGS COLLEGE, CAMBRIDGE**

PRESENT:

In person:

Tim Arianpour	TfL (LUL)
Jasdeep Bhachu	LoBEG
Andy Featherby	C&RT
Paul Fidler	CUED
Richard Fish	Technical Secretary
Tomas Garcia	HS2
Keith Harwood	ADEPT
Nicola Head	TfL
Trish Johnson	Big Bridge Group
Hazel McDonald	Transport Scotland
Cam Middleton (Chairman)	CUED
Osian Richards	CSS Wales
Santosh Singh	National Highways
Martyn Thomas	SSE
Paul Thomas	Railway Paths Ltd.
Sue Threader	Rochester Bridge Trust

Guests:

Cameron Archer-Jones (part)	COWI
Juan Miguel Cereceda	HS2
Clary Elliot	Railway Paths
Arfon Irish (part)	COWI
Helen Jamieson	DfT
Mark Meredith	Big Bridge Group
Phil Wildbore	Network Rail

Virtual:

Kris Campbell	Department for Infrastructure – Northern Ireland
Graham Cole	Heritage Railway Association
Henry Dempsey	SCOTS
Jason Hibbert	Welsh Government

Guests:

Hideo Takano	National Highways
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NB Any statements recorded in these minutes, and attributed to an individual, are their own personal views and not necessarily those of their employer.

1. Welcome

The Chairman welcomed everyone to BOF 73, both those attending in person and those joining via MS Teams. He was heartened to see such a good attendance, with a large number of BOF members bringing guests from their respective organisations.

2. Introductions and Apologies

All present (in person and virtually) gave a brief introduction, including those attending for the first time as either new members, substitutes, or guests. These are given in a little more detail below:

Although by no means a new member, Graham Cole advised that the Heritage Railway Association (HRA) was now a full BOF member (subject to being invoiced) and he was now formally representing HRA as opposed to his more recent affiliation, the Heritage Railway Infrastructure Group. Graham noted that the HRA has a membership of over 200 heritage railways across the UK.

A compatriot of Tomas Garcia, Juan Miguel Cereceda is a Senior Structures Engineer with HS2, joining them in 2022.

Clary Elliot was attending as a second member from Railway Paths Ltd. whom she had recently joined, having been previously working them on a consultancy basis.

Helen Jamieson works with David Coles, DfT's Chief Engineer, as Infrastructure Engineering Lead and also supports the Infrastructure Decarbonisation Team. She had previously worked with consultants before joining the Highways Agency (and its successors) from where she was seconded to her present role. Helen was attending BOF as a substitute for Ioannis Mavvidis who was on paternity leave, having just had a son. If possible, the Chairman asked Helen to pass on BOF's congratulations to Ioannis and his family.

ACTION 1: Helen Jamieson

Mark Meredith was attending as the second member from the Big Bridges Group. Mark is the Bridge Manager for the Tamar Bridge, a post he has held for over 20 years, and prior to which had a background in contracting.

Santosh Singh was attending his first meeting, together with Hideo Takano from National Highways. Santosh was the Group Manager with responsibility for safety and standards.

Phil Wildbore was attending the meeting as a substitute for Colin Hall. Phil is a member of the Network Rail Asset Team. He joined Network Rail some five years ago, having previously worked for Tony Gee and partners.

Richard Fish recorded apologies that had been received from the following:

Malcolm Cattermole	Forestry England
Liam Duffy	Transport Infrastructure Ireland
Colin Hall	Network Rail
Ioannis Mavvidis	DfT
Ian Norris	Environment Agency

Richard also noted that Eloy Tabares had recently left East West Rail (EWR). Although no-one was able to attend today's meeting, Richard reported that he had been given a contact and a decision was expected as to who their representative would be in the future.

Sue Threader had arranged to bring a new member of her staff, Helen Rowe, to this meeting but she had had to make a late apology due to a family bereavement.

The Chairman thanked Jasdeep Bhachu for re-committing LoBEG's membership of BOF, pointing out the strong links between the respective organisations since BOF was established in 2000.

3. Matters Arising from BOF 72 Minutes

The Chairman noted that the accuracy of the BOF 72 minutes had been approved by email and that they were now on the BOF website. He asked for his compliments to be recorded to the Technical Secretary for the comprehensive nature of the minutes. Richard Fish commented that, in a meeting such as BOF, he believed that it was important to record as much discussion as possible, especially when counter arguments were being put forward. This view was broadly supported by the meeting.

The Chairman referred to the BOF 72 Action Update sheet that had been issued with the agenda:

Action 10: Investigations into Highway Bridge Collapses

This item was in the context of ensuring that UKBB and BOF were engaged with CROSS on this topic. Hazel and Richard had met via Teams to discuss, and an email had been sent to Alastair Soane and Paul Livesey of CROSS. To date only a holding reply had been received but discussions will continue.

ACTION 2: Richard Fish/Hazel McDonald

Post meeting note: Alastair Soane had emailed during the morning of this BOF meeting and subsequently on 10th July. The latter had confirmed CROSS' support for this initiative and a meeting has been arranged for 29th September.

Action 20: BICS Bursary Scheme

Covered under agenda item 11.

Actions 23: BOF Website Review

Richard Fish will ask Helena Russell to review the BOF website as a critical friend. Sue Threader noted that there were some funds left in the budget should Helena need remuneration. If not, this could perhaps be used to commission an article on BOF.

ACTION 3: Richard Fish

Post meeting note: Helena has agreed to review the website and is open to some possible additional work.

4. BOF Website – Progress and Demonstration.

The Chairman opened this item by thanking Keith Harwood and Paul Fidler for their efforts in getting the site up and running, and Sue Threader for providing the funding. He saw the site as being both internal – for BOF members – and externally facing – for the wider bridge community and other interested parties. He asked all members to promote the website at every opportunity.

ACTION 4: All

Before giving the demonstration, Keith Harwood praised the merits of the old site, now with over 20 years of valuable records.

As part of his demonstration, Keith showed how a fresh bridge photograph appeared on each page as well as scrolling across on the home page. He asked for more photos to be sent to him; preferably long and thin, in landscape orientation. Sue Threader suggested, and it was agreed, that it would be a good idea to include pictures of bridges with people in them.

ACTION 5: All/Keith Harwood

It was also agreed that it was important that each picture should be credited: i.e., to state the name of the bridge, the owner and when the photo was taken and by whom. Keith agreed to add credits to those photos already on the site.

ACTION 6: Keith Harwood

The Chairman restated the needs to keep the website updated, and to be able to find things from previous meetings. He noted too the necessity for BOF members to be able to access a members-only area and it was agreed that password allocation should be resolved.

ACTION 7: Keith Harwood/Paul Fidler

Keith also demonstrated the calendar tab and requested information from all members on any relevant forthcoming conferences etc., both in the UK and internationally.

ACTION 8: All/Keith Harwood

Keith also explained that the “Contact Us” tab was presently set up to send an email to him and to Richard Fish. Two such emails had been received to date – one very complimentary about the new site and the other offering web design services.

Turning to the topic that had been aired at previous meetings, Keith showed how bridge guidance documents could be accessed, including those which were out of date. The Chairman recalled that many old Highways Agency reports had been available on the old site, but Paul Fidler pointed out that this had been limited to report titles, not the documents themselves. Keith also added that some references in the compendium were links to sites where documents could be found; CIRIA guidance being a good example. Keith then showed how filters could be applied to focus on a specific subject, such as scour.

Finally, Keith pointed out the facility for monitoring hits and the pages visited, noting there had already been some international interest from countries such as Australia, USA, and China.

The Chairman again thanked Keith and Paul for creating the site, noting that this had been an aspiration for many years, and Sue for making it happen. Sue noted that, although Surrey IT Solutions had been the starting point, their overall contribution had been reasonably small. Before inviting observations and comments from the meeting, the Chairman asked all BOF members to visit and critique the site, sending any comments to Keith or for discussion at BOF 74.

ACTION 9: All/Keith Harwood

Paul Thomas asked who else might want to visit the site, other than bridge owners. Richard Fish suggested that it would of interest to anyone in the bridges sector: for example, consultants, contractors, specialist suppliers, academics etc.

Noting that the site was already in the public domain, the Chairman repeated the need to ensure that confidential material was inaccessible to the casual visitor. Sue Threader added that there should be a need to be aware of how comments recorded in the minutes might be construed. The Chairman had already noted that a comment of his noted in the BOF 72 minutes had been recorded almost verbatim and, whilst he stood by what he had said on that occasion, appreciated that it could be challenged. Mark Meredith warned of the need to be wary of anything which might generate press interest, potentially leading to an FoI request. After some further discussion, Richard Fish accepted the need to be a little more cautious in both tone and substance, in the drafting of the minutes.

ACTION 10: Richard Fish

It was also agreed that all future minutes should carry a caveat to the effect that views expressed by an individual did not necessarily represent those of their employer.¹

ACTION 11: Richard Fish

In terms of having authority to access the site, Hazel McDonald asked whether this was only available to a nominated BOF member or whether it could be extended to other members of their respective organisation. The Chairman understood that this had always been the case, but Keith Harwood said he would have to work out how this could work on the new site, whilst maintaining confidentiality.

ACTION 12: Keith Harwood

Returning to the issue of who should manage and maintain the site, Osian Richards suggested that this could possibly be his Gwynedd CC IT team, which also manage the CSS Wales site. The Chairman accepted this but suggested all options would need to be reviewed and considered.

ACTION 13: Chairman/Richard Fish/Keith Harwood/Paul Fidler

Nicola Head suggested, and it was agreed, that the BOF website should be a standing item on BOF agendas.

ACTION 14: Richard Fish

Santosh Singh suggested that the site could provide opportunities for discussions via online fora. Osian Richards thought it could be used as a resource for bridge related STEM materials which could be accessed by all. Sue Threader noted that she has an engineering education website² which could be linked to the BOF site.

ACTION 15: Sue Threader/Keith Harwood

The Chairman closed the item, again welcoming the success in developing the site and the good debate on its operation during this meeting.

5. Grand Challenge Zero and Updating Grand Challenges

Richard Fish recounted how the ideas behind a new Grand Challenge Zero (GC0) had been the subject of the workshop which he had led on the second day of the Bridges 2024 conference in March. He had produced a draft in the style of the other Grand Challenges which had been issued before this meeting. He asked for any comments to be sent to him.

ACTION 16: All

Sue Threader offered to send some notes but asked if the Rochester Bridge refurbishment experience should not be part of GC0, not least the fact that travel to and from site had made such a huge contribution to the total carbon generated by the project.

¹ See top of page 2.

² [Learning Activities - Rochester Bridge Trust](#)

Responding to a question from the Chairman, Sue commented that the project had not been written up as such, but there was a case study on the NZBG website and, as well as her presentation at Bridges 2022, she had so far also presented on a further 22 occasions.

Trish Johnson recalled a previous job she had had, working for M4I³ which highlighted “Demonstration Projects” as exemplars of good practice. Although M4I no longer exists, she suggested that the idea of using low carbon demonstration projects might be a way to push net-zero.

The Chairman questioned how many other organisations had learned from Sue’s work. During his sabbatical in Australia, he had given it many plaudits. He criticised other projects which claimed to be net-zero but appeared to be being built as normal but off-set with carbon credits. He had seen nothing to compare with Rochester and suggested that TRIB⁴ should be interested to use it as a case study.

As for other BOF organisations, Hazel McDonald expressed a desire to embrace net zero, but pressures of time and overstretched resources made this extremely difficult and she had to rely on others to progress the policies. She noted the widespread political aspiration to keep building new projects, often at the expense of investment in maintenance. Santosh Singh noted that National Highways has a number of parallel strategies in place, including the need to take into account carbon produced from diversions around maintenance works. He emphasised the point that dealing with carbon had to be part of the conceptual design; waiting until the construction phase was too late to make any significant impact. He also advised that many projects are now aiming to embrace whole life carbon and National Highways are also promoting research into low carbon materials. Tomas Garcia echoed Santosh’s first point; HS2 were in the position of trying to reduce carbon during construction and, although there had been some success, it was marginal in the scale of things. Tomas also repeated the point made at many recent BOF meetings, that the biggest issue was one of procurement.

Helen Jamieson asked if National Highways is PAS 2080 accredited, noting that all business cases have to have a carbon management plan. She had found that the biggest concern was consistency of data which was essential if it was to inform any approval processes. Santosh Singh advised that all Tier 1 contractors had to be accredited but acknowledged that there was a need to engage with the supply chain. Osian Richards warned of possible greenwash from some companies. He suggested that a holistic approach should be taken, taking every aspect into account, including diversions. Osian also asked for better guidance, and perhaps even a standard spreadsheet which could be shared between client bodies. Sue Threader’s advice was not to wait for every last detail but rather to start with whatever data was readily available.

³ Movement for Innovation: established in 1998 as a result of the Egan Report and part of the (then) Rethinking Construction initiative.

⁴ DfT’s Transport Research and Innovation Board

The Chairman supported Sue's point and also that made by Helen of the need for consistency of approach. He went on to summarise the discussion by wondering if the NZBG output was helpful or whether it was better to favour the more pragmatic approach as advocated by Sue and Osian. He recalled the huge landscape of carbon initiatives and publications, as had been presented at previous meetings⁵. He also highlighted some good practice, notably that of Anglian Water and also an example he had come across from New Zealand where procurement had been based solely on carbon. Lastly, he asked Helen Jamieson how TRIB was approaching carbon; Helen replied that, whilst requirements for construction had been established, there was, as yet little consideration of "tail pipe" carbon. The Chairman requested that BOF 74 should have a focus on carbon.

ACTION 17: Chairman/Richard Fish

Richard Fish noted that this agenda item, specifically on GC0 and Grand Challenges had not been concluded and asked for volunteers who might be prepared to redraft Grand Challenges 1 to 5.

ACTION 18: All/Richard Fish

6. National Highways Updates

The Chairman invited Hideo Takano to present on items a to c. It was agreed that the presentations could be uploaded to the members only area of the BOF website.

ACTION 19 Paul Fidler

a. CG 300

Hideo advised that the consultation had just finished, and the draft revision had gone to National Highways' Technical Scrutiny Committee. The new document would tidy up some of the nomenclature with respect to EU standards but more importantly, among other things, would add a requirement for carbon to be covered in AIPs, and for risks to vulnerable users also to be considered. Responding to a question from Hazel McDonald, Hideo or Santosh agreed to advise on the intended publication date as soon as this is known.

ACTION 20: Hideo Takano/Santosh Singh

b. Bridge Inspection Manual

Hideo reported that work on defects scoring had been completed and other sections are currently being drafted. Completion was targeted for December 2023 but there was a funding issue as the original budget will be insufficient. Hideo or Santosh will give an update at BOF 74.

ACTION 21: Hideo Takano/Santosh Singh

⁵ See the pdf Landscape Map of Carbon in Construction from BOF 68: [BOF68: October 2021 - Bridge Owners Forum \(bridgeforum.org\)](https://www.bridgeforum.org/BOF68%20October%202021%20-%20Bridge%20Owners%20Forum.pdf)

c. Overloaded Vehicles

As well as overloaded vehicles, this item also covered the heavy- and high-load grids which had been part of the BOF 72 agenda. Hideo Takano explained the background, noting that the last update had been in 2008. Originally these routes had been assigned to bring heavy transformers etc. from a port to a power station. National Highways have been in discussions with DfT's freight team about a refresh but concerns had been expressed over the need for possible bridge upgrades.

Osian Richards pointed out that maintaining the capacity of these routes was essential in order to ensure a power station's resilience. He has such facilities in his authority and holds annual meetings with National Grid to ensure that sufficient notice is given of any impending movement. Martyn Thomas advised that SSE often have 400t vehicles supplying wind farm components, often in isolated areas, but his main concern was that mobile cranes would often arrive fully rigged and with no prior notification. Mark Meredith noted that any abnormal load movement over the Tamar Bridge required a specific load assessment, the cost of which had to be met by the haulier. Hideo welcomed these contributions as it reinforced the need for the heavy load grid to be maintained to the correct standard.

Keith Harwood described Hertfordshire CC's experience with the heavy load routes in the county, citing instances of a trunk road bridge not being able to carry a load which then had to transfer to local roads. Henry Dempsey pointed out other implications for local authorities, such the need to temporarily remove lamp columns, signage, and other street furniture.

Osian Richards noted that all AIL movements on the grid require DfT approval – even in Wales. He also noted the need for wider carbon implications to be taken into account as another factor in the need to maintain the routes. Helen Jamieson agreed to review the approach within DfT and Hazel McDonald noted that it was discussed at regular meetings with UK national counterparts.

ACTION 22: Helen Jamieson

With regard to overloaded vehicles, Jason Hibbert confirmed that WSP were about to be commissioned to undertake a study. National Highways, Transport Scotland and the Welsh Government were co-funding; Jason was leading this and agreed to provide updates at future BOF meetings.

ACTION 23: Jason Hibbert

d. Neil Loudon Replacement

As above, Santosh Singh advised that he would now be the National Highways representative on BOF.

7. Suicide Prevention (including attention seekers, vulnerable persons, and thrill seekers)

The Chairman welcomed the opportunity to discuss this sensitive subject in some depth, having touched on it occasionally in previous meetings. He invited Trish Johnson to give her presentation.

Trish began by noting the specific issues associated with Clifton Bridge; not only being at a height of about 75m above the Avon Gorge but also being in an urban area with universities and hospitals relatively close. In order to better understand the problem, she had assessed which areas of the bridge posed the greater risks of serious injury or death. A chart of incidents in which the police had been called provided records of both times and locations. (NB 2022 had seen the total number at almost 250). Trish receives a record of each event, which shows that repeat attenders are about one third of the total and it had been suggested this is often seen as a way of skipping the queue awaiting a mental health assessment. Occasionally repeat attenders are banned from the bridge. On average, there are four suicides a year at Clifton. Another issue is the use of the bridge by base jumpers; generally fit young males attracted by the bridge's height over the Avon.

Trish went on to describe the Trust's engagement with the wider community including the Avon Gorge Working Group and the Bristol Suicide Prevention Group, as well as the emergency services and mental health professionals. She noted recent media reports about the police no longer being prepared to attend mental health incidents but explained that she had been advised that they would always attend when there was a danger to life.

In terms of physical changes, there are direct links between the police and the toll houses (which are manned around the clock), 33 CCTV cameras have been installed, Samaritans signage, and a Quiet Room. On the bridge itself are anti-climb barriers (installed in 1999), low level lighting and an alarm system activated by lasers just outside the parapets. Trish also highlighted the impact these events can have on her supervisory staff both in terms of training and occasionally the need for counselling. The former includes suicide awareness, safe intervention, and negotiation. The public facing image of the bridge has also changed in recent years with a visitors' centre and the use of a team of volunteers. Personal memorials are also removed within a sensitive timescale.

Options for further physical deterrents are limited, not least by the fact that the bridge is Grade 1 Listed, and the parapet is already 1.9m high. Even so, legal challenges have been made arguing that the Trust should be doing more in terms of prevention.

The Chairman thanked Trish and asked Mark Meredith to present on the Tamar Bridge.

Mark's presentation was entitled Person-in-Distress Mitigation and he noted the many similarities between his issues, Clifton, and other long span bridges such as Humber. As with Clifton, Tamar sits in an urban environment and, in local transport terms, is seen as a link encouraging pedestrians and other NMU⁶s to cross between Plymouth and Saltash. Annual Person-in-Distress events number between 75 and 105 and about 20 per year climb the parapet; about half of these "self-rescue" by climbing back. There is typically at least one suicide each year.

Mark reported on a number of triggers which have led to reviews of preventative measures from a desire to help people by staff members, media coverage and public interest. There was also a coroner's Regulation 28 report which had requested a review of procedures and, sadly, two suicides in a six-week period in the summer of 2016. Again, similar to Clifton, Tamar had increased its community profile in recent years, not least with the opening of a visitor and learning centre in 2019.

Mark advocated the use of Public Health England guidance.⁷ Also as with Clifton, Tamar was actively engaging with neighbouring stakeholders. The current parapet height is 1.5m but a trial had been conducted on a 2.6m height. This had not been favoured by the emergency services due to the difficulties it presented for rescue. Other mitigation measures included additional CCTV, linked to the 24/7 control room, and a trial of "Appearance Search" technology.

The Chairman thanked Mark for his presentation before inviting Henry Dempsey to relate his experience.

Henry is the chair the Glasgow Water Safety Group (a multi-disciplinary group concerned primarily with water safety, but also in reducing suicides from Glasgow's bridges and water structures). There is a water safety plan in place which identifies high risk sites, including three bridges where most potential suicides present themselves. Glasgow City Council works closely with all sectors, including Social Services, Mental Health, Fire and Rescue Scotland, Police Scotland, Glasgow Humane Society and the Samaritans. Henry had found his time in this role to have been rewarding but challenging. He cited some advice from Public Health Scotland⁸ which he had found very helpful.

The Chairman then invited questions on the presentations and discussions on the wider subject. Tim Arianpour suggested that technology might be used to measure the speed of someone walking across a bridge and signalling if they were taking longer than expected. Mark Meredith noted that, at Tamar, some visitors tend to walk halfway over, admire the view and walk back again. Tomas Garcia asked about displacement

⁶ Non-Motorised User

⁷ Preventing Suicides in Public Places: [Suicide prevention: suicides in public places - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/suicide-prevention-suicides-in-public-places)

⁸ <https://publichealthscotland.scot/publications/national-guidance-on-action-to-address-suicides-at-locations-of-concern/national-guidance-on-action-to-address-suicides-at-locations-of-concern/overview/>

data and Trish Johnson replied that she had seen no evidence to suggest that those in distress go elsewhere.

Sue Threader commented that Rochester also has similar issues although the difference there was not so much the height above the Medway but the strong currents and tides. Once in, her problem was getting people out and she was planning to trial a remotely controlled lifebuoy. Sue also criticised the media and their tendency to use phrases such as “suicide hotspot”, which can unintentionally lead to encouragement.

Henry Dempsey agreed that there was no evidence of displacement but asked how it was known who the repeat attenders were at Clifton. Trish replied that most had become known to bridge staff and were easily recognised. Henry also noted that lifebelts on the Clyde were problematic, with at least one case when it was found to have been detached from its mooring rope.

Returning to physical measures, Kris Campbell reported that in Northern Ireland, he had been requested to install higher parapets on bridges with no history of suicides etc. Trish Johnson said that any such move should be seriously considered; a consistency of approach was needed.

Nicola Head queried the deployment of Samaritans signage at a bridge. She had once been advised against this in case they prompted suicidal thoughts. Mark Meredith confirmed that it was considered best practice to be placed on bridge approaches rather than on bridge itself, and this was where signage was located on the Tamar bridge.

Osian Richards said that he had been inspired by the presentations and discussion and suggested that some guidance should be available on the BOF website. Hazel McDonald agreed, suggesting that the various measures described today should be included in any guidance document and also commented that engineering measures in isolation were not always the right solution. Hazel also felt that, although there was a self-harm section in the new CG 300, its application could be strengthened.

The Chairman concluded the discussion and welcomed the idea of BOF/UKBB guidance. He suggested that a sub-group should be formed to draft this in a very generic sense. Volunteers were sought and the group will consist of Henry Dempsey, Hazel McDonald, Sue Threader, Osian Richards, Tomas Garcia with Trish Johnson as convenor and chair. An update should be given at BOF 74.

ACTION 24: Trish Johnson

It was also agreed that the presentations could be uploaded to the members only area of the BOF website.

ACTION 25: Paul Fidler

This agenda item had also included the subject of thrill seekers and Sue Threader had previously identified a video clip on the GoPro website of a cyclist (with helmet mounted GoPro) cycling *over* the top chord of a tied arch bridge. As well as being

illegal and dangerous, it was agreed that this was very irresponsible marketing and that a joint letter should be drafted to come from the chairs of UKBB and BOF, pointing this out.

ACTION 26: Richard Fish

Post meeting note: On the subject of thrill seekers, Sue Threader had also located this clip on a climbing website: [Wide Boyz Climb "The Great Rift," 2,500-foot 5.13 Bridge Crack - Climbing](#)

8. Digital BSALL⁹

The Chairman introduced Cameron Archer-Jones and Arfon Irish of COWI. Cameron had mentioned this work, which was being self-funded, in a conversation with Richard Fish and it had been added to the agenda. Cameron agreed that their presentation could be uploaded to the BOF website.

ACTION 27: Paul Fidler

Cameron began by looking at the wider picture of bridges deteriorating and theoretically being “sub-standard” and therefore earmarked for strengthening or reconstruction. The idea of more accurately understanding a bridge’s specific loading would help to address this designation, and would also fit well with the top of the carbon hierarchy: build nothing. Existing codes have to consider the worst eventuality of heavy traffic in a traffic jam whereas the COWI idea is to measure actual traffic loads and patterns on a bridge to derive a BSALL (as is presently permitted with long spans). The bridge could then be assessed for this loading and the process repeated, say, every two years. Rather than collect weight data using weigh-in-motion, COWI propose to use video feeds to identify vehicle types, linked to machine learning.

The Chairman thanked Cameron and Arfon for their interesting presentation, congratulating COWI on using their internal resources to work this up. He invited questions.

On the subject of this being a COWI initiative, Martyn Thomas asked about the risk to a client. Cameron replied that COWI would accept that risk as covered by their PI insurance. Jason Hibbert noted that COWI were also part of the Welsh Government study, noted under item 6c above, with WSP.

Paul Fidler asked about the link to machine learning. Arfon advised that AI support was coming from a start-up company partner. Phil Wildbore asked about the probabilistic inputs into deriving the BSALL. Arfon explained that their approach was to use statistical analyses based on a Gumbel distribution.

⁹ Bridge Specific Assessment Live Load

Cameron concluded by noting that this was still work in progress with much yet to be done, including time of day variations. He asked to be contacted if any bridge owners were amenable to collaboration.

ACTION 28: All

9. 2016 Eastham Bridge Collapse

Now over seven years since this collapse, Keith Harwood had recently managed to glean more information via an FoI request from Worcestershire County Council (WCC), with permission to share. He gave a short presentation (in which there are several relevant links) which is to be uploaded to the BOF website.

ACTION 29: Paul Fidler

Keith began with a timeline from the day of the collapse on 24 May 2016. A draft report had been prepared by WCC's framework consultant, CH2M, by July but no final report had been issued until October 2018. This attributed the cause of the collapse to scour. There were also recommendations, described as "Enhancement Opportunities", including that WCC should consider adopting BICS. Keith had subsequently asked WCC about changes to their bridge management procedures and the reply he had received had been that these were fairly limited. Most of the WCC focus had been on the construction of a replacement bridge. Osian Richards reflected on a similar experience; one of his bridges had partially collapsed and his managers had pushed for the road to be reopened rather than asking why it had occurred in the first place.

The Chairman asked if the FoI could be issued to BOF; it was agreed that it could be added to the member only area of the BOF website.

ACTION 30: Keith Harwood/Paul Fidler

The Chairman also expressed concern about the lack of transparency and the fact that it had been necessary to use an FoI in order to extract any information on the collapse, comparing the statutory RAIB and AAIB requirements for reporting. Hazel McDonald reprised the ongoing email exchanges with CROSS and the desire to establish a similar statutory body for highway bridge collapses. This had been a priority on the UKBB research proposals and accepted by UKRLG. Santosh Singh suggested that investigation, reporting and sharing should be a requirement within the DMRB. Hazel also noted the need to consider pre-cursor events, as advocated by CROSS, and embed those into any reporting mechanism. She also suggested that it should feature in the next revision of the Code of Practice.¹⁰

Jason Hibbert suggested that the requirement could be implemented for all highway authorities in Wales as part of a non-statutory standard. He agreed to investigate this and report at BOF 74.

ACTION 31: Jason Hibbert

¹⁰ Well-managed highway infrastructure (last revised in 2016) [Code of Practice | CIHT](#)

The Chairman summarised the discussion with the following actions:

Larger authorities and national governments should promote the need for a statutory investigation and reporting body at every opportunity.

ACTION 32: Helen Jamieson/Hazel McDonald/Jason Hibbert/Kris Campbell

As noted under Action 2 above, discussions should continue with both UKBB and CROSS.

ACTION 33: Richard Fish/Hazel McDonald

The next revision to the Code of Practice should include a requirement to share experience of collapses, whether mandatory or otherwise.

ACTION 34: Hazel McDonald

The next revision of the most appropriate standard in the DMRB should include a requirement for investigation and reporting. Santosh Singh thought that this could be in GG 128¹¹ but agreed to review.

ACTION 35: Santosh Singh

Osian Richards queried whether the BOF website could have a section on collapses. The subsequent discussion concluded with another action for this to be considered, including whether more minor, elemental failures should be added. Tomas Garcia noted that this was important as it reflected the pre-cursor issue.

ACTION 36: Keith Harwood/Richard Fish/Paul Fidler

Lastly, the question was raised as to whether the collapse of the M20 footbridge in 2016¹² had ever been reported. Hideo Takano recalled having presented on it at a BOF meeting soon afterwards but offered to repeat it at a future meeting.

ACTION 37: Hideo Takano/Santosh Singh

10. Nuneham Viaduct Closure

The Chairman again welcomed Phil Wildbore and invited him to present on the recent emergency closure of Nuneham Viaduct over the River Thames in Oxfordshire, and the subsequent works undertaken to reopen the railway line. Phil agreed that his presentation could be uploaded to the members only area of the BOF website.

ACTION 38: Paul Fidler

Phil described the details of the bridge, as well as its construction and maintenance history. It was in 2012 that settlement problems were identified in the south abutment,

¹¹ DMRB GG 128: Requirements for reporting incidents, events and undesirable circumstances: health, safety, wellbeing, structural and environmental

¹² [Bridge hit by excavator collapses onto busy UK motorway - Bridge Design & Engineering \(Bd & e\) \(bridgeweb.com\)](http://bridgeweb.com)

with evidence of vertical displacement of the track. Over the following years some 600mm of ballast had been added incrementally to maintain the track alignment. Early in 2023, stabilisation works had commenced by injecting a geo-polymer into the fill behind the abutment but, unfortunately, rather than mitigating, this had exacerbated the rotational movement. Works began on 3rd April 2023 with a temporary truss arrangement to support the deck before dismantling the abutment, removing the backfill and reconstruction. The works were completed, and the line reopened, in just under ten weeks. Phil supported his presentation with video clips, one of which is available on YouTube¹³.

The Chairman thanked Phil for sharing both the problems and successes. He remarked on the impressive speed of the reconstruction, and congratulated the team, before inviting questions.

Sue Threader was also impressed by the speed of the project, not least in being able to obtain the necessary approvals from the Environment Agency. She asked what lessons had been learned. Phil replied that these included perhaps being wary of being too tolerant of evidence of movement, an over-reliance on RCM¹⁴, and the need to identify critical assets on the railway with respect to resilience. He offered another presentation at a future meeting to discuss the wider lessons learned.

ACTION 39: Colin Hall/Richard Fish

The Chairman welcomed this, noting the contrast between Nuneham and Eastham bridge. He also pointed out that this was yet another example of the importance of taking notice of pre-cursor events.

11. BICS Update

Hazel McDonald reported on the outcomes from the Steering Group meeting held on May 3rd: to date there have been 28 Senior Inspectors, and 23 Inspectors accredited. Two assessments have yet to be completed with another four in the pipeline. Discussions were continuing with ICE and CIHT about linking BICS to an IEng qualification. Hazel also advised that National Highways' Francis McKeown had prepared some webinars, explaining the BICS process. Sue Threader added that the Rochester Bridge Trust bursary scheme was making progress. The criteria were to be that the prospective inspector should not be earning more than £50k pa and that they had a statement from their employer that they were not prepared to fund the BICS costs. Sue also mentioned that she had been liaising with Sheffield Hallam University regarding their inspector training courses. The Chairman thanked Sue and the Trust for making this happen.

Graham Cole confirmed that the review of the scheme manual was almost complete. He also reported that the assessor standardisation day had been held on 21st March and

¹³ <https://www.youtube.com/watch?v=PZPhCd8U-QQ>

¹⁴ Remote Condition Monitoring

one new assessor had been recruited from the pool of recently qualified inspectors. Graham reaffirmed the need for BICS to be a mandatory requirement for clients. Sue Threader suggested that Graham should write a blog, or prepare a short video clip, promoting BICS for the BOF website. This was endorsed by the meeting.

ACTION 40: Graham Cole

Noting the figures that Hazel had provided, Paul Thomas asked whether there was an estimate as to how many inspectors the UK needed. Graham and Hazel suggested that this figure would probably be between 500 and 700.

The Chairman asked which major clients were requiring BICS¹⁵ for their inspections. It was confirmed that National Highways, Transport Scotland, and Welsh Government were doing so. Kris Campbell noted that DINI use mostly in-house inspectors, most of whom are not only very experienced but also approaching retirement. Kris also noted that when inspector vacancies did arise, it was very hard to recruit suitable candidates. On behalf of SCOTS, Henry Dempsey replied that most authorities were not requiring BICS as yet, and further commented that it was even hard to find consultants who had BICS inspectors. Jason Hibbert supported this view; his trunk road agents also have a problem recruiting and retaining inspectors and, in order to meet their BICS requirement, have to sub-let inspections to specialist companies. Santosh Singh remarked that feedback from National Highways' providers was that the scheme was too complex and took too long to complete. Osian Richards concurred with this view.

The Chairman concluded the discussion by suggesting that public sector bridge owners should try to gain support from their politicians in requiring BICS.

12. UKBB & BOF – the Future?

Hazel McDonald opened this item by giving a short UKBB update, although the next meeting was not due until June 29th. She had, however, attended a recent UKRLG meeting; although there was still nothing to report on the research proposals¹⁶ put forward last year, other than the principle had been established that money could be directed to local authorities who had agreed to manage the projects.

In terms of BOF, Richard Fish confirmed that he would be standing down as BOF Technical Secretary towards the end of 2024 and, whilst he had given the Chairman five years notice in 2019, he believed that now was the time to think not only about a succession strategy but also to start a debate on the value of BOF and its longer-term relationship with UKBB. Suggestions for a new Technical Secretary are to be considered.

ACTION 41: All

¹⁵ NB Most large clients cannot specifically require BICS due to procurement rules and have use generic language.

¹⁶ From UKBB/BOF: 1. Updating the SAVI tool. 2. Revising the 1999 CSS/Railtrack cost sharing agreement. 3. Mandatory investigation and reporting of highway bridge collapses.

The Chairman suggested that having an independent chair and being hosted by an academic institution enhanced BOF's standing in the bridges community which had undoubtedly grown in recent years. He also noted his own retirement could be as early as five years away, but he would retain his status as a Fellow of Kings College and could therefore arrange for BOF meetings to be hosted at Kings even after that time.

A number of possible options were immediately mooted in discussion, but Richard Fish repeated that this was the start of a debate which should continue over the next few meetings.

ACTION 42: All

The Chairman advised that his aspiration was for BOF to engage in some fundamental high-level questions in the construction sector. He had been reading a book by Bent Flyvbjerg, an Oxford University academic, in which the author had found that <1% of construction projects meet their intended outcomes of time, cost and quality. He suggested that BOF might focus on procurement issues and a new business model for major project delivery. Henry Dempsey and Tomas Garcia expressed support for this idea. The former suggested that there was a race to the bottom driven by fee competition and contractors becoming more risk averse. Hazel McDonald also recommended a podcast on this topic by Matthew Syed: Too Big to Succeed¹⁷.

The Chairman closed the item but looked forward to continuing the discussion at future BOF meetings.

13. Updates on Current Bridge Issues and/or Research

The Chairman invited all present¹⁸ to provide verbal updates:

Big Bridges Group/Clifton Bridge

Trish Johnson noted that Clifton Bridge is a partner in a South West Infrastructure Partnership¹⁹ initiative on net zero. Bristol University are leading on this.

Department for Infrastructure Northern Ireland

Kris Campbell reported that he had attended a load test of a wind turbine blade bridge, the prototype of which had been presented at BOF 71.

HS2

Tomas Garcia suggested that the physical testing of concrete parapets could be on the agenda for BOF 74.

ACTION 43: Tomas Garcia/Richard Fish

¹⁷ [Sideways - 11. Too Big to Succeed - BBC Sounds](#)

¹⁸ Including those attending online. Only those who reported are recorded here.

¹⁹ [Home - SWIP \(southwestinfrastructurepartnership.co.uk\)](https://southwestinfrastructurepartnership.co.uk)

TfL

Tim Arianpour noted some research being undertaken in collaboration with Salford University on the performance of cast iron beams which had been strengthened some 25 years ago using GRP plate bonding. The project was in need of additional funding. The Chairman suggested that more details should be given at BOF 74.

ACTION 44: Tim Arianpour/Richard Fish

Canal and River Trust

Andy Featherby noted research being undertaken by Aston University on fibre optic sensors being applied to various C&RT test sites.

14. Bridges 2023 Feedback and Plans for Bridges 2024

Richard Fish reported that he was still in discussion with José Sanchez and related some feedback that had been received from delegates after the conference in March. This largely reflected the views of the meeting with few surprises. In terms of the awards, José is minded *not* to have any in 2024 and to make them every other year thereafter. BOF needs to decide if the Lifetime Achievement Award follows suit or if we keep it as an annual award.

ACTION 45: All/Richard Fish

In terms of 2024, Sue Threader suggested that the “workshop” concept on day 2 should be abandoned, as should the two streams on day 1. This would mean both days would be a series of presentations which everyone would be able to attend. This view was widely shared by the meeting and Richard Fish agreed to report on this to José when they next met.

ACTION 46: Richard Fish

Post meeting note: These thoughts were relayed to José on 28th June 2023, and he was receptive to the ideas. Arrangements were already in place, however, for Bridges 2024 which meant that the various rooms and facilities at the Ricoh Arena had already been booked so the two streams were likely to remain. He was in agreement with day 2 being more of a conference than a workshop and it is likely that the format for Bridges 2025 will follow BOF’s suggestions.

15. Any Other Business

- **Meeting arrangements:** Jason Hibbert remarked that this hybrid meeting had worked very well for those joining virtually.
- **Incursions onto the railway:** Nicola Head asked if anyone knew of a requirement to review all the railway incursion risk ranking exercises that had originally been instigated following the Great Heck²⁰ incident in 2001. No-one else was aware of this.

²⁰ [\[ARCHIVED CONTENT\] \(nationalarchives.gov.uk\)](#)

- **Presentations from specialist suppliers:** The Chairman referred to a conversation he had had with Osian Richards about a sensor company, Screening Eagle, who wished to present at BOF. He clarified his position that BOF was not the place for sales pitches but as and when we focus on a specific topic then it would be acceptable to have a number of presentations on that theme. He also recalled that he had to respond to an email request from one of his previous PhD students (Sakthy Selvakumaran) who now was also running a similar business – BKwai.

ACTION 47: Chairman

16.Next Meetings

BOF 74: 7th November 2023 to be held in Cambridge (but with hybrid facilities).

BOF 75: 6th February 2024 to be held in Cambridge (but with hybrid facilities).

BOF 76: 4th June 2024 probably to be held in Cambridge, unless an option for a visit is proposed.

BOF 77: 5th November 2024 to be held in Cambridge (but with hybrid facilities).

ACTION 48: Richard Fish

17.Close

The Chairman drew the meeting to a close, thanking everyone for their contributions and wishing everyone a safe onward journey.

Richard Fish,
BOF Technical Secretary,
31st July 2023