

BRIDGE OWNERS FORUM

BOF 75: TUESDAY 6 February 2024

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

PRESENT:

In person:

Tim Arianpour	TfL (LUL)
Jasdeep Bhachu (part)	LoBEG
Malcolm Cattermole	Forestry England
Graham Cole	HRA
Mark Cox	DfT
Andy Featherby	Canal and River Trust
Paul Fidler	CUED
Richard Fish	Technical Secretary
Tomas Garcia	HS2
Keith Harwood	ADEPT
Hazel McDonald	Transport Scotland
Cam Middleton (Chairman)	CUED
Ian Norriss	Environment Agency
Osian Richards	CSS Wales
Martyn Thomas (part)	SSE Renewables

Guests:

Ian Hodson	HRA (Isle of Wight Steam Railway)
Anil Kumar	TfL
Maureen Robson	TfL
Alastair Soane (part)	CROSS
Emma Shaw (part)	CROSS

Virtual:

Henry Dempsey	SCOTS
Liam Duffy	Transport Infrastructure Ireland
Jason Hibbert	Welsh Government
Trish Johnson	Big Bridges Group
Ian Norris	Environment Agency
Santosh Singh	National Highways

Guests:

Alex Bouas	Environment Agency
Jim Booth (part)	Rochester Bridge Trust
Kathryn Elliot (part)	SSE
Helena Russell (part)	

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

1. Welcome

The Chairman welcomed everyone to BOF 75, noting that this was another landmark number. As well as himself, he noted that there were still some survivors from BOF 1 in 2000: Graham Cole and Paul Fidler.

2. Introductions and Apologies

The Chairman invited the various guests attending to introduce themselves:

Ian Hodson is the Infrastructure Manager for the Isle of Wight Steam Railway (IWSR) and was attending as a guest of the HRA. He would possibly be the organisation's replacement for Graham Cole on BOF, in due course. Ian's career had focussed on bridges, starting with local authorities before eventually being TUPEd as part of the Portsmouth PFI contract. His most recent role before joining IWSR was with the Isle of Wight highways PFI provider, Ringway Island Roads.

Anil Kumar was standing in for Nicola Head. Anil is a Principal Engineer with TfL for whom he has worked since 2009. He acts as TfL's Technical Approval Authority for Bridges and Tunnels. Prior to joining TfL, he worked for consultants, including Atkins.

Maureen Robson was attending as a TfL guest. She had joined TfL in 2016 and her present role is in the Technical Assurance team. Maureen's career had been with several local authorities, including Surrey County Council, where she worked for Graham Cole.

The Chairman welcomed back Mark Cox who was representing DfT. Although Mark had attended BOF 69 in February 2022, he re-introduced himself noting his previous bridge experience with Atkins and Aecom.

Although he arrived later in the meeting, Matthew Wright's introduction is noted here: Matthew has worked with Jason Hibbert for the Welsh Government for the last two years as a secondee from Arup where he is a Senior Engineer.

The Chairman noted that both he and Sue Threader had connections with the City Bridge Foundation which was responsible for five major bridges over the river Thames. They had asked to join BOF under the usual terms and he asked whether this would be supported. There was no dissent, and they will be invited to attend BOF 76.

ACTION 1: Chairman/Richard Fish
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Richard Fish recorded apologies that had been received from the following:

Kris Campbell	Department for Infrastructure – Northern Ireland
Mark Downes	EWK
Colin Hall	Network Rail
Nicola Head	TfL
Paul Thomas	Railway Paths
Sue Threader	Rochester Bridge Trust

3. Matters Arising from BOF 74 Minutes

The Chairman noted that the accuracy of the BOF 74 minutes had been approved by email and that they were now on the BOF website.

The Chairman referred to the BOF 74 Action Update sheet that had been issued with the agenda:

Actions 1: BOF Meeting Format

This action had referred to the issue of whether BOF meetings should be held in person, solely via MS Teams, or continuing as hybrid. The Chairman asked for views. Those who had had experience of both pointed out the greater value of meeting in person. Even if the technology was better, there were still feelings that on line attendees did not always feel as fully engaged in the discussions as those in the room.

The overall view was that meetings should continue as hybrid, although the Chairman encouraged attendance in person whenever possible.

ACTION 2: Chairman/Richard Fish

For reasons of domestic arrangements and catering, the Chairman asked that those promising to attend in person should stand by that commitment unless there were exceptional circumstances.

ACTION 3: All

The Chairman acknowledged that the IT provision from Kings College was not as good as it should be and offered to try to improve this for future meetings.

ACTION 4: Chairman/Paul Fidler

Andy Featherby asked about sending substitutes to BOF if any member was unable to attend. Richard Fish confirmed that, although not widely taken up, this had been acceptable for many years and should be the norm.

ACTION 5: All

The Chairman also encouraged members to bring guests to BOF meetings (subject to there being enough physical space). He also expressed the view that enhancing gender diversity at meetings would also be welcome.

ACTION 6: All

Richard Fish quickly went through the rest of the BOF 74 Action Update sheet, noting that most items had either been completed or related to specific items on the agenda for this meeting.

The Chairman noted that the sheet also contained additional information on the M20 footbridge collapse (BOF 74, Action 10).

4. Low Carbon Concrete and New Technologies

The Chairman invited Martyn Thomas to present on this item. Martyn was joined on line by his SSE Renewables colleague, Kathryn Elliot, who worked in the company's Sustainability Team. He agreed that his presentation could be uploaded to the members area of the BOF website.

ACTION 7: Paul Fidler

Martyn explained that most new construction related to wind turbine bases which now have to support towers up to a height of 120m. This can require foundations with up to 1000 m³ of concrete. Like every client, Martyn faced not only budgetary pressures to keep costs to a minimum but also a need to reduce carbon. Earlier experience had seen consultants being reluctant to innovate but recent changes in SSE design standards offer incentives to minimise carbon.

SSE had also been working with Strathclyde University to try to develop more efficient designs and have also reviewed European practice which generally achieve smaller footprint foundations. They are also part of the Low Carbon Concrete Partnership, together with Scottish Water, Scottish Power, Network Rail and Transport Scotland. Kathryn Elliot added that this was not yet a formal partnership but more of a group of organisations sharing a common goal. As yet there had only been some exploratory meetings. From Transport Scotland's perspective, Hazel McDonald had understood that the partnership was initially looking only at non-structural concrete.

Finally, Martyn reflected on recent changes to BS 8500 which permitted lower cement contents not only by using slag-based products but also by using up to 20% crushed limestone powder with a direct correlation of every 5% of limestone saving 5% of carbon in every tonne of concrete. He also introduced the concept of Earth Friendly Concrete (EFC) which was made with a geopolymers binder instead of cement.

The Chairman thanked Martyn for his presentation, welcoming some positive movement on the carbon issue. He noted that most organisations seemed to have a carbon strategy but very few could show evidence of action. He questioned whether

there could be some cross-fertilisation with design codes for bridge piers in earthquake zones. He then invited comments and questions from the meeting.

Tomas Garcia shared some of Martyn's concerns about the difficulties of incentivising consultants to produce low carbon designs, especially in a design and build context when time and cost remained the principal drivers. He added that it was important to ensure that all parties: client, consultant and contractor could all work together to agree the best way forward. Hazel McDonald confessed a natural conservatism when being offered new concrete products, especially when the most important issue was one of durability.

Mark Cox noted that through the TRIB Infrastructure Working Group, DfT were working with HS2 on various initiatives associated with low carbon concrete. The Chairman suggested that DfT should have an over-arching role in all things associated with low carbon, including promoting and managing relevant research, both in the UK and on an international basis.

The Chairman asked if the Partnership was engaged with either TRIB or the Net Zero Bridges Group (NZBG). Having only recently been in post and primarily working on aligning the seven business units within SSE, Kathryn Elliot replied that this had yet to happen but was something which she would propose to Emma Bush of Scottish water who was the partnership's coordinator.

The Chairman drew this item to a close by thanking Martyn and Kathryn and noted that the subsequent discussion had led nicely into the next item.

5. New Carbon Initiatives etc.

As a result of discussions at BOF 74, the Chairman noted that this was now to be a standing item on BOF agendas. He began by reprising the points just made about the need for design optimisation and the need to incentivise designers. Osian Richards recalled a point made by the NZBG that consultants were largely unable to accept risk for innovative designs; he believed that the risk was better to be taken by the client as they were the ones requiring such an approach. He also noted that CSS Wales had begun to develop some low carbon work related to roads, through its asset management group.

Tomas Garcia repeated his earlier points about the need to invest in the design phases if there was to be significant carbon savings. HS2 had come to this point too late for Phase 1 but had had a better plan for Phase 2, including parametric analyses for low carbon using an algorithm¹ to determine the optimum design. Unfortunately, now that Phase 2 had been scrapped, this was unlikely to be used in an actual design process.

¹ Software developed by Altair Engineering [Altair | Discover Continuously. Advance Infinitely - Only Forward.](#)

Ian Norriss reported that the Environment Agency now permitted departures from BS 8500 in order to use lower carbon concrete. Keith Harwood questioned whether revising codes and standards was the way forward. The Chairman agreed and argued that improved and less prescriptive design was the better option. Osian Richards proposed that lower whole life carbon could be achieved through better workmanship and supervision producing a much higher quality, durable material. Keith Harwood echoed this point, reminding the meeting of the Hertfordshire bridge he had described at BOF 72 which had since been demolished and a replacement built, with considerable additional carbon; all of which could have been avoided had traditional supervision been in place rather than a reliance of self-certification.

Santosh Singh listed some of the initiatives from National Highways:

- CG 300 was being updated to ensure that designers considered carbon in their proposed designs as well as ensuring that they were safe and efficient.
- A consultant (WSP) had been commissioned to investigate the feasibility for developing a standardised system of carbon accounting and calculation.
- A team within NH has been collaborating with concrete suppliers to review mix designs and the processes around cement production.
- In relation to points made about improving construction supervision, a move was also being considered to make works examiners more accountable.

The Chairman thanked everyone for their contributions, noting that discussions should continue at future meetings.

6. Links with UKBB and NZBG

As much of the previous item's discussion had touched on the need for better collaboration, there was no further debate on this item. The Chairman urged the sharing of data and for all the various low carbon groups to work together as far as they possibly could.

7. SSE Renewables Bridges and Structures

This item was one of a series which enabled BOF members to share a flavour of their bridge stock and the challenges they were facing. Martyn Thomas presented on the bridges for which he was responsible with SSE Renewables. He agreed that his presentation could be uploaded to the members area of the BOF website.

ACTION 8: Paul Fidler

Martyn is responsible for about 450 bridges, both private and public, the majority of which were built between 1940 and 1960. Although most are in relatively good condition, unusually many were designed for specific loads, rather than codified loading, associated with the needs at the time of their construction; to service the hydro-electric power assets. Others were designed for a percentage of the, then, MoT loading requirements. Like many bridge owners, management of the stock has been

hindered by the loss of records on occasions when the organisation changed. The bridges have been assessed to BD 21 or CS 454, although with some bespoke SSE departures allowing a reduction in some load factors. Martyn acknowledged that there had been a history of neglect, mainly because bridges were not considered to be a primary asset by the company. As well as problems in this regard, there were legacies of poor design and construction, the presence of asbestos, convoluted drainage systems, and some with ASR. With respect to inspections, some had been risk assessed for Principal Inspections up to a 12-year frequency, but SSE had also used UAVs, linked to an AI algorithm to identify defects.

The Chairman thanked Martyn for his presentation and invited comments and questions. Alex Bouas asked how the reduction in load factors had been calculated. Martyn explained that there were several issues: the fact that those in private use had low traffic volumes, some research into vertical impact allowance from slow moving loads and, as ever, engineering judgement. Sanosh Singh noted that there had been a recent paper in the ICE Bridge Engineering Journal on this subject. During his presentation, Martyn had noted that the ownership of some bridges carrying the public highway had been questioned by the local highway authority; Jason Hibbert suggested that any “gentlemen’s agreements” should be formalised to future proof the arrangement.

8. BICS – Update and Feedback from Workshop

Graham Cole began this item by reporting on the workshop that had been arranged by National Highways and had taken place in Birmingham on 24th January. Other BOF member present were Hazel McDonald and Osian Richards. Others present included some representatives from inspection companies, LANTRA and some BICS qualified National Highways inspectors.

There had been some good discussions, reflecting on the often alleged perceptions that the scheme was too complex and too expensive. With regard to the former, this was thought to be more of an issue of poor communication because it seemed that the amount of work needed in the preparation of an e-portfolio was being exaggerated. Whilst there had been no dispute that inspectors had to be competent, nor that inspections have to be completed in accordance with the DMRB, the question had been asked as to whether the bar had been set too high in terms of the knowledge expected of inspectors.

Hazel McDonald added that the day had been useful but also a little frustrating and it was hard to see how progress can be made. Hazel was also concerned that, should the required standard be relaxed, it would be problematic for those who had already qualified. LANTRA have been asked what their next steps might be, but no response had been received as yet. The issues from the workshop will be discussed at the Steering Group meeting due to be held on 7th March.

The Chairman reprised the background to the whole inspector competency issue, which had first been aired at BOF over a decade ago before progressing to UKBB and DfT. He recalled that the first attempt to seek a provider had not been successful but, later, Neil Loudon (formerly of National Highways) had brokered a deal with LANTRA as it was consistent with their other Sector schemes. He suggested that the governmental organisations should insist on BICS accreditation which would lead to a tipping point. Santosh Singh pointed out the dilemma facing National Highways: the ORR² monitors the inspections programme for structures, and it is important to carry out regular inspections to keep the structures safe and fit for purpose. Currently, however, there are not enough BICS qualified inspectors to deliver the inspection programme.

Osian Richards accepted the need for a high standard of competence for an inspector but suggested that a system of progressive targets which could be achieved as and when, rather than maintain the existing all or nothing approach. Graham Cole recalled that this had been the original intention when the scheme had first been designed.

Hazel McDonald listed the various communications initiatives which were available, including webinars, all aimed at removing areas of misunderstanding. She also noted the discussions which had been held with DfT and understood that a letter had been sent to all local authority Chief Executives, emphasising the need for proven competence for bridge inspectors. Hazel added that, although there had been a number of comments that the steering group needed to find a solution, it was difficult to achieve a consensus, even in that body. She agreed, however, to report back at BOF 76.

ACTION 9: Hazel McDonald/Graham Cole

The Chairman then asked BOF members about their approach to ensuring inspector competence. For ADEPT, Keith Harwood reported that there was also no consensus. There were five separate local authority schemes which had set up by ADEPT members, with that of CSS Wales considered to be the nearest to BICS in terms of competencies. Jasdeep Bhachu offered to discuss the need to inspector competence, and adopting BICS as a requirement for consultants, with his LoBEG members. Ian Norriss described the Environment Agency policy which had been to categorise their bridges and align more complex structures with more experienced inspectors. That said, Ian added that the EA broadly supported the BICS principles. Jason Hibbert said that the Welsh Government supported the National Highways approach in seeking to work towards BICS accreditation for all inspectors. The Chairman asked everyone to help with communicating the need for competence in bridge inspections, and BICS in particular, within their respective organisations.

ACTION 10: All

Before drawing this item to a close, the Chairman also emphasised the need to continue to raise the need for BICS at UKBB, UKRLG and onwards to DfT.

ACTION 11: Hazel McDonald/Mark Cox

² Office of Road and Rail

9. CROSS³ – Annual Update

The Chairman welcomed Alastair Soane and Emma Shaw from CROSS. Alastair gave his annual update and agreed that his presentation could be uploaded to the members area of the BOF website. The same presentation covered both this and the next agenda item.

ACTION 12: Paul Fidler

Alastair reminded the meeting of CROSS' purpose, its remit, the reporting process, and the concept of precursor events. He went on to review the notable achievements in 2023, not least the significant volume of work created by the well-publicised RAAC⁴ problems. Alastair noted that CROSS had first issued a report on RAAC in 2018, followed by a Safety Alert in 2019.

With respect to bridges, whilst there had been a number of CROSS reports⁵, Alastair suggested that it would be helpful to receive more as and when an incident arose, if only to identify early precursors. The Chairman endorsed this request and encouraged reports to be submitted.

ACTION 13: All

Osian Richards questioned whether some of the issues with defective precast concrete that had been aired at BOF 72 would be suitable subjects for a CROSS report. Keith Harwood noted that, whilst he had raised the issue with a number of bodies, including the Concrete Bridge Development Group, he had not considered submitting a CROSS report. He had some concerns over how effective anonymisation could be, as bridges were relatively easy to identify.

Noting that Alastair had included design concerns as a possible confidential report, Tomas Garcia asked how that could be identified. Alastair replied that examples included concerns over lack of checking, over-reliance on computer software or even poor conceptual design. He noted that such issues could be attributed to fee competition leading to inadequate resources being allocated to a project.

10. Investigation and reporting of Bridge Failures

Before inviting Emma Shaw to present on this item, the Chairman explained that the CROSS/UKBB/BOF series of meetings had continued and, most recently, Mark Hansford from the ICE had joined the discussions.

Emma explained that she was the CROSS Communications, Content & Engagement Manager and was going to coordinate the various activities planned for forthcoming CROSS bridges campaign. The plan was to launch the Voluntary Occurrence Reporting

³ [Collaborative Reporting for Safer Structures UK \(CROSS-UK\) \(cross-safety.org\)](https://cross-safety.org/)

⁴ Reinforced Autoclaved Aerated Concrete

⁵ Slide 16 of the presentation gives hyperlinks to 11 examples of CROSS reports related to bridges.

Scheme (VORS) alongside a communications and engagement strategy to encourage reports *into* the Scheme and to then to push reports *out* into the wider bridges community, using various tools such as newsletters, social media, press releases and events⁶. CROSS newsletters are issued quarterly, and a bridges special is planned for July 2024. Before that, however, a bridge theme page on the CROSS website will go live in April; in May, the technical press (notably NCE and TSE⁷) should launch the scheme; and, in August, there should be a bridges “takeover” of the CROSS website with a bespoke SEO⁸. She issued a table for BOF members to offer their views, either during or after the meeting⁹.

ACTION 14: All

Alastair concluded by noting some longer-term plans once the scheme was up and running, including the needs to establish a bridges expert panel and to secure funding to run the scheme. The Chairman thanked both Emma and Alastair and suggested that discussion should continue both during, and in the items immediately after, lunch.

11. Update on proposed system for reporting bridge failures in Wales

This item had been included as an action from BOF 74. Osian Richards reported that CSS Wales had expressed concerns over the lack of knowledge sharing following a failure. It seemed the only interest, at least from senior managers and politicians, was more about *when* the road could be reopened rather than *why* had a bridge collapsed. He added that CSS Wales had been working with an asset management consultant¹⁰ to try to obtain early reports and set up independent investigations. Following today’s presentation, however, Osian suggested that the CROSS VORS would do just that and CSS Wales would now engage with CROSS throughout.

12. Investigation and Reporting of Bridge Failures - Discussion

The Chairman reflected on the CROSS VORS proposal and asked the meeting whether it had BOF support. This was unanimously given. He then invited comments.

Hazel McDonald noted that UKBB had made the reporting of bridge failures a high priority when asked for research bids by DfT via UKRLG in 2021. As no funding had yet been forthcoming, UKBB had supported voluntary reporting and knowledge sharing. This was not that successful, especially considering that a report on the Eastham bridge collapse in 2016 was only eventually obtained following a FOI request in 2023. Hazel was encouraged by recent initiatives, culminating in the meetings with CROSS and today’s presentation. She agreed to revisit the UKBB research bid and ask DfT to at least consider funding the scheme’s running costs (as had been originally

⁶ As an example, Paul Livesey of CROSS is presenting at the Bridges 2024 conference.

⁷ The Structural Engineer

⁸ Search Engine Optimisation

⁹ The table is on slide 41 of the presentation.

¹⁰ exp|consulting [Home \(expconsulting.co.uk\)](https://www.expconsulting.co.uk)

included). The Chairman offered to also seek this through his contacts, including the Chief Scientific Officer, at DfT.

ACTION 15: Chairman/Hazel McDonald

Hazel also recalled that the UKBB/BOF/CROSS discussions had questioned whether the ORR might be able to support this initiative, and this would be followed up.

ACTION 16: Hazel McDonald

Noting the support from CSS Wales for the CROSS VORS, the Chairman asked for comments from others.

Jason Hibbert offered his support to the principle of the scheme and added that the Welsh Government were proposing to issue non-statutory guidance for Welsh authorities, demonstrating that this would be regarded as national best practice. Jason agreed to share more at BOF 76.

ACTION 17: Jason Hibbert

For Ireland, Liam Duffy confirmed that there was nothing in place other than those owners who were prepared to do so, sharing their experiences in conferences or similar fora. Henry Dempsey noted that SCOTS take a similar route, generally sharing experiences in SCOTS meetings. He cautioned, however, that for local authorities the views of the county solicitor (or equivalent) and elected members could not be ignored.

Lastly, Keith Harwood reported another collapse in Worcester – Old Powick bridge, a 15th-century masonry arch, apparently due to scour.¹¹ Keith agreed to request more information from Worcestershire CC and also encourage them to submit a report to CROSS.

ACTION 18: Keith Harwood

The Chairman closed this item by thanking Alastair and Emma for their attendance and wishing them success with the VORS initiative. At this point they left the meeting.

13. BOF Website Operational Issues

Keith Harwood noted that the new website had now been active for several months and all feedback to date had been positive. He saw its purpose as being twofold: for BOF members to be able to access the information they needed and for outsiders to find out more about BOF and to access the repository of bridge guidance documents. The latter point had been particularly well received.

Keith was concerned, however, that the website was somewhat static and suggested that a blog section would be a good idea. Santosh Singh noted that people often use

¹¹ [Collapse forces closure of Worcester's Old Powick Bridge - BBC News](#) Quote from WCC, Head of Highways: *"This is just an unforeseen circumstance I am afraid and one that we have to deal with."*

LinkedIn to post their thoughts and suggested that this was not dissimilar. The blog idea was generally accepted, although authors and frequency needed to be determined.

ACTION 19: Richard Fish/Keith Harwood/All

Trish Johnson suggested that more information on visitors to the site might help tailor it to their needs. This was agreed and Keith agreed to use Google Analytics and report at the next meeting.

ACTION 20: Paul Fidler/Keith Harwood

Santosh Singh suggested, and it was agreed, that the site should be promoted within all BOF organisations, also asking for feedback.

ACTION 21: All

The Chairman pointed out that there was also a need to maintain and, as necessary, upgrade the site but he was confident that the BOF accounts could now allocate a budget for this purpose.

ACTION 22: Chairman

14. Grand Challenge Refresh

The Chairman welcomed Helena Russell who joined via Teams for this item and gave a presentation which she agreed could be uploaded to the BOF website.

ACTION 23: Paul Fidler

Helena showed the new look to the Grand Challenges pages as well as the revised text, for which she thanked Keith Harwood and Hazel McDonald for their input. The new net zero challenge had also been drafted. Helena posed a number of questions, beginning with the net zero challenge and the need to better understand its purpose.

The Chairman began by suggesting that consistency should be the key in terms of calculating and counting carbon but also in procurement. Osian Richards thought that the challenge should be to enable owners to realise where they are now and to point out where they needed to get to. Both agreed that the need to avoid greenwash was paramount. Ian Hodson agreed, adding that, in terms of carbon and procurement, both PFI contracts he had worked on had very little substance and the green requirements of the contracts were reduced to a numbers game. Helena accepted these points.

With regard to the new challenge, it was agreed that this should be called “Achieving Zero”. Other decisions were taken to no longer allocate numbers to each grand challenge and to embed hyperlinks in the text. It was also suggested that there should be an HS2 photo for the “Building Bridges that Perform Better” challenge. Tomas Garcia will supply this.

ACTION 24: Tomas Garcia

Richard Fish confirmed that he had been given a short slot on Day 2 of Bridges 2024 to relaunch the Grand Challenges. The Chairman thanked Helena for a job well done!

15. The Impact of Deterioration on Bridge Capacity: A Heritage Railway Example

The Chairman invited Graham Cole to present this item. Graham agreed that his presentation could be uploaded to the members area of the BOF website.

ACTION 25: Paul Fidler

Graham gave the background to a project to consider the effects of heavier axles on railway bridges with a lower route availability classification: “The HAW¹² Accessibility Tool”. The research was a 30-month¹³ project being led by Southampton University (under Prof. William Powrie) and funded by Network Rail and the Rail Standards and Safety Board (RSSB). The project aimed to investigate the performance of both metallic and masonry bridges, taking into account their condition and known defects. It would combine theoretical modelling with materials testing in laboratory conditions as well as field monitoring of real structures.

The specific example on which Graham had assisted had been undertaken on a metallic bridge on a heritage railway and involved positioning a locomotive of known weight over the heavily instrumented¹⁴ bridge, both statically and running at various speeds. The chosen bridge had been built in 1910 and was of rivetted plate girder construction with a high skew. The bridge had originally carried two tracks but only one was now in use. The bridge also had significant corrosion defects at the web/bottom flange connection and was subject to Special Inspections at six-monthly intervals.

The Chairman thanked Graham for reporting on an interesting project and suggested that Prof. Powrie could be invited to a BOF meeting when the project was nearing completion.

ACTION 26: Richard Fish

16. Suicide Intervention Sub-Group¹⁵: Update

Trish Johnson was invited to give a verbal progress update on the work of this group since the last meeting. Trish explained that a number of case studies were being considered looking at best practice for mitigation measures under the following headings:

¹² Heavy Axle Weight

¹³ The project started in January 2023

¹⁴ Two sets of instrumentation were used: one had been offered by Accolade on a gratis basis and the other installed by Southampton University.

¹⁵ Sub-Group members: Trish Johnson (lead), Hazel McDonald, Sue Threader, Henry Dempsey and Osian Richards

- Dealing with vulnerable persons.
- Physical deterrents.
- Soft deterrents.
- Rescue requirements.
- Dealing with stakeholders.
- Data collection.
- Dealing with the media.
- Dealing with thrill seekers.
- Legal aspects.

The group also wanted to consider how design of both new build and major maintenance schemes could be improved to prevent future occurrences. Trish requested any further information and/or case studies to be sent to her.

ACTION 27: All/Richard Fish

Trish advised that she had also met with Nicola Tweedie from National Highways and had been made aware of some relevant internal documents on this topic. She also agreed to share the draft guidance within the BOF membership for comments or other feedback.

ACTION 28: Trish Johnson/Richard Fish

Post meeting note: draft guidance issued with draft BOF 75 minutes on 6th March 2024.

Henry Dempsey reminded the meeting of his role as part of the Glasgow Water Safety Group and specifically a study being undertaken by Leeds Trinity University on drowning incidents that were occasionally being encouraged as “suicide tourism”. This was also part of the national Water Incident Database (WAID¹⁶). Henry agreed to forward any further information relating to this study.

ACTION 29: Henry Dempsey/Richard Fish

17. TRIB IWG: Update

As a member of the IWG, the Chairman reported that he had met with senior civil servants at the DfT and had pushed for stronger links and improved communication from BOF to UKBB to UKRLG to DfT and vice-versa. He also wanted to improve the transparency of TRIB research programmes. Mark Cox advised that he had also recently joined the IWG and endorsed these points. Both offered to keep up the pressure on the need for improvement in these areas.

ACTION 30: Chairman/Mark Cox

¹⁶ [The water incident database \(WAID\) 2012 to 2019: a systematic evaluation of the documenting of UK drownings | BMC Public Health | Full Text \(biomedcentral.com\)](#)

18. National Highways/DMRB Update

Santosh Singh listed the following updates, including on some actions from BOF 74:

- A list of the CHE memos has been sent to Richard Fish for adding to the BOF website bridge guidance.

ACTION 31: Richard Fish/Keith Harwood

- The new scour standard (CS 469) is about to be published.
- A consultation on the revisions to the MCHW is currently underway with publication of the revised document targeted for March 2025. More changes to the DMRB will follow as a result.
- There was no project on Electric Vehicle Loading as yet, although questions had been raised over longer-term fatigue effects.
- There was no further information on the 3-D printed concrete headwall built on the A30 dualling scheme in Cornwall, as this had been a contractor initiative.

19. Updates on Current Bridge Issues and/or Research

The Chairman invited updates from the meeting. Those that had points to make are listed below:

Tim Arianpour: Details of the research project at Salford University on the impact of environment on FRP strengthened cast iron elements had been forwarded by Richard Fish but, although TfL are considering part funding this, Tim was aware that other partners were needed. As an aside, the Chairman reaffirmed his position that BOF was not the platform for “sales pitches”, but details could be passed on as had been the case here. He was happy, however, for presentations on completed research projects to be given at BOF meetings.

Osian Richards: Strathclyde University were working on a project to strengthen arch bridges by “locking” the fill material with grout.

Matthew Wright: There had been some progress on the overloaded vehicles research project with raw data having been made available from weigh-in-motion sites in Wales and Scotland. Obtaining similar data for England from National Highways had been more problematic as this was held by the DVSA¹⁷. It was hoped, however, that this would soon be resolved.

¹⁷ Driver and Vehicle Standards Agency

20. Any Other Business

- 20.1** The Chairman referred to an email he had received from Chris Hendy at Atkinsréalis with a draft article for the SCI New Steel Construction Advisory Desk publication originated by the Steel Bridge Group. Once published the article will be circulated.

ACTION 32: Chairman/Richard Fish

Post meeting note: issued with Richard Fish email of 9th February.

- 20.2** Tomas Garcia noted that HS2 were working on concrete parapet containment based on Eurocodes and agreed to present on this at a future meeting.

ACTION 33: Tomas Garcia/Richard Fish

- 20.3** Tomas also referred to a cost/benefit tool that HS2 had developed to optimise the offsets for bridge piers vs strength in derailment situations. He also offered to present on this at a future meeting.

ACTION 34: Tomas Garcia/Richard Fish

- 20.4** Jim Booth reported that Rochester Bridge Trust were working with Urban XR¹⁸ on a project to identify and visualise underground apparatus. A trial was planned which could be presented to a future meeting.

ACTION 35: Sue Threader/Jim Booth/Richard Fish

- 20.5** Paul Fidler asked those on line whether today's meeting had been improved by the use of the "Owl" device. Ian Norriss confirmed that the audio had been much better. Alex Bouas pointed out that the camera had been able to pan to some speakers around the room, but not others.

- 20.6** Andy Featherby advised that C&RT were about to dewater and inspect Telford's Pontcysyllte aqueduct. He agreed to present on this at BOF 76.

ACTION 36: Andy Featherby/Richard Fish

- 20.7** Osian Richards asked if a draft of CS 469 could be made available. Santosh Singh replied that he had been asked *not* to share the draft as it is expected to be published soon, but agreed to ask again.

ACTION 37: Santosh Singh

- 20.8** Finally, the Chairman advised that the BOF accounts were now in the black, but he would now have to include his departmental admin costs for BOF meetings and to budget for website resources.

¹⁸ <https://urban-xr.com>

21.Next Meetings

BOF 76: 4th June 2024 to be held in Cambridge, and via Teams.

BOF 77: 5th November 2024 to be held in Cambridge and via Teams.

ACTION 38: All

22.Close

The Chairman closed the meeting, thanking everyone for their contributions and looking forward to seeing as many as possible in person at BOF 76.

Richard Fish,
BOF Technical Secretary,
22nd March 2024