Railway Industry Health and Safety Advisory Committee (RIHSAC)

Minutes of the 129TH RIHSAC Meeting

Monday 14 October 2024

25 Cabot Square, London, E14 4QZ

Present:

Justin McCracken	ORR
Richard Hines	ORR
Sukhninder Mahi	ORR
Jen Ablitt	ORR
Tom Hague	ORR
Christopher Davies	ORR
Katherine Goulding	ORR
Monica Babb	ORR
Matthew Tackling	ORR
Caroline Barter	ORR
Bertie Bricusse	DfT
Hannah Fisher	DfT
Ali Chegini	Eurotunnel
Joanne Parkes	HS1
Ben Lane	Merseyrail
Michael R. Jones	Merseyrail
Darren Tassell	Network Rail
Sam Pead	Network Rail
Thomas Bruno	Network Rail
Iain Scott Ferguson	Network Rail
Lisa Angus	Network Rail
David Quincey	Network Rail
Martin McMahon	Network Rail
Matthew Green	Heritage Railway Association (HRA)
John Cartledge	Co-opted
Andrew Hall	RAIB
Phil Barrett	Rail Partners
Richard Carr	RIAGB
Jonathan Havard	RMT
Chris Knowles	RSSB
Vaibhav Puri	RSSB
Graeme Hamilton	Scottish Government
Frank Kelly	SPT
Alison Mansfield	TfL
Ralph Davison	TfL
Nader Saffari	TfL
Emma Burton	TfL
Katherine Drayson	TfL
Nicolas Gruselle	TfL
Simon J Reynolds	TfL
Jonathan Exley	TfL
Nadine Rae	TSSA
Mark Ashmore	UK Tram

Welcome, introductions, apologies for absence, and actions from previous meeting

1. Justin McCracken welcomed attendees. Sukhninder Mahi mentioned the apologies received from Simon French, Marian Kelly, and Vincent Borg.
2. No issues were raised with the last RIHSAC meeting minutes, so they were agreed.
3. All actions were agreed as closed: The first action was closed as Justin had written to Ian Prosser thanking him for his contribution to RIHSAC. For the second action, Richard Hines had met with Pam Warren, and, given the context of reform, it was agreed that any proposal would be reviewed when the scope and timescales for reform were matured. The third action was closed as further discussion on mental health and occupational health was added to the RIHSAC forward programme.

Health and Safety Regulation Committee (HSRC) update

4. Justin reported some key items from the September 2024 HSRC. These included the quarterly ORR Chief Inspector's Health and Safety Board report which had provided an overview on a number of live topics within the industry. Justin noted that it was a busy period for the industry in general but there were no specific matters to be raised at RIHSAC.
5. HSRC had discussed the history of enforcement action taken by ORR, particularly issuing notices and prosecutions, to consider whether ORR's approach had changed over time. Justin said that there was no significant trend over the five-year period.
6. The committee had also considered a paper on SPAD risk, which was viewed as timely with discussions held at the last RIHSAC about the increases in SPADs risk over the past 12 months, and with the 25-year Ladbroke Grove anniversary. HSRC has asked for further work to be done on understanding the root causes of residual SPADs that were still occurring, and to consider how other countries handled SPADs risk and whether there could be any learning for the UK rail industry from this. A paper on this will be presented to HSRC in 2025, which will also set out ORR's proposed programme of work in this area.
7. Justin asked for the SPADs update to be added to the RIHSAC forward programme, aligning the discussion at RIHSAC with the HSRC discussion.
8. Weather resilience and ORR's regulatory strategy were also discussed. and HSRC was assured that Network Rail has an appropriate action plan to deal with these changing risks. It supported the proposal from Chris Davies and his team to engage with TfL to enhance our understanding. This paper was included in the RIHSAC pack as context for this meeting.
9. HSRC had been updated on ORR's Railway Safety Directorate (RSD) risk profiling for the rail industry. This work will feed into its resource plan for next year. HSRC was pleased with the refinements made to the process to make this clearer and more transparent than in previous years and had asked for consideration to be given to balancing resourcing with addressing major accident risk and dealing with occupational health issues. This work will be concluding in December 2024, and the outcomes will be shared with 17 February 2025 RIHSAC.
10. John Cartledge asked about the risk profiling exercise; it was clarified that this would cover all segments of the industry, not simply the main line network, and updates will be provided to HSRC and RIHSAC.

Action 129.1: Sukhninder to add discussion on SPADs to the RIHSAC forward programme, with this likely to take place at October 2025 RIHSAC.

Chief Inspector (CI) updates

11. Richard mentioned 5 key points:

- **Fatigue guidance** – the 11 September 2024 launch event (of ORR's refreshed guidance) was well supported with over 100 industry attendees. Richard thanked RIHSAC members for their support in developing the guidance. The work on fatigue was now moving into the delivery phase; a three-year programme to see where the industry is on fatigue, to pause and reflect on this, and possibly to do some follow up work on the gaps identified. A key message was that duty holders have to be self-aware in this area.
- **Train Driving Licences and Certificates Regulations 2010 (TDLCR)** – the main outcome from the post implementation review was a proposal to reduce the minimum age of train drivers from 20 to 18. DfT had held a public consultation on this proposal. and other areas need to be progressed within the legislation. ORR will continue to work closely with DfT on these developments.
- Update on ORR's review into the costs and benefits of health and safety interventions: letter to railway industry – a letter had been sent from Richard and Will Godfrey (ORR Director of Economics), available on ORR's website – Review of the costs and benefits of safety interventions. The purpose of this was to see how the concept of "reasonable practicability" was being tested by duty holders across the system. Engagement with infrastructure managers, train operating companies and interested parties had shaped this, with further work being undertaken by an independent reporter to look at this process within Network Rail. This work will be developed over the next few months with an output in January 2025. RIHSAC will have sight of the developments as they unfold. ORR would also be consulting with trade union colleagues as part of this work over the coming months.
- **Some changes in the regulatory arrangements for the Channel Tunnel** – this is the final piece in the EU exit arrangements for the tunnel, whereby the National Safety Authority (NSA) responsibilities for the UK half of the Channel Tunnel will transfer from the current binational Intergovernmental Commission to ORR. Responsibilities are now expected to transfer to ORR in April or May 2025. The practical impact should be minimal, given that the same colleagues would be involved with this work, albeit with a different regulator. ORR was also planning a workshop with operators and duty holders to understand what this change could mean in practice for duty holders. There will be transition arrangements within the new Technical Framework Agreement (TFA), whereby there would need to be recertification of operators and duty holders by the end of October.
- **Statutory commissioning activities** – Richard said that it had been a busy time with safety certificates for train operating companies and other matters surrounding reform. Next year's work plan for ORR was likely to be heavily focused on that statutory role.

12. John Cartledge mentioned that ten years or more had passed since the Law Commission reviewed level crossing legislation and made recommendations for change. He said that many of these had been stalled, but that an update to the

regulations governing signage at user worked crossings was published in the summer (2024) and these were now in force. John recognised that the industry had made a step forward, but that it was still important to consider further ways in which improvements can be made. He thanked DfT for the changes to the signage regulations, which were a great improvement on what had preceded them.

13. Ali Chegini thanked Richard for his letter on stranded trains arrangements and noted that the letter emphasised the criticality of integration within and between the industry organisations. Ali asked about the ORR's satisfaction with progress being made with managing stranded trains, and the date of the follow-up event mentioned in the letter. Richard said that four responses had been received from all duty holders, and these reflected the joined-up nature in which the responses had been done. Richard noted Ali's work at Eurotunnel with HS1 colleagues, and the work of Network Rail with train operating companies. In relation to Network Rail, Richard added that the system operator provided helpful support to that work to ensure consistency. ORR was pleased with the response. Richard recognised that there are different approaches in different parts of the network and lots of organisations were practicing arrangements as part of the deliverables required in the original letter. Richard wanted to see the improvements completed before bringing the industry back together to reflect and lessons learned. The follow-up event on stranded trains was set to take place in January 2025, with the date currently being finalised.

14. John Cartledge asked whether ORR would be monitoring infrastructure operators' actions in upgrading and delivering signage improvements. Richard clarified that this formed part of ORR's routine liaison work.

Development of technology around level crossings, particularly the Flow footbridge initiative from Network Rail

15. Thomas Bruno, Darren Tassell and Sam Pead presented some context for the Flow bridge programme, highlighting the need for change that Network Rail was proposing, the benefits of the bridge particularly for end users, and some key points that make the bridge efficient. The main messages from the presentation included:

    - there were over 2000 foot-crossings on the railway in varying condition, and 1400 footbridges with some of these being close to life expired.
    - the increasing number of near misses at crossings had highlighted Network Rail's need to find an alternative option.
    - there was currently one standard option for footbridges across the railway, this being a 1980s steel bridge design with limited associated sustainability objectives. Thomas also noted the need for large equipment to be used in order to install the structure which caused rail disruption due to the long construction period of 3 months on site. The increasing cost of steel was also cited; this had increased fivefold over the past few years. This context highlighted the need for Network Rail to look at something different to allow for safety to be brought in an easier way to the railway customer. A better value footbridge programme was initiated resulting in a design with a 50% carbon reduction, a 33% cost reduction, and requiring only 2 weeks on site. The flow bridge initiative at Craven Arms was currently being developed into a product.
    - RIHSAC was taken through the journey of the development throughout Control Period 6 (CP6) and Control Period 7 (CP7); work in CP6 focused on the

development of the concept and the presentation of a prototype at Rail Live 2022, from which Network Rail considered lessons learned.

- A collaborative approach was cited as important, with Network Rail's duty to protect the capability and people within the industry. Thomas mentioned the level of collaboration with various stakeholders involved, through university partnerships, accelerated leadership programmes, and SME spends and local employment. It was noted that 75% of spend was currently with SMEs, as Network Rail wanted to promote diversity of thinking with this project, and to progress its vision of opening these bridges to the public.
- Digital transformation was also highlighted due to the use of high-level technology which helped share design and information across the team.
- This initiative was also viewed as a solution that would actively protect the workforce. From Network Rail's perspective, the flow footbridge initiative would have a vast impact in limiting time spent on site, and it would be safer to build.
- Bridges for communities, cutting costs and transforming rail crossings – it was reported that there was a projected cost saving of over 33% per structure, and that these bridges would also use proactive maintenance. The design of the bridge would allow savings in construction times, with the materials used allowing for a more efficient type of rapid foundation that would be installed by hand as opposed to bringing very heavy plant.
- Thomas outlined the work pipeline through CP7 and how Network Rail aimed to develop the project: 4 bridges in Year 1, 12 bridges in Year 2, 22 bridges in Year 3, 32 bridges in Year 4, 42 bridges in Year 5.
- Thomas highlighted the need for Network Rail to act as a caring neighbour and mentioned the social benefit of such incentives with third parties involved, particularly looking at housing near the railway. The Flow bridge initiative was cited as potentially decreasing the risk of trespassing and as something that would provide a solution with its cost, benefit, and overall social benefit.
- Sam Pead covered the funding of level crossings, using the example of the Penny Lane and Church FP. He said that in the Southern region out of 900 level crossings the aim was to put up 3 bridges in the next 5 years. These examples were used to show how with the possibility of replacing 2 level crossings with bridges, there was potential to provide both a safe passage across the railway and something with a legacy that housing developers can get behind to enhance the area. The Flow footbridge was cited as the only economically viable option for improving safety in the Penny Lane and Church FP area where there were 84 houses.
- Justin asked when the Flow footbridge was started and about the funding arrangements. Network Rail colleagues confirmed that the concept started in 2020, and that Network Rail was looking for funding support for the programme from the regions and stakeholders.
- John welcomed the initiative and thanked Network Rail for the presentation. He said this was a valuable and architecturally striking contribution to the landscape, that provided a step towards a permanent solution to safely maintaining rights of way.
- John raised one concern over accessibility, as rights of way legislation did not require footpaths to be fully accessible. He mentioned accessibility

requirements for all users, such as enabling wheelchair access, and those with prams. He stated the need to move beyond a stepped footbridge to allow access for all users.

- Thomas clarified that Network Rail intended to turn this innovation into a product and would need to focus on the step solutions outlined in the second year of CP7. He added that Network Rail was at the start of their journey with this project, and that they continued to look for support and engagement with the industry on how to best manage that.
- John also added a point about some crossings being in locations where the distance between the tracks and the perimeter fence was quite narrow and asked Network Rail how easy it would be to accommodate this kind of structure in such spaces.
- Thomas said that this had already been noticed, and that Network Rail was also currently working on developing another solution based on a square type design with the same benefit in terms of material.
- Richard and Jen asked about integrated structural monitoring as a solution; Richard asked about the lifespan of this solution. The bridge lifespan was up to 120 years, the same as a standard bridge, and monitoring was done as a demo with fibre optics. Network Rail was also carrying out a separate Innovate UK project which looked at using graphene sensors and storing that much more sensitive sensor within the actual materials themselves, using AI with Sheffield University to monitor and interpret information; in essence it would look after itself. Once several bridges are in place, if any triggers hit, Network Rail RAMS would be informed. Darren also stated that instead of having to go out on site, Network Rail inspectors would be able to analyse trends. AI would allow Network Rail to intervene before problems occurred.
- Jen Ablitt mentioned the community engagement with this project and praised the idea that communities could request a bridge/, The glass panelling would allow the public to appreciate the railway. She asked if Network Rail can consider Rail Safe Friendly initiatives and deliver such content into schools to build rail safety awareness. Iain Scott Ferguson confirmed this is linked to Rail Safe Friendly via Rob Wainwright.
- Justin thanked Network Rail for their presentation and added that this was an encouraging development due to the financial savings, the environmental impact and the potential for making a significant contribution to safety if opportunities would arise to put footbridges in places where they were not previously financially viable.

Wider weather-related risk management

Climate Change and the UK Railway (ORR)

16. There were four different inputs for this item – scene setting from ORR, and management of weather-related risk from Network Rail, TfL and Eurotunnel.
17. Chris Davies (ORR Track and Civils Specialist Team Lead) provided some scene setting / context for the other presentations for this item and what this means for risk management.
    - Chris highlighted the Met Office’s headline slide on the State of the UK Climate report that summarises the key climate issues from last year; a few of these

issues were highlighted with their impact on the railways. It was not just the amount of rainfall, but also the intensity of rainfall that had increased and would continue to do so. Chris mentioned the knock-on effects.

- There were many impacts of climate change on the railway, citing rainfall as the main cause for a lot of these risks such as embankment failure, landslides, flooding on the track, and scour risks associated with high water levels. The importance of other climate factors was also noted. For example, with increased sea levels damaging coastal infrastructure, high winds causing trees or other items to be blown onto the railway, and extreme heat which can lead to tracks buckling. The economic cost for managing climate change-caused disruptions was also highlighted.
- The Three Pillars of Control (asset condition, water and consequence management) are important for managing risks and determining where actions are required.
- Ali thanked Chris for the presentation, particularly for the delineation between the three pillars. He recognised that climate change had been a recurring issue throughout CP5, CP6, and CP7, and referred back to his own presentation in 2003 on how Network Rail could learn from other sectors (such as the supermarket and logistics sectors) in adapting to the impacts of climate change. Ali asked why the railway industry had not adapted more to deal with the impacts of climate change.
- Chris said that there had been a lot of activity in adapting to and trying to minimise the impacts of climate change; the consequence management activity highlights this. However, he recognised that the industry had been constrained in what it can achieve, without having a limitless budget or limitless opportunity to rebuild the railway. This was a moving target and although work had been done, there was a lot more to do. which the industry recognised.
- Lisa Angus said that it was important to acknowledge that Network Rail was collaborating and learning from others but recognised that more could be done.
- John complimented ORR, Network Rail, and the Met Office for the clarity of the presentation of climate change data.

Management of weather-related risk and flood risk related to climate change (Network Rail)

18. Lisa Angus and David Quincey gave Network Rail's presentation from their Weather Resilience and Climate Change Adaptation Team, which focused on the impacts of weather on the railway and the disruption it brings.

- Extreme weather had caused significant impacts on the railway. Lisa highlighted lineside vegetation as one problem due to persistent rainfall, particularly following 2024's warm and very wet summer.
- Lisa presented a graphic which highlighted the disruption that adverse and extreme conditions had caused to railway performance between 2006-2024. During more recent years, rain and wind had been the two main problematic areas, with much more flooding, and these had become two main areas of focus for Network Rail in weather resilience and adaptation.
- Precipitation risks – David Quincey talked through these - sea level and coastal flooding, temperature, and storm and wind related issues - as some

of the main issues for railway performance. Network Rail had an integrated risk assessment across the whole country for the entirety of its assets.

- It was noted that the biggest risks had come from precipitation and flooding-related issues such as washouts and landslides, track flooding, scour of bridges and other assets, and impacts on coastal, estuarine and river defences such as at Dawlish. A list of key asset groups that these risks affected included drainage, the geotechnics (i.e. the branch of civil engineering concerned with the engineering behaviour of earth materials), and the track. Network Rail had gained a better understanding of what asset functions to target actions on and in response to which weather types.
- Changing risk profile – David highlighted what Network Rail was doing where, and how the profile of risks changes. Projections were given for 2050 and 2080 using Network Rail's climate change scenarios. From this, precipitation was presented as the main risk, but this along with all other factors presented (temperature, sea level rise, storms and wind) was forecasted to become worse over the years.
- The Industry Weather Response Directorate – Lisa outlined the structural changes in Network Rail, with the Seasonal Weather Resilience Team, Weather Risk Task Force and Weather Resilience and Climate Change Adaptation Teams all brought under one umbrella. This is "the 'guiding mind' for managing weather and climate impacts".
- Network Rail's 'Greener Railway' Strategy – this strategy fell under Network Rail's wider plan for adapting to the changing climate with an environmental and sustainability strategy. The focus is on infrastructure to ensure that it can withstand the impact of future weather conditions and recover rapidly. Lisa said that, with improvements, they were getting better at managing extreme and adverse events, but that there was still a long way to go, with far too much disruption occurring when extreme weather occurs. The focus is to improve performance and safety during adverse weather conditions – to keep passengers moving safely, for example by putting on speed restrictions or closing part of the line. Six key themes in the strategy were flagged. Climate intelligence was highlighted as particularly important to maximise the use of technology to manage these events better, and operational weather response viewed as something relevant to today's railway and how Network Rail responds to weather events.
- Regional CP7 Weather and Climate Plans – Network Rail centre has continued to work closely with the regions to develop and put these plans in place. This was the third iteration, and over time there had been a shift from purely a weather focus to also considering the climate change space. Each region had a focus on what was most significant in its area, however, drainage and flooding was a key theme for all. It was also highlighted how Network Rail had tried to plan better for when things were about to fail by enhanced strategy and planning, data gathering, and enabling through delivery on the ground. The onus was on preventing problems in the first place but also being able to mitigate the problem when it happened, and being able to quickly recover after it had finished, and then learning from it. A number of examples across the routes and regions were provided to show the impact of disruption and of action taken for minimising disruption

from flooding. A list of things Network Rail is doing to reduce the effects of flooding and prevents delay was also highlighted, as well as the adaptation pathways approach. This is a methodology that allows Network Rail to identify parts of the network which may require transformational change and the correct timing and sequence of adaptation actions.

- Justin asked whether Network Rail had clear targets for achievements in the future in terms of railway performance and managing the impacts of adverse weather and climate change. Lisa said Network Rail had performance targets going forward and builds in how it responds to external incidents (trespass, vandalism, fatalities, suicide). However, in terms of weather-specific detail, this was still to come. Justin also referenced targets on safety as opposed to performance alone.
- John asked a question on behalf of Margaret Winchcomb; he said the problem with flooding was not just rainfall on the railway but rain falling on adjacent land and then flowing onto the railway. Carmont and Watford Tunnel were cases in point where a lot of water had ended up on the railway after flowing off adjacent land. John asked to what extent can this be monitored and how much of an issue was it. David said that landowner management of water had been a big issue for Network Rail as drainage quite often discharges into other areas and there can be downstream choke points; rainfall from other areas discharging into the network can cause drain capacity issues. The size of the railway and the range of areas affected (i.e. both urban and rural) has caused Network Rail to develop a water management strategy, as opposed to a drainage strategy. David said Network Rail was considering a holistic approach covering where water was coming from and how to prevent it arriving, as opposed to just putting in a pipe and getting rid of it when it arrives.
- Ali asked about the rollout of the PRIMA tool. Lisa said this was still being trialled in the North West region and would soon be moving into Scotland; it had been trialled, some successes had been seen, with further development work to be done.

Flood risks in below ground stations and infrastructure and their management

Severe weather – Eurotunnel presentation

19. Ali said that the key aim was to connect with colleagues at TfL and he was keen to liaise with them after the meeting, in order to bring more assurance, clarity, transparency and integration. He briefly explained that in terms of the consequences of severe weather, the resilience of Eurotunnel's processes and strategy had been tried and tested for the past 30 years. The system itself is a fixed link, a critical piece of infrastructure and asset given its location and significance to the UK, France and mainland Europe. The focus is there for ensuring Eurotunnel's preparedness, and the resilience of its processes and procedures. However, the organisation is willing to continue learning and take opportunities to engage with others to do this.
    - Ali highlighted the five components for responding to issues – crisis management structure, activation response criteria, communication and coordination, emergency response and customer management, and crisis

resolution and debriefs. He explained the crisis management structure and crisis command group which aimed to respond to specific technical issues around infrastructure and rolling stock. He also referenced the IT crisis group for responding to cybersecurity related and other major IT issues. He mentioned the Eurotunnel on-call director, who was supported by the operations duty manager in assessing events on a real time basis.

- The binational events were important set events where UK and French blue light services came together on annual basis to do exercises based on dynamic risk and to familiarise all entities with incident management practices.
- Ali mentioned that the Eurotunnel strategy had a number of plans with different risk scenarios associated with extreme cold, snow, flooding, and high winds where the risk assessments are well worked through.
- There were on-going exercises to test systems' resilience to extreme weather events and different types of failures. The forum where Eurotunnel assessed its responses to incidents in the tunnel was also highlighted. This linked to Richard's discussion on stranded trains and preparedness for responding to these incidents, particularly in the tunnel. There were emergency sidings on both the UK and French sides with capability to detrain a number of passengers.
- Justin asked if climate risks would change for the tunnel in the next 25 years. Ali said that Eurotunnel was acutely aware of increasing atmospheric heat, particularly with its stranded trains protocol. He also said that flooding was a key consideration, but heat was the predominant issue. Protocols needed to ensure that snow events did not have heavy impact on the line, as had been the case in previous years.

TfL's resilience to extreme weather & climate change Strategic approach to climate risk management (TfL)

20. TfL's adaptation work programme – TfL colleagues presented their strategic approach to climate risk management. Katherine Drayson said that TfL had been practicing responses to extreme weather for several decades; but recognised that adaptation to climate change as a whole had been much less mature than resilience to weather events. TfL's first climate change adaptation plan was published in March 2023 with the aim of improving understanding of risks and developing actions to respond to risks.
    - Key adaptation activities – these included sustainable drainage systems, the London surface water strategy, understanding of risks, and collaboration which was key to better understanding climate risks in a cost-effective way.
    - Asset management – Jonathan Exley said TfL was extremely asset heavy, and that these assets were important for delivering services across the transport sector. The asset management framework focused on strategy, planning, funding, and decision making. The TfL longer term strategy was to increase focus on climate change, resilience, and adaptation over time.
    - Jonathan also provided an overview of Asset Renewals Investment Planning. Flood risk management was highlighted as an area where TfL had looked to make improvements; all findings were informed by the

London Comprehensive Flood Risk Review project which allows TfL to make strategic decisions and target investment through prioritisation based on risk.

- Earth Structures Management – recognising this as a high-risk asset group, TfL was using the London Underground Network Heavy Rain & Flooding Plan as a way to mitigate these risks through operational procedures. This enables the link between asset management and operational decision making.
- Operational resilience – Countdown to Extreme Weather – Alison Mansfield said that TfL operationally responds to adverse weather on countdown basis starting on day minus 3 and counting down to day 1, with a forecasting system based around that on hot weather, rainfall by hour/day, snow and ice. The Met desk was involved by giving readings, and weather stations were also used by TfL to obtain 15-minute incremental updates on rainfall, snow and ice atmospheric data. These enable TfL to receive alarms which are fed into control centres and civil engineers and set in motion a series of activities if any severe weather predicted.
- Plans and Processes – A Whole Network Approach – each TfL Mode had an adverse weather plan, managed from control centres where specific actions are set out regarding the type of adverse weather forecasted. TfL takes whole network approach to staff welfare and additional risk assessments. This includes keeping staff safe and ensuring appropriate PPE for flooding and treatment of assets such as services suspended when water reaches the bottom of the conductor rail.
- TfL was looking at marrying up live weather data with incident data to give a better insight into what was actually occurring in its space when adverse weather takes place, and to ensure the best response and deployment of resources.
- Linking adaptation and resilience – Katherine said that linking day-to-day resilience and wider longer term climate change adaptation was important, noting that TfL was working collaboratively with Network Rail to allow TfL staff to have access to the Weather Academy resource. Integrating weather as a contributory factor into the instant reporting system was important for addressing root causes and finding fixes for problems. This should help save TfL money in the long run and provide the evidence base for business planning. TfL was piloting this approach with one LU incident reporting system. Katherine said that TfL would be happy to return to RIHSAC for a deeper dive in any area raised in its presentation.
- John asked about the impact of sudden torrential downpours of rain in confined area (the precise location of which could not be forecast), or of burst water mains. He cited instances of severe sub-surface flooding on the metro/subway systems in New York, Zhengzhou and Taipei. There were obvious potential problems at stations such as Holborn where escalators or lifts descend directly from a ground-level ticket office with no barrier to water ingress. The flooding of the ticket offices at Pudding Mill Lane station on the DLR and Hackney Wick on London Overground had been widely reported, and it was fortunate that in these cases the tracks were elevated. He asked how LUL would prevent a high-risk situation

caused by such rain in this type of stations and state of preparedness. Ralph Davison said that risk assessment would need to be carried out, and that there would need to be early intervention with communication between the local station and the central LUCC – whether that be via evacuation or operational preparedness in terms of how many trains were in place. Nicolas Gruselle also commented on the long-term solutions in place.

- Justin said he was encouraged to hear the commonality in terms of principles of the approaches and the focus on improving data and evidence base from all the organisations. He was also pleased to hear that Network Rail and TfL were looking at what he would call upstream water management of weather, or catchment management, looking outside the railway's land in the case of Network Rail, with more and more extreme weather and the challenges the industry is facing. All the presenters were thanked for their contributions.

RIHSAC Forward programme

21. The forward programme had been shared in the slide pack, and the item on SPADs risk would be added to it.

22. John enquired about future agenda items on the heritage sector, as there had not been many updates on this at RIHSAC over the years. There were two elements to this. One was charter trains / old rolling stock on the mainline railways with unconventional forms of traction (which can present particular problems with the behaviour of spectators at the lineside). The other element was the hundreds of independent heritage lines, many of which are operated by volunteers. John said it would be helpful to know more about how these risks are managed and regulated as their risk profile was different from the mainline railway.

23. John also asked about risks relating to derailments of freight trains, as until recently freight trains were 10x more likely than passenger trains to derail, per unit of distance travelled. John noted potential repercussions of such instances for the rest of the railway, particularly if they derail on lines where passenger trains also run. What progress has been made in identifying the causes and addressing them?

24. Matt Green said that he would be happy to support RIHSAC with a presentation on both heritage rail and wagon condition/derailment risk at a future meeting.

Action 129.2: Sukhninder to add discussion of the following two areas to the RIHSAC forward programme (i) heritage sector (charter trains / old rolling stock on the mainline railways risk profile management of the independent heritage lines) and **(ii) risks relating to derailments of freight trains to the RIHSAC forward programme.**

Meeting review and next meeting

25. Justin suggested better agenda/time management to be considered for future RIHSAC, as the meeting had overrun, and it was difficult fitting in all the presentations.

26. Justin said that this would likely be his last RIHSAC meeting. It was noted that there was uncertainty regarding a new chair, but that RIHSAC members could hope for further news on this by the time the next RIHSAC takes place in February 2025. John thanked Justin for his contributions to RIHSAC over the past decade. [Note: since the meeting Justin's term on the ORR Board has been extended and so he will in fact chair the next meeting.]

27. Iain Scott Ferguson also announced that this was his last RIHSAC meeting, with Rupert Lown to take over as Iain's replacement for Network Rail.
28. Richard Carr is the new RIA representative at RIHSAC for today and going forward, as the new to post (1st July) Technical & Innovation Director.
29. **Date of next meeting: Monday 17 February 2025 (at 13:00 – 15:30hrs)**