

RAILWAY DIVISION AGM ANNUAL REPORT 2021-2022

**Institution of
MECHANICAL
ENGINEERS**

Railway Division 52nd Annual General Meeting

16/05/2022 HYBRID – Agenda

Time and place: 16th May 2022 after 18:30, during the judging break of the online Young Members event 'Final of The Future of Rail Presentations'.

1.	MINUTES OF THE LAST MEETING		
	Review of the minutes of the last AGM		All Corporate Members
2.	SUMMARY OF ANNUAL REPORT		
	Chair to summarise key points of his report and to introduce the new Chair		Chair
3.	ELECTION TO RAILWAY DIVISION BOARD		
	Constitution of Board 2022-2023		All Corporate Members
	Announcement of retiring Board Members and confirmation of elected new Members		
4.	CLOSE OF MEETING		Chair
	Annual General Meeting to be formally closed		

MINUTES OF LAST ANNUAL GENERAL MEETING

Minutes of the 51st Annual General Meeting of the Railway Division of the Institution of Mechanical Engineers, held online on Monday 10 May 2021, during the judging break of the final of the Young Members' Future of Rail Presentation Competition.

Felix Schmid was in the chair with James Collinson (deputy chair) in attendance.

1. MINUTES OF THE 2020 MEETING

The minutes of the last Annual General Meeting were reviewed and accepted as a true record of what had been discussed and approved.

2. SUMMARY OF ANNUAL REPORT

The Chair provided a brief summary of his Annual Report. The Annual Report had also been made available on the Railway Division website. The Chair gave thanks to everyone who had assisted him during his term, especially during these challenging times.

3. ELECTION TO RAILWAY DIVISION BOARD

The Chair announced newly elected Railway Division Board Members and thanked those retiring from their positions.

4. CLOSE OF MEETING

The Chair formally closed the Annual General Meeting at 18:50 and the final of the Future of Railway Engineering – Young Members' evening continued.

Felix Schmid

Felix Schmid
Chair
Railway Division

Railway Division Annual Report

Q2 2021 to Q1 2022

RAILWAY DIVISION CHAIR'S INTRODUCTION

BACKGROUND

It was in 2012 that I realised I wanted to get more involved in the Railway Division of the IMechE. I remember it well; while watching Bridget Eickhoff deliver her Chair Address at Birdcage Headquarters, I thought to myself, 'I'd like to do that one day.'

I had no idea how to even begin the journey or whether I was worthy, but, like most things I have come across in my career (and life), once you've decided on a goal, you start to see the opportunities around you and the route gets clearer the more you grasp those opportunities. So, ten years later, I'm delighted to have been able to add my contribution to those of my 52 predecessors, as the 53rd Railway Division Chair.

TENURE PRIORITIES

- **Post-Pandemic ways of working and financial position**

My tenure started at a time when coming out of a pandemic 'lock-down' was a realistic expectation and my priorities needed to reflect this. Maximising the benefit of the easing of restrictions by re-engaging our membership and aiming to mitigate the financial impact of the pandemic became my first priorities for the next twelve months. This meant a return to 'in-person' events for our members, whilst not losing the benefits of some of the new ways of working which we'd been forced to adopt while in a predominantly 'virtual' world.

- **IMechE interfacing and Rail Division Governance reset**

When considering my objectives and priorities, the second thing to consider was the state of the Institution itself and the role of the Railway Division within it. Over the last three years the IMechE has carried out a review of Governance, Finance, and Code of Conduct - this would not have taken place were it not for the tireless efforts and contributions from a number of our Railway Division Board members and the work of the Railway Division Chair's Advisory Group on Governance (CAGG) created by my predecessor Felix Schmid. The new leadership of the Institution has positively recognised this work and this success means there is now an opportunity to continue to harness this energy but with a priority on refocusing it on the Railway Division itself and its ways of working.

- **Events and 'Joining the Dots'**

The final insight to inform my priorities for the year was more of a personal one; I wanted to reconnect with the grass-roots member activities which the Railway Division volunteers, IMechE staff and Executive members spend so much time and effort making happen for our active members. With this in mind, I made it a personal objective to visit and be part of as many events as possible and use my Chair Address to inspire others to do the same.

PRIORITY OUTCOMES

- **Post pandemic ways of working and financial position**

The concept of holding 'hybrid' events and member activities, blending newly established virtual methods with the return to traditional face to face arrangements, was uncharted territory for the Institution. But, as a very active Division, the Railway Division took the opportunity to lead the way in finding out what good looks like, starting with the format of my Chair Address.

This was the first public audience address in the HQ building at Birdcage Walk since the reduction in pandemic lockdown controls, so the Institution were also keen to see how the arrangements could be managed to make the experience for in-person and on-line attendees as engaging and interactive as possible.

Shortly after, in October, we held the 'Refocusing the Railway' Roundtable event at IMechE HQ, introducing another 'hybrid' format for us to explore for later application. Since then, several lectures and events have been in hybrid format. Each time, as we learn from the previous experiences, the format has been fine tuned.

With regards to recovering from the financial impact of the pandemic, following a year of reduced spending on membership engagement activities - as most events were either cancelled / postponed or converted to virtual formats - I was hoping this year would see our return to in-person ways of working supported by the grants and funding we enjoyed at pre-pandemic levels.

However, the reality is that it will take some years to recover from the financial toll of the pandemic on the Institution's finances, and recovery will include continued cost-cutting and tight financial control.

This pain is already being felt in our 2022 budget plans as we experience significantly reduced levels of grants being awarded to our seven Railway Division Centres; creating a real financial impact on our ability to provide membership engagement at a local level. However, unlike other Divisions, we are an established IMechE 'Cost Centre' so we do have the opportunity to manage our funds across the Division through re-distributing them from other activities that are less beneficial to our members.

We will still have difficult decisions to make as we manage our financial performance through the year, but I'm optimistic in our ability to do this; as an industry, we are familiar with such challenges and best placed to lead the way to recovery.

- **IMechE interfacing and Rail Division Governance reset**

Pandemic aside, the last three years have been 'unusual' for past Chairs of the Railway Division as they have been drawn into the broader Institution matters that needed energy and effort to protect the interests of our members. Here, I'm referring to the events that led up to the 2018 Special meeting which was then followed by the independent reviews of Governance, Finance, and Code of Conduct in the Institution.

Thankfully, Felix had the foresight to create the Railway Division Chair's Advisory Group on Governance (CAGG) and much of the work had been done to prepare governance proposal papers for the Institution to consider as it began the journey to address these strategic issues. My mission has been to make sure these were channelled into the appropriate Institution Boards and Committees, so they became part of the conversation, and treated as intended, foundation principles for good governance and strategic direction for the Institution.

I couldn't have done this on my own and I'm incredibly grateful to the Railway Division members who have worked collaboratively with me to integrate the capabilities we have as a Division into the broader Institution forums, including Trustee Board, Council and the Strategy Committee.

This has enabled two things; a level of sustainability in our efforts to continue to support the broader Institution and reduced reliance on Railway Division intervention - giving us the time to reflect on our own governance as a Division and reset our ways of working.

In looking back at our own ways of working, I was struck by two things:

- The Railway Division Handbook is still a robust document, providing the principles for good governance in the Division.
- Our ways of working had crept outside the principles for good governance due to continuing support to the Division from a number of long-standing Division Board members – a credit to their enthusiasm and passion for the Division but with a potential for limiting leadership growth from other Board members.

I'm very pleased with the support I've had from both the Railway Division Executive and Board members as I've initiated the reset in our ways of working; both in terms of the ideas and support for our return to robust Division governance and in terms of the support from those members who have recognised the need to either step up into leadership positions or the need to step down to enable others to bring their knowledge and capabilities into the room.

To ensure no talent and enthusiasm is lost, the Chair's Advisory Group on Governance (CAGG) will transition into the Railway Division's Board Advisory Forum (BAF). The BAF will be led by the immediate Past Chair with a broader remit and more ad-hoc approach; drawing from the talent pool of ex Board Members who can be called upon to assist the Division Chair and Board in any relevant matter.

The work to re-align with the Handbook and reset our Division governance will continue as I hand over to my successor, but the foundations have been laid and I will continue to support the Board in the journey ahead through the new BAF.

- **Events and Joining the Dots**

The Railway Division is noted for its high levels of membership engagement activities, ranging for the many local activities arranged by the Centres to the more discrete and focussed events such as Seminars, the Technical Tour and our own Railway Challenge.

During my tenure I committed to do more than just the duties expected of a Chair and attend as many of these activities as possible. I also used the opportunity of my Chair Address to try to inspire others to do the same by getting more involved in Institution activities and expanding on their knowledge of people and organisational networks by 'Joining the Dots'.

More generally, the return to in-person UK events is continuing as we learn to live with COVID, and we have benefited from this world-changing experience in a number of ways:

- Attendance and engagement at Centres have grown exponentially as the virtual and hybrid formats enable participation for those who live too far to travel. I had the opportunity to attend most of the Young Member Future Rail competition heats held at the Centres; attending the SE event in-person, the rest from my dining room!
- We've introduced a new 'Lunchtime Webinars' format; short (45 minute) virtual presentations held regularly (every 2 months) on a topical subject; so topical the subject isn't announced until a few weeks before the event.
- We now have an additional format for seminars - a 'round-table' format with hybrid attendance; an in-person panel of industry leaders with an on-line audience, discussing key strategic issues, sharing personal views and enabling informed industry direction setting.

After a two-year gap, the Railway Division Technical Tour will once again take place in May 2022. This year's event is UK based and is set to be a great success. Many thanks to the organisers of the tour for making sure this staple of the Division calendar has returned and continues to be fully booked.

TENURE HIGHLIGHTS

- **The Railway Challenge**

The 2021 Railway Challenge finals were held in June 2021 at the established competition venue, the Stapleford Miniature Railway near Melton Mowbray. I had the pleasure of attending this event for the first time since its creation ten years ago.

It was great to see that, despite the many pandemic challenges as well as the actual challenge of the competition itself, eleven teams were able to take part and four teams were able to physically turn up for the finals. The event was a great success, and plans are in place for enhancing the infrastructure to support up to 30 teams competing in future years.

- **Chair Address**

I started my tour in September with the HQ event, addressing a physical audience of over 40 people in the room and nearly 100 members on-line. The newly installed screens, cameras and microphones worked well with only a few technical issues to deal with – including someone in the on-line audience inadvertently muting my microphone!

The baseline for 'hybrid' events was now set and I was keen to see what the Railway Division Centres could do with their local facilities and technology innovations to build on this, and I was not disappointed!

The rest of my Chair Address tour was a mixture of virtual, hybrid and in-person events including virtual events with RD members in India, Australia and New Zealand and actually bumping elbows in Scotland with colleagues and brand-new young members during a thoroughly enjoyable in-person two-day visit.

- **Railway Engineers Forum (REF) – GBR call for Evidence**

This year REF was chaired by the IMechE (this is a two-yearly duty rotated across the Professional Engineering Institution members of this forum). This created a unique and timely opportunity for us to lead this forum in a collaborative response to the 'Call for Evidence' released by the Great British Railways Transition Team (GBRTT) in December 2021.

Andrew Skinner led the collaboration with the REF membership and together we compiled the IMechE and REF response that will inform the rail industry's Strategic Plan, which is itself an enabler for *'the UK government to set a clear and unified direction for the railway in support of long-term priorities, assisting with problem solving, and aligning the rail sector behind a common vision and with joined-up decision making.'*

Our response focussed on the role of the Engineer in a whole system approach, enabling engineers to make a contribution that will lead to more economic, efficient and safer solutions for the future.

Our report was well received and later acknowledged by Anit Chandarana, Lead Director of GBRTT, in his speech at the Railway Division Annual Luncheon entitled, *'The future of rail and the importance of engineering.'*

- **Railway Division Annual Luncheon**

The Railway Division Annual Luncheon was held in March and was a brilliant return to the in-person calendar event for our industry; with nearly 1,200 guests attending to re-connect with their colleagues and friends after a two-year gap.

As the event host, I took the opportunity to encourage more 'joining the dots' by asking regular Luncheon attendees to go out of their way to meet at least two Luncheon newbies.

However, for those planning and arranging this event this year, Institution members and staff alike, the stress and anxiety created this year was exceptional and their efforts must not go unrecognised. With so much riding on the success of this event the concept of trying to predict the next evolution of a changing pandemic and planning around it made this a whole new experience for the

organising committee and I commend their contingency risk planning and positive marketing strategy in the face of the unknown and offer them my heartfelt thanks.

VOTE OF THANKS

Throughout my tenure as Chair, I've been struck by the level of support, encouragement, responsiveness and actual effort from everyone I've come across; from IMechE staff to Board members, Centre Chairs, committee members and ordinary members.

The help of Past Chairs has also been invaluable. The prospect of being Chair of the Railway Division was both exciting and daunting to begin with, but it's been through the advice that several Past Chairs gave me when I started and the offer of 'if you need any help, just ask,' that I've found the experience to be both rewarding and enjoyable.

Thank you to all the IMechE members and staff that I've worked with during these last 12 months, it's been a pleasure to work with you.

HANDOVER TO NOEL TRAVERS

Finally, I'm delighted to announce that the Railway Division Chair for 2022/23 will be Noel Travers. Noel is the Managing Director of Xrail Group which he joined in May 2021. Noel is a Chartered Engineer and Fellow of the IMechE and holds a BEng in Mechanical Engineering from Loughborough University and an MSc in Rail Systems Engineering from the University of Sheffield.

Noel is also passionate about people; the people in our sector, the people around us and the people who are developing to become our leaders and experts of tomorrow. I wish Noel all the best as he steps into the shoes and look forward to working with him going forward.

The Deputy Chair for 2022/23 will be Andrew Skinner who is the Head of Engineering at Great Western Railway train operating company.

James Collinson

Railway Division Chair

Institution of Mechanical Engineers

May 2022

RAILWAY DIVISION MEMBERSHIP

Overall numbers have reduced slightly. The Railway division gained 7 more Fellows and 29 more Members. Affiliates and Associate Member numbers have continued to decrease following the trend of the past few years.

Table 1 Development of the Membership of the Railway Division of the IMechE

Membership Grade	2018	2019	2020	2021	2022
Affiliate	616	492	494	464	419
Associate Member	1,524	1,541	1,524	1,446	1343
Companion	1	1	1	0	0
Fellow	818	834	838	823	830
Honorary Fellow	2	3	3	3	3
Member	2,757	2,968	3,077	3,114	3143
Total	5,718	5,839	5,937	5,850	5738

RAILWAY DIVISION HQ EVENTS

During 2021-22, Railway Division has successfully returned to delivering face to face events at 1 Birdcage Walk, in addition to continuing production of online-only events and introducing hybrid events which can be attended either in-person or online. The events delivered in 2021-22 are summarised in Table 2.

The resumed in-person events have proven to be extremely popular, particularly as they facilitate professional networking in a way which we have been unable to replicate online so far. Online paid-for events are continuing because they provide accessibility to RD events for a wider, more international audience than is possible with in-person events, as well as having the advantage of a low production cost compared to potential earnings.

Hybrid events have been pioneered for free evening lectures, with many more people joining online via MS Teams than attending in-person, demonstrating the continued popularity of this option. Engagement of the online audience, through asking questions of the speaker via the chat option, has been very high. So far, we have yet to attempt a paid-for hybrid event.

Additional free online events have started with a new series of lunchtime webinars focusing on the latest developments in railway technology.

The Events Committee has recruited several new members over the past year who have enthusiastically volunteered to lead or assist on the production of new events, and are enabling us to continue producing major, high-quality seminars.

The primary challenges facing RD events are:

- Changing preferences for event types in the aftermath of the pandemic
- Financial constraints on Network Rail and Train Operating Companies limiting their funding of staff to attend. We are mitigating this through focusing paid-for events on those with direct relevance to major issues facing professional engineers.

The key priorities for Railway Division's events over the coming year are:

- To enable Railway Division to positively influence the future of railway engineering at a time of major changes

- To fulfil our duty as a learned society and maximise the relevance of Railway Division to IMechE members, by providing key information and opportunities.

Table 2 Headquarters Events organised by Members of the Railway Division

Date	Event Type	Title and Speaker(s)	Delegate Numbers
13/09/21	Hybrid In-person/online	Railway Divisions Chair's Address – speaker James Collinson	88
20/10/21	In-Person Round Table	Refocusing the Railway (committee lead Rebeka Sellick)	-
22/11/21	Hybrid in-person/online	Sir Seymour Biscoe Tritton Lecture – speaker Richard McClean, Managing Director, Grand Central	16 in person, 56 online
24/11/21	Lunchtime Webinar	Cryogenic Rail Cleaning – speaker Professor Roger Lewis	68
26/01/22	Lunchtime Webinar	Revolution Very Light Rail – speaker Tim Burleigh	48
24/02/22	In-person seminar at 1BCW	Cracking - Safely Managing Fractures on the Railway (committee lead Graham Neil)	60
04/03/22	In-Person at the Grosvenor House Hotel	Railway Division Annual Luncheon 2020	931 paying delegates
28/03/22	Hybrid in-person/online	George Ramshaw Curry Memorial Lecture – speaker Mike Hulme, UK Engineering Director, Alstom	21 in person, 103 online
26/04/22	In-person at 1BCW	Wheelsets: Life Extension, Maintenance Reduction and Sustainability (committee lead John Reddyhoff)	-
04/05/22	Online paid seminar	Batteries Included: the challenges of adopting battery and hybrid technology in the rail industry (committee lead Rob Doberski)	-
09/06/22	Hybrid online paid seminar and in-person depot visits)	Depots 2022 (committee lead Amjad Natour)	-

RAILWAY DIVISION CENTRE ACTIVITIES 2021-2022

SCOTTISH CENTRE CHAIR'S REPORT BY IAIN RAE

The Scottish Centre has had another fun packed programme. The COVID restrictions helped us develop an inclusive virtual events programme and, thanks to the great work by Graham Taylor, we have mastered the Hybrid events which

gives us the benefits of both the virtual and in-person format. Our final event of the year will be a full hybrid one with no restrictions on the “in-person” size. We hope to encourage a healthy in-person attendance to get the full benefits of personal interactions.

Thank you to the committee for their support over the year, especially David Shirres, for his support and guidance.

The highlights in my final year as chair have been:

- Delivering a wide range of programme topics which have been well attended and relevant to the Railway in Scotland.
- “Lunch with James” - Part of the RD Chair’s Address Tour - which was a great way to get younger members involved and expand the committee.
- Development of the Scottish Centre committee, which has become more diverse with a great mix of people who will assist with delivery of future programmes.

The next session will have a new Chair, Gareth Earle Payne and Secretary Aimee MacDonald, which will bring fresh ideas into next year's programme.

Table 3 Scottish Centre Events, Speakers and Attendance Figures

Date	Event Title/ Topic	Speaker / Delivery Method	Delegates	Partner
09/09/21	Scotland’s Tourist Train	Virtual	55	
23/9/21	Train seats getting it right	Virtual	66	
26/10/21	Chair’s Address Dots & Boxes	James Collinson Hybrid 7 in person; 18 virtual	25	
01/12/21	Scotland’s Hydrogen Train	Benn Todd, Ballard. Hybrid 7 in person; 73 virtual	80	
12/01/22	Class 37 for Freight and Tourist Trains	Stuart Sellars, Virtual	47	
27/01/22	Rail freight new opportunities	John Smith, GBRf, Hybrid 8 in person; 43 virtual	51	
24/02/22	Scottish Transport Strategic Review 2 Projects	Hybrid 19 in person; 41 virtual	60	
10/03/22	Future of Rail Competition	Various Virtual	22	
18/05/22	Transport for Wales	Hybrid - Andrew Gainsbury		

06/06/22	Technical Tour – Brodie Engineering	Gerry Hilferty		
		Total	406	
		Average / Event	50	

NORTH-EASTERN CENTRE CHAIR’S REPORT BY LOUISE SHAW

This has been another successful and rich year for the North-Eastern Centre, despite the challenges that we have all been enduring since March 2020. Our second year of virtual meetings features ten events, some virtual because of Covid and one virtual because we planned it that way. We’re hopeful that our last lecture in May, joint with the NW Centre in Huddersfield University, and our visit to the newly opened Danum Museum and Library in June will be in-person. We even managed a pre-Omicron visit to the Middleton Railway in Leeds, at which we celebrated the longevity of Don Townsley and his 60-year contribution to the North-Eastern Centre, and IMechE.

We’ve featured a wide range of topics, and our lectures are now on the IMechE’s Webinar Hub. We continued to collaborate very happily with the North East and Yorkshire Film Archives for an enjoyable social evening of regional rail films. We still have four more events yet to run, starting with the FoR on 23rd March, Speakers from Tyne & Wear Metro and LNER. Closely followed by a freight wagon lecture from WH Davis on 5th April.

I’d like to thank our speakers for giving up their time, yourselves as our audiences for the contributions that you’ve made and my colleagues on the Centre Committee for all their support and enthusiasm in running a packed and interesting programme in these difficult times. Looking forward to our next programme, we’ll be running a mix of in-person and virtual events.

Table 4 North-Eastern Centre Events, Speakers and Attendance Figures

Date	Event Title/Topic	Speaker / Delivery Method	Delegates	Partner
15/09/21	Gauging Techniques	Karis Day	28	-
21/09/21	Railway Engineers Forum		68	-
19/10/21	Chairman’s Address	James Collinson	21	-
27/10/21	Visit - Middleton Railway	Ian Smith	25	-
10/11/21	Decarbonising Diesel - Class 170 Eminox Project	Nick Lamb, Ian Williams	31	-
03/12/21	Film Evening	N/A	45	-
18/01/22	MkV Caledonian Sleeper and MkVa TPE Day Coaches	Graham Taylor	33	-
17/02/22	Future of Rail Competition - postponed to 23rd March	Chris Johnson, T&W Metro Steven Duncan, LNER	22	-

Date	Event Title/Topic	Speaker / Delivery Method	Delegates	Partner
17/03/22	Robotics in Rail	Simon Jarrett, Gareth Tucker, Dr Andrew Starr	36	-
05/04/22	Modern Freight Wagons Built in the UK	Carl Baxendall	32	-
10/05/22	4 Wheels on My Wagon - Pacer Retrospective	Ian Walmsley Andy Marden	-	-
		Total	341	
		Average / Event	30	

NORTH-WEST CENTRE CHAIR'S REPORT BY GARETH TUCKER

This year has continued to be challenging with the ongoing travel restrictions; especially as rules kept changing toward the end of 2021. However, we have continued to engage with our members and deliver a full programme of evening lectures. The majority of evening lectures in 2021 were delivered through Teams, with the exception of the Chairmans address in October. Since March 2022 we have returned to in-person events held at Manchester Metropolitan University. Our members have suggested they like the option of in-person events but have requested that we hold hybrid events to also give the option to dial in. We intend to start delivering evening lectures as hybrid events, but still need to set up the necessary systems to do this; we are liaising with the other centres to learn best practice so far in carrying this out.

Our most popular evening lectures so far this year have been '*Steep Railways: The Challenge of Managing Adhesion and Gravity*' delivered by Felix Schmid and '*Composite Bogies*' delivered by David Crosbee and Simon Iwnicki. Both of these events received positive feedback from the members. Delivery of these lectures on Teams also meant that members from around the country could attend, not just members in the North-West region.

A summary of events delivered by the Centre, including the remaining lectures in this session's programme can be found in Table 5.

Table 5 North-West Centre Events, Speakers and Attendance Figures

Date	Event Title/ Topic	Speaker / Delivery Method	Delegates	Partner
07/09/21	Merseyrail new trains	David Powell, Teams	22	
21/10/21	Railway Division Chairman's Address	James Collinson, in person at Manchester Conference Centre	25	
14/12/21	Steep Railways: The Challenge of Managing Adhesion and Gravity	Felix Schmid, Teams	65	PWI
18/01/22	Composite Bogies	David Crosbee and Simon Iwnicki, Teams	65	

Date	Event Title/ Topic	Speaker / Delivery Method	Delegates	Partner
08/02/22	Obsolescence - A Journey Through Railway Time	Stuart Broadbent, Teams	40	Institute of Obsolescence Management
08/03/22	Future of Rail Presentation Competition & AGM	Rawia El Rashidy, Jordan Brant, Dan Basher, Charlie Smith, In-person at MMU	35	
12/04/22	ERTMS Installation on Freight Locomotives	Stuart Sellar and Mr. Richard Green, In-person at MMU	TBC	IRSE & IET
10/05/22	4 Wheels on My Wagon - Pacer Retrospect	Ian Walmsley In-person at UoH	TBC	NE Centre
		Total	252	
		Average / Event	42	

MIDLANDS CENTRE CHAIR'S REPORT BY DAVE COXON

The Midlands Centre ran 8 events in the 2021-2022 session, with a technical visit arranged for June 2022. This session's topics have been largely rolling stock related but also included light rail, see Table 6:

We have continued to hold joint meetings and this year have included a meeting with Derby Railway Engineering Society (DRES) in December (Zoom meeting - *Taking trains abroad before the Tunnel*) and with the PWI in October (*Coventry Very Light Rail* live lecture).

The early sessions from September to November were live but, as the new venue was considered to have a number of major drawbacks, we resorted to online meetings from January 2022 using Zoom. The programme had an average attendance of circa 38, and a peak attendance of 84.

The Future Engineers Presentation Competition, held on 9th February 2022, was disappointing as we only managed to recruit 2 candidates - the winner was James Morrison with his paper about icing of the OLE, James will go forward to represent the Midlands Centre at the UK final in May. The competition was also held online using Zoom.

Table 6 Midlands Centre Events, Speakers and Attendance Figures

Date	Event Title / Topic	Speaker / Delivery Method	Delegates	Partner
08/09/21	Midland Main Line Testing	Jez Yarnall - live	20	
20/10/21	Chairman's address	James Collinson - live	20	
10/11/21	Coventry Very Light Rail	Joint with PWI - Chris Micallef, Nick Mallinson and Richard Jones - live	40	

09/12/21	Taking trains abroad before the Tunnel	Dave Coxon - Zoom	30	
12/01/22	East Midlands Railway Fleet cascades	Gareth Race - Zoom	84	
09/02/22	Future of Rail Presentation	James Morrison and Tom Bell - Zoom	35	
09/03/22	High speed Freight locomotives	Karl Watts - Zoom	49	
13/04/22	Loram UK - collected, operated, maintained, delivered	Paul Long and Dan Liddle - Zoom	28	
		Total	306	
		Average / Event	38	

MILTON KEYNES CENTRE CHAIR'S REPORT BY TOM SCARAMUZZA

The IMechE Railway Division Milton Keynes centre's 2021-22 programme was delivered virtually due to the fluctuations in COVID-19 numbers, despite the hope that we would be able to move towards face-to-face events at some point over the course of the year. Due to the uncertainty surrounding the possibility of returning to face-to-face events for the 2022-23 programme, the centre has invested heavily in equipment for delivering hybrid events to allow for us to continue to welcome attendees from all over the world, as we have done over the last two years, as well as those that are looking forward to moving back to in-person events.

Attendance numbers have varied significantly depending on the subject of the presentation. It is felt that a significant part of this is down to "videocall fatigue", especially considering that the events take place generally at 17.30 on a Thursday when many potential attendees have spent a significant part of their day on videocalls. It must also be noted that, pre-pandemic, a significant part of the Milton Keynes centre's attendees were Network Rail employees physically based in The Quadrant. It is hoped that by offering a hybrid meeting option as part of the 2022-23 programme we will be able to appeal to a wider audience and benefit attendance numbers - this will of course only be offered if the number of COVID cases in the wider community are sufficiently low to allow for this meeting type.

A summary of the Milton Keynes Centre events is captured in Table 7.

Table 7 Milton Keynes Centre Events, Speakers and Attendance Figures

Date	Event Title / Topic	Speaker / Delivery Method	Delegates	Partner
09/09/21	From Crossrail to Elizabeth Line: The challenges of commissioning a new railway	Event was delivered via Zoom, speaker was Rory Mitchell, Manager of Engineering: System Integration at Crossrail Ltd	22	None
14/10/21	IMechE Railway Division Chairman's Address: Dots and Boxes, what Engineers can learn from this strategy game!	Event was delivered via Zoom, speaker was James Collinson, IMechE Railway Division chair	11	None
11/11/21	Decarbonisation of Network Rail's Rail Vehicle Fleet	Event was delivered via Zoom, speakers were Chris Nickolls and Sunit Patel, Programme Engineering Managers, Network Rail	25	None
13/01/22	Introducing the Stadler Class 93 Locomotive	Event was delivered via Zoom, speaker was Kal Watts, Chief Executive Officer for Rail Operations Group	45	None
17/02/22	Future of Rail: Milton Keynes Heat	Event was held via Zoom, speakers were Devang Shah and Madeleine Coyle, Network Rail Graduates	10	None
14/04/22	Cyber-Security in Rail (proposed)	The event is to be delivered via Zoom and the speaker will be George Bearfield, Health, Safety and Cyber Security Director, Rock Rail	TBC	None
28/04/22	Electrification: Developments and Delivery	The event will be held at 1 Birdcage Walk and transmitted online. The speaker will be Simon Skinner, Powerlines Head of Engineering	TBC	IMechE RDSE centre
		Total	113 (ytd)	
		Average / Event	23 (ytd)	

SOUTH-EAST CENTRE CHAIR'S REPORT BY TOBY JOHNSON

As pandemic restrictions lifted the South Eastern (SE) centre delivered a mixture of in-person and online events in 2021/22. We also held our first hybrid event allowing attendance in both virtual format and in-person in conjunction with the Milton Keynes centre. In November 2021 we held our first in-person event since March 2020 at 1 Birdcage Walk providing an opportunity to reconnect with members and enable networking opportunities. The Future of Rail presentation SE heat was held in February 2022 and was held at a new venue, University College London in the Chadwick building lecture theatre. The heat was contested by three young engineers and included one remote presentation. The event was well

attended, and James Collinson gave his Chairs address as the keynote speech. The average attendance of in-person events was 30 (not including 28 April event).

Our online events used the MS Teams platform which was a change from the previous year when we were supported by HQ on WorkCast. The average attendance of online events was 53 which was down from 120 in the previous year. However, when the WorkCast events are excluded, the average is much closer with last year averaging 55 on MS Teams. The centre used TicketSource to take bookings for the online events which worked well, although it added some extra administration it alleviated the complaints from the previous year.

Two new volunteers joined the centre committee bringing with them a fresh perspective, a wide range of contacts and renewed enthusiasm. Those in an officer role have remained unchanged from the previous year.

The new programme is currently in development with the meeting format to be based on either in-person or virtual events rather than a hybrid. There is likely to be a higher number of virtual events to achieve the budget that has been set for 2022.

An overview of the activities is provided in Table 8 South-East Centre Events, Speakers and Attendance Figures

Date	Event Title	Speaker / Delivery Method	Delegates	Partner
20/09/21	New Deep Tube Trains for London	Dave Hooper, Director of Major Programmes Rolling Stock and Paul Wright, Operations and Maintenance Manager from Siemens Mobility Ltd MS Teams meeting	67	No
18/10/21	Barking Riverside Extension	David Mansfield, Programme Engineering Manager, TfL MS Teams Meeting	-	No
15/11/21	Rail's COVID Recovery	Neil Ovenden, Head of Engineering at Rail Delivery Group In person at 1BCW	32	No
24/01/22	Light Rail Overspeed Protection	Ian Fisher, Principal Rolling Stock Engineer at Transport for London MS Teams meeting	44	No
21/02/22	Future of Rail Presentation Competition	In-person at UCL	27	No
21/03/22	Current Developments in Rail Cyber Security	Trevor Hardy, Technical Head – Telecoms at TfL MS Team meeting	48	No
28/04/22	Electrification: Developments and Delivery	Simon Skinner, Head of Engineering at Powerlines Hybrid Meeting (1 BCW and MS Teams)	-	MK centre
June 2022	Summer technical visit – subject to confirmation	Old Oak Common depot tour	-	No

Date	Event Title	Speaker / Delivery Method	Delegates	Partner
		Total	218	
		Average / Event	44	

SOUTH-WESTERN CENTRE CHAIR'S REPORT BY THOMAS MOORE

The joint meeting with IET on TOPS computer system had been very well received by the audience but it was noted that the IET only had 2 members present compared to the anticipated 60. The UWE event had almost no students present and very few Centre members (several reports of members attempting to come but unable to find the venue). The committee noted that the actual facilities provided were excellent but too far from student campus and not signposted making them difficult to find. The actual presentations were excellent and seemed to perfect for the anticipated student audience.

Chris Kinchin-Smith has tendered his resignation and Rowan Phillips has also resigned from the committee but offered to help in the future with any action needed. Sutopa Paul has joined the committee; and all agreed that she would make an ideal new member. The committee membership now totals 12 with the potential of future members from Network Rail and Hitachi. The committee felt this was still a good position and compared favourably with other equivalent committees.

Table 9 South- Western Centre Events, Speakers and Attendance Figures

Date	Event Title	Speaker / Delivery Method	Delegates	Partner
27/09/21	James Collinson - Chairs Address	Virtual Event – Unable to secure a venue	15	No
12/10/21	History of London Underground	Cancelled by IET – see Future Events below	-	IET
08/11/21	Class 69 – from the ashes a phoenix arises	In person event	25	No
06/12/21	History of rail incidents	In person event	46	No
05/01/22	On-train infrastructure inspection	In person & hybrid event	80	PWI
07/02/22	TOPS from cold war to coal trains	In person event (only 2 attendees from IET)	32	IET
02/03/22	387 ETCS fitment	In person event, UWE with career fayre	34	No
28/03/22	Future of Rail Presentations	In person event	-	No
25/04/22	AGM followed by CAF new DMU	In person event	-	No
		Total		
		Average / Event		

INDORE, INDIA CENTRE, CHAIR'S REPORT BY LALIT CHANDRA TRIVEDI

New elections were held in Delhi on 5th December 2021 to elect new office bearers for RD Centre India. Mr L C Trivedi (Lalit) was elected as Chair and Mr Rahul Mittal currently Chairman and Managing Director RITES India Ltd. was subsequently appointed vice Chair with common consent. Since Mr Lalit is based at Indore the office of RD Centre India was also shifted to Indore as all office work is being carried out by volunteers as no permanent staff are available.

As was brought out in preceding annual report by Mr P K Agrwal outgoing Chair RD Centre India, on account of non-availability of permanent staff membership attrition is taking place despite Indian Railways reimbursing 90% of fees.

Since COVID's third wave hit India in January and February 2022 the seminars and interactions were held online. The following major events were held.

- On the occasion of 175th inception day (27/01/2022) of IMechE a technical seminar on "Use of stainless steel for rolling stock applications" was conducted by ICF Chennai, the world's biggest Railway coach manufacturing factory with a capability of producing 4,000 high speed railway coaches per annum.
- On 2nd February 2022, a webinar was jointly organised by COFMOW IR and WABTECH on OMRS (Online monitoring of Rolling stock).

In both the above events a record number of engineers from different parts of India participated - making it a grand success.

- On 19th January 2022 on-line discussions were held with RITES (represented by Mr Rahul CMD RITES and vice chair RD India), in which Mr Lalit, Mr Ravi (vice chair IMechE) South Asia and others participated in a discussion on increasing membership of IMechE in RITES.
- On 22nd March 2022 Mr Lalit, Chair RD Centre India, visited the Indian Institute of Science - an eminent place of learning - and facilitated the signing of MOU between DFCCIL and IISc for indigenous development of MVIS (Machine based inspection of Rolling stock) and encouraged students and faculty to join the IMechE.

RD YOUNG MEMBERS' ACTIVITIES, REPORT BY DAVID PEARCE

The Young Members' Committee (RDYM) has continued to be active throughout the various COVID lockdowns and challenging circumstances which have been thrown at us. It is with great pride that the committee can share progress to date and some of the plans which are in store for 2022 and 2023.

EXEC UPDATE

As of 1st January 2022, David Pearce assumed the position of RDYM, with May-Ann becoming Immediate Past-Chair. David and the whole RDYM Committee would like to thank May-Ann for her efforts in steering the committee through

these unprecedented two years and congratulate her on the birth of her first child. David continues to be supported by vice-chairs Paul Burkitt-Gray and Tom Scott.

EVENTS

RDYM has adapted well to holding both virtual and hybrid events. This includes the ever-successful Young Engineers and Apprentices Railway Seminar, the Future of Rail Presentation Competition and the well-received Depots Seminar (the latter of which has been recommissioned for 2022). Whilst some events, such as Rail Trail, were given every effort to be successful, nothing quite beats the energy of the race around London to find the answers to the clues and the committee is thrilled to bring this in-person excitement back to its events.

The RDYM has also supported numerous events from other groups such as the Railway Challenge.

Young Rail Tours is an initiative which the RDYM sponsors and supports in conjunction with the IET and IRSE. Led by the Young Rail Professionals, this provides opportunities to young people across the industry to experience cultures all over the world as well as observe best practice in other rail environments and benefit the wider GB rail industry. Whilst the last major tour was to Japan in 2020, a first step to normality was held in early 2022, with a visit to the Island Line on the Isle of Wight. The next tour is planned for Italy in Summer 2022 with an intercontinental tour to be announced soon.

STRATEGY

As part of David's commitments to taking over as Chair, he has launched a strategy for the duration of his two-year tenure. This details all the prospective events and initiatives that the whole committee will support. Developed in November 2021, as part of a whole committee planning event looking at how to re-invent the RDYM to better serve the needs of the Institution's young rail engineers, the detailed document can be made available on request.

BOARD/COMMITTEE SUPPORT

As always, the RDYM continues to ensure it has a presence on a wide range of boards and committees within the IMechE. These include, but are not limited to: Prizes & Awards, Communications, Learning & Development, Young Members Board, Events, Railway Division Board and the Railway Challenge steering group.

The RDYM is in real need of new members, so please do encourage any young engineers to get involved so 2022 and 2023 can be fantastic years for the RDYM and wider Railway Division.

ANNUAL LUNCHEON COMMITTEE, REPORT BY REBEKA SELICK

Post-pandemic, many people are being more selective about in-person events – choosing those they really value. The RD has been incredibly lucky with the positioning – and the timing – of “probably... the biggest railway event in the calendar”, which went ahead at full strength in 2020, switched to virtual in 2021 and returned in-person in 2022. The virtual version took a huge effort but was valued by participants and hopefully contributed to the near-full strength event

this year. It is clear that the Luncheon is very much easier to make happen in reality than online – and for all to enjoy and profit from (in every sense).

Key facts and figures:

- **Finance**

After warning in successive Board/ Exec reports (to expect £50k not the "usual" £100k), the Luncheon came in better than budget at 86% of "usual":

Delegate revenue: £172,510

Sponsorship: £51,000 (budget was £50k)

Expenditure: £137,811

Hence Gross Profit: £85,699

- **Participants**

Attracted 1,157 people – with the classic "full" atmosphere. Several new takers for tables, including SMEs, boding well for the future.

- **Feedback**

Overwhelmingly positive, generating a range of new quotes we can use for future advertising. Key learning points for future Luncheons include; to have a cash option for the raffle to supplement this year's innovation of e-charity donation (donations were approximately half normal rates), to send the 'survey monkey' post-event questionnaire sooner (feedback response rate was only 5%), to reiterate the event timings (15-minute speeches during courses, to leave plenty of networking time).

- **Thankyous to everyone involved:**

Event Sponsors & Supporters – Aegis, Atkins, Frazer-Nash, PTM Design, TXM group, Siemens, Alstom, RSSB.

Guest Speakers – James Collinson (as RD Chair) and his guest Anit Chandarana (Lead Director, GBR Transition Team).

Table hosts and the IMechE staff.

RAILWAY CHALLENGE COMMITTEE REPORT BY SIMON IWNICKI / TIM POOLE

The Railway Challenge in 2021 was, for the second time running, significantly affected by the Covid epidemic. Whereas in 2020 it was clear that the physical competition could not be run, this was not been the case this year. The spring lockdown prevented the February physical site visit (held virtually instead) and the possibility of holding the competition weekend at the end of June looked less than certain. However, with the vaccination programme running to plan, at the end of March the Challenge committee made the considered decision to proceed with the event. For those teams unable to complete a locomotive (primarily as a result of travel restrictions and access to workshops), competing in the design elements was encouraged

The committee compiled a list of Covid-safe restrictions (including having no spectators or organised social events) and decided to hold the event over two days

only due to the limited number of teams expected to attend. This reduced, by design, the expenditure for the Institution, as did a smaller support team. The Business Case Challenge was held virtually, on 4th June.

The event, despite its limited format, was a success. Teams from Alstom/University of Derby, the University of Huddersfield, Network Rail and the University of Sheffield arrived at Stapleford. Aachen sent in video entries – and won the auto-stop challenge, albeit they were the only team who had completed a working system. The weather was mixed but kind on the competition day and most of the teams attending managed to complete in some of the challenges, justly rewarding the team members for their hard work in difficult circumstances. There were also a number of excellent design-only entries. All competing teams had self-scrutinised before the competition (using the published checklist) and for the first time there were almost no fails in this respect during the pre-competition inspections.

Sheffield won a special mention for aesthetics, their locomotive being clad in transparent panels with coloured LED strips inside which looked extraordinary in the tunnel. As the Challenge's aim is attract attention to the possibility of railways being exciting, this was well-deserved.

The University of Huddersfield were the overall winners.

2022 EVENT AND EXPANSION PLANS

Planning for the 2022 Railway Challenge is progressing well with a site visit for teams having successfully taken place on 2nd February. The final will take place at Stapleford on 23rd – 26th June. There are eight confirmed teams, a lower number than pre-Covid but as expected - bearing in mind much of the academic year has again been affected by the pandemic. This year also includes a new challenge associated with refuelling

Work on the upgrade to the railway is also progressing with support from FSMR and Network Rail and the works are expected to be completed for the 2023 Challenge, in time for the expected increased number of entries. RD Board is asked to support the Stapleford Upgrade by encouraging and facilitating the development of groups of colleagues who are willing to form 'track gangs' to work on various aspects of the construction.

RAILWAY TECHNICAL TOUR (RTT), REPORT BY LOUISE SHAW AND RICHARD LOCKETT

2021/2022 was a difficult year for the RTT team, with the various COVID waves and the ever-changing and unpredictable sets of travel restrictions associated with each stage of the virus's evolution making travel planning impossible.

Nevertheless, the RTT team (Felix Schmid, Bridget Eickhoff, Louise Shaw and Emma Armstrong) decided in early 2022 that a Great Britain tour could be on the cards for early May and commenced planning and gratefully accepted the help of Andrew Skinner in making arrangements the Welsh part of the trip.

The tour took place between the 7th and 14th May with 28 participants (including 6 younger members) visiting to South Wales, Ironbridge, Liverpool and Glasgow. As well as inspecting new technology (e.g. the Scottish Hydrogen train) the tour enabled the participants to compare the approaches of the devolved administrations of Wales, Merseyside and Scotland and to reflect on how these will evolve under the “guiding mind” of Great British Railways.

The team is now contemplating the possibility of reinstating the tour to Finland, Sweden and Norway first envisaged for 2020.

RAILWAY ENGINEERS FORUM REPORT BY ANDREW SKINNER

MEETINGS

The Chair of the Railway engineers Forum rotates between the participating Professional Institutions on a two-yearly cycle. The Institution of Railway Signal Engineers held the Chair until the meeting on 15th July 2021 when it passed to the IMechE. From this point until Summer 2023 Andrew Skinner chairs the Forum. There have been two further meetings of the Railway Engineers’ Forum since then, namely, 14th October 2021 and 20th January 2022.

The forum agreed that as a collective we were in a very good position to engage with the Great British Railways Transition Team (setting up Great British Railways). The RD Chair was very keen to have this engagement but agreed with me that it was best facilitated through the Forum to provide a holistic voice from and single point of contact with the rail professional institutions. Through the RD Chair’s contact with Anit Chandarana (Lead Director) arrangements were made for Graham Richards to attend the meeting on 20th January.

Key points were:

- Legal changes are required to bring Great British Railways (GBR) into being. GBR requires changes to Railways Act and railway legislation to bring it in and give it a remit.
- GBRTT mantra is “Creating a simpler better railway for everybody in Britain” and will take a system-wide approach using the Whole Industry Strategic Plan, particularly in terms of safety.
- Part of Graham’s role is looking at skills and training which fits neatly with the REF and the RD Skills Taskforce.

Graham is keen to continue to meet with REF to sound out ideas and draw on our expertise and has a regular slot at future meetings.

GBRTT ran a call for evidence and the REF coordinated a jointly badged response from the RD, IRSE and IRO.

REF members participated in the RD organised round table event to discuss “Engineering Challenges and Opportunities for the GBR Transition Team”.

DISCUSSION AROUND HOW EVENTS WOULD BE MANAGED DURING THE PANDEMIC

The Forum provided a useful interchange of information on how each institution had managed to keep running events during the pandemic and the options and

formats available for online meetings. There was also discussion as restrictions eased around how hybrid meetings may be the way forwards.

FUTURE REF EVENTS

REF are currently considering a proposal to organise a conference capitalising and expanding on the Round Table paper to review engineering a "Post pandemic Shapps-Williams world".

NEXT MEETING OF THE REF

The next meeting of the Railway Engineers' Forum will be held on 14th July 2022.

RAILWAY DIVISION PRIZES AND AWARDS 2021, REPORT BY EMIL TSCHEPP

Since the start of the pandemic the Railway Division Prizes & Awards Committee has faced continued challenges in obtaining timely copies of the Part F Proceedings Papers (Journal of Rail and Rapid Transit) published by Sage in the Institution's name. Coupled with some difficulties in maintaining volunteer motivation when most social and professional networking opportunities have been impossible this has led to delays in the consideration of papers published in 2021 for awards.

Despite this, the committee has made its nominations for awards this year which are now before the Trustee Board Awards Committee (TBAC) for ratification. Once these awards are confirmed by TBAC we will announce them outside of this report.

The Railway Division has several awards that it is not able to make effective use of due to constraints on the Institution's Trust Funds and developments in the Railway Sector since most of these awards were created. The Committee will be bringing forward proposals to refresh its stable of awards this summer to make them more effective and relevant. The intention of the reforms is to:

- Increase the value of awards for Young Members by accessing alternative sources of funding.
- Consolidating existing awards for research, innovation, and industry achievement into two new prizes with up-to-date awarding conditions.

These reforms will require the approval of both the Railway Division Board and the Trustee Board Awards Committee. If approved, any such changes will be implemented in 2023.

SKILLS TASK FORCE, REPORT BY JOHN REDDYHOFF

The Skills Task Force has reviewed its role within the Railway Division and has proposed some changes to better support the future skills agenda. These have been accepted by the RD Board

The existing remit, as defined in the RD handbook, is:

- Provide a focus for the Traction & Rolling Stock (T&RS) skills agenda to ensure that this receives an equal share of industry attention.
- Identify and promote the successes of those organisations that are already addressing the issues.

- Identify viable reasons to address the T&RS skills gap and encourage stakeholders, including operators, suppliers and Government, to consider these.
- Continue to engage with industry initiatives such as the Skills Delivery Plan to provide a voice for the T&RS skills agenda.
- Communicate skills information within the RD.

Recent activities have focused on:

- T Levels. The Engineering & Manufacturing tranche of T Levels will be introduced in September 2022. This is a Level 3 qualification but the relationship with professional qualifications is less clear, and this is being investigated. The STF is seeking to promote this knowledge within the Railway Division.
- Apprenticeships. Rail engineering apprenticeships at Levels 2 to Level 7 and the associated funding model are now well established but there is limited take up at the higher levels. The STF is seeking to promote the understanding of the access to training funding.
- Engagement with the education sector. This includes Teachers in Residence, STEM, Young Rail Professionals and Primary / Secondary Engineer. The STF is seeking to encourage contact between the Railway Division and these groups.
- EngTech. The STF supports the IMechE's EngTech initiatives, which have significantly improved the offering for Engineering Technicians in the last few years. However, the interest in the Railway Division is limited and the STF is looking at opportunities to promote the benefits.

The work of the STF needs to support the IMechE's initiative to improve its relevance to the membership, to increase the focus on future skills and to adapt to the requirements of Great British Railways.

This will be achieved through some specific initiatives:

- Education & Skills Strategy Board. The Skills Task Force is developing its relationship with the IMechE's ESSB to ensure that its work is aligned to the Institution's strategy.
- EngTech. The STF will promote the current IMechE offering and influence this to align with the needs of the Division.
- Future skills. The skills balance in T&RS is changing. Whilst some of the traditional skills are still needed, the focus needs to shift to digital skills, particularly critical software, cyber security and artificial intelligence. The STF will seek to ensure that the balance of T&RS skills remains relevant.

- The Williams-Shapps Plan for Rail refers to the skills agenda, particularly Chapter 8 Empowering rail's people:
 - o 59. A new joined-up, cross-sector training and skills offer will support people at every career stage to develop skills and bring in experience from outside the rail sector.
 - o 60. A sector-wide workforce plan will be developed to assist employers and build system-wide resilience.
 - o 61. Diversity across the sector will be improved through the inclusion of stretching measures in contracts to actively promote and increase recruitment and retention of a diverse workforce.

The STF will monitor the development of the GBR skills initiatives and will seek to influence the T&RS engineering agenda directly and through RD Board members.

- NSAR. The STF will develop a formal relationship with The National Skills Academy for Rail (NSAR). This will also contribute to the development of GBR.

LEARNING AND DEVELOPMENT ACTIVITY REPORT BY BRIDGET EICKHOFF

During 2021 the review of technical content was completed for the remaining modules and thanks are recorded for the RD members who supported this process, it is important for continued credibility of the courses that the content remains current. Demand for in-company training continued to be strong for a range of different customers with some of these being conversion courses for non-rail engineers entering the industry. Some public courses were also run, though the demand for these is still low, as in recent years. Most courses were delivered virtually. Feedback from attendees continues to be good.

Discussions are underway on potential ways to combine the different modules into 'programmes' that may be attractive to current and new customers.

The value of the Steering Group was discussed, and it was agreed that the current arrangements were working well. The remit has been circulated for comment, but no major issues have been identified so this will be reissued shortly.

FINANCIAL RESULTS BY ANDREW SKINNER

YEAR END REPORT SUMMARY – FINANCIAL YEAR JAN 2021 – DECEMBER 2021

The RD Finance position at the end of 2021 generated a surplus against budget of **£1,931**.

- RD Events finished **£31,217** worse than budget.

- A virtual Annual Luncheon was held to keep the event “warm” rather than generate revenue and it incurred a loss of £10,961.
- Other events made a combined revenue of £4,274.
- Rail Division Board activities finished **£1,103** better than budget.
 - Savings against budget were mainly from the Chairs Address tour (£1,600).
- RD Young Members finished **£2,643** better than budget.
 - The YRP dinner and YM event at the Railway Challenge did not take place due to Covid.
- RD Centres finished **£14,756** better than the budget (grant value).
 - No centres drew down from this funding due to meetings remaining virtual and end of (2020) year balances being used to support the relatively small expenditure they did have.
- Railway Challenge finished **£8,872** better than budget

RAILWAY DIVISION SURPLUS

Proposal: The RD Profit Centre surplus of **£1,931** is retained and incorporated into the 2022 Rail Division profit centre budget to support investment in member engagement activities and the ‘Hybrid Learned Society’. The roll-over of this surplus into the 2022 budget is subject to agreement with the IMechE.

THE RAILWAY DIVISION BOARD

BOARD COMPOSITION AND ELECTION

The composition of the present RD Board is included as Appendix 2 of this report. An election was held between the 11 April-13 May for 4 Ordinary Members. Duly elected for a term of three years were Farzana Hampshire, Aimee MacDonald, Ben Ackroyd. Gareth Tucker was duly elected for a single year term following the early resignation of one of the Ordinary Members.



James Collinson
Railway Division Chair
Institution of Mechanical Engineers

May 2022

Appendix 1. 2021 Prizes and Awards

The T A Stewart-Dyer Prize / Frederick Harvey Trevithick Prize

An award in the sum of £500 (to be divided equally between authors) is made to Hamid Alturbeh, Julian Stow, Gareth Tucker and Alan Lawton for their paper:

'Modelling and simulation of the train brake system in low adhesion conditions'.

(Proceedings volume 234 Issue 3, 301-320)

Citation:

"One of the great benefit of railways is the low rolling resistance of the steel wheels on steel rails. This benefit can turn into a severe disadvantage if the interface between the wheels and the rails becomes contaminated. A normal coefficient of friction of between 0.2 and 0.4 can become as low as 0.02, with serious implications for the traction and braking performance of trains. Braking, in particular, is critical to the safety of train operation, and there has been significant research and testing to understand the impacts of poor adhesion and methods of mitigating or controlling the issue. Track testing is expensive and difficult to set up to deliver reliable, repeatable results and the researchers, in partnership with the Railway Safety and Standards Board developed a validated configurable model to simulate braking in poor adhesion conditions.

The paper described the work to define and model the various components of the vehicles, their dynamic and braking systems and the infrastructure on which they will run as well as the algorithms of motion which will vary wheelset by wheelset. Different routes, train types and train lengths are catered for in the model and it can accept modules provided by others.

This paper clearly identified a problem, described how the problem was broken into its component parts leading to a modular model that delivers results that are useful to the railway industry – suppliers and operators alike. The model allowed many hundreds or thousands of tests to be carried out at a small cost compared with on-track testing and also allowed some beliefs to be disproved. The general belief was that in poor conditions, wheel slide on the leading axles of a train would clean the rails to deliver better adhesion for wheelsets towards the rear of the train. The simulation demonstrated that for very low adhesion this effect does not happen, and that some sort of adhesion enhancer is essential."

The W A Agnew/C N Goodall Award

A prize in the sum of £500 (to be divided equally between authors) is made to

Federico Zenith, Raphael Isaac, Andreas Hoffrichter, Magnus Skinlo Thomassen and Stefan Møller-Holstfor their Paper:

'Techno-economic analysis of freight railway electrification by overhead line, hydrogen and batteries: Case studies in Norway and USA'

(Proceedings volume 234 Issue 7, 791-802)

Citation:

"With the majority of the world's railways operated by diesel powered trains, increased electrification of railway vehicles is essential for the decarbonisation of global networks and the reduction of emissions resulting from the transportation of passengers and freight.

In recent years there has been much debate about the merits of overhead line electrification against emergent technologies such as hydrogen and battery power. The rapid development of such technologies has caused some governments and infrastructure owners to defer investment in railway electrification while they wait and see which approach will become the most cost-effective.

This paper takes an in-depth look at expected improvements in hydrogen and battery system performance over the next three decades. Using two very different real world case studies the authors identify optimal strategies for electrification, in each case offering a solution with lower equivalent annual costs than the diesel motive power used on those routes today. The authors show how overhead line electrification will continue to be most cost-effective approach to railway decarbonisation for routes with significant traffic flows while showing how hydrogen power is likely to have a slight advantage over batteries for less travelled routes.

The use of real-world case studies makes this important but easily misunderstood topic much more approachable, and it illustrates that there is sufficient technological and economic understanding of new motive power technologies to make investment decisions on electrification now.

This paper is an excellent example of the Institution's motto of 'Improving the World through Engineering'."

APPENDIX 2. THE RAILWAY DIVISION BOARD AS OF 1 MAY 2022

Position/Role	Name	Organisation
Chair	James Collinson	Network Rail
Deputy Chair	Noel Travers	XRail Group
Vice Chair	Amanda White	West Midlands Rail Executive
Vice Chair	Andrew Skinner	Great Western Railway
Vice Chair	Stephen Thompson	Sabre Rail
Vice Chair	Howard Parkinson	Digital Rail Ltd
Annual Luncheon	Rebeka Sellick	Sellick Rail
Communications	Louise Shaw	Waxwing Engineering
Events Committee Chair	Paul Burkitt-Gray	Transport for London
Prizes & Awards	Emil Tschopp	Transport for London
Railway Challenge Representative	Tim Poole	London Underground
Skills Task Force Chair	John Reddyhoff	Consultant
Young Members Committee Chair	David Pearce	MTR
India Centre Chair	Lalit Chandra Trivedi	Consultant
Midlands Centre Chair	Dave Coxon	Retired
Milton Keynes Centre Chair	Tom Scaramuzza	Network Rail
North-East Centre Chair	Louise Shaw	Waxwing Engineering
North-West Centre Chair	Gareth Tucker	Huddersfield University
Scottish Centre Chair	Iain Rae	Brodie Engineering
South-East Centre Chair	Toby Johnson	RSSB
South-West Centre Chair	Tom Moore	TE Connectivity
Immediate Past Chair	Felix Schmid	University of Birmingham
Past Chair (2019/20)	Graham Neil	Consultant
Past Chair (2018/19)	Andy Mellors	First Group
Past Chair (2017/18)	Richard McClean	Grand Central Railway
Past Chair (2016/17)	Richard East	Retired
Past Chair (2015/16)	Chris Kinchin-Smith	Consultant

Past Chair (2014/15)	Simon Iwnicki	University of Huddersfield
Past Chair (2013/14)	Bridget Eickhoff	RSSB
Past Chair (2012/13)	Bill Reeve	Transport Scotland
Past Chair (2007/08)	Richard Lockett	Consultant
Past Chair (2005/06)	Malcolm Dobell	Consultant
Past Chair (2004/05)	Cliff Perry	Retired
Ordinary Members		
2021-2024	Jason Groombridge	Porterbrook
2021-2024	Graham Taylor	
2021-2024	Matt Prosser	Angel Trains
2020-2023	Zena Dent	Retired
2020-2023	Graeme Clarke	Siemens
2020-2023	Ben Parry	Greater Anglia
2019-2022	Craig Young	Ricardo
2019-2022	Tim Burleigh	Eversholt Rail
2019-2022	Rashid Wahidi	Network Rail
Co-opted	David Clarke	Railway Industry Association

APPENDIX 3. ELECTIONS FOR 2022-2023

The position of Chair was elected unopposed:
Noel Travers CEng FIMechE, XRail

The position of Deputy Chair was elected unopposed:
Andrew Skinner CEng MIMechE, Great Western Railway

The vacant positions for Ordinary Members were decided by means of an election since there had been 4 candidates. The following have been elected as ordinary members for the period 2022 to 2025:

Farzana Hampshire
Aimee MacDonald
Ben Ackroyd

One ordinary member position was just for a year. The following was elected to the post for the period 2022-2023

Gareth Tucker