



THE
OPERATIONAL
RESEARCH
SOCIETY

Annual Report and Accounts

for the year ended 31 December 2021

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Foreword from the President

It is a great pleasure to introduce this report, which describes The Operational Research Society's achievements during 2021 and sets out our future plans.

Last year I described 2020 as a 'year like no other'. Unfortunately, 2021 was very much like its predecessor, with UK and the rest of the world still under restrictions imposed to limit the impact and spread of COVID-19. The Society was able to continue with the virtual delivery of nearly all of its services. The wider OR community also continued with its significant contribution to tackling the global crisis.

As we emerge from the pandemic, both the Society and the wider community can start to turn our thoughts to our role in the recovery towards some form of normality. The Society is considering how to combine the best of the online world with some return to face-to-face elements. However, many of our governance meetings will continue to take place via tools like Zoom and Teams, saving the cost, time and environmental impact of travelling to meetings.

This report describes some of The OR Society's key achievements during 2021 in responding to the opportunities and challenges presented by the 'new normal'. These have included: building the scope and reach of our online delivery of services, the move towards becoming an End Point Assessment Organisation for the level 7 apprenticeship for an Operational Research Specialist; and our continued contribution to the Royal Society inspired Alliance for Data Science Professionals.

Edmund Burke
OR Society President 2020-2023
May 2022

Introduction

The Operational Research Society is a charity set up to advance knowledge, interest and education in operational research (OR). Our vision is of a world improved by rigorous analysis and better, evidence-based decision-making: "OR providing world class analysis for world class decisions". In this world OR would be seen as indispensable – not just a 'nice to have' but a 'must have' – and be used and acknowledged widely in all areas of industry, business, government and the third sector.

As a charity, we must work for the public benefit, but we also aim to work for the good of our members, because without active, able and well-supported researchers and practitioners, students and supporters, OR would not exist. We disseminate learning; promote awareness of OR; support OR professionals and standards; and aim to ensure that UK OR has a 'voice at the table', both in the international OR world and in wider UK arenas. This represents a broad programme of activities and services, that has been growing year on year and that we continue to maintain and develop.

With the continuing dramatic changes in the world around us – the global coronavirus pandemic – our activities and services have had to adapt accordingly. These changes present great challenges for the whole world, but offer great opportunities for the OR discipline, OR professionals and The OR Society.

Review of the Year 2021

2021 was the first year of a new 3 to 5-year strategic planning cycle, for which we adapted our main priorities on top of the 'Business as Usual' services and activities. The strategic pillars are: raising awareness of the importance of OR; supporting OR knowledge development; supporting OR education; growing membership and wider reach; ensuring financial sustainability of the Society; and embedding good diversity practice in OR and the ORS. Whilst we aim to put EDI considerations at the heart of everything we do, we felt its importance deserves highlighting as a separate strategic strand.

Highlights of the Year

This has been another year of highlights which, along with our full range of activities, support our charitable aims to advance knowledge, interest and education in OR.

Advancing knowledge

The Society's portfolio of academic journals continued to make a substantial contribution to both advancing and sharing knowledge specifically related to COVID-19. All of our relevant content was made free to access and a significant volume of new research material was published in much condensed time frames.

Operational research apprenticeships took further steps towards becoming a serious route to training the analysts of the future, with the Society looking to establish itself at the heart of the quality assurance processes core to that route.

The Society continues to work with Council for Mathematical Sciences on the next steps towards the establishment of a national Mathematical Sciences academy. This could play a key role in the future advancement of knowledge in OR. Other activities to advance knowledge are covered below in the Events, Publications and Research sections.

Advancing interest

Again, the Society's strategic goal of advancing interest in OR was both hindered and helped by the global pandemic. Its usual programme of face-to-face activities was unable to resume during the year, but the opportunity to expand its global reach through the expanded programme of online events was grasped

wholeheartedly. This year's annual conference returned to its usual breadth and depth and still drew worldwide participation.

The Society continued to implement the recommendations of its Artificial Intelligence (AI) task and finish group. One such activity was the delivery of an extensive workshop at the BCS AI conference, highlighting how OR can contribute to AI projects. Other activities to advance interest are covered below in the Events, OR in Education and Pro Bono OR sections.

Advancing education

The Society is now pursuing approval as an End Point Assessment Organisation. It is hoped that the first cohort of apprentices will commence in early 2022. Other activities to advance education are covered below in the Education, Training and OR in Education sections.

Other highlights

Some of our 2021 highlights made contributions to all our charitable aims. These included the expansion of our Women in OR and Analytics Network (WORAN) with a number of virtual events held during the year. This network provides a key focus for addressing issues facing women in our profession.

Finally, the Society is actively involved in an alliance of learned societies (BCS, IMA, and RSS) to implement recommendations in the Royal Society report *Dynamics of data science skills*, including shaping professional standards for data science. This has the potential to be pivotal in improving trust in data analysis across all sectors of the economy.

Achievements during the year

Equality, Equity, Diversity & Inclusion

Part of the OR Society's vision is to have a vibrant and active membership drawn from diverse areas. In support of this, the Society has been active over the past year in the Equality, Equity, Diversity & Inclusion (EEDI) area. In line with its commitment to the Science Council declaration, the Society has a Board level Diversity Champion and a member of the Society's permanent staff working together to drive the realisation of our EEDI ambitions.

The major milestone for the year was the submission of our response to the Science Council's Diversity Framework exercise. We were pleased to be able to record progress in all areas since the last submission / exercise in 2017. All of the Society's committees have taken ownership of the relevant areas and programmes of work to continue the progress have been put in place. An EDI steering group was set up to oversee this work. Further to this, Board agreed the statement of our strategy and ambition for EEDI.

Four EDI training modules plus an autism awareness session were delivered for staff and volunteers. Take-up of the sessions was excellent. The Society also marked several celebration days throughout 2021 including International Women's Day, International Men's Day, Black History Month, International Day of Persons with disabilities and LGBTQ in STEM.

Improved data collection allowed us to target particular areas for action. Our Publications committee was successful in improving the gender diversity of the editorial boards of its portfolio of academic journals, and other initiatives included using inclusive language and images in all our publications, including the website.

Finally, we were delighted that our Women in OR & Analytics Network (WORAN) continued to be very active and to build its engagement with a wide range of participants.

Conferences and Events

Events and Conferences remain an important part of what the OR Society contributes to the membership and the wider OR Community. The continuing and unpredictable influence of the pandemic has continued to make the organising and delivery of events a challenge.

The move to online events has continued, with the OR63 conference in September being virtual, along with most of the events during the year. This now being the second year of this kind of disruption our experience with delivering engaging and interesting content through online platforms had greatly increased. Thus, the OR63 conference was conducted online as a virtual version of the normal conference, with 11 parallel sessions, plenaries, a pub quiz and even a virtual Titanic tour. There were 24 streams, a full Making an Impact programme and a pre-day of activities.

Unlike OR62 Online, this was a paid-for event using a professional events platform and succeeded in turning a useful surplus, with almost 400 attendees. As before, our online offering allowed delegates to attend from all over the world, with one MAI workshop being delivered simultaneously from India and the Pacific coast of Canada. Many thanks must go to Martin Kunc and Christine Currie of the University of Southampton who were the academic co-chairs, and Sham Musthapha of Boeing who served as the practitioner co-chair.

All our other major events in 2021 were online, starting with the Analytics Summit in February – this covered a wide range of topics in Analytics, AI and OR, with particularly popular talks covering themes such as making fairer decisions with AI and how to make use of softer skills when developing a business. The Beale Lecture also took place in February, starting with Geraint Palmer, winner of the 2018 Doctoral Award, talking about modelling deadlock in queuing systems. This was followed by an expert panel discussion on the use of optimisation models.

March saw Simulation Workshop 2021, a celebration of 20 years of the biannual simulation workshop, with contributions from distinguished international plenary speakers and a comprehensive programme of talks. The paper 'Celebrating 20 years: the story of the simulation workshop' by Professor Stewart Robinson and Professor Simon Taylor gave an overview of the evolution of the conference from the earliest days. April was the 3rd joint conference between the OR Society and the Institute for Mathematics and its Applications (IMA). This conference was led by the IMA and covered a wide range of topics, with an engaging plenary from Kevin Glazebrook and Jake Carlson on Multi-Armed Bandits (look it up, I didn't know). The experience of the OR Society team in conducting online events proved invaluable in overcoming last-minute difficulties, supporting this conference, and making it a success.

The AGM in June included a talk on Soft OR and Practice by Robert Dyson and Frances O'Brien, looking back at the links between the founders of OR and the history of Soft OR within the OR community. This was followed by the usual opportunity to review the activities of the Society and vote on its business.

Following its cancellation in 2020, July 2021 saw ISMOR 38 held online, with a plenary on Emerging and Disruptive technology by Jason Field and a series of talks covering historical analysis, artificial intelligence, and COVID-19 vaccine response. The international nature of the conference was maintained with presentations from researchers in Brazil, Canada, Norway, Belgium, and the UK.

The Blakett lecture in November was given by Professor Anthony Finkelstein, who gave an overview of his work in national security. The talk, entitled 'A Systems View of National Security' gave an interesting insight into a world often concealed behind a cloak of mystery.

Our final conference of 2021 was the Validate AI conference in December, with contributions from not just those in OR but also medicine, banking and policing, including a talk on transforming healthcare with AI by Dr Hutan Ashrafian of Imperial College, with an introduction given by Lord Darzi of Denham, the Labour peer, surgeon and researcher.

Our Webinar Wednesdays continued as a popular means of developing professional knowledge and seeing what other techniques and approaches were available to those working in the world of OR. Webinars for 2021 included several sessions on Data Envelopment Analysis (DEA), talks on different soft OR approaches and how the UN Sustainable Development Goals can be realised in a post-COVID world. As always, these talks are all available to members on the OR Society website.

Our Special Interest Groups (SIG) and Regions continue to provide a chance for members to meet to pursue their interests and make local connections. Groups have made use of the Society's online zoom platform to meet up during the year, with over 30 separate online meetings, in addition to those directly arranged through the groups themselves.

It is our intention that 2022 should be the year in which we return to physical events, with OR64 at the University of Warwick marking our first physical annual conference since OR61 at Kent. We are already preparing for our first physical conference since the Beale lecture in early 2020 – the Analytics Summit at the IET in London on 5 July.

We also intend to ensure that the lessons of the pandemic are not forgotten, both by ensuring that physical events are carried out in a way that prioritises the safety and health of our members and through making sure that the long-term potential of online events to extend our reach and encourage diversity is exploited. Our experience with delivering online events has led the OR Society to introduce a new events platform. This will be more efficient in terms of the management of events and will allow us to swiftly move an event from physical to virtual if we need to.

We are also looking forward to the OR Society's 70th anniversary – which is also the 75th anniversary of the founding of the OR Club, its predecessor organisation. We are looking for ideas from the membership as to how we can commemorate this occasion as part of our Events programme – suggestions are welcomed.

Nothing from this programme of events would be possible without the dedication and efforts of the OR HQ team, committee members and volunteers. We greatly appreciate the time they give and their ongoing support in what have been very difficult and challenging times.

Publications

The OR Society has six academic journals. These are the *Journal of The Operational Research Society* (JORS), *European Journal of Information Systems* (EJIS), *Knowledge Management Research & Practice* (KMRP), *Journal of Simulation* (JOS), *Health Systems* (HS) and the *Journal of Business Analytics* (JBA).

The statistics on downloads are again very encouraging. Following the increase in the number of papers downloaded from our journals in 2020, there was a further increase in 2021 with about 230k more downloads than in 2020. In total, there were 952,078 downloads from our academic journals in 2021.

The number of citations to articles in each of our academic journals also increased in 2021 compared to 2020, indicating the value and relevance of our publications. JORS, EJIS, KMRP and JOS are indexed and their Impact Factors for 2020 (published in June 2021) showed significant increases compared to those published in the previous year, even when allowances were made for a different method of calculation.

The page budget for JORS increased in 2021 and the page budgets for KMRP and JOS will both be increased in 2022.

The editorial teams continued to work hard to ensure that their journals were published according to plan and to give timely feedback to those submitting papers. In 2021, Samir Chatterjee replaced Cynthia LeRouge, and Daniel Gartner replaced Paul Harper as members of the editorial team for HS, while Richard Vidgen joined the editorial team for JBA and Nav Mustafee for JOS.

The Society and the editors of the journals greatly value the contribution of reviewers who provide reports on articles submitted for publication. These reports are vital to maintaining the quality of the papers published. In 2021, as well as thanking all reviewers, certificates were awarded to reviewers who had made particularly helpful contributions to the reviewing process, some at an outstanding level. Responses from reviewers suggest that the certificates were much appreciated, and it is planned to continue the award process for reviewers in 2022.

The diversity of the editorial boards for each of our journals continues to be monitored and managed. In 2021, steps were taken to start to monitor the diversity of authors and reviewers by geographical location and gender. The results of this exercise will be considered by the Publications Committee in 2022.

Developments in Open Access continue to be considered. UKRI announced their Open Access policy in 2021, following a wide consultation. In the calendar year 2021, all the Society's academic journals included some Open Access articles, and the overall proportion of Open Access articles is increasing.

In addition to our academic journals, the Society also publishes two editions of *Impact* magazine every year aimed at practitioners and potential users of OR. It is freely available in print or electronic versions. The editor, Graham Rand, has continued to find informative and entertaining articles that showcase ways in which OR can make a difference in practice.

Inside OR is the Society's newsletter and magazine for members which is published at the beginning of each month. Despite a wish to stand down, John Crocker has continued to edit *Inside OR* throughout 2021 and will continue as editor until the Society is able to recruit a suitable replacement.

Carol McLaughlin from the OR Society office and Richard Goodman from Taylor & Francis have worked hard to monitor and update our joint publications strategy and provided support to all the editorial teams. Our thanks go to all those involved over the past year in supporting and promoting the OR Society publications.

Education

We would like to start by thanking Eve Hardy, our Education Officer, who has ensured the continuation of our OR in Education (ORiE) programme during another challenging year. Our appreciative thanks go to Matthew Robinson, the ORiE Taskforce chair, and to all volunteers who have participated in online events.

Apprenticeships continue to be a focus for the committee. The committee proposed that the Society become an End Point Assessment Organisation to further support the take-up and operation of the level 7 standard for 'Operational Research Specialist'. The business case was accepted by Board, and the application process for Ofqual recognition got underway. The Society is also supporting the establishment of a trailblazer group to consider the options for level 6 standards.

The Training Working Group (TWG) continues under the remit of the Education committee. TWG recruited a number of new members during the year and began work to expand the scope of the training programme. It is particularly keen to widen the coverage offered for AI, analytics and data science. It is holding discussions with a number of relevant bodies, including the Alan Turing Institute.

Like many of the other committees, Education committee consider the proposals for a National Academy for Mathematical Sciences. Education will be a key area of an academy's remit.

The committee also started to consider whether the Society could offer some form of degree course accreditation, covering operational research and analytics courses. This is closely linked to the Society's involvement in the Alliance for Data Science Professionals, through which data science degree course accreditation standards are being developed.

Research

The Research committee members continued to play an essential role in supporting OR researchers and ensuring the Society's and the OR community's voice was heard in relevant national bodies throughout 2021.

The year started with further discussion on the themes raised in Chris Skidmore MP's Blakett Lecture (from November 2020). These themes included the importance of operational research to government, the role of OR in national priority areas, and how we might address the people pipeline of OR and expand it. The pandemic has only served to strengthen the case for a strong OR voice accessible to government. These ongoing discussions may result in an Institute for OR; indeed, the discussions also informed other areas of development for the OR community.

The most significant of these has been the proposal to develop a National Academy of Mathematics. The Academy proposal originated from the Bond review, published in 2020. Several Research committee members were involved in the strategic advisory and working groups, which subsequently led to the drafting of a Green Paper. A discussion of the latter by the Research Committee was led by Christine Currie, one of the Green Paper's authors. The Council for Mathematical Sciences (CMS) will now lead on this following the Green Paper's publication.

The committee has also been proactive in our relationship with UKRI and, in particular, EPSRC. Following a recruitment drive to increase OR Society's membership of the EPSRC College in the early part of the year, fifteen ORS members joined the College. This means that more OR experts are available to review EPSRC funding applications. EPSRC received an additional £300m in government funds for Mathematical Science and an increase in their forecasted 2021/22 budget. Frustratingly for many researchers, the release of funds from the 2021/22 review has been delayed, but we are in a stronger position as funding becomes available.

Other areas we have worked with EPSRC include contributions toward their strategic plan, which included the future of doctoral training, the development of an EDI policy, and the development of funding impact measures. Updates of EPSRC and other new funding opportunities continue to be available on the OR Society Research webpages and social media. The committee has also ensured OR has a place on the scoping group for a potential new funding platform to replace J-eS in the future.

The ECR Network, launched last year, continued its Spring and Autumn events online. The events covered guidelines on creating impact case studies and forging successful collaborations with industry. In 2021, eighty ECRs registered to attend the events and/or receive further updates on ECR activity.

The proposal to introduce discussion papers to the *Journal of the OR Society* was presented to the committee by John Boylan. In the subsequent discussion, strong support was expressed.

Training

During 2021, the Society delivered 32 courses covering a range of OR topics, attracting a total of 168 delegates. The coronavirus pandemic continued to impact take up of the training offer, and as a result, all courses were run virtually. We thank our pool of excellent tutors for the continuing adoption of virtual delivery methods.

A new administration platform for our training programme went live shortly before the end of the year. We're excited about the improvements this brings to the delegate journey from discovery through to booking.

Publicity and Membership

Our activity to promote the Society and improve the membership journey has continued throughout the year. This has included some paid advertising. We have seen membership numbers slowly increase, with a particularly good outcome signing up members when they registered for the annual conference. We have also made some changes to the accreditation scheme to keep it relevant and up to date.

We reviewed the fees and increased them in line with inflation – this was the previously agreed longer term strategy. This is now due for review, so we are considering a number of options, taking into account factors such as; the membership offer including our publications, what other societies charge, the role of accreditation and our corporate offer. To help us do this, we want to be very clear what value The OR Society brings to our members and to this end we have done a lot of work to redesign the member survey and conduct a focus group. This will go live in March 2022 and the results will inform our strategy.

Along with the other groups, our Terms of Reference were updated to reflect some recent changes, and to make sure we included a focus on Equality, Diversity and Inclusion. Work in this area also included a full review of relevant sections to contribute to the Science Council Diversity Framework review that took place this year.

Finally, we have started a review of the membership and publicity KPIs that will help measure progress against the Society's broader strategic objectives.

OR in Education

In 2020-21 there was a total of 24 individual visits and events. The COVID-19 pandemic and continued working/learning from home impacted the entire academic year. This allowed for more outreach work aimed at teachers and volunteers than usual, but the irregular learning conditions and increased pressures on teachers meant we worked with school students less than in previous years.

There was one school visit, five extracurricular visits (such as online science fairs/careers panels) and 18 university events. Other headline results include:

- running eight volunteer training sessions for nine STEM Hubs
- running two combined teacher and volunteer training events for five STEM Hubs
- delivering five teacher events – a mix of training courses and conferences
- exhibiting at four maths teacher conferences
- revamping an old YouTube channel and producing two new YouTube video resources

Although COVID-19 limited our work, volunteer availability remained the largest barrier to carrying out more outreach work.

Teachers and volunteers gave lots of positive feedback from ORiE events.

Volunteer feedback:

- *It was a nice feeling, giving the students some advice and recommending them to join the OR Society, and I think they found it useful.*
- *I thought the whole process went very smoothly. Maybe send a calendar invite to remind/help people feel confident in the exact timings of the event? Definitely not necessary though.*
- *It was good talking to students about how great OR is! A thank you for all the support from ORiE!*

Teacher feedback (from Teacher CPD webinars):

- *Really good thank you Eve, I can see applications for encouraging STEM into maths*
- *Really interesting and thought-provoking presentation. Thank you for your time and enthusiasm!*
- *Thank you. Very useful for a Science teacher involved in STEM and Careers. Will pass specific resources to Maths colleagues.*

Student feedback has been limited this year due to the change from in person to online events.

Pro Bono OR

Pro Bono OR's dedicated volunteers worked on 15 projects throughout the year, using a variety of OR, analytics and data science methods to help third sector organisations tackle issues such as food poverty, preventing child abuse, creating impactful social procurement and supporting families with young children. Feedback from the organisations and volunteer analysts has remained positive.

Feedback from our volunteer prize draw winner: *"The experience that I'm getting as a junior analyst is invaluable, whether it is in the spheres of project management or building stakeholder relationships or implementing OR techniques. This is a win-win situation for both me and the organisation I'm working with, they get access to data analysis expertise and I get the opportunity to lead on a project."*

Feedback from the organisation that they volunteered with: *"Our matched pro bono volunteer was very helpful and provided a set of skills we do not have within the organisation. She also provided mapping data and tools so that we could build upon this work independently ourselves moving forward. We would highly recommend any organisation to seek opportunity to work with The OR Society."*

The aftermath of the pandemic is still forcing the majority of the third sector to focus on simply keeping their doors open and supporting their ever-increasing number of service users. For the Pro Bono OR scheme, this

means a reduced number of expressions of interest from third sector organisations and consequently a reduced number of pro bono projects. We hope 2022 will be a more positive year.

The Pro Bono OR scheme was managed by Amy Hughes until May 2021 when she resigned and was replaced by Louise Allison. Louise has previously worked for The OR Society (as Education Officer and Strategic Projects Manager) and returned to take up this role following a career break.

The Steering Group is chaired by Ruth Kaufman and at the end of 2021 the group consisted of: Jane Parkin, Graham Rand, Ian Seath, Shamim Rahman, Mike Boyles, Owen Bowden, Kate Hammond, John Lincoln, Ashleigh Monks and Felicity McLeister. The group was enlarged in winter 2020/21 to include the user perspective, increase capacity, and strengthen succession management. There are plans to recruit a further member representing The OR Society's General Council.

In 2021, we held our first series of webinars for third sector organisations to help them "build back better" post COVID-19. Our series of webinars was designed to help charity and not-for-profit organisations, big or small, understand where to start with complex problems. We hosted five webinars, all delivered by our volunteers who were able to relay first-hand experience to showcase how OR, analytics and data science can help with: Making sense of data – top tips to get you started; Measuring the impact of charitable investment; How to use modelling to improve efficiency and effectiveness; How to use simulation modelling to perform better; and Strategic planning in uncertain times. As a result of attending the webinars or seeing promotional emails, six organisations have initiated pro bono projects.

Pro Bono OR participated in the annual Volunteers' Week (1-7 June). It's an opportunity to celebrate the work that volunteers do and to thank them. In doing so, we showcase projects that volunteers have worked on, share quotes from third sector organisations and volunteers, and promote the benefits of the Pro Bono OR scheme for both volunteers and third sector organisations.

Members, Affiliates and Fellows

At the end of the year, The OR Society had 3,625 members. The Analytics Network boasted 2,153 members, the Society's LinkedIn group had 5,750 members and we had 5,791 Twitter followers. In addition, there were 14 corporate partners – CORDA (part of BAe Systems), Natwest Group, Ministry of Justice, Home Office, Dept for Work & Pensions, AWE, Office for National Statistics, Ministry of Defence, NHS Wales, The Smith Institute, TP Group, Linnaeus University (Sweden), HM Land Registry and HMRC – representing 776 affiliates.

There were 358 accreditees, comprising 169 Fellows, 75 Associate Fellows, 52 Associates and 62 Candidate Associates. There were 22 members accredited as Chartered Scientists and one as a Registered Scientist.

Awards

- **Goodeve Medal** (awarded for best paper published in *JORS* in 2020): Awarded to Greg Gehret, Jeffrey Weir, Alan Johnson and David Jacques "Advancing stock policy on repairable, intermittently-demanded service parts.", *Journal of The Operational Research Society* (2020) 71, 1437-1447.
- **Stafford Beer Medal** (awarded for best paper published in *EJIS* in 2020): Awarded to Abayomi Baiyere, Hannu Salmela and Tommi Tapanainen "Digital transformation and the new logics of business process management.", *European Journal of Information Systems*, 29 238-259.
- **Tocher Medal** (awarded for best paper published in *JOS* in 2019/2020): Awarded to Eric Applegate, Guy Feldman, Susan Hunter and Raghu Pasupathy "Multi-objective ranking and selection: Optimal sampling laws and tractable approximations via SCORE.", *Journal of Simulation*, 14 21-40.
- **Griffiths Medal** (awarded for best paper published in *Health Systems* in 2019/2020): Awarded to Terry Young, Sada Soorapanth, Jim Wilkerson, Lance Millburg, Todd Robberts and David Morgareidge "The costs and value of modelling-based design in healthcare delivery: five case studies from the US.", *Health Systems*, 9 253-262.
- **Doctoral Award** (awarded for the most distinguished body of research leading to the award of a doctorate in the field of OR in 2020): Awarded to Jake Clarkson, University of Lancaster, " Optimal Search in Discrete Locations: Extensions and New Findings".
- **President's Medal** (awarded for the best practical application of OR): Awarded to Antuela Tako, Stewart Robinson, Anastasia Gogi and Zoe Radnor (Loughborough University) for "'The SIMTEGR8 project: Helping the Lightbulb Service Deliver improved housing support services to the Frail and Vulnerable in Leicestershire and Rutland".
- **Lyn Thomas Impact Medal** (awarded annually for the academic OR research which best demonstrates both novelty and real-world impact): Awarded to Paul Harper, Izabela Spernaes, Daniel Gartner, Tracy England, Doris Behrens, Vincent Knight, Geraint Palmer, Mark Tuson and Sue Bale (Cardiff University and Aneurin Bevan University Health Board).
- **Beale Medal** (awarded for a sustained contribution to the theory, practice, or philosophy of OR): Awarded to Chris Potts.
- **Companionship of OR** (awarded for sustained support and encouragement for the development of operational research or for those in influential positions who are in broad sympathy with the subject area): Awarded to Christina Pagel.

Structure of the Funds

The Society revised the presentation of its funds for 2020. It now shows the split between unrestricted and restricted funds.

The unrestricted elements make up the majority of its funds and covers:

- ongoing operations (previously categorised as the General fund); and
- the Seymour House property together with investments and cash on deposit to cover potential risks of a general nature, the most significant of which would arise if the Society were forced to move quickly to a financial regime in which its publications income was significantly reduced (previously labelled the Reserve Fund).

The restricted funds represent a bequest received from Mrs May Hicks in 2002 and which is used for purposes consistent with her wishes, by providing awards for the best student OR projects undertaken for a client organisation.

Review of Operations

The Society's income and expenditure account showed a healthy surplus of £79k during the year, on a turnover of £1.38m. This compares with a small surplus of £15k in 2020.

The performance is gratifying considering the ongoing impact the coronavirus pandemic had on much of the Society's normal operations. Income for the year was up over £136k compared to 2020, but still not back to pre-pandemic levels. The biggest increase, almost £120k, was for Events and Conferences, with fees being reintroduced for key events. Training income recovered well (up more than £30k) as a result of a full year of courses held online. The Society continued to benefit from the cost savings associated with the staff working from home and holding all meetings virtually.

The publications income was almost £28k below the 2020 level, with our publishing partners, Taylor & Francis, continuing to build the strength of our journal portfolio. The outcome for the year was slightly short of expectations, with much of the shortfall attributable to exchange rate pressures. The existing contract with Taylor & Francis comes to an end in 2022 and discussions on a contract extension are essentially complete.

The execution of a previously approved membership recruitment and retention project remained on hold during the year. Work on internal processes proved beneficial, with improved membership numbers being reflected in the financial returns; income from membership subscriptions was up £11k on 2020.

Most operations to support the charitable aims of the Society – such as conferences, special events, regional societies, special interest groups, education, publicity and outreach initiatives, the monthly *Inside OR* magazine and special charitable projects – result in deficits to the Society. To support them the Society relies primarily on subscriptions and income from its academic journals – particularly the latter which in 2021 contributed over £810k net of all associated costs. This serves as a reminder of the Society's current financial dependence on the academic publication system; see the section on 'Risk' below.

The Society employed 18.3 members of staff during 2021 (averaged over the year, 16.85 full-time-equivalents), compared to 16.7 (16.5 FTE) during 2020.

Assets, Reserves and Investments

The total net assets of the Society increased by over £255k to £2.65m over the year, with the small surplus on income and expenditure being boosted by an increase in investment values and a net £176k capital gain (realised and unrealised) on our investment funds. This reflects the markets' continued recovery from the losses due the coronavirus pandemic in 2020, but masks ongoing turbulence. Prudent financial management

of its cash resources meant the Society did not need to draw down any of its investment funds during the year, allowing the recovery to take place.

It is important that the Society maintains an appropriate level of reserves in relation to perceived financial risks. During the year the Board reviewed the Society's reserves policy. In setting its reserve policy, the Board was keen to ensure that the Society can continue long-term operations in the event of financial risks materialising. The policy review considered the minimum and maximum levels for the amount required as reserves. It was agreed to increase the maximum level to be based on three years' costs rather than two. This would give the Board more flexibility in setting its future policies to guard against the impact of open access and further turbulence in the financial markets.

Based on the usual annual costs of running the Society, one year's costs of £900k should be a minimum value for the reserves and the maximum value would then be three years' costs giving a value of £2.7 million. This would cover any growth of the Society over the next few years and release funds to further the Society's aims.

The Society's reserves, with a definition slightly widened from previous years, cover funds which are neither restricted nor designated, less illiquid assets (such as tangible fixed assets). At 31 December 2021, this amounted to £2.3m. The reserves are therefore within their prescribed limits. The Board will bear this in mind when considering opportunities for spending on worthwhile one-off projects that further the Society's objectives, and may be more inclined to do so on finalising the extension to its publications contract.

The Society's investments and their performance are kept under review by the Investment Committee in accordance with policies decided by the Board. The Committee is chaired by the Treasurer and, in addition to other members of the Society, includes representatives from the Society's investment managers.

Risk

The Society's dependency on journal income is the most significant material risk. Our contract with Taylor & Francis to a large extent mitigates this risk for the Society, for the five years of the contract (finishing in December 2022), by transferring much of it to the publisher. The risk has not disappeared though, and we could never be wholly insulated from any impact that might result from this risk on our publisher. Discussions on an extension to the contract have concluded, with the contract expected to be signed during the first half of 2022, and while this does reduce the risk, the publications market will be rapidly adapting to the demands of open access over the course of the extension and this element of income remains at risk.

A key strategic risk is that OR could be seen as less relevant in the rapidly changing environment, as big data and increasing computing power drive technical developments and as new discipline descriptions compete for attention and funding. We have been mitigating this through a number of initiatives led by our Analytics Development Group and are also actively promoting the relevance of OR to data science, robotics and artificial intelligence as well as other overlapping fields. More generally, we aim to raise the visibility of OR and support outward-looking practice and membership through outreach to other professional societies and to organisations and businesses who may benefit from what OR has to bring and through the variety of topics and speakers at our events.

A further key risk is that The OR Society could be seen as less relevant to OR professionals. We have been mitigating this through the whole range of activities addressing our strategic goals and described elsewhere in this report.

The Board regularly reviews the risk register covering a wide range of operational risks, including IT risks, and, where feasible, puts mitigating action in place.

Key Management Personnel

The Key Management Personnel for the Society comprise the trustees (its Board of Directors) and the Executive Director. No remuneration is payable to trustees for service on the Board.

Basis for Remuneration

The President, Treasurer and President Elect or Immediate Past President review the Executive Director's salary and, when agreed by Finance Committee, a written recommendation is made to Board. The Executive Director leads the process for other staff which is again initially discussed by Finance Committee before the recommendations go to Board for final approval.

Voluntary Contributions

The Society's work in 2021 benefited from voluntary contributions of time, from members and others, through these principal lines of work: refereeing of journal papers; editing of journals; conference organisation; authorship and delivery of talks to regional societies and special interest groups; organisation of regional societies and special interest groups; the work of the Society's officers; contributions to the administration of the Society, its Awards and its accreditations through service on Board and the Society's committees.

The coronavirus pandemic has meant that some of the usual volunteering opportunities have been unable to take place. The Society is delighted in the way its pool of volunteers has responded to the switch to online activities where this has been possible, especially with our two main outreach projects, OR in Schools and Pro Bono OR. Their work benefits the OR community, the future development of the profession and the wider society and is a fine contribution to The OR Society's charitable objectives.

It is estimated that a total of 4,000 person-days were contributed in 2021. If this time is valued at £500 per day, its value is £2M. The Society is most grateful to all who contributed voluntary effort, without which the Society could not accomplish its goals.

Fundraising

The OR Society does not engage in public fundraising activities by professional fundraisers or commercial participators. The charity has not received any fundraising complaints in the year.

Related Parties

The Society is a member of EURO, the Association of European Operational Research Societies, and IFORS, the International Federation of Operational Research Societies. It shares information and works closely with other operational research societies around the world, particularly its counterpart in the USA, INFORMS. The Society pays membership fees to both EURO and IFORS.

The Society is also a member of the Council for Mathematical Sciences, CMS. It works with the other member bodies (Institute for Mathematics & its Applications, London Mathematical Society, Royal Statistical Society and Edinburgh Mathematical Society) on relationships to research funding bodies, relevant consultations and various other initiatives. Currently this includes the development of plans for a national academy for mathematical sciences.

The Society's related party transactions for the year ended 31 December 2021 have been disclosed in note 8 of the financial statements.

Objectives for 2022

At the start of 2021, Board produced a revised version of its 3-5 year goals and priorities. These build on those in place for the previous strategic planning phase and represent exciting opportunities for the Society and the wider OR community. The revised strategic pillars are to: raise awareness of the **importance of OR**; support **OR knowledge development**; support **OR education**; grow **membership and wider reach**; ensure **financial sustainability** of the Society; and address **diversity and inclusion challenges** in OR and the OR Society.

Work has already started on many of the initiatives that we hope will come to fruition in the next year or so:

- working with Taylor & Francis to capitalise on its strategy to maximise the value of our current publications contract, develop robust publishing models to deal with opportunities and challenges presented by open access publishing and Plan S;
- ensuring that OR is fully involved in the establishment of a National Academy for Mathematical Sciences (following up the recommendations of the Bond review of knowledge exchange in the mathematical sciences);
- building policy influence with key Government contacts and connect with other key decision makers;
- implementing an engagement plan for the analytics / artificial Intelligence /data science community, and specifically implementing the recommendations of the artificial intelligence task-and-finish group;
- supporting the continued growth of the Women in OR and Early Careers networks;
- maximising benefit from the website, social media campaigns and other marketing activity to raise the brand profile of OR itself;
- launching its museum-based travelling exhibition to raise public awareness of OR;
- progress its bid to come an End point Assessment Organisation and further support the uptake of the level 7 OR apprenticeship scheme for OR Specialist;
- strengthening relationship with key bodies such UKRI, Royal Society, Science Council and other learned societies;
- investigating diversification of income, including exploring new streams (accrediting University courses, fundraising / donations, sponsorship);
- implementing our diversity plan based on recommendations from the diversity champion;
- creating and disseminating thought leadership pieces (with the initial focus on ethics);
- demonstrating the relevance of OR to complex problems and big issues.

These developments will be on top of our existing broad sweep of services: conferences, events, lectures and training; publications; Pro Bono OR and OR in Schools; representing The OR Society on bodies including The Council for Mathematical Sciences, the Science Council, EURO and IFORS; and our more inward-looking activities to improve sustainability, efficiency and effectiveness.

For a relatively small professional body in an uncertain world, there are many challenges to overcome. By undertaking these activities, we aim not just to meet the challenges, but to grow the profession and The OR Society's contribution and make the most of the opportunities awaiting us.

Information about the Society

- (1) The Operational Research Society is a company limited by guarantee (no. 663819). It is also a charity registered in accordance with the provisions of the Charities Act 2011 (registration no. 313713)
- (2) The objects of the Society are given in its Memorandum and Articles and can be summarised as:
 - (a) the advancement of knowledge by fostering, promoting and furthering interest in operational research; and
 - (b) the advancement of education by providing facilities for and, by subsidising it, endowing, organising or supporting scholarships or educational or training schemes; and conducting examinations or advising on their content.
- (3) The Society is empowered to do all proper things in pursuit of these objectives.
- (4) The affairs of the Society were managed during 2021 by the elected officers and members of the Board listed below. Together they constitute the Board of Directors of the limited company and Trustees of the charity and the members of its management committee. Specific matters are delegated to particular committees of the Society by resolution of the Board and in accordance with the Society's Articles.

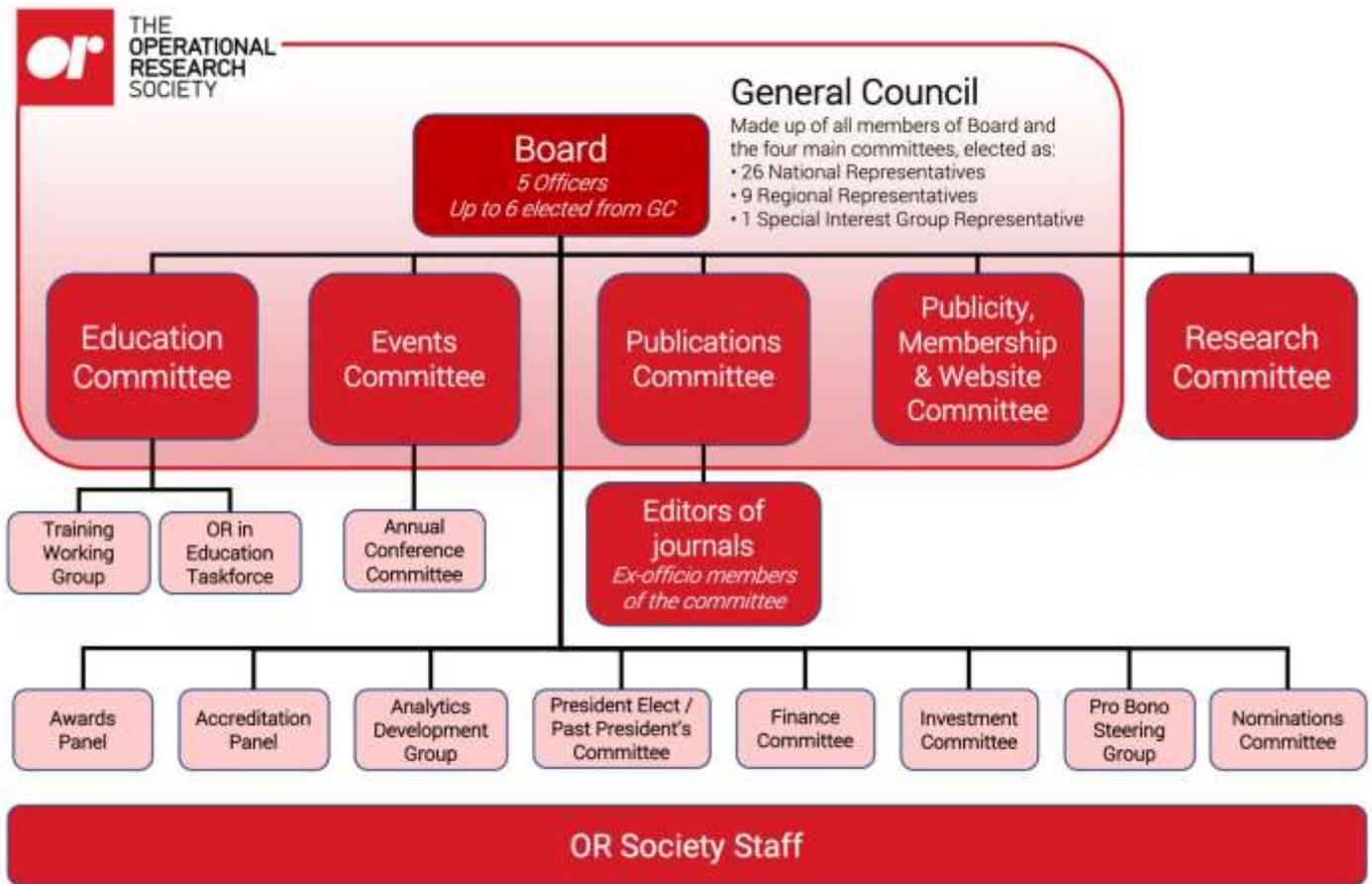
The following served as members of the Board in 2021

E K BURKE President	R BYDE	V SENA
J R HOPES Immediate Past President	R W EGGLESE	
S HOWICK Vice President	J MEDHURST	
A P ROBINSON Vice President	N MORRILL	
J E WILLIAMS Hon. Treasurer	R A SCOTT	

Unless otherwise stated, changes in the membership of the Board occur at the end of a calendar year.

The Board is supported by a General Council with a maximum membership of thirty-six. These two bodies assist the Society in its ongoing commitment to involve as many members as possible in its affairs. The Board of Directors is responsible for governance and strategy and the General Council, with its wide representation, provides advice, feedback and challenge and monitors the Board's activity. Members of General Council have also, in all cases, been assigned to one of the Society's four main committees: Publications; Publicity, Membership and Website; Education and Research; and Events and the Chairs of those committees are currently Board members.

The structure is set out in the diagram below.



(5) The committees are established to implement policies of Board & General Council with respect to meeting the Society's objectives and to controlling expenditure. The names of the committees are set out as follows, together with the object ((a) or (b) as above) towards the achievement of which they contribute:

Accreditation Panel	(a)
Analytics Development Group	(a)
Awards Panel	(a)
Education	(b)
Events	(a), (b)
Finance	Management of financial aspects
Investment	Management of investments
Nominations	Volunteer recruitment to governance roles
Past President's/President Elect's	Elections, planning & administrative reviews
Pro Bono Steering Group	(a)
Publications	(a)
Publicity, Membership & Website	(a)
Research	(a)
Training Working Group	(b)

(6) Other Committees are set up from time to time for specific purposes, but they are given no delegated powers. In addition, the Society has a large number of active Special Interest Groups which are listed in the Journal of the Society. They contribute particularly to object (a).

(7) The registered address of the Society is:

Seymour House
12 Edward Street
BIRMINGHAM
B1 2RX

Its Executive Director is:

I G Blackett
The OR Society
12 Edward Street
BIRMINGHAM
B1 2RX

Its Bankers are:

The Co-operative Bank
Delf House
Southway
SKELMERSDALE
WN8 6WT

Its Solicitors are:

Sydney Mitchell and Co
Cavendish House
Waterloo Street
BIRMINGHAM
B2 5PU

Its Auditors are:

Sayer Vincent LLP
Invicta House
108-114 Golden Lane
LONDON
EC1Y 0TL

Its Investment Adviser is:

Tom Quicke
Investec
30 Gresham Street
LONDON
EC2V 7QN

Its Stockbrokers are:

Investec
30 Gresham Street
LONDON
EC2V 7QN

(8) The Society's investment policy is governed by the legislative provisions relating to charity investments, but the Society is not otherwise restricted in the way in which it can invest. However, it is the Society's policy not to invest in tobacco shares.

(9) These particulars are published in compliance with Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) (effective 1 January 2019).

Public Benefit

The OR Society is a charity and meets the public benefit test as set out in the Charities Act 2011 in various ways:

Advancement of education:

Through the OR in Schools initiative, its many networking, training and conferencing activities in schools, universities and workplaces and extensive on-line resources, The OR Society promotes the understanding of OR and how it can be applied for the wider benefit. The OR Society is a participating society (with voting rights) on the Joint Mathematical Council of the UK.

Advancement of science:

Through its publications, conferences and networking activities; representation on the Council for Mathematical Sciences, Science Council, funding bodies and international federations; and on-line materials and facilities, The OR Society supports, promotes and publicises research; raises standards of research and practice; and promotes the effective application of OR for wider social benefit. Through its accreditation and awards schemes, The OR Society recognises and promotes engagement, effectiveness and development in its members, further raising standards.

Advancement of community development:

The OR Society encourages volunteering and involvement through its Pro Bono OR initiative, involvement of members in outreach to schools and universities and networks of Regional and Special Interest Groups.

The OR Society funds educational, development and research projects that are in line with its charitable aims of advancing knowledge and education through fostering OR

All OR Society events and training are open to all who may be interested. In addition, it minimises barriers to access by:

- (1) ensuring that many of its on-line resources are publicly and freely available;
- (2) keeping membership fees low and offering reduced fees for unwaged groups; and
- (3) supporting Regional and Special Interest Group networks which offer free meetings.

In governing The OR Society, the Trustees have had regard to the Charity Commission's public benefit guidance.

Statement of responsibilities of the elected officers and members of the Board

The trustees (who are also directors of The Operational Research Society for the purposes of company law) are responsible for preparing the trustees' annual report and the financial statements in accordance with applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice).

Company law requires the trustees to prepare financial statements for each financial year which give a true and fair view of the state of affairs of the charitable company and of the incoming resources and application of resources, including the income and expenditure, of the charitable company for that period. In preparing these financial statements, the trustees are required to:

- Select suitable accounting policies and then apply them consistently;
- Observe the methods and principles in the Charities SORP;
- Make judgements and estimates that are reasonable and prudent;
- State whether applicable UK Accounting Standards and statements of recommended practice have been followed, subject to any material departures disclosed and explained in the financial statements;

and

- Prepare the financial statements on the going concern basis unless it is inappropriate to presume that the charity will continue in operation.

The trustees are responsible for keeping adequate accounting records that disclose with reasonable accuracy at any time the financial position of the charitable company and enable them to ensure that the financial statements comply with the Companies Act 2006. They are also responsible for safeguarding the assets of the charitable company and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

In so far as the trustees are aware:

- There is no relevant audit information of which the charitable company's auditor is unaware; and
- The trustees have taken all steps that they ought to have taken to make themselves aware of any relevant audit information and to establish that the auditor is aware of that information.

The trustees are responsible for the maintenance and integrity of the corporate and financial information included on the charitable company's website. Legislation in the United Kingdom governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions.

Appointment of trustees

The officers and other members of the Board are elected by secret ballot of the Society's membership and the members of General Council respectively, to serve for a three-year term (except for the President, who serves one year as President-Elect, two years as President and a further year as Immediate Past-President). A member of the Board, other than the President, whose first term of office has expired may stand for election for one further term. At the end of 2021, three members of the Board completed their terms of office: R W EGGLESE, J R HOPES and S HOWICK.

Induction of new trustees

New trustees receive a comprehensive information pack, setting out details of their role and responsibilities as both trustees and company directors, the nature of a charity, the Society's constitution, its policies on members' interests and expense claims and including the Charity Commission's 'welcome' leaflet.

Members' interests

In accordance with Article 46 of its constitution, the Society requires that members of Board or committees having an interest in a matter to be debated should declare that interest and leave the room whilst the matter is discussed and decided. Members of the Training Working Group are drawn from organisations which have no interest in bidding for courses and wherever appropriate, recommendations on major charitable projects are made by a special expert committee comprised entirely of disinterested parties.

Approval of report

We approve this report and the audited accounts for the year 1 January to 31 December 2021 and recommend their adoption by the Society at its Annual General Meeting.

E K BURKE President

R A SCOTT Hon Treasurer

T W ARCHIBALD

R BYDE

J MEDHURST

N MORRILL

G OWUSU

A C PAGEL

C J PHILLIPS

A P ROBINSON

V SENA

Being the elected officers and members of the Board of The Operational Research Society as at 19 May 2022.

I G Blakett

Executive Director

19 May 2022

Accounts

for the year ended 31 December 2021

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF OPERATIONAL RESEARCH SOCIETY

Opinion

We have audited the financial statements of Operational Research Society (the 'charitable company') for the year ended 31 December 2021 which comprise the statement of financial activities, balance sheet, statement of cash flows and notes to the financial statements, including significant accounting policies. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards, including FRS 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland (United Kingdom Generally Accepted Accounting Practice).

In our opinion, the financial statements:

- Give a true and fair view of the state of the charitable company's affairs as at 31 December 2021 and of its incoming resources and application of resources, including its income and expenditure for the year then ended
- Have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice
- Have been prepared in accordance with the requirements of the Companies Act 2006

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of our report. We are independent of the charitable company in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the FRC's Ethical Standard and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Conclusions relating to going concern

In auditing the financial statements, we have concluded that the trustees' use of the going concern basis of accounting in the preparation of the financial statements is appropriate.

Based on the work we have performed, we have not identified any material uncertainties relating to events or conditions that, individually or collectively, may cast significant doubt on Operational Research Society's ability to continue as a going concern for a period of at least twelve months from when the financial statements are authorised for issue.

Our responsibilities and the responsibilities of the trustees with respect to going concern are described in the relevant sections of this report.

Other information

The other information comprises the information included in the trustees' annual report, other than the financial statements and our auditor's report thereon. The trustees are responsible for the other information contained within the annual report. Our opinion on the financial statements does not cover the other information and, except to the extent otherwise explicitly stated in our report, we do not express any form of assurance conclusion thereon. Our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the course of the audit, or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether this gives rise to a material misstatement in the financial statements themselves. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to

report that fact.

We have nothing to report in this regard.

Opinions on other matters prescribed by the Companies Act 2006

In our opinion, based on the work undertaken in the course of the audit:

- The information given in the trustees' annual report, for the financial year for which the financial statements are prepared is consistent with the financial statements; and
- The trustees' annual report has been prepared in accordance with applicable legal requirements.

Matters on which we are required to report by exception

In the light of the knowledge and understanding of the charitable company and its environment obtained in the course of the audit, we have not identified material misstatements in the trustees' annual report. We have nothing to report in respect of the following matters in relation to which the Companies Act 2006 requires us to report to you if, in our opinion:

- Adequate accounting records have not been kept, or returns adequate for our audit have not been received from branches not visited by us; or
- The financial statements are not in agreement with the accounting records and returns; or
- Certain disclosures of trustees' remuneration specified by law are not made; or
- We have not received all the information and explanations we require for our audit; or
- The directors were not entitled to prepare the financial statements in accordance with the small companies' regime and take advantage of the small companies' exemptions in preparing the trustees' annual report and from the requirement to prepare a strategic report.

Responsibilities of Trustees

As explained more fully in the statement of trustees' responsibilities set out in the trustees' annual report, the trustees (who are also the directors of the charitable company for the purposes of company law) are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the trustees determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the trustees are responsible for assessing the charitable company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the trustees either intend to liquidate the charitable company or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

Irregularities, including fraud, are instances of non-compliance with laws and regulations. We design procedures in line with our responsibilities, outlined above, to detect material misstatements in respect of irregularities, including fraud. The extent to which our procedures are capable of detecting irregularities, including fraud are set out below.

Capability of the audit in detecting irregularities

In identifying and assessing risks of material misstatement in respect of irregularities, including fraud and non-compliance with laws and regulations, our procedures included the following:

- We enquired of management and the finance committee, which included obtaining and reviewing supporting documentation, concerning the charity's policies and procedures relating to:

- Identifying, evaluating, and complying with laws and regulations and whether they were aware of any instances of non-compliance;
- Detecting and responding to the risks of fraud and whether they have knowledge of any actual, suspected, or alleged fraud;
- The internal controls established to mitigate risks related to fraud or non-compliance with laws and regulations.
- We inspected the minutes of meetings of those charged with governance.
- We obtained an understanding of the legal and regulatory framework that the charity operates in, focusing on those laws and regulations that had a material effect on the financial statements or that had a fundamental effect on the operations of the charity from our professional and sector experience.
- We communicated applicable laws and regulations throughout the audit team and remained alert to any indications of non-compliance throughout the audit.
- We reviewed any reports made to regulators.
- We reviewed the financial statement disclosures and tested these to supporting documentation to assess compliance with applicable laws and regulations.
- We performed analytical procedures to identify any unusual or unexpected relationships that may indicate risks of material misstatement due to fraud.
- In addressing the risk of fraud through management override of controls, we tested the appropriateness of journal entries and other adjustments, assessed whether the judgements made in making accounting estimates are indicative of a potential bias and tested significant transactions that are unusual or those outside the normal course of business.

Because of the inherent limitations of an audit, there is a risk that we will not detect all irregularities, including those leading to a material misstatement in the financial statements or non-compliance with regulation. This risk increases the more that compliance with a law or regulation is removed from the events and transactions reflected in the financial statements, as we will be less likely to become aware of instances of non-compliance. The risk is also greater regarding irregularities occurring due to fraud rather than error, as fraud involves intentional concealment, forgery, collusion, omission or misrepresentation.

A further description of our responsibilities is available on the Financial Reporting Council's website at: www.frc.org.uk/auditorsresponsibilities. This description forms part of our auditor's report.

Use of our report

This report is made solely to the charitable company's members as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the charitable company's members those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the charitable company and the charitable company's members as a body, for our audit work, for this report, or for the opinions we have formed.

Fleur Holdon
Senior statutory auditor

Date

for and on behalf of

Sayer Vincent LLP

Statutory Auditor

Invicta House

108-114 Golden Lane

LONDON

EC1Y 0TL

The Operational Research Society

Statement of financial activities (incorporating an income and expenditure account)

For the year ended 31 December 2021

	Note	Unrestricted £	Restricted £	2021 Total £	Unrestricted £	Restricted £	2020 Total £
Income from:							
Charitable activities							
Subscriptions	2	147,642	–	147,642	136,390	–	136,390
Events and Conferences	2	131,120	–	131,120	11,641	–	11,641
Training	2	105,192	–	105,192	73,084	–	73,084
Publications	2	941,755	–	941,755	969,653	–	969,653
Accreditation	2	8,679	–	8,679	8,315	–	8,315
Websites / Digital Services	2	1,080	–	1,080	1,900	–	1,900
Investments	3	42,082	2,130	44,212	39,891	2,249	42,140
Total income		1,377,550	2,130	1,379,680	1,240,874	2,249	1,243,123
Expenditure on:							
Raising funds							
	4	13,145	–	13,145	11,672	–	11,672
Charitable activities							
Subscriptions	4	137,599	–	137,599	132,952	–	132,952
Events and Conferences	4	227,392	–	227,392	181,894	–	181,894
Training	4	105,501	–	105,501	92,004	–	92,004
Apprenticeships	4	2,000	–	2,000	–	–	–
Publications	4	280,778	–	280,778	271,107	–	271,107
Accreditation	4	15,598	–	15,598	8,898	–	8,898
Websites / Digital Services	4	182,215	–	182,215	179,606	–	179,606
Other Charitable expenditure	4	334,506	1,500	336,006	327,781	1,500	329,281
Total expenditure		1,298,733	1,500	1,300,233	1,205,914	1,500	1,207,414
Net income / (expenditure) before net gains / (losses) on investments		78,817	630	79,447	34,960	749	35,709
Net gains / (losses) on investments		180,088	(3,604)	176,484	(46,426)	2,078	(44,348)
Net income / (expenditure) for the year		258,905	(2,974)	255,931	(11,466)	2,827	(8,639)
Transfers between funds		(14,600)	14,600	–	–	–	–
Net movement in funds		244,305	11,626	255,931	(11,466)	2,827	(8,639)
Reconciliation of funds:							
Total funds brought forward		2,333,660	61,722	2,395,382	2,345,126	58,895	2,404,021
Total funds carried forward		2,577,965	73,348	2,651,313	2,333,660	61,722	2,395,382

All of the above results are derived from continuing activities. There were no other recognised gains or losses other than those stated above. Movements in funds are disclosed in Note 18 to the financial statements.

The Operational Research Society

Balance sheet

Company no. 00663819

As at 31 December 2021

	Note	£	2021 £	£	2020 £
Fixed assets:					
Tangible assets	10		238,365		262,922
Intangible assets	11		43,097		87,608
Investments	12		2,024,494		1,819,211
			<u>2,305,956</u>		<u>2,169,741</u>
Current assets:					
Debtors	13	212,295		221,479	
Cash at bank and in hand		305,327		390,237	
		<u>517,622</u>		<u>611,716</u>	
Liabilities:					
Creditors: amounts falling due within one year	14	(172,265)		(386,075)	
Net current assets			<u>345,357</u>		<u>225,641</u>
Total net assets			<u>2,651,313</u>		<u>2,395,382</u>
The funds of the charity:					
Unrestricted income funds:	18				
Restricted Funds		73,348		61,722	
Unrestricted Funds		2,577,965		2,333,660	
Total unrestricted funds			<u>2,651,313</u>		<u>2,395,382</u>
Total charity funds			<u>2,651,313</u>		<u>2,395,382</u>

Approved by the trustees on 19 May 2022 and signed on their behalf by

R. A. Scott
Honorary Treasurer

E. K. Burke
President

The Operational Research Society

Statement of cash flows

For the year ended 31 December 2021

	2021 £	£	2020 £	£
Cash flows from operating activities				
Net income / (expenditure) for the reporting period (as per the statement of financial activities)	255,931		(8,639)	
Depreciation and amortisation charges	72,252		77,766	
(Gains)/losses on investments	(176,484)		44,348	
Dividends and interest from investments	(44,212)		(42,140)	
Decrease in debtors	9,184		39,961	
(Decrease)/increase in creditors	(213,810)		188,417	
Net cash (used in) / provided by operating activities		(97,139)		299,713
Cash flows from investing activities:				
Dividends and interest from investments	44,212		39,891	
Purchase of fixed assets	(3,184)		(72,710)	
Proceeds from sale of investments	238,320		427,838	
Purchase of investments	(257,451)		(462,712)	
Net cash provided by / (used in) investing activities		21,897		(67,693)
Change in cash and cash equivalents in the year		(75,242)		232,020
Cash and cash equivalents at the beginning of the year		410,245		178,225
Cash and cash equivalents at the end of the year		335,003		410,245
Analysis of cash and cash equivalents and of net debt				
	At 1 January 2021 £	Cash flows £		At 31 December 2021 £
Cash at bank and in hand	390,237	(84,910)		305,327
Cash deposited with investment brokers	20,008	9,668		29,676
Total cash and cash equivalents	410,245	(75,242)		335,003

1 Accounting policies

a) Statutory information

The Operational Research Society is a charitable company limited by guarantee and is incorporated in England and Wales.

The registered office address is 12 Edward Street, Birmingham, B1 2RX, UK

b) Basis of preparation

The financial statements have been prepared in accordance with Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) – (Charities SORP FRS 102), The Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) and the Companies Act 2006.

c) Public benefit entity

The charity meets the definition of a public benefit entity under FRS 102.

d) Preparation of the accounts on a going concern basis

The Operational Research Society operates as a going concern. The trustees consider there are no material uncertainties about the charity's ability to continue as a going concern.

The Society operates a reserves policy that reflects its critical dependence on journal income.

The policy sets the minimum level of reserves at one year's fixed running costs of £900k to keep the charity viable whilst alternative funding is found.

The maximum level is to be set at three years' running costs or £2.7 million. The charity is currently meeting its reserves target.

e) Key estimates and judgements

When preparing the financial statements, management makes a number of judgements, estimates and assumptions about the recognition and measurement of assets, liabilities, income and expenses. The estimate that has the most significant effect relates to intangible fixed assets. The company amortises fixed assets over their estimated useful lives. The estimation of the useful lives of assets is based on historic performance as well as expectations about future use and therefore requires estimates and assumptions to be applied by management. The actual lives of these assets can vary depending on a number of factors, including the maintenance and level of upkeep of the software systems.

f) Income

Income is recognised when the charity has entitlement to the funds, any performance conditions attached to the income have been met, it is probable that the income will be received and that the amount can be measured reliably. Income from government and other grants, whether 'capital' grants or 'revenue' grants, is recognised when the charity has entitlement to the funds, any performance conditions attached to the grants have been met, it is probable that the income will be received and the amount can be measured reliably and is not deferred. Income received in advance of the provision of a specified service is deferred until the criteria for income recognition are met.

g) Dividends and investment income

Interest and dividends on funds held on deposit or invested is included when receivable and the amount can be measured reliably by the charity; this is normally upon notification of the interest or dividend paid or payable by the relevant institution.

h) Expenditure

Expenditure is recognised once there is a legal or constructive obligation to make a payment to a third party, it is probable that settlement will be required and the amount of the obligation can be measured reliably. Expenditure is classified under the following activity headings:

Costs of raising funds relate to the costs incurred by the charity in inducing third parties to make voluntary contributions to it, as well as the cost of any activities with a fundraising purpose.

Expenditure on charitable activities includes the costs of delivering services, exhibitions and other educational activities undertaken to further the purposes of the charity and their associated support costs.

Other expenditure represents those items not falling into any other heading.

i) Value added tax

The Society has partial exemption status for Value Added Tax and Value Added Tax on apportionable costs which cannot be reclaimed is disclosed separately within administration costs.

1 Accounting policies (continued)

j) Allocation of costs

Salaries, depreciation, websites / digital services expenditure and other central and establishment overheads are allocated to appropriate cost categories using consistently applied ratios based on estimates of actual time and costs expended in each area.

Allocation of support and governance costs:

Raising funds	0%
Subscriptions	13%
Events and Conferences	19%
Training	6%
Apprenticeships	0%
Publications	14%
Accreditation	2%
Websites / Digital Services	18%
Other Charitable expenditure	28%

k) Tangible and Intangible fixed assets

Tangible and intangible fixed assets costing more than £1,000 and with a useful economic life in excess of 3 years are capitalised and included at cost including any incidental expenses of acquisition.

Depreciation of tangible fixed assets is charged on a straight line basis at the following rates:

Long leasehold building	2%
Office machines and computer equipment	25%
Fixtures and fittings	10%

Amortisation of Intangible fixed assets is charged on a straight line basis at the following rate:

Software systems	25%
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The amortisation rate charged is based on management's best estimate of the useful life of the software systems.

l) Investments

Investments are a form of basic financial instrument and are initially recognised at their transaction value and subsequently measured at their fair value as at the balance sheet date using the closing quoted market price. Any change in fair value will be recognised in the statement of financial activities. Investment gains and losses, whether realised or unrealised, are combined and shown in the heading "Net gains/(losses) on investments" in the statement of financial activities. The charity does not acquire put options, derivatives or other complex financial instruments.

m) Debtors

Trade and other debtors are recognised at the settlement amount due after any trade discount offered. Prepayments are valued at the amount prepaid net of any trade discounts due.

n) Cash at bank and in hand

Cash at bank and cash in hand includes cash and short term highly liquid investments.

o) Creditors and provisions

Creditors and provisions are recognised where the charity has a present obligation resulting from a past event that will result in the transfer of funds to a third party and the amount due to settle the obligation can be measured or estimated reliably. Creditors and provisions are normally recognised at their settlement amount after allowing for any trade discounts due.

p) Pensions

The Society contributes to individual pension schemes established for each eligible employee.

q) Financial instruments

The Society only has financial assets and financial liabilities of a kind that qualify as basic financial instruments. Basic financial instruments are initially recognised at transaction value and subsequently measured at their settlement value.

2 Income from charitable activities

	Unrestricted £	Restricted £	2021 Total £	Unrestricted £	Restricted £	2020 Total £
Journal of The OR Society / Knowledge Management Research & Practice / Journal of Simulation	729,968	-	729,968	661,494	-	661,494
Inside OR	1,096	-	1,096	1,728	-	1,728
European Journal of Information Systems / Health Systems / Journal of Business Analytics	206,735	-	206,735	301,944	-	301,944
Other publications	3,956	-	3,956	4,487	-	4,487
Sub-total for Publications	941,755	-	941,755	969,653	-	969,653
Subscriptions	147,642	-	147,642	136,390	-	136,390
Events and Conferences	131,120	-	131,120	11,641	-	11,641
Training	105,192	-	105,192	73,084	-	73,084
Accreditation	8,679	-	8,679	8,315	-	8,315
Websites / Digital Services	1,080	-	1,080	1,900	-	1,900
Total income from charitable activities	1,335,468	-	1,335,468	1,200,983	-	1,200,983

3 Income from investments

	Unrestricted £	Restricted £	2021 Total £	Unrestricted £	Restricted £	2020 Total £
Income from Listed Investments	42,058	-	42,058	39,888	-	39,888
Interest on Bank Deposits	24	-	24	3	-	3
Distributions – CAF	-	2,130	2,130	-	2,249	2,249
	42,082	2,130	44,212	39,891	2,249	42,140

4a Analysis of expenditure (current year)

	Charitable activities										2021 Total £	2020 Total £
	Raising funds £	Subscriptions £	Events and Conferences £	Training £	Apprentice- ships £	Publications £	Accreditation £	Website / Digital Services £	Other Charitable Activities £	Support and governance costs £		
Staff costs (Note 6)	-	92,363	135,829	42,686	-	98,134	11,963	79,628	216,817	81,519	758,939	692,914
Establishment Costs	-	2,704	3,976	1,250	-	2,873	350	2,331	6,347	2,386	22,217	23,490
Postage and phones	-	959	1,811	900	-	3,043	12	118	1,139	420	8,402	11,691
Office Costs	-	4,228	6,218	4,228	-	4,476	249	-	4,228	1,245	24,872	20,593
Computer s/ware and maintenance	-	6,867	4,578	2,289	-	6,409	-	16,023	9,614	-	45,780	37,254
Website	-	4,925	3,283	1,642	-	4,597	-	11,492	6,895	-	32,834	39,694
Bank Charges	-	2,328	3,186	1,816	-	-	-	-	-	-	7,330	5,717
Legal and Professional Fees	13,145	-	-	-	-	-	-	-	-	29,789	42,934	33,079
Other Direct costs	-	5,208	41,497	42,752	2,000	142,180	-	-	51,037	-	284,674	265,218
Depreciation & Amortisation	-	2,544	5,287	604	-	2,867	1,201	51,327	6,623	1,798	72,251	77,764
	13,145	122,126	205,665	98,167	2,000	264,579	13,775	160,919	302,700	117,157	1,300,233	1,207,414
Support and governance costs	-	15,473	21,727	7,334	-	16,199	1,823	21,296	33,306	(117,157)	-	-
Total expenditure 2021	13,145	137,599	227,392	105,501	2,000	280,778	15,598	182,215	336,006	-	1,300,233	
Total expenditure 2020	11,672	132,952	181,894	92,004	-	271,107	8,898	179,606	329,281	-		1,207,414

Other Charitable Activities covers the remaining non-revenue earning activities carried out in pursuit of the Society's charitable aims. It includes: library, public information about OR, third sector pro bono, research support, strategic initiatives, regional societies, special interest groups, awards and scholarships.

The Operational Research Society

Notes to the financial statements

For the year ended 31 December 2021

4b Analysis of expenditure (prior year)

	Charitable activities										2020 Total
	Raising funds £	Subscriptions £	Events and Conferences £	Training £	Apprentice-ships £	Publications £	Accreditation £	Website / Digital Services £	Other Charitable Activities £	Support and governance costs £	
Staff costs (Note 6)	-	90,768	123,075	32,988	-	82,327	5,838	78,846	202,532	76,540	692,914
Establishment Costs	-	3,077	4,172	1,118	-	2,791	198	2,673	6,866	2,595	23,490
Postage and phones	-	1,334	2,521	1,252	-	4,250	16	164	1,544	610	11,691
Office Costs	-	3,500	5,148	3,501	-	3,707	206	-	3,501	1,030	20,593
Computer Software and maintenance	-	5,588	3,725	1,863	-	5,216	-	13,039	7,823	-	37,254
Website	-	5,954	3,969	1,985	-	5,557	-	13,893	8,336	-	39,694
Bank Charges	-	1,816	2,485	1,416	-	-	-	-	-	-	5,717
Legal and Professional Fees	11,672	-	-	-	-	-	-	-	-	21,407	33,079
Direct costs	-	6,346	11,924	38,591	-	141,505	-	-	62,939	3,913	265,218
Depreciation & Amortisation	-	2,738	5,691	650	-	3,085	1,292	55,245	7,128	1,935	77,764
	11,672	121,121	162,710	83,364	-	248,438	7,550	163,860	300,669	108,030	1,207,414
Support and governance costs	-	11,831	19,184	8,640	-	22,669	1,348	15,746	28,612	(108,030)	-
Total expenditure 2020	11,672	132,952	181,894	92,004	-	271,107	8,898	179,606	329,281	-	1,207,414

Other Charitable Activities covers the remaining non-revenue earning activities carried out in pursuit of the Society's charitable aims. It includes: library, public information about OR, third sector pro bono, research support, strategic initiatives, regional societies, special interest groups, awards and scholarships.

5 Net income / (expenditure) for the year

This is stated after charging / (crediting):

	2021 £	2020 £
Depreciation and amortisation	72,252	77,766
Auditor's remuneration (excluding VAT):		
Audit	8,850	8,000
Other services	-	1,449
	<u>72,252</u>	<u>77,766</u>

6 Analysis of staff costs, trustee remuneration and expenses, and the cost of key management personnel

Staff costs were as follows:

	2021 £	2020 £
Salaries and wages	634,379	574,088
Social security costs	58,847	56,051
Pension costs	65,713	62,775
	<u>758,939</u>	<u>692,914</u>

The following number of employees received employee benefits (excluding employer pension costs and employer's national insurance) during the year between:

	2021 No.	2020 No.
£80,000 – £89,999	1	1

The key management personnel of the Society comprise the Executive Director. The total employee benefits (including pension contributions and employer's national insurance) of the key management personnel were £109,557 (2020: £94,686).

No remuneration was paid or is payable to Trustees for service on the Board for the year (2020: £Nil).

Trustees' expenses represents the payment or reimbursement of travel and subsistence costs totalling £0 (2020: £2,204) incurred by 0 (2020: 11) members relating to attendance at meetings of the trustees.

7 Staff numbers

The average number of employees (head count based on number of staff employed) during the year was 18.3 (2020: 16.7).

Staff are split across the activities of the charity as follows:

	2021		2020	
	Headcount	FTE	Headcount	FTE
Charitable activities	14.3	13.7	12.6	13.2
Management and administration	4.0	3.1	4.1	3.3
	<u>18.3</u>	<u>16.8</u>	<u>16.7</u>	<u>16.5</u>

8 Related party transactions

Gavin Blackett, as part of his Society role as Executive Director, is also a Director of Edward Street Management Limited, the company that manages the Society's buildings car park. During the year the Society paid rent to the company of £3,030 (2020: £3,030).

Amanda Blackett, the wife of Gavin Blackett, the Society's Executive Director, is employed by the Society. Amanda receives an appropriate salary for the role undertaken, in line with market rates.

9 Taxation

The charity is exempt from corporation tax as all its income is charitable and is applied for charitable purposes.

10 Tangible fixed assets

Cost	Long leasehold land and buildings £	Office equipment £	Fixtures and fittings £	Total £
At the start of the year	314,306	146,354	161,742	622,402
Additions in year	–	3,184	–	3,184
Disposals in year	–	(92,880)	(34,574)	(127,454)
At the end of the year	314,306	56,658	127,168	498,132
Depreciation				
At the start of the year	169,722	132,653	57,105	359,480
Charge for the year	6,286	8,738	12,717	27,741
Eliminated on disposal	–	(92,880)	(34,574)	(127,454)
At the end of the year	176,008	48,511	35,248	259,767
Net book value				
At the end of the year	138,298	8,147	91,920	238,365
At the start of the year	144,584	13,701	104,637	262,922

The Trustees consider the market value of the Long Leasehold Land and Buildings to be materially in excess of the book written down value shown above.

11 Intangible fixed assets

	Software systems £	Total £
Cost		
At the start of the year	206,672	206,672
At the end of the year	206,672	206,672
Amortisation		
At the start of the year	119,064	119,064
Charge for the year	44,511	44,511
At the end of the year	163,575	163,575
Net book value		
At the end of the year	43,097	43,097
At the start of the year	87,608	87,608

12 Listed investments

	2021 £	2020 £
Fair value at the start of the year	1,799,203	1,806,428
Additions at cost	257,451	464,961
Disposal proceeds	(238,320)	(427,838)
Net gain / (loss) on change in fair value	176,484	(44,348)
	1,994,818	1,799,203
Cash held by investment broker pending reinvestment	29,676	20,008
Fair value at the end of the year	2,024,494	1,819,211

Investments comprise:

	2021 £	2020 £
UK Common investment funds	226,151	242,278
Shares listed on the London Stock Exchange	727,745	683,351
UK Property and assets	336,838	285,218
Overseas Investment funds	48,786	25,594
Overseas Shares	655,298	562,762
	1,994,818	1,799,203

All the above investments are either listed on a recognised stock exchange in Great Britain or are represented by unit trusts which are traded on a daily basis in the UK, and fall within the wider range of investments as defined by the Trustees Act 1961.

The Society's narrower range of investments as defined by the Trustees Act 1961 is covered by deposits held at Investec.

13 Debtors

	2021 £	2020 £
Trade debtors	31,456	39,741
Prepayments	67,502	42,853
Accrued income	111,102	138,885
Recoverable VAT	2,235	-
	<u>212,295</u>	<u>221,479</u>

14 Creditors: amounts falling due within one year

	2021 £	2020 £
Trade creditors	29,532	22,724
Taxation and social security	22,534	177,634
Other creditors	14,092	24,985
Accruals	75,056	93,434
Deferred income (note 15)	31,051	67,298
	<u>172,265</u>	<u>386,075</u>

15 Deferred income

	2021 £	2020 £
Balance at the beginning of the year	67,298	35,548
Amount released to income in the year	(67,298)	(35,548)
Amount deferred in the year	31,051	67,298
	<u>31,051</u>	<u>67,298</u>

Deferred income consists of 2022 subscription income paid in advance.

16 Pension scheme

The Society contributes to individual pension schemes established for each individual employee. The assets of these schemes are held separately from those of the Society in independently administered funds. The pension charge represents contributions payable by the Society to the schemes and amounted to £65,713 (2020: £62,755).

Pension payments outstanding at the end of the year were £1,670 (2020: £7,577).

The Operational Research Society

Notes to the financial statements

For the year ended 31 December 2021

17a Analysis of net assets between funds (current year)

	Unrestricted £	Restricted £	Total funds £
Tangible fixed assets	238,365	–	238,365
Intangible fixed assets	43,097	–	43,097
Investments	1,951,146	73,348	2,024,494
Net current assets	345,357	–	345,357
Net assets at 31 December 2021	2,577,965	73,348	2,651,313

17b Analysis of net assets between funds (prior year)

	Unrestricted £	Restricted £	Total funds £
Tangible fixed assets	262,922	–	262,922
Intangible fixed assets	87,608	–	87,608
Investments	1,741,284	77,927	1,819,211
Net current assets/liabilities	241,846	(16,205)	225,641
Net assets at 31 December 2020	2,333,660	61,722	2,395,382

18a Movements in funds (current year)

	At 1 January 2021 £	Income & gains £	Expenditure & losses £	Transfers £	At 31 December 2021 £
Restricted Funds	61,722	2,130	(5,104)	14,600	73,348
Unrestricted Funds	2,333,660	1,557,638	(1,298,733)	(14,600)	2,577,965
Total funds	2,395,382	1,559,768	(1,303,837)	-	2,651,313

The narrative to explain the purpose of the restricted fund is given at the foot of the note below.

18b Movements in funds (prior year)

	At 1 January 2020 £	Income & gains £	Expenditure & losses £	Transfers £	At 31 December 2020 £
Restricted Funds	58,895	4,327	(1,500)	-	61,722
Unrestricted Funds	2,345,126	1,240,874	(1,252,340)	-	2,333,660
Total funds	2,404,021	1,245,201	(1,253,840)	-	2,395,382

Restricted Funds

Consists of a legacy received in 2002. The Legator, Mrs May Hicks, expressed a non-binding wish that the Society uses its bequest to fund an annual award to be determined by the Council of the Society. The legacy is currently invested in the Charities Aid Foundation Fixed Interest B Accumulation Fund. It also includes an amount received from the ISMOR trust of £14,600 to be used to fund ISMOR scholarships.

19 Operating lease commitments payable as a lessee

The charity's total future minimum lease payments under non-cancellable operating leases is as follows for each of the following periods

	Equipment 2021	2020
	£	£
Less than one year	5,548	7,783
One to five years	8,390	13,436
	<u>13,938</u>	<u>21,219</u>

The Society has a commitment to a service charge on the car park of the leasehold property over the next 90 years estimated at £263,610 (Under one year £3,030; Two-five years £12,120; Over five years £248,460).

20 Post balance sheet events

The value of the Society's investments fell in the first quarter of 2022, due to turbulence in the markets primarily caused by the conflict in Ukraine. Their value at 30 April 2022 was £1.8m. The trustees have no current plans to draw down from the investments and expect the investments to get back to balance sheet value in due course.

21 Legal status of the charity

The Society is a company limited by guarantee, has no share capital and is a registered charity. The objectives of the Society are the advancement of knowledge and education in operational research.

The liability of each member in the event of a winding-up is limited to £1.

History

In the autumn of 1947, at a dinner discussion convened at the Athenaeum Club in London, it was decided to form the Operational Research Club. The club was inaugurated in April 1948 with an initial membership of 50, under the chairmanship of Sir Charles Goodeve and with Mr J A Jukes as the first secretary. The exclusivity associated with the word "club" was deliberately chosen for the initial period, to ensure clarification of what was meant by operational research and to attempt to develop a wholeness in what was otherwise a somewhat vague field. The club met regularly in the rooms at the Royal Society for technical discussions. By 1953 the initial objectives had been achieved and the pressure to form a normal "learned and professional" society had become strong. Therefore, the club was transformed into The Operational Research Society and its first president was Sir Owen Wansbrough-Jones and the hon secretary Mr B H P Rivett.

Presidents of the Society

Sir Owen Wansbrough-Jones	1954/55
Sir William K Slater	1956/57
Professor M G Kendall	1958/59
The Earl of Halsbury	1960/61
Professor B H P Rivett	1962/63
Professor G A Barnard	1964/65
Professor R T Eddison	1966/67
Mr E C Williams	1968/69
Mr S Beer	1970/71
Professor K D Tocher	1972/73
Mr R C Tomlinson	1974/75
Mr A M Lee	1976/77
Professor M G Simpson	1978/79
Mr G H Mitchell	1980/81
Professor K B Haley	1982/83
Dr R S Stainton	1984/85
Professor J V Rosenhead	1986/87
Dr J C Ranyard	1988/89
Mr P N Thornton	1990/91
Professor C B Chapman	1992/93
Professor L C Thomas	1994/95
Mr I J Disley	1996/97
Professor R G Dyson	1998/99
Professor M Pidd	2000/01
Mr J Gibb	2002/03
Professor V Belton	2004/05
Professor J D Griffiths	2006/07
Mrs S M Merchant	2008/09
Professor R W Eglese	2010/11
Dr G H Royston	2012/13
Professor S L Robinson	2014/15
Ms R A Kaufman OBE	2016/17
Mr J R Hopes	2018/19
Professor E K Burke	2020/22

OR Society Awards

Companion of Operational Research

Sir Hermann Bondi	1983	Professor R G Dyson	2007
Mr D Hicks	1983	Mr E K G James	2007
Professor R V Jones	1983	Professor J Friend	2008
Professor B H P Rivett	1983	Dr G Royston	2008
Mr H R W Watkins	1984	Professor R J Paul	2009
Professor Sir David Cox	1985	Professor A Mercer	2010
Lord Ezra	1985	Mr T O'Connor	2010
Mr P Hughes	1985	Professor V Belton	2011
Lord Zuckerman	1985	Ms R A Kaufman	2011
Sir John Kingman	1986	Professor M Pidd	2011
Sir Dennis Rooke	1986	Professor P H Millard	2012
Sir Charles Carter	1987	Professor D M Ryan	2013
Mr T P Frost	1987	Professor R M Davies	2014
Professor H.Muller-Merbach	1988	Mr C R Humby	2014
Mr D A Quarmby	1989	Mrs S M Merchant	2015
Professor R C Tomlinson	1990	Professor S C Brailsford	2016
Mr R A Showell	1991	Professor J D Griffiths	2016
Mr G H Mitchell	1992	Professor E K Burke	2017
Professor P Whittle	1994	Professor P R Harper	2018
Mr J Plymen	1994	Professor R W Eglese	2019
Professor S Vajda	1995	Mr A Waterhouse	2020
Professor K B Haley	1996	Professor A C Pagel	2021
Professor M F Shutler	1996		
Professor D J White	2001		
Professor K C Bowen	2001		
Dr R A Forder	2005		
Professor F Kelly	2005		
Mr G K Rand	2005		
Dr J C Ranyard	2005		
Professor J V Rosenhead	2005		
Dr J F Miles	2006		

Beale Medal

J V Rosenhead	1992	J D Griffiths	2009	R Cheng	2018
D J White	1993	K H Haley	2010	A Land	2019
A H Christer	1995	F Kelly	2011	V Belton	2020
G H Mitchell	1998	M D Elder	2012	C Potts	2021
H P Williams	1999	K D Glazebrook	2013		
R C Tomlinson	2005	R Fildes	2014		
P Checkland	2006	J Friend	2015		
C Eden	2007	R Ormerod	2016		
L C Thomas	2008	M Jackson	2017		

Silver Medal

C F Goodeve	1964	A M Lee	1970	S Eilon	1982
P M Morse	1965	R L Ackoff	1971	G Dantzig	1986
K D Tocher	1967	C G Vickers	1975	L V Kantorovich	1986
B H P Rivett	1968	E.K.G.James	1979		
R T Eddison	1969	E M L Beale	1980		

Bronze Medal

R M Adelson	1965	A R Wild	1967	F K Lyness	1970
J Stringer	1967	D J Chambers	1968	A M Duguid	1972
T A Burgin	1967	M F Cantley	1969	C G Moss	1972

Goodeve Medal

B H Mahon	1976	J Banasik	2000	S Kapoor	2012
R J M Bailey	1976	J N Crook	2000	A Sheth	2012
N R Tobin	1977	L C Thomas	2000	R True	2012
I Sanderson	1979	R Korporaal	2001	P Kemmer	2013
A J Williams	1980	A Ridder	2001	A Strauss	2013
J G Shepherd	1981	P Kloprogge	2001	T Winter	2013
F K Lyness	1982	R Dekker	2001	J Bengtsson	2014
L P Fatti	1984	S Howick	2002	D Bredstrom	2014
A H Christer	1985	C Eden	2002	P Flisberg	2014
W M Waller	1985	J E Beasley	2003	M Ronnqvist	2014
G Best	1987	H Howells	2003	S Crowe	2015
G Parston	1987	J Sonander	2003	P Bennett	2015
J V Rosenhead	1987	R Hartley	2004	M Daraktchiev	2015
D Rowland	1988	G Lanot	2004	M Utley	2015
I R Turner	1989	S C Brailsford	2005	S C Brailsford	2016
R Bandyopadhyay	1990	V Lattimer	2005	D De Silva	2016
S Datta	1990	P Tarnaras	2005	A Backiel	2017
D Schrady	1992	J Turnbull	2005	B Baesens	2017
D Wadsworth	1992	K Taylor	2006	G Claeskens	2017
A Bouzaher	1993	B Dangerfield	2006	A I Ali	2018
S Offutt	1993	S C Brailsford	2007	G Ince	2018
D W Bunn	1994	D Evenden	2007	A Brice	2019
E R Larsen	1994	V Harinda	2007	R Bye	2019
K Vlahos	1994	P Harper	2007	J Oppen	2019
G M Campbell	1995	A Medina-Borja	2008	J Royset	2019
C F Davis	1995	K S Pasupathy	2008	E Adiyeye	2020
M Carey	1996	K Triantis	2008	S Agrali	2020
D Lockwood	1996	D Ronen	2009	E Canakoglu	2020
C M Yeats	1997	C A Goodhart	2009	G Gehret	2021
T Rehman	1997	S Kumar	2010	J Weir	2021
D-W Tcha	1998	D A Nottestad	2010	A Johnson	2021
T-J Choi	1998	E E Murphy	2010	D Jacques	2021
Y-S Myung	1998	L C Thomas	2011		
F Duckworth	1999	F R Johnston	2012		
A J Lewis	1999	E A Shale	2012		

Stafford Beer Medal

JJ Jahng	2003	P O'Reilly	2011	R Parks	2018
H Jain	2003	P Flanagan	2011	H Xu	2018
K Ramamurthy	2003	R Lederman	2012	C-H Chu	2018
R Lindgren	2004	R Johnston	2012	P Lowry	2018
D Stenmark	2004	H Koch	2013	N Hikmet	2019
J Ljungberg	2004	E Gonzalez	2013	A Connolly	2019
S Sarker	2005	D Leidner	2013	C Davis	2019
S Sahay	2005	D Denyer	2014	A Bhattacharjee	2019
S Madon	2006	M Hall	2014	F Brachten	2020
C Middleton	2007	E Kutsch	2014	B Cabrera	2020
W Cukier	2007	E Lee-Kelley	2014	G Neubaum	2020
S K Sia	2008	P Tallon	2015	L Pilz	2020
C Soh	2008	J Gerow	2016	B Ross	2020
C Ashurst	2009	J Thatcher	2016	S Stieglitz	2020
N Doherty	2009	V Grover	2016	A Baiyere	2021
J Peppard	2009	A Utesheva	2017	H Salmela	2021
F Thiesse	2010	J Simpson	2017	T Tapanainen	2021
J Al-Kassab	2010	D Cecez-	2017		
E Fleisch	2010	Kecmanovic			

Tocher Medal

K Kotiadis	2009	J Xu	2017	E Nino-Perez	2019
T Pitana	2011	E Huang	2017	Y M Mendez-	2019
E Kobayashii	2011	L Hsieh	2017	Vazquez	
C Boer	2013	L H Lee	2017	E Applegate	2021
Y Saanen	2013	Q Jia	2017	G Feldman	2021
K-H Chang	2015	C Chen	2017	S Hunter	2021
A-L Chang	2015	M Cabrera-Rios	2019	R Pasupathy	2021
C-Y Kuo	2015	D E Arias	2019		
		Gonzalez			

Cook Medal

P Jackson	2014	M Walsh	2016	D Apostolou	2020
J Klobas	2014	R Murray	2016	E Kalogeraki	2020
D Pentland	2016	L Irvine	2016	S Papastergiou	2020
K Forsyth	2016	F Di Vincenzo	2018	N Polemi	2020
D MacIver	2016	D Mascia	2018		

Griffiths Medal

H Witteman	2015	V Mabin	2019	J Wilkerson	2021
J Stahl	2015	J Yee	2019	L Millburg	2021
M Mihaylow	2017	S Babington	2019	T Robberts	2021
P Smet	2017	R Moore	2019	D Morgareidge	2021
W Van Den	2017	V Caldwell	2019		
Noortgate		T Young	2021		
G Vanden Berghe	2017	S Soorapanth	2021		

Ranyard Medal

A Jeyaraj	2020
A Zadeh	2020

Lyn Thomas Impact Medal

S Crowe	2019	I Spernaes	2021	V Knight	2021
C Pagel	2019	D Gartner	2021	G Palmer	2021
M Utley	2019	T England	2021	M Tuson	2021
P Harper	2021	D Behrens	2021	S Bale	2021

Doctoral Award

K Kaparis	2008	T Lidbetter	2013	G Palmer	2018
A Strauss	2009	M Takac	2014	M Bedenek	2019 †
F Liberatore	2010	C Koc	2015	L Morgan	2019 †
R Wood	2011	I Megiddo	2016	J Clarkson	2020
K Rustogi	2012	J F Sze	2017		

† Joint winners

President's Medal

D R Corkindale	1976	P Loader	2004	M Wauben	2019
M L Chambers	1977	M Bryant	2004	P Macdent	2019
R G Dyson	1977	P Bates	2004	B Marshall	2019
M Sloman	1978	C McGuckin	2004	E Baggot	2020
J V Rosenhead	1979	D Kelly	2004	K Brett	2020
P Doyle	1980	P Loucopoulos	2005	J Low	2020
J Fenwick	1980	KG Zagafos	2005	H Mann	2020
G P Savage	1980	Y Pyrgiotis	2005	M McKee	2020
D B Gilding	1981	D Beis	2005	S Rose	2020
C Lock	1981	A Swain	2006	S Smith	2020
B Fokkens	1982	A Ross	2006	A Tako	2021
M Puylaert	1982	A Lewins	2007	S Robinson	2021
R S Hambleton	1983	M Sykes	2007	A Gogi	2021
A W Nimmo	1984	A Moon	2007	Z Radnor	2021
C B Chapman	1985	M Allwright	2008		
D F Cooper	1985	J Ball	2008		
A B Cammaert	1985	D Pankhurst	2008		
P Doyle	1987	I Wright	2008		
J Saunders	1987	P Frangos	2010		
M Pidd	1988	S Hughes	2010		
S R Clarke	1989	S Hammond	2011		
A H Christer	1990	K Slater	2011		
K A H Kobbacy	1990	C Marston	2012		
B C Dangerfield	1991	P Rose	2012		
C A Roberts	1991	S Mardle	2013		
M B Wright	1992	L Fildes	2013		
C P Thunhurst	1993	A Lewins	2013		
C J Ritchie	1993	E Husemann	2014		
A Khakee	1994	D Lane	2014		
K Stromberg	1994	E Munro	2014		
J J Glen	1996	G Owusu	2016		
H Tsoukas	1997	S Shakya	2016		
D B Papoulias	1997	R Dorne	2016		
J H Powell	1998	A Mohamed	2016		
G Laporte	1999	A McCormick	2016		
F Semet	1999	A Liret	2016		
V V Dadeshidze	1999	O Buhlinger	2017		
L J Olsson	1999	C Henzel	2017		
F Vasko	2000	M Clocherty	2017		
H Gilles	2000	M Knapton	2017		
D Bright	2000	H Papachristou	2017		
V Kocatulum	2000	C Legge	2017		
E Wolf	2000	R Leese	2018		
J Moffat	2000	J Blaavand	2018		
J J Race	2001	C Centazzo	2018		
D Burnell	2001	A Bejan	2018		
M Neighbour	2002	P Munday	2018		
M Acutt	2003	A Booker	2019		



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