

Skills, Research and Higher Education





Foreword

from Professor Adam Tickell, Vice-Chancellor and Principal

Envied across the globe and home to many of the world's brightest minds, the UK's universities are amongst our most important national assets. Through education and skills, research and development, and our work with students, staff, local communities and partners, universities make a positive and lasting impact on individuals and society.

Universities add value and grow the economy through teaching and learning, research and knowledge exchange. The University of Birmingham alone contributed £4.4 billion to the UK's economy and supported nearly 20,000 FTE jobs in the UK in the 2021-22 academic year. While Birmingham's economic impact is significant – including relative to other universities – we are not alone in this. Taken together, UK higher education generates £130 billion for the UK economy and supports more than three quarters of a million jobs (768,000).

Universities are also an essential component in delivering sustainable and equitable regional growth. From attracting and retaining human capital, to driving innovation and entrepreneurship, universities are engines of local economic development. Universities such as ours are at the heart of emerging and developed innovation clusters across the UK. The Birmingham Health Innovation Campus, for example, will bring researchers and health professionals together to establish Birmingham as a leading economic hub for life sciences, promoting job creation and boosting regional growth.

Universities are integral civic institutions, and support vital cultural assets like art galleries and museums, sponsor and support schools, provide SMEs with subsidised advice, run 'public good' programmes such as degree apprenticeships at a considerable loss, and contribute to social mobility measures.



Our research isn't just intrinsically important, though it is, it also helps us to understand how to tackle some of the sticky challenges facing us, changing the way the world works. Our inventions of today are the innovations of tomorrow in a wide array of areas such as new medicines, sustainable plastics, better education, conflict resolution.

Tackling these challenges will require the government and universities to view each other as allies and to work together to address common threats.

This vision offers examples of how we can collaborate to tackle the thorny issues the UK and the world is facing. We look forward to engaging with the new UK Government, and policy-makers from across the political spectrum, to deliver it.

Message

from Professor Deborah Longworth, Pro-Vice-Chancellor for Education

As Pro-Vice Chancellor for Education at the University of Birmingham, I ensure that our students acquire the knowledge, skills, and capabilities needed to thrive in a changing world. Our education strategy promotes learning excellence across a lifelong learning portfolio, from our University of Birmingham School (ages 11-18) to undergraduate and postgraduate programs, and professional development opportunities. This includes 16 apprenticeships at Levels 3 to 7, aligned to nine apprenticeship standards, developed in response to industry and local authority needs.

An outstanding university education supports high achievement, but success should be measured in more than numerical grades. Students develop a broad range of integrated competencies and behaviours during their time with us: growing their knowledge and skills acquisition, but also the broader intellectual, ethical, and civic/global attributes that are increasingly understood as supporting personal success, career readiness, and wider societal gain.

The UK university sector is globally renowned for the quality of its education and research, providing transformational opportunities for students, attracting the best international talent to the country, and contributing significantly to the success of our national knowledge economy. At the University of Birmingham our educational principles promote Intellectual Curiosity, Practical Wisdom, and a Future-Focused skillset to prepare students to contribute productively to the world beyond university life.

Our broad programme portfolio enables the development of these attributes within the core curriculum, while our academic calendar provides the space for students to broaden and enrich their academic and co-curricular interests and skills. The consistently strong employability outcomes of our students have been underpinned by a sustained focus on providing our students with excellent teaching and learning support, along with access to sector-leading employability provision.

Government support for student access to university but also, crucially, for adequate maintenance support,



is essential. Our Pathways to Birmingham (P2B) program helps students from diverse backgrounds access higher education, while the Birmingham Scholar scheme supports students from underrepresented backgrounds in achieving their full potential. Our work in outreach and access to Higher Education is supported via our membership of the AimHigher West Midlands partnership, which has benefited over 61,000 learners and 195 schools. However, successive cuts to UniConnect funding are restricting the opportunities and support available.

Barriers to opportunity exist beyond access however, and we urge the government to undertake an urgent review of maintenance support, and of maintenance grants for students from the most economically disadvantage backgrounds. At Birmingham, the Academic Skills Centre and Student Well-being teams provide accessible support, including outside normal working hours and online to enhance student retention and outcomes. Our Pause@UoB drop-in hub and UBHeard, a 24-7/365 mental health support line, have supported over 5,000 students. Despite university investment, the cost of living pressures hinder many students' ability to focus on their studies and their 'on-course' success.

Our motto, 'Per Ardua Ad Alta', means 'through efforts to high things'. Founded in 1900 by Joseph Chamberlain, the University was established to provide 'great school of universal instruction' and a model of learning grounded in original research, benefiting the region and its people. This philosophy of social responsibility and equality of opportunity has shaped us as an institution ever since. We look forward to working with the government to support a diverse student body in achieving strong academic outcomes and developing the skills to become future leaders, innovators, and global citizens of tomorrow.

Message

from Professor Rachel O'Reilly, Pro-Vice-Chancellor for Research

As Pro-Vice-Chancellor for Research at the University of Birmingham, I see first-hand the impact that high quality research has on the prosperity, health, and economic growth of our cities and regions. Researchers across the UK punch above their weight; at our university alone, every £1m of research income generates £6.49m of economic impact. Our research initiatives generate high-skilled jobs, stimulate business growth, bring culture and communities together, and enhance quality of life through cutting-edge solutions in health, environment, and technology.

The UK's research universities are recognised internationally as operating at the frontier of knowledge. In collaboration with a government that is committed to UK research – we can achieve even more – starting with a robust and forward-looking Industrial Strategy that connects research, innovation, and skills to drive productivity-led growth.

Our universities are pivotal to delivering inclusive, sustained economic growth across the UK. At the University of Birmingham, our research, education and industrial partnerships exist as a nexus. Industry-informed research is taught by pioneering scholars, making us the top choice for graduate employers, and earning us the Queens Anniversary Prize for our partnership with Rolls Royce.

Sustained investment in research is vitally important for promoting innovation, enabling groundbreaking work that translates into tangible benefits for society. This requires fully funded research and maintaining flexible block grant funding, allowing universities to invest strategically in research that contributes to regional and national prosperity. Predictable, long-term funding empowers universities to invest in crucial research infrastructure, as exemplified by our Quantum Technology Hub, and National Buried Infrastructure Facility.

We call on the government to set an ambitious target for the proportion of GDP invested in Research and Development, one that matches the most innovative global economies and puts the UK on a footing to lead the G7 as a powerhouse for research and innovation. Public and higher education sector leadership in investment will encourage private industry to follow.



Place-based innovation funding mechanisms, such as our regional Innovation Accelerator, foster collaboration between universities, policy makers and private industry, from SMEs to large corporations. Extending the timescales of the Innovation Accelerator programme, and expanding devolved funding for university-led spin-outs and startups, would ensure vital projects are able to realise their potential and deliver a step change for firms.

We must also focus on nurturing the next generation of research leaders. It is imperative we re-examine funding and support for Post-Graduate Researchers, ensuring it is of sufficient flexibility and scale to give researchers from all backgrounds the opportunity to thrive.

International partnerships, collaborations and mobility are the bedrock of high-quality research. We urge the government to play an active role in developing the successor programme to Horizon Europe, and forge new Free Trade Agreements that facilitate future scientific partnerships. A visible commitment to international collaboration would attract scientific talent to the UK, while a positive narrative regarding our university sector, coupled with progressive policies on visas, and a reduction of upfront visa costs, would remove barriers to international scientific mobility.

Government support for research is critical to a knowledge-based economy, accelerating innovation, and advancing our progress in addressing shared global challenges. Universities and their research represent a global success story for the UK – we look forward to working in partnership with government to unleash our power on the national economy, for the benefit of all.



Our commitment and contribution

The University of Birmingham has a major impact on the city and region as an employer, research leader and international gateway. We are an anchor institution, one of the region's largest employers, a driver of economic growth, and a catalyst for cultural development in Birmingham, the West Midlands, and across the UK. In the current landscape, this is more important than ever.

Our recent economic impact report, conducted with London Economics, highlights the significant contribution the University makes. Our total economic impact in the UK in 2021-22 is estimated at ± 4.4 billion:

Key findings

- The University of Birmingham contributed £4.4 billion to the UK economy in the 2021-22 academic year
- We supported nearly 20,000 FTE jobs in the UK, and more than 13,000 of those in the West Midlands, in the 2021-22 academic year
- We supported students and graduates to start more than 60 new businesses
- We trained more than 5,300 teachers, social workers, nurses, doctors and dentists
- 36% of our students are first generation from their family to attend university
- We worked with more than 15,000 school pupils across the West Midlands to raise aspirations
- Our research and knowledge transfer activity contributes £1.4 billion to the economy

London Economics' report shows that the University supports nearly 20,000 fulltime equivalent jobs in the UK, with more than 13,000 of those located in the West Midlands. The University also directly provides 1 in 50 jobs in Birmingham.

The University's contribution to our public sector is also vital, with over 5,300 teachers, social workers, nurses, doctors and dentists in 2021-22 (16% of those being trained in the West Midlands) being trained.

Given the role of the University of Birmingham, and the importance of the higher education sector to the UK, we are calling on government to support our activities and create the necessary conditions for the sector's economic and cultural growth.

Read the report to find out more about the University's impact: birmingham.ac.uk/news/economic-and-social-impact-report

Our call to the UK Government

Safeguard routes for international students to engage with UK universities.

International students are not taking the places of domestic students. In fact, our universities have been able to grow the number of places for UK undergraduates over time because of the funding they receive from international student fees.

International students are a UK success story, bringing cultural, social and economic benefits. At the University of Birmingham, there are more than 8,700 international students from approximately 150 countries. They boost businesses and local communities, underpin the provision of high-level education and skills for home

students, and enable universities to invest in R&D activity. Modelling by London Economics shows that a single cohort of international students produces a net benefit of £37bn for the UK economy.

Universities needs the support of government if we are to continue to develop one of the UK's most resilient, successful, and globally influential sectors. Britain faces real problems with growth and productivity. Our public services need improvement, and rapid climate change is challenging our infrastructure. The research from universities is an integral to finding solutions.

Create the environment for universities to thrive, so they can help to tackle the pressing challenges facing the country.

Innovation in universities is founded on discovery research that allows them to create capacity, capability and facilities to address short-term challenges and to make strategic investments. This is the kind of ground-breaking research that grows to become world-changing

innovation. What we need to see if quality-related funding to be prioritised with longer-term plans that support stability for greater investment and innovation to flourish.

Prioritise **quality-related funding** to allow universities to pursue high-risk high-reward discovery research.

The UK's universities are facing their own challenges; ones which threaten their very survival. Due to a perfect storm of rising costs, the rapidly decreasing value of tuition fees, and increased competition globally, the UK university sector has arguably never faced greater threats or uncertainties.

Tackling these issues will require the government and universities to view each other as allies and to work together to address common threats.

Commit to working hand in hand with the UK's Higher Education sector to both **safeguard and enhance** our universities as a national asset.



Our research and impact – changing how the world works

Our research expertise, across five key challenge themes, focusses on vital issues and tangible solutions locally, nationally, and on a global stage.

Our research is changing how the world works.

We are unveiling the hidden with quantum technology,
understanding how future atmospheres affect biodiversity,
removing barriers to create more inclusive education,
promoting cultural understanding, and preventing maternal deaths.

Our Research Challenge Themes

Our Research Challenge Themes showcase our pioneering breakthroughs, multidisciplinary collaborations and significant global impact.





Life-changing technologies



With the growth of our global population the demand for products, infrastructure, and services also increases, creating a growing burden on our planet's resources and geopolitical relations. To answer this challenge we must alter the world's approach to manufacturing, engineering, and healthcare.

Professor Marika Taylor, Head of the College of Engineering and Physical Science:

Life changing technologies help shape the future through addressing global challenges, unlocking new opportunities and improving the quality of life around the world. Researchers at the University of Birmingham are leading the development of critical technologies for the twenty-first century, from quantum sensors through to state-of-the-art healthcare devices, from advanced materials through to artificial intelligence. Our work on energy and advanced manufacturing processes will help reduce the use of resources and minimize environmental impact, contributing to a more sustainable future.

- Smart hydrogels that detect early signs of mouth cancer by 'catching' saliva proteins and releasing them in a lab for testing have been developed by Dr Ruchi Gupta. A recent award of £350,000 from Cancer Research UK and EPSRC to create a prototype flavoured 'lollipop' from these hydrogels will further the research, resulting in the kinder diagnosis of mouth cancers, avoiding painful and invasive procedures and biopsies.
- The transition to electric vehicles (EVs) brings challenges and opportunities associated with the need to manage the recycling of EV lithium-ion batteries. To cope with the increasing volume, vast improvements in the speed, environmental footprint and the economics of recycling processes will be required. The ReLiB project is developing recycling technologies that will put the UK at the cutting edge of research & development while building the industrial capacity to underpin the transition to EVs.

- Support for the progression of life-changing technologies to market with patient capital investment to scale and grow start-up companies through technology readiness levels, creating a welldeveloped ecosystem for deeptech organisations in the UK and long-term returns for the economy.
- Enhanced support and initiatives to accelerate a national strategy for materials innovation, aligning government, industry, and academia, on the synergies and opportunities to ensure the UK maintains a world-leading position in rapidly expanding materials markets.
- Support investment in large scale compute resources so that the West Midlands can maximise use of artificial intelligence to enhance productivity across all sectors of the economy.



- Future Forests. The Birmingham Institute of Forest Research "FACE" facility is a Free Air Carbon Dioxide Enrichment facility in a mature Oak woodland in Staffordshire, the only such facility in the Northern Hemisphere. To meet the urgent challenge, the team are increasing CO2 levels immediately around the trees to simulate the atmosphere we're predicted to have in 2050, evaluate risk, and develop solutions.
- Clean Air Science. WM-Air Clean Air Science for the West Midlands - integrates internationally leading research expertise from environmental science to economics to support regional policy development for improved air quality and health. Working with partners ranging from the West Midlands Combined Authority and the NHS through to Birmingham County Football Association, WM-Air is developing real-world measures to improve the health and lifespan of 2.8 million people across the region, and reduce air pollution inequality between communities. WM-Air played a pivotal role in the development of the nationally unique West Midlands Air Quality Framework, launched in late 2023 to drive improved air quality for the region for the coming decade.

- Our country and our planet cannot survive without thriving forests. Government must secure the proper establishment of new, diverse, forests, and the sustainable management of our existing forests. We are calling for work across government to establish highly-skilled "forest GPs" as the intellectual and policy equals of medical and veterinary practitioners for a healthy and sustainable UK.
- Regulation of carbon markets to avoid "carbon colonialism" and degradation of existing biodiversity.
 Measure and account for the whole climate impact of forests, including non-CO2 greenhouse gases, and changes to land-surface brightness. It is vital that forest contributions to Net Zero balance only essential, non-replaceable, fossil-fuel uses.
- 3. The Government should introduce a sliding scale to reward companies that surpass the 30% threshold of the 2022 Plastic Packaging Tax, and introduce appropriate measures to mitigate the risk of fraud, to ensure end-of-life impacts are priced into materials.



- Birmingham Health Innovation Campus. Located in Selly Oak, Birmingham Health Innovation Campus (BHIC) is set to become a world leading healthcare technologies hub. The first phase of the development, No.1 BHIC, which is due to open in 2024, will harness world-leading academic and clinical strengths while bringing new commercial power to the region to accelerate life sciences research, taking innovative new healthcare treatments and technologies from early development to real life application. Birmingham Health Innovation Campus will provide world-class infrastructure for the development and scaling of startups, spinouts and attract investment from large pharma and biotechnology firms; and all connected to Birmingham Health Partners to utilise the unrivalled infrastructure and relationships with NHS partners and universities in the city.
- Medical AI regulation. The STANDING Together project is bringing together MHRA, NIHR and the NHS AI Lab to create a framework to make sure medical AI applications are safe and effective for everyone, regardless of their background or ethnicity. AI in healthcare has huge potential, but regulation is necessary to avoid data biases begin amplified. The project is now mapping communities underrepresented in AI models that are being used, and the team have worked with NICE, the WHO and the National Screening Committee on fair use of AI in healthcare.

- Empower regions to maximise innovation to solve healthcare needs and health inequalities through the creation of Health Science Systems, bringing together Universities and healthcare providers to access greater, targeted funding for place-based research and development to speed up diagnostics and access to treatment for conditions including cancer.
- Enable the untapped potential for innovation in healthcare technology and life sciences research by improving incentives for starting and scaling up businesses, extending innovation accelerators, and implement the recommendations of the O'Shaughnessy report for commercial clinical trials.
- Ensure that our healthcare system is exploiting the benefits of artificial intelligence for every UK citizen through the creation of a Centre of Excellence for Regulatory Science & Innovation in Digital and Al Healthcare.

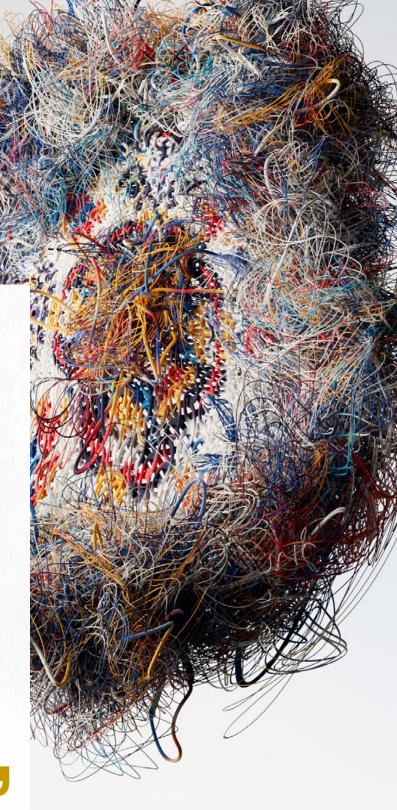
Connecting Cultures

Our Connecting Cultures research promotes and connects diverse cultures, fosters social inclusion, shared ownership, and a sense of belonging. Through all of our work we're changing lives and bridging gaps through innovative projects that celebrate diversity.

Professor Helen Abbott, Head of the College of Arts and Law:

The big questions of the day can only be answered by deep understanding of culture and heritage. In a time of rapid societal change, our researchers at the University of Birmingham are unlocking access to global cultures and heritage to help improve inclusivity, wellbeing, and belonging. Our large-scale analysis of language systems and media forms is generating ways to strengthen community relations and advance societal cohesion.

It is vital that we do this work in collaboration with key players in the creative economy and heritage industries, as much as with technology providers and business leaders. Developing long-term sustainable ways to ensure continued access to the learning, insights, and knowledge of global cultures and heritage is the ultimate goal, and is needed more than ever.



- element of the National Curriculum in England, yet many deaf young people struggle to access his work and there are very few resources available to help teachers support them. The University of Birmingham's Signing Shakespeare project sets out to tackle this issue and make culture more inclusive. Since 2000, our academics have worked with the Royal Shakespeare Company to produce a programme of active, rehearsal room-based resources for the study of Shakespeare's plays, supported by image-rich presentations and films created by deaf actors and directors using three different sign languages.
- Russian invasion in February 2022, more than 184,000 Ukrainians have arrived in the UK via the government's 'Homes for Ukraine' scheme. Ukrainians in the scheme can travel to the UK, work and claim benefits, provided they have a sponsor willing to offer them accommodation for a minimum of six months. But it is currently unclear if and how they will be able to remain in the UK after their initial visas of between 18 months and 3 years run out. We are working with Citizens UK on their campaign for pathways to citizenship that are fair, affordable, and timely.

- Ensure access to culture and heritage for all as a crucial component of wellbeing, representation, and inclusivity.
- 2. **Embed SEN provision in the delivery of literary heritage** that is part of the National Curriculum, such as Shakespeare.
- Provide fair, affordable and timely routes to citizenship for all those who have settled in the UK. Clear routes to citizenship will improve lives and strengthen our communities, democracy, and economy.

Fairer World



- Inclusive Education. The Autism Centre for Education and Research (ACER) is challenging the prevalent misconceptions around autistic children and young people. ACER is offering knowledge of autism to staff in education settings, supporting them to steer away from generalist understandings of what makes for 'good' education of autistic students. The Vision Impairment Centre for Teaching and Research focuses on the social and educational inclusion of people with vision impairment. It has conducted studies in developing countries aimed at increasing access, promoting inclusion, and improving the curriculum and teaching methods. This work is taking place alongside research in the UK, which is empowering young people with greater educational and social inclusion as they transition through to adulthood.
- Pagional Development. City-REDI brings together partners across the Midlands to shape policy, advancing economic and social development of cities and regions and creating a fairer world that equips regions equitably to grow and be secure. Through place-based research, City-REDI is leading on the Local Policy Innovation Partnership, a research hub exploring how local places can be empowered to meet the needs of their communities. Collectively these projects have the potential to catalyse key sectors, design better interventions and develop clear monitoring systems in the region.

- Reduce regional inequalities through long term investment in place-based economic development institutes.
- 2. **Provide national guidance** on reducing school exclusions and non-attendance of students with Special Educational Needs and Disabilities (SEND).
- 3. The Curriculum Framework for Children and Young People with Vision Impairment (CFVI) to be embedded within the National Standards to address inconsistencies in specialist support.



Afterword

from Professor Stephen Jarvis, Provost and Vice-Principal

As England's first redbrick university founded to serve the public good, our history of civic and regional engagement is as old as the University itself. We take seriously our responsibility to foster community relationships and drive economic, social, and cultural growth. It is our way of giving back to the city we call home. Through our international excellence, we are able to bring the world's best practice to the region, applying our teaching, innovation and research locally to tackle challenges that the region faces.

As an anchor institution, the University plays a major role in shaping the lives of people within Birmingham and the West Midlands - building capability, capacity and helping to inform local agendas. The University's City-Region Economic Development Institute - City REDI - has provided analytical capacity to the Mayor of the West Midlands and the Combined Authority to ensure they have access to the skills and capabilities they need.

Our impact on the regional economy is extensive. As one of the largest employers in the West Midlands, the University supports more than 13,000 full-time equivalent jobs in the region and 1 in 50 jobs in Birmingham alone. Nearly half of the University's procurement expenditure takes place in the West Midlands, with a quarter in Birmingham itself.

We have established numerous partnerships with local businesses, from start-ups to industry giants, creating a robust ecosystem that fosters innovation. The Birmingham Health Innovation Campus and Tyseley Energy Park are prime examples of how we are translating academic research into real-world applications, generating jobs, and attracting investment to the region.

The University is leading on the delivery of the West Midlands Health Tech Innovation Accelerator pilot project, that brings together key regional stakeholders to supercharge the region's ability to accelerate new health and medical technologies. The project aims to attract more public and private R&D investment into the region, potentially catalysing an innovation cluster in the long term.



We would welcome the opportunity to build on the innovation partnership we have developed with the West Midlands Combined Authority, local industry and other key regional higher education institutions, by delivering a West Midlands Innovation Deal. This would allow us to act as a key stimulus for the Local Growth Plan and unlock the potential for economic growth that comes through the combination of cutting-edge academic research, training and skills generation, and dynamic local businesses.

The University is poised to tackle new and longstanding challenges, shape the development of local skills and innovation ecosystems, and address productivity and social issues hindering prosperity in the region. However, we cannot achieve this alone. It requires active collaboration with our civic partners to understand and then address key economic development and community needs in the area. The University is crucial to that process from the very outset, so should be at the table when any local growth plans are developed.

In its 125th anniversary, the University remains steadfast in its dedication to civic engagement and regional development. By working together with our partners in government, industry and the community, we can overcome challenges and unlock the full potential of our region. In so doing, the University will continue to be a catalyst for regional prosperity and a model of civic responsibility for generations to come.





Who we are

The University of Birmingham is a global institution working within an inclusive and vibrant city. We're the UK's first civic University and we see this as being a force for good to the communities we serve, here in Birmingham, but also across the world. For nearly 125 years we've remained firmly committed to our foundations in the highly diverse communities, people, and economy of the city of Birmingham and the West Midlands.

We are a key member of the Russell Group, a founding member of the Universitas 21 global network of research universities and, for more than a century, have been pursuing and sharing knowledge through outstanding teaching and world-leading research.

With more than 8,000 staff, 40,000 students, and 300,000 alumni across the globe, we are a key part of the UK's cultural and soft power in geopolitically important regions around the world.

We count ten Nobel Laureates among our staff and alumni who have been integral to some of the greatest scientific discoveries of recent times, such as the Higgs Boson and Gravitational Waves. Pioneering in other ways, we were the first university to establish a fully comprehensive secondary school, and we opened our new campus in Dubai in 2018, becoming the first Russell Group and Global Top 100 University to do so. Our 2030 strategy will see us further enhance our research expertise and establish ourselves in the top 50 universities globally. We'll also build on the substantial progress we've made in the quality, ambition and impact of our research in different areas over the last decade.

Visit our website to find out more about the University of Birmingham: https://www.birmingham.ac.uk

Working with us

We actively engage with regional and national policymakers and stakeholders. As such, we are very keen to support you with your parliamentary activities, and also to highlight some of the key issues and themes our university is focussed on.

Please do let us know if you would be interested in:

- Meeting or hearing from our key academics on research or policy issues.
- Tabling Written or Oral Parliamentary Questions in support of the UK's universities.
- Writing to Ministers or speaking in debates on these policy issues.
- Visiting our campus in Birmingham to see our research in action.
- Attending our events.

We would be very happy to draft any materials to support your parliamentary work, so please do get in touch with our public affairs team at publicaffairs@contacts.bham.ac.uk



