



International Festival of Surveying

University of the West of England, Bristol

10-11th February 2021



Programme Introduction



The **International Festival of Surveying** is a partnership between UWE Bristol and CASLE (Commonwealth Association of Surveying and Land Economy). Following on from CASLE's Golden Jubilee Conference in 2019 the theme for this two-day event was the **United Nations Sustainable Development Goals** (SDGs). Held as a virtual conference on the 10th and 11th February 2021, the Festival brought together experts in the surveying sector to discuss the future of the built environment and to celebrate international communities. Chairs, presenters, and delegates, including members of CASLE and students from the Department of the Built Environment, UWE connected from their homes and places of work from locations worldwide.

Organised by **Dr Jim Mason**; Associate Head of Department Built Environment, UWE, the event was structured into four half-day sessions, each with a specific focus, comprising:

- Sustainable Project Management
- Conservation Challenges
- Current and Emerging Technologies
- Real Estate and the Environment

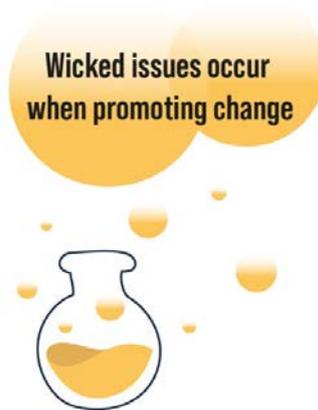
The Rapporteur Notes provide a summary of each of the 12 presentations, supplemented by notes on presentations given by **Dr Jim Mason** reviewing the UK context, and that of **Mr Tony Westcott** upon the history of surveying and education at UWE. Feedback on the CASLE members' questionnaire is also included. The Notes conclude with a reflection upon converging themes and tensions which emerged across the two days and their relationship to the theme of the Festival: the **United Nations Sustainable Development Goals**. Further resources are available on the Festival Website at <https://www.festivalofsurveying.co.uk/>



Day 1 - Welcome



Opened by CASLE President **Joseph Ajanlekoko** with a warm welcome to speakers, chairs, and delegates and thanks to organizers, the festival demonstrates CASLE's continuing commitment to encouraging the development of constructive attitudes towards sustainability through appropriate educational opportunities. Moreover, **Joseph Ajanlekoko** highlighted the Festival's contribution to defining the future of surveying, and to the development of the professional ethics and competencies needed to advise Governments on the sustainable management and development of land and natural resources in the future.



"How do we need to change for a better future?"

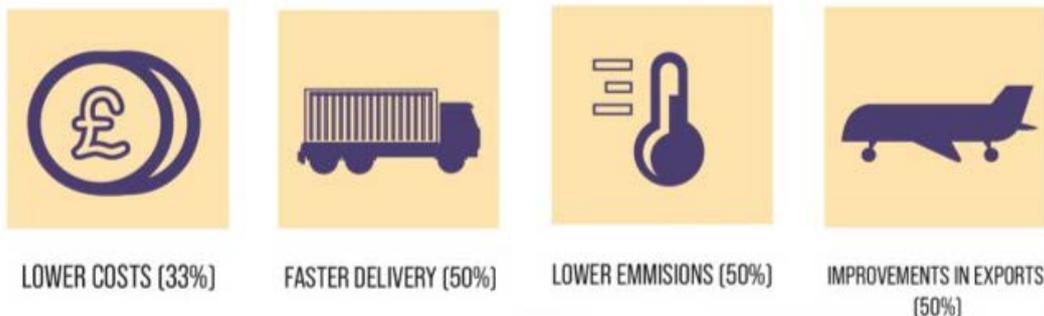
Expanding upon these themes and posing the question, "How do we need to change for a better future?" **Professor Elena Marco**, Head of Department of Architecture and the Built Environment (ABE), UWE, identified climate change and diversity as two critical factors within the wicked problems faced by the construction industry and education. To this end, embedding the ethos and practices of sustainability within the array of Higher Education ABE courses at UWE is an ongoing process of curriculum review and development, the aim being to educate a diverse next generation of leaders to challenge the current and prevailing perspective and practices of the construction sector. Making these changes also requires a critical mass of like-minded people from culturally diverse perspectives, such that the Department comprises 18% BAME and 45% female employees. As the 3rd largest Department of the Built Environment in the UK, the need to improve, adapt and overcome, is further challenged by the constraints, and demands of the pandemic, for which online teaching/learning and CPD initiatives, such as the Festival of Surveying and the "Introduction to Zero Carbon" MOOC, provide additional opportunities and value. **Professor Elena Marco** was pleased to extend a warm welcome to CASLE members and for UWE to be able to participate within this vibrant global community.



The UK Context – Events, Drivers and Trends

Dr. Jim Mason reviewed the changing circumstances and impact of recent events upon the construction sector from a UK perspective. The pre-pandemic expectation placed upon the sector by the UK Government for sustainable economic growth through built environment and infrastructure projects, has become an imperative in post-pandemic recovery. The industry is challenged with embracing collaborative practices and technological innovation such as Modern Methods of Construction (MMC) to improve project outcomes not only across time, cost, and quality criteria, but also to support sustainable social, environmental, and economic goals. This includes stakeholders accepting responsibility for past industry failures, such as the Grenfell tragedy, and implementing lessons learned to improve the provision of “better” homes, services, and infrastructure within the new Planning framework. Ramifications of the uncertainties of Brexit upon the supply chain, size and diversity of workforce, and as a potential source of disputes continue to unfold and are yet to be fully understood and evaluated. A UWE alumnus Frank Arko-Thakor also briefly described his work as a QS in several major civil engineering projects in England, and his role as cofounder of the Black Professional Network to connect, influence and impact the inclusion of ethnic minorities in the sector.

Construction Industry Strategy 2025



Day 1



Sustainable Project Management

REDUCE
Economic, Environmental and Social Impacts
of Construction, while **ENSURING**
the health and social interaction of people.



Chaired by **Dr Hector Aquila, Dr Chaitali Basu and Dr Pablo Prez**

Delay Footprint in Public Infrastructure Construction Projects

Dr. Yash Kumar Mittal - Assistant Professor, Malaviya Institute of Technology, Jaipur

The impact of the late completion of infrastructure projects in India is conventionally measured in terms of tangible project-centric economic loss. Yet, intangible effects are also produced which include a quota of intended yet unrealized broader sustainability gains. The Delay Footprint proposed by **Dr. Yash Kumar Mittal** is thereby an over and above measure of the detrimental outward impact of a project's late delivery upon its envisaged social, environmental and economic benefits. Significantly, the Delay Footprint of a project appears proportional to its scale, such that the Delay Footprint of a Mega project may be in the order of 80 - 90% of its initial budget. While European, Indian and UK data reveal the average delay of infrastructure projects to be between 3 - 4 years, limited data exists regarding the causal factors of delay pertaining to each project-sector. Each project's uniqueness further compounds difficulties of their comparable analysis and mitigation of risks for which **Dr. Yash Kumar Mittal's** research proposes Sustainable Construction Management input parameters comprising; 1) differentiated strategies and methodologies according to project sector, 2) extent of delay footprint, and 3) the impact on local and global societies beyond the internal project stakeholders. It is also envisaged that the Delay Footprint may also be utilised as an assessment model within compensation claims.



Sustainable Futures + Project Management

Rob Leslie-Carter - Director, Arup

What role can Project Management play in achieving a sustainable future? Setting this question within a context of project centric trends and drivers, **Rob Leslie-Carter** elaborated upon three categories identified in *The Future of Project Management* (Arup, 2017), comprising; the need for a diverse workforce that includes a younger generation equipped for digital transformation; the democratization of Project Management and its professional services through open innovation and sharing, and the professional obligation of Project Managers to challenge corporate culture and norms incompatible with sustainable outcomes. Arup's framework for a shared understanding of how to shape a better world is provided by the United Nations Sustainable Development Goals (SDG), against which project outcomes can be mapped to ascertain their value. Of the 17 SDGs, (6) Clean water and sanitation; (7) Affordable and clean energy; (9) Industry, innovation and infrastructure and (11) sustainable cities and communities, are those in which Project Managers have most impact. Moreover, opportunities exist for Project Managers to influence sustainable outcomes beyond the project delivery phase. This should commence though an appropriate choice of client and project, thereupon providing guidance upon strategic and operational direction to support the development of a sustainable business case capable of attracting project funding from ethically minded investors. Acting on moral obligation and responding to business imperatives are both reasons why someone might want to be project managed by you.



A “Stubborn Optimist’s” guide to NZC

Giulia Jones MEng PIEMA – Sustainability Manager, Mace Group



The climate emergency is now and steps towards achieving net zero carbon (NZC) are needed today. As a sustainability manager with a focus on embodied carbon and healthy buildings, **Giulia Jones** addressed the steps an organization needs to take in practice to achieve NZC. Within an existing portfolio, measures such as efficient space utilization, energy efficiency and waste reduction, choice of energy suppliers and changes in behaviour should all be employed. However, these direct approaches are currently insufficient to achieve ZNC, for which the utilization of certified carbon offsetting schemes is vital. Applying these principles of quantifiable carbon emission reduction and verifiable offsetting to their own business and operations, Mace achieved net-zero in January 2021. Setting carbon reduction targets across the entire life cycle of a new build asset from the outset is essential. While greatest opportunities for carbon reduction exist during a building’s operational and maintenance phase, opportunities to reduce embodied carbon during the construction phase should not be overlooked as achieved in the “BREEAM Outstanding” UCL Student Centre through the specification of concrete mix with no detriment to the project’s structural and aesthetic requirements. Furthermore, NZC is compatible with goals for healthy buildings, for which several complementary certification schemes exist. Not only do healthy internal environments which incorporate greater biodiversity reduce CO₂ levels, but also improve occupant wellbeing, cognitive performance and productivity. Meeting the challenging LETI 2020 best practice target of 600 kgCO₂e/m², requires an attitude of stubborn optimism and at least for the time being the application of imperfect solutions.



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Rapporteur Notes: Rebecca Lashley

Day 1

Chaired by **Dr Sam Organ**



Conservation Challenges: Miami, Florida

Warren Adams – Preservation Officer at the City of Miami, Florida

The historic preservation of buildings is contentious and litigious, and the challenges faced in Miami according to **Warren Adams** are further compounded by climate change, the need for sustainable solutions and poverty. Flooding, sea level rise and hurricanes are actual, not theoretic threats to Miami's historic building fabric in which a pragmatic approach is required when considering what it is reasonable to protect within the limits of available resources. Exempting historic buildings from FEMA standards required of new buildings and the need to maintain historic integrity puts historic monuments such as the Miami Marine Stadium (1963) and Vizcaya Museum and Gardens (1910) at risk. While in the former there is no clear solution, in the latter 3D digital scanning has proved a useful tool in the reconstruction of storm damaged elements. Retaining the original features of Miami's historic vernacular buildings while integrating contemporary hurricane protection and sustainable technologies to improve energy performance creates a tension, as does development pressure and the process of gentrification upon once unfashionable districts now considered more desirable within the context of climate change. While some inappropriate and unpermitted alterations may be carried out with good intentions, in other cases buildings are left to fall into neglect and must be protected by order of the City from demolition. Not only is the physical fabric of the City at risk, but also its social and cultural heritage, as communities are displaced. Education and innovative solutions are being used to motivate and enable building owners to appropriately maintain and adapt their historic properties. Approaches include transfer of development rights, grants, tax freezes and credits, parking wavers and permitted change of use in residential areas to encourage the retention of small businesses and cultural enterprises.

Greening the Whitworth

Dean Whiteside

Head of Operations and Buildings for the Whitworth Art Gallery & Manchester Museum



The Grade II Listed Building (1889) that houses The Whitworth Art Gallery and Manchester Museum had become increasingly unfit for purpose and disconnected from its local community and surrounding park. The project aims described by **Dean Whiteside** are to improve access to the collection, expand the exhibition space, enhance visitor facilities, engage with the local community, reconnect the Gallery with the Park, and develop the organizations sustainable credentials. These aims are met in the form of an extension that partially wraps around the existing western galleries, so creating a protective buffer zone and the formation a Courtyard Garden flanked by a café and new gallery. Energy performance is improved through a building with high thermal mass and the adoption of a conservation heating strategy to maintain appropriate humidity levels but requiring the use of airtight displays to treat objects rather than spaces and building occupants to dress appropriately. Sources of green energy utilised for space and water heating in the new building include ground source heat pumps and earth tubes situated in the adjacent park and solar thermal panels on the roof. Natural over artificial light is prioritised in the galleries; with bris-soleil to obstruct low-level winter sun and lighting levels monitored and controlled via a Smart system to adjust blinds and LED lighting appropriately. Lessons learned include the need for improved engagement and integration of stakeholders during the design phase, avoidance of construction defects through appropriate onsite management, challenges in the commissioning, operation and maintenance of the complex, bespoke building management systems, and difficulties of interfacing new with existing building systems. Successes included improved energy performance and enhanced visitor facilities, with greater links to the community and park and an increase in biodiversity and use across the site.

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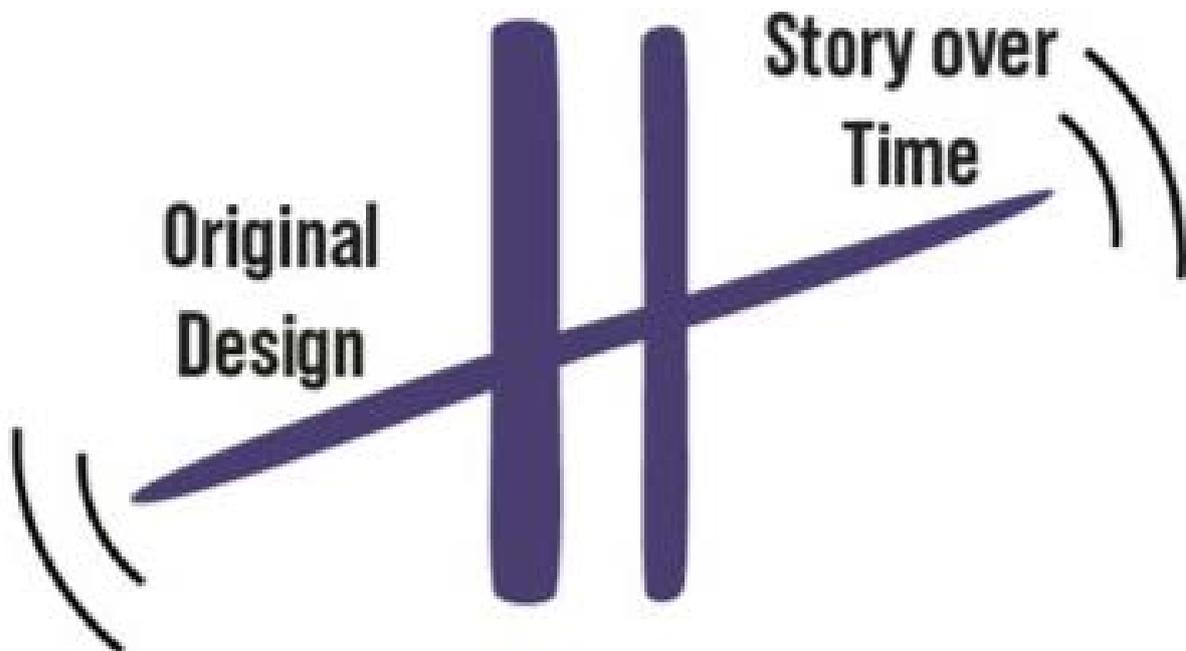
Rapporteur Notes: Rebecca Lashley

Harrods: Heritage as brand

Hornsey Town Hall: Heritage at Risk

Katy Ghahremani – Partner at Make Architects

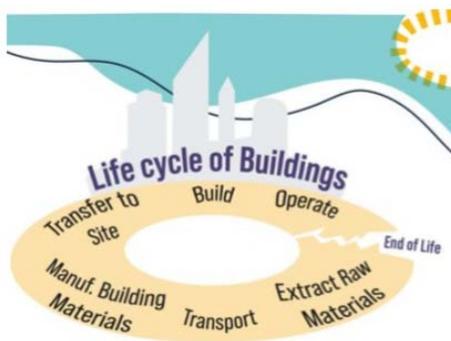
Historic buildings change over time and accumulate accretions; Harrods, London is no exception. Reestablishing the Harrods' brand through its historic architectural presence requires careful archival research, building fabric investigations, and liaison with stakeholders from maintenance crews to Historic England. Stakeholder collaboration informs decisions regarding how far to turn back the clock, while satisfying current legislative requirements and enhancing customer experience. For instance, **Katy Ghahremani** explained that returning the building façade to its diurnal rhythms of daytime awnings and nighttime illuminated transparency is facilitated through 3D digital modelling to reconfigure years of building services including sprinkler systems currently hidden behind vinyl applied to the glazing. Similarly, creating three new transitional double height spaces which enhance the spatial connections up and through the building while reinstating the 1930's aesthetic has required strict scheduling and coordination with manufacturers to drop in prefabricated cantilevered escalators before closing the top lit atrium with a new double-glazed, curved lattice dome. By contrast Hornsea Town Hall is a Grade II* Listed Building on the Buildings at Risk Register. Having fallen into disrepair over the last 30 years, a light touch approach is being adopted to repair existing features, while mixed-used planning approval with no designation of individual space allows for flexible and adaptable use of spaces in the future. The capital cost of the project being covered by a mixed residential development has met with some local objections, despite the gains for the local community including co-worker community spaces, assembly hall and performance space, roof top palace and hotel.



Day 2 - Welcome



Day Two of the Festival was opened by Professor **Paul Olomolaiye**, Pro Vice-Chancellor Equalities and Civic Management at UWE Bristol. Paul is an enthusiastic supporter of international collaboration and the sharing of best practice amongst the community of learners. Paul extended his welcome to speakers, chairs, and delegates and hoped for a meaningful dialogue and legacy from the undertaking. Paul's background is in construction project management and his comprehensive and extensive publication is a good evidence base for the importance of collaboration.



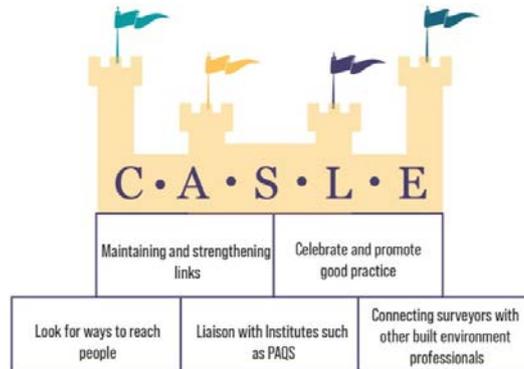
A Personal History of Quantity Surveying at UWE

Tony Westcott – FRICS, MSc Proj. Mgmt., Dipl. Bldg. Econ.

A member of the Executive Board of CASLE, **Tony Westcott** has over 50 years' experience as a QS working in private practice and academia in the UK and abroad. Looking back to look forward, Tony shared his personal journey from trainee at Gleeds to Senior Lecturer at UWE to consider how the profession has developed, faced challenges and adapted over the years. Changes in career entry pathways have occurred not only in response to the shifting position of RICS regarding the value of vocational training versus academic qualifications, but also to meet the various needs of employers and students. The Faculty of the Built Environment, UWE has been subject to these changes but also innovative in its approaches to teaching and learning, using blended methods which include the use of digital tools and integrated work-placed practice. Providing online learning since 2007 has meant UWE was well equipped to respond to the requirements of the current pandemic. Utilizing the latest technologies such as BIM, also prepares students for the digital workplace. Core to the Faculty is the ethos of interdisciplinary collaboration and sustainable development. Learners benefit from the diversity of staff and students, in which team-based modules provide the opportunity to engage with each other's perspectives across cultural and professional boundaries. Within this context, the role of the QS is increasingly to assess whole life value for money and life cycle carbon reduction through the management of relevant data. Analogous to climbing a mountain, working as a QS requires a spirit of innovation and the ability to face challenges collaboratively.

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Rapporteur Notes: Rebecca Lashley

Feedback on CASLE Questionnaire



CASLE members were invited to submit a questionnaire on the future directions that should be considered. The questionnaire received 30 returns and a preference for research and short courses was identified in the results. CASLE's European Vice-Chair **Dr Jim Mason** outlined a SWOT report (Strengths Weaknesses Opportunities and Threats) for CASLE. Key strengths were identified as its people and network. Weaknesses are apparent around overlap with other organisations and lack of funding. Opportunities exist around an increased emphasis of the importance of the Commonwealth post-Brexit and funding tenders. Threats centre on the precarious position of the organisation in terms of involving and engaging current and future generations of surveyors.

Day 2 Current and Future Technologies

Chaired by **Dr. Abdul-Majeed Mahamadu** and **Trina Ratcliffe-Pacheco**

HBIM: Towards Smart Heritage for Sustainability and Preservation Purposes

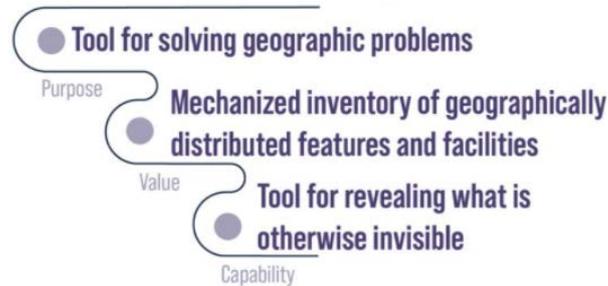
Trina Ratcliffe-Pacheco, MSc BIM Programme Leader, Architecture Studio Leader



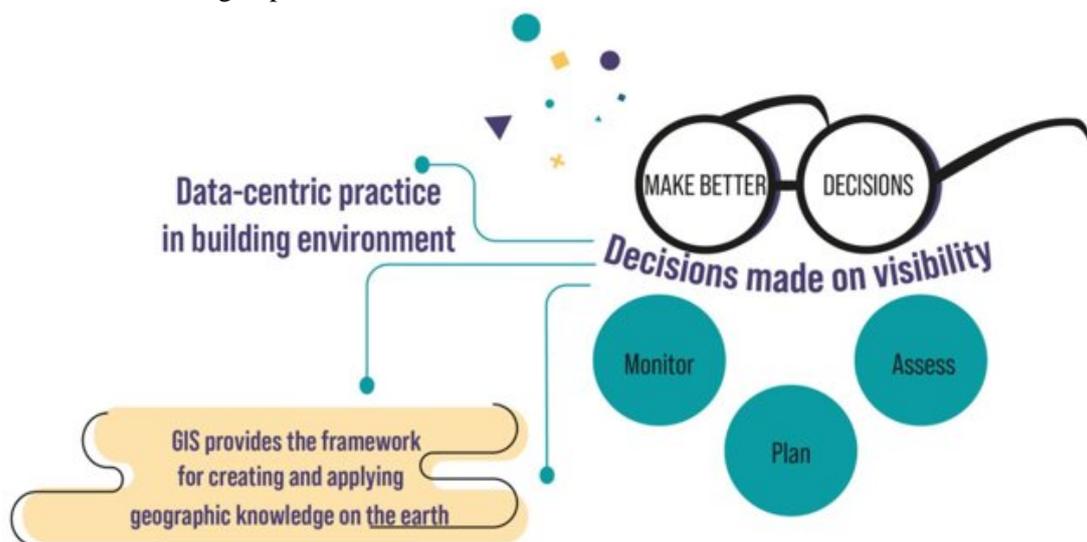
An increasing array of digital and smart tools associated with building information modelling (BIM) can be used in the management and operations of historic assets including for preservation and sustainability purposes. **Trina Ratcliffe-Pacheco** explained that Heritage Building Information Modelling (HBIM) can be used to provide a repository of archival building data collected by digital surveying tools such as 3D laser or Lidar scanning, to support a range of conservation associated activities such as reproduction, reconstruction, rehabilitation or retrofitting. In circumstances where it is not possible to investigate the existing building fabric through stripping back, non-invasive digital tools can be used to collect more complex data about the physical characteristics of the asset using techniques such as thermography, air permeability and pressurization tests, point cloud surveys and building pathology analysis. Drone scanning facilitates the monitoring of building elements or assets that would otherwise be hard to access due to their location. Live data across a range of physical and environmental parameters, including active systems, can also be collected through sensors to monitor an asset over time and can be used for sustainability, health and safety, management and maintenance purposes. Data can be accessed through a range of digital devices connected to the Heritage Building Information Model, and the potential exists to create virtual and/or augmented reality models for use by a range of stakeholders. The value of HBIM has been demonstrated in projects such as Bath Abbey Footprint Project to install sustainable geothermal underfloor heating which included the cataloguing, lifting and repair of the existing nave floor. A recent UWE PhD research project has investigated the use of Artificial Intelligence for damage diagnosis and analysis of causal factors of structural movement from which to propose coherent interventions.

Geographic Information Systems/ Science

Collins Terkpetey

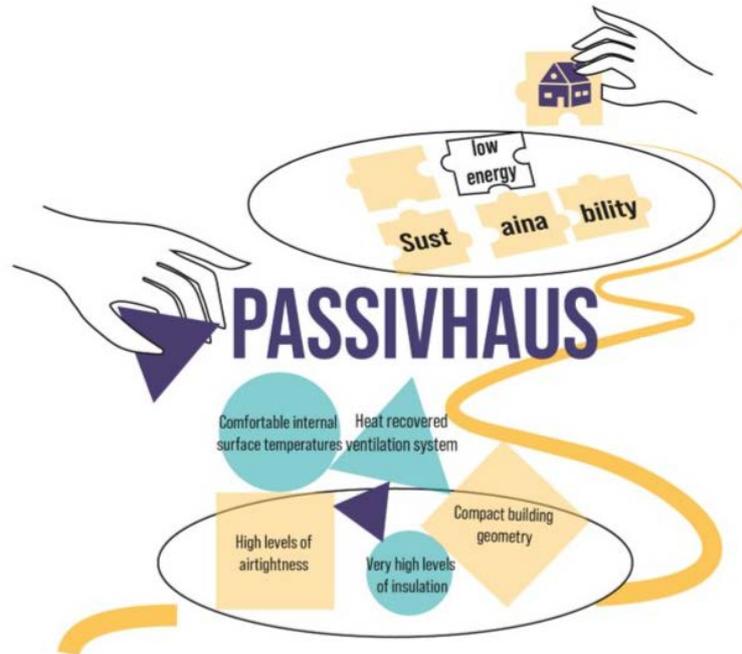


Collins Terkpetey explained GIS from first principles to some applications in the built environment. Every activity on the surface of the earth has a geographic location and time of occurrence. Together Geographic Information Systems and Geographic Information Science respectively provide the technologies and methods to capture, store, manage, manipulate, analyse and display geographic information. GIS thereby provides a framework through which information can be captured, measured, analysed and modelled to create knowledge about the earth and used to inform better decision making for the purposes of planning, managing, acting and controlling. The five components of GIS comprise hardware, software, data, people and methods. When connected in a network the system is complete. Data stored in GIS is either in Vector or Raster form, can be transformed between the two, and can be applied in multi-criteria decision analysis, for example to identify sites that satisfy all 'X' criteria. Outputs can be represented to the user in a simple graphical format showing geographically where all the criteria intersect. Other applications include modelling house prices based on contextual parameters such as crime levels, air quality and schools, or monitoring environmental changes over time from satellite imagery against relevant climatic data. Using layering of multiple binary viewsheds, GIS can also be used to calculate a privacy score for individual residential garden in a proposed new development based on its visibility from the surrounding windows. Architects, planners and local authorities can use such approaches to model and test different design options.



Passivhaus: Origins & Technologies of a Low-Energy Design Standard

Giles Boon BSc (Hons) MSc MCIAT CEPH AFHEA
Senior Lecturer in Architectural Technology at UWE



Giles Boon is a Passivhaus designer and advocate of Passivhaus; both as a certified standard and an approach to the low-energy design and construction of buildings. Originally developed in the late 1980s for application in the housing sector, the Passivhaus approach utilizes a range of technologies to balance energy losses and gains and interfaces with different sustainability outcomes such as thermal comfort and healthier internal environments. Principles commonly applied to Passivhaus design include a compact building geometry, very high levels of insulation, large areas of south facing triple/Low-E glazing, comfortable internal surface temperatures, and high levels of airtightness with the use of Mechanical Ventilation with Heat Recovery (MVHR). Energy performance is calculated using Passivhaus' proprietary software design tool (PHPP spreadsheet), while onsite quality assurance and testing upon completion are used to ensure and verify a performance heating energy requirement of below 15kWh/m²/year is delivered. Recent advances by the Passivhaus Institute include the integration of renewable sources of energy for offsetting purposes within higher tiers of certification and a Sketchup plugin, Design PH, for 3D energy modelling. Neither PHPP nor Design PH are compliance tools. Under ongoing development is a new Passivhaus standard for leisure centres using data from the world's first multi-zoned Passivhaus leisure complex, currently nearing completion in Exeter. **Giles Boon** hopes to see Passivhaus characteristics such as the use of MVHR, progressively incorporated into UK regulatory standards despite potential industry barriers.

Day 2

Real Estate and the Environment

Chaired by **Dr. Louise King**

Delivery of Sustainable Developments

Elgan Jones, Associate Director Cubex Ltd.

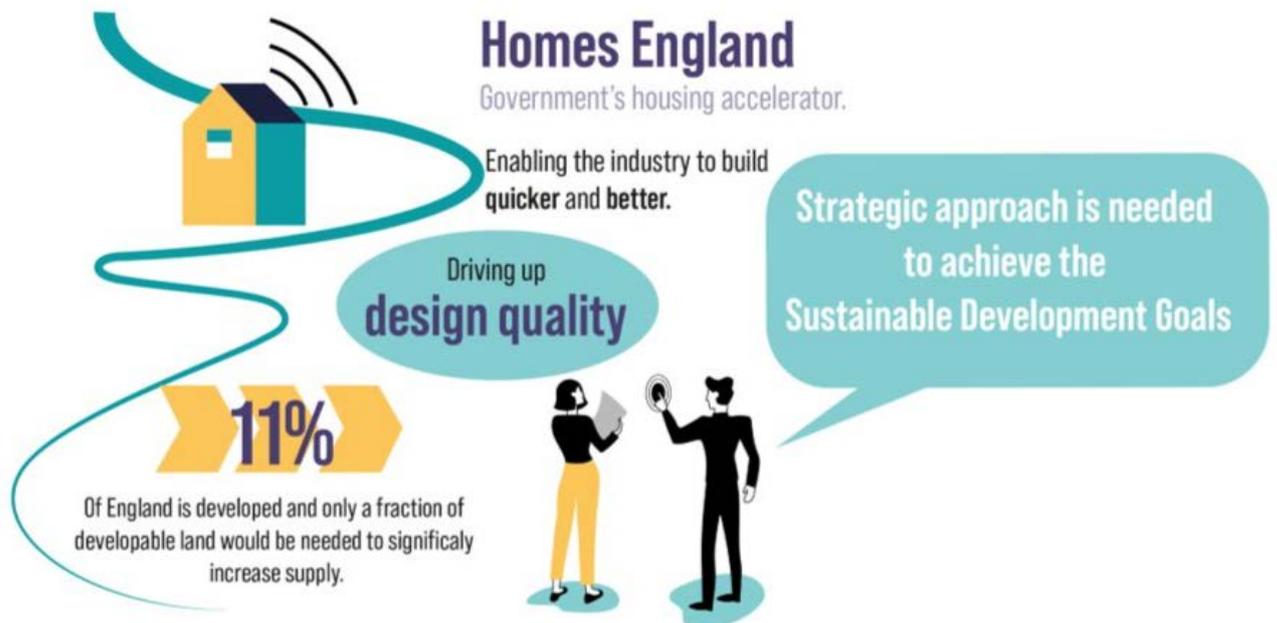
Launched in 2004, Cubex Ltd. is a regional real estate developer working across the South West and South Wales. The business case for sustainable development is driving the investment required to make urban regeneration viable, as **Elgan Jones** explained; in which mixed-use, residential and commercial developments are becoming increasingly appealing to ethically minded investors due to lower operational costs, improved whole life returns and building as the physical embodiment of preferred values. Backed by Fiera Capital, the industrial brown field site at Finzels Reach, Bristol demonstrates how a dense mixed-use development incorporating commercial property, affordable housing, housing for rent, and housing for open market sale has resulted in a revitalised urban community and social hotspot. The sense of place is enhanced by pedestrian routes and cycle ways that ensure connectivity into and across the site, including via the sculptural form of the new Castle Bridge. Adjacent to Finzels Reach and forward funded by Tesco Pension Fund, Halo is an energy efficient sustainable office building designed to meet BREEAM Outstanding criteria. Innovative features include connecting into Bristol's district heating network, intelligent air quality management and EV charging in underground parking. The long-term business value and de-risking of investments due to the property's sustainable credentials including WELL certification has attracted key clients such as Osborne Clarke to let space prior to completion. Finzels Reach and the Halo demonstrate how social, environmental and economic sustainability has appeal both locally and internationally.



Sustainability and Design in Property

Ian Collins, Senior Partnership and Development Manager, Homes England

Homes England is the Government agency responsible for sustainable housing growth tasked with enabling the delivery of 300,000 homes per year throughout this decade. Working with Partners and stakeholders, the agency has access to £2 billion in funding, relevant expertise and the authority to unlock the land needed to address the housing shortage caused by market failure, lack of investment and land shortages. Within this context, **Ian Collins** highlighted the importance of improving design quality in “building for a healthy life” and the work being carried out with the Building Research Establishment (BRE) and Design Council to support the development of an appropriate vision and strategic framework. Liveable Exeter is an urban regeneration project that exemplifies good practice in sustainability and placemaking, in which Exeter County Council’s (ECC) political commitment is driving forward an ambitious delivery plan. Barriers to overcome include housing density, typology and values linked to viability, technical constraints and upfront infrastructure costs, compounded by the absence of a current Local Plan. As a key Partner, opportunities for Homes England to facilitate the programme include identifying a pipeline of suitable sites and supporting ECC to unlock strategic opportunities for low carbon, financially viable development guided by Garden City principles and the Toolkit for Future Placemaking. The project envisages the development of 12,000 new homes, including new buildings on green-field sites and repurposed redundant buildings to form 8 new communities within the bounds of a thriving and connected city by 2040.



All at Sea? Development in 21st century

Dr Tom Appleby, Associate Professor of Property Law
and David Turner, Projects Director, Blue Marine Foundation



The conversational format of this presentation between **Dr Tom Appleby** and **David Turner** explored issues of sustainability pertaining to the marine environment surrounding the UK. The Crown Estate is an independent public body which operates on a commercial basis, owns vast area of seabed surrounding the UK and has responsibilities extending up to 200 nautical miles offshore. The physical scale and power generation capabilities of offshore windfarms around the UK has increased dramatically in the 4 leasing rounds since 2003, and in contrast to generally remote North Sea oil rigs, fields of wind turbines are not only situated comparatively close to shore but appear to be moving ever closer. Yet only with the formation of the Marine Management Organization (MMO) in 2009, has any form of governance existed with strategic oversight for the sustainable development of the marine environment of England's waters. Both interlocutors expressed concern that the opportunity should not be missed to envision a sustainable development strategy for optimising the use of the sea for recreational and commercial uses including aqua culture and fishing, energy production, infrastructure and communications. The National Marine Park in Plymouth Sound, home to a complex and diverse mix of uses, exemplifies the sustainable benefits of improved connectivity between coastal cities to the public realm of their local seas. The Blue Marine Foundation has worked with adjoining Local Authorities and landowners to ensure the marine space works as a valued and integrated whole, and that terrestrial planning challenges are overcome as they link and collide with the sea.

Emerging themes and reflections from the Festival

Dr Jim Mason and the UWE team which to thank all the participants and attendees at the Festival. Special thanks go to the excellent rapporteur team of Rebecca Lashley and Ugne Astra who have performed extremely well with their graphical and note based reporting.

Making steel and cement counts for 10% of all Greenhouse Gas emissions worldwide. A greater and richer population will only push harder for more. The conference heard of climate crises events in Florida on the front line of sea-level rises. Solutions were addressed in the conference ranging from Passivhaus to monetarizing the value of sustainable real estate. Innovation and behavioural change appears to be the keys to unlocking meaningful inroads into the emissions figure. UWE and CASLE have significant contributions to make to this vital area and have aspirations to be beacons for positive change in the built environment.

