

# HEALTHY CITY DESIGN INTERNATIONAL

RESEARCH • POLICY • PRACTICE

14-15 OCTOBER 2019

ROYAL COLLEGE OF PHYSICIANS, LONDON

## FINAL PROGRAMME

DESIGNING FOR UTOPIA OR DYSTOPIA?  
PEOPLE AND PLANETARY HEALTH AT A CROSSROADS

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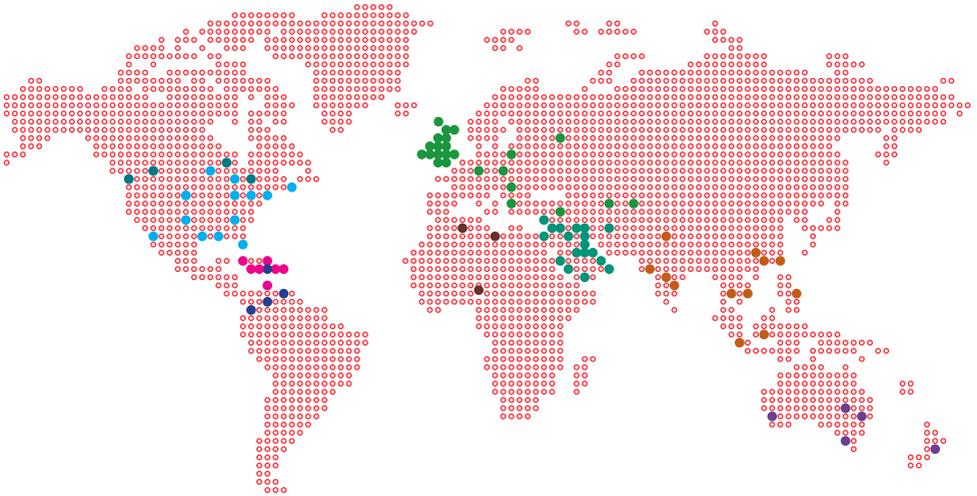
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# LLEWELYN DAVIES

- Architecture
- Interior design
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- Graphic design
- Urban design



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Regarded as the UK's most successful exporter of hospital planning and design, Llewellyn Davies has delivered over 250 healthcare projects in more than 80 countries worldwide over the last 6 decades. We are active in Africa and the Middle East and are currently working on several major hospitals in Greece, Trinidad & Tobago and Qatar.

In the UK, Llewellyn Davies maintains its position as a proponent of flexible, patient-centric solutions for a range of primary, community and acute care developments. Our deep understanding of master planning further underpins our value to healthcare clients in estate planning and in complex planning environments.

**Dear colleagues,**

Against a background of global climate change, healthier cities and communities are shaped by taking tough decisions on issues such as air quality, resilience planning, spatial strategies, working practices, active travel, sustainable homes and green spaces. How can we design a thriving, health-inducing future for all citizens – and avoid descending into crisis and chaos?

The movement to develop healthier cities appears to be coming to a crossroads. On one hand, there is a utopian vision of urban change and renewal. In this scenario, walking, cycling and public transport addresses over-reliance on the car; effective resilience planning stops the spread of infectious diseases and mitigates the effects of climate change; flexible working strategies and environments reduce stress and improve productivity; and access to safe, affordable housing, green spaces and healthy local food underscore a commitment to community wellbeing. Technological advances and AI are safely integrated into our daily lives, enhancing city services, increasing efficiencies and improving the quality of life for all citizens in a fair and equitable way. As a result, a significant burden is lifted off formal healthcare services.

The alternative vision is dystopian. In this scenario, indoor and outdoor air quality deteriorates further as cars clog up the roads; more than 500 cities are threatened with flooding, and many more with water shortages and heatwaves more intense than before; tensions rise between business districts and areas of urban deprivation; 'food deserts' increase; and green spaces are gobbled up by development. Healthcare services, in this scenario, start to collapse under exceptional pressure and demand.

In this, our third Healthy City Design International Congress, we'll address the question of designing for utopia or dystopia. In a world where the effects of population migration and ageing play out amid rapid urbanisation, how can we support cities to take a healthier path? How can we ensure that, despite the best intentions of policymakers, urban planners, public health professionals, architects, designers and developers, our worst dystopian nightmares don't come true? Environmentalist Sir David Attenborough's impassioned plea to save our planet at the World Economic Forum in Davos, in January this year, effectively sketched out the destructive path we're currently on.

**Bridging the gap between research, policy and practice**

Healthy City Design 2019 (HCD 2019) International Congress & Exhibition is a global forum for the exchange of knowledge on the research, policy and practice of designing healthy and sustainable cities and communities. Each day will open and close with keynote plenary sessions before splitting up into four streams (eight in total). Day one will focus on: urban design and placemaking; homes and neighbourhoods; work and workplace; and smarter cities. Day two will cover: sustainable development; city planning and the public realm; place-based health; and mobility, travel and transport.

The event will also host a poster gallery of innovative research and projects (pp24-25), a knowledge-focused exhibition space, and an evening gala and networking dinner (p26) with entertainment from the Royal Academy of Music and a keynote address from Lord Nigel Crisp, a world-leading thinker in the design of healthy communities.

**Prof Jeremy Myerson**

Helen Hamlyn Chair of Design  
The Helen Hamlyn Centre for Design,  
Royal College of Art

**Marc Sansom**

Director  
SALUS Global Knowledge  
Exchange

# CREATING HEALTHY CITIES, THROUGH NATURAL PLAY.



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# THE ROYAL COLLEGE OF PHYSICIANS

The 3rd Healthy City Design International Congress, 14–15 October 2019, is being held, once again, at the prestigious headquarters of the Royal College of Physicians (RCP) in London.

Since its foundation in 1518, the RCP has had five headquarters in London. The current Grade 1 listed building in Regent's Park was designed by architect Sir Denys Lasdun and opened in 1964. Considered a modernist masterpiece, it's one of London's most important post-war buildings.

In 1992, Sir Lasdun was awarded the Royal Institute of British Architects' Trustee Medal in recognition of his work at the RCP, considered to be "the best architecture of its time anywhere in the world".

Sir Lasdun won the competition to design the new headquarters in 1959. He was surprised at being asked to design for such a traditional body, given his modernist philosophy, and he made it clear that he would not create a classical-style building. Ultimately, he responded to the challenge with a skilful integration of centuries-old traditions and his own vision.

As an award-winning and highly versatile venue for conferences, meetings, banquets, training and outdoor events, the building has an atmosphere of space and light, with stylish, modern architecture, and a selection of both old and new styles to suit all tastes.



The venue offers:

- **A central London location** – overlooking Regent’s Park, with good access to road, rail and tube.
- **Magnificent conference and banqueting facilities** – tiered auditoriums, exhibition space, event and dining facilities, including the stunning Council Chamber and the ‘jewel in the crown’ – the Dorchester Library.
- **An award-winning Grade 1 listed modern building** – an atmosphere of space and light with a contrasting mix of old and new facilities.
- **A rare heritage collection** – with over 500 years of history and more than 50,000 antiquarian books.
- **High-quality food and service** – eclectic cuisine, bespoke menus and first-class service.
- **A professional venue for international conferences** – a member of Unique Venues of London, International Association of Conference Centres, and London and Partners, to name a few.
- **A private ‘Physic Garden’ for events** – filled with rare plants and flowers from all over the world, suitable for barbecues, receptions and al fresco dining.
- **A professional and friendly events team** – dedicated event managers, catering experts and technicians. Full support is provided before, during and following events.



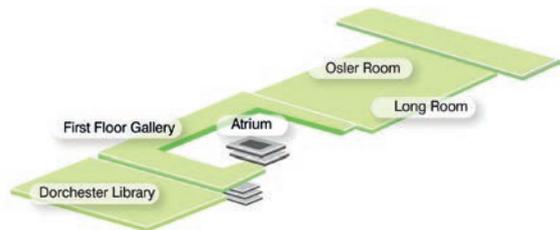
## FIRST FLOOR

### Dorchester Library

- Breakout sessions (Streams 2 and 6), lunchtime workshops, and gala dinner

### Long Room and Osler Room

- Lunch, poster gallery and exhibition



## GROUND FLOOR

### Wolfson Theatre

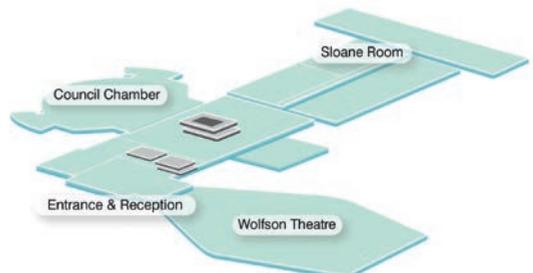
- Main conference plenary sessions and breakout sessions (Streams 1 and 5)

### Council Chamber

- Breakout sessions (Streams 3 and 7) and breakfast and lunchtime workshops

### Sloane Room

- Breakout sessions (Streams 4 and 8)



08.00 REGISTRATION OPENS



**Session 1: Opening keynotes – People and planetary health at a crossroads**

Chair: **Jeremy Myerson**, Royal College of Art, UK

08.45 **Welcome and introduction**

**Jeremy Myerson**, Royal College of Art, UK

09.00 **Keynote: Rewiring the urban landscape for people and planetary health**

**Audrey de Nazelle**, Senior lecturer, Centre for Environmental Policy, Imperial College London, UK

09.30 **Keynote: Designing the future city for human and planetary health**

**Mark W Johnson**, Founding principal, Civitas, USA

10.00 **Panel discussion**

10.15-10.45 COFFEE, POSTER GALLERY AND EXHIBITION



**Session 2: Policy frameworks, tools and community**

Chair: **Giselle Sebag**, Bloomberg Associates, USA

10.45 **Creating utopia and correcting dystopia: innovative transdisciplinary contributions**

**Roderick Lawrence**, Honorary professor and adjunct professor, University of Geneva, University of Adelaide, Universiti Kebangsaan Malaysia, International

11.05 **Improving global and national wellbeing through place-centred approach**

**Michael Chang**, Programme manager – planning and health, Public Health England, UK

**Aimee Stimpson**, National lead – Healthy Places, Public Health England, UK

**Tazeem Bhatia**, Consultant in public health, Public Health England, UK

11.25 **From evidence to practice: interdisciplinary guidelines to integrate health into urban planning processes in Catalunya, Spain**

**Carolyn Daher**, Co-ordinator, Urban Planning, Environment and Health Initiative, Barcelona Institute for Global Health, Spain

**Irene Martin**, Technical officer for planning and programmes, Generalitat de Catalunya, Spain

11.45 **The Place Standard – how good is your place?**

**Shruti Jain**, Health improvement manager (place), NHS Health Scotland, UK

12.05 **Panel discussion**

12.30-14.00 LUNCH, POSTER GALLERY AND EXHIBITION



### Session 3: Designing a healthy new town

Chair: **Jeremy Porteus**, Housing LIN, UK

14.00 **Human connections help us live longer and better. But how do we do it? The case study of 'Local' – a new integrated and sustainable community model**  
**Georgina Lee**, Co-founder, Age of No Retirement, UK

14.15 **From contested space to democratised utopia: sharing ideals at Cranbrook Healthy New Town**  
**Kenji Shermer**, Urban designer, East Devon District Council, UK  
**Jenny McNeill**, Assistant director, strategic development, NHS Devon CCG, UK

14.30 **Northstowe: planning and designing a healthy new town from scratch**  
**Katja Stille**, Director, urban design, Tibbalds Planning and Urban Design, UK  
**Jane Manning**, Director, Allies and Morrison Urban Practitioners, UK

15.00 **Panel discussion**

15.30-16.00 **COFFEE, POSTER GALLERY AND EXHIBITION**



### Session 4: Designing equitable and inclusive communities

Chair: **Rachel Cooper**, Lancaster University, UK

16.00 **A healthy urban design and planning framework integrating sustainability, equity and inclusion**  
**Helen Pineo**, Lecturer in Sustainable and Healthy Built Environments, University College London, UK

16.20 **A systematic review of interventions in community infrastructure (places and spaces) to boost social relations and community wellbeing**  
**Anne-Marie Bagnall**, Professor of Health & Wellbeing Evidence, Leeds Beckett University, UK

16.40 **Creating healthy, living communities – an Irish perspective**  
**Philip Jackson**, Associate director, Scott Tallon Walker Architects, UK  
**Donal Blake**, Director, Scott Tallon Walker Architects, UK

17.00-17.15 **Panel discussion**



### Session 5: Keynote address

Chair: **Chris Liddle**, HLM Group, UK

17.15 **Keynote: Building the healthy city – inciting the healthy choice**  
**Dan Burden**, Director of innovation and inspiration, Blue Zones, USA

17.50 **Closing remarks**  
**Jeremy Myerson**, Royal College of Art, UK

18.00 **Close**

18.30-22.00 **Gala dinner, live music and keynote address**  
 Venue: Dorchester Library – see page 26 for details

Supported by



Stream 2 begins at 10.45 in the Dorchester Library, after the day's opening plenary session (08.45-10.15).



## Session 6: Healthy and sustainable neighbourhoods

Chair: **Helen Pineo PhD, MRTPI**, University College London, UK

### 10.45 **Public housing and public amenities: achieving Sustainable Development**

#### **Goal 11.7**

**Sridevi Rao**, Landscape architect, Indian Society of Landscape Architects, India

### 11.05 **Ruwais UN-planned: a public health and territorial intervention**

**Faris Abuzeid**, Managing director, Faris Abuzeid + Associates (FA+A), Saudi Arabia

### 11.25 **Can affordable and sustainable housing be the keystone to social mobility? Progress one year on**

**Mike Nightingale**, Founder, The Mike Nightingale Fellowship, UK

**Barry Lewis**, Director, Ubuhle Bakha Ubuhle / Beauty Builds Beauty, South Africa

### 11.45 **A framework for a healthy neighbourhood: establishing relationships between healthy behaviours and the social-environmental determinants of health**

**Denise Tan**, Executive architect, Ministry of Health, Office for Healthcare Transformation (MOHT), Singapore

**Samantha Singham**, Executive, Ministry of Health, Office for Healthcare Transformation (MOHT), Singapore

### 12.05 **Panel discussion**

### 12.30-14.00 **LUNCH, POSTER GALLERY AND EXHIBITION**

### 12.40-13.50 **Lunchtime workshop: Designing a healthy city: global perspectives on future living**

Supported by: **Ryder**

**Chair: Oliver Jones**, Director of research, Ryder Architecture, UK

**Panel: Peter Ellery**, Senior advisor, National Wellness Institute, USA

**Sue Morgan**, Director of architecture and built environment, Design Council, UK

**Marcus Grant**, Editor-in-chief, Cities and Health, UK

**Rachel Cooper**, Professor of Design Management and Policy, Lancaster University, UK



## Session 7: Designing for mental health and wellbeing

Chair: **Rhiannon Corcoran**, University of Liverpool, UK

### 14.00 **Urban planning factors and positive impacts upon mental wellbeing**

**Alexander Tully**, Associate technical director, Arcadis, UK

### 14.20 **Impact of design of urban dwellings on health and wellbeing**

**Parisa Kanabar**, Architectural assistant, BDP, UK

**Steve Marshall**, Architect director, BDP, UK

### 14.40 **How do front gardens impact health and wellbeing?**

**Lauriane Suyin Chalmin-Pui**, PhD researcher, University of Sheffield, UK

### 15.00 **Panel discussion**

### 15.30 **COFFEE, POSTER GALLERY AND EXHIBITION**



## Session 8: UK and international policy on healthy homes

Co-chairs:

**Jade Lewis**, Director of advocacy, Saint-Gobain UK and Ireland, UK and Ireland

**Keith Ritchie**, Executive chairman, Titon Holdings, UK



### 16.00 **Workshop: Delivering healthy homes: influencing and shaping government policy and thinking**

The All-Party Parliamentary Group (APPG) for Healthy Homes and Buildings' White Paper 'Building our future: laying the foundations for healthy homes and buildings' makes a series of policy recommendations aimed at ensuring that the homes we live in, both new and old, positively contribute to our physical and mental health and wellbeing. This panel and workshop will explore and compare UK and international research and policy on creating healthier homes and buildings.

**Panel: Roderick Lawrence**, Honorary professor and adjunct professor, University of Geneva, University of Adelaide, Universiti Kebangsaan Malaysia, International

**Bart Vandeghinste**, CEO, Belvent, Belgium

**Jeremy Porteus**, Chief executive, Housing LIN, UK

*Stream 2 will be brought to a close at 17.15, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.15-18.00).*

Stream 3 begins at 10.45 in the Council Chamber, after the day's opening plenary session (08.45-10.15).



**Session 9: Inclusive workplaces: behaviour and biophilia**

Chair: Jane Ellery, Ball State University, USA

10.45 **Designing in the age of anxiety – shaping space through affect**  
Abbie Galvin, Principal, director, BVN Architecture, Australia

11.05 **Workplace loneliness: studies into various workplaces and design interventions**  
Trevor Keeling, Associate, BuroHappold Engineering, UK  
Rachel Edwards, Senior consultant, Lendlease, UK

11.25 **Optimism in workplace design through biophilia**  
Robert Hopkins, Regional director, AHR, UK  
Clive Constable, Commissioning director, Royal College of Physicians, UK

11.45 **The role of landscape architecture in creating the biophilic workplace**  
Joe Clancy, Senior landscape architect, WSP, UK

12.05 **Panel discussion**

12.30-14.00 **LUNCH, POSTER GALLERY AND EXHIBITION**

12.40-13.50 **Lunchtime workshop: Moving from productivity to performance: understanding the modern workplace and how it links to health**

Supported by: International Well Building Institute

Panel: Professor Sergio Altomonte PhD, Faculty of Architecture, Architectural Engineering, Urbanism, Catholic University of Louvain, Belgium

Aidan Parkinson PhD, Senior engineer, skills manager, building performance and systems, Arup, UK



### Session 10: Briefing, measurement and performance

Chair: **Eve A Edelstein**, HxLab Perkins&Will, USA

- 14.00** **The role of creative participatory briefing in strategic workplace design**  
**Aditya Aachi**, Architect and partner, Cullinan Studio, UK
- 14.20** **Measuring the impact of health and wellbeing in the workplace**  
**Young Lee**, Research associate, University College London, UK  
**Derek Clements-Croome**, Professor, University of Reading, UK
- 14.40** **Power to the people: using pre- and post-occupancy evaluations to shine a light on actual design performance**  
**Harry Knibb**, Associate, Sustainable Places team lead, WSP, UK
- 15.00** **Panel discussion**

**15.30-16.00** **COFFEE, POSTER GALLERY AND EXHIBITION**



### Session 11: Light, sound and health

Chair: **Jeremy Myerson**, Royal College of Art, UK

- 16.00** **Exploring soundscaping options for the cognitive environment in an open-plan office**  
**Young Lee**, Director, Innovative Workplace Institute, UK  
**Elizabeth Nelson**, Head, Learn Adapt Build, Netherlands  
**Joshua S Jackman PhD**, Senior science consultant, ART Health Solutions, UK
- 16.20** **A comparison of daylight and artificial lighting: the effects on subjective alertness, vitality and cognitive performance**  
**Chengpeng Zhao**, PhD student, The Bartlett School of Environment Energy and Resources, UCL, UK
- 16.40** **How to make cities sound healthier**  
**Jian Kang**, Professor, University College London, UK
- 17.00-17.15** **Panel discussion**

*Stream 3 will be brought to a close at 17.15, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.15-18.00).*

Stream 4 begins at 10.45 in the Sloane Room, after the day's opening plenary session (08.45-10.15).



**Session 12: Mapping and data: people, place and health**

Chair: **Blake Jackson**, Stantec Architecture, USA

- 10.45**     **Public participation GIS approach for mapping leisure-time physical activity**  
**Anna Kajosaari**, Doctoral candidate, Aalto University, Finland
- 11.05**     **Project CityZen: impact-focused research to deliver transformational health improvements in Sao Paulo, Brazil**  
**Michael Wilkinson PhD**, CEO and founder, Inavya Ventures, UK
- 11.25**     **Streetcoin: an idea to integrate place-based social landscape with healthcare risk models through the electronic health record**  
**Chethan Sarabu MD**, Paediatrician/Director of clinical informatics, Stanford Medicine / doc.ai, USA  
**Alan Waxman MLA**, Landscape architect, Alan Waxman Ecosocial Design, USA
- 11.45**     **How data analytics can speed up the urban transformation towards a healthy city**  
**Marianne Lefever**, Partner, Healthy City Global, Canada
- 12.05**     **Panel discussion**
- 12.30-14.00**     **LUNCH, POSTER GALLERY AND EXHIBITION**



### Session 13: Connected cities: modelling the urban experience

Chair: **Katie Wood**, Arup, UK

- 14.00** **Developing a BIM-based predictive digital advice platform and retrofitting sensors to measure energy consumption, damp and mould in housing association properties to improve facilities management and occupant health and wellbeing**  
**Oliver Jones**, Director of research, Ryder Architecture, UK
- 14.20** **Using computational fluid dynamics (CFD) to model the impact that tall buildings have on the dispersion of roadway emissions**  
**Ender Ozkan**, Vice-president, RWDI, Canada
- 14.40** **Examining urban oppressiveness in real and virtual settings**  
**Robin Mazumder**, Vanier Canada graduate scholar, PhD candidate, University of Waterloo, Canada
- 15.00** **Panel discussion**
- 15.30-16.00** **COFFEE, POSTER GALLERY AND EXHIBITION**



### Session 14: Resilient and productive neighbourhoods

Chair: **Peter Ellery**, National Wellness Institute, USA

- 16.00** **Flourishing cities**  
**Derek Clements-Croome**, Professor emeritus, University of Reading, UK  
**Marilyn C Ramos**, Director-Development Consultancy, PRP, UK
- 16.20** **Construction of health resilience of local communities: with the contribution of Internet of Things (IoT) technologies**  
**Rosalba D'Onofrio**, Associate professor, University of Camerino, Italy  
**Elio Trusiani**, Associate professor, University of Camerino, Italy
- 16.40** **Commercialising health: the future of productive neighbourhoods**  
**Andrea Imaz**, Senior urban designer, Perkins&Will, UK  
**Peter Baird**, Associate, Perkins&Will, UK  
**Veronica Reynolds**, Specialist travel advisor, Vectos / Milton Park, UK
- 17.00-17.15** **Panel discussion**

*Stream 4 will be brought to a close at 17.15, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.15-18.00).*

08.00 REGISTRATION OPENS



**Session 15: Opening keynotes – Arts and health in the city**

Chair: Sunand Prasad PPRIBA, UK Green Building Council; Penoyre & Prasad, UK

08.55 **Welcome and introduction**

Chair: Sunand Prasad PPRIBA, Trustee, UK Green Building Council; Founding partner, Penoyre & Prasad, UK

09.00 **Keynote: Creative cities: the importance of arts, culture and community to population health**

Daisy Fancourt PhD, Senior research associate, University College London, UK

09.30 **Keynote: Music, health and the city: a utopian vision**

Julia Jones, CEO, Found in Music / Author, The Music Diet, UK

10.00 **Panel discussion**

10.15-10.45 COFFEE, POSTER GALLERY AND EXHIBITION



**Session 16: Designing for planetary health**

Chair: Carolyn Daher, Barcelona Institute for Global Health (ISGlobal), Spain

10.45 **Rapid assessment of the environmental and health impacts of city sustainability policies**

James Milner, Assistant professor, London School of Hygiene & Tropical Medicine, UK

11.05 **Developing a framework to encompass coastal flooding and mental health under present and future climate change**

Caroline Anitha Devadason, Public health consultant, Johns Hopkins University, USA

11.25 **Post-waste landscapes: design principles for a paradigm shift**

Eleni Gklinou, Urban designer, Grimshaw Architects, UK

11.45 **Health systems on Mars? Sustainable development designing for people, place and planet**

Alice Liang, Principal, Montgomery Sisam Architects, Canada

Karine Quigley, Intern architect, Montgomery Sisam Architects, Canada

12.05 **Panel discussion**

12.30-14.00 LUNCH, POSTER GALLERY AND EXHIBITION



### Session 17: Climate action, urban health and green infrastructure

Chair: **Janet Sutherland**, The Academy of Urbanism, UK

14.00

#### Healthcare's climate footprint: how the health sector contributes to the global climate crisis and opportunities for action

**Kristian Steele**, Senior consultant, Arup, UK

14.20

#### Valuing urban green infrastructure: a tool to level the playing field

**John Haxworth**, Landscape planner, Barton Willmore, UK

**Caroline Vexler**, Analyst, Vivid Economics, UK

14.40

#### Restorative values and cognition ability improvement effects of man-made park in Hong Kong downtown area

**Luyao Xiang**, PhD candidate, Chinese University of Hong Kong, China

15.00

#### How community-focused systems are addressing urban-global issues

**Blake Jackson**, Sustainable design leader, Stantec, USA

15.20

#### Panel discussion

15.45-

COFFEE, POSTER GALLERY AND EXHIBITION

16.15



### Session 18: Global responses to urban air quality

Chair: **Audrey de Nazelle**, Imperial College London, UK

16.15

#### The Clean Air Hospital Framework (CAHF): a health-sector response to tackling air pollution

**Larissa Lockwood**, Head of health and air quality, Global Action Plan, UK

**Nick Martin**, Head of sustainability and environmental management, Great Ormond Street Hospital NHS Foundation Trust, UK

16.35

#### Air quality in the built environment: a national and global perspective

**Catriona Brady**, Head of Better Places for People, World Green Building Council, UK

**Sophia Cox**, Sustainability advisor, UK Green Building Council, UK

16.55-

#### Panel discussion

17.10



### Session 19: Closing plenary

Chair: **Jeremy Myerson**, Royal College of Art, UK

17.10

#### Panel debate: Designing the healthy city – is utopia possible? Is dystopia inevitable?

Panel: **Rachel Cooper**, Professor of Design Management and Policy, Lancaster University, UK

**Sunand Prasad PPRIBA**, Senior partner, Penoyre & Prasad, UK

**Giselle Sebag**, Urban planning consultant, Bloomberg Associates, USA

**Mark W Johnson**, Founding principal, Civitas, USA

**Sue Morgan**, Director of architecture and built environment, Design Council, UK

17.40

#### Closing remarks

**Jeremy Myerson**, Royal College of Art, UK

17.45

#### Close

07.30-08.45

## Breakfast workshop: Healthy City Design: maximising your impact through public engagement

**Panel:** **Dan Burden**, Director of innovation and inspiration, Blue Zones, USA  
**Sarah Bowman**, Director of strategic engagement and impact, Trinity College Dublin, Ireland  
**Pam Sethi**, Chief innovation officer, The Institute for Advancements in Mental Health, Canada

*Stream 6 begins at 10.45 in the Dorchester Library, after the day's opening plenary session (08.55-10.15).*



## Session 20: Modern visions of the garden city

**Chair:** **Marcus Grant**, Cities & Health, UK

10.45

### A new vision for Letchworth Garden City

**Sarah Wigglesworth**, Director, Sarah Wigglesworth Architects, UK

11.00

### Gardenia: re-imagining the garden city

**Robert Delius**, Divisional director, Stride Treglown, UK

11.15

### Nostalgia or utopia? The role of garden villages in delivering healthy communities

**Geraint Hughes**, Director, NEW Masterplanning, UK  
**Andy Ward**, Director, NEW Masterplanning, UK

11.30

### A systemic approach to healthy placemaking: re-imagining the garden city

**Prachi Rampuria**, Co-founder and director, EcoResponsive Environments, UK

11.45

### Growing together: a productive framework for a circular garden city

**Rolf Nielsen**, Partner, architect, C.F. Moller Architects, UK

12.00

### Panel discussion

12.30-14.00

### LUNCH, POSTER GALLERY AND EXHIBITION

12.40-13.50

### Lunchtime workshop: Taking action towards transdisciplinary partnership working for planning inclusive and healthy places

**Supported by:**  HEALTH & WELLBEING IN PLANNING

**Chair:** **Michael Chang**, Co-founder, Health and Wellbeing in Planning Network (HiP Network), UK  
**Panel:** **Rachel Flowers**, Director of public health, Croydon Council; Co-founder, HiP Network, UK  
**Gemma McKinnon**, Public health officer – planning, Warwickshire CC; Co-founder, HiP Network, UK  
**Paul Southon**, Chair, Faculty of Public Health, Healthy Spatial Planning Special Interest Group, UK  
**Charlotte Morphet**, Principal policy planner, Waltham Forest Council; Co-founder, Women in Planning Network, UK  
**Irene Beautyman**, Planning for Place programme manager, Improvement Service Scotland, UK  
**Liz Green**, Programme director for health impact assessment, Public Health Wales, UK



### Session 21: Urbanisation, active living and placemaking

Chair: **Steven Ware**, Art & Build, France

14.00 **Challenges to providing active-living infrastructure in England and Jamaica: a qualitative cross-cultural comparison**

**Anna Le Gouais**, PhD researcher, University of Cambridge, UK

14.20 **Health and wellbeing as a catalyst for whole-systems, place-based design**

**Paul Simkins**, Associate, Arup, UK

14.40 **Madinat al Irfan: a case study for the New Urban Agenda**

**Nicholas Choy**, Associate, Allies and Morrison Urban Practitioners, UK

15.00 **Creating a sense of place through placemaking**

**Peter Ellery**, Senior advisor, National Wellness Institute, USA

**Jane Ellery**, Assistant professor, Ball State University, USA

15.20 **Panel discussion**

15.45-16.15 **COFFEE, POSTER GALLERY AND EXHIBITION**



### Session 22: Design for the public realm

Chair: **Tarsha Finney**, Royal College of Art, UK

16.15 **The Nighttime Design Initiative**

**Joana Mendo**, Architect and lighting designer, Joana Mendo | Lighting Design, Germany

**Leni Schwendinger**, Creative director and consultant, International Nighttime Design Initiative, USA

16.35 **Designing for active lives: contextualising toilet provision**

**Gail Ramster**, Senior research associate, Helen Hamlyn Centre for Design, Royal College of Art, UK

**Jo-Anne Richard**, Senior research fellow, Helen Hamlyn Centre for Design, Royal College of Art, UK

16.55-17.10 **Panel discussion**

*Stream 6 will be brought to a close at 17.10, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.10-17.45).*

Stream 7 begins at 10.45 in the Council Chamber, after the day's opening plenary session (08.55-10.15).



**Session 23: Community-based healthcare**

**Chair: Adrian Powell**, NHS Property Services, UK

**10.45** **Developing model communities**  
**John Cooper**, Director, John Cooper Architecture, UK  
**Richard Darch**, CEO, Archus, UK

**11.05** **The therapeutic landscape**  
**Lucy Brittain**, Architect and partner, Cullinan Studio, UK

**11.25** **Physical, mental and civic health: suburban intensification and integration**  
**Kathryn Firth**, Urban design director, NBBJ, USA  
**David Lewis**, Partner, NBBJ, UK

**11.45** **Healthcare in the urban habitat: challenging healthcare providers, designers and urban leaders to collaborate for the improvement of community health**  
**Andrew Irvine**, Senior principal, Stantec Architecture, USA

**12.05** **Panel discussion**

**12.30-14.00** **LUNCH, POSTER GALLERY AND EXHIBITION**

**12.40-13.50** **Lunchtime interactive panel discussion: Designing the healthy city from the inside-out: measuring the impact of places on people**

Supported by: **Perkins&Will**

**Chair: Eve A Edelstein**, Co-founder, Clinicians for Design; research director, HxLab Perkins&Will, USA

**Panel: Emma F Stockton**, Consultant paediatric anaesthetist, Great Ormond Street Hospital, UK

**Gerry Tierney**, Associate principal, co-director, P+W Mobility Lab, Perkins&Will, USA

**Peter Baird**, Associate, Perkins&Will, UK

**Andrea Imaz**, Senior urban designer, Perkins&Will, UK



### Session 24: Designing for children

Chair: **Sue Morgan**, Design Council, UK

14.00

#### Child obesity and the built environment

**Jessica Attard**, Portfolio manager, Guy's & St Thomas' Charity, UK  
**Kieron Boyle**, CEO, Guy's & St Thomas' Charity, UK

14.20

#### School superzones: creating healthier and safer places for children to live, learn and play

**Katie Hunter**, Public health specialist, Greater London Authority, UK  
**Jin Lim**, Deputy director of public health, Southwark Council, UK  
**Michael Chang**, Programme manager – planning and health, Public Health England, UK

14.40

#### Exploring children's needs of natural elements in the school environment under hot desert conditions

**Tasneem Bakri**, Architectural engineer, Alpin, UAE University

15.00

#### Paving the way for neighbourhood play: examining the social and environmental affordances that support children's neighbourhood activity and mobility

**Janet Loebach**, Assistant professor, Cornell University, USA

15.20

#### Panel discussion

15.45-  
16.15

COFFEE, POSTER GALLERY AND EXHIBITION



### Session 25: Designing for ageing

Chair: **Hugh Barton**, WHO Collaborating Centre, University of West England, UK

16.15

#### Homes4Life: certification for investment in ageing in place

**Menno Hinkema**, Senior researcher and consultant, TNO, Netherlands

16.35

#### The potential for intergenerational living

**Roland Karthaus**, Director, Matter Architecture, UK  
**Anthony Hu**, Architect, Matter Architecture, UK

16.55-  
17.10

#### Panel discussion

*Stream 7 will be brought to a close at 17.10, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.10-17.45).*

Stream 8 begins at 10.45 in the Sloane Room, after the day's opening plenary session (08.55-10.15).



## Session 26: Mobility and the urban realm

Chair: Harry Knibb, WSP, UK

- 
- 10.45 **A framework for integrated active travel in the future city**  
Cathy Russell, Urban designer, Ryder Architecture, UK  
Oliver Jones, Director of research, Ryder Architecture, UK
- 
- 11.05 **Reclaiming the public realm: how evolving mobility could help reclaim our cities**  
Gerry Tierney, Associate principal, co-director, P&W Mobility Lab, Perkins&Will, USA
- 
- 11.25 **Small Change, Big Impact**  
Andy Martin, Urban designer, Transport for London, UK
- 
- 11.45 **Slow interchange and the quality of sharing in public and mobile spaces**  
Dan Phillips, Studio leader, Royal College of Art, UK  
Artur Mausbach, Senior research fellow, Royal College of Art, UK
- 
- 12.05 **Panel discussion**
- 
- 12.30-14.00 **LUNCH, POSTER GALLERY AND EXHIBITION**



### Session 27: Designing and planning for active travel

Chair: **Oliver Jones**, Ryder Architecture, UK

- 14.00** **The walkable city**  
**Snigdha Jain**, Associate sustainability consultant, WSP, UK
- 14.20** **What are city streets for? Bring back the “jaywalker”**  
**Bernd Steffensen**, Professor, Darmstadt University of Applied Sciences, Germany  
**Robert F Cox PhD**, Senior associate, dean for globalisation, Purdue University, USA
- 14.40** **Inequalities in neighbourhood walkability for older adults**  
**Razieh Zandieh**, Lecturer in Urban Design and Planning, University of Manchester, UK
- 15.00** **What prevents city planners monetising the benefits of active travel through a widely available online tool? Results of a mixed-methods study**  
**Christopher Billington**, Public health specialist, Transport for London, UK
- 15.20** **Panel discussion**

**15.45-16.15** COFFEE, POSTER GALLERY AND EXHIBITION



### Session 28: Urban mobility, behaviour and health

Chair: **Jim Chapman**, Manchester School of Architecture, UK

- 16.15** **Cognitive health and mobile navigation systems: the role of physical environment**  
**Negar Ahmadpoor**, Lecturer in Urban Planning and Design, Ulster University, UK
- 16.35** **Comparative roles of urban-form factors shaping walking behaviour to/from school**  
**Ayşe Ozbil Torun**, Senior lecturer, Northumbria University, UK
- 16.55-17.10** **Panel discussion**

*Stream 8 will be brought to a close at 17.10, whereupon delegates are invited to return to the Wolfson Theatre for the day's closing plenary session (17.10-17.45).*

Hosted in the Osler and Long Rooms, the poster gallery offers a chance to learn about many inspiring research and design projects, enriching the oral sessions. To view the digital posters and their abstracts, visit [www.salus.global/journal](http://www.salus.global/journal) and join the SALUS community for free as an individual member.

**P01 The community as a catalyst for healthier lifestyle**

Jane Ellery, Ball State University / Sustainable Muncie Corp (USA); Peter Ellery, National Wellness Institute (USA)

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**P02 Engaging a wider public health workforce: bringing public health into architecture education**

Rachael Marsh (UK), Paul Pilkington (UK), Elena Marco (UK), Louis Rice (UK), University of the West of England

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**P03 Transformative learning to support caring places**

Kirsty Macari, University of Dundee (UK); Diarmaid Lawlor, Architecture and Design Scotland (UK)

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**P04 Re-imagining a city's assets and resources**

Jane Ellery, Ball State University / Project for Public Spaces (USA); Sally Goerner, Research Alliance for Regenerative Economics / Project for Public Spaces (USA); Laura Torchio, Project for Public Spaces (USA)

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**P05 Acoustic performance planning and assessment protocols for open-plan offices: a case study in an open-plan office prototype lab**

Young Lee, Innovative Workplace Institute (UK); Elizabeth Nelson, Learn Adapt Build (Netherlands)

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**P06 What's next? An analysis of Groningen's ambitions and challenges to figure as a healthy city in the 21st century**

Lara Caldas Fernandes da Silveira, University of Groningen (Netherlands)

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**P07 Campaigning for lower speed limits as a catalyst for community regeneration**

Rod King MBE, 20's Plenty for Us (UK)

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**P08 A participative case study: changes required to transform urban community food growing in Dundee**

Ness Wright, Centre for Alternative Technology (UK)

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**P09 The tyranny of lifeless housing: reinstating integrated good practices for a secure future**

Simran Singh, Freelancer (India)

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**P10 Research and practice for wellbeing in the workplace**

Veronica Baroni, BDG architecture+design (UK)

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**P11 Service design for homeless tuberculosis patients: peer-support network and pilot for inpatient rehabilitation / self-help capacity enhancement**

Jisun Yang, Yonsei University (South Korea)

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**P12 Challenged mobility**

Anna Boldina, Koen Steemers, Cambridge University (UK)

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**P13 An exploration of the impact of oriental culture and its physical environment on present-day city suicidal prevention design in Seoul, Republic of Korea**

Alex Harrington, Loughborough University (UK)

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**P14 The plastic-free house**

Harry Knibb, WSP (UK); Olga Turner Baker, Ekkist (UK); James Robb, Fiona McGarvey, WSP (UK)

**P15 Population influx: opportunity for salutogenic design**

Maneka Kunder, CallisonRTKL (USA);  
Darshita Gillies, Maanch (UK); Jun Jia,  
Cannon Design (USA)

**P16 Better workspaces – a holistic practical standard for temporary construction facilities**

Dr Eva Gkenakou, James Pay, Multiplex Europe (UK); Maria Fernandez Cachafeiro, Multiplex Canada (Canada); Paloma Algarra Resino, Multiplex Europe (UK)

**P17 Impact of urbanisation and sunlight exposure on cataract incidence: a population-based study in an Asian country**

Chia-Hui Wang, University of Taipei (Taiwan); Wan-Syuan Yu, Joint Commission of Taiwan (Taiwan); Nai-Wen Kuo, Taipei Medical University (Taiwan)

**P18 Eco-urbanism and healthy cities**

Luke Engleback, Studio Engleback (UK)

**P19 Building out vector-borne diseases in sub-Saharan Africa: the BOVA Network**

Fiona Shenton, Steve Lindsay, Durham University / BOVA Network (UK)

**P20 Light therapy for all: light therapy in public space**

Pam Sethi, Elizabeth Brazen, Deborah D'Amico, Institute for Advancements in Mental Health (Canada)

**P21 Socially valuable: from opportunities to outcomes in the built environment**

Michaela Packer, Becci Taylor, Arup (UK)

**P22 Healthcare at home: right size, right location**

Mohammed Ul-Haq, Neil Orpwood, HLM Architects (UK)

**P23 Health and wellbeing as a catalyst for whole-systems, place-based design**

Paul Simkins, Arup (UK)

**P24 A net-zero carbon future: achieving ambitious energy demand targets in public-sector buildings**

Alastair Forbes, Dr Oliver Jones, Ryder Architecture (UK)

**P25 Adopting the Scandinavian Sengetun model to design for end-of-life care**

Alastair Forbes, Dr Oliver Jones, Ryder Architecture (UK)



# GALA DINNER, LIVE MUSIC AND KEYNOTE ADDRESS

**Monday 14 October, Dorchester Library**  
18.30-22.00

## Keynote speaker:

### Lord Nigel Crisp

Independent crossbench member of the House of Lords;  
Co-chair, All-Party Parliamentary Group on Global Health



## Designing for utopia or dystopia? People and planetary health at a crossroads

Taking place on the first evening of the congress, in the Dorchester Library, the gala dinner will be an opportunity for delegates to network informally with members of the programme committee, as well as enjoy a mouth-watering three-course meal and a live classical musical performance from the Royal Academy of Music.

Since its foundation in 1822, the Royal Academy of Music has made an inestimable impact on the musical landscape, both in the UK and abroad. Indeed, it has permeated the music profession at all levels, with Academy alumni including classical giants Sir Simon Rattle and Sir Harrison Birtwistle, along with pop stars Sir Elton John and Annie Lennox.

During the evening, Lord Nigel Crisp, an enthralling public speaker, will deliver a keynote address on the importance of urban health and creating healthy communities.

Currently co-chair of global nursing campaign Nursing Now, Lord Crisp is a senior fellow at the Institute for Healthcare Improvement, an honorary professor at the London School of Hygiene and Tropical Medicine, and a foreign associate of the US National Academy of Medicine. He was formerly a distinguished visiting fellow at the Harvard School of Public Health and Regent's Lecturer at Berkeley, California.

As chief executive of the English National Health Service and permanent secretary of the UK Department of Health – the largest health organisation in the world with 1.3 million employees – he led a series of major healthcare reforms between 2000 and 2006.

The organisers wish to thank HLM and Llewelyn Davies for sponsoring the gala dinner and networking evening.



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# Ryder



Join our panel and workshop sessions

Designing a healthy city: global perspectives on future living  
14 October, 12:40, Dorchester Library

Connected cities: modelling the urban experience  
14 October, 14:00, Sloane Room

Designing and planning for active travel  
15 October, 14:00, Sloane Room



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## LUNCHTIME WORKSHOP:

### Designing a healthy city: global perspectives on future living

**Monday 14 October,  
Dorchester Library, 12.40-13.50**

Organised by:

# Ryder

Against a backdrop of a planetary and environmental health crisis, the way humanity lives in the future will be determined by the decisions we make today.

This session will bring together an influential international panel of interdisciplinary researchers, practitioners and policy thinkers to share their views on the challenges and opportunities facing future living. Our panellists will address the key challenges that are currently edging us closer to a dystopian future and highlight the opportunities that will lead us towards a more utopian vision.

Challenging decisions need to be made on issues such as the use of 5G technology, driverless cars, artificial intelligence, and the Internet of Things to the way we design and plan for urban resilience, improved air quality, new forms of renewable energy, green infrastructure, healthier homes, and sustainable food systems. These decisions have the potential to set a new course for a utopian vision of a thriving global society, where health, wellness and opportunity are accessible by all, or a dystopian world characterised by dysfunction and chaos.

We'll touch on broader topics of health and wellbeing, as well as social and environmental health and creating resilience in our cities and communities. We'll inquire into the impact of how changing behaviours, technology and economic models are influencing how we're likely to live and work in the future. We'll collectively decide where to begin and what we should focus on first to deliver healthier and sustainable cities to create a more utopian future.

#### Chair:



**Dr Oliver Jones (UK)**  
Director of research,  
Ryder Architecture

#### Panel:



**Peter Ellery (USA)**  
Senior advisor,  
National Wellness Institute



**Sue Morgan (UK)**  
Director of architecture and built  
environment, Design Council



**Marcus Grant (UK)**  
Editor-in-chief,  
Cities and Health



**Rachel Cooper (UK)**  
Professor of Design Management and  
Policy, Lancaster University

## Panel:



**Professor Sergio Altomonte PhD**  
(Belgium)  
Faculty of Architecture, Architectural  
Engineering, Urbanism,  
Catholic University of Louvain



**Aidan Parkinson PhD** (UK)  
Senior engineer, skills manager,  
building performance and systems,  
Arup

## LUNCHTIME WORKSHOP:

**Moving from productivity to performance:  
understanding the modern workplace and  
how it links to health**

**Monday 14 October,  
Council Chamber, 12.40-13.50**

Supported by:  
International WELL Building Institute

Work sits at the core of contemporary societies, shaping much of our lives, structuring our buildings and cities, catalysing the priorities of our life choices, and impacting strongly on our temporal and physical identities. Indeed, the workplace is the subject of profound transformations, challenged by the blurred confines brought to the fore by the digital revolution, the expectations of permanent connectivity, the increasing interference and interpenetration between professional, social and family timeframes, the flexibility of working hours and conditions, etc.

New forms of work types are also emerging, changing the requirements for working conditions that have dominated the workplace for several decades. This has a direct and indirect impact not only on the principles by which workplaces operate (eg, energy use) but also on occupants' physical, physiological and psychological comfort, wellbeing and health. In fact, the conditions conducive to energy performance, human comfort and health can, at times, be substantially different, while the combination of physical parameters that are considered conventionally to support task performance might, in the long run, be to the detriment of sustained health and wellbeing.

This workshop aims to catalyse discussion on several interdisciplinary challenges that are necessary to grasp and address in order to design better, more comfortable, healthier, higher-performing and, ultimately, more sustainable and resilient workplaces.

## BREAKFAST WORKSHOP:

### Healthy City Design: maximising your impact through public engagement

**Tuesday 15 October,  
Dorchester Library, 07.30-08.45**

Public engagement is based on the idea that those most affected by a particular project should be involved in that project. Initiatives are advanced with community partners rather than for or about them. The best-supported outcomes for built environment projects happen when relevant stakeholders have a role in confirming values, identifying and addressing challenges, and envisioning viable solutions together.

Agencies, elected officials, advocacy organisations, researchers, and those with complementary objectives are valuable partners in built environment interventions, and yet co-ordination across sectors and disciplines is often missing. It's critical that stakeholders feel heard and understand how their input integrates into the full process, maximising the value of their participation, and ensuring both shorter-term outcomes and longer-term impacts. This workshop presents tools for advancing strategic engagement plans, including an impact framework for modelling your project, and choosing key performance indicators to monitor and measure success. Public engagement and impact planning examples from the United States and Ireland, and which illustrate levels of engagement to involvement, will be presented, along with lessons learned and best practices.

#### Panel:



**Dan Burden** (USA)  
Director of innovation and inspirations,  
Blue Zones



**Sarah Bowman** (Ireland)  
Director of strategic engagement and  
impact, Trinity College Dublin



**Pam Sethi** (Canada)  
Chief innovation officer,  
The Institute for Advancements  
in Mental Health

## Chair:



**Michael Chang (UK)**  
Co-founder, Health and Wellbeing in Planning Network (HiP Network)

## Panel:



**Rachel Flowers (UK)**  
Director of public health, Croydon Council; Co-founder, Health and Wellbeing in Planning Network



**Gemma McKinnon (UK)**  
Public health officer – planning, Warwickshire CC; Co-founder, Health and Wellbeing in Planning Network



**Paul Southon (UK)**  
Chair, Faculty of Public Health, Healthy Spatial Planning Special Interest Group



**Charlotte Morphet (UK)**  
Principal policy planner, Waltham Forest Council; Co-founder, Women in Planning Network



**Irene Beautyman (UK)**  
Planning for Place programme manager, Improvement Service Scotland



**Liz Green (UK)**  
Programme director for health impact assessment, Public Health Wales

## LUNCHTIME WORKSHOP:

**Taking action towards transdisciplinary partnership working for planning inclusive and healthy places**

**Tuesday 15 October,  
Dorchester Library, 12.40-13.50**

Organised by:



This session embraces the spirit of innovation and combines this with co-operation and mutual support around the broad agenda of healthy planning and places. For the first time, leading thinkers and doers on this agenda will come together to help build a critical mass of like-minded practitioners to improve public health spatial planning practice.

There is an inherent complexity in the way professions, sectors and parts of civil society operate to plan the places where we live, work and play, which has resulted in a number of different networks. This fragmentation can deepen a sense of silo-mentality within and across professions.

The workshop will be structured in a PechaKucha format, with each panellist/speaker providing short, punchy insights. These structured interjections from panellists will provide the necessary context and provoke positive structured contributions from all participants in working towards a collective pledge. This pledge will be a call to action from individuals or as a critical mass of public health spatial planners, which the panel chair, with the congress organiser, will publish after the congress.

## LUNCHTIME INTERACTIVE PANEL DISCUSSION:

**Designing the healthy city from the inside-out: measuring the impact of places on people**

**Tuesday 15 October,  
Council Chamber, 12.40-13.50**

Organised by:

### Perkins&Will

An interdisciplinary panel of experts, representing technologically driven shifts in medicine, neuroscience, urban analytics, and transportation, will debate how to avoid dystopia by design. From inside of the brain, to biological and behavioural impacts, they will explore the proposition that a citizen's journey through a city impacts health and wellbeing. The panel, who specialise in research-based design, will consider the application of scientific methods to assess how buildings influence the brain, body and experience of design.

Dr Eve Edelstein will reveal how the disciplines of neuroscience and architecture merge to inform design of each person, place and their purpose. Dr Stockton, a consultant anaesthetist at Great Ormond Street Hospital, and a doctor on London's Air Ambulance, will present a view from above, reflecting on the bleeding edge of design and how distributed health systems may impact public and individual health. Gerry Tierney, will highlight how healthier cities may arise when we reclaim our public spaces through innovations such as autonomous vehicles. Peter Baird and Andrea Imaz will demonstrate novel 4D interactive mapping of urban development to reveal how design drivers interact, and test the proposition that technological autonomy and artificial intelligence may be leveraged to yield our utopian dreams for healthy communities.

#### Chair:



**Eve A Edelstein (USA)**  
Co-founder, Clinicians for Design;  
Research director, HxLab Perkins&Will

#### Panel:



**Emma F Stockton (UK)**  
Consultant anaesthetist,  
Great Ormond Street Hospital



**Gerry Tierney (USA)**  
Associate principal, co-director, P+W  
Mobility Lab, Perkins&Will



**Peter Baird (UK)**  
Associate,  
Perkins&Will



**Andrea Imaz (UK)**  
Senior urban designer,  
Perkins&Will



**Dr Audrey de Nazelle**  
(UK)

Senior lecturer, Centre for  
Environmental Policy,  
Imperial College London

### **Keynote: Rewiring the urban landscape for people and planetary health**

Whether it's climate change, physical inactivity, air pollution, traffic injuries, social isolation, stress, or inequalities, we all agree these major urban environmental and health challenges need to be addressed profoundly and urgently. But the way we address these problems matters.

Typically, we use siloed and often piecemeal approaches. They sometimes have knock-on effects and unintended consequences. If we remind ourselves of the purpose of tackling each of these problems and let a healthier, more sustainable and resilient society be the goal of our policies, rather than merely compliance with standards and targets, we'll find different types of solutions emerge as more advantageous. For example, walking and cycling can be convenient and low-cost alternatives to driving, thus reducing air pollution, greenhouse gas emissions and noise, and also an opportunity to integrate healthy physical activity in daily lifestyles.

The infrastructure and urban design features conducive to walking and cycling may in turn have further benefits, such as traffic safety and greenspace exposure. Evidence on benefits and co-benefits of different types of urban policies that tackle some of our greatest urban health challenges jointly will be presented, making the case for holistic approaches to urban policy decision-making, particularly through urban planning and design strategies.

**Keynote: Designing the future city for human and planetary health**

For well over 150 years, the urban planning profession has shaped theory and practice to improve the quality of life and public health in cities. Yet we live at a time when public health, especially non-communicable chronic diseases, addictions and similar non-pathogenic illnesses, are increasing.

New stresses are emerging on human and global systems – with technologies and climate very much at the forefront. Now is the time for urban planners to learn from history and the consequences of earlier thinking, to help create more comprehensive theories and tools for action to combat these forces.

In our rapidly urbanising world, we must find ways, through planning and design, to improve the true qualities of life and the environment, be more adaptable to rapid change, and be more resilient to impact. This presentation will set the context for planning, design and health professionals to better understand how their own expertise and practice can contribute to a better future.

**Mark W Johnson** (USA)

Founding principal,  
Civitas



**Roderick Lawrence**  
(International)

Honorary professor and adjunct professor,  
University of Geneva, University of  
Adelaide and University of Malaysia

### **Creating utopia and correcting dystopia: innovative transdisciplinary contributions**

Utopian thinking has been part of the history of cities over 10,000 years. Utopias include Arcadia, Paradise Lost, and visions such as Broadacre City by Frank Lloyd Wright. Planning of new cities, including Brasilia and Canberra, were grounded in idealism and symbolism, and have yielded mixed results. Creating utopia and correcting dystopia are dependent on shared societal visions, and diverse human intentions about present and future habitats. Creating innovative visions and implementing corrective measures depend on expert knowledge, as well as social and political agendas.

Promoting and sustaining human wellbeing and planetary health require a new approach. Today, we know that land-use planning, infrastructure and building construction have failed to provide safe and secure habitats for many in the wake of climate change and extreme weather. Recent examples indicate that the multiple impacts of urbanisation on natural resources, extant ecosystems, planetary health and human wellbeing are still not fully understood.

Urban history, however, confirms that cities are not only localities of environmental and social problems but also sites with a high potential for innovative change. This paper describes how virtuous relations between knowledge produced by empirical research and professional skills and competences can be the foundation of creative projects that are environmentally responsible, economically fair, socially inclusive, and just. Creating utopia will be illustrated by the development of Singapore, from a colonial city and port with many slum areas, low-income households, polluted rivers and few natural resources, into a modern metropolis with a multi-cultural population, diverse economy, low unemployment, reliable transport and community services, and an affordable housing market and education system. Correcting dystopia will be illustrated by the Ringland Project in Antwerp, Belgium, which has challenged planning for road traffic in the city. Co-created by 50 scientists and professionals on a voluntary basis, the project has been endorsed by public authorities and created multiple co-benefits.

This paper illustrates how community associations, private enterprises, public administrations, and local authorities can form transdisciplinary consortiums. Creative community and local government initiatives have bypassed the institutional frameworks of national governments. Our research confirms that innovative programmes and projects can serve as beacons for change in other cities around the world.

## Improving global and national wellbeing through place-centred approach

Promoting population health and reducing health inequalities are firmly embedded in built environment practice. Literature reviews reveal strong evidence that determinants such as neighbourhood design, food access, air quality, physical activity, and housing have a spatial impact on population health and quality of life.

Public Health England (PHE) is building on the Getting Research into Practice (GRIP) project to build capacity in advancing healthy urban development practice, in combination with the PHE Environmental Public Health Strategy to support healthier lives for all, and tackling health inequalities at the core.

This session will demonstrate the relevance of various PHE evidence reviews to the practice of planning, developing and managing spaces and places that have a material impact on people's quality of life and wellbeing. It will start with an overview of international obligations and how they can be used to frame this agenda. Referring to evidence resources on topics such as spatial planning, air pollution, green spaces and high streets, we will draw on the results of the GRIP project with a discovery phase of practitioner interviews and survey on barriers, facilitators and opportunities, and illustrate learning from place-centred approaches such as the Childhood Obesity Trailblazers and the London Health Superzones. The talk will describe the need to connect research, policy and practice to support equitable approaches across a number of settings in England and globally, particularly where inequalities exist.

**Outcomes:** There is increasing and strengthening evidence on the implementation gap around interdisciplinary awareness of spatial planning and health. There is a need to continue sustained support to overcome these barriers to ensure public health objectives can be achieved. PHE's strategic priorities focus on improving aggregate health through the environment while enhancing resilience, security and collective action to achieve Sustainable Development Goals. We seek to instil public confidence that these environmental factors are being appropriately addressed and regulated by highlighting recent achievements in global and local healthy places.

**Implications:** The impetus is stronger than ever to better understand the potential of place to impact health and health inequalities, by improving the state of policy, practice and services both abroad and at home.



**Michael Chang** (UK)  
Programme director – planning and health,  
Public Health England



**Aimee Stimpson** (UK)  
National lead – Healthy Places,  
Public Health England



**Dr Tazeem Bhatia** (UK)  
Consultant in public health,  
Public Health England



**Carolyn Daher** (Spain)  
Co-ordinator, Urban Planning,  
Environment and Health Initiative,  
Barcelona Institute for Global Health



**Irene Martin** (Spain)  
Technical officer for planning and  
programmes,  
Generalitat de Catalunya

**Co-author:**

**Natalie Mueller** (Spain)  
Post-doctoral researcher,  
Barcelona Institute for Global Health

## From evidence to practice: interdisciplinary guidelines to integrate health into urban planning processes in Catalunya, Spain

The Sustainable Development Goals and New Urban Agenda require increased collaboration to address urban challenges and drive change. As illustrated by the 2016 Nieuwenhuijsen framework, a growing body of research links urban and transport planning to environmental and lifestyle-related health pathways, and health outcomes. This evidence, however, often fails to reach policymakers and other stakeholders in an accessible way, and urban planning processes don't explicitly include health criteria. Examples of successful interdisciplinary work that bridge academia, policy and other sectors can help catalyse new opportunities and initiatives.

Over a two-year period, the Barcelona Institute for Global Health (ISGlobal) worked with the Catalan Regional Government (Generalitat) to develop a tool that assists city planners to incorporate measures that promote and protect health and wellbeing. This tool will serve as a guideline for technical staff in the Government's Environmental Policy and Natural Environment Department tasked with approving municipal plans. The tool was developed with researchers, environmental officers and planners working through an iterative and participatory process. It's based on an extensive literature review of evidence of urban planning measures linked to health. Evidence was grouped into planning principles, and indicators developed and adjusted for the local context. The tool was piloted with end users and the government agency responsible for local planning.

**Outcomes:** The result is a checklist of ten planning principles and a series of indicators, with defined benchmarks or ranges for each principle. The checklist is accompanied by a background document summarising the scientific evidence from the literature review.

**Implications:** The tool will be incorporated into the regional and municipal planning evaluation and approval processes. The checklist both raises awareness about and provides a mechanism for the links between health, environment and urban planning to be explicitly integrated. Indicators can be adapted to the urban context in cities worldwide. Locally, this tool has generated interest among other government agencies to be included in front-end planning regulations. This experience and the final product provide a relevant and replicable example of work across sectors, to put evidence into practice and facilitate change to promote healthy city design.

## The Place Standard – how good is your place?

How places are designed, how they evolve and how they are maintained are vital to the health of the people and communities within them. Empowering individuals and communities to gain control over the environments that shape their lives is a fundamental driver of good health and wellbeing.

Developed by NHS Health Scotland, the Scottish Government, and Architecture & Design Scotland, the Place Standard was launched in December 2015. It translates public health and placemaking relationships into a simple tool to help identify the assets of a place and areas for improvement. It asks 14 questions about a place, including physical and social factors. The tool has been used by community and spatial planners, developers, the third sector, and members of the community. It's been used widely across Scotland, and, more recently, in western and northern Europe.

**Outcomes:** The Place Standard helps maximise the potential of a place to support health and wellbeing, and tackle inequalities by:

- providing a framework for dialogue about the things that influence our health;
- supporting public, private and third sectors and communities to work together;
- facilitating an inter-sectoral perspective going beyond public health and planning;
- enabling people and communities to have a role in decisions about place;
- engaging new groups in the planning process; and
- identifying priorities for action to increase the potential of place to nurture health.

Barriers include: the resources required to manage and analyse the data; ensuring representative engagement; gaining buy-in across services; and uncertainty about responsibility for taking forward identified actions.

**Implications:** A review of the tool, its guidance and learning resources is under way. It's important that future implementation ensures that all communities, including those most marginalised and under-represented, are supported to participate. The standard provides a starting point for identifying priorities, and action must deliver on these to improve the quality of places. The impact of the standard will depend on whether the resources and commitment are available to deliver on the local priorities identified.



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**Human connections help us live longer and better. But how do we do it? The case study of 'Local' – a new integrated and sustainable community model**

The Age of No Retirement and Age 2.0, working with Ebbsfleet Development Corporation, Kent County Council and local health partners, as well as more than 1500 residents, have created 'Local', a new community model that empowers residents of all ages to live longer, healthier and happier.

With community and human connectivity at its heart, the Local model ensures that Ebbsfleet can be a place for all its residents, business and civic organisations to be part of a socially and technically connected community, where everyone feels they belong, are active, healthy, and are supported to thrive at every stage in their lives.

A complete economic and social health system with supporting technology, the Local Health and Longevity Community Model promotes and improves health, wellbeing and longevity of all Ebbsfleet residents. Designed to be self-sustaining, it's also a model (and supporting process) that can be easily replicated in any community – large or small.

There are two key elements to the model:

1. The Health and Longevity Community framework and process – a four-layered model that puts individuals at its heart.
  - Layer 1: My life, values, goals, challenges, needs (this links to a bespoke map from layer 3, created for each resident).
  - Layer 2: The values and vision of my community, co-created with the residents and stakeholders. This vision underpins all thinking in layer 4.
  - Layer 3: A wide-ranging and connected integrated community asset map and supporting community media platform (online and offline) called the 'Local Voice'.
  - Layer 4: Community infrastructure using the vision from layer 2 to help define transport, urban design, technology, data management, sustainability, governance, finance, etc.
2. Behaviour change – by designing the community model with the community we can encourage positive behaviour change at an individual and community level across key health and wellbeing areas, eg, increasing physical activity, social connections, reduction in obesity and diabetes, a greater sense of happiness, and a sense of purpose. Individual and community baselines are established and ongoing impact measured.

### From contested space to democratised utopia: sharing ideals at Cranbrook Healthy New Town

Planning systems often attempt a generalised utopia, resolving multiple ideals and exercising control over individual conditions without fully understanding their overall function. This, arguably, creates dystopian developments that function on one level but fail to be healthy or sustainable.

This paper suggests that by relinquishing control and avoiding a single definition, multiple utopias can develop and co-exist. Health and wellbeing provides the opportunity to create a consensual development framework, while emerging evidence is starting to define design parameters within which co-existing utopias can thrive.

The Healthy New Towns programme brought together disciplines and organisations from public health, healthcare, construction, the community and local government to pursue health and wellbeing outcomes for the new town pilots. With increasing evidence showing how urban areas affect our health and happiness, we argue for radical departures from normative design and delivery models, and explore how to develop a diverse, democratised development model.

**Outcomes:** A model of multiple utopias combines knowledge bases on the following shared outcomes:

- environments are generated from within the community and are more conducive to their health and wellbeing;
- communities are more resilient when working to shared goals;
- people are more able to take responsibility for their own health and support those around them to do the same; and
- a more flexible, innovative development process allows a community to furnish its own needs as they arise.

**Implications:** Our experience of partnership working at this healthy new town shows how health and wellbeing makes it possible to coalesce diverse interests and opinions around shared goals. Developing such consensus can radically alter the priorities and design outcomes away from the commercial or traditional norm. However, the constraints of the planning system can restrict or prevent solutions from being applied.

It also demonstrates the need for a very different range of people to be involved in early discussions around new development, and that health and wellbeing professionals should have a central role in the proposal, commissioning and design of new developments.



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### **Northstowe: planning and designing a healthy new town from scratch**

Located northwest of Cambridge, Northstowe is one of the largest new settlements in the country and is built on the former RAF Oakington base. When complete, it will be home to around 25,000 people. As a Healthy New Town, health and wellbeing principles influence and guide all stages from outline planning application (phase 3) to the design code and delivery (phase 2). It provides a useful case study and learning example.



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At a first glance, the principles of promoting healthy and active lifestyles appear to be already embedded in a best practice masterplanning approach, such as access to green infrastructure, and routes for walking and cycling. Research has shown that key influences on increased activity include: development density; permeability; access to public transport; and increased number of parks. The Design Code for Northstowe phase 2 demonstrates that a focus on health and wellbeing can enhance masterplanning practice and take it a step towards delivering healthy places.

Northstowe phases 2 and 3 have a higher than average density of between 40-70u/ha. Of the 3500 new homes located in phase 2, none will be further away than 12 minutes by foot and two minutes by bike from the centre, schools and bus stops. Higher densities relying on terrace housing and urban typologies of family housing create active and animated streets. Together with a variety of greenways and open spaces, a varied and attractive environment will be created. A choice of attractive routes, higher densities and variation in character help deliver streets and spaces that are safe and interesting to walk along. Routes through attractive landscaped areas will be lined with regular seating opportunities to allow resting points for the elderly and those with disabilities.

Issues that are being explored range from:

- strategic level: challenging outdated policy focused on formal sports provision, and instead delivering a strategy of open space that enables active lifestyles for all; to
- securing the detail: for example, putting in place water fountains throughout the development to encourage hydration levels, and public toilets and frequent seating opportunities to assist the elderly population.

A key part of the health strategy in Northstowe is the co-location and co-ordination of health and community services in the town centre. However, the emerging masterplan for the town centre has sought to go further, and explore how health objectives can be integrated as a core theme in the design, land-use mix and layout of the town centre as a whole.

Our early work involved researching future trends in the retail economy through to consideration of how people might move around in the coming decades. Direct and indirect links to future residents' health were highlighted and a set of themes developed to be progressed through the design options and into the final framework.

Key areas of focus were:

- how the green infrastructure network permeated into the town centre, encompassing a greater diversity of spaces both on and off the high street;
- how prioritisation of walking and cycling could be achieved while retaining flexibility to future movement scenarios and needs; and
- how play could be brought into the heart of the town centre and become an important attraction for visitors from outside the town.

**Outcomes:** Designing a town centre from scratch allows great freedom in responding to challenges such as future health and climate change, but there is an inherent danger too. The emerging masterplan for Northstowe has involved much research into future trends to ensure the town centre can be resilient to future changes in lifestyles. Finding a balance between fixes that support the good health of residents and flexibility to ensure the long-term resilience of the town centre as a whole has been key.

**Implications:** The debates and options tested over the production of the masterplan highlighted the mutually supportive nature of designing for health and climate adaptation. However, the need to build in flexibility to support the town centre's ability to adapt to future economic and social trends must be maintained, and this can create conflicts that need to be carefully navigated in order to ensure win-win solutions.



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### **A healthy urban design and planning framework integrating sustainability, equity and inclusion**

Built environment design and planning practitioners have reported a number of barriers to implementing healthy urban environments. A 2018 Design Council report found that UK practitioners see healthy placemaking as being in competition with other development objectives and too costly to implement. This research develops an integrated framework for healthy urban design and planning, which promotes greater understanding of the co-benefits of healthy places for sustainability, equity and inclusion.

**Methods:** A scoping review was conducted to identify existing healthy placemaking resources. Searches were conducted using University College London's electronic library search engine and Google Advanced Search. Search terms related to: the urban environment; health and related concepts; and framework terms. Data about the resources were logged in Excel, and included: scale; geography; scope; inclusion of monitoring recommendation; producer; evidence base; and publication date.

**Results:** The scoping review produced 30 resources published in the UK, USA, Australia and Canada between 2007 and 2019. The resources covered strategic principles and detailed design measures, including discussion of synergies between health, sustainability, inclusive design and equity. Most resources suggested monitoring and reviewing built environment health impacts.

**Implications:** Separation of healthy placemaking guidance from other urban planning objectives may contribute to a view that health is in competition with other policy objectives during the process of implementation. Furthermore, although monitoring indicators were frequently provided, research has demonstrated that these are rarely measured or used by built environment practitioners. The literature demonstrates that guidance about addressing urban environmental health determinants should highlight the health impacts of climate change, biodiversity losses, and resource depletion alongside social issues, such as widening income inequalities.

A healthy environment is sustainable, equitable and inclusive – yet current guidance doesn't provide built environment practitioners with integrated resources for these pressing health challenges. New resources should not assume that practitioners will be able to monitor the built environment and health (eg, through indicators). The literature review informed the development of a preliminary framework that will be tested through participatory workshops.

## A systematic review of interventions in community infrastructure (places and spaces) to boost social relations and community wellbeing

Stakeholder engagement for the What Works Centre for Wellbeing's (WWCW) Community Wellbeing Evidence Programme identified 'boosting social relations' in communities as a priority topic. A scoping review of 34 reviews identified evidence gaps relating to social relations in the following areas: community infrastructure (places and spaces); interventions to reduce or prevent social isolation in adults <60 years; community engagement and volunteering; and social network analyses.

We developed "community infrastructure (places and spaces)" as a systematic review, as this can be addressed at a local or regional level and produce immediate impact. Community infrastructure was defined as: public places and 'bumping' places designed for people to meet; places where people meet informally or use as meeting places; and services that can facilitate access to places to meet.

**Methods:** We searched 11 bibliographic databases from 1997-2017, performed reference and citation checking, searched websites of relevant organisations, and issued a call for evidence through the WWCW. We included studies that reported: interventions to improve or make alternative use of physical places and spaces at community or neighbourhood level; outcomes of social relations, community wellbeing and related concepts; quantitative, qualitative and mixed-methods studies; and process evaluations. Two reviewers undertook study selection, with validity of included studies assessed using established checklists. A narrative synthesis was produced for each of eight intervention categories. GRADE and CERQual approaches were used to rate the overall strength of evidence for each outcome.

**Results:** Some 51 studies, mostly of poor to moderate quality, were included. The better quality evidence was qualitative, and most of the review's findings come from the thematic synthesis of qualitative evidence. Interventions were placed into eight categories: community hubs; events; neighbourhood design; placemaking; improvements to green and blue space; alternative use of space; community development; and urban regeneration.

**Conclusions:** The review found moderate evidence that a range of intervention approaches to community infrastructure can boost social relations and community wellbeing. Future research should prioritise high-quality evaluations using repeated measures and validated tools, with robust and credible qualitative evidence.



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### Creating healthy, living communities – an Irish perspective

This presentation will give an overview of a collaboration with the Royal Institute of Architects for Ireland (RIAI) to develop a 'town and village toolkit' to create healthy, living communities.

This toolkit sets out an approach to the design and management of towns and communities, based on many years of experience. Many Irish towns developed as small, fairly self-contained communities with a rural farming hinterland. This development model worked until the mid-20th century, but with the introduction of a planning system based on single land-use zoning and car-based movement, a more dispersed pattern became dominant. While many town centres have declined, the urban form has grown much more dispersed with suburban estates, ribbon development and sprawl resulting in dependency on vehicular movement.

Evidence-based research is showing the adverse consequences of this form of urban development on the health of people, such as increasing obesity, loneliness and depression, while town centres appear neglected and unattractive with poor economic health.

The toolkit sets out principles to create healthy sustainable communities based on a 'people-centred' approach to design. This includes:

- planning for towns to be compact with everyone able to access services within a 5-10 minute walk or cycle;
- designing a high-quality network of routes, spaces and places that are interesting, attractive and enjoyable for people of all ages to walk, cycle and interact;
- clustering a variety of uses and facilities close to each other to create activity, interest and social awareness;
- designing the public realm and urban form to respond to the spatial needs of people of all ages; and
- work with the natural environment and enhance the built environment in a sustainable way as an essential part of improving our health and wellbeing.

Critical is the management process, which requires a community-based approach supported by professional 'enablers' who can help source funding, and manage implementation and progress. The toolkit includes several best-practice case studies and forms part of a government-supported approach linking quality placemaking with human health and economic prosperity.



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## Keynote: Building the healthy city – inciting the healthy choice

In 2017, the world crossed a major threshold, with more than half of the world's population now living in urban places; in the US, Canada, Australia and much of Europe, urban dwellers already range from 80-90 per cent.

Cities laid out for cars foul our air, water, deplete land resources, breed crime, isolate us, and produce major losses in physical, emotional, mental and spiritual health. Today, a third of city surfaces are blackened with asphalt, producing massive heat sinks, raising urban air temperatures, impacting water quality, and pumping tons of carbon dioxide into the air daily. Urban cities must return to people-centric, green, habitable, natural placemaking mixing bowls that induce human health. We must stop the madness of designing our cities for cars, the least efficient form of transport and the most land consumptive – but how?

In this session, Dan Burden, with 50 years' experience designing cities for human and community health, identifies the five healthiest, most sustainable places in the world, called Blue Zones. He then identifies through science those urban design elements proven to induce health and happiness, providing greater human interaction and active lifestyles. Ten years ago, Blue Zones came up with a formula to make the healthy choice the easy choice; to get diverse people, populations, governments, non-governmental units, health agencies, and other interests to work together to reach common ground. Dan will showcase the outcomes achieved by this organisation during ten years of well-principled, designed, tested, refined and monitored work to induce healthy outcomes for downtowns, neighbourhoods, cities and districts in 50 US cities, ranging from 3000 to 2 million in population.

Strategies feature: active transportation; compact land form; housing diversity; urban greening; connectivity; mixed land use; age-friendly design; placemaking; activity centres; parks and green spaces; smart growth; and healthy urban planning.

Most importantly, poor city design must be overcome with a sense of urgency and through multidisciplinary collaboration. This can only happen when a new united approach is applied to city-making. This session provides hope, inspiration and a compass bearing for a healthy, sustainable future.



**Dan Burden (USA)**

Director of innovation and inspiration, Blue Zones



**Sridevi Rao** (India)  
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### **Public housing and public amenities: achieving Sustainable Development Goal 11.7**

Public open spaces in the urban setting include green areas, commons, water bodies and their banks, and others where recreation, passive or active, is facilitated by the local administration. Those allocated for public housing, however, don't appear to attract design definition in spite of the importance they deserve. Their role in reducing heat islands, as storm water and flood mitigation urban elements, air purifiers, soil enrichment assets, and vehicles of biodiversity is well established through numerous studies.

The Government of India's Ministry of Housing and Urban Affairs website shows 7.9 million (79 lakh) houses have been sanctioned. This paper attempts to establish guidelines for incorporating the characteristics of public open spaces by highlighting use and user links between rural and urban settings. This aspect is important since those residents of Economically Weaker Sections housing (EWS) and Lower-Income Group housing (LIG) have culturally rich backgrounds, and reuse and recycle as a way of life. Questions relating to their sense of community in this scenario are examined with reference to two public housing layouts and distribution of open space. The lifestyle of the user determines design definition of public open space.

This paper attempts to establish intricate and intimate relations between the user and the open space, with findings from a case study of Hyderabad, India, a metropolis of 12 million. With two examples of public housing projects, the harmony between open space use and user lifestyles is examined.

This presentation will also consider an area within the city identified as most unsafe for women, exploring a website of crowd-sourced online data, its design definition, and the location of public open space. Possible changes in design definition to make the identified space safer, based on the findings of the Hyderabad case study, are provided.

The paper argues that based on a study of centuries of public open space use and distribution, cities are utopian; borrowed and imposed ideas, however, usually tending towards revenue generation, introduce dystopian aspects in cities.

## Ruwais UN-Planned: a public health and territorial intervention

Rapid expansion of the Saudi Arabian port city of Jeddah during the 1960s and 70s resulted in the creation of urban sprawl, with some neighbourhoods becoming unplanned or slum districts. As a solution, an urban and territorial intervention has been proposed to enhance the quality of life for inhabitants throughout these neighbourhoods. Using a public health platform, the aim is to raise awareness on basic hygienic practices and create inclusive waste management programmes.

With more than 53 unplanned neighbourhoods across Jeddah, poor public works, such as running water, sewer systems, and waste management, are common. This leads to the proliferation of infectious diseases, such as dengue fever, typhoid and cholera among inhabitants. The neighbourhood of Al Ruwais is one example, spanning an area greater than 4 square kilometres and supporting more than 35,000 inhabitants – approximately half of whom live in slum conditions. Under the umbrella of Ruwais UN-Planned, the neighbourhood was used as the case study for mitigation research.

Results from investigating the neighbourhood situation, including discussions with residents, suggest that successful alignment of inhabitants is a key component in achieving the main goal. Thus, we categorise our intervention approach into the following actions:

- a public awareness campaign to educate residents on how to reduce public health illnesses associated with poor hygiene practices;
- sanitation control through an incentive-based waste management programme and a non-intrusive pest control scheme; and
- an economical infrastructure intervention, temporarily improving the quality of roads in between slums.

Through this platform, inhabitants are expected to be empowered and help eradicate the spread of infectious diseases, by being the driving force behind the revitalisation process, and transforming the area into an urban core. This, in retrospect, will bring necessary economic development to the neighbourhood and its community, through the initial transfer and spread of knowledge, disease prevention actions and community integration, which can be implemented in similar areas.



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### Can affordable and sustainable housing be the keystone to social mobility? Progress one year on

This paper will explore the progress of approaches to creating more affordable and sustainable housing for the poor through community engagement, in the townships of Hout Bay, South Africa.

Workshops with young residents and data collection of key factors, such as land ownership, helped engage the community. In one group, discussion focused on the theme, “where we want to be”, and involved representatives of black, coloured and white communities, and sustainable housing suppliers, identifying some key objectives. Finally, we asked “how do we get there”, inviting three operators in the provision of affordable homes for the disadvantaged to describe their experiences so we could assess what might be applicable.

Homes with Heart presented its self-build Vocational Village in Simondium, near Stellenbosch Western Cape. The model sees young people build their own homes through on-site employment via franchises to grow CO<sub>2</sub> absorbing Spekboom trees. Ikhayalami described its twin approach to improving housing in existing townships: replacing individual shacks with newly built structures that are fire-resistant and eco-friendly; and using “super blocking” to provide plots on fully serviced roads accessible by fire engines. Finally, UBU explained its work with sandbag houses at Sweet Home Farm and Milnerton, Cape Town, demonstrating a careful community approach.

**Application:** More work is needed to make clear action plans on future housing in Hout Bay. One proposal for a youth forum, represented by all three Hout Bay communities, aims to define more clearly the shape of future housing and how it can be achieved.

**Outcomes:** Over the past year, there has been encouraging progress on two flagship projects in Hout Bay. First is a new health clinic serving all three communities. Previous local objections to the siting of the clinic have been overcome, and the Ministry of Health has appointed a design team. The other project is the Bay Walk. This pedestrian and cycling route, connecting the townships of Imizamo Yethu and Hangberg, has been revitalised by the Hout Bay Rivers Conservancy.

**Implications:** The combination of good education, employment, health and housing are a potent formula for social integration and improvement. It’s hoped that success in Hout Bay will lead to similar projects in other parts of South Africa and elsewhere.

### **A framework for a healthy neighbourhood: establishing relationships between healthy behaviours and the social-environmental determinants of health**

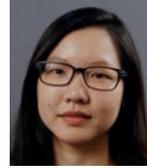
Since the 1990s, discussions and research literature exploring the relationships between the social determinants of health and health outcomes have been gaining traction. These have paved the way for policymakers to improve public health holistically and seed interventions in a targeted manner, especially when health behaviours, environmental and social factors may be much more significant determinants of health outcomes than healthcare.

In a developed city like Singapore, many basic standards of health are already fulfilled, even within the determinants of health (eg, high water sanitation standards; high provision of public transportation). Rates of diabetes and cardiovascular diseases, however, are still on the rise, and these may be driven by behavioural risk factors. Yet, the literature doesn't adequately explore the relationships between socio-environment determinants and their influences on behaviour. Further, resulting interventions targeting such health outcomes often remain at the national and healthcare level, failing to empower the community to embrace sustained healthy behaviours.

Set up last year, the Singapore Ministry of Health, Office for Healthcare Transformation (MOHT) has been tasked to implement integrated interventions in neighbourhoods to address the socio-environmental determinants of health, and to empower individuals and communities to live healthily. Therefore, the MOHT is proposing a framework that hypothesises various relationships between the socio-environment determinants and their influences on health behaviours. The framework is to be tested in the greater Jurong Lake District (JLD), a mixed-used district in the west of Singapore undergoing rejuvenation.

This framework employs a 'health in all' policies and data-driven approach. It will be formulated by literature reviews, together with other non-health stakeholders, to derive contextualised and realistic determinant-behaviour relationships. The framework will also be concurrently applied in JLD and tested with various sources of data (eg, administrative data from government or big data; needs assessment with the community).

The framework is envisioned to reveal gaps and opportunities in the health behaviours in the district. These will guide and inform non-health stakeholders and activate the community to implement integrated interventions in JLD, to influence healthy behaviours.



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## Urban planning factors and positive impacts upon mental wellbeing

The United Nations predicts 60 per cent of the world's population will be living in urban areas by 2030, the same year that depression is anticipated to have become the leading global disease. Urban planning has an important role to play in preventive strategies for modern population health challenges, but mental wellbeing is not being considered a primary outcome in urban planning decision-making or healthy city planning policy. The research sought to identify urban planning factors that impact mental health and wellbeing positively, towards a refinement of existing policies and programmes, targeting mental wellbeing outcomes directly.

**Method:** A systematic literature review explored urban planning factors that may contribute positively to mental health and wellbeing, organised to enable examination of urban factor typologies, physical and social, as well as connections between these and sustainability, resilience and productivity.

**Results:** The literature review revealed urban planning factors impacting positively on mental wellbeing to be urban green space, 'natural' or living elements, and urban and biodiversity. Direct benefits were found to be derived from factors of social cohesion, control and participation. Interventions that have impacted positively on mental wellbeing include urban commons and allotments, where community control, management and involvement are associated with improved social cohesion, education and productivity. Although the positive impact of green open space stood out, a reliance on a provision-based planning strategy will not necessarily maximise those benefits, with proximity, awareness, diversity and spatial size all contributing. Of the factors identified, benefits derived from green/blue infrastructure, ecosystem services and community management were linked with physical and mental resilience.

**Conclusions:** Mental wellbeing is still not high enough up the urban planning agenda, with focus instead on physical health and targeting solutions for specific conditions, such as diabetes and obesity. Refinement of the National Planning Policy Framework and land-use allotment tenure regulations could help, while at a development level, the NHS Healthy New Towns programme goes some way to reconnect population health with urban planning, although it's still focused on physical health improvements. If we can connect the best scientific evidence with built development knowledge, changing our understanding of healthy development requirements, mental wellbeing could become more than an accidental benefit.

## Impact of design of urban dwellings on health and wellbeing

Research has shown that the built environment plays a critical role in determining our health and wellbeing. We've reached a point in time where interrelated crises of environment, mental health and obesity require urgent interventions across all sectors, including the built environment. But evidence also suggests that current housing provision is not responding to the needs of residents, with unhealthy homes still being permitted. In April this year, Lewisham Council approved plans for a housing development in an area where pollution levels exceed the legal limit, with future residents to be advised to keep their windows closed.

This paper explores how we can embed health and wellbeing principles into the planning and design of new city centre apartments. This typology was chosen as apartments are likely to play a key role in meeting housing needs over the next few decades.

The paper also seeks to establish how apartment design can be improved in the future by examining existing residents' attitudes to health and wellbeing in their home environment. A survey answered by city centre residents was conducted to understand the characteristics of their apartments and the link to health and wellbeing criteria. Sleep, diet and exercise data were collected from residents to reveal how the design of their home impacted on their day-to-day functioning. Participants were also asked whether they believed the design of their apartment had an impact on their health and wellbeing, and what they wanted from their home in terms of a healthy lifestyle.

In addition to resident data, the paper explores the issues from the perspective of industry professionals. Housing developers and designers were interviewed on how health and wellbeing can be designed into homes, as well as the main barriers they face. Market demand for new apartments with better standards for health and wellbeing was also explored.

The paper concludes with recommendations to promote designing for health and wellbeing. These include ensuring key principles such as: orientation and adjacency are correct at the masterplanning stage; educating and advocating for healthy homes; and perhaps, most importantly, lobbying for changes to planning policy so that it becomes much harder to build unhealthy homes.



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### How do front gardens impact health and wellbeing?

While evidence grows for the biopsychosocial interdependence of green spaces and human wellbeing, front gardens in the UK are increasingly being paved over. At the city level, the disappearance of front gardens leads to 'urban creep' – an increase in impermeable surface area, and associated hydrological and ecological changes. These processes are intertwined with housing provision, road and parking infrastructure, climate change and localised flooding, and are set against an increasingly strained national health sector with challenges in addressing mental health.

This research explores whether introducing plants to impermeable front gardens improves residents' health and wellbeing. Domestic gardens represent more than a quarter of UK urban green space and are the most readily accessible green spaces for residents. Front gardens bridge domestic and public realms, helping shape both an outward and inward sense of place. Front gardens hereby become physically demarcated places, through which to explore the relationship between urban design and human health.

Through a front garden greening intervention in a street of a deprived suburb in northern England, we build on Attention Restoration Theory (Kaplan and Kaplan, 1989) and Stress Reduction Theory (Ulrich, 1983; Ulrich et al, 1991) to provide a basis on which to value these liminal spaces of urban nature in terms of their sociocultural impacts. The interdisciplinary approach includes a horticultural intervention alongside pre/post-intervention testing using questionnaires, in-depth interviews, and physiological measures of salivary cortisol. Participants' (n=42) front gardens were planted with: *Petunia Surfinia Sky Blue* (petunia); *Viola 'Sorbet series'* (viola); *Rosmarinus officinalis Prostratus* (rosemary); *Lavandula angustifolia 'Hidcote'* (lavender); *Rhododendron 'Wombat'* (azalea); *Clematis alpina 'Jackmanii'* and *'Ville de Lyon'* (clematis); *Galanthus nivalis 'Flore Pleno'* (snowdrop); *Narcissus 'Tête-à-tête'* (daffodil); *Crocus sativus* (crocus); *Amelanchier canadensis 'Glenn Form'* (amelanchier tree); and *Juniperus scopulorum 'Blue Arrow'* (juniper tree). Residents' wellbeing was monitored over the course of a year following the planting.

Perceived stress decreased following the introduction of colourful, planted containers and small trees in front gardens. Participants also reported heightened moods, motivation, relaxation and pride of place. The intervention has had no negative consequences for residents or the area. Opportunities exist for this type of low-cost, small-scale, urban green infrastructure to be replicated elsewhere.

## Delivering healthy homes: influencing and shaping government policy and thinking

The All-Party Parliamentary Group (APPG) for Healthy Homes and Buildings' White Paper 'Building our future: laying the foundations for healthy homes and buildings' makes a series of policy recommendations aimed at ensuring that the homes we live in, both new and old, positively contribute to our physical and mental health and wellbeing. This panel and workshop will explore and compare UK and international research and policy on creating healthier homes and buildings.

Most of us spend around 90 per cent of our time indoors and unhealthy homes are known to be linked to a wide range of health conditions – in the short and long term. Even conservative estimates put the cost of unhealthy housing to the NHS at the multiple billions each and every year.

The APPG calls for better governance to join up all government departments and agencies responsible for health, housing and construction to ensure that health and wellbeing sit at the heart of housing provision, not least because the Government has set itself the ambition of building 300,000 new homes. Evidence from the Healthy New Towns initiative shows that it's possible to build quality new homes and communities, with health and wellbeing at the forefront of delivery. Maximising occupants' health and wellbeing must be placed at the centre of new housing provision, and building design must take a holistic approach to include safety, space, energy efficiency, ventilation, heating, noise, air quality and lighting. It's also important to note that 85 per cent of our housing will be existing stock by 2050.

If we're serious about delivering healthier homes, renovation of existing homes must become a national priority.

The APPG for Healthy Homes and Buildings' recommendations set the agenda on how to deliver healthier housing in the UK. This workshop looks at the need for practice, which requires leadership not just from government but from industry too.

The authors of the White Paper set out what they see as the challenges that lie ahead. Delegates are invited to partake in this interactive session, with a view to highlighting best practice, examining success in other nations, and determining where industry can and should lead the way.



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### Designing in the age of anxiety – shaping space through affect

In 1944, the poet W H Auden began work on *The Age of Anxiety*, a six-part verse highlighting human isolation in the modern age. It explores the spiritual emptiness, loneliness, and anxiety-ridden purposelessness of four characters' lives, ending at dawn on the streets of the city. Today, it appears disturbingly prophetic, as anxiety appears to have become our everyday milieu and is being considered not only as a medical but also a sociological condition. What role do our cities, buildings and spaces play in contributing to – or, more importantly, in – addressing this new age of anxiety?

The most important characteristic of our built environment is whether it meets the needs of its occupants, residents and visitors, both material and psychological. These needs, so important to our lives, are often at the periphery of conversations about the future of design. Architectural criticism and discourse have historically been shaped by interpretation and narrative, with its currency of meaning, while those who commission and fund our built environment tend to focus on consideration of cost, profit, speed of construction, risk and, at times, 'marketability'.

The modern imperative to design something individual tends to override considerations of how it might shape the behaviours of those who will live with it. Likewise, the relentless pursuit of economy at the expense of experience, rather than co-existing with it, has led to landmark projects that fail to recognise basic aspects of human behaviour.

This paper analyses a number of spaces in our portfolio of built projects and environments – from hospitals to campuses, workplaces, schools and libraries – to investigate the impact of shifting the lens of our combined critique and approach to design from meaning/narrative and cost/efficiency towards 'affects', ie, how we're shaped by mood, atmosphere and feelings.

From this foundation, with anxiety, isolation and loneliness in our societies on the rise, we could reframe our approach to rethink what and how we build, and equip ourselves with the framework and tools to design healthier environments that address the complex range of human individual and social needs.

## Workplace loneliness: studies into various workplaces and design interventions

Britain has more than 9 million lonely people and the problem is growing. Loneliness is bad for our communities, health and wellbeing, and business. It can even be as harmful as smoking.

**Purpose:** The Loneliness Lab brings together business, government and civil society to explore how we can reshape and reimagine our cities to design out loneliness and isolation. To reimagine the places in which we live and work, in ways that help us make connections more easily, get to know our neighbours, and feel part of a community. Most importantly, to reimagine the city so that the most vulnerable and isolated are included.

**Methodology:** The Lab brought together businesses, policymakers, experts and NGOs with people experiencing loneliness for a one-day event in London. During the day we explored what's making all of us lonely and identified opportunities to reimagine the places and spaces in our cities with loneliness and isolation in mind. We then tested the emerging ideas through a week-long design sprint. Thirty-two participants formed 10 teams prototyping ideas in real communities and places over six days. These projects are now being developed into pilots that will be rolled out through 2019. The two-year programme has looked at a range of different building types, running workshops or design sprints in four different working environments. From each of these we have a range of images and participant feedback to illustrate interventions that help and hinder workplace loneliness.

**Results:** We'll share the Lab's preliminary work and the development of the theoretical framework that underpins these interventions. We'll present the methodology for our workshops, our findings, the theoretical work, an overview of the achievements so far, and where this work will venture next. The main purpose will be to use the evidence we've gathered and develop potential solutions to loneliness.

Outcomes from the session will be fed into the long-term outputs of our work on workplace loneliness.



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### Optimism in workplace design through biophilia

Located in Knowledge Quarter Liverpool, the Spine building is to become the new northern home for the Royal College of Physicians. The development has enabled Knowledge Quarter Liverpool to attract other leaders in science, health, technology, culture and education, to establish it as one of the world's leading innovation districts. Completing in 2020, the building will reflect the values of the college and is set to become one of the healthiest buildings in the world.

**Purpose:** The objective for the college was to significantly expand its facilities while reflecting its diverse membership across the UK and internationally.

**Methods:** The new facility will showcase health and wellbeing in design. The WELL and BREEAM standards are both being applied, along with data from a staff questionnaire on areas including work activities, physical features, service features, workplace impact and employee mobility, to measure the impact of the design on employees' productivity, pride and sense of community.

**Results:** The building design is based around the narrative of the human body and its abstract representation through architecture and biophilia. The facade is designed to represent the integumentary system, with a distinct voronoi pattern created from 23 million polygons. Exposed concrete columns represent the trabecular system, and a timber curtain-wall system helps connect occupants with nature. The ventilation system delivers greater levels of fresh air than typical commercial systems, with additional filtration. The interior uses natural materials, textures and finishes wherever possible and all furniture has been responsibly sourced to ensure that air quality is kept to a high standard. Sky gardens act as lungs in the building. While improving visual and physical connectivity between floors using helical stairs, the spaces also contain a rich mix of plants and trees, which help increase oxygen levels and promote salutogenic properties.

**Conclusions:** When complete, the facilities will include: collaboration space for evidence-based research and knowledge sharing; public exhibition space; events space; conference facilities; education space; and a workplace setting for up to 200 people. The building will also become the college's main assessment centre and contain some of the world's best medical simulation spaces.

## The role of landscape architecture in creating the biophilic workplace

Using project examples and research, this proposal looks at the role of landscape architecture in biophilic design for enhancing productivity and wellbeing in the workplace. Biophilia is our innate connection to nature, while biophilic design is its application to the built environment to enhance health and wellbeing. With increased urbanisation, however, and the fact we now spend more than 90 per cent of our time indoors, we're heading towards a future with fewer opportunities to encounter nature in our daily lives.

Biophilic design can create offices that boost productivity, have higher rates of staff retention, enhance psychological mood, and reduce employee absenteeism by 10 per cent. While we know that good quality outdoor space is beneficial to wellbeing, it's often absent from office design. As such, the potential role of external office green space remains largely untapped. This proposal seeks to rectify this issue by identifying the health opportunities landscape architecture offers workplaces, while exploring the business case for extending the application of biophilia to the wider built environment, not only to create productive offices but also productive cities.

With a large proportion of biophilic literature and media focused on interior environments, this paper will widen the discussion on how previous research, strategies and lessons learnt from biophilic workplace design can be applied to workplace landscape typologies and a broader framework: to bring the biophilic office outdoors. This proposal will also look at best practice approaches for design team methods of collaboration and implementation of biophilic landscapes for workplaces – from interior and exterior perspectives. For Delos' headquarters in New York City, for example, a design workshop was facilitated to prioritise the project health and sustainability goals from the outset, as well as identifying opportunities for cross-platform integration with biophilic interventions. This led to the creation of a biophilia plan to guide the design development, ensuring the final product would provide real connections to nature.

In summary, by adapting the evidence base for a broader framework, the potential gains for human health and wellbeing of the wider urban environment will be nurtured – from one building to a neighbourhood, to a city-wide scale.



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## The role of creative participatory briefing in strategic workplace design

Increasing employee engagement, wellness and satisfaction are at the top of organisations' lists of benefits sought during a workplace relocation or retrofit. According to the World Green Building Council, salaries account for 80-90 per cent of operational costs of a typical business. Moreover, the British Council for Offices states that productivity gains can be valued at between 30-75 per cent of annual office rent. Hence, a strategic approach to providing an effective workplace is of paramount importance to businesses.

Generic solutions alone are unlikely to provide the right cultural or operationally practical fit for organisations that may be moving to a drastically different way of working. But how can organisations be sure that activity-based working or a more open office will be the right move?

We believe the answer lies in broad user engagement. Our method of client engagement involves understanding work cultures and distinct practices, culminating in the creation of a strategic briefing toolkit. It uses quantitative and qualitative methods to establish a wider view of how an organisation operates, as well as people's perceptions and opinions of their workplace.

The method aims to reach the widest possible pool of participants, thereby increasing levels of inclusion and ownership of the transition process. By developing a detailed brief of user requirements for each proposed space, we're able to establish an overarching strategy based on rigorous functional reasoning.

Using the example of our engagement with investigative journalists and environmental campaigners, Global Witness, we'll explore two areas of creative briefing that were part of a successful office transition: peer group workshops and creative tasks.

**Peer group workshops:** We used peer groups to run workshops at different levels of seniority to ensure people were comfortable enough to provide genuine feedback without feeling watched by seniors. We used models to discuss a variety of hypothesised scenarios, allowing participants to show us what might work.

**Creative tasks:** These can engage participants in a way that uses their own skill set, or with an activity that they feel comfortable with or interested in doing, in order to illicit distinct and personal responses. Campaigners were asked to use a Polaroid camera to investigate their workplace and report headline issues.

## Measuring the impact of health and wellbeing in the workplace

Addressing health and wellbeing issues in the workplace has been an undervalued part of a long battle in public health over several decades. Workplaces are not only where people spend most of their time but also central places to implement health programmes in social settings. People spend a substantial amount of time at work in a sedentary posture, which is associated with overweight and obesity. Furthermore, mental health issues account for nearly half of all reported work-related illnesses and are the number-one cause of absences at work.

These issues impose a huge amount of healthcare costs and various secondary costs on organisations through absenteeism, presenteeism, lost productivity, lower engagement and lower employee satisfaction. Many studies have focused on individual health outcomes as primary outcomes of workplace health and wellbeing promotion, but organisations are interested in the secondary outcomes that might be more beneficial at the organisational level. In addition, sickness absenteeism has been the most frequently used key metric for workplace health promotion, but whether it's the most meaningful health measure from an organisation's perspective is open to debate.

This paper presents a study examining the impact of workplace health and wellbeing by comparing comprehensive frameworks to assess workplace design and management. The environmental impact of workplace health and wellbeing is assessed in workplace health and wellbeing models called PROWELL and FLOURISH, encompassing physical, mental and social domains of wellbeing defined by the World Health Organization. These data are then linked to employee data at the individual level (individual health and wellbeing states) and the organisational level (productivity, absenteeism and presenteeism, engagement, attitudes towards the organisation, and satisfaction). The environmental data are also paired between a list of prescriptive measures of workplace health and wellbeing and environmental monitoring sensors, and the employee data between employee survey and individual health-tracking wearable devices.

The paper highlights a methodological approach to measuring organisational health outcomes (PROWELL) and post-occupancy evaluation (FLOURISH), which provide insight for evidence of the impact of health and wellbeing in the workplace.



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### **Power to the people: using pre- and post-occupancy evaluations to shine a light on actual design performance**

We're in the midst of a wellness revolution. Supported by a growing body of literature linking mental and physical health to our built environment, economically savvy businesses are taking note. They've realised that productivity improvements through a healthy and happy workforce can be many times more valuable than efficiency savings in energy and maintenance expenditure alone. As a result, new workplaces are propagating their health benefits, developments are aggressively seeking certification, and industry is awash with discussion around the principles of healthy design.

Often, however, once the design is complete and buildings constructed, little effort is spent assessing the success of these strategies. Clearly, there is a lack of outcome-orientated evidence. Much like environmental, social and governance (ESG) sustainability in real estate, which has matured to a point where greater importance is placed on actual, rather than predicted, performance, health and wellness outcomes are moving from the aspirational to the more tangible. Post-occupancy evaluations (POEs) or building-use studies are a robust way to close this gap.

In this paper, we call on pre- and post-occupancy evaluation data of more than 2000 respondents to assess the direct and indirect health benefits of two large office consolidation projects in Birmingham and Manchester. In each city, three existing offices were consolidated into one larger office during 2018, requiring eight surveys in total.

Delegates will learn of the techniques needed to deliver a successful occupancy evaluation, how to assess data, and the importance of communication. On top of this, we'll present fine-grain data comparing perceptions of wellness metrics, including but not limited to thermal comfort, views of nature, space needs, acoustic design, and air quality – both before and after the relocations. The presentation will conclude with further evidence around the productivity benefits of these new buildings, an outline business case calculation, taking wider determinants into account, and a call for advanced statistical techniques to show causal links between dependent and independent variables.

## Exploring soundscaping options for the cognitive environment in an open-plan office

One major source of noise complaints in open-plan offices has consistently been co-workers talking nearby or talking on the phone. Various masking sounds, such as white noise and pink noise, have been explored to reduce the intelligibility level of speech from adjacent co-workers in open-plan offices. While a high acoustic variation, such as music, can affect emotion positively, it tends to distract people's concentration and disrupt with short-term working memories and cognitively demanding functions.

Recently, nature soundscapes such as water, rainfall or birdsong have been introduced to open-plan offices. Water sounds with limited acoustic variation have shown to be more effective than other nature sounds, such as birdsong, which has high acoustic variation. In addition, an auditory-visual congruency in the physical environment seems important when using nature soundscapes. This is because the auditory and visual sensory systems trigger each other to make sense of the environment that people experience, and the human brain tends to automatically attempt to identify the sounds it hears.

This study examined four types of background sounds in a controlled lab environment, which simulated a typical open-plan office in a large pharmaceutical UK company, to understand people's physiological responses, preferences and cognitive performance among the four types of background sounds. In areas where a water soundscaping theme was implemented, a monitor was also implemented to visually play flowing spring water. All other indoor environmental factors were controlled in the lab environment – including carbon dioxide, particulate matter (PM<sub>2.5</sub>), temperature, humidity, and ambient lighting level – following UK standards. The four types of background sounds included: white noise from the HVAC system; spring water sound; typical daily office noise; and no external acoustic noise. The study employed three methods: wearable devices to monitor physiological responses; a survey to understand subjective satisfaction and preference, and a cognitive performance test to measure memory, distractibility, and decision-making performances. The study was repeated twice with two different types of wearable devices to observe consistency.

The paper discusses discrepancies found between participants' satisfaction/preference and their cognitive performance under the four background sounds, and potential future implications of masking sounds in open-plan offices.



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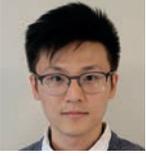
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**A comparison of daylight and artificial lighting:  
the effects on subjective alertness, vitality and  
cognitive performance**

The discovery of the third photoreceptors in the retina, intrinsically photosensitive retinal ganglion cells (ipRGCs) revealed that light has non-visual effects such as alertness, core body temperature and hormone suppression. Several studies were conducted to investigate the alerting effects of light with different light intensities. However, most of them used illuminance to represent light intensity, which cannot fully represent responses of ipRGCs. Moreover, since the agenda of the healthy building is developing, several luminaire manufacturers propose that light products with high correlated colour temperature (CCT) would benefit alertness and circadian entrainment. With research needed to justify this statement, the aim of this study is to examine whether the blue-rich artificial light sources could be an acceptable alternative to daylight, in terms of alerting effects. A new metric for quantifying responses of ipRGCs, Equivalent Melanopic lux (EML) was controlled for both light sources in this study instead of illuminance.

**Methodology:** Twenty students (male: 9, female: 11) aged 18-35 years were asked to undertake two separate experiments: exposure to daylight (DL); and exposure to artificial lighting (AL). Both daylight and artificial lighting should provide the same level of EML in the eyes. Their subjective alertness was measured by the Karolinska Sleepiness Scale (KSS) and Subjective Vitality Scale (VS). Objective alertness was measured by the Psychomotor Vigilance Test (PVT) and Letter Digits Substitution Test (LDST). The results showed that when providing the same level of EML, there was no significant difference between DL and AL in subjective sleepiness and overall reaction time. Moreover, exposure to both daylight and artificial lighting can significantly reduce subjective sleepiness and increase vitality in the morning. Nevertheless, AL was considered as brighter and less comfortable than DL.

**Results and conclusions:** The findings suggest that exposure to light with high EML in the morning can help improve alertness. Artificial lighting with high CCT can provide the same level of alerting stimulus as daylight in the short term, but it's unsuitable for long-term working. Future studies should consider responses of ipRGCs, as well as rods and cones, to investigate the alerting effects of light.

## How to make cities sound healthier

The acoustic environment in cities influences wellbeing. Noise can have adverse effects on health, yet not all of the acoustic environment in cities is made of noise. Further, our auditory experience is largely influenced by various non-auditory factors. They can span from the current visual setting to personal preferences and preconceptions.

This complexity of acoustic environment perception lies behind the inefficiency of many noise mitigation actions, despite the funds invested. The soundscape approach is distinguished by evaluating quality of acoustic environment holistically instead of solely by measuring sound pressure levels. High-quality soundscape can be both loud or quiet. While the connections between positive, calm soundscapes and wellbeing benefits are known, the benefits of vibrant soundscapes for wellbeing still need investigation.

The existing noise mitigation approach is based on sound propagation modelling, decibel-based metrics, and applying content-based penalties, again in decibels. While the existing approach involves a qualitative approach at the input (analysis) stage, it's still limited, since the outcome, in form of a noise map and noise mitigation measures, doesn't include sufficient information span. In order to move from noise to sound planning and adequately describe its perceptual outcomes, a new metric is needed. The ongoing European Research Council (ERC) Advanced Grant project, outlined in this paper, aims to create a single soundscape index (or a set of indices). It relies on on-site protocols (comprising surveys, recordings and measurements), laboratory tests (including perceptual, physiological and neural data) and, finally, building a model for soundscape quality prediction.

The simple and effective set of quantitative information about the perceived quality of an acoustic environment is expected to enable easy implementation of the results at different planning stages and scales. The predictive model and analysis framework developed in the project would allow for implementing urban soundscape control at both the early planning and design stages, and as a posteriori noise mitigation, whether through a GIS-based approach suitable for urban and spatial planning or pedestrian-based simulation approach for the urban or landscape design stage.



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### **Public participation GIS approach for mapping leisure-time physical activity**

Healthy cities promote easy access to environments where residents of diverse socio-economic background, life stage, and physical ability may engage in leisure-time physical activity (LTPA). Planning for human-oriented LTPA environments requires spatially referenced evidence on actual LTPA environments and their users. Owing to limitations in large-scale collection of place-based health behaviour data, research on the actual environments where residents engage in leisure-time physical activity is in short supply. This study applies public participation GIS (PPGIS), an advanced participatory mapping method to explore the spatial dimensions of urban dwellers' LTPA behaviour in and outside of the residential context.

**Data and methods:** Cross-sectional survey data of adults aged 18 to 65 was collected using an online PPGIS survey. Data collection took place in August 2018 in the Helsinki Metropolitan Area. Using the survey's mapping tool, participants located destinations they frequently visit for LTPA. Follow-up questions on visiting frequency, activity level, and travel mode were posed for each destination. GIS analyses were used to categorise LTPA locations based on their land-use and accessibility. LTPA locations were categorised into indoor, built outdoor and natural outdoor environments. Patterns in the environment type, visiting frequency, and accessibility of the LTPA locations were assessed with statistical analyses.

**Results:** Significant differences were observed in the use of the identified LTPA environments. Natural outdoor environments were the most common setting for LTPA, measured both in the number of mapped LTPA locations and the visiting frequency. Indoor environments were visited less frequently but contributed more to the overall level of PA. Public open spaces within walking distance from the residential location were particularly important for respondents with children, respondents on low income, and respondents reporting the lowest participation rates in PA. Visiting frequency correlated strongly with network distance.

**Implications:** This study introduces a framework for the joint and spatially sensitive analysis of observed built environment measures and LTPA environments mapped by laymen participants. Preliminary results support a holistic conception of LTPA, which acknowledges the diversity of person-environment interactions affecting the use of accessible LTPA environments. These results may be used to inform planning and policy efforts aiming to increase population-level PA with built environment interventions.

### **Project CityZen: impact-focused research to deliver transformational health improvements in Sao Paulo, Brazil**

Project CityZen takes a design-led approach to the development of technology and services to meet an ever-rising demand to provide high-quality health services for citizens, and to do so in the most cost-efficient way possible.

Delivering health and wellbeing services for older citizens in a city such as Sao Paulo is a major challenge. Project CityZen engaged directly with patients and doctors at the Albert Einstein Hospital, as well as policymakers from Campinas City and Sao Paulo to identify and prioritise unmet needs. This work included the creation and publication of stakeholder personas, enabling each stakeholder group to be profiled, with reference to demographic, behavioural, attitudinal, economic and health predisposing factors. Reinforcing and enabling factors within the context of the local community also provided insight.

Working with Einstein Hospital resulted in the creation of new features to the AVATR technology toolset. AVATR is an AI-enabled mobile application that enables a person to create, own and share a digital profile of their self by collecting data of interest to their doctor. Data is sourced from a person via medical wearable devices, phone and environmental sensors, and smart cities infrastructure. The person's AVATR profile is analysed and shared with their doctor in real-time. The doctor uses this insight to adjust care plans – via AI and machine learning technologies – to help a patient stay well and engaged with their local community on their own terms. The user interacts with their AVATR via a voice- and text-driven chatbot in order to stay on their care plan, with the city positioned as an enabler for personal health and wellbeing.

Complementing AVATR is a data analytics toolset called CityZen Explorer. This web-based system delivers a citizen-centric and location-specific view of population-based healthcare needs in Sao Paulo, with respect to the availability of local service support, such as housing, transportation, healthcare, etc. It aims to increase awareness of unmet need, leading to improved efficiency and resource deployment in the city.

CityZen is designed to deliver significant improvement to health outcomes and reduce healthcare costs. It also aims to create high-value jobs in Brazil and support the development of local and international health innovation ecosystems.



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**Streetcoin: an idea to integrate place-based social landscape with healthcare risk models through the electronic health record**

Place- and action-based psychosocial data integration allows for the creation of an interoperable dataset from within a high-risk network node, which can be evaluated by aggregated electronic health records over time, and traded within and between accountable care organisations (ACOs). The greater the place-based action potential to improve the aggregate health of the population, the greater the savings for the ACO. As chronic disease management costs rise, so the agency of neighbourhoods and their psychosocial management also increase.

A network node in New York City, Brownsville, Brooklyn, has drawn the interest and investment of major tech companies, which engage neighbourhood groups to secure social capital and manage risk in ACO cost. The greater the risk of the group, the more likely participants are to be intoxicated, shot, shoot, or otherwise affect the neighbourhood. In the 21st century health economy, the “means of production” lie in the hands of the most marginalised. It remains to be seen whether high-risk groups and locations, which derive this network value, will continue to manage the process or simply become sites of extraction – a prison-hospital-mental-health industrial complex in data-health systems.

The session will provide an introduction to psychosocial mapping in a human scale and healthcare context, exploring new forces in the healthcare system leading to: new roles for landscape architects; how payment models are moving towards upstream preventive measures at the scale of urban design interventions; and the application of electronic health record systems and the vast expanse of data and data exchange.

The session will provide examples of psychosocial mapping techniques, as well as the role of geospatial tools in healthcare psychosocial mapping.

**Conclusion:** The session will explore a new collaborative future for landscape architects in healthcare, with discussion from the perspective of a practising paediatrician and landscape architect.

## How data analytics can speed up the urban transformation towards a healthy city

Air pollution is hampering our children's cognitive development. Lack of accessible green space and safe walking and cycling infrastructure is contributing to rapidly rising rates in child obesity. Transforming our cities into healthy environments is a long-term game, however, there are multiple strategic projects that can be done right now to limit the significant health and wellbeing impact on our younger generations. Data analytics can help identify these projects and prioritise action.

One way to speed up this transition is by converting big city data into digestible information. Data analytics can show us where different problems occur and how they correlate to a broader set of city indicators, and other challenges like climate adaption or infrastructure renewal. This paper will present the development of a broad range of data indicators to visually and spatially map out the current state of an area. These indicators always cover three different aspects of the healthy city: physical and mental wellbeing; socio-economic and behaviour; and the built environment. Visualising and analysing big city data allow us to understand where potential opportunities for improvement lie and how they intersect with other challenges in resiliency, community building, sustainability or infrastructure. Data analytics can help us understand how proposed developments in other areas should be adjusted in order to improve quality of life.

Understanding where to start is not enough to actually speed up the transition. Once we have a clear view of the current challenges, we can start looking at solutions. Because we take an integrated systems approach in our work, we always start by assessing existing infrastructure and initiatives. Looking at them through a healthy city design lens helps us understand how to use them to increase overall health and wellbeing. It allows us to single out the low-hanging fruits, identify immediate solutions, and speed up necessary change. This paper will illustrate both points through case studies from our client work.



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**Developing a BIM-based predictive digital advice platform and retrofitting sensors to measure energy consumption, damp and mould in housing association properties to improve facilities management and occupant health and wellbeing**

There are currently more than 20 billion Internet of Things (IoT) devices installed in buildings globally and this number is increasing exponentially. The magnitude of data being collected is almost unimaginable, however, ways of exploiting this data for the benefit of housing operators and occupants are in their infancy. An estimated 2.4 million households in England are managed by housing associations and funded through government. This paper presents a platform that collects and analyses data on buildings, using occupant feedback, sensor data and building information models to generate practical advice to improve facilities management and optimisation for building owners, and improve the health and wellbeing of occupants.

The BIM Academy conducted a feasibility study to develop a web application called Smart Connected Buildings to a pre-alpha stage. The project centred on delivering a platform for social housing providers that could improve the performance of their buildings and the wellbeing of vulnerable tenants, specifically in this instance, monitoring energy consumption and providing alerts on detection of damp and mould. The long-term goal was to develop an open, scalable and software/hardware agnostic platform that would offer significant economic, social and health value to social housing providers and occupants.

The web application links spatial BIM contextual data with operational and environmental performance data from smart devices and sensors retrofitted in housing association properties. The project resulted in a web-hosted dashboard, into which any data source could be plugged. The platform acts as a hub, where data can be received, collected, analysed, and actionable advice provided for facilities managers and occupants.

While the ability to offer actionable advice was built in at an early stage, the study initially offered facilities management alerts only. The second phase focuses on linking sensor data to actionable health and wellbeing advice, linking new sensor technology to quantifiable health and wellbeing metrics. This paper presents project findings, and highlights barriers encountered and lessons learnt during the feasibility study and the platform's subsequent development.

### **Using computational fluid dynamics (CFD) to model the impact that tall buildings have on the dispersion of roadway emissions**

This study provides a more detailed way to account for local air pollution around tall buildings compared with traditional air quality dispersion models. Computational fluid dynamics (CFD) modelling was employed to evaluate the dispersion of vehicle emissions within the City of London.

Traditional or regulatory type models, such as the commercial ADMS software, typically use simplified Gaussian plume algorithms, which are unable to accurately capture dispersion around individual (or a cluster of) tall buildings in complex urban environments. To account for tall buildings, one needs to simulate the interaction between air movement and the complex, three-dimensional urban environment, as well as the resulting transport and dispersion of traffic-generated pollutants at street level. It's expected that the eastern cluster in the City of London will have a significant impact on local air pollution, potentially cleansing some streets and junctions, while possibly increasing pollutant concentration at other locations. This study is aimed at understanding this phenomenon in more detail and allowing planners to make informed decisions for future planning.

Baseline road emissions were obtained from the London Atmospheric Emission Inventory. This data was used to develop representative sources of tracer gas emissions in the CFD model. Such sources are a simplified depiction of the average pollution generated by vehicles. Detailed CFD simulations were then carried out to track the movement of pollutants across the city. Preliminary results for the initial model conditions will be provided.



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### Examining urban oppressiveness in real and virtual settings

A study by Azgarzadeh et al (2012) suggested that viewing skyscrapers caused feelings of oppressiveness, which they defined as the sensation of crowdedness. In their study, participants rated pictures of urban settings using an oppressiveness scale; they found a correlation between building height and oppressiveness. Although Azgarzadeh suggested that oppressiveness influenced feelings of stress, they didn't measure this directly.

Building on Azgarzadeh's work, we used psychological methods to examine the experience of participants in oppressive urban environments. Participants were brought to a location in central London, populated by both short and tall buildings. They were monitored for physiological arousal using skin conductance, and asked to complete an oppressiveness questionnaire as well as a self-assessment manikin to measure affect. The tall building condition was found to have a negative impact on affect, friendliness and openness ratings.

This study was then replicated in a lab setting, where participants, in Waterloo, Canada, were exposed to a 360 video of the exact location, using immersive virtual reality (IVR). The IVR study yielded similar results.

This two-part study demonstrates that tall buildings have negative impacts on mood and perceptions of openness and scene friendliness. These findings are important to consider, as cities continue to densify and build upward. Efforts are needed to ensure that urban dwellers have access to open, restorative space that allows ample sky view. Furthermore, this study provides an innovative methodology that can be used to examine the psychological impacts of urban design.

Being able to use immersive 360 video, as opposed to "real world" exposures, allows more experimental control as well as higher numbers of study participants. Real world studies are necessary and useful, but the methodology introduces variables that can impact the quality and amount of data that can be collected. The use of 360 video allows a "best of both worlds" approach to studying the psychology of the urban experience.

## Flourishing cities

Increasing urbanisation has led many decision-makers and strategists to think more deeply about how to make cities less stressful, more creative, more sociable and more resource-efficient, by creating better services and infrastructure that offer opportunities for long-term social, economic and environmental sustainability.

Liveability, adaptability and quality of life are key factors for people while recognising the need to design and effectively manage energy, water, pollution and waste systems that will not only mitigate the climate emergency we're currently facing but do so while allowing humans to flourish. The way we conceive cities needs to be challenged so that the places where we live and work have high social value, promote physical and mental wellbeing, support economic growth, and promote zero carbon and zero waste.

Our increasingly siloed design, technology, public health and socio-economic disciplines have led to disjointed urban design and planning systems that focus too much on individual functionality while neglecting the need to provide thriving, liveable places that promote holistic health and wellbeing outcomes. This paper proposes a framework for thinking about how intelligent, sustainable, and liveable cities can evolve into fully integrated, flourishing and soulful places where people can thrive. The basis for evolving these 'flourishing' cities is discussed and a proposed design framework will be presented.



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**Construction of health resilience of local communities: with the contribution of Internet of Things (IoT) technologies**

Regenerating cities and placing health at the centre of policies and projects is an effective response to combat the effects of climate change that impact human health. However, a silo approach doesn't allow common objectives to be defined or integrated design proposals to be formulated.

**Objectives:** CCUHRE research aims to define a transdisciplinary methodology to evaluate the effects of climate change on urban health, to direct policies for adaptation/mitigation through the contribution of many scientific disciplines, interaction with municipalities and local health agencies, and the involvement of local communities. In CCUHRE, this occurs with the support of new IoT (Internet of Things) technologies and mobile crowdsensing techniques, to measure and assess the effects of climate change on health, involve communities in designing shared plans for development, empower them when dealing with urban health and wellbeing, and support public administrations in making decisions.

**Methodology:** CCUHRE research proposes a methodology to explore the relationships between the impacts of climate change and the health of inhabitants on the urban scale of the neighbourhood.

Outputs include:

- a) a Climate and Health Profile (CHP): to construct the neighbourhood CHP, reference will be made to qualitative/quantitative indicators, which assess the effects of climate change on the health and wellbeing of the population.
- b) Climate and Health Actions: selection of actions for adaptation and mitigation, with reference to fundamental themes of urban design and some themes of technological design.

A methodology is also proposed for public administration to select scenarios for adaptation to or mitigation of the effects of climate change, using real-time analytics and data feedback mechanisms, and non-instrumental interaction with local communities.

Outputs include a Climate Health Lab: construction of a platform of sensors and automation technologies, which will provide real-time information/measurement of the physical/environmental conditions of the neighbourhood and its inhabitants.

Experimentation of the proposed methodology will occur in the Monticelli Quarter, an area of Ascoli Piceno, Italy.

## Commercialising health: the future of productive neighbourhoods

Historically, business parks were presented as urban utopias, where people could work and live in a healthy environment close to nature and outside congested urban centres. This research explores how these 'utopias' have evolved – and, in many cases, declined – and how the relation between health, wellbeing and quality of life can be restored to business parks as productive neighbourhoods.

**Methodology:** The project starts with an analytical exercise to identify factors that impact the development of successful neighbourhoods in terms of economic growth and healthy environments. Metrics were aggregated at homogenous scales to enable comparison across southeast England through a geospatial interactive platform. This exploration of the existing distribution of knowledge economy drivers, accessibility to public transport, commercial and residential markets, demographics patterns, and services, allows the user to identify areas with better opportunities to provide healthy and productive neighbourhoods.

**Practical application:** The analytical exercise gives us insight and knowledge to design for new 'utopias' of healthy and economically successful neighbourhoods. The Milton Park Vision 2040 adopted a multiscale and multidisciplinary approach, mixing data analysis, design and engagement with a final aim of preparing the park for the future, while encouraging behavioural changes in its population towards a healthier lifestyle. Efforts on behavioural change aimed at encouraging physical activity, sustainable mobility options, and active commuting, while valuing the natural and leisure assets of the park. The Vision 2040 worked to embed healthy infrastructure that provides choices for an active community with services, amenities and leisure options.

**Outcomes:** Finally, the implementation of the methodology, interactive platform, behavioural change efforts, and design resulted in a projection of Milton Park providing up to 10 per cent of the jobs of Oxfordshire's Local Industry Strategy. This gives Milton Park the economic weight and business case to secure funding, both from the private sector and different governmental authorities, to deliver a healthier neighbourhood with high quality of life.



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### **Keynote: Creative cities: the importance of arts, culture and community to population health**

Tales of the fundamental importance of the arts within societies have existed for more than 40,000 years. In the past two decades, research has begun to demonstrate the tangible impact of arts and cultural engagement for health and wellbeing.

This presentation will reveal some of the fascinating findings on the impact of the arts on the prevention and treatment of mental and physical health conditions, and consider the psychological, physiological, social and behavioural mechanisms underpinning this phenomenon.

It will also explore how insights from behavioural science can help us understand patterns of human interactions with the arts and how behavioural interventions can encourage greater arts participation within communities.

**Keynote: Music, health and the city: a utopian vision**

Music is much more than mere entertainment. Research examining the impact of music on human behaviour dates back decades. This presentation will showcase new approaches to music in society that are delivering opportunities to listen, dance and sing more.

These activities, when embedded into strategies and design, tap into the lifelong music tastes of the population and provide engaging ways to encourage healthier lifestyles and wellbeing.



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**Rapid assessment of the environmental and health impacts of city sustainability policies**

Policies aimed at improving environmental sustainability in cities can also improve public health. There is a need for tools to assess the effectiveness of different policies on health to support evidence-based decision-making within the typical timeframes and resources available to policy development and prioritisation teams.

**Purpose:** We demonstrate the application to London of a new screening tool for rapid assessment of the environmental and health impacts of sustainability policies.

**Methods:** The tool, Cities Rapid Assessment Framework for Transformation (CRAFT), uses simple and transparent calculations to estimate changes in greenhouse gas (GHG) emissions and exposures to a range of environmental hazards using a proportional reduction method. Resulting impacts on health are estimated using standard epidemiological methods. The CRAFT tool has been applied to ten policy objectives to improve sustainability in London. The policies cover a range of sectors, including power generation, transport, housing and urban planning.

**Results:** The results show that the selected policies have potential to produce important health benefits for people in London, but there are differences in the scales of those benefits. Actions achieving the greatest benefits for health and reducing emissions are those that affect the whole urban population, rather than geographical or demographic subsets, and that lead to substitution of energy sources for all main activities in a given sector. We estimate, for example, that making London's entire transport system zero-emission would reduce the city's GHG emissions by around a fifth, and lower ambient fine particulate matter (PM<sub>2.5</sub>) air pollution by roughly 4 per cent. This would substantially reduce the number of air pollution-related premature deaths in London.

**Conclusions:** The CRAFT tool provides rapid estimates of the effectiveness of policies on city-level GHG emissions, exposures to a range of environmental hazards, and population health. Integrating health into policy assessment can provide additional insights for city-level decision-making, helping with prioritisation, as well as identifying interactions between policies and unintended consequences. Future work will develop the model for use in cities in other parts of the world and at different stages of development.

## Developing a framework to encompass coastal flooding and mental health under present and future climate change

Anthropogenic climate change is altering the frequency and magnitude of extreme climate events while also changing historically stable means. One example of such change is coastal flooding, where the globally averaged mean sea level is rising slowly due primarily to expansion of the ocean and melting of land-based ice, while the characteristics of tides, storm surges and wind-driven waves are themselves responding to climate change.

Coastal flooding can have myriad impacts, including on natural ecosystems, physical infrastructure, socio-economic system stress, and human health. The effect of coastal flooding on human health, in particular, mental health and the cascade of derivative effects, has attracted limited attention. Part of this problem stems from the large number of confounding factors and limitations of data to explore whether such an impact is detectable.

We propose a causal pathway framework to encompass the main factors impacting mental health outcomes from coastal flooding, beginning with anthropogenic climate change as an underlying factor. Coastal flooding is also separated into two categories: rare, catastrophic events and regular, tide-induced “nuisance flooding”, which we hypothesise will affect people differently. These “nuisance floods” cause local and temporary disruption to local services, transport and communication networks. We also consider the human-system effect in this framework by assessing a range of factors affecting people’s mental health, including prior disorders, level of preparedness, community support, degree of existing coastal protection, and perceived risk.

We conclude that based on available information, the lack of connection between climate change, coastal flooding and an individual’s perceived risk may well contribute towards limited coping capacity and the lack of desire to act in a preventive manner until it’s too late. Finding effective solutions to these challenges will address planetary and socio-economic systems – the former through rapid, deep emissions reduction, the latter through varied forms of coastal protection and capital investment in mental healthcare quality, capacity and education. In light of this, determining an effective causal pathway is critical to systems evaluation and subsequent solutions to the wellbeing of the planet.



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### **Post-waste landscapes: design principles for a paradigm shift**

Much like prisons, cemeteries, psychiatric facilities and sanatoriums, urban waste disposal and treatment ‘institutions’ have been traditionally pushed outside the city’s boundaries, in an effort to retain the health of the social and urban fabric at its optimum state. The highly urban system of storing, managing and processing solid waste, wastewater, and toxic waste has successfully occupied the periphery and the rural, far from the general public’s eyes and consciousness; any scrutiny, or understanding even of the socio-environmental ramifications relevant to the superfluous and reckless culture of consumption, can be buried under a pile of its residues.

Forgotten somewhere in the hinterlands, waste disposal and treatment facilities, although seemingly mundane, have been posing highly concerning questions regarding public health, technology, aesthetic and visual impacts, and the quality of urban life at large. Today, well within the anthropocene, and with the world’s population increasing at a frenetic rate, a new, resilient waste management prototype is indispensable: one that moves beyond an outdated system of infrastructures that have already been crumbling into bits and pieces.

Through three case studies – Freshkills Park, Garraf Waste Landfill and Hiriya Landfill Rehabilitation – that have shifted the narrative of waste processing from a dystopian wasteland to a multipurpose infrastructure with a pleiad of benefits for urban inhabitants, this research will seek to discuss the latest design practices in international projects that are initiating change.

Simultaneously, the paper will aim to uncover the potential of waste sites as instigators of wider urban regeneration processes, with waste management incorporated in the design process of a healthy city. The aim is to highlight the derelict spaces of waste facilities as essential actors of the healthy city, and as grounds of opportunity for new, inclusive, accessible public spaces.

## Health systems on Mars? Sustainable development designing for people, place and planet

Colonial strategies of development have left land barren, decimated biodiversity, and severed our ties with the landscape. We face the consequence of these decisions daily, through destroyed human habitat, evidence of climate change, and depletion of natural resources.

The First Nations Technical Institute (FNTI) is a net-zero project on the Tyendinaga Mohawk Territory in Ontario, Canada. To meet the FNTI's vision for a net-zero facility, energy is provided by wind and solar power. Building materials and products will be selected on the basis of: durability; recycled content with low VOCs; local sourcing; low-maintenance; low emissions; and low-embodied carbon emissions. For the new campus, nature plays a major role in creating an environment that responds to and celebrates the indigenous people's traditional belief in interdependency between humans and the land, reflective of responsible stewardship and reciprocity with the natural habitat. The design for the new facility considers the building footprint and location in the context of existing site conditions, respecting topography and landscape with its forest, open field and wetlands.

**Outcomes:** Nutritious food and clean water are fundamental to people's health and wellbeing. The FNTI's new campus development also aims to address food security, food sovereignty, and reliable supply of clean potable water for consumption. Culinary kitchen and produce gardens based on First Nations' food culture, as well as green/living wall supporting indoor cultivation of traditional medicinal herbs, reinforce the indigenous traditional approach to health and wellness. Water features incorporated in the design contribute to indoor air quality and serve as a symbolic reminder of injustice and inequality, which the First Nations face even today.

**Implications:** Reciprocity between people and the planet must remain a core value. Resurrecting the traditional belief and practice of the First People's respect for Mother Nature lends hope for a more resilient Earth. Even still, the global community is focused elsewhere – to other planets and hopes for new territory. With the lander on Mars, it begs the question, what will health systems look like on the planet? If our current trajectory goes unchecked, we may need to know the answer – not only for other planets but for Earth itself.



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### **Healthcare's climate footprint: how the health sector contributes to the global climate crisis and opportunities for action**

The study focuses on how the health sector, which sits on the front lines as a first responder to climate change, also makes a significant contribution to the problem.

The paper argues that healthcare must respond to the climate emergency not only by treating those made ill, injured and dying from the climate crisis and its causes but also by practising primary prevention, by radically reducing its own emissions. The study:

- establishes the first-ever global estimate of healthcare's climate footprint;
- is based on full global coverage of spending data, together with detailed information from 43 countries;
- identifies key sources of healthcare emissions while allowing for a comparison between nations and among many regions of the world; and
- makes a set of recommendations to align global health goals with global climate goals.

The green paper is the first of a climate-smart healthcare series, produced by Health Care Without Harm in collaboration with Arup.

## Valuing urban green infrastructure: a tool to level the playing field

In early 2018, grant funding was secured from Innovate UK to deliver a tool that can assess the value of urban green infrastructure. Since then, we've been collaboratively researching and developing Greenkeeper – an online and consultative tool, due at the time of writing to launch in the UK in September 2019.

We know that green infrastructure is vital to our cities, supporting not only their environmental health but also delivering social and economic benefits for all urban residents and visitors. But local authority budgets for park and green infrastructure management services are being squeezed.

Maximising the benefits urban green infrastructure can deliver requires urban planners and designers, governing bodies and influencers alike to understand what motivates the use of these spaces, how visitors interact with them, and what aspects deliver the most economic, environmental and social value. Historically, this information has been difficult and expensive to collect. Today, however, the availability of mobile phone technology provides us with the opportunity to use anonymised location data, which can greatly improve our understanding of park use. When layered with a wider range of open-source and paid-for data sets, the Greenkeeper model can understand the drivers of demand, temporal and spatial use patterns in green space and, in turn, deliver a reliable valuation tool for the public and private sectors alike.

In this talk, the Greenkeeper team will set out how our experience in the application of economics to policy, leading research into measuring health and wellbeing outcomes, and designing and delivering development throughout the UK have combined to deliver a tool that can level the playing field across our industry. We'll demonstrate the tool, its abilities and functionality, and how we believe it can transform the way we design green infrastructure, inform local policy and design approaches, drive collaboration, and enhance portfolio management and future investment.



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**Restorative values and cognition ability improvement effects of man-made park in Hong Kong downtown area**

This study sought to test two questions on man-made parks located in downtown areas: whether they're more restorative than built environments; and whether they're more helpful to improve cognitive ability than built environments. Fifty-two young adults in good health condition living in Hong Kong were asked to walk two pre-defined routes: Tsim Sha Tsui (commercial area) – Kowloon Park Route; and Hung Hom (residential area) – Hutchison Park Route. Both routes have two parts of built environment and man-made park.

Subjects were divided into two groups. Group A walked from the man-made park to the built environment, with group B walking the opposite sequence. The two man-made parks feature: fountain; pool; shrub maze; tree array; falling water; sculpture square; Chinese classical pavilion; corridor; and memorial building. Subjects stopped at pre-defined points and assessed the restorative value of the scenes using the Restorative Component Scale. Attention ability and response time were used for measuring cognitive ability. Scores were taken pre-test, mid-test and post-occupancy to compare the cognition ability improvement effects from the built environment and man-made park.

Three main conclusions can be drawn: the restorative score of the man-made park is significantly higher than the built environment; people feel more stress in a commercial area than a residential area; and dynamic water is the dominant element to increase the landscape's restorative value. Regarding cognitive ability, the pre-test results showed no significant correlation between the groups. However, both the mid-test and post-test results showed that subjects performed better after walking the man-made park part than walking the built environment part. Two groups' differences between post-occupancy and pre-test have no significant difference.

The results imply that the man-made park downtown could help pedestrians restore attention, recover from stress, and improve cognitive ability. Arrangement of landscape is more important than the size of the park, so it's better to site the park in a downtown area. The results have implications for urban design, and future study should focus on the sequence of experiencing different landscapes to help designers arrange the landscape node in the park.

## How community-focused systems are addressing urban-global issues

The notion that architecture has the power to become a physical embodiment of the ideals for which a civilization should aspire to is as ancient as human history itself, and in cases where the end goal is as near to earthly perfection as attainable, we call these “utopias”. While admirable in their aim, the quest for “utopia”, or the imposing of order over chaos, has resulted in both intended consequences (beautiful cities, public spaces, monuments, infrastructure, and engineering marvels) and unintended ones (pollution, congestion, biodiversity loss, poor health, inequity, and vulnerability to volatility). When unintended consequences overwhelm high aspirations, or when order becomes simply organised chaos, we call these “dystopias”.

It seems mankind is living in a time when these unintended consequences are surpassing the potential of our intentional design capabilities. Rather than merely imposing our order over nature (and ourselves), we’re eradicating nature (and ourselves) at a rate at which neither may ever recover. Dystopia is everywhere: oceans and wildlife filled with plastic; cities filled with empty luxury condos suffering income disparity and housing shortages; the emergence of “super-commuters”; a global opioid crisis; and impending climate change from burning fossil fuels – all while fighting endless wars in the Middle East and Afghanistan. Simultaneously, mankind is increasing its footprint while depleting available resources.

This talk addresses how internationally recognised third-party systems for neighbourhood, urban and community design – including LEED for Neighborhood Development; BREEAM Communities; WELL Communities; the International Living Future Institute’s Living Community Challenge; the American Institute of Architects’ 2030 Districts; EcoDistricts; 100 Resilient Cities; and the Center for Active Design – can promote utopia and reverse dystopia, through measurable outcomes for sustainability, wellness, equity, beauty, placemaking and resilience.

It will look at the various standards available, what strategies they employ, who is using them, and what impact they’re having now and aiming for in the future. The goal is to raise awareness of the potential for community-focused systems to create utopias for future generations, through collaboration, recognition and meaningful strategies promoting sustainability, health and resilience.



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### **The Clean Air Hospital Framework (CAHF): a health-sector response to tackling air pollution**

Air pollution is a health issue causing up to 36,000 deaths and 20,000 respiratory and cardiovascular hospital admissions in the UK yearly. Air pollution is also a health opportunity with solutions benefiting our health in other ways. Walking and cycling, instead of driving, reduces air pollution and the risks of heart disease, stroke, cancer, diabetes and mental ill health. Air pollution therefore requires a health-sector response.

**Purpose:** Hospitals can tackle air pollution in a number of ways:

- role model: show leadership by minimising air pollution from activities within the health sector's control;
- educate: inform patients and the public about the health risks and how to protect their health; and
- champion: support policy measures and work with others to improve air quality.

**Methods:** With significant input from practitioners and review from peers, Great Ormond Street Hospital for Children (GOSH) and Global Action Plan (GAP) together developed the CAHF to help the hospital self-assess progress and set ambitions on tackling air pollution in seven key areas: travel; procurement and supply chain; construction; energy; local air quality; communication and training; and hospital outreach and leadership.

**Results:** Using the CAHF, GOSH now has a clean air action plan, which sets out the actions we're delivering and ambitions we seek: driver, contractor, clinical staff and play-service training; artwork with patients and families; indoor and outdoor air monitoring; a play street with various partners; research linking health and air quality; clean-air contractual provisions; staff induction and online training; and case studies shared through wider NHS structures.

We're also planning for: increased charging infrastructure; electric patient transport; zero tailpipe deliveries; BREEAM 'excellent/outstanding' construction; increased onsite renewables; patient clean-air advocate development; and innovative clean-air strategic and technological partnerships.

**Conclusions:** The CAHF provides a step-by-step approach for hospitals to create cleaner air for their patients, staff and neighbours, and help people protect their health from air pollution. The framework is free to download at [www.cleanairhospitals.org](http://www.cleanairhospitals.org).

## Air quality in the built environment: a national and global perspective

The presentation will set the scene around air quality in buildings, and the relationship that buildings have with air pollution – buildings use 40 per cent of global energy and are therefore responsible for significant emissions of greenhouse gases, which are driving climate change. Additionally, the direct burning of fuels for heat and energy in buildings in less-developed parts of the world release short-lived climate pollutants (SLCPs), which have direct and immediate health implications to people, as well as the environment. These outdoor air pollutants can also penetrate indoors – the places where we spend the vast majority of our time.

Further to that, many of our materials, cleaning practices, and even ventilation choices lead to the build-up of indoor pollutants in homes, offices, hospitals and other buildings. These indoor pollutants, such as VOCs, can be two to five times higher than outdoor pollutants. We'll discuss the science behind these issues and present healthy building solutions on both a national and global scale.

As politicians and countries around the world grapple with the intangible forecasts of the climate crisis, both the World and UK Green Building Councils believe that part of the power of the campaign messaging is that air pollution is happening right now. Most of the time air pollution may be invisible, but the personal issues around human health, with such obvious business-case benefits for the private sector and public purse-strings, helps raise the profile of emissions on many a distracted political agenda. Ambient (outdoor) air pollution and climate change are two sides of the same coin, and we believe our campaign around air quality in the built environment has the power to catalyse large-scale health improvements for people around the world, as well as encourage a reduction in emissions and help mitigate dangerous climate warming.



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**Panel debate: Designing the healthy city – is utopia possible? Is dystopia inevitable?**

The movement to develop healthier cities appears to be coming to a crossroads.

On one hand, there is a utopian vision of urban change and renewal, with the green shoots of revival clearly evident in a host of policies and projects that support healthier lifestyles. In this scenario, walking, cycling and public transport addresses over-reliance on the car; effective resilience planning stops the spread of infectious diseases and mitigates the effects of climate change; flexible working strategies and environments reduce stress and improve productivity; and access to safe, affordable housing, green spaces and healthy local food underscore a commitment to community wellbeing. Technological advances and AI are safely integrated into our daily lives, enhancing city services, increasing efficiencies and creating intelligent environments, seamlessly converging with art and culture in the city to improve the quality of life for all citizens in a fair and equitable way. As a result, a significant burden is lifted off formal healthcare services.

The alternative vision is dystopian. In this scenario, indoor and outdoor air quality (already unacceptable in many cities, homes and workplaces) deteriorates further as cars clog up the roads. More than 500 cities are threatened with flooding, and many more with water shortages and heatwaves more intense than ever before; tensions rise between well-heeled business districts and areas of urban deprivation that circle them; ‘food deserts’ increase; and green spaces are gobbled up by development. Healthcare services, in this scenario, start to collapse under exceptional pressure and demand.

In this concluding session of the third Healthy City Design International Congress, we’ll thread together two days of insightful and inspiring presentations to provide some final observations on whether we’re designing for utopia or dystopia. In a world where the effects of population migration and ageing play out amid rapid urbanisation, how can we support cities to take a healthier path? And how can we ensure that, despite the best intentions of policymakers, urban planners, public health professionals, architects, designers and developers, our worst dystopian nightmares don’t come true.

## A new vision for Letchworth Garden City

The continuing failure of current market-driven delivery models to provide adequate housing in the UK indicates a new method is well overdue. Letchworth is a good case study, as the original tenets of the garden city movement were a response to similar problems more than a century ago.

Drawing on Ebenezer Howard's original vision for Letchworth, our proposal showcases an economically and environmentally sustainable development that supports and involves a growing community. The landscape-led masterplan embeds the principles of urban agriculture, landscape maintenance and land management training into the core of the place. Furthermore, it provides employment and training, cementing the economic basis for the new neighbourhood, and seeks reconnections with the landscape as a precious resource for food, climate mitigation, wellbeing and energy. Importantly, our scheme considers the development model. We proposed that the Letchworth Heritage Foundation act as master developer and retain ownership of the land in the long term. This ensures that value is captured from the land and put back into the long-term stewardship of the site, and support of the community.

**Practical application:** The development aims to promote health and wellbeing at three scales: home, neighbourhood and community. Sustainable urban drainage systems with indigenous planting and urban agricultural schemes will protect against adverse weather, localise food supply, and provide a biodiverse setting. Managed coppice will offer potential for biochar production. The strategy is for a connected place that prioritises walking, cycling and other sustainable forms of transport.

**Outcomes:** The project brings together work carried out at Ebbsfleet Healthy Garden City, the DWELL (Designing for Wellbeing in Environments for Later Life) project in Sheffield, explorations into how health and wellbeing can be integrated into town planning, and our overarching commitment to sustainability. In many respects, the principles of economic, social and environmental sustainability are the same as those that drove the garden city movement.

**Implications:** The project illustrates a new form of development applicable to many UK towns and cities. Critical to this is the retention of value in the place itself. This notion disrupts the normal profit-based housing delivery process and takes a whole-system approach to development.



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### **Gardenia: re-imagining the garden city**

A RIBA international design competition was launched in 2018 to explore how a modern garden city can meet the needs of the 21st century, while recapturing the pioneering spirit that led to the development of the world's first garden city at Letchworth. A site for approximately 900 homes was identified to the north of the city. The competition was a partnership between the Royal Institute of British Architects, Letchworth Heritage Foundation, the Town and Country Planning Association, Homes England, Anglian Water, the BRE and University of Hertfordshire. This paper will present one of the shortlisted competition entries, Gardenia.

**Purpose:** The purpose of the competition was to revisit the original garden city principles conceived by Ebenezer Howard more than 100 years ago. The Town and Country Planning Association offers the following guidelines for garden city design: "beautifully and imaginatively designed homes with gardens, combining the best of town and country to create healthy communities, and including opportunities to grow food". Competitors were invited to propose their own understanding of garden city design with a 900-home development on a site to the north of the city. The proposal for Gardenia was inspired by a connection with nature and Letchworth's founding vision of a city of gardens.

**Methods:** The design was based around a linear parkland, from which clusters of homes are designed around garden spaces, not roads. These mini communities harvest sunlight and water to produce their own food and energy. Outdoors living is actively encouraged and the boundaries between architecture and landscape are broken down. Homes are designed to be flexible to suit 21st century living.

**Results:** The competition attracted entries from competitors based in Australia, France, Germany, India, Iran, Italy, the Netherlands, Poland, Thailand, the UK and the USA. Following appraisal of the anonymous design submissions, four teams were shortlisted.

**Conclusions:** As the concept of the garden city approaches 120 years old, and hundreds of thousands of new homes are required across the country to address housing shortages, Ebenezer Howard's notion of a place that blends the best of the town and the country is more relevant than ever today. Gardenia offers a bold, original and modern 21st century model that is nature-inspired, semi-autonomous and community-centric.

## Nostalgia or utopia? The role of garden villages in delivering healthy communities

In South Gloucestershire, 200ha has been identified as having potential for a new garden village. The land is in single ownership with Tortworth Estate, and St Modwen has been selected as its development partner. South Gloucestershire Council supports the proposal for a mixed-use community, providing around 3000 homes, plus jobs, schools and associated facilities. An outline planning application is likely to be submitted by the end of the year.

**Purpose:** The objective is to create a new garden village that meets the housing and health challenges of the 21st century, in particular:

- physical health – promoting active lifestyles, reducing reliance on the car, improving air quality, and providing access to healthy, affordable, locally produced food;
- mental health – reducing social isolation through design of streets, spaces and buildings, and improving access to nature;
- community – providing health, cultural and leisure facilities to support healthy communities, and ensuring public transport access to towns and cities with a wider range of facilities; and
- affordability – delivering a range of house types and tenures, and measures to retain long-term value for the community.

**Methods:** A masterplan is being prepared and includes:

- garden city and garden village principles from the TCPA;
- best practice processes for delivering healthy and sustainable neighbourhoods; and
- wider planning and placemaking research on creating legible, walkable, sociable neighbourhoods.

**Results and implications:** The masterplan seeks to incorporate a range of design measures to promote healthy communities, including:

- retaining areas of highest value agricultural land as a working farm, producing food for the garden village;
- creating a social 'green spine', incorporating food production, play and community spaces, and prioritising walking and cycling;
- creating a public transport and cycling route to the nearby town of Thornbury, and future-proofing this for autonomous vehicles, while enhancing public transport connections to Bristol; and
- 'taming' the A38 to create a new high street.



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**A systemic approach to healthy placemaking:  
re-imagining the garden city**

Healthy placemaking is a multi-dimensional concept, comprising environmental, economic and social aspects. It brings together built environment stakeholders with the physical and social infrastructures of place, in a process that supports long-term positive impacts on physical and mental health and wellbeing.

Ebenezer Howard's garden city movement addressed the dire living conditions faced by people drawn to towns in search of work, as technology eroded agricultural employment. At its heart, the movement promoted healthy lifestyles through holistic design with local food production and 'gardens for epileptics', integrating natural systems and seeking basic social and economic fairness. These values are as important today as ever but new issues are emerging.

Current ways of life are damaging natural capital's capacity to regulate climate; provide food, clean air and water; and offer cultural inspiration. Artificial intelligence is rapidly reducing demand for all but highly skilled workers, although creative use of ICT can support an alternative co-operative economy. Social systems, too, face problems, with many people trapped between endemic loneliness and a pervasive sense of stranger-danger.

The garden city's long-lasting success stems from its embrace of complexity – weaving together natural landscape, public space, plots and buildings in symbiotic ways across multiple scales, while reinvesting the land value increases that development creates.

We present Grange-In-The-Hedges – a finalist in the RIBA competition to expand the garden city of Letchworth – as a case study in re-imagining this approach. Features include: an exposed water system that embraces sustainable drainage; a green structure enabling soil-to-soil agriculture; street networks fostering natural exercise and clean air through walking and cycling; development plots with a mix of tenures promoting social cohesion; and an adaptable building stock that supports intergenerational living. These are interlaced through bottom-up information systems – challenging the stresses of underemployment, climate change and social disconnection.

The project seeks sustainable value-capture by community involvement through 'Share-App'. The idea is for residents to benefit from their own data using technological innovation to support a community-led management and governance system.

## Growing together: a productive framework for a circular garden city

This paper presents the design ideas behind the second-stage submission for the 'Re-imagining the Garden City' competition in Letchworth. The aim is to create a hybrid between an agricultural landscape and a housing development by integrating food growing into the design of the neighbourhood.

Our entry turns the usual process of development on its head. Rather than fitting greenery around the development, we're using the dual meaning of the word 'plot' to create a framework for food growing that can then become plots for development.

About 2000 trees will be planted as part of this development and we proposed to use these as the overarching element of the masterplan, setting out the pattern of the new development. Our aim is to fully utilise the potential of the trees as a community generator and integrate them into both the housing, community and growing components of the development, including agroforestry.

Our masterplan seeks to replicate the process of setting out plots that can be developed for both food and housing. The masterplan is based on a series of neighbourhoods, or hamlets, laid out along an avenue, with densities rising towards the avenue and decreasing towards the edge of the site. The district centre will be developed in the northern part of the site with a primary school, communal facilities, food hall, square and transport hub. Each hamlet will have a different character, both in terms of its materials and design but also the form and species of planting. Each hamlet is made up of three fields divided into plots that will initially be used for food production.

Agroforestry, as a complex system combining trees, crops and livestock, can contribute to achieving economic and ecological value while restoring soil health. By incorporating trees in agriculture, we can increase the amount of carbon sequestration in the soil, triggering a food chain that starts with the decomposition of organic matter and results in an overall increase in biodiversity.

Our vision is to design a neighbourhood transforming the monotonous farmland into a more complex landscape, which integrates housing, woodland, hedgerows and agro-forestry, resulting in an expressive biodiversity net gain.



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### Challenges to providing active-living infrastructure in England and Jamaica: a qualitative cross-cultural comparison

Physical inactivity leads to increased risk of diseases such as stroke, diabetes, heart disease, cancer and poor mental health. How towns and cities are designed can influence population physical activity, as walking and cycling infrastructure, and quality open space can enable people to achieve more active lifestyles. These types of spaces, however, are often not attained, potentially building in physical inactivity for generations. This study seeks to understand what influences the design of active living infrastructure across different contexts.

We conducted 35 semi-structured interviews in three areas of England and 10 interviews in Jamaica to understand the perspectives of key stakeholders from the public and private sectors, including public health, urban planning and transport planning. All study areas had large amounts of development ongoing, with high demand for new housing.

We found shared challenges to investing in active living infrastructure in Jamaica and England. These included: a focus on quantity of housebuilding rather than quality of place; lack of enforceable local and national policies supporting walking and cycling infrastructure, and limited mechanisms to influence designs by developers to support active lifestyles; lack of finance for maintenance of open spaces; and social stigma of walking and cycling alongside aspirations for private cars in lower-income groups.

Pressure to tackle congestion was a major issue in both countries. In England, however, congestion and associated air pollution were used as a reason to invest in walking and cycling infrastructure, whereas in Jamaica, the lack of concern about air pollution made it more difficult to garner multi-sectoral support for active travel investment. Instead, emphasis was on increasing road capacities. Additional barriers were distinct for the middle-income setting of Jamaica: high crime rates; external pressures from international funding sources; greater focus on infectious diseases compared with 'lifestyle' diseases; and very low levels of existing cycling infrastructure and public open space.

This cross-cultural comparison highlights the shared but divergent challenges that inhibit designs of active living infrastructure. It's important to understand these contextual factors that influence design and implementation to enable healthier urban environments.

## Health and wellbeing as a catalyst for whole-systems, place-based design

Health and wellbeing can be a powerful catalyst and lens through which to understand people and places, and evaluate outcomes.

This paper explores the possibility of taking a health-led approach to infrastructure, city design and investment, drawing on recent collaborative studies undertaken by Arup. It will give examples of how health and wellbeing may support collaboration across multiple scales and sectors. It will explore how a focus on delivering better health and wellbeing outcomes for people and communities may also help address wider urban and global challenges.

In 2018, Arup published a discussion paper entitled 'Exploring a health-led approach to infrastructure'. Infrastructure is fundamental to the resilience, health and wellbeing of communities, yet asset planning, investment and management across health and infrastructure systems are rarely well-aligned. A series of economic, environmental, social and political challenges is driving convergence between health, wellbeing and infrastructure, based around cross-sector collaboration and holistic, place-based responses. Drawing on health-sector innovation in asset-based community development and the shift in infrastructure towards social value and partnership working, the paper explored how by using a shared vision and asset framework, infrastructure investments might be aligned to support health and wellbeing outcomes for communities.

More recently, Arup has been exploring the application of this health-led approach at community scale ('Exploring a health-led approach to place'). This work looks at aligning city design and investment with critical issues such as inclusive growth, closing the health gap, resilience, and climate change. We've been developing and testing collaborative design tools and ideas, working with a range of partners. This work has highlighted the importance of balancing local insight and place-based understanding with wider urban systems. It has highlighted the importance of building a shared vision and common understanding around place-based priorities, and the challenges around this.

The shared asset framework supports collaboration across multiple dimensions, from global to community scale, from physical to non-physical, and from the collective to the personal. As healthcare, public health, infrastructure and other city systems converge, we find a health-led approach – based around the wider determinants of health and wellbeing – could unlock a new collaborative practice that balances human, city and planetary health.



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**Madinat al Irfan: a case study for the  
New Urban Agenda**

Ensuring the health of urban populations extends well beyond the provision of health services. Effective urban planning, infrastructure development and governance can promote wellbeing and have positive effects on a city's sustainable development.

The new urban extension for Muscat intends to become a model of future sustainable urban development for growing cities. A detailed masterplan for Madinat al Irfan, a new urban quarter, will help Muscat accommodate future growth responsibly. The masterplan exemplifies many of the ambitions set out in the New Urban Agenda adopted at UN Habitat III, addressing a range of challenges from housing to happiness, offering a visionary and implementable alternative to car-dominated, resource-hungry urbanism.

Accommodating a population of up to 120,000, Irfan is designed around some simple principles that have worked well for centuries: cluster buildings tightly together; make places easy to get to; mix them up; design with the climate and to a human scale; grow food closer to home; and respect nature.

In addition to designing a masterplan, we also created a streamlined governance model, setting new structures for planning and delivery. This work included organisational design on how a masterplan will be implemented, suggesting the creation of the Madinat al Irfan Authority with the capacity to develop the project and provide security for investors. A set of rigorous design codes codify the spirit of the masterplan. These locate all key site-wide information and detail strategies for implementing the macro principles at the micro scale of individual buildings and blocks. Allowing for flexibility, these codes will ensure that the strong vision is realised at all levels.

The project provides a new model of urban design and planning not only for Oman but also for growing cities and societies around the world. Irfan lowers carbon from the outset, builds on existing cultural identity, promotes social cohesion, and creates value for residents and investors alike. Irfan hopes to learn from the past to create a city whose design provides all the ingredients of wellbeing for citizens, while responding to culture and geography to create a healthier city from the outset.

## Creating a sense of place through placemaking

The concept of community involvement and the effect that the act of making has on the community itself is a key consideration in the placemaking discussion. The National Academy of Sciences' report 'Community and the Quality of Life' notes that community is often used as a synonym for place, and that creating a sense of place is important because it also develops a strong sense of community among those who live there. This report also suggests that sense of place or community is a form of social capital that shapes residents' personal identities, fosters a degree of community member rootedness in a place, provides us with a measure of liveability for that place, and creates a sense of wellbeing within us.

Historically, community development has most often been placed in the hands of individuals who are considered experts in the creative process. This approach frequently results in targeted criticism of the proposed development by the host community and a lack of trust in the motives and priorities of the professionals involved. This approach often deters community involvement in the development of public space – a practice that could empower host communities and foster a sense of place among community members.

This presentation discusses the theoretical foundations of community participation and the value of co-production from a community health as well as a planning and design perspective. It explores the role of placemaking as a strategy for developing a community's sense of place, and proposes a continuum of placemaking strategies, based on Arnstein's ladder of citizen participation, to increase the likelihood that a sense of place is developed within the community as an outcome of the planning and design process. This continuum is designed to help planning and design professionals better understand how they might include the community in a co-produced process. It will also highlight the degree to which a co-production approach to community planning and design can cultivate a sense of place as an outcome.



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**The Nighttime Design Initiative**

Despite concerns about the proliferation of 24-hour cities, no holistic planning approach exists for the dark hours and their characteristics.

Are cities serving their citizens when night travels are considered unsafe? How can public space usage, crucial to health during the day, be improved at night? For those working the night shift, is it safe to traverse during these hours?

Current research on city nights can be defined in three areas:

- nighttime economy, with focus on entertainment, citizens' behaviours, urban policy and cultural planning;
- events and festivals, which increase cultural offerings and tourism; and
- lighting masterplans, by city membership organisations and planning practitioners, setting standards.

These areas have two cross-cutting trends: concern about energy efficiency and improvement in lighting technologies. Nighttime design diverges in that it's inclusive of all these dimensions.

**Purpose and methods:** The greater vision for safety, public health and local economies is the prime mover. Our mission has been to further develop qualitative and quantitative transdisciplinary research and implementation, city by city. Our efforts are materialised in pilot projects that widen the uptake of nighttime design application on a greater scale.

Lighting improvements affect safety in cities, namely crime and accidents. The visible act of care from a city authority improves the perception of place, while increasing confidence, shown to reduce crime. Better lighting with transport policies reduces accidents. When vulnerable citizens (children, elders, women) enjoy after-dark public space, streets are safer for everyone. Walkability and sociability are key nighttime health foci. Illumination encourages pedestrian use. Blending light with cultural planning can help attract people to public space, resulting in health benefits.

A market push for uptake in smart digital technologies, which rely on light poles as hosts for sensors, city services, data collection and surveillance has already started. But commercial interest and understanding of the actual effect of nighttime lighting is minimal.

With suitable training and principles, new lighting will not only save more energy but also contribute to the enjoyment of nightlife, and help with organisation and governance in the hours of darkness.



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## Designing for active lives: contextualising toilet provision

Access to toilets when away from home is a necessity for living active lives. The tendency to stay at home, or to stick to familiar routes, if toilets are not certain is well reported in research by Help the Aged (2007), Hanson et al (2007), Ramster & Bichard (2011) and, more recently, the Royal Society for Public Health (2019), which concluded that the lack of toilets is “affecting equality, mobility, physical fitness and other aspects of health”.

Our own research and practice reflect this, while also emphasising the fragmented nature of provision (Greed, 2003). Provision can no longer be captured by a catch-all term ‘public toilets’. A range of facilities from the council-owned block to those provided for customers has shifted public toilet provision towards ‘publicly accessible toilets’ (Ramster and Bichard, 2011) shared between public and private providers. Access to many of these facilities, however, may be restricted by the context of use shaping what the user is comfortable with, as well as what they’re entitled to use.

Using data from the Great British Public Toilet Map, we’ll show this diversity of provision and how it compares in different towns across the UK. Factors such as security, anonymity, necessity, expectation and sense of inclusion can feature in people’s ability to use a toilet as much as physical access requirements. How might these be considered and what would that mean in the context of the toilet in the parks, trains, libraries and pubs of the future city?

This work presents the case that to design better, more open and more inclusive toilet provision requires consideration of the context of provision. Previous studies on toilet design agree that the interior is not a one-size-fits-all solution (Greed, 2003; Hanson et al, 2007; Ramster & Bichard, 2011; Slater & Jones, 2018). However, we extend this finding to argue that for toilet provision in healthy city design, the context of provision is also not one-size-fits-all and requires specific interior, product and service design (Bichard, 2015) to meet the needs, challenges and design conflicts for the city’s varied contexts, including park v shopping centre; night v day; enabled v excluded.



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### Developing model communities

In the UK, the transfer of services from acute hospital settings to more local centres is often misunderstood as being driven by cost-cutting rather than improvement. This has led to political opportunism and a general opposition to many closures or transfers. This presentation will look at the potential opportunities from redevelopment of acute hospital estates. We can create model health villages or districts, and construct much needed housing and health facilities that demonstrate what 21st century health provision should look like.

The hospital of tomorrow needs to be a large, integrated system providing extensive outpatient care beyond its primary facility, dedicated to keeping community members healthy. A well cared-for population should require less inpatient care, leading to lower demand for hospital beds. Population health management is the nexus that brings together an understanding of population need through big data, patient engagement and healthcare delivery to embrace the triple aim of experience of care, the health of populations, and cost savings.

This requires mixed-use development, mixed funding and greater co-operation than before. Reconfiguration requires a national development programme with a decade-long, £1 billion-plus funding stream and two phases of identified projects to secure the property sector's commitment. The health sector must regain a culture of procurement and delivery, and work within a mixed-use, mixed-funding structure, maintaining control of development through partnership or leasehold arrangements.

This paper will present three developments, each of which reconnects the hospital campus to the city as a permeable health district, strips out all the century-old accretions, and restores historic buildings to their original quality. Housing more than 1000 people in social, extra-care and for-sale accommodation, with 'health' elements including a nursing home, small mental health unit, a community hub, and a new smaller hospital, the proposed model for the future comprises a green re-use of existing building stock as the centrepiece in an integrated healthcare network, which can demonstrate genuine improvement at all levels.

This can only be achieved through partnership, a mixed-funding model, and a far more inclusive approach to development, which can overcome the current contradictions in a programme of integrating care at community level driven down from the top.

## The therapeutic landscape

This paper is a case study on the design of Springfield Park in Liverpool, encompassing the new Alder Hey Community Cluster and Dewi Jones inpatient facility, as part of the Alder Hey Children's Hospital campus. The new buildings will provide community outpatient and inpatient mental health facilities for children in a parkland setting. This is set to be a pioneering project that integrates three environments: healthcare, community and landscape, to create Alder Hey's aspiration for "a parkland community for children," with each offering therapeutic benefits to the other.

The park is a key node in North East Liverpool and will provide an important community resource. It will promote healthy lifestyles for everyone as part of the NHS Healthy Liverpool Blueprint, Liverpool's Healthy City Status, and the NHS's aspiration to reduce social and health inequalities, and provide opportunities for lifelong learning focused around the natural environment.

The presentation will cover the key design aims for the two new buildings and park. The design draws on cognitive, psychological and physiological principles of therapeutic environments. We'll demonstrate how these ideas are relevant not only for all healthcare buildings but to promote wellbeing in all settings.

The whole area of Springfield Park is being redeveloped in phases, as part of a land-swap agreement between the city and the hospital. Following completion of the main hospital in 2015, the next phase will provide new typologies of research and community facilities to allow the full vision for the park's redevelopment to be realised.

The park will connect three communities, with a wide variety of public amenities planned – from sports and play facilities, a running route, public events areas, community food growing, and the aspiration for an outdoor classroom, café and animal petting areas.

The Community Cluster and Dewi Jones building are designed to be fully integrated with landscape, focused around courtyards that overlook and connect to the new park, and use therapeutic principles throughout. Timber is used extensively in the structure and finishes, with close attention paid to natural daylight and ventilation, views to green spaces, different scales of spaces, and a coherent arrangement of public circulation, places to wait and clinical rooms.



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### **Physical, mental and civic health: suburban intensification and integration**

This paper will investigate how the way in which healthcare, life sciences and educational institutions occupying suburban sites can be transformed for the civic benefit of their occupiers and, most importantly, the wider area constituents.

From an international perspective, many occupiers of healthcare facilities, life sciences campuses, technology parks, shopping malls, and enclaves of light industry are embracing what it means to be a contemporary – and urbanised – retail place and workplace. They recognise that facilitating collaboration and knowledge exchange are key to attracting the best and brightest. They understand their employees have rising expectations about access to amenities, the outdoors, and activities that contribute to wellbeing.



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The positive transformation of many scale-less and anonymous places found backing up against highways and turning their backs on nearby neighbourhoods is still a rarity. Even when redeveloped, these places are often myopic in their approach – perhaps we should not be creating ‘villages’ but rather urban extensions to existing settlements. Too often the so-called public realm in these new ‘villages’ depends on retail for activation. As online shopping grows, retail consumerism can no longer be depended on to activate the public realm. These factors, combined with growing interest in health and wellbeing, makes this an opportune time to focus both on the typological redevelopment of characterless boxes and the space between big boxes and residential neighbourhoods. Healthcare institutions have a key role to play.

From a UK perspective, healthcare estates should be spaces where ‘health engines’ combine and convert the power of healthcare, research and development, and industry to deliver positive progress. Instead of selling off surplus land for residential use and reducing the NHS estate, there is potential to create health eco-systems in our cities. As hospitals act as anchor tenants, surrounded by layers of step-down care, commercial tenants, research and wellness services, the concept of a ‘health return’ can be realised. Thinking is required from both the inside-out and the outside-in to ensure that important healthcare sites are knitted back into their urban context, promoting mutualism between healthcare and education, and creating societal hubs that encourage public access and community use.

## Healthcare in the urban habitat: challenging healthcare providers, designers and urban leaders to collaborate for the improvement of community health

This paper concerns the convergence of theory on population health management and “liveable cities” initiatives. The co-authors are exploring how healthcare providers, civic leadership and non-traditional healthcare providers (such as Amazon, YMCA, etc) can work together to co-ordinate to improve community health outcomes. This community collaboration would provide more effective wellness opportunities and a reduction in healthcare costs.

**Objectives:** For many years, placemaking designers have explored concepts for achieving healthy cities, and civic leaders have been developing guidelines to this end. In parallel, international healthcare systems have been exploring how to reach out to provide more effective healthcare to the communities they serve. Challenges to healthcare providers include: a) overcoming inequity in healthcare access; b) motivating the population they serve to embrace healthy living to overcome an increase in developing chronic illness; c) determining return-on-investment on strategies; and d) achieving reduction in healthcare costs. We’ve observed that civic and public health leadership are frequently unaware of the challenges faced by healthcare providers. If they were engaged, would they be able to openly collaborate to create programmes and facilities to promote community health, while reducing healthcare costs?

This session will challenge participants to explore how to engage both healthcare providers and urban leaders to create healthy “liveable” cities by fostering collaboration.

**Results and conclusions:** This session will explore topics of improving community health from the perspective of two separate catalysts: 1) the healthcare provider – motivating and empowering their patients, while addressing inequities in healthcare and changes in reimbursement; and 2) community leadership – the growth of “liveable city” concepts to provide for healthier, more liveable cities. The presentation will articulate the common ground for community health that these two catalysts can embrace.



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## Child obesity and the built environment

The boroughs of Lambeth and Southwark are densely populated, and have great areas of affluence and stark poverty living side by side. Dulwich Village in Southwark is an affluent area with some of the lowest child obesity rates in the UK (one in 10). About a mile away in Camberwell, the average annual income halves and one in three children are overweight or obese.

**Purpose and objectives:** Our childhood obesity programme aims to reduce the number of children and young people reaching an unhealthy weight, focusing on the relationship between child obesity and inequality. Our goal is to close the obesity deprivation gap in our boroughs over the next 10 years, bringing high-obesity levels in the most disadvantaged areas down to levels in the more affluent areas.

**Methodology and findings:** Emerging evidence shows that the built environment can impact on a range of health issues and on child obesity specifically. We'll effect greater change by focusing on environments in which children and their families spend their time, rather than trying to influence individual behaviour. This year, we expect to invest in several built environment projects, working in a defined location to test and learn how we can alter spaces in some of the most deprived wards to address childhood obesity.

We'll present on the following:

- targeting interventions for impact: how data is used to map obesogenic environments and how it impacts on communities' behaviours to target interventions in the right places;
- space changers: partnering with schools and local communities to co-design changes to the built environment, to increase incidental activity and play, and engage with young people to redesign their parks and social spaces, increasing physical activity; and
- regeneration for health: how insights from our wider programmes are used to embed health as a core pillar in our property portfolio.

**Conclusions:** The upfront investment for changing the built environment is high, with its potential value returned over a long period. We aim to build the evidence base on the positive health impacts of changing the built environment. Our goal is to back projects that can be replicated, shared and scaled, not only in our boroughs but in similar urban environments.

## School superzones: creating healthier and safer places for children to live, learn and play

Giving every child the best start in life is crucial to reducing health inequalities across the life course. What happens in the early years has lifelong effects on many aspects of health and wellbeing – from obesity, heart disease and mental health, to educational achievement and economic status. The environment in which we live is inextricably linked to our health across the life course and our ability to make healthy choices. Unhealthy urban environments drive health inequalities in cities, with exposures such as unhealthy food and drink outlets, gambling premises, and poor air quality clustering in deprived areas.

London health and social care partners are developing an innovative approach to creating healthier and safer environments for children to live, learn and play. 'School superzones' are the 400m radius area around schools in which public health issues are addressed in concert to develop a healthier zone. School superzones are targeted to deprived areas, addressing environmental and health inequalities. Superzone action plans are co-produced locally, tailored to suit the character of the neighbourhood.

In 2018–19, 13 London boroughs participated in an exploratory project to test, develop and refine the superzones approach. Boroughs selected a school superzone, scoped assets, harms and opportunities in the area, and worked with local stakeholders to co-produce an action plan. Plans include a range of actions, such as: reducing traffic around schools to bring down air pollution; restricting the advertising of unhealthy foods; improving pedestrian routes to schools; and redesigning public spaces to discourage crime.

Other innovations include installing public water fountains to encourage healthier drinking habits, improving access to and usage of green spaces, and community food-growing projects. Early successes include political buy-in, stakeholder engagement, co-production, and sharing of best practices. We're currently working with the University of Manchester to evaluate the process of setting up local superzone projects.

Based on learning so far, we're developing a transferable school superzone model for wider adoption across London and other urban areas across the country. We're working with academic partners to embed a complex systems evaluation into further rollout of the superzones approach to continue to build the evidence base.



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### Exploring children's needs of natural elements in the school environment under hot desert conditions

The green design movement stresses the need to reintegrate nature into the built environment, given it has a significant impact on many aspects affecting building occupants' health and wellbeing.

Biophilia – people's affiliation with nature – is an aspect often studied because of nature's positive effects on cognitive performance, productivity and the psychological state of buildings' occupants. Children living in a hot desert environment such as the United Arab Emirates (UAE) may lack exposure to natural elements, which can have negative impacts on their health and wellbeing at the critical developmental age of 7-14 years. The aim of this exploratory qualitative study is to investigate children's current experiences with natural elements in UAE's learning environments, and their possible need for vegetation, water and other natural elements, as integrated with such environments.

**Method:** Draw-and-tell sessions were conducted with a sample of children aged 7-14 in the city of Al Ain. Children were asked to draw their preferred or dream classroom, and their dream recess outdoor space. This helped capture what they currently perceive as a pleasant experience, and whether it includes natural elements or not. Their current level of connection to nature was deduced, in addition to their preferred experiences with natural elements.

**Results:** Children's drawings and verbal elaborations helped extract preferred physical elements as integrated features in their dream schools. Thematic patterns were observed with different age groups and with the difference of gender, although different expressions were used. The results primarily indicated a need to have more opportunities to connect to nature.

**Conclusion:** The preliminary results highlighted children's current deprivation of a connection to nature, indicated by their lack of association between natural elements and the school's context. Moreover, the findings also facilitate the potential of suggesting architectural design strategies and environmental regulations, which allow for the adoption of these design solutions in both new and existing school designs in the region. Eventually, UAE schools can be transformed into more biophilic schools that improve the health and wellness of future generations and increase the sustainable development of our cities.

## **Paving the way for neighbourhood play: examining the social and environmental affordances that support children's neighbourhood activity and mobility**

The value of independent exploration, play and movement through local neighbourhood environments for supporting children's physical, social and psychological development is well documented. Research evidence, however, suggests that the ability of children to independently explore neighbourhood settings has become restricted, as a result of increased participation in structured activities, parental perceptions of neighbourhood risk, and changes in neighbourhood design. Although recent work has begun to cover some of the social and environmental factors that may constrain children's out-of-home activities, we still have little direct evidence of spatial and temporal specifics of their neighbourhood-based activities to allow us to connect behaviour patterns to environmental or social affordances offered by the neighbourhood setting.

This paper will present the results of a multi-method study examining the neighbourhood-based play and activity patterns of children from urban and suburban neighbourhoods in a mid-sized Canadian city. The study used several child-friendly and child-engaging quantitative and qualitative tools, including GPS trackers, activity diaries, child-annotated neighbourhood maps, child and parent surveys, and Google-Earth enhanced group interviews, integrated within a GIS, to highlight patterns in children's neighbourhood play and movement. Deep pattern analyses revealed distinct patterns in children's neighbourhood activity domains, play activities and independent mobility, as well as the social and environmental affordances affecting their neighbourhood-based perceptions and activity.

Child participants noted a diverse range of local independent destinations, but habitually spend little time playing outdoors in their neighbourhoods. Children's local leisure activity related to the amount of free time available to them, their perception of neighbourhood affordances for preferred activities, and their license to travel independently. Both social and environmental conditions of children's micro-neighbourhoods influenced the number and range of independent destinations and domains.

This paper will discuss neighbourhood planning strategies for promoting diversity of activity affordances for young people, and for addressing conditions that can support increased independent mobility for youth. It will conclude with a reflection on the challenges and opportunities for engaging children in neighbourhood-based research seeking to link children's play to place.



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AGE Platform Europe**Homes4Life: certification for investment in ageing in place**

At the time this session takes place, Homes4Life will be in transition from its conceptual phase to development of a certification scheme. This offers the opportunity to:

- reflect on the project's proposed vision on and working taxonomy of age-friendly homes in terms of their characteristics, requirements and effects; and
- receive input from experiences of the development of the Homes4Life certification scheme.

Our homes have a tremendous impact on our health and wellbeing. Ensuring their suitability and adaptability to people's needs and preferences is one of the most effective approaches to respond to challenges brought to us by Europe's ageing demographics. A huge share of the building stock, however, is not adapted for ageing at home.

Faced with the above, researchers, architects, older persons and certification experts have teamed up to develop a new European certification scheme for ageing in place. Ensuing from analysis of how ageing demographics will impact home adaptation, the Homes4Life certification will offer a holistic life-course approach to housing, which integrates affordable construction and digital solutions. It will be flexible enough to address specificities of each country and apply to both new and existing buildings.

Homes4Life is run by a multidisciplinary group of nine partners from five EU countries (Spain, France, Netherlands, Italy and Belgium), led by the leading European research centre Tecnalia. The project has received funding from the European Union's Horizon 2020 research and innovation programme.

**Method:** The Homes4Life vision, vision document and taxonomy will be presented, with barriers to innovation and investment explored. Inputs are mapped on to a visual representation of the Homes4Life taxonomy using a Mindmap tool or equivalent. The mapping will be discussed and major clusters identified. Discussion outcomes will be synthesised into recommendations for finalisation of the taxonomy and vision document, and into identification of areas of interest for the Homes4Life certification scheme.

**Conclusion:** The session will conclude with a preview of the second year of the project and will highlight opportunities for participants to stay informed and engage with the project.

## The potential for intergenerational living

Over the past year, the authors have been researching a model for intergenerational housing, identifying and challenging the obstacles to turn it into a mainstream housing option. Isolation is extremely harmful to health and is increasingly being understood as a modern disease and significant factor in a wide range of life-limiting conditions. Housing options are increasingly segregated by age and where people do live with other generations, it's often due to a lack of choice rather than as a positive option. Intergenerational living is not a new idea, but the authors' hypothesis is that it has potential to support people who are not related to one another to benefit from such an arrangement, while maintaining independence.

Drawing on research from around the world, categories of ad-hoc and circumstantial models for intergenerational living have been analysed. Each case study responds to a specific problem, so they cannot be readily scaled as a mainstream option; they do, however, offer insights and suggest a strategic response to broader social issues. Working with partnering organisations, including policymakers and housing providers, the research has followed three distinct components, which are hypothesised to be necessary changes to the established mainstream housing model:

- social impact methodology with objectives and value benefits;
- form of social contract supporting social exchange; and
- architecture that provides conditions to balance community and independence.

Each component has been developed with research partners and used to develop a prototype for a new form of housing. The findings of the study have shown that the sharing of these family-style care services are where significant societal and economic benefits lie. It's argued that this is largely due to a lack of dialogue between housebuilders, operations and management, and eventual end-users. By reviewing the process in which housing developments are procured, opportunities to integrate approaches that support community cohesion have been established and tested.

Making our cities more healthy, successful and sustainable requires participation from policymakers, governance, investment, planning and design. The research acts as a tool to provide evidence to developers, local authorities, agencies and service providers of the benefits of a healthier approach to designing a thriving, sustainable future for citizens of all ages.



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### **A framework for integrated active travel in the future city**

NHS England's Healthy New Towns Network Prospectus identifies the key health challenges in the UK: we're living longer but in poorer health. While spatial disparities in health are the product of individual, socio-economic and political factors across the life course, the physical environment plays a crucial role in influencing people's behaviour and choices.

Historic failures in planning and design have created places where pedestrians are marginalised, so that driving often seems a more attractive option than walking even for a short distance. This can be due to disconnected, circuitous street patterns, routes which feel unsafe, over-engineered roads rather than streets for people, mono-use developments, and a lack of green space.

According to Sustrans, in 2016, 62 per cent of all trips made were by car, 68 per cent of these trips were under five miles, and 23 per cent were under one mile. Research has shown that cities where residents walk and cycle more enjoy better air quality, a healthier population, and increased economic productivity.

We've drawn together research and practice case studies to develop a framework of ambitious urban design interventions, coupled with measures to reduce car dependency, and increase walking and cycling. We'll highlight barriers to adopting these interventions as the norm, discussing strategic policy, culture and impact of individual behaviour change. We consider if we should be designing cities for the most vulnerable users that benefit everyone? And how multi-modal transport and better facilities can support people in their daily routines to incorporate more walking and cycling? We also look at the role technology and how this proposed framework transforms the design, function and appearance of our neighbourhoods, high streets and cities.

Our findings propose that the concept of 'mobility as routine' should be promoted in the environments we design so it becomes the easiest transport option for people. However, this must be integrated with other modes, particularly the burgeoning sectors of micro-mobility, co-mobility and electric vehicles. A multi-modal blend with an emphasis on active travel is the basis for our framework and poses huge opportunities for the future of urban design, people, business and public services.

## Reclaiming the public realm: how evolving mobility could help reclaim our cities

We're experiencing a technologically driven shift in the transportation industry that is transforming the way we move and live in cities. However, the impact on liveability and urban design have not been present in this conversation. This presentation aims to reframe the conversation by focusing on the type of city we want to inhabit and asking how future mobility can support this vision. Starting with the notion that the public realm should benefit all stakeholders, we examine how future mobility could help reclaim urban space, which, over the past 100 years, has come to be dominated by the automobile. We're now at an inflection point that is potentially as transformative to how we experience cities as the arrival of the private automobile was at the start of the 20th century.

We need to reset our mobility priorities set so as to give primacy to active mobility, transit and shared vehicles. We'll examine studies that have been carried out regarding street capacities measured in people per hour, kerb access for ride hails and e-commerce, and the resulting increase in available space for widened sidewalks and active transportation. We'll look at Mobility-as-a-Service (MaaS), equity in a digital age, the impacts on urban sprawl, and the impacts of e-commerce on our streets and sidewalks (pavements). Much of what is being proposed could be implemented today; we'll look at examples of present-day proactive masterplanned projects that present a future city vision that embodies liveable city principles and a people-first approach to mobility.

Current market forces will result in repeating the same mistakes we made 100 years ago, ensuring that the public realm will continue to be dominated by the private automobile, with all the current negative health, social, environmental and equity issues simply amplified. There is a path out of this trajectory, but it requires changes in our regulatory approaches and ownership models.

By establishing a set of values to guide design decisions and policymakers to shape desirable outcomes, we're optimistic that the city of the future will be a safer, healthier, happier and more sustainable place in which to live and work.



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## Small Change, Big Impact

London's streets account for 80 per cent of the city's public space. With a rising population in the capital placing greater demands on the public realm, the function of streets as places and multi-use destinations is becoming increasingly important.

Using temporary, light-touch and low-cost projects to change the way a street looks and feels can have a big impact on people's lives, and can often be the first step towards more permanent changes. These projects allow people to see how the 'Healthy Streets' approach can benefit them, showing the potential of their local streets and public spaces for uses other than moving cars.

We'd like to see more of these types of projects across London, and the Small Change, Big Impact toolkit, created by TfL with Architecture 00 and Studio Weave, is aimed at anyone interested in finding out more or empowering them to get involved. It's been produced in collaboration with a number of individuals and groups who are already delivering these projects on the ground. The toolkit helps set out a common process to follow and increase collaboration between different parts of the community – including local businesses, voluntary and community organisations, groups of neighbours, artists, and all sorts of motivated people.

The toolkit breaks the process into four parts:

1. Getting started – coming up with an idea and having the confidence to get started.
2. Making it happen – getting prepared to deliver your project.
3. Execute and enjoy – going live and enjoying your project.
4. Conclude – wrapping up the project.

It also presents a variety of case studies from successful projects in London, including: Palmers Green's Play Quarter; community-led traffic calming on Brixton Hill; revitalising forgotten corners of Islington; and turning an area under the A21 into a live music stage.

This presentation will lead delegates through the process and present the toolkit from getting started to conclusion, using case studies of exemplar projects that have been delivered by different groups in London. Delegates will get an insight into how iterative project delivery provides a whole new dimension to delivering and applying the 'Healthy Streets' approach across London.

## Slow interchange and the quality of sharing in public and mobile spaces

One of the earliest forms of transport interchange was the coaching inn. In this archetypal public house, mail was delivered, passengers embarked and disembarked, and people (and horses) were rested and fed. Much of the cultural, economic and social life of the area happened here. Fast forward 300 years and the equivalent transport interchange is rushed, separated from civic life, and focused on the efficient throughput of commuters.

**Purpose:** This session will provide an opportunity for practitioners and policymakers to re-examine the underlying value of the interchange and develop initial design provocations that stimulate thinking around the slow interchange and quality of sharing in public and mobile spaces.

**Methods:** The session will use empathic and inclusive techniques to better understand people's needs and aspirations, as well as their hopes and fears around transport interchanges. We will use provocations to highlight the differences between historic and modern interchanges, and explore the values and experiences that underpin their design.

**Results:** Our research team plans to present our results to wider audiences via an interdisciplinary seminar and future publications.

**Conclusions:** The transport interchange exists at many scales and forms a key component of modern urban planning and architectural design. Its current form is predicated on many behaviours and technologies that are either redundant or the outcome of reductive thinking. This thinking reduces citizens to throughputs, and places to purely economic environments, robbing towns and cities of the richness that can be created by slowing people and traffic down, and focusing on the encounters and relationships that may arise.

The solutions developed through our work will help us understand the assumptions that underpin current state-of-the-art interchange development and provide new models for the development of future interchanges that place human wellbeing at their heart.



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## The walkable city

Physical inactivity is a growing health problem in the UK, with around 20 million adults insufficiently active. Moving to walking and cycling is the easiest and most affordable way to achieve an active and healthy lifestyle. Thirty minutes of walking can help prevent and manage more than 20 chronic conditions and diseases, including cancer, heart disease, type 2 diabetes and depression. At present, existing metrics are aimed at one or the other of the many parameters of assessing walkability. Metrics include:

- Walk score – a trademark metric available for the US, Canada, Australia and New Zealand;
- Perception-based Composite Walkability Index, by the University of California at Berkeley;
- PedShed Connectivity measure, by Active Healthy Communities Australia; and
- Walkability Index, by the University of British Columbia at Vancouver.

In addition, there is a variety of technical tools and approaches used in the transport planning industry for assessing the quality of the pedestrian environment. Each takes a similar approach, identifying a wide range of criteria, which can be assessed using a qualitative rating or linked to more quantitative data. This paper presents an innovative, holistic and multi-layered approach to address the need for a comprehensive assessment of walkability.

The parameters that would feed into this approach include: land-use classification; proximity to local amenities; pedestrian wind comfort; pedestrian thermal comfort; pedestrian visual comfort; local air quality; local noise levels; crime rates; pedestrian environment; and the urban realm.

Temporal and spatial data related to the identified parameters will be collected. The methodology will include a literature review, a review of existing checklists and webtools, and identification of suitable datasets and simulation engines, using London as a case study. Consideration will also be given to the development of a combined map-set to consider the individual and combined impact of all these parameters, their weighting in order to formulate a multi-variable scoring mechanism for evaluating walkability.

Proposed outputs will include development of a web-based mapping tool, where the user can understand the performance of a site against different variables. This has massive potential for global applications as a planning and design tool, as well as providing citizens with a valuable health indicator.

### What are city streets for? Bring back the “jaywalker”

In the 1890s, the Rover Safety Bicycle entered the market, leading to a discussion in German cities about safety and speed in the street (R. Bauer). This discussion came up again in the 1920s and 30s, and especially after WWII, in relation to cars and pedestrians. The ‘jaywalker’ was removed from the street and relegated to the side (P. Norton). In the case study “Middletown” (Lynd/Lynd, 1929), the observation is made that the car changed the town centre from a meeting point of people to a traffic junction of cars.

Individual observation, as well as a review of the literature, reveals a permanent process of city planning around the needs of motorcar owners: more parking space; more and wider roads; direct access to all facilities with cars; and acceptance.

The thesis of this paper is: small measures – such as greening the facades of houses, planting a few trees, establishing playgrounds or one-way roads, implementing electric mobile vehicles, inner-city tolls, or pedestrian zones in cities – are not enough. A more radical and fundamental approach is needed: at the centre of a healthy city project is the necessity to bring the pedestrian back into the street and to turn the power hierarchy in the city, defined by speed and horsepower, upside down. Slow is beautiful!

We must redefine what getting fast from A to B, which guides mainstream transport policy, actually means. To do so, we need to ask what is so particular at “B”? It’s the fulfilment of needs and participation in social life. In political debates and cityplanning, stakeholders tend to emphasise the “getting fast from” but don’t think about the “B”. B is often not a place but something people want to do – for example, go shopping, visit a doctor, meet people, etc. From a perspective of social practice theory (Schatzki, Giddens), routines and habits are important. These must be addressed, as well as individual town projects.



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### **Inequalities in neighbourhood walkability for older adults**

Outdoor walking is a type of physical activity and has certain benefits for healthy ageing. It has been found that older residents of high-deprivation areas walk less than those of low-deprivation areas. Previous research has shown that the neighbourhood built environment may support and encourage outdoor walking. The extent to which the built environment supports and encourages walking is called “walkability”.

This study examines inequalities in neighbourhood walkability in high- versus low-deprivation areas and their possible influences on disparities in older adults' outdoor walking levels. For this purpose, it focuses on specific built environment attributes (residential density, land-use mix and intensity, street connectivity, retail density, safety, pedestrian infrastructure, and aesthetics) relevant to neighbourhood walkability.

The research applied a mixed-methods approach, included 173 participants (aged 65 years or older), and used a Geographic Information System (GIS), a questionnaire and walking interviews (with a sub-sample) to measure neighbourhood built environment attributes. It used the Geographic Positioning System (GPS) technology to measure outdoor walking levels. Data on personal characteristics was collected by completing a questionnaire.

The results show inequalities in certain land-use intensity (ie, green spaces, recreation centres, schools and industries), safety, pedestrian infrastructure, and aesthetics in high- versus low-deprivation areas, as well as demonstrating that they may influence disparities in participants' outdoor walking levels. Modifying neighbourhood land use and improvements of perceived neighbourhood safety, pedestrian infrastructure and aesthetics in high-deprivation areas are encouraged.

## What prevents city planners monetising the benefits of active travel through a widely available online tool? Results of a mixed-methods study



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The World Health Organization's (WHO) Health Economic Assessment Tool (HEAT) is used to monetise the economic benefits associated with active travel. Building the economic case for active travel interventions is crucial in ensuring future investment in walking and cycling, which will improve population health and reduce emissions.

Use of HEAT in business cases across Transport for London (TfL) was not well understood following staff training and publication of a guidance manual. This cross-sectional analysis aims to understand people's experiences of using HEAT in TfL business cases, assess potential future use of the tool, and identify further support required for staff.

**Methods:** The Active Travel and Health team used telephone and follow-up email surveys to ask TfL staff about their use of HEAT since attending an internal training session.

**Results:** Ninety-one (91) staff completed the survey, 75 per cent of whom had undertaken the training and were still employed by TfL. Forty-seven (47) per cent of those involved in writing a business case in the past 18 months had used a HEAT assessment in a business case. Fifty-one (51) per cent of those who reported they will be involved in writing a business case in the next year said they felt confident in using HEAT. The main barriers to including HEAT assessments in business cases included: not trusting the robustness of the tool; not thinking it was appropriate for public transport schemes; and a lack of input data. Staff suggested that someone who could provide assurance, case studies and a refresher session could be beneficial to encourage future use of HEAT in business cases.

**Conclusion:** A large proportion of TfL staff do not feel confident in using HEAT despite having attended training. More TfL staff could be including HEAT in business cases, promoting walking and cycling. The developers of the tool, as well as transport authorities, should be addressing barriers to encourage more widespread use.



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### **Cognitive health and mobile navigation systems: the role of physical environment**

People are increasingly using navigation systems in their everyday lives (Speak, 2015). However, different empirical studies have demonstrated that mobile navigation systems can have a negative impact on people's mental representation of environmental and navigational information.

These reports have compared spatial knowledge in people using mobile navigation systems to participants using other types of assistance, such as physical maps (Aslan et al, 2006; Ishikawa et al, 2008; Krüger et al, 2004; Münzer et al, 2006; Willis et al, 2009; Ahmadpoor and Heath, 2017). They have measured differences in factors, including accuracy of memory for the location of discrete environmental features (eg, landmarks and their allocentric spatial organisation), as well as estimation of distance and heading between two locations. Also, studies have noted that using these systems can result in cognitive impairment. Researchers argue that releasing the brain from the efforts of navigational tasks through use of navigation systems can change the shape of the brain. They suggest that constant use of navigation systems could result in atrophy of neurons in the brain, which are involved with memory and navigation, increasing the risk of cognitive problems such as Alzheimer's (Neyfakh and So, 2013).

While individual-focused interventions remain important in supporting cognitive health, there has been growing interest in population-focused interventions, such as the role of the surrounding architectural and neighbourhood physical environment. We describe an investigation of the effects of physical-spatial attributes of the built environment on cognitive function among people who navigate using GPS-based systems.

In an experimental study, in Nottingham city centre, we collected cognitive maps of people who navigated using GPS systems and compared them to the cognitive maps of people who navigated the site non-aided by technology. We then examined the association between the physical-spatial attributes of the built environment and cognitive maps across the two groups. Our results identified several environmental factors that moderate GPS users' cognitive function, including street and intersection layouts, and existence of landmarks along streets and intersections. These results help urban planners in (re)designing cities to support cognitive health, where people are equipped with advanced navigation systems.

## Comparative roles of urban-form factors shaping walking behaviour to/from school

Despite a plethora of studies investigating how the built environment correlates to children's walking behaviour, firm conclusions about the role of street network design is still lacking. This is partly due to the measures applied by planning and transportation literature, which lack in measuring the structural properties of the street network configuration. This study aims to fill this gap by investigating the associations of urban form, in general, and street network connectivity, in particular, on walking rates and distance to/from school among primary school children, controlling for socio-economic factors.

**Methodology:** Data on commuting modes to/from school is collected through questionnaires conducted in 20 elementary schools (1780 students, ages 12-14) in Istanbul, Turkey. School environments (1600-metre buffers around the school) were evaluated through GIS-based, land-use data and street-level topography. Street networks within the same buffers were evaluated by using angular segment analysis (integration and choice) implemented in Depthmap, as well as two segment-based connectivity measures, namely metric and directional reach, implemented in Java.

Segment angular integration measures accessibility of each space from all the others within the radius, using the least angle measure of distance. Segment angular choice measures how many times a space is selected on journeys between all pairs of origins and destinations. Metric reach captures the density of streets and street connections accessible from each individual road segment. Directional reach measures the extent to which the entire street network is accessible with few direction changes. In addition, socio-economic characteristics of parents, obtained from parental questionnaires, were also included in the analysis.

**Results:** It's shown that spatial structure of the street network's surrounding schools is strongly associated with walk-mode shares and average walking distances to/from schools when controlling for parental socio-demographic attributes, land-use compositions and topographic features of school environments. Findings suggest that the scale at which urban form has an impact on pedestrian travel is considerably larger than a few blocks around the school.

**Conclusions:** Findings suggest that modifications to the school environment may help support active commuting patterns to/from school and, hence, prevent childhood obesity, but would require large interventions in current planning and land-use practices.



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## SALUS Global Knowledge Exchange

SALUS (Science, Architecture, Lifestyle, Urbanism, Sustainability) is a global media, publishing, research, events and training organisation with a vision to improve human and planetary health by design.

Our mission is to create, share and disseminate knowledge concerning the relationship between human health and the natural, built and social environment. We believe that the two great challenges of our age – the need to maintain and improve human health in the face of ageing populations and an epidemic of chronic disease, and addressing planetary health through a more sustainable management of the Earth's finite resources – are inextricably linked. Healthy people require a healthy planet.

As well as Healthy City Design, SALUS organises the European Healthcare Design (EHD) Congress in collaboration with Architects for Health. Held annually at the Royal College of Physicians, EHD is now in its sixth year and has established itself as one of the leading healthcare design events in the world. EHD 2020 takes place on 8-10 June 2020.

SALUS has also created an online knowledge-sharing environment dedicated to the design of healthy and sustainable communities at [www.salus.global](http://www.salus.global). This groundbreaking knowledge resource features videos of the talks, posters, and full papers from our conferences, a daily online journal, and a fully searchable map of healthy and sustainable built projects, alongside a variety of innovative community features. We invite you to join at [www.salus.global](http://www.salus.global) to participate and contribute to the community and a global knowledge exchange.



Royal College of Art

**THE HELEN HAMLYN  
CENTRE FOR DESIGN**

Contact:

Prof Jeremy Myerson, Helen

Hamlyn chair of design

Rama Gheerawo, director

Dr Chris McGinley, age and

diversity research leader

Dr Jak Spencer, social and

global research leader

Jonathan West, healthcare

research leader

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## The Helen Hamlyn Centre for Design, Royal College of Art

The Helen Hamlyn Centre for Design in London is the Royal College of Art's largest and longest-running centre for design research. It's an international leader in people-centred and inclusive design – the process of designing products, services and systems for ease of use by the maximum number of people.

Founded in 1991 and endowed by the Helen Hamlyn Trust, our purpose is to conduct design research and projects with industry that will contribute to improving people's lives. Our interdisciplinary approach is based around a series of interlocking research activities related to design for ageing, health, work, mobility and cities. We have developed empathic and innovative research methods, working in partnership with a wide range of business, industry, government, academic and third-sector partners.

Our expertise in healthcare has extended from design policy and information to the development of systems, services and products. Our projects include a total redesign of the interior space of the emergency ambulance.



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### Cities & Health

*Cities & Health*, provides an innovative international platform for consolidating research and know-how for city development to support human health. Committed to developing a shared evidence base, encouraging better cross-disciplinary understanding and supporting critical transdisciplinary practices.

The journal publishes papers and commentary from researchers and practitioners working to build a new wisdom for supporting healthier cities.

*Cities & Health* explores the drivers of urban change through the lenses of health and health equity. The journal invites contributions from a broad range of disciplines, including but not limited to: urban design, planning, architecture, transport, landscape, and city governance.

The journal covers a wide range of topics but public health and health equity lie at the heart of the discourse.



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### Research Design Connections

Research Design Connections is an important research-based resource for practicing designers. It reports on findings from studies conducted by social and physical scientists that designers can apply in their work. Subscribers are architects, interior designers, landscape architects, industrial designers, urban designers/planners, and others interested in how our experiences in the physical world influence how we think and behave.

Findings from trustworthy, unbiased sources are shared in everyday language. Insights derived from studies in recent peer-reviewed publications, etc, are integrated with classic, still relevant findings in concise, powerful articles. Topics covered range from the cognitive, emotional, and physiological implications of sensory and other physical experiences to the alignment of culture, personality, and design, among others.

Information is shared in a monthly subscription newsletter, an archive of thousands of previously published articles, and a free daily blog.

### THE ACADEMY OF URBANISM

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### The Academy of Urbanism

The Academy of Urbanism is an active, not-for-profit, politically independent membership organisation founded to expand our collective understanding of placemaking and share best practice. We recognise, encourage and celebrate great places across the UK, Europe and beyond, and the people and organisations that create and sustain them.

We bring together the current and next generation of urban leaders, thinkers and practitioners. We embrace city management and policymaking, academic research and teaching, development planning and design, and community leadership and urban change-making.

We use the evidence we gather to promote better understanding of how development and management of the urban realm can provide a better quality of living for all. Creating places that promote health and resilience is at the heart of our mission.



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### C3 Collaborating for Health

Imagine a world where people find it easier to live healthy lives and where there are no premature or preventable deaths from chronic non-communicable diseases (NCDs). That was the dream of our founder and current director, Christine Hancock, when she started C3 Collaborating for Health in 2009.

Following an illustrious career in nursing, including many years as CEO of the Royal College of Nursing and president of the International Council of Nurses, Christine came to realise that healthcare was intervening too late in a person's life. This delay meant that people were suffering and dying from illnesses that could have been prevented. Christine made a bold decision: to shift the focus to prevention and wellbeing by addressing non-communicable diseases (NCDs) and their risk factors before people fall sick or need care.

C3 believes that preventing these diseases requires collaboration between all sections of society and a focus on the three risk factors that impact NCDs: unhealthy eating and drinking; lack of physical activity; and tobacco use. This includes addressing both the individual and environmental barriers to leading a healthier life. We're pleased to see increasing global recognition that prevention, NCDs and risk factors are critical issues, especially with the inclusion of NCDs in the UN Sustainable Development Goals. Our work, however, has become more urgent as the NCD epidemic escalates and health systems buckle under enormous financial demands.

Only through collaboration can society hope to overcome this public health crisis. We're known for the breadth of our work and openness to engagement with all sectors, which is evident by our past and current partners and funders. We also specialise in projects with businesses, communities, workplace health and health professionals.



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## Centre for Urban Design and Mental Health

The Centre for Urban Design and Mental Health (UD/MH) is an international think tank focused on answering one question: how can we design better mental health into our cities?

Mental illness accounts for 14 per cent of the global burden of disease, and one in four people will experience mental health problems in their lifetime. Good population mental health is essential for a thriving, resilient, sustainable city. Yet urban living is not only associated with stress and loneliness but also with substantially elevated rates of depression, anxiety and schizophrenia. Planners and designers are only just starting to understand the huge potential opportunities for impact and value in designing for good mental health.

UD/MH launched in 2015 in response to the need for increasing global knowledge at the nexus of urban design and mental health. With fellows and associates around the world, UD/MH brings together diverse evidence, promotes strategic research, catalyses conversations, and develops practical guidelines to inspire and empower policymakers, planners and designers to systematically integrate public mental health into their work.



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## Design Council

The Design Council champions great design: design that improves lives and makes things better, improving our built environment and tackling complex social issues.

As an enterprising charity, our work places design at the heart of creating value by stimulating innovation in business and public services. We inspire new design thinking, encourage public debate and inform government policy to improve everyday life and help meet tomorrow's challenges today.

In 2011, the Design Council merged with CABE, the UK Government's advisor on design in the built environment. Together, we're passionate about using design to improve people's lives, and we believe that design-led innovation can stimulate business growth, transform public services and enhance places and cities.



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## Health and Wellbeing in Planning (HiP) Network

The Health and Wellbeing in Planning (HiP) Network was set up in October 2018 to help support practitioners working in the area of promoting health through planning and the built environment, whether you're a planner, health professional, architect, developer, academic, engineer in any sector.

The HiP Network aims to remain an active platform for its members as it supports a new generation of public health planners.



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### Housing Learning and Improvement Network

The Housing Learning and Improvement Network (LIN) brings together housing, health and social care professionals in England and Wales to exemplify innovative housing solutions for an ageing population.

Recognised as a leading 'knowledge hub' on specialist housing, our online and regional networked activities aim to:

- connect people, ideas and resources to inform and improve the range of housing choices that enable older and disabled people to live independently;
- share market insight and intelligence on the latest funding, research, policy and innovative developments to spread practice faster; and
- engage with industry to raise the profile of specialist housing with developers, commissioners and providers, in order to plan, design and deliver aspirational housing for an ageing population.



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### ISGlobal

ISGlobal is a consolidated hub of excellence in health research that encompasses more than 30 years' experience, drawing on expertise from both the hospital environment and academic institutions.

ISGlobal has become a pioneer in its field, combining research on communicable diseases with research on chronic diseases and their environmental and climatic causes. A pivotal mechanism of our work model is the transfer of knowledge from scientific research to practice, a task undertaken by the institute's education and policy, and global development departments, and through programmes such as the Urban Planning, Environment and Health Initiative.

Our ultimate goal is to help close the gaps in health disparities between and within different regions of the world.



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### Mike Nightingale Fellowship

The Mike Nightingale Fellowship was established in 2012 and is a registered charity in the UK. It aims to change lives through sustainable development and is active in South Africa. The charity sees its role as one of enabling improvements, by providing resources and skills that bridge critical gaps, which are often small but prove difficult to overcome. Applied judiciously in the right place and the right time, even small amounts of resources can help people with limited opportunities develop their own skills and capacities to improve their own lives, and those of their families and communities.

By applying methods and approaches that can be readily replicated in other similar projects and places, resources can be deployed even more efficiently and sustainably. The Fellowship will support changes that meet the needs of the present without compromising the ability of future generations to meet their own needs.



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## Town and Country Planning Association

The TCPA campaigns for the reform of the UK planning system to make it more responsive to the needs and aspirations of all people. The independent charity, which was formed over a century ago by Ebenezer Howard, founder of the garden city movement, challenges legislation that intensifies social, environmental and health inequality.

As part of its Reuniting Health with Planning initiative, the TCPA is working to improve the knowledge of practitioners, planners and non-planners – especially those involved in national and local policymaking – to inspire better integration between the health and planning disciplines.



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## UCL Institute for Environmental Design and Engineering

Part of the Bartlett, the UCL Institute for Environmental Design and Engineering pursues a deeper understanding of the interactions between the built environment and health, human wellbeing, productivity, energy use and climate change.

Creating buildings and spaces that support human health and wellbeing, and ensuring the sustainability of local and global ecosystems are the core purposes of our research, which is reflected in our postgraduate teaching.

Our postgraduate programmes include:

- Health, Wellbeing and Sustainable Buildings MSc;
- Environmental Design and Engineering MSc;
- Smart Buildings and Digital Engineering MSc; and
- Light and Lighting MSc MPhil/PhD.



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## Urban Design Group

The Urban Design Group (UDG) is an international membership charity devoted to improving life in cities, towns and villages through better design. The UDG believes that good urban design depends on successful collaboration between all those who shape the built environment, whatever their professional or personal background.

Founded in 1978, the group aims to promote high standards of performance and inter-professional co-operation in planning, urban design and architecture, landscape design, and all other aspects of the built environment; and educate relevant professions and the public in matters relating to urban design.

We work to support urban designers and foster an increased appreciation of the value of quality in the public realm through our events programme, newsletter and acclaimed journal *Urban Design*.



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### Work in Mind

Work in Mind is the world's first knowledge platform dedicated to the connection between healthy buildings and workplace wellbeing.

We believe that the environment in which we work, exist and learn should be a space in which health, wellbeing and productivity can co-exist with sustainability and efficiency. Launched in September 2018, Work in Mind establishes a space for a growing community of individuals who share a belief that positive change and better, healthier buildings are possible.

We're not a magazine but rather a knowledge-sharing platform designed to give a voice to a community of thinkers, businesses, journalists, and builders and influencers. Our network includes: architects; designers; property owners and managers; workplace consultants; human resources manager; business owners; as well as anyone associated with the health, wellbeing and productivity of the workforce.

We aim to curate, share and write powerful content that catalyses debate and encourages a more unified approach to creating healthier, happier, and more productive buildings and workspaces. As such, we actively welcome contributions – news, research, authoritative thinking and project-led case studies – from stakeholders across the entire built environment supply chain.

To join the Work in Mind community and to contribute your own ideas and thinking, visit us at [www.workinmind.org](http://www.workinmind.org)



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### WorkTech Academy

The WorkTech Academy aims to capture the inspiration and evidence emanating from its global faculty of speakers, experts and partners – and build knowledge and best practice across a global community.

Established in September 2016, the Academy curates content across six streams – people, place, technology, culture, innovation, and architecture and design – and provides comprehensive coverage of the changing world of work.

By combining an interactive online platform with live events, the organisation offers access to best practice in the field, with opportunities for peer learning, study, networking, as well as analysis and joint research.

The WorkTech Academy was co-founded by Jeremy Myerson, an academic researcher, author and activist in workplace design and innovation. Jeremy is also chair of design at the Helen Hamlyn Centre for Design, Royal College of Art, and the programme director of the Healthy City Design 2019 International Congress.



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 EXHIBITION PARTNER

## 20's Plenty for Us

20's Plenty for Us was set up in 2007 to assist communities wanting lower speeds and speed limits. With a focus on the single issue of campaigning for 20mph limits for most roads across a complete local authority, it now has 430 local campaigns in UK, Ireland, USA, Canada and Australia. It has been influential in transport thinking and guidance on the use and benefits of 20mph limits.

20's Plenty has also engaged with many of the places implementing wide-area 20mph limits. These include many of the UK's largest 40 urban authorities, 80 per cent of inner London boroughs, and the Welsh Government, which is setting a national urban default limit of 20mph. In 2017, 20's Plenty worked with the World Health Organization for UN Global Road Safety Week on a 'Slow Down Day' toolkit.

## Art in Site

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 EXHIBITION PARTNER

## Art in Site

Art in Site is an award-winning studio founded in 2003, led by directors Louisa Williams and Martin Jones. We produce integrated art, design and wayfinding for healthcare environments and social spaces.

Recent projects include: apps for children to relieve fear and anxiety at A&E; sculptures and illustrations that bring wellbeing benefits to mental health patients in long-term care; and a suite of artworks offering reassurance, dignity and better orientation for cancer patients receiving treatment.

We've developed nationally endorsed, best practice methods across the creative process, from community and stakeholder engagement, to the development of relevant and insightful art strategies, through to the selection of artists, design, compliance and quality control, and the co-ordination and manufacture of artwork.

## Create Partnerships

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 EXHIBITION PARTNER

## Create Partnerships

Create Partnerships brings together a portfolio of high-quality brands for the outdoor environment, all sharing the same philosophy of delivering exemplary products alongside superior customer service.

Operating as autonomous businesses, all companies in the portfolio have as their common hub Paul Collings, who has been working with the external environment since 2000, when he set up Timberplay. Dovetailing with this expertise, Create Partnerships' Playgarden brand presents a landscape-led approach to play design, suitable for the early-years setting.

Alongside Timberplay and Playgarden, Create Partnerships also includes All Urban, which presents world-leading street furniture and lighting brands, and Lightmain, which offers sport and skate solutions to suit a wide range of projects and budgets.



## Emerald Group

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 EXHIBITION PARTNER

Emerald Publishing is a leading international publisher in applied fields such as health and social care, the built environment, and environmental management. Our core ethos is to make a difference through research, by connecting academia, policy and practice, as well as publishing content that helps drive real change.

Emerald publishes more than 300 peer-reviewed journals, 2500 books and 1500 teaching cases, as well as Emerald Open Research – a new interdisciplinary open-access platform aligned to the UN Sustainable Development Goals, with gateways dedicated to healthy lives and sustainable cities. With open peer review controlled by the author and an open data policy, research is freely available to read, download and reuse. For more details, see <https://emeraldopenresearch.com/>



## HLM

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 SILVER PARTNER

The HLM Group works internationally as one, sharing best practice, knowledge and experience across the globe. The group comprises four independent architectural and interior design practices: HLM, Llewelyn Davies, Sidell Gibson and 33 Interiors.

The HLM brand combines design skills from four integrated elements of our business: HLM Architects, HLM Landscape & Urban Design, HLM Interiors and HLM Environment. We believe that successful urban communities are created through a placemaking approach with the community at the heart of the process. Our approach focuses on understanding the context, history, culture, patterns and forms of cities, towns and neighbourhoods. We're committed to delivering a sustainable built environment that aspires to achieve inclusive communities and economic viability for a healthier, safer future and a cohesive environment for all.



## Llewelyn Davies

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 SILVER PARTNER

The original partnership of Llewelyn-Davies Weeks was founded in 1960 by (Lord) Richard Llewelyn-Davies and John Weeks, both innovators in the design of flexible, highly serviced environments.

Llewelyn Davies has since pioneered new thinking in the planning and design of health and science buildings, delivering more than 250 health projects in 75 countries, by employing an adaptive, intelligent approach to create high-value solutions for complex building types.

Llewelyn Davies is also one of the UK's leading masterplanners. From Milton Keynes to the urban renaissance agenda of the 21st century, through policy guidelines and development strategies, the company has influenced the UK Government's vision for planning and design. Its knowledge in this area has led to commissions on six continents.



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Partners



## Perkins&Will

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KNOWLEDGE PARTNER

## Perkins&Will

Perkins&Will is an interdisciplinary, research-based architecture and design firm established in 1935. Founded on the belief that design has the power to transform lives and enhance communities, we have over 2000 professionals across more than 20 global offices, which include some of the brightest minds in architecture, interior design, branded environments, urban design, and landscape architecture. Our work has helped shape many of the world's most progressive academic medical centres, research institutions, and hospitals.

Through our Human Experience Research Lab, Perkins&Will proudly supports Clinicians for Design (CfD), an international network with a vision to enrich the healthcare experience. Clinicians for Design's goal is to translate innovative technologies, research and systems into design guidelines and policies, which enhance health and care environments.

## Ryder

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KNOWLEDGE PARTNER

## Ryder Architecture

Established in Newcastle in 1953, Ryder now has teams in London, Glasgow, Liverpool, Hong Kong, Vancouver and Amsterdam – and through Ryder Alliance, in Australia, Hungary, Spain and South Africa. Our projects range in value from £50,000 to £300m and cover the civic, education, healthcare, infrastructure, leisure, manufacturing, office, residential, retail and science sectors.

Through 'Everything architecture', our goal is simple: to improve the quality of the world around us and, in doing so, improve people's lives. It defines a responsibility to an inclusive society and to the future of our planet. It's embedded as much in pioneering science and technology as in art, and is the foundation for the collective journey – from the initial vision through designing and making, and beyond into use.



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EXHIBITION PARTNER

## StreetGym

StreetGym is Army veteran John Allison's urban micro-adventure, designed to promote an improvisational mindset, teamwork, as well as build resilience. It's about showing people how to use what they already have around them – so your street literally becomes your gym.

Walk along any high street and you'll see people glued to their smartphones, oblivious to the world around them and the huge potential that lies beneath their feet. StreetGym also aims to address this negative impact of our technology-driven world.

During a typical one-hour session you'll be running, jumping, balancing and crawling your way around the city, feeling a deeper connection with the streets. Architectural features and street furniture become workstations, where you'll perform a variety of bodyweight-based exercises before jogging along to the next workstation.

## Milton Park, UK

Our vision for Milton Park will spark growth in the region while elevating Oxford as the leader of the new knowledge economy. It will be a next generation of Sci-tech District, built on data analysis and 360-degree engagement.



# Enriching Health and Human Experience

**Perkins and Will**, an interdisciplinary, research-based architecture and design firm, was founded in 1935 on the belief that design has the power to transform lives. Guided by its core values—design excellence, diversity and inclusion, research, resilience, social purpose, sustainability, and well-being—the firm is committed to designing a better, more beautiful world.

Urban settings, buildings and interiors can have a significant and measurable impact on human health, performance, wellbeing and creativity. The mission of the Perkins and Will **HxLab** is to enhance design for the human experience. Our goal is to equip our design teams with the latest research and advanced technologies to translate emerging knowledge into rigorous design principles that better serve human outcomes.

We translate research into applications for the interaction between brains, bodies and built settings.

Join Perkins and Will at the **Healthy City Design International** conference, as we explore how our journey through a city impacts **health and wellbeing**. We will discuss and debate the application of scientific methods to assess how buildings influence the **brain, body, and our experience** of design.

**Hx**  **Lab**  
**Perkins&Will**

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## Healthy Cities - The Movement, Greenwich

The Movement comprises a major regeneration scheme at the heart of Greenwich, London, the aim being to catalyse the local economy, creating value and growth in the local community. The total development comprises 180 affordable new homes, a 350 bed student village, associated employment space, 2 new hotels, a community centre extension, bike café, health & fitness club, convenience store, employment incubator units, parking, and an FM and Community Energy Centre.

A unique, quality and accessible public realm has been created in the centre of Greenwich, creating a legible and coherent urban design, linking in with the DLR and mainline station. This masterplan delivers a vibrant, inclusive and sustainable mixed-use community based upon cultural, social and economic diversity, whilst recognising the need to generate value. Ground breaking energy performance standards have been achieved through extensive use of HLM's Dynamic Simulation Modelling.