

ULI Greece & Cyprus Annual Conference | 27 June 2023

An aerial photograph of a coastal city, likely Nicosia, Cyprus, showing a large stadium complex in the foreground, a dense urban area in the middle ground, and rolling hills in the background. The image is overlaid with a semi-transparent blue filter.

Resilience through Reuse... A Vision for Sustainable Urban Landscapes

Dan Ringelstein
Director - Cities, Planning & Design | Arup

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Director – Cities, Planning & Design – Arup



I've lived in:
Chicago
Boston
Paris
London

Education: Univ of Illinois,
Arch School of Versailles France,
MIT / Harvard, Cambridge USA

joined Arup in 2022
after 28yrs at SOM
(9yrs in Chicago, 19yrs in London)

Arup - Who are We...?



Total Design

Acoustics | Architecture | Audiovisual | Bridge Design | Building Design | Civil Engineering | Construction Planning | Commissioning | Cost Management | Development Planning | Electrical Engineering | Energy Consulting | Environmental Consulting | Façade Engineering | Facilities Management | Fire/Life Safety Consulting | Geotechnical Engineering | Highway Engineering | Infrastructure | Impact and Blast Engineering | Information Technology and Communications Consulting | Laboratory Design | Lighting Design | Logistics Consulting | Management Consulting | Maritime Engineering | Mechanical Engineering | Offshore Engineering | Plumbing Engineering | Project Management | Rail Engineering | Risk Consulting | Security Consulting | Seismic Design | Structural Engineering | Sustainability Consulting | Transport Planning | Tunnel Engineering | Vehicle Design | Venue Consulting | Visualization and Modeling | Water Engineering | Wind Engineering

Investing in walkable urban space should be a no-brainer.
ARUP

We are built upon an enduring legacy...

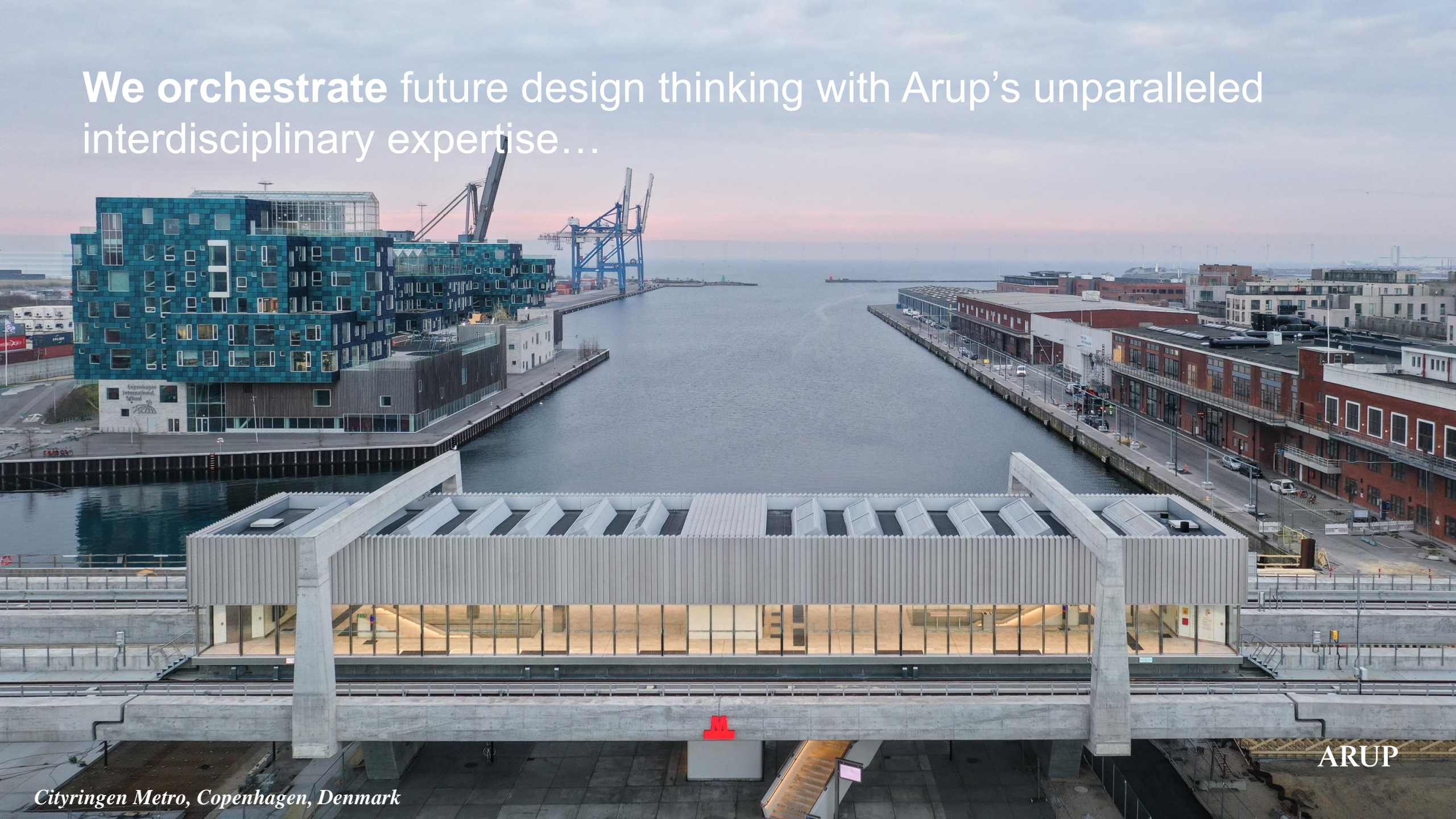


ARUP

We lead our clients towards excellence
and sustainable outcomes...

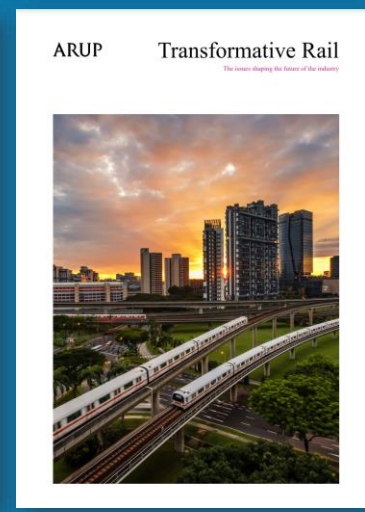
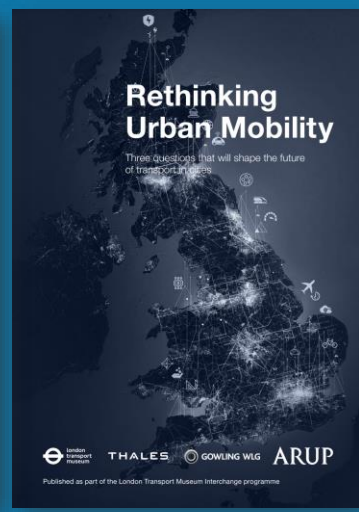
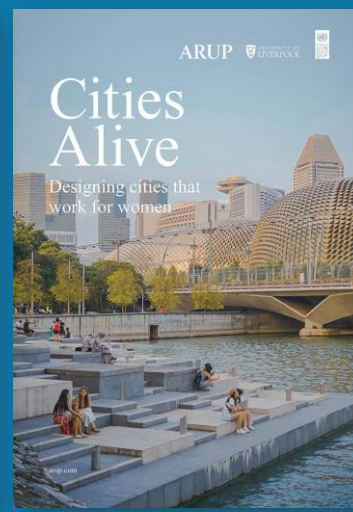
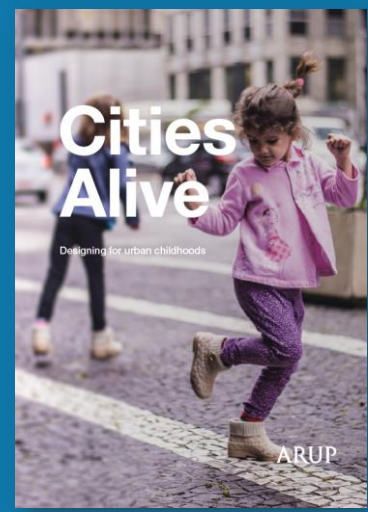
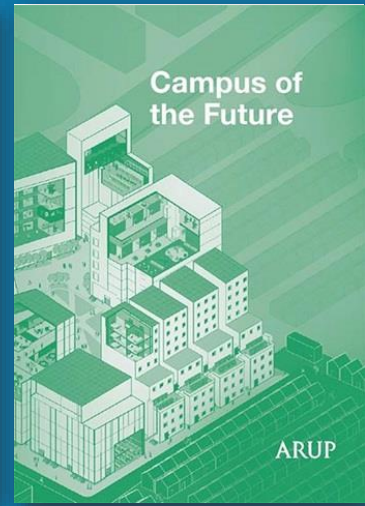
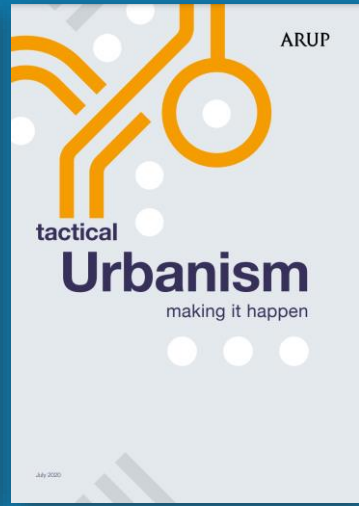
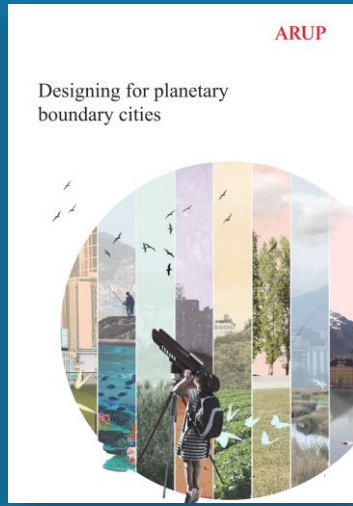
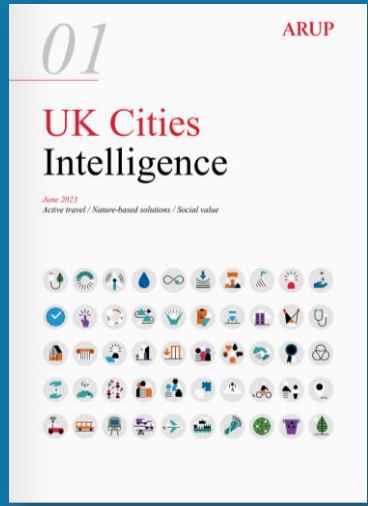


We orchestrate future design thinking with Arup's unparalleled interdisciplinary expertise...

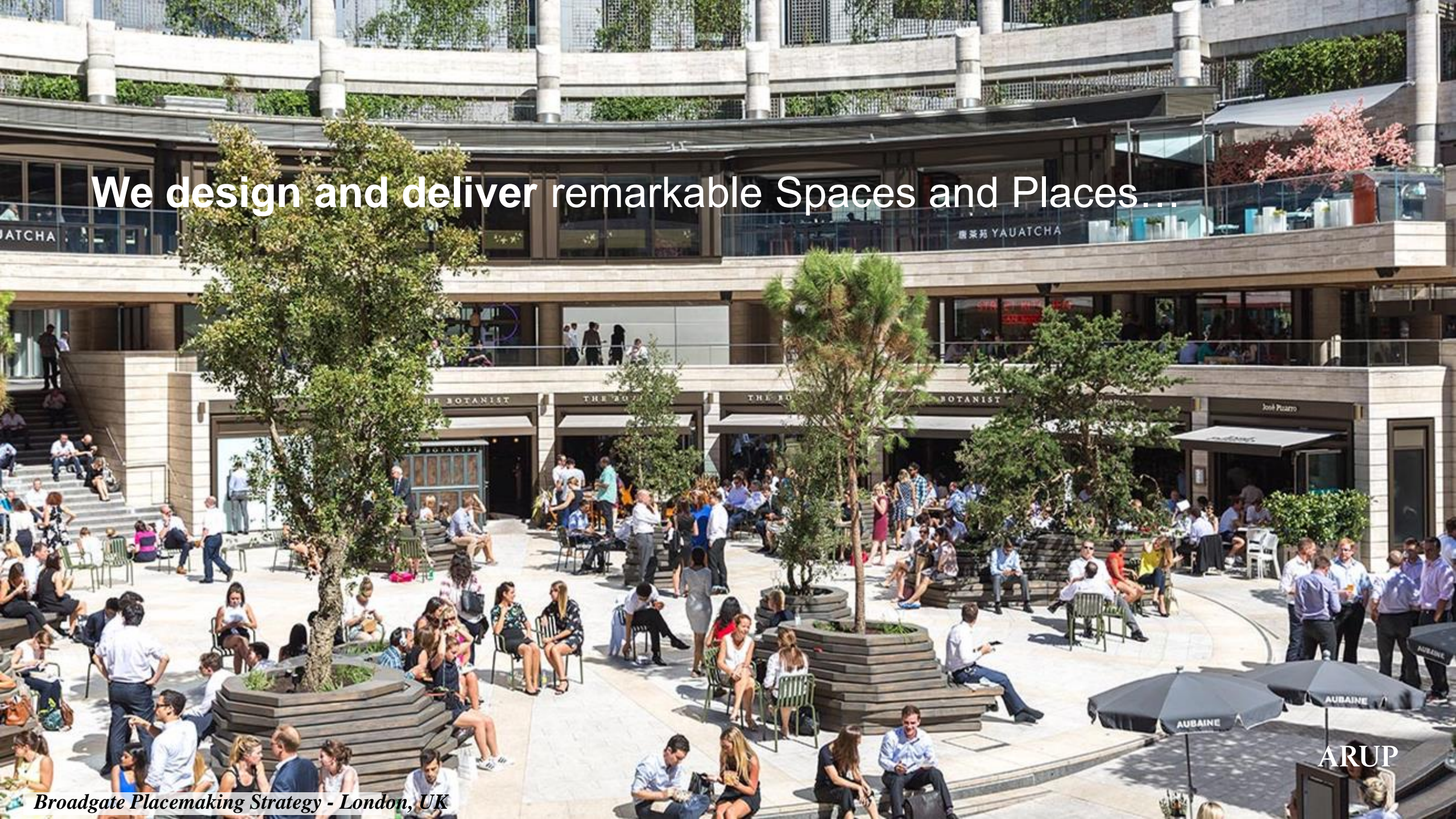


Cityringen Metro, Copenhagen, Denmark

We design informed by deep research in a wide range of today-centric topics...



We design and deliver remarkable Spaces and Places...



The Setting

An aerial photograph of London, England, featuring St. Paul's Cathedral as the central focus. The cathedral's large dome and classical architecture are prominent. Surrounding the cathedral and extending across the city skyline are numerous construction cranes of various colors (red, blue, yellow), indicating a period of significant urban development and rebuilding. The foreground shows a mix of modern and older buildings, with some greenery visible. The sky is clear and bright, suggesting a sunny day.

During the next 2 decades, over **80 billion m²** of new and rebuilt buildings will be constructed in urban areas worldwide.

* Source: UN Report

An aerial view of the New York City skyline at sunset. The sky is a warm, hazy orange, and the city's buildings are silhouetted against the light. The Empire State Building is prominent in the center, and other skyscrapers like the MetLife building are visible on the right. The text is overlaid on the left side of the image.

60% of the entire stock of the world,

Equivalent of building and rebuilding a NYC every 35 days

Massive change is coming... it is imperative to promote
positive change

* Source: UN Report



Reuse vs.



Rebuild

Drivers for Transforming and Reusing Existing Buildings



Financial

Cost effective – Lower cost than demolition and rebuild

Faster to complete – Quicker to bring back to market



Environmental

Low carbon – Cut embodied carbon, when compared to demolition and new build

Waste and resources – Divert materials from waste and saves natural resources



Placemaking

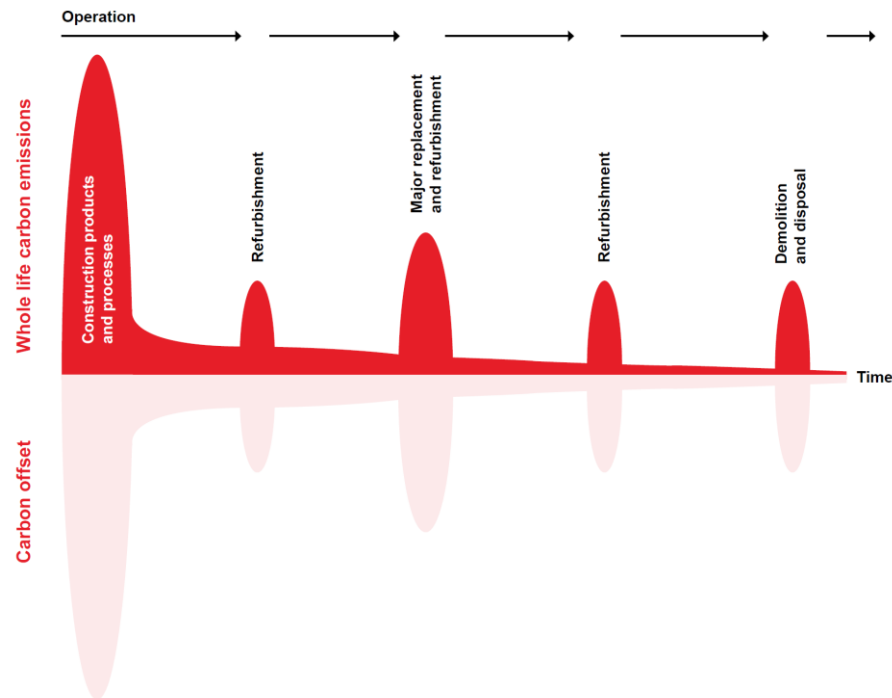
Heritage value - Preserve, refresh to create a unique identity.

Socially positive – Can create positive changes within communities and meet local needs

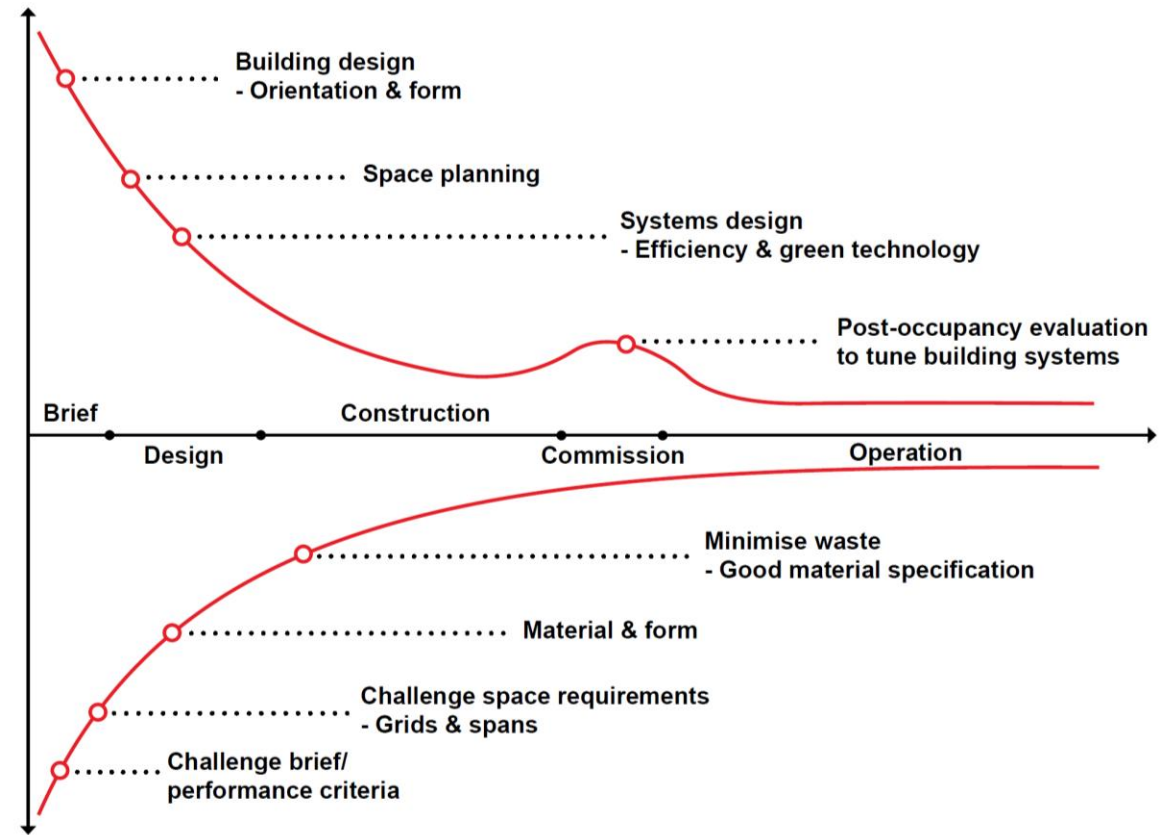
Reuse vs. Rebuild

Whole lifecycle emissions

we must take account of whole life emissions. **There are many trade-offs between operational and embodied carbon emissions, starting with the decision about whether to demolish or repurpose.** Newly constructed buildings are more energy efficient operationally, but their construction generates significant embodied emissions.



Reducing Operational Carbon



Reducing Embodied Carbon



No single building should ever be one thing...

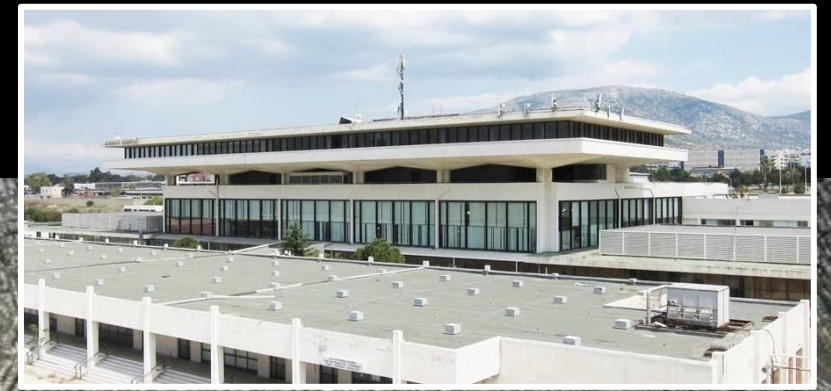
Drivers for Transforming and Repurposing the Built Environment

Along with environmental benefits, transforming and reusing existing buildings often delivers greater commercial and social returns than demolishing and reconstructing.

It can be far more cost-effective for clients, create characterful places for occupiers and preserve heritage value for communities.



Hellinikon - Athens, Greece



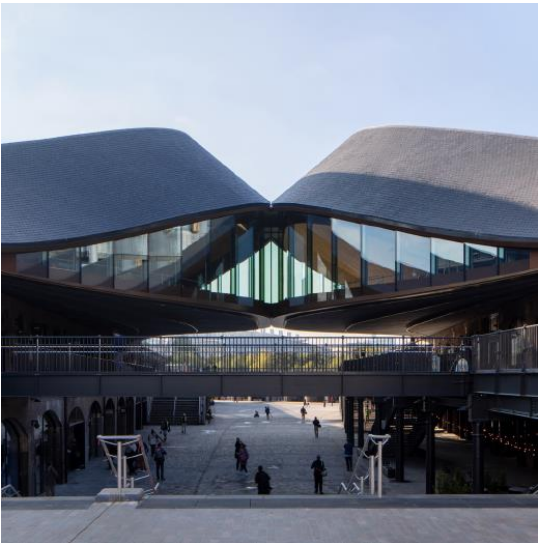
Types of Reuse

Retrofitting / Repurposing the Built Fabric

1. Proactive Reuse



2. Adaptive Reuse



3. Expansive Reuse



4. Meanwhile Use



Retrofitting / Repurposing the Built Environment

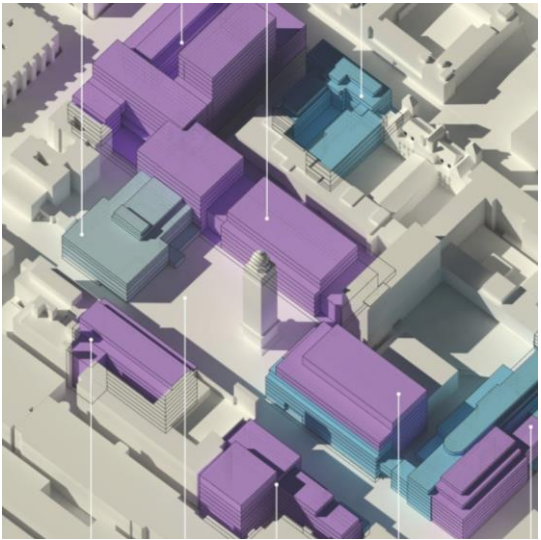
1. Proactive Reuse



2. Adaptive Reuse



3. Expansive Reuse



4. Meanwhile Use



Proactive Reuse (Refurbishment)

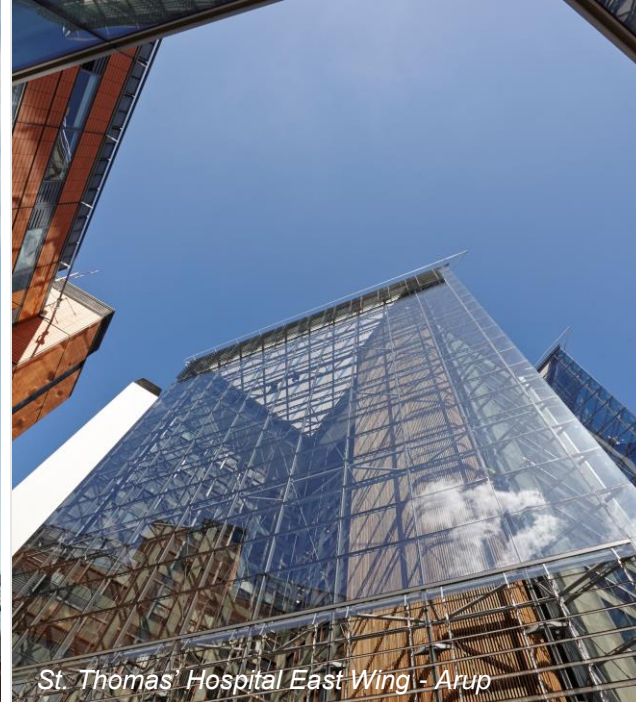
Enhancing performance and extending the life of existing buildings and urban fabric



The Grand Hotel - Arup



Engineering Building University of Leicester - Arup



St. Thomas' Hospital East Wing - Arup



Broadgate Circle Public Realm - Arup



1 Finsbury Avenue, Broadgate - Arup | AHMM



GSTT Vision Plan - SOM | Arup



Bradgate Circle, London - Arup



St Pancras Station, London.

📍 LONDON (UNITED KINGDOM)

Bow Bells House

Office Refurbishment

Early insight into embodied carbon has informed our clients decisions about retention and scope. Rapid analysis & visualisation in the teams' Revit model identified the raised floor as having the greatest potential to save embodied carbon.

Client

 PATRIZIA

 Fubon Financial

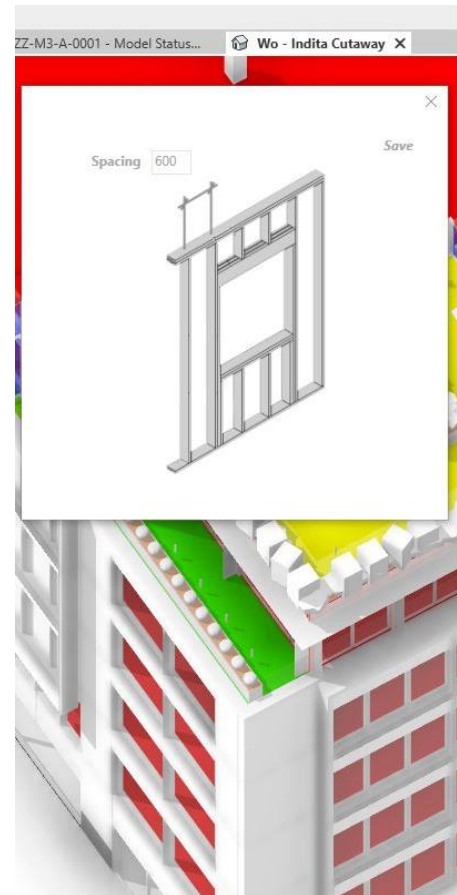
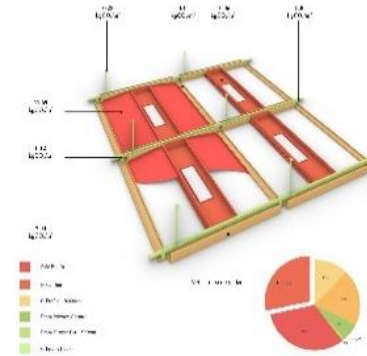
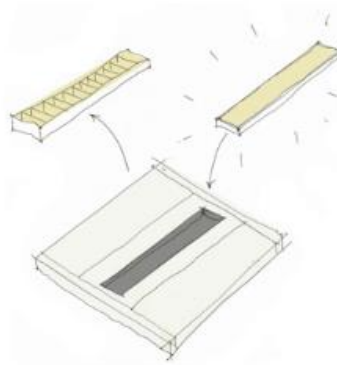


Arup Carbon Calculator (Indita)

A New Initiative at Arup

Following Cop 26 Arup has committed to doing whole life carbon assessments across all its projects. For embodied carbon we can currently do this only at a very high level that is unlikely to provide data with enough fidelity to inform detailed material choices

Within a new services distribution tool within Indita in Revit, material assemblies or components can be loaded from our [Veracity](#) database, with pre-determined carbon values based on manufacturers EPDs and the ICE Database. Alternatively, you can add carbon data for specific products for more accurate calculations.



CO2e_Glazed Stick System

Name	Carbon (kgCO ₂)
R50T Glass System	356,770
Structure	2,107

Environmental Product Declaration

Name: **Structure**

Type: **Frame (Wall)** [Edit](#)

EPD: A1-A3: **1** A4: **0** A5: **0**

EPD Units: **m²**

Wastage (%): **13**

Density (kg/m³): **1**

EPD Source (URL):

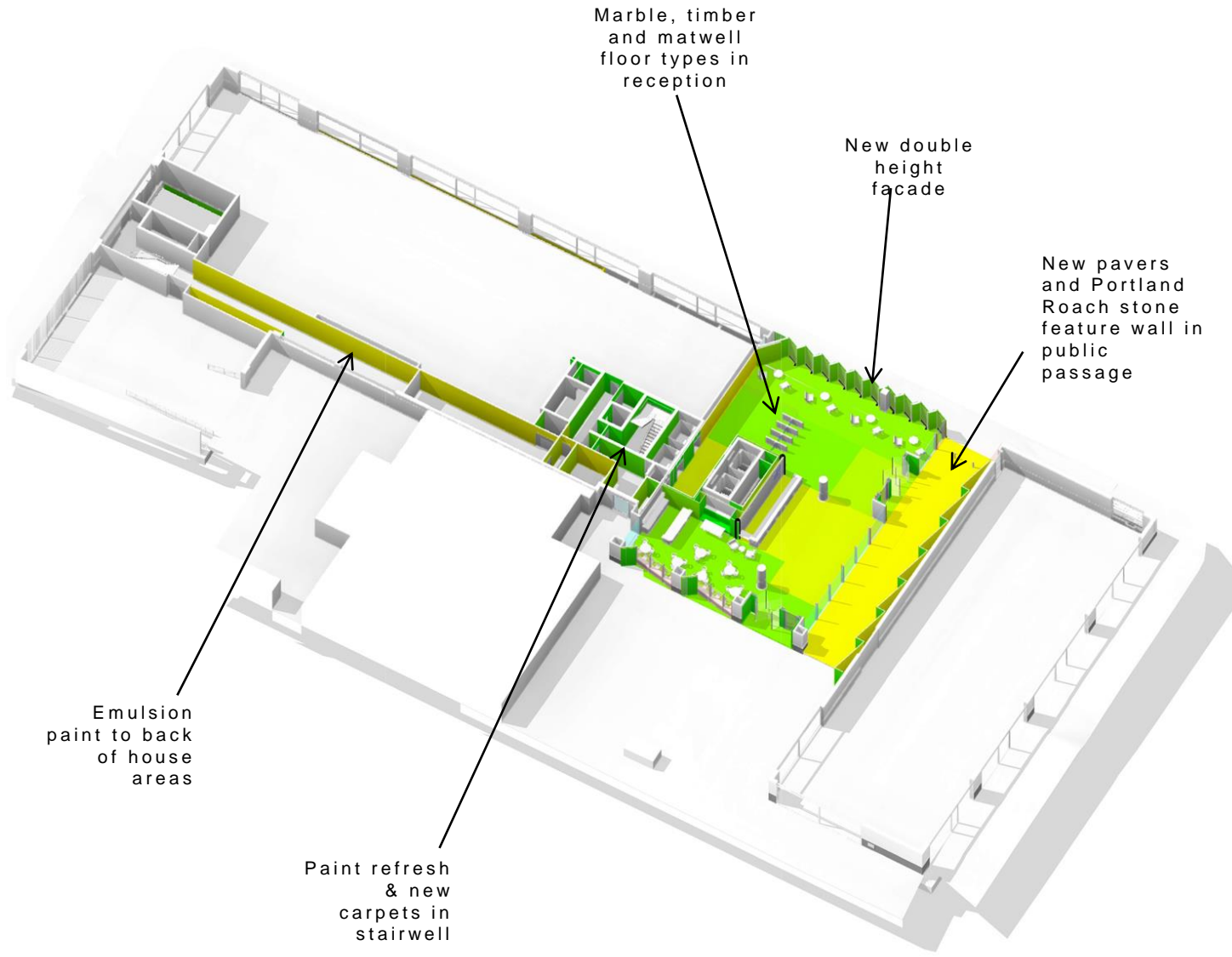
Family parameter:

[Save](#)

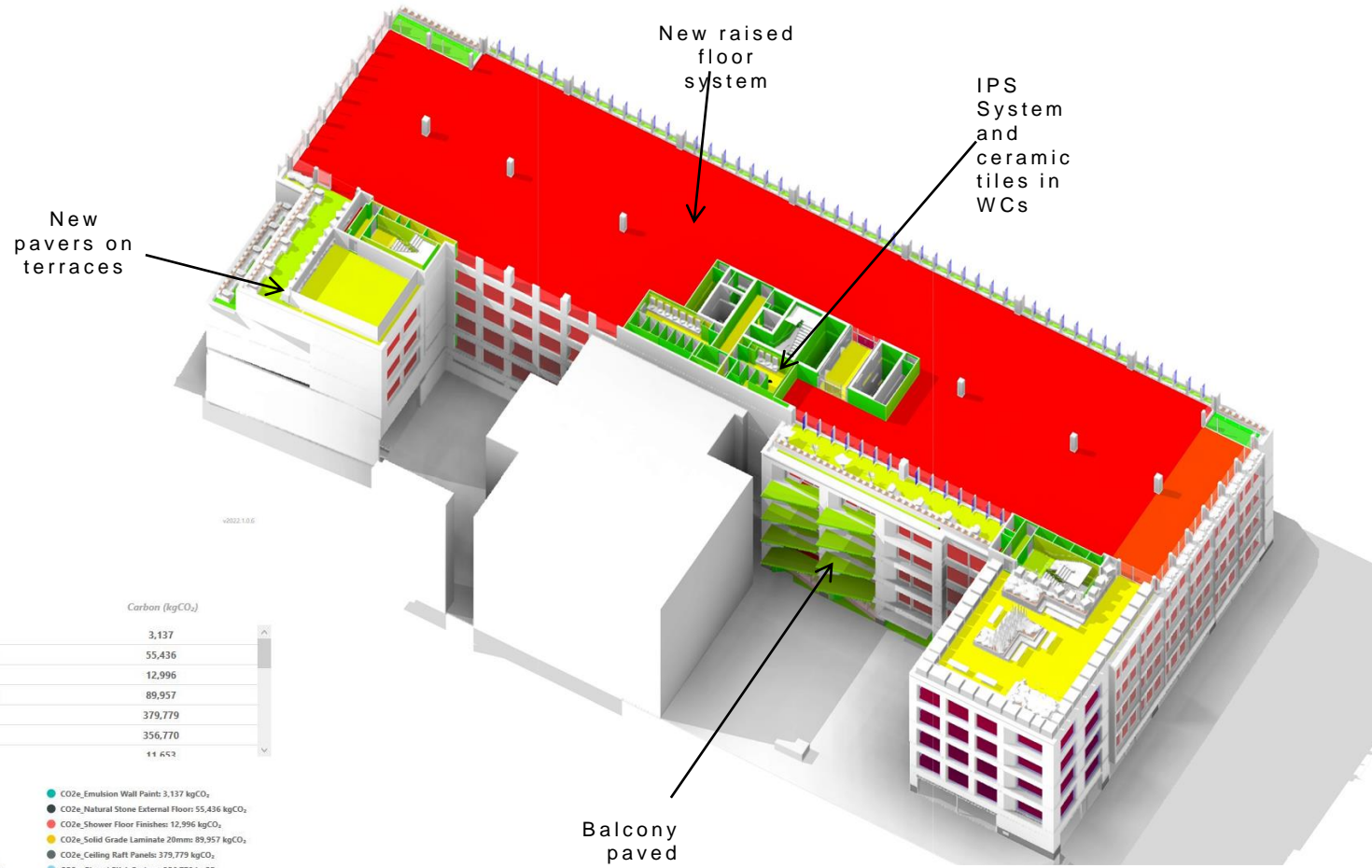
Material	Carbon (kgCO ₂)
Paint	3,137
Natural Floor	55,436
Finishes	12,996
Concrete 20mm	89,957
Windows	379,779
System	358,876
Total	11,652

- CO2e_Emulsion Wall Paint: 3,137 kg
- CO2e_Natural Stone External Floor: 55,436 kg
- CO2e_Shower Floor Finishes: 12,996 kg
- CO2e_Solid Grade Laminate 20mm: 89,957 kg
- CO2e_Ceiling Raft Panels: 379,779 kg
- CO2e_Glazed Stick Systems: 358,876 kg
- CO2e_Blockwork: 11,653 kgCO₂
- CO2e_Plaster: 1,916 kgCO₂
- CO2e_Marble: 12,555 kgCO₂
- CO2e_Epoxy Floor Paint: 13,118 kgCO₂
- CO2e_Glazed Opening Panels: 1,187 kgCO₂
- CO2e_Ceramic Tiles: 38,608 kgCO₂
- CO2e_Carpet: 966 kgCO₂
- CO2e_Architectural Mesh: 3,936 kgCO₂
- CO2e_Oak Wood Flooring: 5,562 kgCO₂
- CO2e_Matwell: 7,659 kgCO₂
- CO2e_Raised Floor: 836,227 kgCO₂
- CO2e_Aluminium Panel Insulated 15: 2,091 kgCO₂
- CO2e_Glass Single Pane 12mm: 2,091 kgCO₂
- CO2e_WC Floor Finish: 15,706 kgCO₂
- CO2e_Portland Stone Wall: 20,755 kgCO₂

Reception Refurbishment

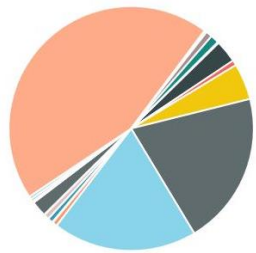


Office Floorplate & Terraces Refurbishment



ARUP Indita

Name	Carbon (kgCO ₂ e)
CO2e_Emulsion Wall Paint	3,137
CO2e_Natural Stone External Floor	55,436
CO2e_Shower Floor Finishes	12,996
CO2e_Solid Grade Laminate 20mm	89,957
CO2e_Ceiling Raft Panels	379,779
CO2e_Glazed Stick System	356,770
CO2e_Blockwork	11,653



- CO2e_Emulsion Wall Paints: 3,137 kgCO₂e
- CO2e_Natural Stone External Floor: 55,436 kgCO₂e
- CO2e_Shower Floor Finishes: 12,996 kgCO₂e
- CO2e_Solid Grade Laminate 20mm: 89,957 kgCO₂e
- CO2e_Ceiling Raft Panels: 379,779 kgCO₂e
- CO2e_Glazed Stick System: 356,770 kgCO₂e
- CO2e_Blockwork: 11,653 kgCO₂e
- CO2e_Plaster: 1,916 kgCO₂e
- CO2e_Marble: 12,555 kgCO₂e
- CO2e_Epoxy Floor Paint: 13,118 kgCO₂e
- CO2e_Glazed Opening Panel: 1,187 kgCO₂e
- CO2e_Ceramic Tiles: 38,608 kgCO₂e
- CO2e_Carpets: 966 kgCO₂e
- CO2e_Architectural Mesh: 3,936 kgCO₂e
- CO2e_Oak Wood Flooring: 5,562 kgCO₂e
- CO2e_Matwell: 7,659 kgCO₂e
- CO2e_Raised Floor: 836,227 kgCO₂e
- CO2e_Aluminium Panel Insulated 150mm: 4,004 kgCO₂e
- CO2e_Glass Single Pane 12mm: 2,998 kgCO₂e
- CO2e_WC Floor Finish: 15,706 kgCO₂e
- CO2e_Portland Stone Walk: 20,755 kgCO₂e

Total: 1,874,024 kgCO₂e



📍 LONDON (UNITED KINGDOM)

Broadgate Estate Transformation



📍 LONDON (UNITED KINGDOM)

Broadgate

Before 2012



📍 LONDON (UNITED KINGDOM)

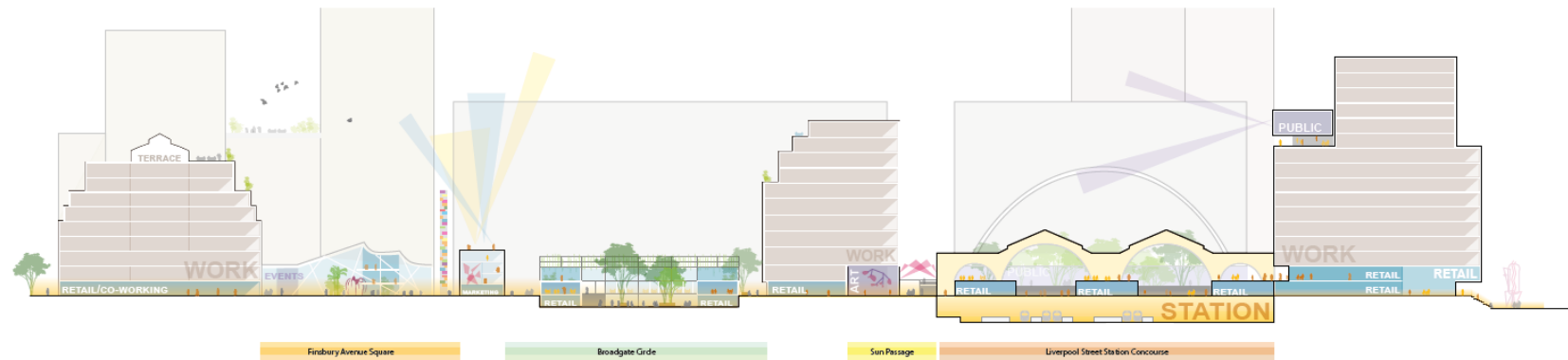
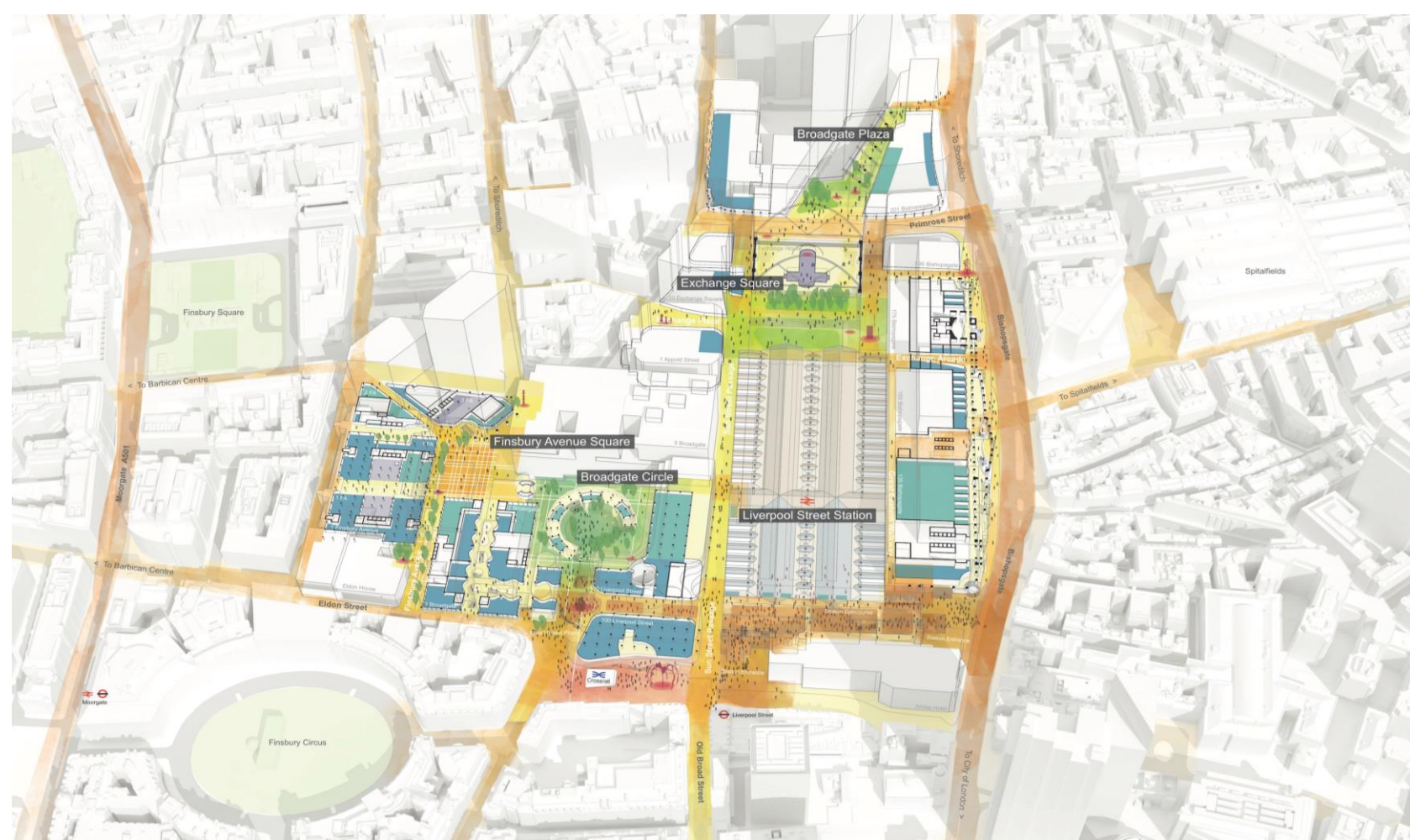
Broadgate

The Plan

- An 'integrated mixed-use urban district'
- Well-connected to Liverpool Street Station and to its vibrant neighbouring districts including the City of London, Shoreditch, Spitalfields, and London's booming technology quarter around Old St.



A significant gateway site to the City of London



📍 LONDON (UNITED KINGDOM)

Broadgate

The Plan

Anticipating Increased Activity and Footfall to Fuel Curated Local Events

- **‘Creative Curriculum’** - run with Open City including artists, architects and British Land volunteers, which enables hundreds of local children to understand and explore the art and architecture design process, from idea to production.
- **Archikids!** - an interactive design and engineering festival by Open City included six festival events at Broadgate.
- **London Design Festival** - Broadgate hosts art installations and events as part of year-round events programming.





唐茶苑 YAUATCHA

唐茶苑 YAUATCHA

STREET KITCHEN

THE BOTANIST

THE BOTANIST

THE BOTANIST

THE BOTANIST

José Pizarro

AUBAINE

AUBAINE

ANCA

100 Liverpool Street – London, UK



📍 LONDON (UNITED KINGDOM)

Guy's & St. Thomas' NHS Trust Vision Plan



Harefield Campus

Harefield Hospital

Chelsea Campus

Royal Brompton Hospital



Westminster Bridge Campus

*St Thomas' Hospital
Evelina Hospital*

London Bridge Campus

Guy's Hospital

Part of London's network of healthcare and life-science centres

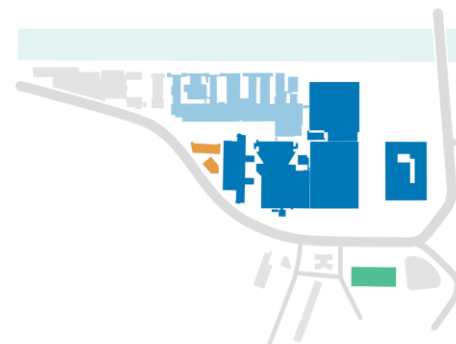
Harefield Campus

Harefield Hospital



Chelsea Campus

Royal Brompton Hospital



Westminster Bridge Campus

*St Thomas' Hospital
Evelina Hospital*



London Bridge Campus

Guy's Hospital



Today

Acute Hospitals

GFA ~ 50,000 - 200,000 m²

Highly specialised & critical care

Ambulatory care

Urgent Care

Co-located Clinical & Academic Research Activity

Community Sites

GFA ~ 2,500 m²

Ambulatory care

Consultations

Prescriptions

Home / Virtual

GPs

Consultations

Prescriptions



Tomorrow

Acute Hospitals

GFA ~ 50,000 - 200,000 m²

Highly specialised & critical care

Proximate Hubs

GFA TBC m²

Highly specialised consultations

Co-located Clinical & Academic

Research

**Ambulatory Centers /
Community Diagnostic Centres /
Integrated Care Hubs**

GFA TBC m²

Ambulatory care

Low Complexity Surgery

Imaging

Social

Urgent Care

Home / Virtual

Virtual

Consultations

Prevention

GPs

Consultations

Prescriptions

R&D

Admin

A Distributed Campus of Care

Tactical transformations



Pilot a shared proximate virtual consultation space.



Repurpose South Wing and improve the public realm to create amenities.



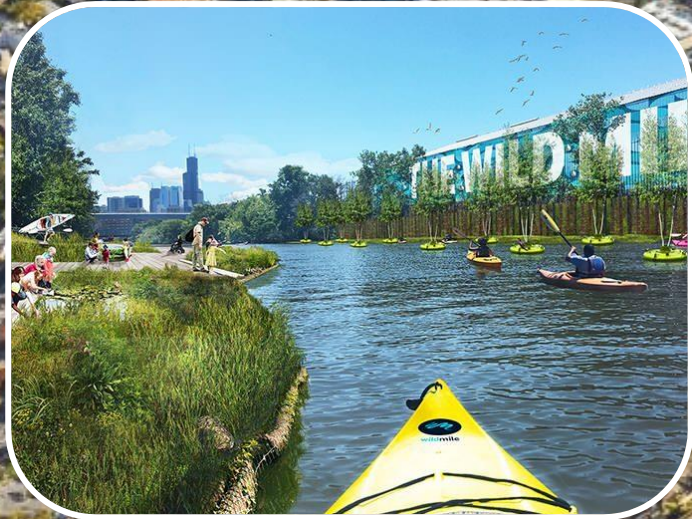
Test the ability to increase ambulatory functions in an existing community site.



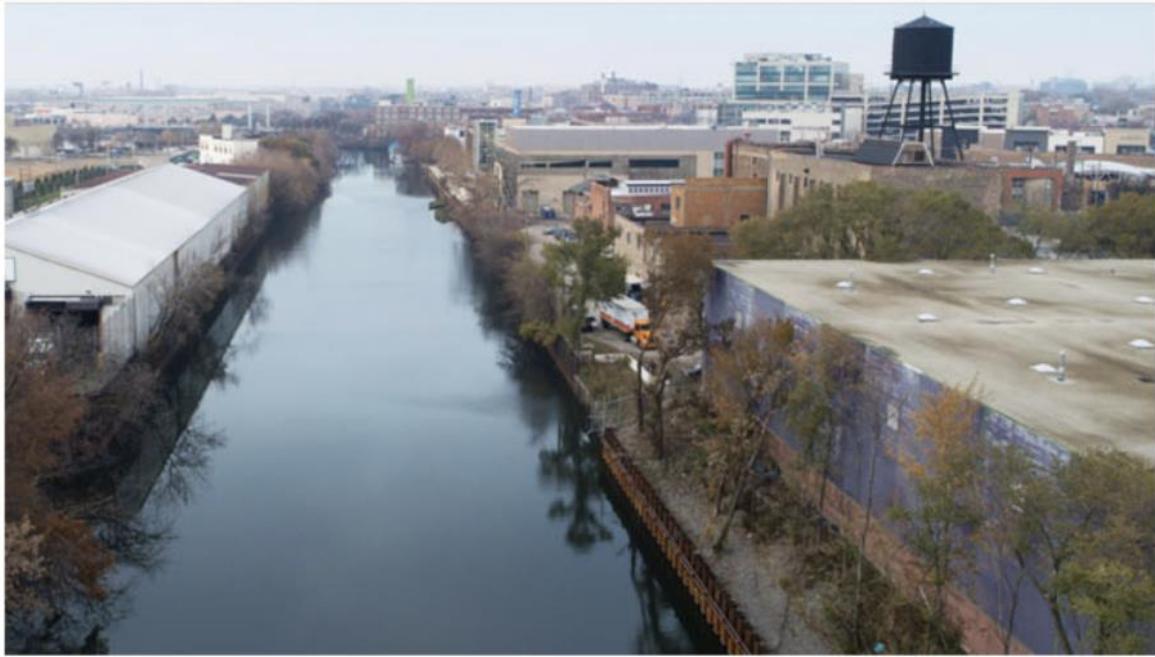
Rethink circulation to optimise space and improve wayfinding experience.

📍 CHICAGO (UNITED STATES)

Wild Mile











Adaptive Reuse

Creating new futures for existing buildings and neighbourhoods.



Gasholders, Kings Cross



The Standard



Here East



BBC White City



*Museum of Contemporary Art, South Africa,
Heatherwick Studio*



*Coal Drop Yards, Kings Cross, London
Heatherwick Studio*



Tate Modern, Herzog & de Meuron



*Former US Embassy London, David
Chipperfield Architects*

📍 LONDON (UNITED KINGDOM)

BBC White City

170,000m²

mixed use hub

432

new homes (Phase 1)

3 acres

of revitalised public spaces



BBC White City

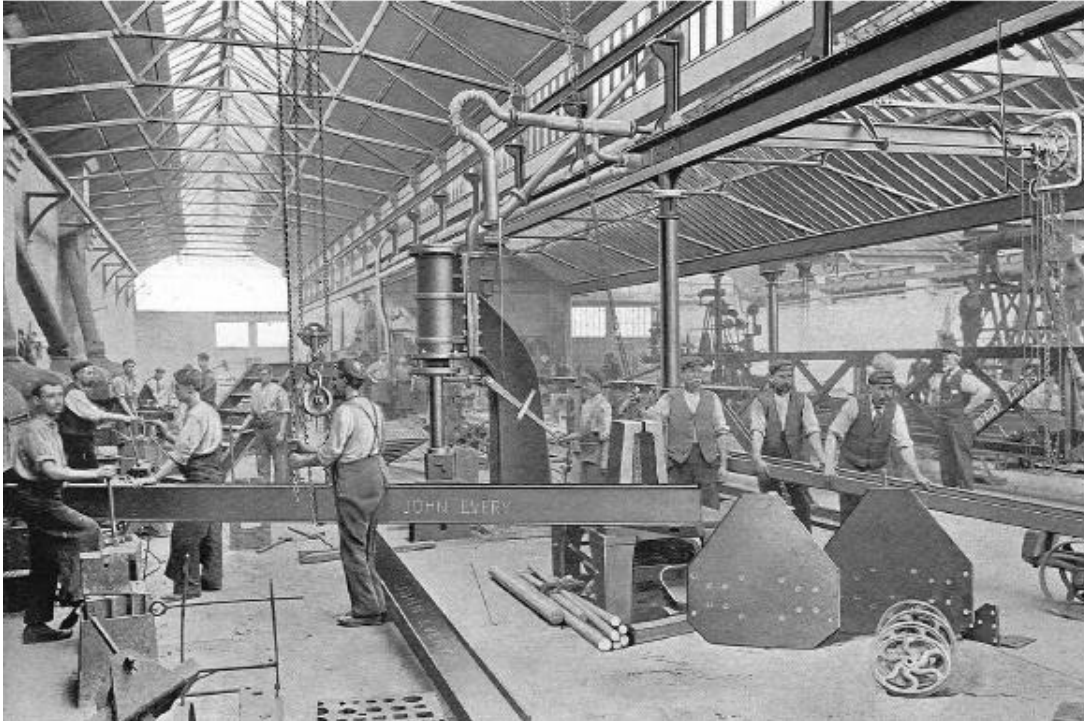
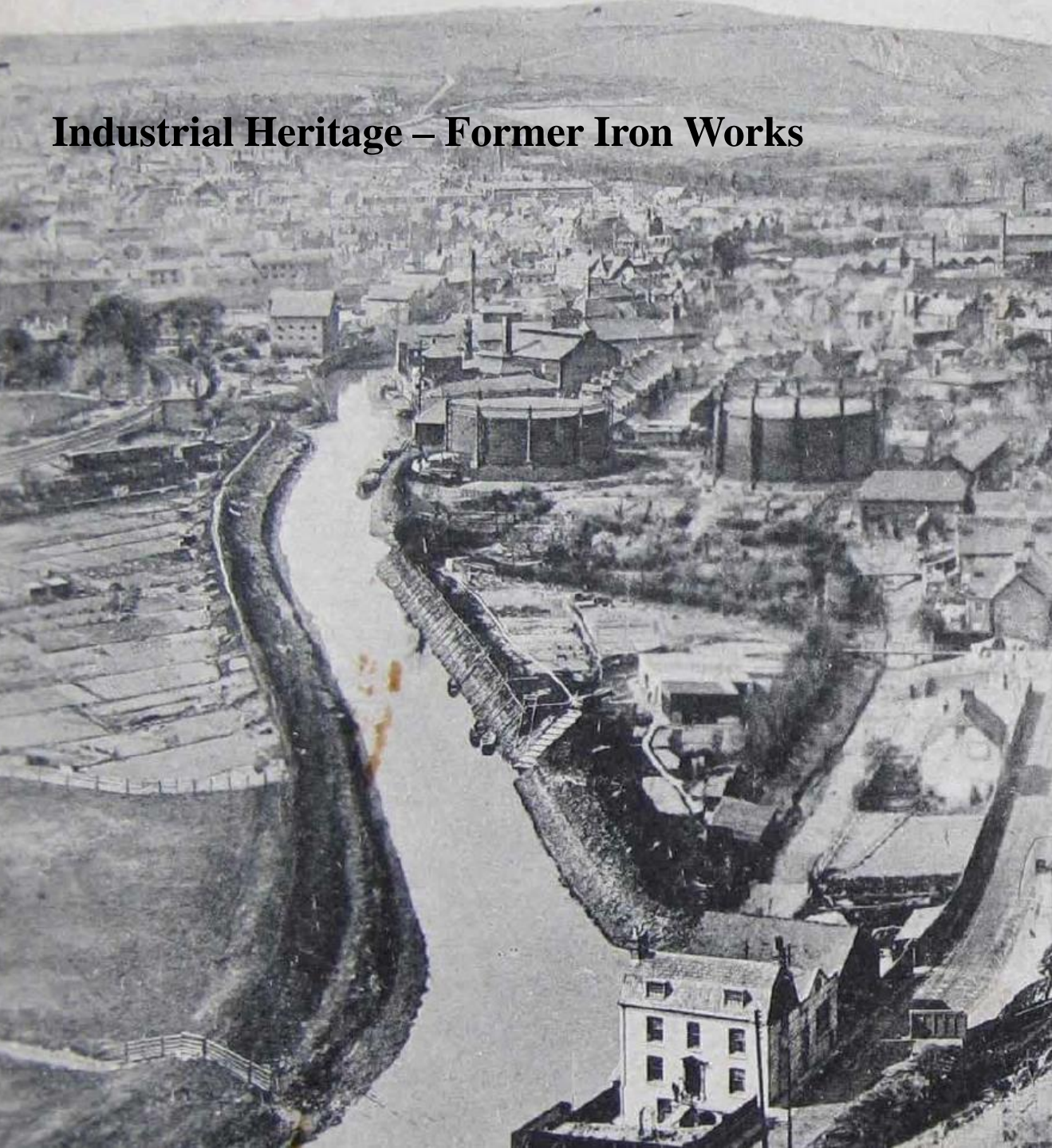


📍 LEWES (UNITED KINGDOM)

The Phoenix Project



Industrial Heritage – Former Iron Works



The Centre Today – Informal Maker's Spaces



The Future Plan



Retrofit and repurpose industrial heritage





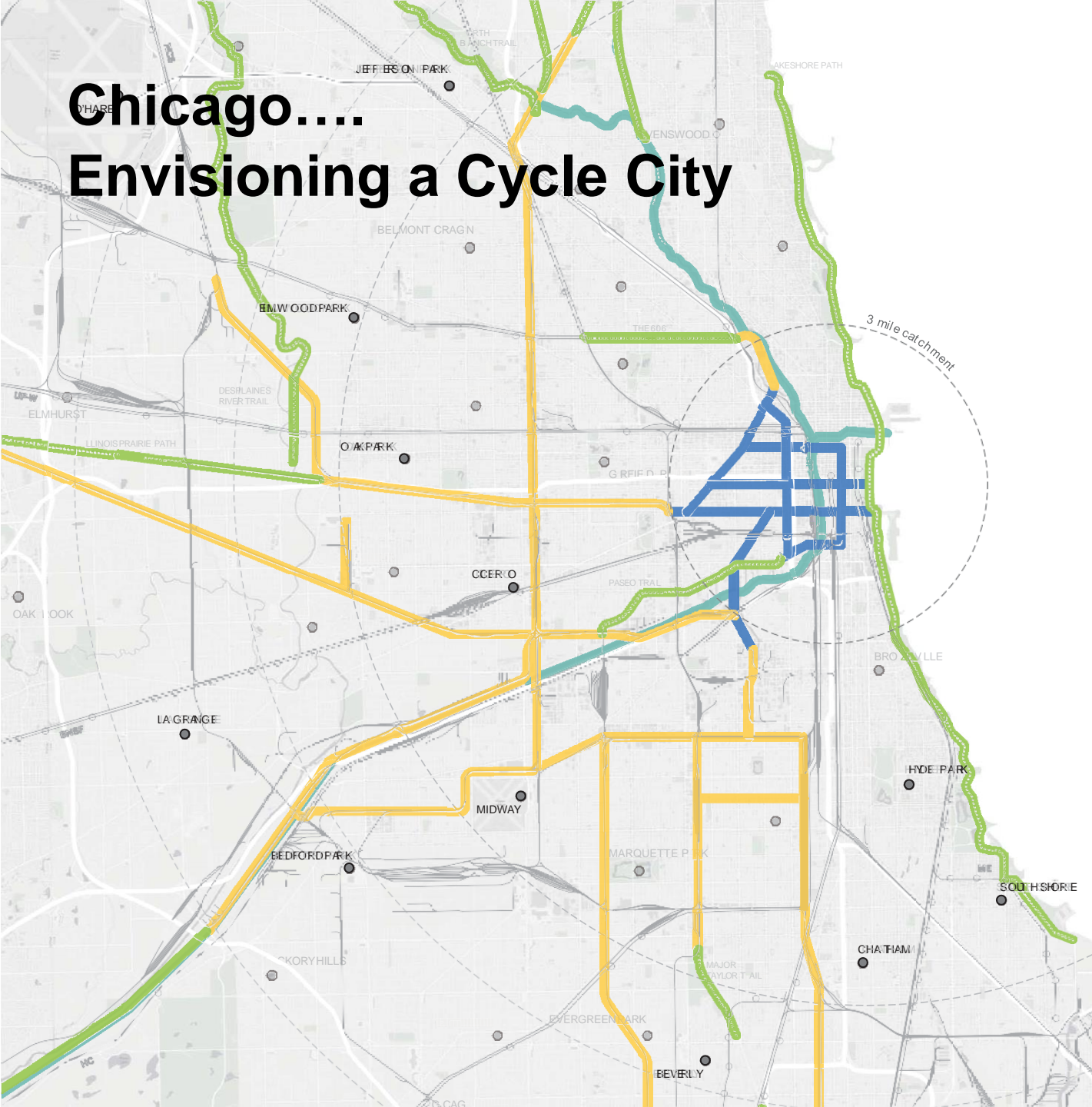
📍 CHICAGO (UNITED STATES)

The 606 Rail to Trail Project





Chicago.... Envisioning a Cycle City



A robust city bike network

Total trail system

226 mi

 Existing bikeways

41% 93mi

 New cycle freeways

42% 96mi

 Streets

9% 19mi

 Rivers

8% 18mi

*From: University of Illinois at Chicago Student Group Project
Professor Phil Enquist*

Expansive Reuse

Upgrading and adding new space to existing buildings and urban districts



1 Triton Square, London



Royal Academy of Arts, London



Sea Containers House



New Scotland Yard, London



CaixaForum Madrid - Herzog & de Meuron



Madrid Nuevo Norte (Arup Madrid)



3XN Tower Sydney



The Standard, London - Arup

📍 LONDON (UNITED KINGDOM)

1 Triton Square

43%

cost saving compared to typical commercial building

40,000

Tonnes carbon saved

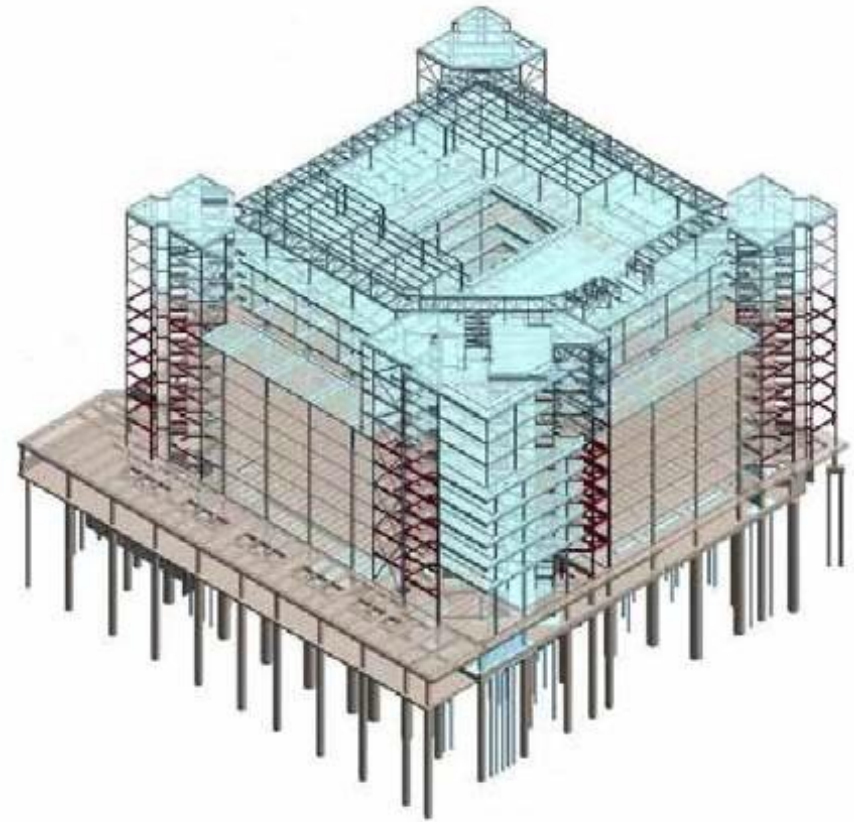
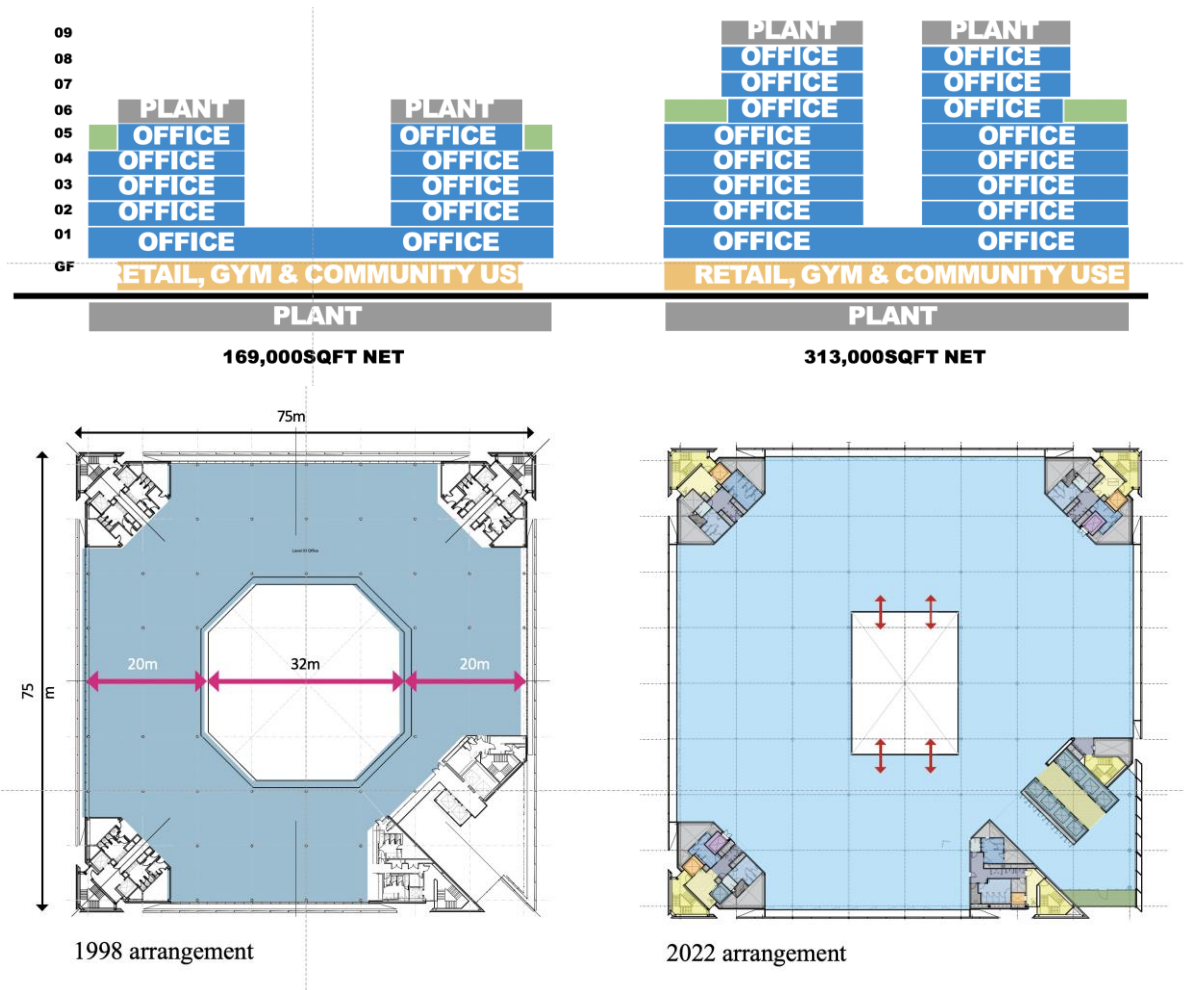
30%

faster to completion vs typical new build



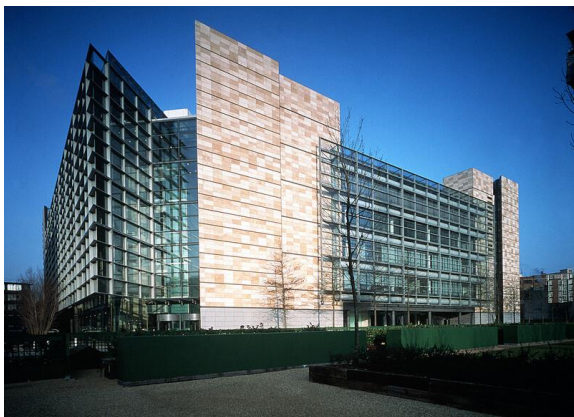
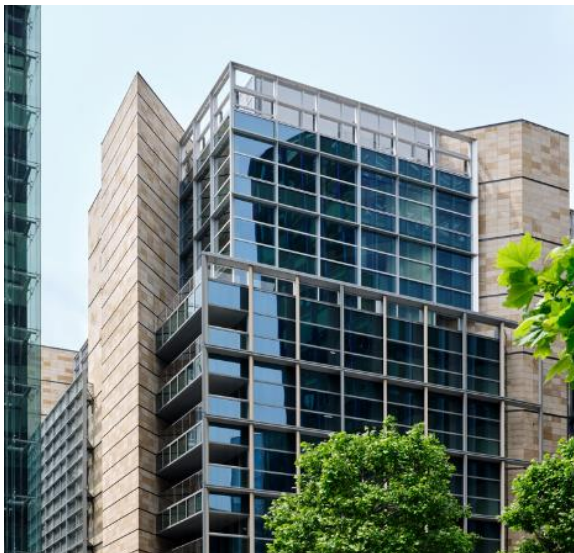
📍 LONDON (UNITED KINGDOM)

1 Triton Square



📍 LONDON (UNITED KINGDOM)

1 Triton Square



📍 LONDON (UNITED KINGDOM)

1 Triton Square

Circular Facades

Temporary offsite facility set up within UK to reduce transport emissions

Each panel of the external envelope removed, inspected, cleaned and seals and gaskets replaced

Replacement double glazed units inserted into retained and refurbished horizontal spandrels



BREEAM Outstanding – 92.3%

Super efficient building fabric and energy performance combined with exemplary material sourcing to deliver British Land's first **BREEAM Outstanding** building.

492sqm of natural sedum green roofs enhancing biodiversity and ecology.

Enhancing ecology. Insect hotels, bee hives, bird boxes to enhance local fauna and flora.

Stair cores **outside thermal line** offering exceptional energy performance and air tightness.

Escape stairs used for circulating - naturally daylight panoramic windows

Innovative strengthening solutions for existing columns allow load of three additional floors

5 Panoramic Terraces, Events, socialising, meeting, working, exercising or relaxing.

Low energy lighting in lobbies, washrooms and all other common areas.

313,000sqft of dynamic, and flexible workspace.

Sustainable Urban Drainage systems

Fantastic greener landscaping around the building. Feature living wall with potential for integral audio-visual arts installation

35,000 tons of concrete & **1,877 tons** of steel reused and saved from demolition.

3000sqm of refurbished and reused façade contributing to **19,000 tons** of carbon saved.

56,000sqft Gymnasium & Health Club beneath 1 Triton Square, split over two floors.

Circular Economy - Targeting **2800sqm** of paving and other roof coverings reused from other demolished buildings.

Flooded with daylight - **282sqm** rooflight with large central atrium. 3m by 3m panels to maximise daylight

Used building plant up-cycled for sustainable retrofit.

3000sqm of refurbished and reused façade contributing to **19,000 tons** of carbon saved.

10,000sqft of Affordable Workspace, rethinking community uses in Camden.

Doubled net area with no increase in plant

All timber within the building will be sustainably sourced & Forestry Stewardship Council Regulated

4000 talented, healthy & happy people working in a State-of-the-Art Building at the heart of Regent's Place

536 cycle spaces located centrally at ground floor level celebrating & encouraging healthy personal transport.



BREEAM New Construction 2014

Office

New Construction (Shell and Core)

Overall Score: 92.3%

Rating: Outstanding



Category Scores	0	10	20	30	40	50	60	70	80	90	100
Management	100										
Health and Wellbeing	60										
Energy	86										
Transport	100										
Water	89										
Materials	69										
Waste	89										
Land Use and Ecology	90										
Pollution	92										
Innovation	70										

Signed for BRE Global Ltd., Melanie Forester

26 August 2021
Date of Issue

📍 LONDON (UNITED KINGDOM)

Imperial College London



📍 LONDON (UNITED KINGDOM)

Imperial College London – South Kensington Campus

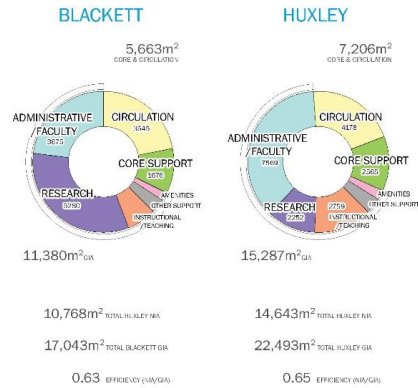


Imperial College London – South Kensington Campus



Utilisation Analysis and Assessments Blackett & Huxley

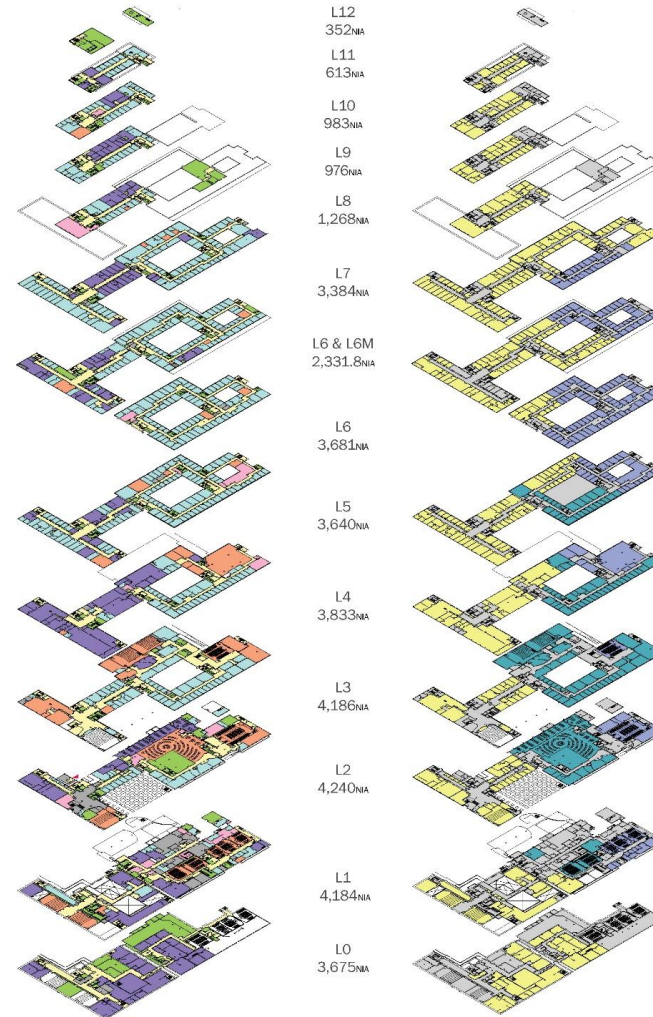
Areas by Program



TOTAL

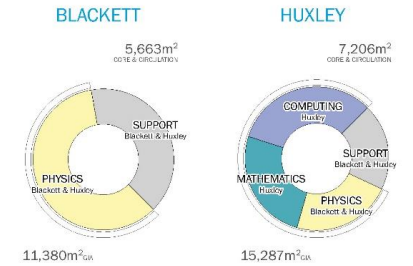
26,419m² TOTAL NIA
 +11,964m² TOTAL CORE & CIRCULATION NIA
 +1,153m² TOTAL COLUMNS & PARTITIONS
 = 39,536m² TOTAL GIA
 0.66 EFFICIENCY (NIA/TOTAL GIA)

Refer to Appendix for Spatial Definitions



*Calculation of each floor above includes core and circulation area

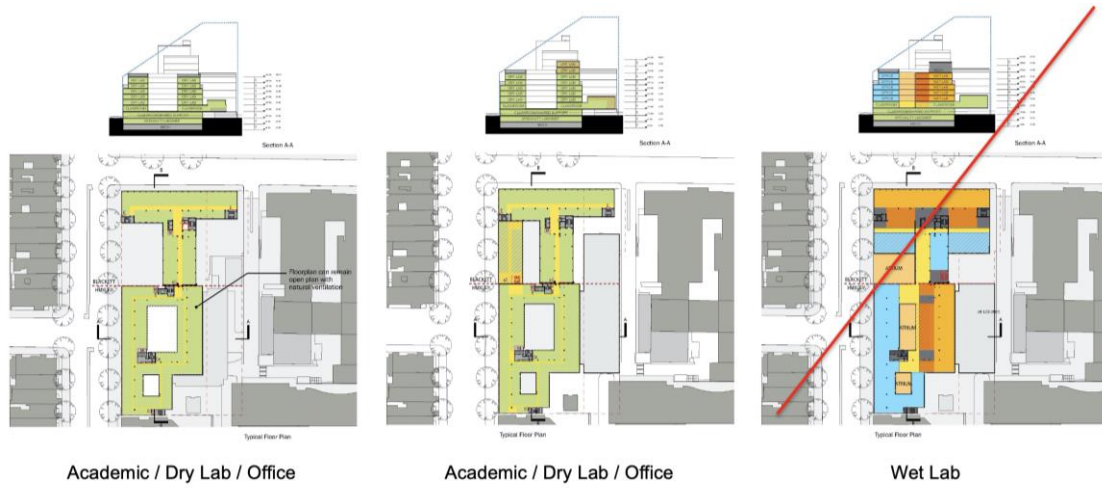
Areas by Department



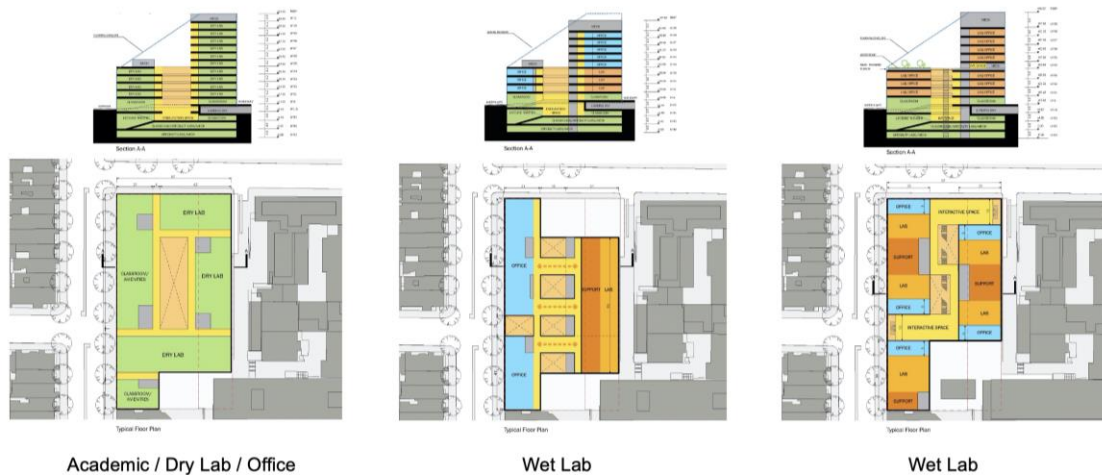
Blackett & Huxley are occupied by the Departments of Computing, Mathematics and Physics. The buildings are comprised of dry labs and teaching spaces.

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Refurbishment / Expansion

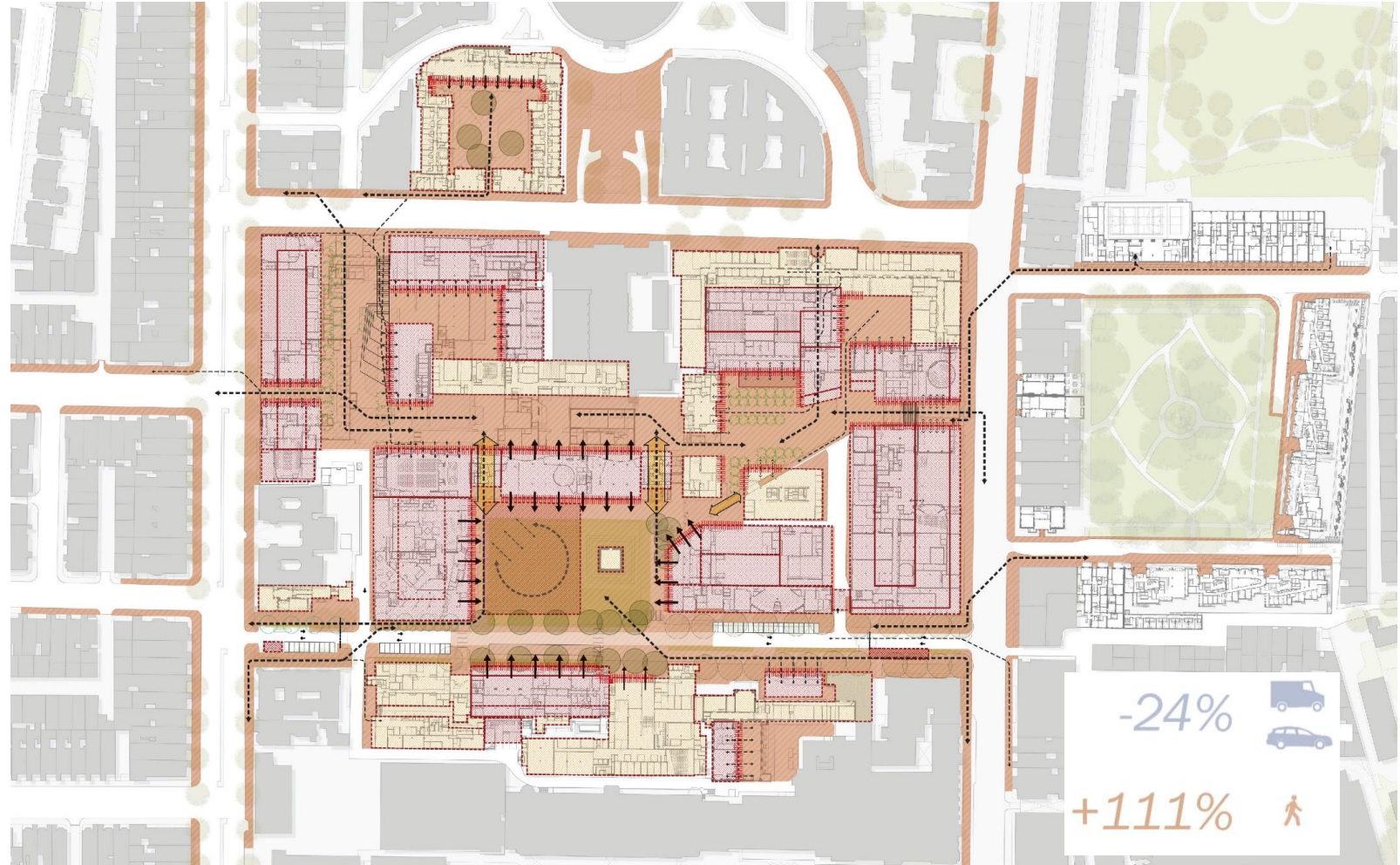
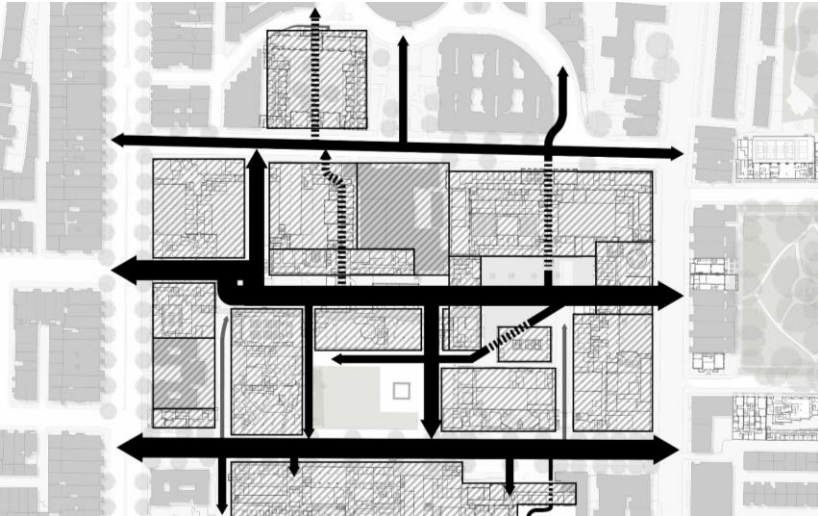
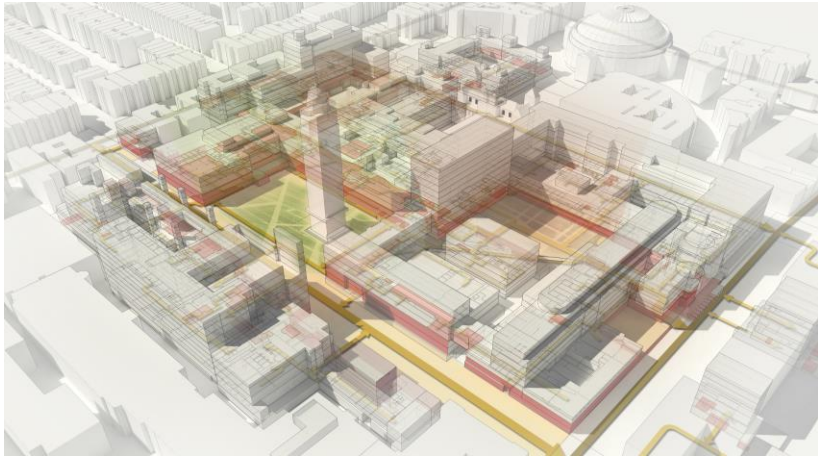


Redevelopment



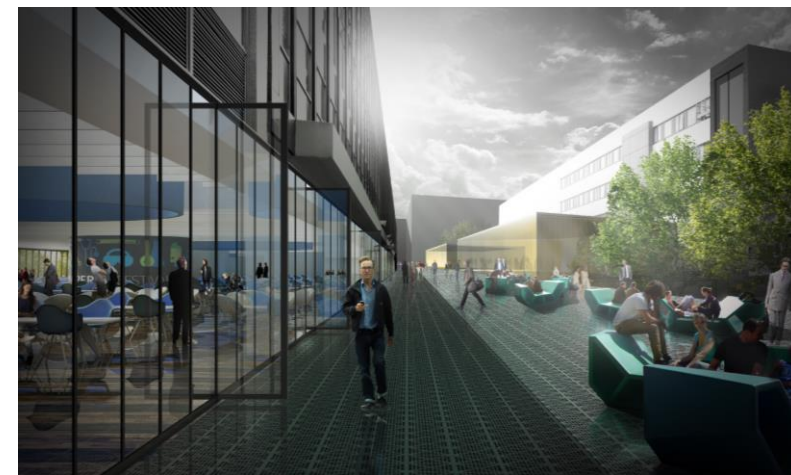
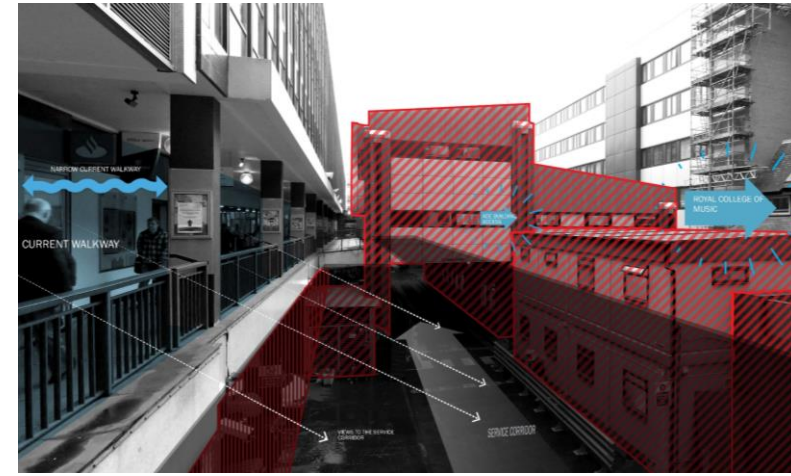
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Meanwhile Reuse

Creating immediate impact as a catalyst for longer term positive change



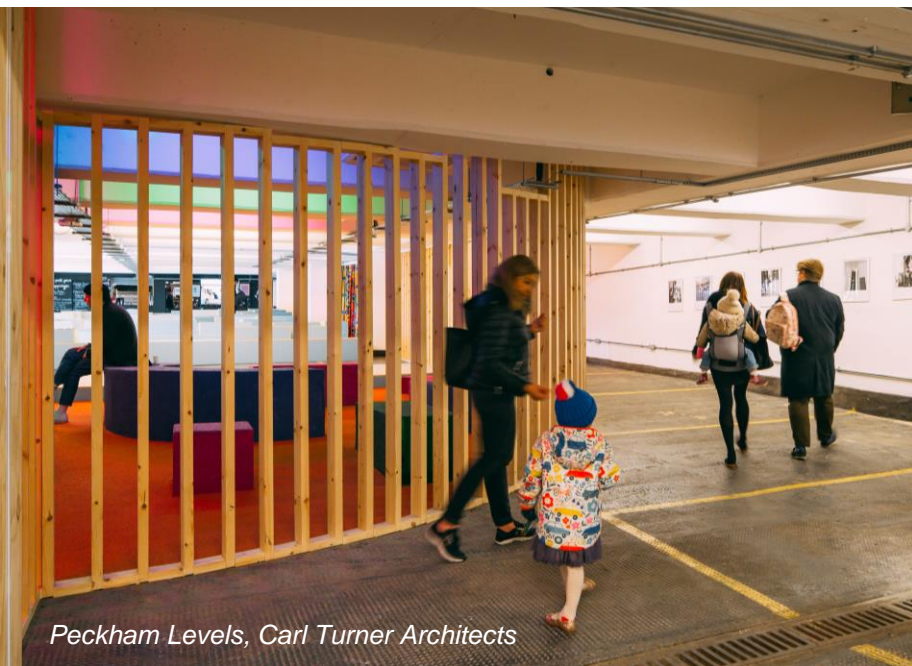
College Square, Croydon, Fiona Hartley and Ellie Fox Johnson



Aberfeldy Street, Jan Kattein Architects



Camden Collective



Peckham Levels, Carl Turner Architects



Eccleston Yards



Sayer Street, Jan Kattein Architects

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Ebury Bridge

100%

electric buildings

5+

reuses of structure

17 tonnes of CO₂e_q

saved in foundations



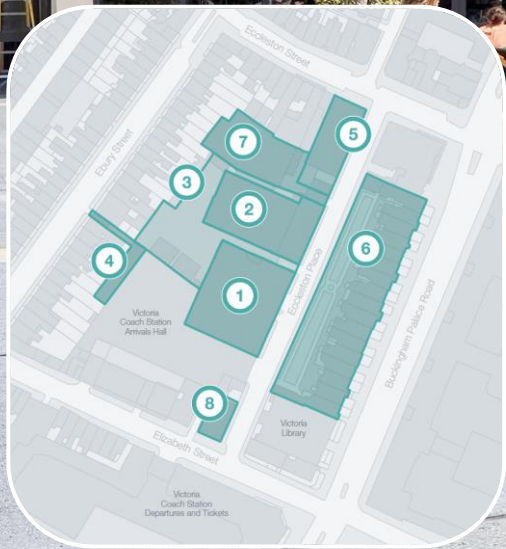
LONDON
(UNITED KINGDOM)

Ebury Bridge



LONDON (UNITED KINGDOM)

Eccleston Yards



📍 LONDON (UNITED KINGDOM)

Eccleston Yards



ENGAGEMENT SPECTRUM

Each anchor represents a specific and targeted use that falls within a spectrum of engagement. It is possible, and even likely that anchors can be applicable in multiple stages along this gradient.



Spark: How did you know SW1 was changing? What caught your eye? Where did you see it?



Engage: What was the thing that made you want to visit SW1? Why did you change your routine to see it?



Cultivate: What is the thing that makes you want to come back? Again and again? Or stay?



Establish: How has SW1 and Eccleston Place established itself? What is it known for?

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Eccleston Yards



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Eccleston Yards

A new destination for Belgravia

- Maximise architectural merit: Enhance the character and appearance of the conservation area.
- Reuse & Adapt: Meet modern sustainability standards.
- Vibrant public realm.
- Active retail frontage and restaurants
- Connect to the local streets with a network of new passageways.
- Flexible and unique workspace to attract a vibrant mix of businesses and creative jobs



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Eccleston Yards

Life at the Yards revolves around this central courtyard, which is both an anteroom to the buildings around it and a place in itself.

It now hosts pop-up screenings, food festivals and sporting events, while local artists have taken occupation of the space by painting murals around its walls.



ULI Greece & Cyprus Annual Conference | 27 June 2023

An aerial photograph of a coastal city, likely Nicosia, Cyprus, showing a large stadium complex in the foreground, a dense urban area in the middle ground, and rolling hills in the background. The entire image is overlaid with a semi-transparent blue filter.

Resilience through Reuse... A Vision for Sustainable Urban Landscapes

Dan Ringelstein
Director - Cities, Planning & Design | Arup