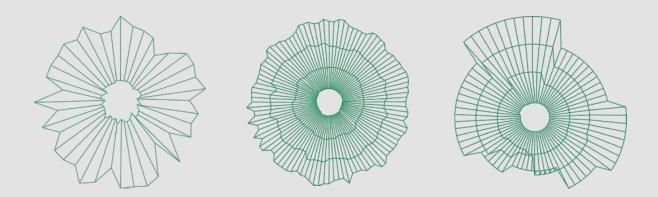


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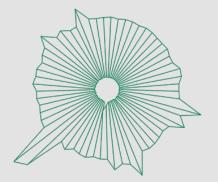
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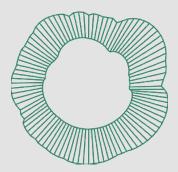


### Where Next for Urban Space?

Six transitions facing work and the city







Prepared for:



### **Executive Summary** for Area area

The interplay between work and the city is complex, as this Trend Report for Q2 2023 illustrates. But the way we understand cities, how we get around them, and what we build in them, will have a huge bearing on how we work in the future. The key transition areas where the workplace and the city overlap represent some key brand positioning and business opportunities for AREA within the Fourfront Group. These can be summarised as follows:

Sustainable design: As trends in adaptive reuse, demountable structures, timber buildings and more go mainstream, AREA can capitalise on its record of best practice and company case studies in sustainability. Clients with tough ESG targets will increasingly expect their interior designers to lead on a more indepth consideration of materials, design and construction.

Health equity: Well-established AREA expertise and focus on wellbeing at work will be instrumental in positioning the company at a nexus point between a healthy workplace and health for all in the urban environment. How we think about space from a health-inducing perspective will receive a positive hearing from developers and occupiers.

Social inclusion: Creating genuinely inclusive environments is not simply about tolerance it is about creating a sense of belonging and welcome for all. AREA's commitment to using human-centred design as a force for positive

change will gain credibility with clients around the diversity, equity and inclusion (DEI) agenda.

**Open innovation**: Widening the lens from the office desk to the innovation district to expand company creativity is a distinct urban trend that AREA can exploit by joining the dots between its interior workspace design and the urban neighbourhood plans in which its projects sit. Human and digital connectivity will be critical to districts based on access to a collective intelligence.

Smart mobility: How we travel to work and whether we even want to brave the commute will be a major factor in office planning and design. Trends showing micro mobility on the rise, for example, will increase demand for bike and scooter parking in workplaces. Closeness to transport links will affect the success of any office space. AREA awareness and insight around mobility patterns will be increasingly important.

Mixed experience: The next generation of mixed-use development will do more than simply bolt retail, leisure, residential and office space together on one site. It will activate novel and overlapping amalgams of amenities and experiences that can drive social purpose. For clients relocating to mixed-experience districts, this approach can be advanced by AREA as an antidote to the stale, monocultural Central Business District, which has had its time.







### Where next for urban space?

Welcome to your Q2 2023 Trend Report from WORKTECH Academy, which explores six transitions facing work and the city

City centres and offices share the same challenge: to bring people back after the pandemic when they have plenty of reasons and opportunities to stay away. In that sense at least, our urban and organisational destinies are now entwined.

The more that city-centres can overcome urban barriers, from poor air quality and lack of green space to poor connectivity and social exclusion, the more attractive city workplaces will look to employees.

This is the subject of our latest Trend Report for Q2 2023, a period in which Canadian wildfire smoke shrouded New York, acting as timely reminder of the difficulties cities around the world face in terms of pollution, congestion and strains on infrastructure.

In this report, we ask the question 'Where next for urban space?' in the knowledge that the overriding priorities for city policymakers – from sustainability to social equity and inclusion – will exert an influence on how workplaces are designed and managed over the near horizon. When Ricky Burdett, Professor of Urban Studies at the London School of Economics, addressed the WORKTECH's Unworking conference in June 2023, he spoke of the need to broaden our thinking about what constitutes a city. This call to reimagine the urban realm mirrors the current drive to reinvent the office as we seek a healthier, greener and more socially equitable future.

Basing our analysis on academic research, market insights and media reports as well as stories and case studies from around the global WORKTECH Academy network, we have identified six transitions facing work and the city:

From climate crisis to sustainable design:

how ambitious city targets for climate and net zero will shape company ESG policies.

From mixed use to mixed experience:

why novel amalgams of urban amenity and experience will drive footfall and add social value. **From commuting congestion to smart mobility**: how innovations in urban mobility might remove commuter barriers to returning to the office.

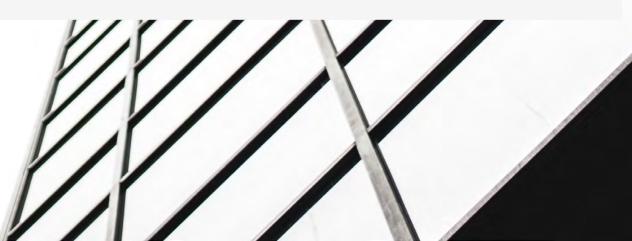
**From privileged access to social inclusion**: how measures to tackle exclusion in cities apply equally to creating a more inclusive workplace.

**From close networks to open innovation**: how a renewed focus on the urban innovation cluster will extend the office from the desk to the district.

**From wellbeing deficit to health equity**: how workplace wellbeing sits within the larger frame of creating health for all in cities.

Clearly, these transitions call for new urban policies and practices, as well as new areas of research. As we reach the halfway mark in 2023, we welcome your feedback on this Trend Report, and we look forward to discussing it with you in our quarterly online Trend Report Briefing.

Professor Jeremy Myerson Director, WORKTECH Academy

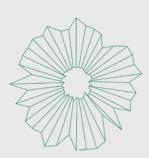






### From climate crisis to **SUSTAINABLE DESIGN**

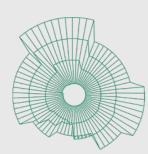
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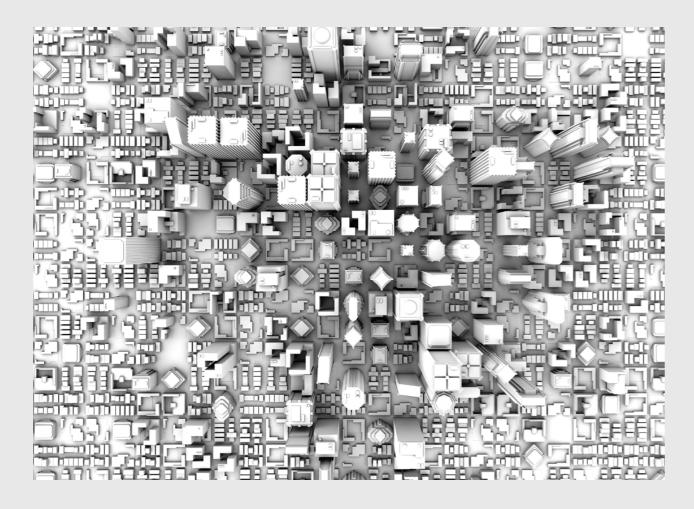
### From mixed use to **MIXED EXPERIENCE**

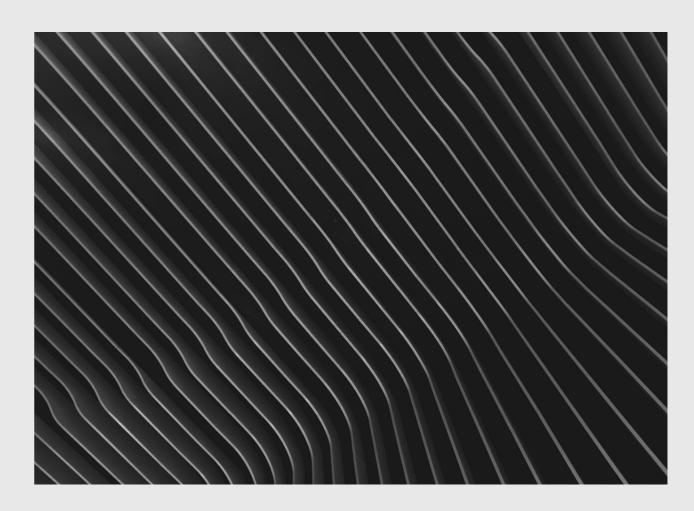
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### From commuting congestion to **SMART MOBILITY**







### From privileged access to 28 SOCIAL INCLUSION



From close networks to **OPEN INNOVATION** 



From wellbeing deficit to **HEALTH EQUITY** 

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### FROM CLIMATE CRISIS TO SUSTAINABLE DESIGN

The ambitious climate and net-zero targets of cities are shaping the agenda for the commercial workplace to adopt more sustainable practices

If the real-estate managers inside large organisations are today feeling extra pressure to meet ESG targets around sustainability, then they need look no further than the urban context in which their office buildings are located. Cities have ambitious climate and netzero targets too and expect businesses to play their part in reducing environment impact and energy use.

Sustainable design is seen as the bridge from the climate emergency to a greener future – and it is rising fast up the agenda of both city policymakers and corporate decision-makers.

When engineering consultancy Arup teamed up with the C40 global network of cities committed to addressing climate change at COP26 in November 2021, they not only presented some of the world's best examples of impactful climate action at the urban scale but also sent a message calling for greater investment in cityled climate action to inspire future initiatives.

So, what can we expect in the future? And where might investments be made? According

to the latest Intergovernmental Panel on Climate Change (IPCC) report (March 2023), setting out a path for climate-resilient development will provide many wider benefits for cities. Access to clean energy and technologies, for example, improves health, especially for women and children. Low-carbon electrification, walking, cycling and public transport, enhance air quality, improve health, boost employment opportunities, and deliver equity.

Sustainable research and practice showcased in this section further point to where innovation might be focused. Adaptive reuse is on the rise and new technologies will support more projects along the lines of Quay Quarter Tower in Sydney, the world's first 'upcycled' skyscraper. Demountable construction, as showcased in the Amsterdam Business Park, will enable more than 90 per cent of building materials to be reused. Mass timber commercial buildings of the type championed by Walmart and The Office Group will break the office's fixation with concrete.

### **Cities at the crossroads**

The importance of sustainable design and action to the future of cities is spelled out in a new report by real estate investment firm Landsec, 'Shaping Successful Future Cities', which maps out four future urban scenarios.

Landsec worked with The Future Laboratory's strategic foresight methodology to build a picture of what a successful – and unsuccessful – city could look like over the next decade and more. The report outlines four models – from worst case through to best case scenario – and examines the key characteristics and defining features of each potential outcome. The scenarios are:

- The problematic future Exhausting and depleting: this 'worst case scenario' depicts a future in which urban planning and construction have failed entirely to address environmental concerns and social inequality.
- The probable future Adaptive and evolving: the 'most likely scenario' is where cities evolve by retrofitting existing infrastructure, and social resilience becomes as important as physical resilience.
- The possible future Collective and vitalising: a city designed for society holistically, using data and digitisation to enhance quality of life for all residents, and with a focus on health and equity.
- The prosperous future Green and flourishing: this 'best case scenario' sees

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### SUSTAINABLE DESIGN



people flourish alongside the environment. The positive elements of urban life can thrive and the returns from eco-system restoration are clear, but this vision is contingent on understanding the ways in which low-impact materials and building techniques affect the environment.

As if to underscore its message on protecting the environment, the report sets out six principles of urbanisation in order of urgency. The top priority is to be 'climate prepared' to protect people against man-made and natural disasters, while ensuring the built environment is greener, more efficient, and becomes a net generator of energy and other crucial resources.

Commenting on the insights contained in the report, Landsec chief executive Mark Allan says: 'We're at a crossroads when it comes to the future of our cities... Put simply, we need to act now – starting with urgently needed policy reform.'

### SUSTAINABLE DESIGN

### Adaptive reuse advances

The urban environment is, by definition, densely populated and competition for space for new construction projects within cities can be fierce. The temptation for designers and clients can be to tear down existing buildings to create space for new builds, but even if some of the materials are reused, demolition is often an unsustainable approach to urban architecture.

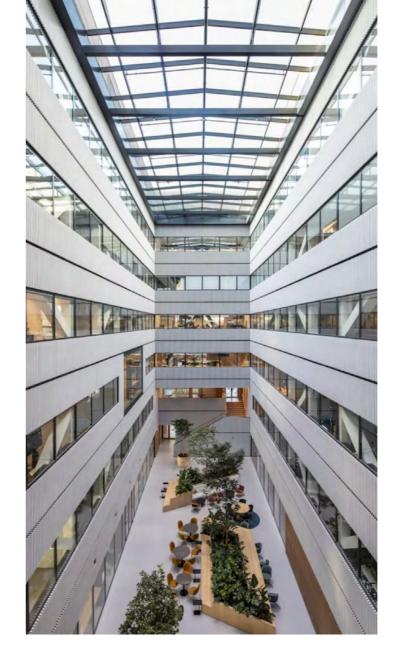
But could the tide be turning? Research by the American Institute of Architects (AIA) suggests that in 2022, 50 per cent of architectural projects were focused on reconstruction over new builds. Not only is this a more sustainable approach, with the embodied carbon of a new build often vastly outstripping the carbon needed to retrofit or reconstruct an old building, but this approach can help retain the character of neighbourhoods.

In Australia, this trend towards adaptive reuse is particularly clear, with Quay Quarter Tower by Sydney Harbour springing up in the place of the old AMP Tower, making it the first 'upcycled' skyscraper. Utilising more than two-thirds of the original building's structure and 95 per cent of the old core, this recycling project has proved that size is no barrier to sustainability.









### Amsterdam's demountable office

A new laboratory and office building in the heart of the Amsterdam Science Park has been described as pushing the envelope in sustainable design through its strategy to meet the city's ambitious targets for energy use.

From demountable construction to solar energy generation, smart lighting and generous facilities for bicycle parking, the new Matrix One building designed by Dutch architects MVRDV serves as the main hub of the Matrix Innovation Center, a sixstorey, 13,000 sq m building.

Containing a mix of science laboratories, its users are themselves working on sustainability solutions and future technologies, with the University of Amsterdam's SustainaLab operating from within the building, alongside other companies.

### SUSTAINABLE DESIGN

Matrix One aims to be a sustainable example for the other buildings in the Science Park and beyond. Designed to be demountable, the building features simple connections that allow elements to be detached and reused when various parts of the building are updated; even the building's floors are made using prefabricated concrete slabs with no fixed connections, allowing them to be reused at the end of the structure's lifespan.

The platform Madaster provides a material passport system to give insight into the materials and products used, and the CO2 storage for more than 120,000 individual components. As a result, in excess of 90 per cent of the building's materials can be reused again later.

On the roof, 1000 sq m of solar panels generate a portion of the building's energy, while internet-connected lighting and heating fixtures help reduce energy consumption (power for critical lab equipment runs on a separate circuit). With this mix, the building itself produces a significant proportion of the energy it consumes, says the architect.

Source: Salus Global Knowledge Exchange



### Working with wood

Working with timber may have previously been the reserve of small-scale domestic projects, but with innovation in design comes a wave of large-scale urban office buildings constructed from timber frames.

With the World Economic Forum reporting that the built environment causes 39 per cent of all global greenhouse gas emissions, 11 per cent of which are related to construction and materials, the methods we currently use need rethinking. Concrete, a traditional building material associated with the urban environment, has an enormous carbon footprint and strong, safe alternatives are sorely needed.

Enter cross laminated timber: now considered a safe, fire-proof material when treated correctly, this material is reshaping the urban landscape with a wave of mass-timber commercial buildings springing up all over the world.

Early examples of mass-timber construction pushed planning regulations to their limits. The ground-breaking Tameida office building in Zurich, designed by Shigeru Ban and built in 2015, pushed the boundaries of local fire-safety codes in order to deliver the seven-storey

prefabricated timber frame. Since its creation, fire safety codes were reassessed, opening the door to further mass-timber constructions.

But now they are springing up everywhere, with offices like the Black and White Building in Shoreditch, London and Walmart's new HQ in Arkansas, which is the largest mass timber project in the US to date.

But despite the excitement that mass-timber structures are causing, there are concerns that the impact on the environment may still be significant. Logging and deforestation are already major issues, and although wood is a renewable resource, unless steps are taken to address the sustainability of supply chains and the ways in which wood, as a limited resource, is treated and allocated there is a risk of over-reliance.

The solution to this? The majestic T3 building by MGA in the US may offer a solution. Made exclusively from trees that were killed by mountain pine beetles, this structure takes the sustainability of its wood seriously, utilising resources that were already made naturally available without excessive logging.







# SUSTAINABLE DESIGN

### **Black and White** building, London

Designed by Waugh Thistleton Architects for The Office Group, the Black and White Building claims to be the largest mass-timber office building in London. Made of laminated beech, pine and timber, the arresting structure was made from prefabricated components which were designed to be slotted together for easy assembly and disassembly if needed. This makes the building visually attractive as well as highly sustainable, reducing the embodied carbon of the building by almost 40 per cent.

We're at a crossroads when it comes to the future of our cities... we need to act now + starting with urgently needed policy reform'

Landsec chief executive Mark Allan

### City governance a key issue

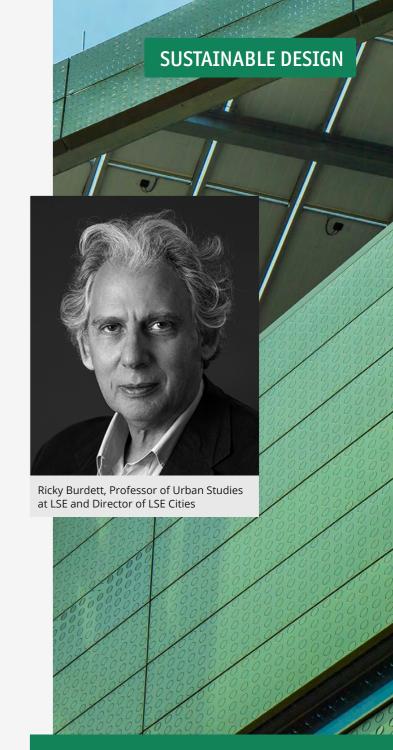
The uncontrolled growth of unregulated cities poses a huge threat to environment, according to leading city planning academic Ricky Burdett, Professor of Urban Studies at the London School of Economics.

Speaking at WORKTECH's Unworking conference in London in June 2023, Professor Burdett warned that cities that are 'growing and sprawling rather than densifying and intensifying' are endangering our climate systems. He explained that three-quarters of the world's CO2 emissions are produced by cities and that a third of city dwellers live in slums.

We need to broaden our idea of what constitutes a city, said Burdett. We need to play closer attention to the governance and management of cities, and have a serious debate about increasing densities in city centres rather than allowing urban sprawl at their fringes. He cited Hong Kong as a model for combining high-density living with high-density working, thus reducing commuting times. In contrast, London has highdensity working in the City, but relatively lowdensity housing. Commuting therefore times are much longer.

Placing sustainability at the heart of the future city was a top priority alongside improving social equity, said Professor Burdett. The two issues went hand in hand.

Source: WORKTECH Unworking conference, London (June 2023)



#### **Key Links**

How can we make cities more sustainable?

<u>ARB: Competence Guidelines -</u> <u>Sustainability</u>

<u>Global cities unite to showcase</u> <u>impactful climate action</u>

### FROM MIXED USE TO MIXED EXPERIENCE

Mixed-use has become a familiar part of the urban landscape. But could a shift to mixed-experience development add social value and bring people back?

City centres and workplaces share the same struggle to attract people back in the aftermath of the pandemic. A core part of the urban economy depends on a regular influx of office workers, and given current uncertainty, realestate developers face a challenge to adapt their assets to the changing needs of the hybrid era.

Mixed-use development has long been advanced as an approach to reanimate Central Business Districts, which have traditionally been mono-cultural in character, with a mix of uses such as workspace, retail, entertainment, hospitality, transport and so on.

However, a new trend is emerging which reflects the argument that simply bringing together physical spaces with different commercial use types in one location will no longer be enough to deliver the outcomes needed to create vibrant, equitable and sustainable places where people want to be. Instead of mixed-used projects, developers and occupiers should be eyeing up urban sites that offer mixed experiences. One of the key drivers for this shift is the growing trend for urban transformation projects around the world to actively look to extract social value and use experiences as a lever for renewal.

According to Jeremy Kelly, Lead Director of Global Cities Research at JLL, 'city governments are looking beyond traditional metrics like GDP and employment growth and are refocusing on harder-to-measure factors relating to liveability, opportunity and experience.' There are clear implications for commercial property if city governments now expect the industry to deliver projects that have a positive social impact.

Moving from mixed-use to mixed-experience developments, which add social value through programming and curation, could be the way to go, as this section explores.

### **Unlocking Nexus value**

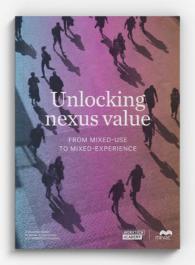
Australian developer Mirvac is an advocate for mixed-experience development, arguing that it represents a novel shift from mixed-use that has the potential to create new value chains.

In its latest whitepaper produced in partnership with WORKTECH Academy, Mirvac describes the added value of mixed experiences as 'nexus value'. This can be broadly defined as an approach that enhances the component parts of a development through carefully considered and complementary uses, so that the combined effect is greater than the sum of its parts.

Beyond the right mix of spaces, the idea of 'nexus' value speaks to the incremental increases in value that you get when you programme a site to deliver enhanced amenity and a better quality of life for people than they might find elsewhere. The Mirvac report identifies a set of interdependent factors such as place identity, grassroots projects, events,



### **MIXED EXPERIENCE**



festivals, public art and multi-sensory richness, which are experiential in character and create a sense of belonging, as contributing to this.

Getting the mix of experiences right makes it much more likely that a place will achieve the kind of vibrancy and activation that drives positive social outcomes and encourages people to visit – and to stay in the area. One of the challenges of the traditional Central Business District has been that they tend to be deserted outside business hours – layering living over working over retail with a strong programme for activation creates a 24-hours-a-day mix of uses so that a location is never empty.

Mixed experiences can also occur in a single building – animating the ground plane of an office with retail, or a programme of activations, for example, to help bring people back to the workplace.

**Source**: <u>'Unlocking nexus value: from mixed-use to mixed-</u> <u>experience'</u>, Mirvac (2023)

## Mixed experience in motion...

### Outernet, London

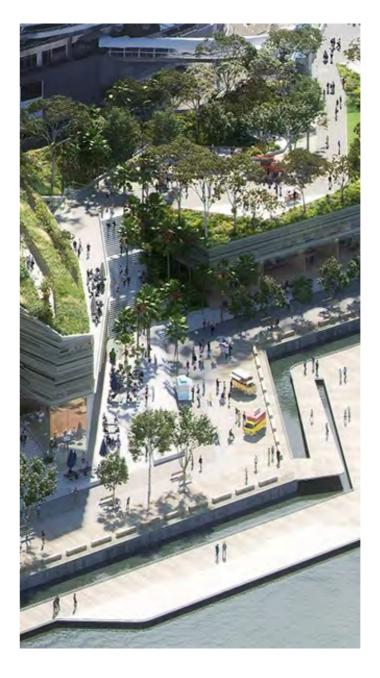
The Outernet is a new entertainment district located in Denmark Street next to Tottenham Court Road station, one of Central London's key transport hubs. The music heritage of the site – centred around a street historically known as 'Tinpan Alley' – set the scene for the development approach which responds sensitively to what's already there.

Although the site is mixed-use – offices, residential, retail, entertainment, hotel and hospitality – all of the businesses centre around music, from legal firms to historic recording studios and music shops, and large-scale entertainment venues. Rather than being vertically split, the uses are horizontally layered and interconnected to replicate the organic development of a city.





A revolutionary aspect of the development, designed by architectural firm Orms, is the use of new technology to provide a vibrant, activated visitor experience. Two large volumes wrapped in LED screens sit at the centre of the site to create an immersive audio-visual experience. The AV technology means that the core business model is based on a shift from rent per square foot to rent per screen time (advertising, events). This enables the landowner to subsidise rents for the smaller independent music businesses that would otherwise struggle to stay in the area.





### Harbourside, Sydney

Located on an iconic Sydney waterfront site that once housed a shopping centre, this new destination by developer Mirvac will deliver new retail, a campus-style commercial space and residential, all integrated with an abundance of accessible, green public domains to create an equitable user experience. The central vision for this mixed-experience precinct is based on the idea of 'Returning to Tumbalong, where all are welcome.' Tumbalong is the traditional name for Darling Harbour.

Having a shared vision, project narrative and a deep understanding of the user types agreed at the start of the project provided a 'north star' for the project. Following in the tradition of the local First Nations Gadigal and Wangal people, the design for this new development will create a shared place for all, a place for connecting water, land and people. This project will deliver 10,500 sq m of public domain, with a 3,500 sq m waterfront garden. Importantly, 6,000 sq m of landscaped roof will increase biodiversity and reduce heat.



### **The Playground City**

When Edward L Glaeser, Chair of the Economics Department at Harvard University, and Carlo Ratti, director of the Senseable City Lab at MIT, wrote a joint opinion piece for *The New York Times*, they described New York as 'undergoing a metamorphosis from a city dedicated to productivity to one built around pleasure'.

Charting the Big Apple's economic shifts in population and use, they declared: 'We are witnessing the dawn of a new kind of urban area: The Playground City.' This has huge and painful implications for the city's office property market, at least in the short-term.

To help manage the transformation from productive to playground city, Glaeser and Ratti joined a Mayoral panel in New York last December to address low commercial occupancy rates and address struggling businesses. Their work resulted in a report with six lines of action:

### 1 Learn from big data and experimentation

There are many tools for potentially reviving urban centres but we don't know what will work where. Initiatives need to be refined through experimentation, data collection, analysis and adjustment.

### 2. Jettison regulations that hinder urban innovation

The most obvious obstacle is single-use zoning, which has separated where people live from where people work since the 1920s. We need flexible zoning to integrate the city, spread the power of play across every neighbourhood and allow offices to be converted into residences.

#### 3 Reinvent the building core

Even without red tape, remaking a city from the empty but brittle shells of 20th-century office towers with deep floor plans meant to maximize square footage is no easy task. To achieve conversion at scale, we must find new ways to convert deep-core office buildings into new kinds of spaces optimised for co-living and coworking.



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### 4. Animate the street

Policy should support a dynamic and scenespecific life at ground level. During the pandemic, municipal governments armed only with yellow paint remade the streets and brought about a revolution in pedestrianisation and outdoor dining. The urban playground should be constantly rearranged: streets could be cleared for festivals and temporary exhibitions; food bazaars and pop-up shops could multiply.

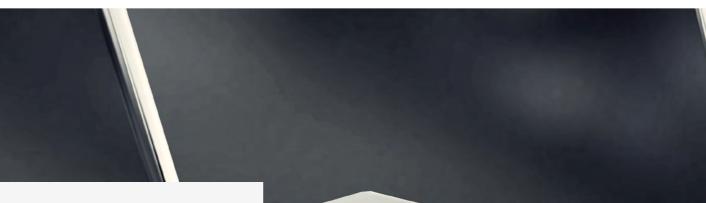
#### 5.Level the playing field between e-commerce and neighbourhood businesses

To sustain a vibrant street life, municipalities should fairly tax e-commerce for the congestion it creates and lower their retail sales taxes, making local shops more competitive.

#### 6. Engage citizens

Governments should empower citizens to participate directly in making the Playground City. The generation that grew up on social media has developed a fierce, collective yearning to come together in the real world – we should harness that energy.

**Source**: '26 Empire State Buildings Could Fit Into New York's Empty Office Space. That's a Sign'. Edward L Glaeser and Carlo Ratti, The New York Times, May 2023



### How tech is enabling mixed experiences

For mixed-experience developers to move forward, they will need to tap into a powerful new resource - a set of digital tools that can revolutionise how they engage with communities, understand how spaces are used, and think about user experience.

#### Supporting community engagement:

Community consultation has historically been limited by the time it takes and by the challenge in translating architectural concepts for people who can't easily read plans. Bricks-and-mortar experience centres or static visualisations have historically been the only tools available, both of which have significant disadvantages.

Technology has the potential to streamline the process of bringing communities into the conversation. Virtual and augmented reality are coming to the fore to allow designs to be quickly tested with different groups of users, enabling developers to better understand preferences and optimise features.

Data-driven decision-making: Understanding how buildings are used is key to managing them as efficiently as possible – and to making informed decisions about any longer-term changes that might need to be made in response to changing populations or needs.

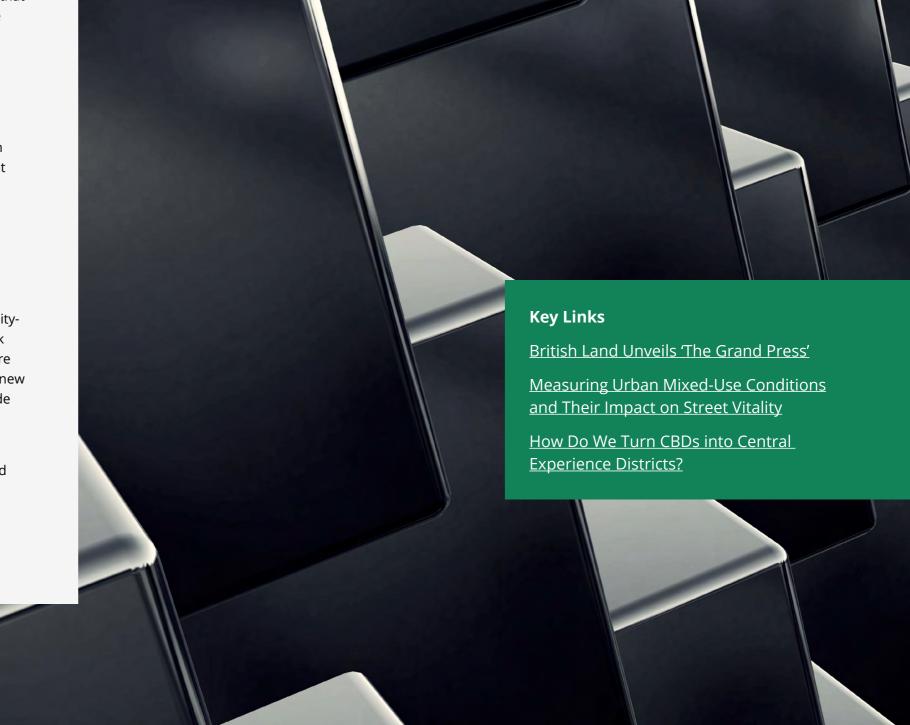
The transformational value of technology is that it enables us to understand use down to the second, 24 hours a day.

The ubiquity of the smartphone opens up further opportunities. This might extend to gamification of experiences in an urban district, systems of loyalty points within the local business ecosystem or even AI that can enhance through predictive behaviours what people might want from a venue on a given day. This digital layer creates truly mixed experiences that connect people to space in a way that extends beyond their physical presence on site.

Informing user experience: Technology is becoming more people-centric and less facilitycentric in approach, enabling people to book and use amenities with ease. Tenant apps are becoming an increasingly integral aspect of new developments so that developers can provide tenants with a more seamless, on-demand experience.

In addition to streamlining user journeys and providing data, there's the potential for new technology to play a role in creating novel immersive experiences that not only draw people in but can generate revenue.

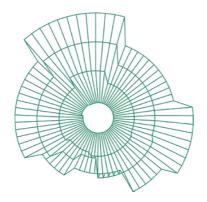
Source: <u>'Unlocking nexus value: from mixed-use to</u> *mixed-experience*', Mirvac (2023)



### **MIXED EXPERIENCE**



### FROM COMMUTING CONGESTION TO SMART MOBILITY



### The return to the office is intricately connected to the future of urban mobility and the possibility of reducing and redesigning the commute to the city

'Earn the commute' is the cry frequently aimed at large employers trying to orchestrate a return to the office. Commuting is a welldocumented barrier to bringing people back to the workplace as workers remain reluctant to resume the daily slog by road or rail. But could smart mobility solutions ride to the rescue?

The image of cities as congested and carclogged was briefly transformed during the pandemic as empty streets, green spaces and new cycle lanes promised a better future. Now that so many cities have again filled up with traffic, what is the evidence for moving forward?

As this section suggest, there are some grounds for optimism. Micro-mobility is on the rise according to research in 50 cities by Gensler, so we can expect further innovations around e-bikes and scooters, and more provision inside offices to park them. A report by Australian consultants ERA-Co shows how pedestrianisation of smaller streets in Sydney has the potential to take cars off the road, help build community and reduce emissions. Bloomberg research suggests the era of the super commuter (spending 90 minutes a day or more in transit) is on the wane.

Then there are the smart mobility favourites: electric and autonomous vehicles. Sales of EVs are accelerating even while the charging infrastructure struggles to keep pace. In the US, there are ambitious plans to repurpose gas stations to support a switch to electric vehicles. Workplaces will be increasingly co-opted into this effort. Connected and autonomous vehicles (CAVs) are not as ubiquitous as EVs yet. But things are happening and pre-programmed routes, special lanes, cruise control and self-parking innovations promise safer, streamlined city streets.

Vehicle redesign can only go so far, however. Experts believe the future of urban mobility lies with multi-modal transport planning so that different forms of transport are integrated for city work and play as part of a safe and enjoyable user experience.

### Micro-mobility on the rise

Public transport use has declined but the world of micro-mobility has taken off, according to research by architectural firm Gensler in 30 global cities.

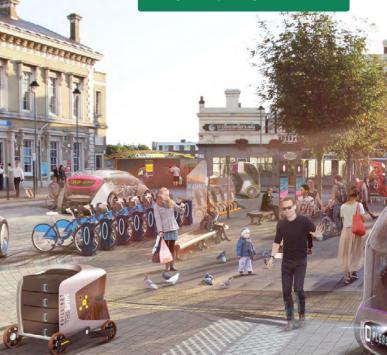
Its 'City Pulse 2022: Urban Mobility Report' surveyed more than 15,000 city residents, revealing new patterns and perspectives on how people move around cities. Its data shows that purchases of private e-bikes and scooters dramatically increased in 2022, especially for people who commute to the office between one and four times a week. E-bike sales grew by 190 per cent, bicycle sales increased by 120 per cent, and e-scooter sales jumped by 61.2 per cent. This means that more people will be requiring bike and e-scooter parking on arrival at the office as they forego the bus and the metro.

Overall, public transit use was down by 5 per cent from 32 per cent of all journeys before the pandemic to 27 per cent after it, while micromobility use and walking went up by 7 per cent from 40 per cent to 47 per cent.

Concept designs for cargo bike and e-scooter by BMW Group Research. Micro-mobility is on the rise in cities amid a wave of innovation.



#### **SMART MOBILITY**



Future concept for autonomous vehicles in London by the Intelligent Mobility Design Centre at the Royal College of Art. Self-driving is an area anticipated to develop rapidly.

The decline in public transport overall is correlated to a decline in feeling safe within urban centres. During the pandemic, buses and tubes may have felt dangerous and crowded. People fearing for their health were tempted to get on a bike and travel in the fresh air away from the crowds. With crime on public transport networks also increasing, a sense of unease could be keeping people away from more traditional transport networks.

Sofia Song, who leads Gensler's City Pulse research, told us that that a key predictor of a great urban experience is feeling safe in one's city followed by feeling safe and comfortable in the transit system.

Disappointingly, cars are still the dominant form of transport in urban areas, remaining steady at around 63 per cent before and after the pandemic. This suggests that those cycle-to-work schemes are not going far enough when it comes to cutting travel emissions. However, walkability has become more important to people since the pandemic, which suggests that with clever design to enable active travel, people will be more inclined to get out and about.

### Shifting patterns of urban mobility

What would persuade you to travel long distances? Socialising and seeing friends? To see a show or go for dinner? But what about getting to work? For many employees, this may be a far less tempting proposition.

A report by architectural practice <u>Perkins &</u> <u>Will</u>, based on a discussion featuring Jennifer Wieland of transport planning firm Nelson Nygaard, Gerry Tierney, Associate Principal at Perkins & Will, and Gregory Taylor for the City of Sacramento, highlights the new habits of employees. It suggests that people are not against commuting *per se.* In fact, they are travelling as much as they were pre-pandemic – they're just travelling less for work purposes.

Before the pandemic, transport providers used to experience peak hours early morning and early evening and quiet hours. Now commuters are behaving differently, and the peaks have flattened, with people travelling at times that are more convenient to them. The US picture is mirrored by what is happening in and around London, according to data from Transport for London.

Despite these changes, there are still challenges with the high cost of commuting in some US cities and a fear of unreliability continuing to drive people towards their cars. Adopting a streamlined system for card and contactless payment, and making the experience of public transport more user-friendly and pleasant, will help support campaigns to cut travelrelated emissions. So will reducing availability of parking spaces and adopting a 15-minute district approach to urban planning, ensuring that everyone can access basic amenities for working and living on foot or by bike when they need to.

In Australia, meanwhile, attention has turned to pedestrianisation as part of thinking at a local scale about city design. In the pandemic, people were forced to socialise closer to home and local communities came together to support each other. Australian consulting firm ERA-co wants people to capitalise on this shift to create connection as well as tackle climate change. It suggests in its 'Streets Ahead' report that smaller streets be pedestrianised to allow for tighter communities to form whilst bigger public thoroughfares be kept open to cars to allow a flow of people into an area.

This would create space for more parks, markets and public spaces in local communities where these amenities could be made much more accessible on foot and local businesses could be supported.

ERA-Co has modelled this approach in Sydney, using data to illustrate how this approach could remove 100,000 cars from the roads, thereby cutting emissions and saving people money on their bills. The removal of roads could also facilitate the introduction of 80,000 trees, providing people with green space and shade all year round. This approach is also scalable, allowing other cities to utilise the methodology to better understand the transformations that are possible in their environment.

Source: *The City of Tomorrow Will Have Way Fewer Cars'*, Perkins & Will (May 2023). *'Streets Ahead: A New State of Wellness'*, ERA-Co/Woods Bagot (2020)

### Is super commuting a thing of the past?

Are you a 'super commuter'? This subsection of the workforce is defined by the length of their commute – encompassing anyone who commutes 90 minutes or more a day to their place of work. But this group may well be on the decline – a report by Bloomberg suggests that super commuting is going out of fashion.

According to census data from Apartment List, the number of 'super commuters' in America has reached its lowest recorded level in 10 years. This is a significant reversal of a previous trend towards increasing commuting times. In 2019, super commuters represented the fastest growing group in the labour market, with the practice of super commuting becoming most common for the highest earners.

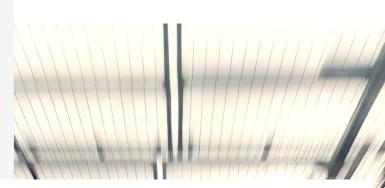
But with the pandemic shaking up the way that lots of people work, the commute has been the first thing to go for many employees. Bloomberg suggest that this is mainly driven by white-collar workers who are choosing to work from home and forego the office on a regular basis. This means that the number of highearning super commuters is dropping while less well-off employees are left to brave their journeys alone.

Although this data doesn't fully take into account hybrid working patterns, it is still an interesting reflection on the modern workplace, exposing those who are adapting with the new world of work and those for whom it is business as usual.



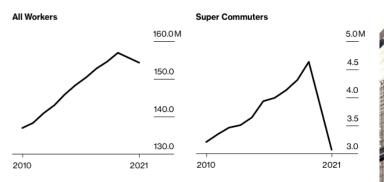
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#### **SMART MOBILITY**



#### Workers Are Ditching Their Super-Commutes

The share of the workforce with commutes of 90+ minutes has dropped to decade-long lows



Source: Census American Community Survey; Apartment List calculations

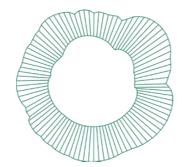


#### Key Links

Solutions for smart mobility in urban areas

<u>Connectivity: The fundamental</u> ingredient of a successful smart city

Mobility ecosystems for a more sustainable future



### FROM PRIVILEGED ACCESS TO SOCIAL **INCLUSION**

Diversity can be a source of innovation in cities as well as workplaces. But it is a sense of inclusion that will make all the difference to where people want to be

The growing commitment by senior business leaders to diversity, equity and inclusion (DEI) in the workplace sits within the larger frame of what cities are striving to achieve. 'Leave no-one behind' is the pledge at the heart of the UN's 2030 Charter for Sustainable Development, which makes social inclusion its major defining feature.

According to Unesco, 'Social exclusion has negative consequences for all within society, not just the poorest or most marginalised. Solving the problem of social exclusion is urgent. The consequences of deepening inequalities can be particularly devastating."

The brutal experience of many groups during the pandemic when age, disability, race, ethnicity and economic circumstance shone an unforgiving light on deep social inequalities has left many city policymakers and corporate executives determined to take a more inclusive approach in the future.

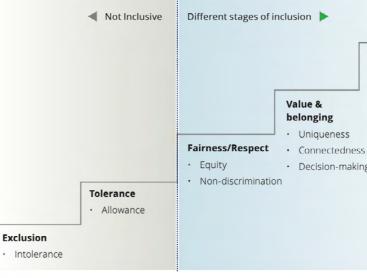
Diversity is now seen as a key driver of innovation in cities, just as it is inside organisations where hiring more diverse teams (including neurodiverse employees) has become a priority. But diversity by itself only captures variation in the group -inclusion is what makes everyone feel welcome.

As this section explains, there are some key things that cities can do to become more inclusive places. Deloitte's report points out the opportunities in practising inclusive design, taking an integrated approach to planning, avoiding bias in data collection and improving digital literacy. These apply equally to the workplace which has also provided privileged access to some groups in the recent past while excluding others, often due to the ill-considered design of systems and spaces. This has to change and there are now inclusive exemplars and tooklits to help us do that.

### How to create an inclusive city

A report from Deloitte on how to bring inclusive services and planning into city development makes a number of key recommendations:

- Promote an integrated planning **approach**: A fragmented approach with a lack of inclusivity when planning housing and public infrastructure is typically the starting point for inequality.
- Follow an equity-centred design **approach**: The practice of inclusive design, also known as universal design, is now widely adopted. This should extend beyond infrastructure improvements that accommodate physical disabilities - such as audible walk signals and wheelchair ramps - to communications and services that can reduce systemic barriers faced by historically marginalised groups.
- Improve technology solutions: To boost participation and inclusion within a city's ecosystem, city leaders should launch digital skills and literacy programmes, and improve the broadband infrastructure.



#### SOCIAL INCLUSION

- Pursue data equity: Data collected and analysed for decision-making must accurately represent the entire underlying population and minimise bias. The use of AI and algorithms introduces a risk of using potentially distorted datasets in the design of services and programmes.
- **Establish inclusive living labs**: Create and foster dedicated public spaces and environments where city planners can test solutions, assess their desirability, acceptance and impact, and evaluate whether to scale them up to the whole city as part of a co-creation process.
- Use agile methods to anticipate needs: With increasing amounts of data collected and processed to meet citizens' needs, cities have the opportunity to get on the front foot by using data analytics to predict needs.

All of these recommendations can apply equally to the inclusive workplace as companies figure out new ways to improve employee engagement and social equity.

Source: 'Inclusive Service and Planning', Deloitte (2023)

Inspiration & Confidence

- Enthusiasm
- Empowermen
- Trust
- Unleashed

Source: The Economic Benefits of Improving Social Inclusion, Deloitte (2019)



### Reclaiming the town centre: Stockton-on-Tees, UK

Stockton-on-Tees, a market town in the northeast of England that is home to 200,000 people on the River Tees, has embarked on an urban transformation project with the aim is to create a more socially inclusive towncentre environment.

To achieve this, it has taken the dramatic decision to knock down half the high street, including a failing 1960s shopping arcade, and replace it with a riverside park three times the size of Trafalgar Square.

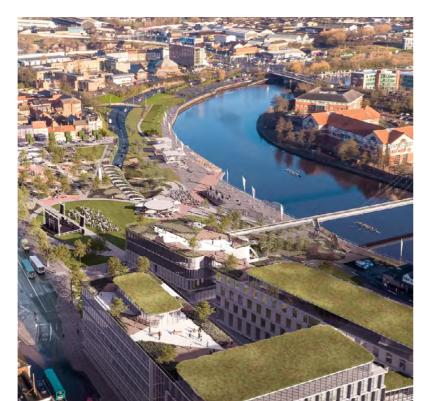
As part of building a more socially equitable town centre, there is more living accommodation and a focus on heritage, culture and learning as well as swimming and fitness. The aim is to rebuild an emotional connection between local people and their town after decades of anonymous retail development which ignored the rich industrial heritage of the area.

The widely acclaimed scheme includes a local authority-owned hotel and a refurbished Art Deco theatre. The project team worked closely with a well-known local activist and musician, tapping into his passion to improve the town and involving him in community decisionmaking rather than regarding his activism as a barrier to development.

Neil Schneider, Chief Executive of Stockton-on-Tees Borough Council from 2008 to 2019, told us how a business incubator was created in an 'Enterprise Arcade' to offer free advice and mentoring. This has led to 24 local businesses being set up in the town centre.

Stockton Waterfront urban park site will be completed by the end of 2024.

Source: Interview with Neil Schneider (2023)



### Designing for urban happiness

What are the ingredients that create a happy and inclusive public space? Researchers Pieter Desmet and Sahar Samavati of Delft University of Technology have created a 'guide with 20 ingredients to design for urban happiness'. The list includes mixed land use and mobility but goes much further in describing a set of interdependent factors such as place identity, grassroots projects, events, festivals, public art and multi-sensory richness which are experiential in character and create a sense of belonging.



### SOCIAL INCLUSION

- 1. Connectivity, accessibility and mobility
- 2. Mixed land use
- 3. Friendly urban furniture
- 4. Public art
- 5. Greenery
- 6. Interactive design
- 7. Compatibility with user needs
- 8. Environmental Comfort
- 9. Visual aesthetic qualities
- 10. Multisensory richness
- 11. Inclusiveness and diversity of users and activities
- 12. Leisure time and recreational places
- 13. Events and festivals
- 14. Promoting vibrant and diverse social interactions
- 15. Sense of safety and security
- 16. Place identity, memorability and city image
- 17. Foster grassroots projects
- 18. Promote trust and participation
- 19. Place attachment
- 20. Adaptability and flexibility

**Source**: Pieter Desmet and Sahar Samavati, Delft University of Technology (2022)

SOCIAL INCLUSION

We need to understand that inclusion and equity is not simply "good to have": it is essential. It is a foundation that we build on and it is an enabler of thriving communities'

Jeff Merritt, Head of IoT and Urban Transformation at the World Economic Forum

### SOCIAL INCLUSION

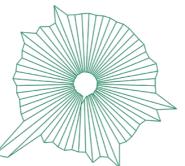
#### **Key Links**

Cutting Edge | All Aboard! Culture and social inclusion

Inclusive by Design – McKinsey

Social Inclusion and Levels of Urbanisation: Does it Matter Where You Live?





# FROM CLOSED NETWORKS TO

### Innovation districts that open the workplace to a wider world of ideas and connections are back on the map as part of urban place-making

The idea of connecting the workplace to the neighbouring district as part of an ecosystem of collaborative innovation is not new. Innovation districts based around certain themes from life science to education were springing up well before the pandemic called a temporary halt to open innovation practices performed against the backdrop of the public realm.

Now, attention is back once again on the pulling power of the innovation district to support creativity and new ideas, as large companies increasingly recognise the limitations of running innovation activities from behind closed doors inside internal corporate labs.

Permeable innovation districts give employees direct access to external public and cultural amenities, university research centres, entrepreneurs and start-ups, as well as a mix of restaurants, cafes, retail and transport links which supports a more vibrant working environment. In approach, they represent the complete opposite to isolated, out-of-town science parks. The term 'collaborative innovation' is often interchangeable with 'open innovation'. Both refer to a process in which multiple players both inside and outside an organisation contribute towards the development of new products, services and business solutions, and openly share what they develop. Innovation districts or clusters accelerate this process. In the words of Geoff Mulgan, Professor of Collective Intelligence, Public Policy and Social Innovation at University College London, 'cities speed up the circulation of ideas, people and money'.

When Mulgan studied innovation districts, he argued that their construction needed to be matched by curation – creating a sense of place was essential to 'ensure sharing of data, insight, ideas, creativity between large numbers of people, firms, universities and other institutions, using both online and offline links, formal and informal connections'. As this section suggests, there is growing evidence that place-making in innovation districts is on an upward curve.

### Working without boundaries

A new report from professional services firm Deloitte and developer Lendlease sets out five key opportunities in navigating the new world of work. Among them is a recommendation for companies to 'embrace boundaryless ecosystems'.

The report observes: 'As innovation precincts receive significant attention and investment from across all sectors, it's increasingly likely you'll need to think about how your organisation collaborates to achieve its objectives. How will your people work with others, inside and outside your organisation, to solve these challenges?'

Deloitte and Lendlease argue that to meet future challenges, companies will be required to lead large-scale innovation in products, systems and solutions. The pandemic showed that firms could adapt quickly and cross boundaries to meet different needs – car makers such as Ford and General Motors producing ventilators, for example. Now the challenge is to be nimble and flexible enough to explore new avenues critical to succeeding in the modern world of work.

Source: 'Mastering The Next Evolution of Work', Deloitte and Lendlease (2023)

### **OPEN INNOVATION**



Developing innovation ecosystems, opening up to unexpected partnerships and prioritising transparency to improve communications are all key factors. 'Fostering an environment that supports an organisation's public and private sector relationships can dramatically improve the experience of the workforce', says the report.

Boundaryless ecosystems are not without their challenges, however. The potential benefits of cross-organisational work are clear, but one of the greatest threats to transparency comes from worker data and intellectual property (IP). Who controls their data and how will it be used? How is content and conduct regulated? And how are your organisation's IP and digital assets protected? Little wonder that the report suggests that 'the future of work is both dynamic and complex'.

### 'Planners and developers of clusters of this kind need to understand them as a kind of collective intelligence'

Professor Geoff Mulgan, University College London



### Ford's innovation district in Detroit

Automobile giant Ford is renewing its commitment to Detroit by creating a new mobility innovation district in one of the city's oldest neighbourhoods, Corktown. The new district, known as Michigan Central Development, will bring world-class talent, start-ups, entrepreneurs, and partners to join Ford in designing new mobility solutions for the way people and goods will move around tomorrow.



#### **OPEN INNOVATION**

One of the first buildings to open in the new district is the skilfully refurbished Book Depository, a 1930s Albert Kahn building originally built as the city's main post office and then used as a Detroit Public Schools Book Depository.

This isn't your traditional office space. Designed by Gensler, it's positioned for the future of work as a nexus for exchange, featuring what the architectural firm describes as 'flexible and adaptive workspaces, ample access to daylight...and unhindered connection'. Emerging tech firms, researchers and designers will be able to develop new mobility solutions in a fluid environment designed to flex for future needs.

The ground floor of the Book Depository connects the overall Michigan Central Development, serving as a boulevard for the community, industry partners and the neighbourhood. When it's completed, this innovation district be a key link in the State of Michigan's proposed connected and autonomous vehicle corridor running from Ann Arbor to Dearborn to Detroit, linking the district to the region's other centres of automotive research and testing.

Source: Gensler Research Institute

### How does urban design affect innovation?

What role does the urban environment play when it comes to how innovative you might be at work?

In a paper titled 'Does urban form matter for innovation productivity?', University of Texas researchers Shima Hamidi and Ahoura Zandiatashbar investigate the relationship between the level of innovation in an area and the surrounding built environment.

Their research suggests that urban areas that are compact and easily walkable are more likely to attract knowledge workers. Having high-quality transport networks is also a feature of areas attracting more innovative small firms.



Aerial view of Milan Innovation District expected to be completed by 2031



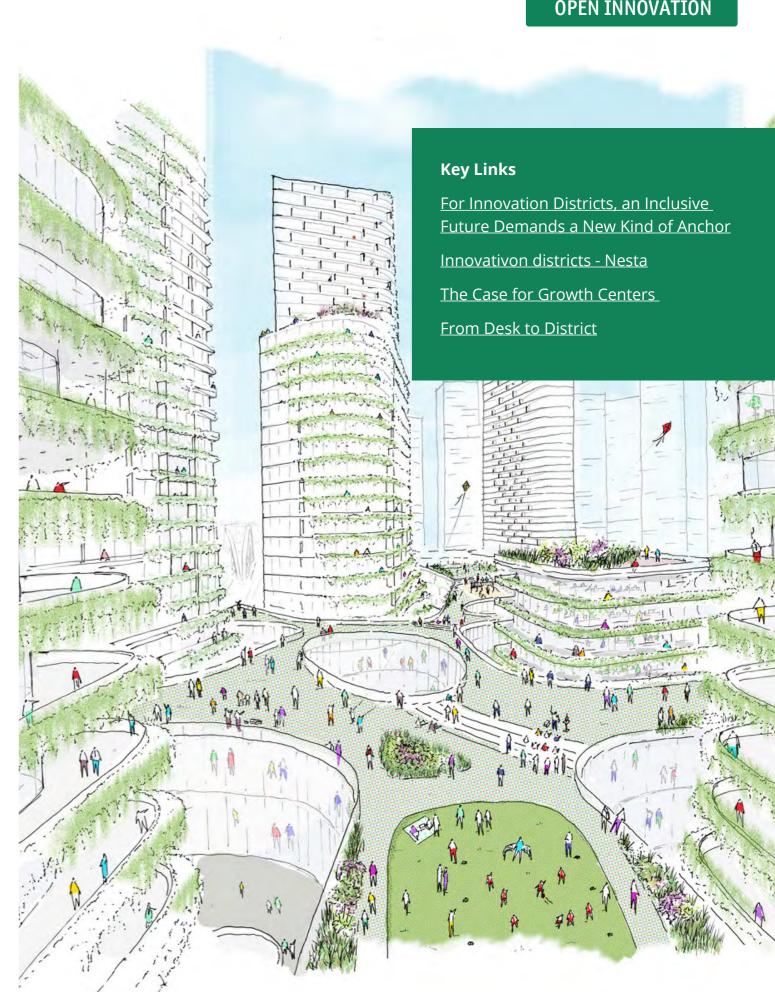
West Cambridge Innovation District will create new destination quarter Image credit: Alan Marten

The report finds that this clustering together of groups of businesses with shared interests is the most important factor driving innovation as their proximity to each other allows them to share resources and attract industry-specific employees as well as providing opportunities to network and communicate with each other more informally.

This study provides validation for developers of innovation districts, suggesting that access to a mix of amenities, proximity to similar organisations, good public transport and a high level of walkability are the factors that are most likely to drive innovation in the workplace.

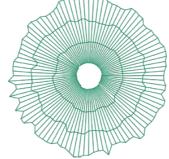
The ways in which urban design factors affect the level of innovation will give companies pause for thought, especially those that have been focused on digitalisation, downsizing and cost-reduction since the pandemic. As this paper shows, who your nextdoor neighbour is and whether there is the space to stop and chat may have more bearing over your level of innovation at work.

**Source**: 'Does urban form matter for innovation productivity? A national multi-level study of the association between neighbourhood innovation capacity and urban sprawl'. Shima Hamidi and Ahoura Zandiatashbar, 2019



Miami Innovation District by the team of SHoP, West 8, and developer Michael Simkins

### **OPEN INNOVATION**



# FROM WELLBEING DEFICIT TO

A renewed focus on workplace wellbeing owes much to the current drive to improve health equity in our cities after the global pandemic

The global pandemic exposed deep health inequalities between different groups of urban dwellers along the lines of age, ability, race and ethnicity – and the current focus on wellbeing in the workplace derives at least in part from the drive towards achieving greater health equity in our cities.

Health equity is defined by the World Health Organisation as 'the absence of unfair and avoidable or remediable differences in health among population groups defined socially, economically, demographically or geographically'. One of its most powerful advocates is the epidemiologist Professor Sir Michael Marmot of University College London, who has just launched the UK's first health equity network.

Marmot's research has identified three things that businesses can do to support health equity: first, they should look at their employment practice from a 'holistic, wholesociety perspective'; second, companies should recognise that there is a clear relationship between people's health and planetary health, and adopt greener policies in workplace design; and third, they should strive to create a friendlier work environment that reduces stress, particularly among lower status and lower paid workers. Poor mental health is a particular concern in cities. Research by the Design Council (see Key Links) suggests that people in urban environments are 40 per cent more likely to suffer from depression, 20 per cent more likely to suffer from anxiety and twice as likely to develop schizophrenia. This means that city workers are more likely to be stressed, anxious and unwell, having a knock-on impact on their performance.

In part these increased risk factors relate to the built environment, with more limited access to nature and poorer air quality increasing health risks and negatively impacting employee wellbeing. So how can urban design be effectively utilised to mitigate the risks?

The Centre for Urban Design for Mental Health sets out a number of key areas where design can support mental wellbeing. These include access to green spaces, safe and accessible active travel routes, pro-social spaces and design to support sleep. There is an opportunity for workplace developers and designers to adopt these principles and create positive impact, not only for their employees and for the urban public as a whole.

### Health Street: building back healthier

British architectural practice Heatherwick Studio has called for a radical approach to health creation, based around communityled facilities on the local high street. In a new report, called 'Health Street: Health creation as a new mission for our high streets', the practice recognises the need for a new strategy against the backdrop of UK health services pushed to their limits and the hollowing out of many high streets and town centres.

The 'Health Street' concept combines public health, local business and social spaces in one familiar setting that feels completely different from the typical clinical setting of a hospital or doctor's surgery. Instead of focusing on treating illness, it champions the idea of living well.

The resultant framework aims to address growing social inequalities and support new initiatives, such as integrated care systems and social prescribing. It adopts the key principles of regenerative retail, supporting local aims and activities, rather than imposing any set programme.

The report outlines seven steps to creating a Health Street – from creating a 'seed space' in vacant or under-used buildings, to growing interconnected services and activities that can welcome people in and spill over onto the street.

A vision is also presented for how a Health Street might take root in a theoretical scenario in Nottingham's Lister Gate.

### **HEALTH EQUITY**



Some essential ingredients for the blueprint to work are identified as:

- a retail street in the town or city centre, in need of re-activation;
- proximity to multiple residential communities within a 15-minute walk;
- excellent public transport links, cycle routes and bike parking;
- a nearby public green space, ideally within walking distance;
- plans for relocation of outpatient services into the city; and
- local businesses and community groups passionate about health creation and an innovative integrated care system.

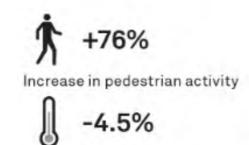
Now, Heatherwick Studio is looking to refine the model by working with a town or city keen on piloting the concept. It says it wants to connect with community champions to learn how the model could adapt to work in their location.

**Source:** 'Health Street: Health creation as a new mission for our high streets', Heatherwick Studio (2023)

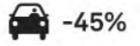
### Cheonggyecheon restoration project, Seoul

Work on increasing urban health equality can have significant benefits for both city residents and commercial enterprises. In the early 2000s, the Seoul Metropolitan Government in Korea embarked on an audacious project to revitalise the Cheonggyecheon area and create a healthier, pedestrian-friendly public area. This sustainable project revolved around a political decision by the mayor to dismantle a four-lane elevated highway that covered the Cheonggyecheon stream and carried 170,000 vehicles daily.

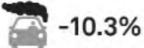
By opening up the waterway and introducing a vibrant space mix, the project reduced air pollution by more than 10 per cent and the urban heat island effect by 4.5 per cent. Pedestrian activity rose by 76 per cent and bus ridership by 15 per cent, according to an impact survey.



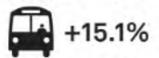
Reduction in the urban heat island effect



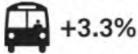
Decrease in vehicle volume



Decrease in air pollution



Increase in bus ridership



Increase in subway ridership



In an interview with Dr In Keun Lee, former director of the project, we learnt that public investment of around US \$350 million by the Seoul Government paid off as private investors poured into what was a low-grade industrial area to build retail, office and hospitality schemes, leading to a rise in land prices and extending the city's business district.

This was a controversial civil engineering project given that its objectives were healthdriven, rather than commercial. Social value was paramount, driven by continuous community consultation throughout a project fast-tracked to coincide with the mayor's fouryear term of office. The question is whether European or North American cities could have pulled off the same audacious trick.

### How builders can tackle air quality

The relationship between people and planetary health has also become more apparent in recent years and the workplace has its role to play in cleaning up the environment. This is particularly true in cities where there is a density of office spaces and housing in close quarters.

Air quality is a particular health issue in urban environments. Research from the European Environment Agency suggests that levels of air pollution regularly exceed World Health Organisation standards in the majority of European cities. This means that people working and living in most urban environments are exposed to poor levels of air pollution, a factor that increases the risk of developing a range of respiratory and cardiovascular diseases.

While there are a significant number of reasons for poor urban air quality, research by Urban Health suggests that construction projects



#### **HEALTH EQUITY**

are a major contributing factor to low levels of air quality, creating about 30 per cent of all particulate matter found in the air around London. This problem appears to be getting worse, with construction projects contributing more to levels of air pollution in recent years.

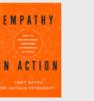
While workplaces may consider the environmental impact of their buildings once they are built or after a retro-fit, how often do they consider the impact of the construction of a building on the surrounding environment? Arguably, not often enough.

It's not all doom and gloom, however. In their report on 'Air quality and emissions in construction', Urban Health sets out ways in which construction can be made less polluting through adoption of electric machinery, adoption of anti-idling policies, off-site manufacturing and more effective construction logistic plans, amongst other interventions.



### **On Our Radar**

Here is a selection of external links to articles, podcasts and books on subjects that are on WORKTECH Academy's radar this quarter:





Empathy in action

Five myths business needs to overcome

Using case studies and To save the planet, expert experience, this book is a masterclass on using businesses have to change but companies are falling empathy to create trust and short of ESG target. Two loyalty and build a better experts show where the customer experience. future of business might lie.





Metaverse Summit

How can mixed reality create better connections? That's the hot topic set to be debated at this year's Metaverse Summit, run by The Economist and hosted this year in Los Angeles.



When your boss is

tracking your brain

Bioethicist Nita Farahany

privacy laws are running

behind in the new world of work – and how

neurotechnology might exacerbate this issue.

discusses how worker







Unworking podcast

Philip Ross and Jeremy Myerson talk all things WORKTECH in the new Unworking podcast and reflect upon the changes they have witnessed over the years.



#### Meta podcast series

Led by a series of experts on technology, culture and wellbeing, Meta's workplace podcast offers a range of insights from how the metaverse will affect us to building a connected community.





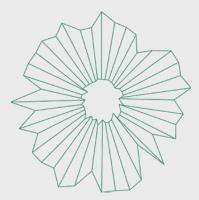


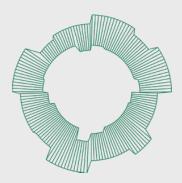
Blind hiring of staff

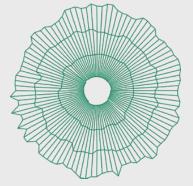
Blind hiring is an approach to employing staff that aims to avoid the intrinsic bias of the hiring manager, but does it always work? That's the critical question this article aims to interrogate.

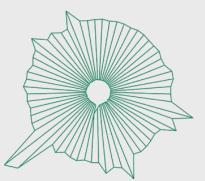


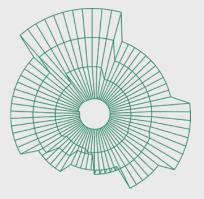
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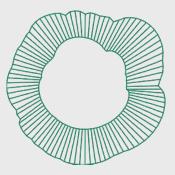












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