

ISSUE 28 • JUN 2026

# URBAN SOLUTIONS

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INTERVIEW

**Chee Hong Tat**  
**Sadiq Khan**

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CITY FOCUS

**Hamburg**

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OPINION

**Xufeng Zhu**  
**Cris Turner**

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ESSAY

**Zac Toh**  
**Brent Ryan**

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CASE STUDY

**New South Wales**  
**South Africa**  
**Cape Town, Jakarta**  
**& Visakhapatnam**  
**EU IURC**

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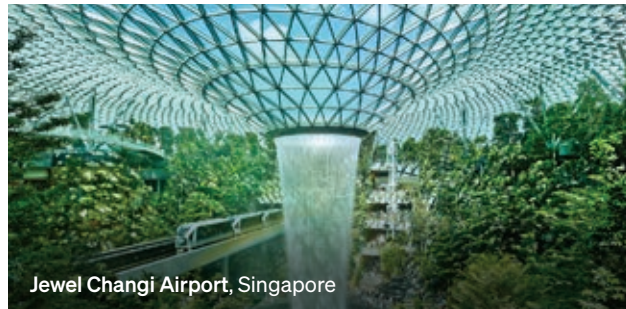
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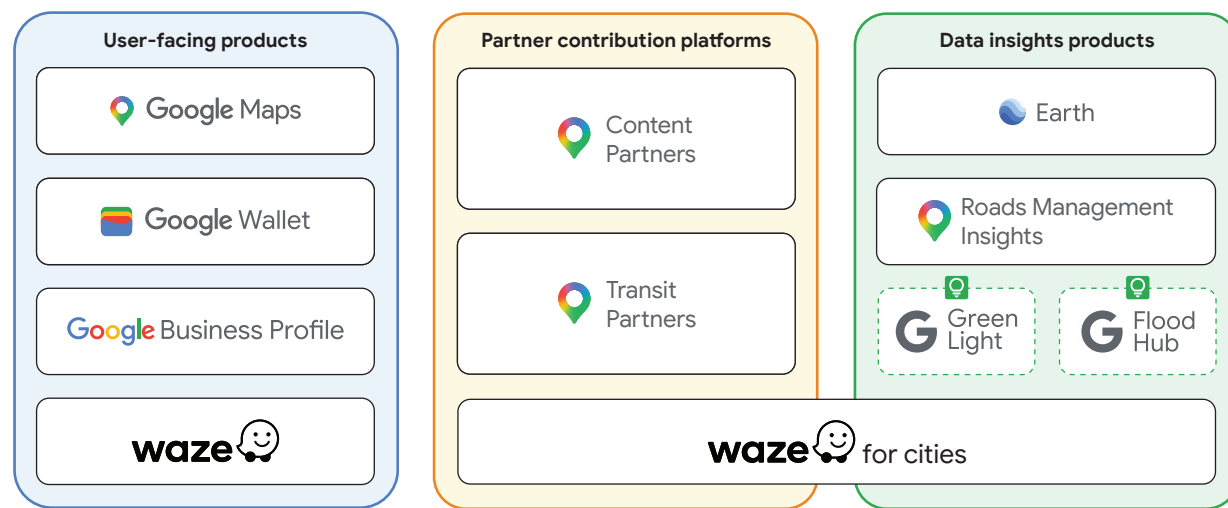


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# URBAN SOLUTIONS

ISSUE 28 • JUN 2026

CENTRE for **Liveable Cities**  
SINGAPORE

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5 Maxwell Road, #18-00, Tower Block,  
MND Complex, Singapore 069110

ISSN 2301-3540 (print)  
ISSN 2301-3532 (e-version)

**E-version:** <https://knowledgehub.clc.gov.sg/clc-publication/urban-solutions/>

Printed on Enviro Wove, a paper made from 100% recycled content.

**Cover Image:** People enjoying public space at Granary Square in King’s Cross. London was awarded the Lee Kuan Yew World City Prize Laureate 2026.  
*Image: VV Shots / iStock*

**URBAN SOLUTIONS** is a bi-annual magazine published by the Centre for Liveable Cities. It aims to equip and inspire city leaders and allied professionals to make cities more liveable and sustainable.

Set up in 2008 by the Ministry of National Development and the then-Ministry of the Environment and Water Resources, the Centre for Liveable Cities (CLC)’s mission is to distil, create and share knowledge on liveable and sustainable cities. CLC’s work spans four main areas—Research, Capability Development, Knowledge Platforms, and Advisory. Through these activities, CLC hopes to provide urban leaders and practitioners with the knowledge and support needed to make our cities better. For more information, visit [www.clc.gov.sg](http://www.clc.gov.sg).

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# ACT Now!

“A successful city must go beyond functionality—it must be a place that people feel connected to and are proud to call home.”

10

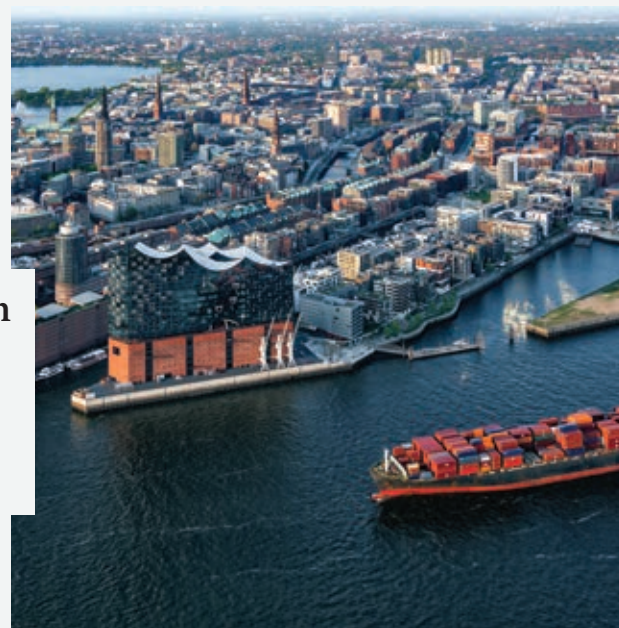
CHEE HONG TAT



“Delivering long-term projects requires a clear vision and unshakeable determination.”

20

SADIQ KHAN



“Waterfront and port areas can be rejuvenated into liveable urban neighbourhoods that balance economic, social and environmental needs.”

JÖRG RAINER NOENNIG

28



“Agile city governance offers a pathway for managing the dual imperatives of innovation and regulation in the digital age.”

36

XUFENG ZHU

“We must solve the physical footprint of the digital world to unlock the immense potential of AI to decarbonise our physical world.”

42

CRIS TURNER



“Cities are not merely built for human habitation, but are also shared ecosystems while constantly being rewoven, unpicked and expanded by new generations with budding ideas.”

ZAC TOH

48





“A life-course approach to public space design and city planning recognises that people’s spatial needs evolve over time as they always have.”

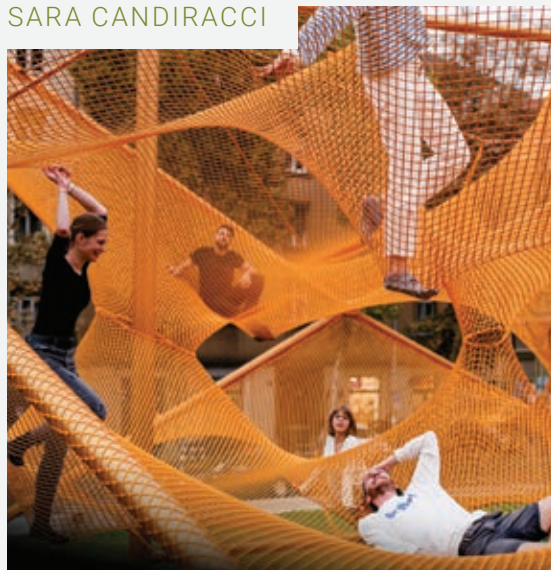
56

BRENT D. RYAN

“When cities make room for play, they create healthier, more inclusive and more liveable urban systems for everyone.”

64

SARA CANDIRACCI



“Through SALGA’s leadership, municipalities are being positioned not only as implementers, but also as strategic partners in shaping national urban policy.”

80

TEBOGO MATLOU  
SEANA NKHAHLE



“By quantifying impacts and linking them to financing strategies, APEX helps cities make informed decisions, attract investment and deliver results.”

86

LORRAINE SUGAR  
KELVIN TAGNIEPEZ



“Place-based governance can help cities worldwide rebalance safety, culture and economic vitality after dark.”

74

MICHAEL RODRIGUES

“The IURC AA serves as a hub for knowledge exchange, policy dialogue, and capacity building, nurturing a vibrant community of practice for cooperation among cities.”

92

PABLO GÁNDARA  
JACQUELINE CHANG



# Contents

## i INTERVIEW

**Planning for Tomorrow: Singapore's Blueprint to Stay Liveable, Agile and Pro-Enterprise** 10  
CHEE HONG TAT

**Building a Fairer, Greener, Safer, and More Prosperous London** 20  
SADIQ KHAN

## c CITY FOCUS

**Waterfront Development in the Port City** 28  
HAMBURG

## o OPINION

**Agile City Governance in the Digital Age** 36  
XUFENG ZHU

**The Urban AI Paradox: Balancing the Digital Future with Our Physical Reality** 42  
CRIS TURNER

## e ESSAY

**Weaving Green Threads: Building Resilient Cities from the Ground Up** 48  
ZAC TOH

**Planning and Designing the City for All Ages: Evolving Urban Planning for Demographic Change, Health and Well-Being** 56  
BRENT D. RYAN

## i ILLUSTRATION

**How Playful Cities Strengthen Health, Equity and Urban Resilience** 64  
SARA CANDIRACCI

**Through the Years: World Cities Summit—the 10th Edition Special** 70

## c CASE STUDY

**Powering Up the Neon Grid to Revitalise New South Wales, Australia** 74  
NEW SOUTH WALES | URBAN TRANSFORMATION

**South Africa's National Urban Forum: Policy Dialogues on Sustainable Urban Development** 80  
SOUTH AFRICA | DISCUSSION PLATFORMS

**The International Finance Corporation's APEX Platform: Mobilising Sustainable Investment in Cities** 86  
GLOBAL | CLIMATE FINANCING

**International Urban and Regional Cooperation Asia and Australasia (Phase 1): City-to-City Partnerships** 92  
GLOBAL | INTERNATIONAL PARTNERSHIPS



## From the Executive Director

# Why Cities Need to ACT Now

In the face of changing demographics, economic disruption, technological advances and the growing impacts of climate change, cities need to take bold transformational steps.

Published alongside the milestone 10th edition of the World Cities Summit, this issue of *Urban Solutions* explores how cities can ACT now—to accelerate, collaborate and transform—to actively shape a more liveable future for all. Across the articles, three key themes emerge.

### People-centred policy and design create shared benefits.

Minister for National Development Chee Hong Tat highlights how Singapore's adaptive urban planning and housing policies are responding to changing needs and aspirations, and the ways the city is supporting the built environment sector to advance new solutions. Mayor of London Sadiq Khan illustrates how innovative strategies led to improved liveability outcomes, earning the city the title of the Lee Kuan Yew World City Prize Laureate 2026.

Health and well-being are increasingly central to urban design as cities accelerate their efforts to create healthier environments. Dr Sara Candiracci explains that cities can integrate play into everyday spaces to support communities, while Professor Brent Ryan explores designing cities for all ages that meet the needs of current and future residents.

### Strategic innovation unlocks urban potential.

Hamburg's distinctive approaches to its waterfront developments exemplify how cities can reimagine urban spaces as catalysts for sustainable growth. New South Wales' comprehensive 24-Hour Economy Strategy demonstrates that tailored policies can revitalise the after-dark experience, creating dynamic urban environments that unlock economic vitality.

Cities are also transforming through the power of technology to test and scale urban solutions. Professor Xufeng Zhu outlines the use of artificial intelligence (AI) in Chinese cities to enhance urban governance and deliver public services effectively. But as Cris Turner points out, it is crucial to balance the trade-offs that arise with the use of AI in our urban interventions.

### Collaborative networks amplify global impacts.

Cities recognise that collaboration is essential to address common issues. The International Urban and Regional Cooperation Asia and Australasia programme reinforces the value of cross-border exchanges. Similarly, the International Finance Corporation's APEX platform shows how partnerships and evidence-based solutions can help translate ambitious climate plans into actionable investment strategies.

Convening local stakeholders through platforms such as the National Urban Forum coordinated by the South African Local Government Association is equally important to address common goals. At the grassroots level, Zac Toh shares how ground-up initiatives can play a vital role in fostering stronger community ties and social cohesion.

I hope the insights shared here will illuminate the way ahead for us to leverage the power of cities to make transformational change to improve urban life.

**Hugh Lim**

**Executive Director**  
Centre for Liveable Cities



IN CONVERSATION WITH  
**CHEE HONG TAT**

# Planning for Tomorrow: Singapore's Blueprint to Stay Liveable, Agile and Pro-Enterprise

**Chee Hong Tat, Singapore's Minister for National Development, shares how Singapore is adapting to emerging opportunities in urban planning and the built environment sector.**



Image: Ministry of National Development

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**Beyond physical infrastructure, we also place strong emphasis on designing and activating public spaces that foster identity and reflect local character.**  
||

**In recent years, we have seen how cities are responding to changing live-work-play patterns brought about by new lifestyle aspirations and technological advancements. How is Singapore ensuring that its precincts and districts react to these trends so that the city remains liveable and loveable?**

Singapore has three key strategies. First, we plan our city to be flexible, encouraging mixed-use developments that can meet the needs of our people. As work and lifestyles become more diverse, our planning approach has evolved from strict zoning based on specific uses to building well-connected districts where homes, jobs and leisure are in close proximity. For example, we have brought opportunities closer to where people live by adding a wider mix of activities and uses to our Downtown through an updated Central Business District Incentive Scheme and by developing decentralised regional centres such as the Jurong Lake District. In this way, our people benefit from reduced commuting times, and our city is able to cater to new ways of living and working while remaining connected and accessible.

Second, we design precincts to be people-centric, to support residents of all ages and mobility abilities with everyday amenities, public transport, green spaces, and community facilities, all within easy reach. Beyond physical infrastructure, we also place strong emphasis on designing and activating public spaces that foster identity and reflect local character. For instance, Singapore's Identity Corridors, introduced in 2022, serve as community and active mobility spines that connect heritage sites, local businesses, and community activities within precincts. These efforts help to foster a strong sense of place and belonging, ensuring that even as our city evolves, it continues to feel familiar and meaningful to residents.



Singapore also works with the community to enliven public spaces in neighbourhoods through the Lively Places Fund.  
Image: Urban Redevelopment Authority and Chee Boon Pin

Third, we leverage technology and sustainability to future-proof our city while improving quality of life. In line with our Smart Nation and sustainability agendas, we have been deploying digital tools, data and smart systems to enhance urban services, environmental performance, and convenience at the precinct level. For example, we carry out environmental modelling and wind simulations for new districts. The findings from these simulations enable us to better design high, mid, and low-rise zones to create wind corridors that can cool streets and public spaces more effectively.

Together, these strategies reflect our belief that a successful city must go beyond functionality—it must be a place that people feel connected to and are proud to call home.

**The Master Plan 2025 translates the city's collective vision of shaping a more liveable, inclusive and endearing home into actionable land use strategies. What are some key insights and priorities that emerged from the consultation process and how did they shape the Master Plan?**

Singapore takes a long-term, integrated approach to land use planning, balancing immediate needs with those of future generations. At the highest level, Singapore's Long-Term Plan sets out a 50-year vision for our development, while the Master Plan, reviewed every five years, translates our vision into detailed plans for the next 10 to 15 years.

||  
**Engagement does not end here and we will continue to work closely with Singaporeans as we implement the Master Plan.**  
||

We carry out each Master Plan review with residents, businesses and local communities to ensure our plans are grounded and responsive to the needs of Singaporeans. For example, for the Master Plan 2025, our planning agency, the Urban Redevelopment Authority, engaged close to 220,000 people over two years through workshops, dialogues, focus group discussions and surveys—gathering ideas and feedback on how we can shape a more liveable, inclusive and endearing city for the future. Following these engagements, a Draft Master Plan was exhibited publicly at 15 locations around the city before it was finalised.

The feedback we received has resulted in the Master Plan and its four key themes:

- a. **Shaping a Happy, Healthy City**—Singaporeans continue to prioritise quality housing and liveable environments. To meet these aspirations, we will ensure a strong pipeline of homes that are located near transport nodes, jobs, amenities and recreational spaces to support well-being and social connections.
- b. **Enabling Sustainable Growth**—To remain a key global and regional hub, we are strengthening our air, sea and land gateways while developing new business nodes and rejuvenating existing ones such as the Woodlands Regional Centre and Bishan Town Centre.
- c. **Strengthening Urban Resilience**—With climate change bringing higher temperatures and more intense rainfall, we are bolstering the resilience of our built environment through climate-responsive design, coastal protection and innovative land use solutions, including underground developments.
- d. **Stewarding Nature and Heritage**—Singaporeans value our green spaces and heritage. We will develop more than 25 new parks and over 50 km of park connectors by 2030, while conserving buildings of historical significance. We will continue to carefully balance our growth and development with environmental and heritage considerations.

Importantly, engagement does not end here and we will continue to work closely with Singaporeans as we implement these plans.

**Aspirations such as homeownership remain a top priority in Singapore. What are Singapore's key housing strategies to ensure that the city can continue to provide quality homes in vibrant towns for current and future generations of Singaporeans?**

The homeownership rate in Singapore is more than 90%, one of the highest in the world. It remains a cornerstone of Singapore's social compact. Our approach focuses on ensuring homes are accessible, affordable and liveable.

First, we maintain a strong pipeline of both public and private housing. For example, in 2025, we launched about 20,000 public housing flats for sale, and committed to building at least 55,000 flats between 2025 and 2027, with the capacity to increase our supply as needed.

Second, besides accessibility, we make sure our public housing flats remain affordable to meet the homeownership aspirations of Singaporeans. Through significant market discounts and housing grants, nine in 10 first-time buyers have been able to service their Housing & Development Board housing loans using their Central Provident Fund savings (the Central Provident Fund is our national social security savings scheme), with little to no cash outlay.

Third, we are placing greater emphasis on the quality of our living spaces, and on sustainability, when planning for new towns. For example, one of our new estates, Tengah, is designed as a lush evergreen town with car-lite infrastructure, and common spaces spread across the town to encourage community bonding through sports, fitness and play.

And as our towns and public housing flats age, we will continue to keep them vibrant and liveable through a suite of upgrading programmes such as the Home Improvement Programme and Neighbourhood Renewal Programme, which provide infrastructural improvements both within and outside the flat.



Tengah is designed as a lush evergreen town with car-lite infrastructure, and common spaces spread across the town.  
Image: Housing & Development Board

### Given Singapore's ageing population, how is the government refining its housing policies to meet evolving needs?

As Singapore's population ages, we are adapting our housing policies to support seniors with different needs and preferences.

For those who wish to right-size, there are public housing flats with shorter leases that better match seniors' needs. We also provide the Silver Housing Bonus, a cash bonus for eligible seniors who right-size their public housing flat to supplement their retirement savings. For those who prefer more integrated living arrangements, we offer Community Care Apartments that combine senior-friendly housing with on-site care services and shared amenities.

Our seniors have also expressed a preference to age in place, in familiar neighbourhoods and within their existing communities. We are therefore establishing Age Well Neighbourhoods, where we bring together healthcare, community care and social support within the community. At the same time, we enhance the built environment with more senior-friendly features to make daily living safer and more convenient.



The first Community Care Apartments project, Harmony Village @ Bukit Batok, was completed in 2024.  
Image: Housing & Development Board

By staying anchored to these principles, Singapore can continue to evolve with confidence while remaining a city that provides for the needs of both present and future generations.

In addition, we support seniors in making their homes safer through subsidised improvements, such as the installation of hand rails, anti-slip tiles and ramps, under the Enhancement for Active Seniors programme which is offered to both public and private residential properties.

Seniors can also unlock the value of their public housing flats through the Lease Buyback Scheme, where they sell part of their remaining lease back to the government to receive a stream of income in their retirement years.

Taken together, these efforts ensure that seniors are supported at every stage of ageing, with housing options that remain accessible, flexible and responsive to their needs.

### As Singapore continues to transform its urban landscape, what considerations and guiding principles will help the city remain adaptable to future challenges?

There are several key considerations and guiding principles that shape our approach to ensure our city remains adaptable, resilient and people-centred in the face of future uncertainties.

First, we build flexibility into our long-term plans. Given the rapid pace of technological change, demographic shifts, and climate risks, our urban planning framework must be sufficiently agile to cater to multiple possible futures. This is why we safeguard land for future needs and design developments that can be adapted or repurposed over time. We also build reserves and resilience into our plans. Our Long-Term Plan is a good example of how we set strategic direction for the future, while making room for adjustments as circumstances evolve.

Second, we continue to stay attuned to Singaporeans' changing needs and aspirations. We have an established practice of engaging stakeholders across different sectors, and we have leveraged digital tools to further strengthen these efforts. For instance, the Urban Redevelopment Authority's Dream Lab, deployed as part of the Draft Master Plan 2025 Exhibition, allowed residents to visualise their ideas for Singapore using artificial intelligence. This enhanced how we gathered feedback and developed shared ownership of our plans.

Third, we embed sustainability and climate resilience as core planning imperatives. Climate change presents one of the most significant long-term challenges for cities. To address this, Singapore integrates environmental sustainability into land use planning, building design, and infrastructure development. For example, the Long Island project, announced in 2019, will protect our low-lying eastern coastline from sea level rise. At the same time, it will create additional space for housing, jobs and recreation, and provide a new reservoir to strengthen our water resilience.

By staying anchored to these principles, Singapore can continue to evolve with confidence while remaining a city that provides for the needs of both present and future generations.



By reclaiming about 800 hectares of land, the Long Island project will bring about cross-cutting benefits and prepare Singapore for the needs of future generations to come.

Image: Urban Redevelopment Authority

### Innovation and transformation in the Built Environment (BE) sector are key to enabling a liveable city. How is the government fostering a pro-enterprise environment to prepare this sector for the future?

As a small island state, Singapore needs a BE sector that is innovative, resilient and future-ready, to address the longer-term challenges that our city will face.

Innovation requires an environment where businesses can experiment and take calculated risks. Hence, we want to ensure that our regulations for Singapore's BE sector are robust enough to safeguard residents and businesses, and preserve systemic resilience, while remaining flexible enough to support experimentation and growth.

As Minister for National Development, I have made this a key priority for my Ministry. We take a pro-enterprise approach to reviewing our policies, rules and processes. This is to ensure that they remain fit for purpose, cut unnecessary red tape and reduce business costs, while improving efficiency and making better use of our scarce resources. While each rule review may seem small on its own, collectively they help foster a more business-friendly environment and strengthen collaboration between the government and industry.



**With feedback from industry, we can focus our efforts more precisely and work together to refine our rules, reduce processing time, and open up more opportunities for innovation and collaboration.**



This is an area where close partnership with industry is essential. Businesses are best placed to identify pain points from their day-to-day experiences. With their feedback, we can focus our efforts more precisely and work together to refine our rules, reduce processing time, and open up more opportunities for innovation and collaboration.

Innovation also does not happen in isolation. Collaboration enables the exchange of ideas, skills and perspectives that deliver better solutions. It is therefore important that we work closely with stakeholders across the value chain to drive system-level change. It is equally essential that businesses evolve from being regulated entities to active partners and co-creators of innovation with the government. The Built Environment Technology Alliance (BETA), led by the Building and Construction Authority of Singapore, is a good example of such collaboration. BETA brings together technology providers, contractors and developers to accelerate the adoption of robotics, automation and digital construction technologies, such as by co-sharing costs, reducing risks and tapping on one another's expertise.

**What pro-enterprise initiatives has the government put in place to support and grow the Built Environment (BE) sector?**

One of the most significant initiatives for Singapore's BE sector in recent times is CORENET X—the world's first integrated digital platform for building plan submissions. Launched in 2023, CORENET X consolidates over 20 regulatory touchpoints into three key gateways, replacing complex, multi-agency submissions with collaborative processes. This enables upfront stakeholder collaboration, reduces downstream abortive work, and achieves significant time and cost savings. CORENET X also exemplifies how government agencies and industry stakeholders come together to deliver ambitious pro-enterprise outcomes. Since its launch, CORENET X has been used for over 50 projects involving 100 firms, and many of these projects have achieved time savings of up to 20% for regulatory approvals.

Another example of a needle-moving initiative is the use of 360° Capture technology to conduct virtual building inspections as part of the Temporary Occupation Permit and Certificate of Statutory Completion issuance process. The use of this technology has benefited firms by reducing the time they spend coordinating physical inspections, and accelerating regulatory approval timelines, while maintaining safety and quality standards. Early adopters of this technology have enjoyed productivity improvements of up to 60% in the building inspection process.

As we move forward, we are taking further steps to drive the next bound of transformation in the BE sector. I am chairing an Action Team—comprising representatives from government agencies and the industry, including developers, consultants, contractors, facility managers and academics—to improve BE productivity. The Action Team will focus on three key areas:

1. Accelerating enterprise transformation by scaling up the adoption of productive technologies and progressive practices
2. Reviewing Singapore's regulatory approach to reduce regulatory compliance burden, support innovation, as well as to improve procurement and contracting practices
3. Supporting an enabling ecosystem through measures that can reap system-level synergies and address industry-wide challenges

These are challenging issues facing the industry, and we need to relook at how we plan, manage and grow our BE industry. I am confident that with strong support from our industry stakeholders, we will chart a bright future for the BE sector together, and ensure a liveable, agile and pro-enterprise Singapore. 📍



IN CONVERSATION WITH  
**SADIQ KHAN**

# Building a Fairer, Greener, Safer, and More Prosperous London

Sadiq Khan, Mayor of London,  
shares his plans to make  
London a more liveable city.



Image: Greater London Authority

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**Delivering long-term projects  
requires a clear vision and  
unshakeable determination.**



**You have served as the Mayor of London across three terms, giving you a unique perspective on the city's trajectory. How have you seen London evolve during your tenure, and how has your approach to governance adapted in response to emerging trends and opportunities?**

As Mayor of London for ten years, I have had a unique opportunity to deliver truly transformative projects which will define the path our city takes in the decades to come. The Elizabeth Line, for example, has revolutionised our transport network. Now as the United Kingdom's busiest railway service, it is bringing prosperity and opportunity to communities who had been left out of London's success story for far too long. Last year, the Ultra Low Emission Zone—the world's first and largest urban clean air zone—helped us get the levels of toxic nitrogen dioxide in London's air below legal limits for the first time, almost 200 years before the experts said we would.

Delivering these kinds of long-term projects required a clear vision and unshakeable determination—especially as, in the last decade, my team and I have also had to confront an unprecedented series of external shocks. From Brexit to the pandemic and the war in Ukraine, London has faced no end of challenges. In the depths of each crisis, however, we have found an opportunity to change our city for the better.

## Building a fairer city means supporting those who have been left behind by the pace of economic change or locked out of the opportunities it offers.

When the coronavirus pandemic shone a light on London's glaring inequalities, we created the London Anchor Institutions Network to unite public and private sector leaders around a shared mission to rebuild a fairer London for everyone. As prices surged in the aftermath of Russia's invasion of Ukraine, we launched a cost of living hub to help Londoners access the support they need. As populists tried to divide the capital's communities, we launched 'Loved and Wanted'—a campaign to remind Londoners that, no matter the colour of their skin or the God they worship, they are welcome in our city.

Today, the rapid pace of technological progress is creating extraordinary opportunities for cities like London, alongside worrying new risks. That is why I have launched a new AI and Jobs Taskforce, which will investigate the impact artificial intelligence (AI) could have on London's workforce and help us to understand how we can best prepare Londoners to seize the benefits. Rather than passively awaiting the future technology will bring, in London we are actively shaping it in the interests of the people we serve.

### What are some initiatives London has implemented to ensure that vulnerable communities are well-supported?

When I was first elected Mayor, I promised to build a fairer, greener, safer, and more prosperous London for everyone—a city where no one was left behind. I have dedicated the last decade to doing just that.

I believe in a city where your life chances are not determined by the circumstances of your birth. As Mayor, I have provided more than 120 million free school meals for children in our state primary schools, ensuring that none of the capital's kids suffer the gnawing ache of hunger in the classroom. I have also set up a Violence Reduction Unit, which has provided over 550,000 positive opportunities to prevent young Londoners from being caught up in violence and exploitation. Today, London's teenage homicide rate has fallen to its lowest level in three decades.

Building a fairer city also means supporting those who have been left behind by the pace of economic change or locked out of the opportunities it offers. I have provided free training for more than a million people, and I recently launched a new Inclusive Talent Strategy to ensure that every Londoner has the skills they need to thrive in the decades to come. We have also built record numbers of council and affordable homes, providing a lifeline for families across London, and helped over 20,000 homeless people off the streets.

Supporting vulnerable communities also means defending those who are targeted because of the colour of their skin, the God they worship, or the people they love. Londoners know that diversity is a strength to be celebrated, not a weakness to be hidden. That is why, as Mayor, I have always sought to stand up for London's minority communities and champion the extraordinary contributions they make to public life. As leaders, we must build bridges, not walls—because the only way to beat division and fear is with unity and hope.



More than 120 million free school meals were provided for children in London's state primary schools.  
Image: Greater London Authority

### London has invested significantly in accessibility improvements, including major projects like the Elizabeth Line and the upcoming pedestrianisation of Oxford Street. How have these transport and urban design initiatives enhanced liveability across the city?

Investment in transport infrastructure does not just make it easier to get from A to B. It can completely reshape a city, connecting people with new opportunities and catalysing economic growth.

I have made overhauling London's transport network one of my top priorities. Since its launch in May 2022, the Elizabeth Line has carried over 600 million passengers, moving up to 800,000 people every day. An architectural marvel, it is both beautiful and accessible. It has also transformed the prospects of the places it serves—within 1 km of Elizabeth Line stations, more than 70,000 homes have received planning permission and over 125,000 jobs have been created.



24

The 'This is Oxford Street' event showcased what a reimagined and pedestrianised Oxford Street could offer.  
*Image: Greater London Authority*

Extraordinary though it is, the Elizabeth Line is just one part of London's transport revolution. We have also extended the Northern Line and the Overground, with plans to extend the Docklands Light Railway (DLR) to Thamesmead and turbocharge the construction of 25,000 homes. At the same time, we have delivered the Superloop, radically improving bus travel in outer London, and the Night Tube.

The pedestrianisation of Oxford Street marks the next step in our mission to build a better London for everyone. Together, we are turning Britain's most famous high street into a genuinely world-class public space for Londoners and visitors alike.

**Given that these initiatives often cut across multiple sectors and stakeholder groups, there may be unintended consequences. How does the city manage these competing interests and trade-offs?**

I want London to be a fairer, greener, safer, and more prosperous city for everyone. When you are delivering bold, ambitious change, disagreement is to be expected. But my priority has always been bringing as many people with me as I possibly can.



25

Queen Elizabeth Olympic Park.  
*Image: Jason Hawkes*

Take housing, for example. If we want to tackle London's housing crisis and set our city up for success in the decades to come, we have got to build more of the homes that Londoners desperately need. At the same time, however, we must also safeguard the green space that millions of Londoners cherish.

Access to nature should be a right, not a privilege—particularly in a city where one in five households have no access to a garden. That is why—alongside building record numbers of council and affordable homes—we have also planted 640,000 trees, created or improved 2,000 football pitches' worth of green space, and delivered rewilding projects to bring back species like beavers and white storks to London for the first time in centuries.

In London, our approach to planning plays a crucial role in getting this balance right. For example, our policies now ensure that all new developments include community facilities, green spaces, and cultural programming—a key part of our commitment to creating inclusive and liveable communities for everyone.

||  
**This award is a testament to the creativity, resilience, and determination of all the talented Londoners who make our city the modern, multicultural metropolis it is today.**  
 ||

**London was announced as the Laureate of the Lee Kuan Yew World City Prize 2026. Can you share what this recognition means for the city and how you see the value in learning from other cities within the Network?**

I was born and raised in London, and I have lived here all my life. My journey, from a council estate kid to Mayor, would not have been possible anywhere else. It is for this reason that, for me, and for millions of Londoners like me, winning the Lee Kuan Yew World City Prize is such an extraordinary honour.

This award is a testament to the creativity, resilience, and determination of all the talented Londoners who make our city the modern, multicultural metropolis it is today. It also speaks to the enduring power of what I call the London promise: the idea that, if you work hard here, you get a helping hand—and you can achieve anything you want.

Lastly, this prize is also a tribute to all the amazing things we have achieved together over the last decade, from tackling toxic air pollution and transforming transport to supporting young Londoners and standing up for our values we share.

A place where English and over 300 languages are spoken, London is one of the most diverse cities on Earth. Our success as a global hub for talent, investment, and culture is inseparable from our openness to the world and all the opportunities it offers.

As Mayor, I try to embody that openness by building bridges with cities across the world. The Lee Kuan Yew World City Prize Network gives us a chance to do just that, learning from trailblazing cities who are taking on some of the toughest challenges we face.

From navigating the age of AI to confronting the climate crisis, cities like London are standing face to face with the forces that are reshaping our world. By working together, we have a unique opportunity to build a better future for everyone.

**What does success and liveability look like for London over the next decade, and what should residents and visitors be most excited about regarding the city's future?**

I am an optimist by nature—I would not be in politics unless I believed in our ability to change the world for the better. Ten years into the job, I still believe that we can make the greatest city in the world even greater.

London faces no shortage of challenges in the decade ahead. But, with a clear vision—and with Londoners behind us—we also have bold and ambitious plans to overcome them. Having secured record funding from the Government, we will be able to build more of the affordable homes that Londoners deserve. And we are investing £30 million to support a good late-night youth club in every borough, providing young Londoners with safe spaces where they can discover new opportunities.



London will turn Oxford Street into a world-class, pedestrianised public space.  
 Image: Greater London Authority

As we push ahead with our project to turn Oxford Street into a world-class, pedestrianised public space, we are also cleaning up our rivers and waterways so that every Londoner can enjoy them. At the same time, we are moving full speed ahead with our plan to improve London's transport network as part of our goal for 80% of journeys to be made on foot, by bike or via public transport by 2041. That includes extending the DLR to Thamesmead and investing in world-class walking and cycling infrastructure.

Finally, preparing our city for the future also means helping Londoners harness the potential of transformative technologies like AI. Through the London Growth Plan, we are championing our fastest-growing industries with the aim of boosting our productivity and helping to create 150,000 good jobs by 2028.

My mission as Mayor has been the same since the day I was first elected: building a fairer, greener, safer, and more prosperous London for everyone. Today, I'm more determined than ever to deliver. 🎯



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HAMBURG  
2018 SPECIAL MENTION

HAMBURG

# Waterfront Development in the Port City

Over the past decades, Hamburg has reshaped parts of its former industrial port into liveable neighbourhoods—giving the city a new face and urban identity. Major urban redevelopment projects like HafenCity, Holzhafen and the upcoming Kleiner Grasbrook demonstrate Hamburg’s balanced approach to integrated urban development.

HAMBURG 



Professor Jörg Rainer Noennig, Chair of Digital City Science, HafenCity University (HCU) Hamburg  
Professor Dr.-Ing. Jörg Rainer Noennig is Professor for Digital City Science at HCU Hamburg and head of the WISSENSARCHITEKTUR Laboratory of Knowledge Architecture at the Dresden University of Technology. His work focuses on data-driven urbanism and co-creative interactive environments.



Aerial view across the Elbe River, Elbphilharmonie towards downtown Hamburg.  
Image: Andreas Vallbracht, Mediaserver Hamburg

## || Hamburg developed innovative planning strategies that address growth pressures and strengthen the port's role as the economic muscle of the city.

### The Challenge

The port of Hamburg forms the heart of the city, with urban development growing around it over the centuries. Its central location has made it a foundational component of Hamburg's urban structure and identity. While the port contributes significantly to the economic, social and cultural landscape, operating a large international port within a metropolitan area of almost 2 million residents poses several challenges. These range from logistics and transportation, safety and emissions to urban zoning and development.

As one of three German city-states (i.e., municipalities that are also federal states), Hamburg cannot grow beyond its borders and must therefore find opportunities for internal redevelopment and densification. This has driven innovative planning strategies that address growth pressures and strengthen the port's role as the economic muscle of the city.

Policies for its port and waterfront are thus complex and cut across multiple domains, requiring an integrative and comprehensive approach. The city's efforts in such balanced development have paid off, with Hamburg now ranking among the most attractive, liveable and thriving cities, both within the country and globally.

Hamburg's comprehensive approach is exemplified by three distinct projects—HafenCity, Holzhafen and Kleiner Grasbrook. These demonstrate how waterfront and port areas can be rejuvenated into liveable urban neighbourhoods that balance economic, social and environmental needs.



View from the public terrace towards the Elbphilharmonie.  
Image: Thomas Hampel, Mediaserver Hamburg

### Urban Projects and Solutions

#### HafenCity

Once obsolete following changing trade patterns, substantial land at the Hamburg Free Port was redesignated for urban development, creating what is now known as HafenCity. Covering 2.4 km<sup>2</sup>, it is one of Europe's largest projects and extends Hamburg's downtown area by 40%. The masterplan was set up in 2000 and construction has proceeded in three stages since 2001—progressing from the west to the east along the northern banks of the Elbe River. The site also sits next to a UNESCO World Heritage Site, Speicherstadt or "Warehouse City".

The HafenCity development has led to different urban expressions, typologies and atmospheres across its three construction phases. By 2030, HafenCity will house approximately 16,000 residents, create 45,000 new workplaces, and welcome an additional 10,000 students and 50,000 tourists. It will form the new city centre of Hamburg.

The first phase (Western HafenCity) was largely completed in 2009, featuring office buildings for international businesses as well as high-class residences, most of which were located along a long stretch of quays. This phase established and implemented the fundamental principles of urban flood protection, namely the construction of the buildings and streets on elevated dykes.

This segment of HafenCity enjoys the prime location of being close to the city's central tourist hotspots which benefitted from the 2016 completion of the iconic landmark, the Elbphilharmonie. The building's combination of concert halls, hotels and elevated panorama walks quickly made it a main attraction in Hamburg.

The second phase (Central HafenCity) placed more emphasis on urban spaces and building typologies. It created an urban focal point with modern downtown scenery,

retail and dining offerings, museums and the HafenCity University. Additionally, it introduced buildings with higher densities that added to the urbanity of the area.

Central HafenCity also served as a testbed for new development policies such as “Conceptual Tendering”, which selected winning land bid proposals based on ambition and originality instead of just economic considerations. For example, a dedicated housing complex with attached soundproof studio spaces was built for musicians, enabling practice and rehearsals in a residential setting. This not only served the nearby Elbphilharmonie and its orchestra, but also added artistic character to the district.

Currently nearing completion, the third and final phase (Eastern HafenCity) adopts even more experimental planning and construction approaches, such as the use of timber for high-rise structures. This area will feature a more compact layout of offices and residential buildings. Special attention is also being paid to ensure diversity of housing typologies, sophisticated landscape design and connectivity to Hamburg’s main transportation arteries.

#### Holzhafen

Unlike HafenCity which underwent a grand master planning effort, Holzhafen or the “Timber Port” saw incremental changes over time.



Integration of old and new structures at Holzhafen—with historical warehouses and the Hamburg fish market hall to the right.  
Image: Christian Spahr, Mediaserver Hamburg

## || The HafenCity and Holzhafen redevelopment projects have resulted in spillover revitalisation effects on the existing centres and old city districts. These experiences have helped to inform future urban development plans in Hamburg.



#### Outcomes and Future Outlook

Holzhafen is Hamburg’s oldest man-made port downstream of the Elbe River, with a variety of historical layers, contrasting architectural styles and urban typologies. After centuries as a busy labour spot, the modern redevelopment of Holzhafen commenced around the turn of the millennium. This transformed the area into a mixed-use district—with modern apartments, hotels and offices—that also houses Hamburg’s main fish market, a historical maritime port and a cruise centre.

Here, priority was on the balancing and integrating of historical and cultural assets with modern architecture, tourism and cultural industries. Besides preserving certain historical structures, some new buildings subtly mimic the old brick-stone warehouses lining the riverbank. The thoughtful design of Holzhafen allows visitors to take a peek into its maritime past while also getting an overview of the operations of the industrial port across the river.

Without doubt, both HafenCity and Holzhafen are becoming increasingly popular and vibrant. This can be attributed to their attractive waterways and unique port atmospherics. At the same time, there have been spillover revitalisation effects on the existing centres and old city districts.

Experiences from both projects have helped to inform future urban development. Lessons from HafenCity include the importance of distributing commercial activities across the city, and providing infrastructural and pedestrian connectivity from redevelopment areas to the existing urban fabric. A good mix of housing types also boosted social integrity in neighbourhoods, with HafenCity achieving a higher proportion of families with children (28%) than the citywide average (18%). In addition, Holzhafen underscored the value of having smaller historical buildings and structures throughout the landscape to add character to the area.



Kleiner Grasbrook (also known as the “Leap across the river” project). Preparation of the site is underway with terps (man-made mounds for flood protection) for buildings and streets. To its left is the final phase of HafenCity development.  
Image: Martin Elsen, Mediaserver Hamburg

### Kleiner Grasbrook

Kleiner Grasbrook is an upcoming waterfront and port redevelopment project that aims to convert a former industrial site into an innovation-oriented business district. Lying across the Elbe River from HafenCity, the project will accommodate 16,000 new jobs and 6,000 new residential units to address the pressing demand for housing.

The planning of Kleiner Grasbrook seeks to address two key issues:

1. How can the city create a new district while ensuring connectivity to the main urban centres?
2. How can the city balance and manage potential changes to socio-spatial dynamics, including in the neighbouring residential district, Veddel?

To improve connectivity, train lines will be extended to provide transport links from Kleiner Grasbrook to HafenCity and the Hamburg city centre. Furthermore, the city will replicate and expand the use of HafenCity’s successful flood and stormwater safety solutions in Kleiner Grasbrook.

Hamburg’s urban developers also pursued unconventional planning approaches. For example, the city held an urban and landscape design competition called the Wettbewerblicher Dialog or “Competitive Dialogue”. This competition allowed for multi-stakeholder participation and citizen engagement. As Veddel residents had highlighted concerns such as a lack of recreational offerings and poor transport connectivity, the redevelopment plans took into account the need to build infrastructure including bridges to enhance accessibility, allowing Kleiner



Digital Simulation Tool for Kleiner Grasbrook’s urban planning.  
Image: HCU Digital City Science

### Conclusion

Grasbrook and Veddel to develop together. The Kleiner Grasbrook town square would also serve as a shared centre for both districts.

In addition, the competition was supported by novel digital tools that allowed “on-the-fly” analysis of design proposals. Digital City Science researchers of HafenCity University, the Massachusetts Institute of Technology, and the city-owned HafenCity Hamburg development agency collaborated to create a custom-made tool called “Cockpit for Collaborative Urban Planning”. Utilised in the urban design competition and schematic planning phase, the tool was able to simulate pedestrian flows, stormwater run-off and wind speeds between buildings to be constructed in Kleiner Grasbrook.

Hamburg continues to blaze a trail towards becoming an attractive, forward-looking and resilient city, leveraging its port areas and waterfront developments as essential success factors. Insights gained from past projects will continue to form the foundation of new development plans and endeavours in the city. 📍

VIEWPOINT  
XUFENG ZHU

# Agile City Governance in the Digital Age



Xufeng Zhu is Professor and Dean at the School of Public Policy and Management and Executive Director of the Institute for Sustainable Development Goals at Tsinghua University. He was appointed by the Economic and Social Council as a member of the United Nations Committee for Development Policy.

China pursues digital transformation by pairing clear central direction with local experimentation.

Digital technologies are transforming economies and societies at an unprecedented speed, but their most consequential effects may be more prevalent at the city level. As the primary sites of public service delivery, economic activity and social interaction, cities are increasingly becoming laboratories for digital governance. Municipal governments today face a dual challenge to use digital technologies to improve efficiency, transparency and responsiveness while managing the risks these technologies introduce, such as data insecurity and widening social inequality. How cities navigate this tension will shape not only urban governance, but also the broader trajectory of state capacity in the digital age.

## Digital Transformation and Asian City Governance

Across Asia, digitalisation has become a central tool for strengthening policy coordination, improving administrative performance, and enabling data-driven decision-making. These developments are deeply shaped by institutional context. East Asian governance systems have long emphasised technocratic competence, long-term planning, and state-led development. Digital transformation in Asian cities therefore tends to build upon existing traditions of strategic coordination and public-private collaboration, rather than radically redefining the role of the state.

Singapore's Smart Nation initiative is an example of this model. It institutionalises digital transformation across the government through integrated data governance, with a strong emphasis on user-centric design and interoperable public services that allow for seamless information exchange to deliver better public services. South Korea's e-government system, supported by advanced technological infrastructure and high digital literacy, prioritises transparency, efficiency and seamless service delivery. Japan, while slower in implementation, has articulated a long-term vision through Society 5.0 for a super-smart society. Society 5.0 envisions a sustainable and inclusive socio-economic system, powered by digital technologies, such as big data analytics, artificial intelligence (AI), the Internet of Things and robotics.

China's digital transformation has taken a distinctive path that is making rapid headway in the country. Its digital governance model combines large-scale data integration and algorithmic coordination with active involvement by the state to drive its national development policies. Rather than relying primarily on decentralisation or market-driven innovation, China pursues digital transformation by pairing a clear central direction with local experimentation. Chinese cities have emerged as key sites where digital technologies are integrated in governance processes.

### The Evolution of Digital Governance in Chinese Cities

China's digital transformation began in the 1980s as national leaders viewed informatisation as essential to economic modernisation. In 1984, the State Council approved key informatisation projects in finance, energy and transportation, signalling a strategic commitment to technology-enabled governance. The launch of the "Three Golden Projects" in 1993—Golden Bridge, Golden Card, and Golden Customs—marked a milestone by establishing national information networks in telecommunications, finance and customs administration.

In the late 1990s, China formally entered the e-government era. The 1999 E-Government Project promoted the use of internet technologies in public administration, while the 2002 Guidelines on the Construction of E-Government in China framed digital government as a means to transform administrative functions and improve service efficiency. By the mid-2000s, all levels of government had established official websites, enabling basic online access to information and services.

The 2010s marked a qualitative shift from digitisation to integrated digital governance. Advances in telecommunications—especially the rollout of 4G and later 5G—enabled mobile government services to scale rapidly. Citizens increasingly accessed public services through platforms such as WeChat mini-programmes, Alipay, and municipal apps. During this period, leading cities pioneered reforms that restructured administrative processes rather than simply moving them online.

For example, Shanghai's "One-Stop Online Government Services" reform consolidated fragmented services and enabled cross-departmental approvals through a single digital platform. Beijing built integrated government clouds and unified service portals to improve inter-agency coordination. Hangzhou's City Brain applied real-time data and AI to traffic management, emergency response, and energy efficiency. Shenzhen developed the "iShenzhen" platform to provide mobile-first, citizen-oriented services, while Guiyang leveraged its national big data pilot status to experiment with data-driven public management.

These initiatives shared a common logic: shifting governance from department-centred administration to citizen-oriented service delivery. By 2020, China ranked among the world's top performers in the United Nations E-Government Development Index, reflecting the cumulative impact of these reforms.<sup>1</sup>

### From Digital Government to Intelligent Governance

In the 2020s, Chinese cities moved beyond digital integration toward AI-enabled governance. Municipal governments are increasingly deploying AI to support decision-making, automate routine administrative tasks, and optimise urban systems. Cities such as Shenzhen, Chongqing, Kunming and the Xiong'an New Area have taken the lead.

Shenzhen's Futian District has implemented a large government affairs model that deploys AI agents across hundreds of administrative

scenarios, reducing processing time and improving service consistency. Kunming's AI Empowerment Centre, developed in partnership with technology firms, integrates computer vision and multimodal learning to improve urban management. Xiong'an has experimented with causal models—analytical tools used to identify cause-and-effect relationships—to enhance infrastructure planning and resource utilisation.

Taken together, China's digital evolution reflects a distinctive governance logic characterised by three features: strong state-led strategic coordination, localised and incremental experimentation, and adaptive learning focused on problem-solving rather than ideological debates. This approach has enabled rapid scaling, but it also raises new governance challenges.

### New Challenges in Digital City Governance

While digital technologies have expanded governance capacity, they have also introduced complex risks that must be addressed to ensure sustainability and legitimacy. Issues of data security, privacy protection and digital inequality have become increasingly salient. These challenges are global, but their implications are amplified in China by the scale, speed, and centralisation of digital deployment.

Data security and privacy concerns have moved to the centre of public debate. The Health Code system illustrates this tension. During the COVID-19 pandemic, the Health Code system significantly enhanced public health governance by enabling real-time risk assessment and mobility management. At the same time, it

raised concerns about personal data collection, algorithmic transparency, and the duration of data retention. The system's eventual nationwide discontinuation and data deletion underscored the importance of institutional mechanisms to limit technological overreach.

Digital inequality presents a second major challenge. Despite high levels of adoption in urban areas, disparities persist across regions and social groups. Rural populations, elderly residents, migrant workers and low-income households often face barriers related to connectivity, digital literacy, and service usability. These gaps can translate into unequal access to public services and economic opportunities. Digital governance, therefore, is not merely a technical issue but a socio-technical one that requires complementary policy interventions.

To address these risks, China has strengthened its legal and regulatory framework. The Cybersecurity Law (2017), Data Security Law (2021), and Personal Information Protection Law (2021) together establish rules for data protection, risk management and personal privacy. These laws provide essential safeguards, but they also pose challenges of interpretation and enforcement across different administrative levels. Legal frameworks alone are insufficient without institutional capacity and public trust.

### Towards Agile City Governance

The accelerating pace of technological change and the growing complexity of socio-technical systems call for new governance approaches. In this context, *agile governance* has emerged



China introduced legal and regulatory frameworks to address data security, privacy and digital literacy concerns.  
Image: Pexels

as a practical framework for governing under conditions of uncertainty.<sup>2</sup> Rather than relying on fixed rules and linear policy implementation, agile governance emphasises flexibility, responsiveness, iterative learning, and collaboration across sectors.

In practice, agile governance in Chinese cities manifests in several ways.

First, it entails rapid policy response and intervention to technological and social risks. The Health Code system during the COVID-19 pandemic is a prime example: authorities were able to design, deploy, and iteratively refine a nationwide digital health monitoring system within weeks, reflecting both organisational agility and technological adaptability. After the COVID-19 pandemic, the Chinese government took prompt action to discontinue the health code system nationwide, deleting relevant data in compliance with legal requirements to safeguard user privacy. Similarly, the deployment of AI-powered city management systems—such as Hangzhou’s City Brain and Shenzhen’s intelligent administrative assistants—demonstrate the capacity of local governments to implement adaptive solutions that respond to real-time data and citizen needs. These initiatives illustrate the principle that governance in the intelligence era is not a static process but an ongoing iterative engagement between technology, institutions and society.

Second, agile city governance relies on collaboration and interaction among multiple stakeholders. In China, this is evident in the partnerships between government agencies, technology firms, research institutions and civil society organisations. The AI Empowerment Centre in Kunming, for example, integrates expertise from public authorities and private technology developers to optimise municipal operations, reflecting a governance logic that values co-production, knowledge sharing, and joint problem-solving. Cross-departmental integration, as seen in China’s “All-in-One Net” platforms (integrated online government service), further illustrates the necessity of institutional coordination to achieve coherent digital services that are both efficient and responsive to citizen needs. Agile governance thus emphasises horizontal collaboration as much as vertical authority, recognising that digital problems are rarely confined to a single organisational silo.

Third, agile city governance incorporates iterative feedback and learning mechanisms. Continuous monitoring, data analysis, and evaluation allow governments to detect emerging risks, measure performance and adapt policies in near real time. In smart city applications, AI-driven monitoring of traffic, public safety and environmental conditions generates large datasets that inform both operational decisions and strategic planning. This feedback loop transforms governance into a dynamic,



AI-driven monitoring of environmental and traffic conditions informs both operational decisions and strategic planning.  
Image: Wikimedia Commons

learning-oriented system, enabling authorities to anticipate challenges and recalibrate interventions as conditions change. Iterative learning also facilitates public engagement, as citizens’ experiences and responses to digital services provide valuable information for refining service design and delivery.

Fourth, agile city governance has implications for citizen-state relations. By embedding responsiveness, transparency and adaptability into digital services, governments can enhance public trust, accountability and participation. Citizen feedback becomes an integral part of the governance cycle, informing service design, monitoring and evaluation. In China, digital platforms such as municipal apps, online complaint systems and e-participation tools exemplify this interactive approach, allowing authorities to align governance processes with citizens’ preferences and expectations. The emphasis on user-centric design reflects a normative model of agile governance—a framework that defines how decision-making should be carried out—which pairs technological efficiency with collaboration, inclusivity and public value.

## Conclusion

Agile city governance offers a pathway for managing the dual imperatives of innovation and regulation in the digital age. China’s experience shows that cities can develop adaptable governance systems through strategic coordination, experimentation and learning. While China’s institutional context is unique, its practices highlight broader lessons for cities across Asia and beyond: digital transformation must be matched by institutional agility, legal safeguards and social inclusion.

As digital technologies continue to evolve, the central challenge for city governments is no longer a question of adopting such technologies, but rather how to manage them effectively. Ensuring agility, responsiveness and public value in digital governance will be essential to build high-trust cities that are not only smart, but also resilient and inclusive. 🗣️

[1] United Nations, 2022 E-Government Survey 2022: The Future of Digital Government. New York: United Nations Department of Economic and Social Affairs

[2] World Economic Forum, 2018. Agile Governance: Reimagining Policy-Making in the Fourth Industrial Revolution. Geneva: WEF

VIEWPOINT  
CRIS TURNER

# The Urban AI Paradox: Balancing the Digital Future with Our Physical Reality



Christopher "Cris" Turner is the Vice President for Government Affairs and Public Policy at Google. He leads global policy strategy for Google's Knowledge and Information products, including Ads, Search, and Maps. A veteran at the intersection of technology and public policy, Cris works with city leaders and international organisations to promote the responsible use of AI in urban governance and sustainability.

|| Navigating the AI paradox is not about choosing between technological progress and environmental stewardship. It is about integrating them. We must solve the physical footprint of the digital world to unlock the immense potential of AI to decarbonise our physical world.

|| In the grand timeline of urbanisation, we are navigating a transition as pivotal as the industrial revolution. For centuries, cities were defined by physical infrastructure—roads, bridges, aqueducts, and power grids. Today, a new layer is being woven over the concrete and steel: a digital fabric of data, machine learning, and artificial intelligence (AI). patterns requires computation, and computation requires resources. Answering the challenges of urban environments demands data centre infrastructure capable of operating responsibly.

The challenges facing modern cities—from shifting demographics to the existential threat of climate change—are too complex for linear solutions. They require the exponential problem-solving capacity of AI. However, as city leaders and technologists, we must be clear-eyed about the "AI Paradox": the very technology that holds the key to solving our most pressing urban climate challenges requires significant physical resources—energy and water—to operate.

Navigating this paradox is not about choosing between technological progress and environmental stewardship. It is about integrating them. We must solve the physical footprint of the digital world to unlock the immense potential of AI to decarbonise our physical world.

## The Physical Footprint of a Digital Future

AI holds tremendous potential for the operation of smarter cities. However, analysing complex datasets such as traffic light flow or weather

The hardware requirements behind data centres are vast, and securing the physical footprint of digital cities means optimising these resources. Instead of treating hardware as disposable, the industry must develop resilient, circular economies for servers and infrastructure. At Google, this looks like engineering hardware with modular cores that can be disassembled, repairing servers, and integrating refurbished components into necessary upgrades. Currently, we divert 84% of global data centre operations waste from landfills.

Similarly, computational energy creates heat that must be balanced with responsible cooling solutions. Operators deploy water, air, or hybrid cooling systems dependent upon localised environmental data. For example, water cooling is highly effective, utilising less power and releasing fewer carbon emissions than traditional air cooling. Yet, in areas facing watershed stress, or places where the local grid offers clean energy to power air chillers, pivoting to air cooling is the more responsible approach. Further, committing to water replenishment projects, such as Google's target of 120% freshwater replenishment by 2030, transforms operational necessities into local community benefits.

Potential for up to 10% less emissions with optimised traffic lights



Green Light optimises traffic lights to reduce vehicle emissions in cities, helping mitigate climate change and improving urban mobility.  
Image: Google

Ultimately, building the infrastructure for urban AI necessitates building sustainably. That is why Google is working hard to advance clean energy (more information can be found in our 2025 Environment Report).

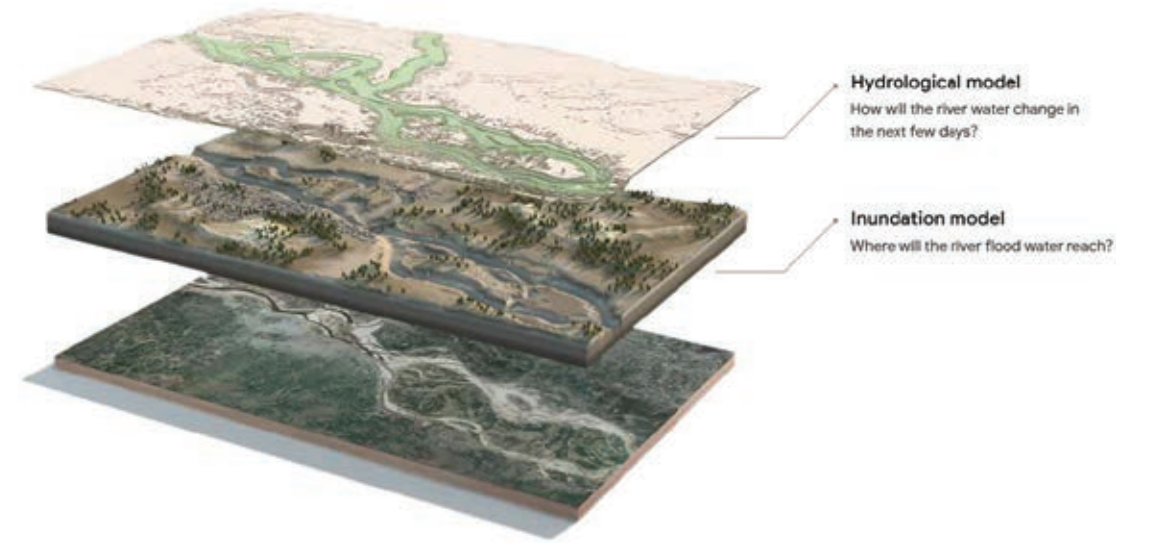
**The AI Return on Investment: Decarbonising Mobility**

While we must hold ourselves accountable for the energy AI consumes, we must also examine the "return on investment" regarding the carbon AI prevents. The World Economic Forum has noted that widespread adoption of digital technologies and AI could reduce global emissions by 20% by 2050 in the highest-emitting sectors—energy, materials, and mobility—by enhancing carbon-intensive processes, improving energy efficiency in buildings, and deploying and managing renewable energy.<sup>1</sup>

This brings us to the bridge between digital consumption and physical impact. The energy spent training a model is a fixed cost; the energy saved by deploying that model to optimise a city's transportation network is a recurring, compounding benefit.

Consider the traffic light. In many cities, signal timing is outdated, leading to unnecessary stop-and-go traffic that spikes emissions. Traditionally, fixing this would require expensive hardware sensors and manual counts. AI changes the equation. Through partnerships with cities like Boston, Rio de Janeiro, and Jakarta, we are using AI to model traffic patterns at intersections with Project Green Light. Utilising advanced machine learning, we are able to recommend adjustments to city traffic engineers that can have a huge impact on reducing wait times and emissions. This project is now active in over 20 cities globally with a significant and growing pipeline. In Boston, Massachusetts, early implementation at diverse intersections helped reduce stop-and-go traffic by up to 30%. By smoothing the flow, we are actively stripping carbon out of the transportation sector.

Similarly, we are empowering individual citizens to act through Eco-Friendly Routing in Google Maps. By using AI to analyse road incline, traffic congestion, and constant speeds, we can suggest routes that consume the least amount of fuel or energy. Since its launch, this feature is estimated to have helped prevent more than 2.9 million metric tonnes of carbon emissions—roughly equivalent to taking 650,000 fuel-based cars off the road for a year.



Using AI to make critical flood forecasting information universally accessible.  
Image: Google

**Environmental Intelligence: Making the Invisible Visible**

Beyond mobility, AI creates a new form of "environmental intelligence" that allows cities to adapt to a changing climate. A truly liveable city is a healthy city, yet threats like air pollution are often invisible and hyper-localised.

To address this, we have moved beyond simple monitoring to ecosystem-wide solutions. City leaders often tell us they are "drowning in data" but struggling to operationalise it. In response, our approach with Air View+ in India has been to shift the focus from reactive maintenance to predictive foresight. Instead of relying solely on sparse government stations, we helped create a city-wide network of low-cost sensors. We then combined this granular sensor data with AI models to provide a real-time, hyperlocal view of air quality.

This approach transforms raw data into a governance insights engine. It empowers city administrators to move beyond simply "knowing" a problem exists to actively "acting" on it—identifying hotspots to design targeted interventions, whether that's rerouting heavy traffic, planning green barriers, or issuing

health advisories to specific neighbourhoods. This model has also been deployed successfully in Dublin, Ireland, and across cities in Brazil, where the combination of Air View+ and Google's transportation data (including distances travelled by vehicle, transit, cycling and walking) are being used to directly influence governance. For instance, Google's transportation data was instrumental in shaping Boa Vista's new Urban Mobility Law, and was used by the City of Recife, Brazil to obtain ISO 37120 (Smart Cities) certification, setting precedents for how our data empowers cities to implement new, climate-conscious policies and unlock new investment and funding.

Central to this intelligence is the ability to democratise complex environmental data. Google Earth now serves as a no-code platform, allowing city planners to bypass expensive data science barriers. By utilising pre-loaded datasets for land surface temperature and tree canopy coverage, officials can visualise urban heat islands in minutes. This turns a complex climate crisis into an evidence-based urban forestry programme, allowing cities to prioritise cooling the neighbourhoods most vulnerable to extreme heat before the next heatwave hits.

### Here are a few ways that Google Earth is being used by cities:



#### Heat resilience

Identify urban heat islands and target hotspots for tree planting interventions. Pinpoint hotspots, assess community needs, and target interventions for cooling strategies like trees and reflective roofs.



#### Sustainable building

Accelerate planning with AI-powered tools to evaluate building designs and solar potential for urban development. Plan greener projects, faster, by identifying ideal building locations, accelerating solar analysis, and analysing environmental impact.



#### EV infrastructure

Layer EV Google Search Interest data with existing charging station locations to identify opportunities for new charger installations. Layer EV demand and infrastructure data into actionable insights to spot ideal locations and plan strategically.

Images: Google



#### Mobility planning

Visualise traffic patterns with data on vehicle trips and congestion points to improve mobility and safety. Understand traffic movement patterns, pinpoint problem intersections, and target solutions to help reduce traffic congestion.

Resilience also means preparing for the acute shocks of climate change. Through Flood Hub, we are using AI hydrological models to predict when and where riverine flooding will occur, up to seven days in advance. This tool now covers territories home to over 460 million people globally. But data alone does not save lives; delivery does. That is why we collaborate with organisations like the International Federation of Red Cross and Red Crescent Societies to set up "offline alerting networks"—trained community volunteers who translate digital foresight into physical action, warning neighbours who may lack connectivity.

#### The Governance of Innovation

The transition to an AI-enabled city is not just a technological challenge; it is a governance challenge. If we simply drop black box algorithms (AI models using opaque decision-making processes) onto city departments without a framework for oversight, we risk eroding public trust. We have learned that the most successful smart city projects are those that put people, not technology, at the centre.

For example, in Memphis, Tennessee, city leaders used AI to automatically detect potholes and road assets from video feeds. This helped drastically reduce the time it takes to identify and repair crumbling infrastructure, allowing city crews to focus on fixing problems rather than finding them.

To scale this kind of success responsibly, we must prioritise transparency and equity. We are proud to collaborate with organisations like the United States Conference of Mayors to develop AI guidelines for cities. These frameworks emphasise that AI should be explainable, equitable, and subject to human oversight. City leaders must understand *why* an algorithm recommends a certain traffic pattern or resource allocation.

Furthermore, we must ensure that the benefits of this data revolution are shared. Through initiatives like the Environmental Justice Data Fund,

supported by Google.org, we are helping frontline communities collect and analyse their own data on environmental hazards. When cities use AI, they must ensure the data reflects the reality of all neighbourhoods, not just the connected ones.

#### The Path Forward: Act Now

The theme of the World Cities Summit in 2026, "ACT Now", feels particularly prescient and is a call to action. We cannot afford to wait for perfect solutions or infinite resources. We must act now, with the tools we have, to build cities that are resilient, efficient, and humane.

AI offers us a chance to decouple economic growth from carbon emissions. It offers us a way to make our grids smarter, our traffic smoother, and our air cleaner. But it requires us to manage the trade-offs responsibly.

For Google, that means continuing to drive energy efficiency in our data centres and pushing the frontiers of carbon-free energy. For city leaders, it means embracing digital transformation not as a vendor contract, but as a strategic capability. By balancing the physical demands of this new infrastructure with its boundless potential for sustainability, we can build cities that do not just survive the 21st century, but thrive in it. 🌱

To find out more about Google's 2025 Environment Report, please refer to <https://sustainability.google/reports/google-2025-environmental-report/>

[1] World Economic Forum, "Digital Tech Can Reduce Emissions by up to 20% in High-Emitting Industries," May 24, 2022, <https://www.weforum.org/press/2022/05/digital-tech-can-reduce-emissions-by-up-to-20-in-high-emitting-industries/>



URBAN GREENERY  
**ZAC TOH**

Zac Toh is the Founder of GWS Living Art and Co-Founder of City Sprouts. Growing up immersed in the horticulture scene, he is passionate about greening cities through innovative solutions that connect communities with nature for healthier, more sustainable living. As part of his advocacy for greener cities, Zac has also been part of the World Cities Summit Young Leaders Network since 2024.

# Weaving Green Threads: Building Resilient Cities from the Ground Up



Urban greening strategies such as vertical gardens exemplify how ecological systems can be reintroduced into densely built environments.  
*Image: GWS Living Art*

**This essay explores the role of urban greenery in building resilient cities and how ground-up initiatives can shape these nature-based urban solutions.**

## The Converging Futures of Mega-Cities

By 2050, an estimated 70% of the world's population will reside in urban settlements (UN, 2019). As global populations rise, cities face mounting pressure to accommodate the expanding needs of its citizens. This accommodation may take the form of horizontal expansion into surrounding lands or vertical densification through high-rise development and economies of scale. Each city, shaped by its cultural heritage, historical context and planning philosophy, takes on distinct physical forms, yet all are bound by a shared trajectory of rapid and unprecedented urbanisation.

This transformation, however, comes at a considerable environmental cost. Urban growth is typically marked by the proliferation of impervious surfaces and the encroachment upon surrounding forested areas. These changes trigger cascading vulnerabilities such as heightened flood risks, declining air quality, intensified urban heat island effects and deepening climate insecurity. The ecological toll of urbanisation extends beyond immediate environmental degradation to long-term climate challenges.

As global institutions and municipal authorities grapple with managing emerging mega-cities amid the climate crisis, a fundamental reorientation of urban planning is required. Planning must reconnect with its foundational elements: the land upon which cities are built, the communities for whom they are designed, and the non-human inhabitants whose ecosystems have been displaced. These "silent voices" from lost habitats represent not merely an environmental concern, but also a critical dimension of sustainable urban development.

The central challenge confronting contemporary urban centres is therefore multifold: to meet evolving human needs while simultaneously enhancing urban resilience and ecological integrity. This demands an inclusive vision of urban planning—one that serves not only human residents, but also the diverse species and ecosystems that constitute the broader urban community.

## The Cities We Make

### Climate Resilience Through Nature-Based Urban Solutions

As cities increasingly prioritise climate resilience in strategic planning, nature-based solutions have gained global prominence. These interventions address complex societal challenges including climate change adaptation, water security and disaster risk reduction, while delivering co-benefits for both people and ecosystems. Urban greening strategies such as green roofs and vertical gardens exemplify how ecological systems can be reintroduced into densely built environments.

### Stormwater Management in High-Density Cities

Impervious surfaces are an inherent characteristic of urbanisation. Concrete rooftops, cement pathways and asphalt roads share a critical limitation: they cannot absorb rainfall. Instead, precipitation is redirected into complex drainage and catchment systems that are increasingly strained by contemporary climatic realities.

As weather patterns become more intense and unpredictable, conventional drainage infrastructure frequently proves inadequate, resulting in urban flooding and widespread disruption.

Replacing impervious surfaces with green infrastructure systems offers a substantive response to this challenge. Among such infrastructure systems,

green roofs have distinguished themselves by optimising limited urban space while directly addressing hydrological imperatives. Through substrate (or base) layers and vegetative cover, green roofs intercept and retain rainfall at source, reducing both the volume and velocity of runoff before it enters municipal drainage networks.

Beyond flood mitigation, these living systems deliver other multiple benefits. Green roofs enhance urban aesthetics, improve air quality and provide ecological refugia (or habitats) for urban fauna. In doing so, green infrastructure emerges not merely as a technical solution for stormwater management, but also as a holistic strategy for reconciling urban density with environmental stewardship.



Green roof Gaiamat™ installation at the Sembawang Sports and Community Centre, Bukit Canberra. Green roof was installed by GWS Living Art in 2022 using proprietary, patented, soilless Gaiamat™ that can capture 26 litres of rainwater per square metre.  
Image: GWS Living Art



Large-scale vertical greenery installations, such as the 300 m<sup>2</sup> living wall at the National University of Singapore E7 building installed by GWS Living Art, establish vertical garden pockets that weave greenery into the built fabric where horizontal space is scarce.  
Image: GWS Living Art

### Creating Ecological Stepping Stones

Strategically designed and well-maintained green spaces can support biodiversity and strengthen ecological connectivity across fragmented urban landscapes.

Successful integration of green infrastructure into urban environments depends on intentional, evidence-based design that balances development efficiency and ecological-centred approaches. Urban expansion inevitably transforms complex ecosystems, displacing scavenging beetles, burrowing earthworms, nesting sunbirds and countless other species, as undeveloped land gives way to dense architectural forms.

Urban greenery therefore serves a dual function: providing refuge for both human populations and displaced ecological communities. While green installations cannot fully replicate the complexity of natural habitats, strategically designed and well-maintained green spaces can support biodiversity and strengthen

ecological connectivity across fragmented urban landscapes. Such spaces function as ecological stepping stones, offering food sources, shelter and migratory pathways for species navigating the urban matrix.

A critical distinction must be drawn between interventions that deliver genuine biodiversity outcomes and those that function primarily as aesthetic “nature-washing”. Authentic ecological value depends on deliberate design parameters: locally adapted plant species, structural complexity that mimics natural habitat layers, integration within broader green networks and design informed by species-specific requirements rather than visual appeal alone. Without these principles, urban greening risks becoming tokenistic rather than transformative.



City Sprouts community programmes bring people of diverse backgrounds together to connect, learn and relax.  
Image: City Sprouts

|| The most enduring green interventions emerge when a feedback loop between top-down support and bottom-up ownership converges. At the same time, institutions must provide continuity, technical guidance and resourcing, while communities retain agency over design and stewardship.

||

#### Cultivating Social Cohesion Through Community-Centred Urban Greening

The overall resilience of a city depends not only on its capacity to withstand climatic pressures, but also on the strength of its social fabric. This means robust social systems that nurture citizen engagement, strong collective identities and cultures of environmental stewardship.

Expanding cities are faced with the inevitable growing physical distances between residents. Yet spatial separation need not translate into social fragmentation. Effective city-building is simultaneously community-building, requiring spaces where social bonds can form and collective identity can flourish. Within this framework, green infrastructure serves a dual purpose: it functions not only as environmental intervention, but also as social infrastructure that brings people together and fosters shared stewardship of place.

#### Bridging Communities Through Shared Stewardship

Urban farming initiatives demonstrate how nature-integrated design can catalyse community cohesion. When residents actively participate in shaping these spaces, from cultivation methods to harvest-sharing protocols, these projects promote social inclusion and spatial justice while strengthening sustainability outcomes.

Community-led urban agriculture initiatives such as City Sprouts are grounded in reconnecting urban populations with food systems to build ecological literacy and resilience. Beyond food production, these spaces host workshops, educational programmes, and informal gatherings that foster knowledge exchange and social capital often diminished in high-density urban contexts. Such sustained community engagement surfaces tensions between ecological ideals and social realities, expert prescriptions and lived experiences, or initial enthusiasm and long-term maintenance capacity.

Rather than being obstacles, these tensions provide critical feedback that can inform and refine institutional practice. When institutional mandates remain responsive to insights generated through community programmes, policies and design standards evolve to better reflect on-the-ground conditions. In this way, grassroots initiatives do not merely complement top-down frameworks; they actively shape them, guiding how sustainability objectives are interpreted, prioritised and implemented at scale.

The most enduring green interventions emerge when this feedback loop is maintained. As top-down support converges with bottom-up ownership, institutions provide continuity, technical guidance and resourcing, while communities retain agency over design and stewardship. Green spaces thus become embedded within the social fabric, functioning as shared civic assets rather than ornamental installations, sustained through collective responsibility and institutional learning.



An innovative space created by City Sprouts to spark ideas and facilitate field testing and exploratory experimentation.  
Image: City Sprouts

## Young urbanists and community experimentalists bud from engagements and become catalysts for adaptive urban solutions.

### The Experimentation Imperative

From this living foundation of engagement and enthusiasm, a sense of civic agency and latent innovation capacity emerges within communities. When residents develop ownership over their urban environment, they transition from passive beneficiaries to active co-creators, attuned to local conditions and invested in continuous improvement.

Young urbanists and community experimentalists bud from such engagement and become catalysts for adaptive urban solutions, testing interventions that respond to hyperlocal conditions while contributing to broader systemic learning. Communities transformed through participatory stewardship thus become incubators of urban innovation, where experimentation

is not imposed from above but emerges from lived experience and collective aspiration.

As cities evolve toward climate-responsive urban ecosystems, experimentation and iterative learning must become central planning principles. Innovation should not remain confined to academic institutions or corporate laboratories; it must be democratized across the civic spectrum. Citizens of all ages and backgrounds bring lived experiences essential to responsive urban innovation.

These urbanists, community innovators and citizen scientists require dedicated spaces to prototype, test, evaluate and scale solutions.

### The Future of Resilient Cities

Traditional risk-averse regulatory frameworks often obstruct this adaptive learning. To overcome this, cities must adopt mechanisms such as innovation sandboxes, controlled environments that permit experimentation while maintaining safeguards. Cities that embrace calculated risks, learn from failure, and institutionalise adaptive processes position themselves at the forefront of climate resilience and sustainable development.

#### Innovation in Practice: Lightweight Green Roof Systems

Through innovation-driven development and market analysis, GWS Living Art has identified critical limitations in traditional soil-based green roof systems, particularly substrate weight that constrains building-load capacity and complicates transportation to inaccessible areas. In response, GWS Living Art developed a proprietary, patented soilless GaiaMat system in 2017, a lightweight solution that is three to four times lighter than conventional systems while enabling immediate green roof installation. This advancement addresses key logistical and structural barriers to widespread green roof adoption.

Cities constitute multi-layered, multidimensional systems of profound complexity, and their development necessarily demands an equivalently multifaceted approach. The creation of resilient and sustainable urban environments requires the deliberate integration of diverse elements: meaningful community engagement that cultivates civic ownership, empowerment of emerging urbanists to assume stewardship of their cities, deployment of innovative nature-based solutions for climate adaptation and preservation of ecological space for non-human inhabitants within the urban matrix. Each of these dimensions represents an essential thread in the urban fabric.

When woven together with intention and care, these elements form a complex tapestry that appears intricate, occasionally contradictory, yet ultimately coherent in its commitment to holistic urban flourishing. This tapestry acknowledges that cities are not merely built for human habitation, but are also shared ecosystems while constantly being rewoven, unpicked and expanded by new generations with budding ideas. The resulting urban form may resist simple categorisation and defy conventional planning orthodoxies, yet it is precisely this complexity that constructs cities capable of adapting to contemporary challenges while honouring their responsibility to all residents, human and non-human alike. 🌱



HEALTHY CITIES

**BRENT D. RYAN**

Brent D. Ryan is Professor of Urban Design and Public Policy at MIT. His research examines emerging urban design paradigms in global cities. His most recent book is *Small-Town Renaissance: Bridging Technology, Heritage and Planning in Shrinking Italy* (2025). Ryan lectures, practises, and writes widely on urban design.

# Planning and Designing the City for All Ages: Evolving Urban Planning for Demographic Change, Health and Well-Being



Public spaces that serve all segments of the population through simple yet essential features such as seating areas and benches.  
Image: Unsplash

**Cities are dynamic systems that are shaped by demographic, environmental and socio-economic change. Yet much of today's cityscape was designed for a different era, one characterised by 20th-century economic patterns, traditional household structures, journey-to-work-dominated commuting patterns and a population centred around working-age adults and young people.**

In the 21st century, this city model no longer reflects lived urban reality. Across much of the developed world and increasingly in the developing world as well, everything is changing. Populations are ageing, household sizes are shrinking, migration is active and contested, and more people are dealing with age- and activity-related health issues, particularly chronic and degenerative illnesses while climate change is intensifying environmental stress.

In many parts of the world, including Europe and Asia, and increasingly in North and South America, change is a structural necessity. Many Asian populations are rapidly ageing and

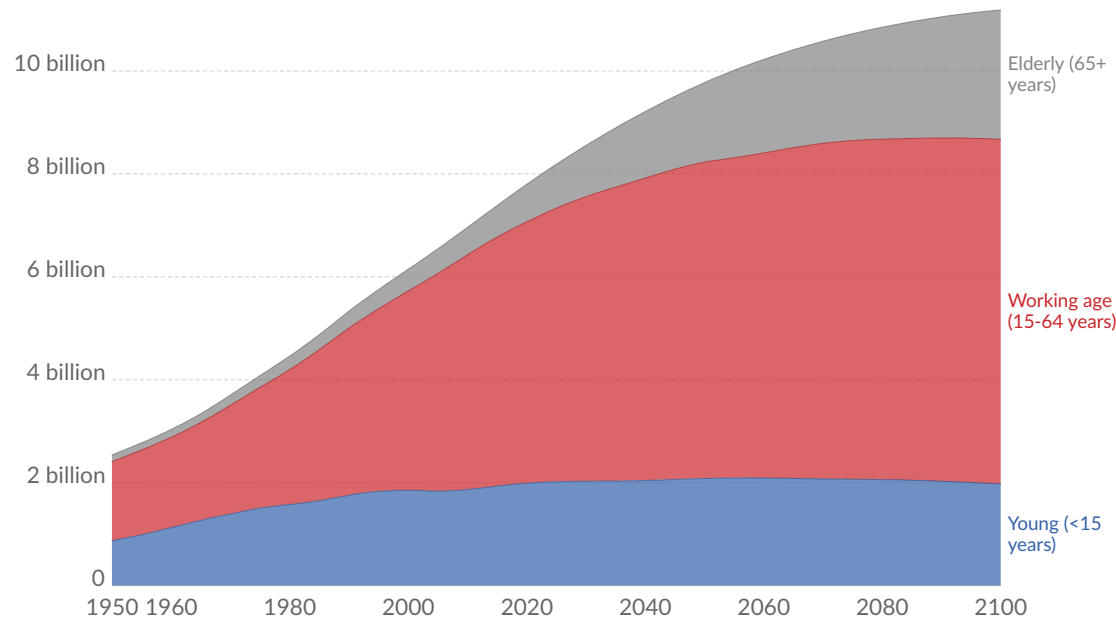
new household size and labour market realities reflect global changes at a dramatic level. Asia is a particularly important testbed for new urban planning strategies that do not simply accommodate growth, but also support diverse populations across their life courses while safeguarding individual physical and mental well-being.

A city for all ages is not a niche aspiration. Demographic changes and new lifestyle needs require, in some cases, incremental adjustment, but, in other cases, demand new approaches towards urban planning priorities, city form and design.

## Size of young, working-age and elderly populations projected to 2100, World

Our World in Data

Total population categorised by three age groups: young (under 15 years old); working-age population (15-64 years old); and elderly (65+ years old). This is shown for historic estimates from 1950 to 2015, and projected to 2100 based on the UN medium scenario.



Source: UN World Population Prospects (2017)

Human demographics are changing the world in unforeseen ways. The number of persons over age 60 is increasing globally, while the population of young people under age 15 may already have peaked. Future cities will be older, and city design and planning needs to adapt to create cities for all ages.  
 Image: Our World in Data, CC BY 3.0 / Wikimedia Commons

In cities across Europe, East Asia and North America, people aged 65 and above already represent more than 20% of residents.

### Demographic Transformation and the Life-Course Approach to Public Space Design

In recent years, transformed demographics have reached a tipping point in many parts of the world. In cities across Europe, East Asia and North America, people aged 65 and above already represent more than 20% of residents. Other than ageing societies, youth are choosing larger cities over smaller ones for work and education. This has resulted in multi-generational urban communities with distinct spatial and social needs.

Planning, and national economies with concomitant welfare and social systems, historically operated with implicit demographic assumptions. The archetypal urban resident was a working-age commuter travelling daily between suburban housing

and a central employment district. Infrastructure investment prioritised roads, parking, and separated land uses for users assumed to be the typical adult resident with long daily commutes, often in a car. On top of that, public spaces were designed for families with children, often marginalising those outside the “productive” workforce, particularly older adults, people with disabilities, or children with caregivers instead of parents.

A life-course approach to public space design and city planning challenges such assumptions. It recognises that people’s spatial needs evolve over time as they always have, and that the “dominant” demographic in populations is shifting away from

active adults to older adults who may or may not be working, and may or may not be physically able. Older residents benefit from a differently designed city, one that is not only step-free, but also has vastly enhanced proximity to services and ever greater opportunities for social participation.

Interestingly, the spatial needs of the new dominant group may not differ greatly from those of others in society. Nowadays, spaces for children are subject to increasingly high safety standards. At the same time, working adults have more needs than just long daily

commutes—they require flexible mobility options. Of course, all these necessary changes to the built environment are not isolated; they overlap. A street safe enough for an eight-year-old to cycle in is also safer for an eighty-year-old to cross. Adopting a life-course approach therefore reframes the design of the built environment as intergenerational infrastructure.

### Health as Preventive Urban Infrastructure

The relationship between urban form and health is increasingly evident. Sedentary lifestyles, air pollution exposure and limited social interaction contribute to non-communicable diseases that now account for substantial global mortality. Mental health challenges—including anxiety, depression and loneliness—are particularly acute in dense urban settings in mature societies where social isolation, in some cases exacerbated by technology, can paradoxically coexist with physical proximity. Planning decisions therefore have the potential to contribute to long-term health improvements.



Pedestrianisation of parking along 44th Avenue in New York City created painted sidewalk extensions that provide safe spaces for students.  
 Image: New York City Department of Transportation, CC BY-NC-ND 4.0



## City fabrics are slow and costly to reform. Yet the long-term costs of not considering health in urban planning are likely greater.



A preventive health-based planning paradigm recognises that sidewalks, trees and benches play a role in supporting population health alongside hospitals, vaccines and clinics. Walkable neighbourhoods make for a very good start. They embed physical activity into daily routines while mixed-use districts enhance destinations for walking, add visual and experiential interest, and can reduce reliance on cars and decrease exposure to emissions. Accessible and reliable public transport supports independence for non-drivers, such as increasing numbers of young adults who choose not to drive, older adults with less driving dexterity, and low-income residents with less access to cars.

The COVID-19 pandemic that resulted in near-total societal shutdowns in many countries further revealed how housing quality, access to green space and neighbourhood design

can directly affect resilience to pandemics. Residents confined to small, poorly ventilated dwellings without nearby parks experienced disproportionate stress and health impacts. In contrast, communities with accessible open space that permitted flexibility of egress and circulation demonstrated greater adaptability during the COVID-19 pandemic.

Preventive health is challenging. The effects are long-term, but city fabrics are slow and costly to reform. Yet the long-term costs of not considering health in urban planning are likely greater. Improvements will require collaboration between urban planners and designers, public officials, infrastructure specialists, public health professionals and social policy experts. The challenge, in many cases still unmet, will be to integrate health impact assessments into planning approvals and transport strategies.

### The 15-minute City: Proximity and Urban Space

There has been growing popularity of proximity-based models, including the “15-minute city”, in the reconsideration of urban structure. Paris is one such example. It is rich in pedestrian amenities, dense with high-quality housing and abundant transportation. So, in some ways, is central Philadelphia. The principle is simple: essential services should be reachable within a short walk or cycle from home.

The 15-minute city offers many benefits. Proximity enhances independence for both younger and older residents. It reduces time burdens for caregivers, who can live nearby or access homes more easily, and proximity enables children to navigate neighbourhoods safely and equally importantly, independently. Proximity reallocates urban value, challenging auto-centric zoning and encouraging alternative economic arrangements.

I am privileged to live in one of Boston’s 15-minute cities, the Coolidge Corner neighbourhood of Brookline. This is an inner-ring suburb where much of the street and open space network was designed by Frederick Law Olmsted. Within 15 minutes of my multifamily dwelling are a neighbourhood park, several light-rail transit stations and bus stops, two full-service grocery stores, a cinema, an independent bookstore, and over 20 restaurants in three different commercial areas. On-street parking is easy, streets are walkable and shaded by abundant trees, and amazingly enough, the neighbourhood is, for the most part, an oasis of quiet.



Coolidge Corner, a neighbourhood-scale commercial district near Boston, exemplifies many of the physical qualities of the 15-minute city. The neighbourhood features light rail transit, a variety of commercial establishments and high and medium-density housing. Image: Pesotsky, CC BY 3.0 / Wikimedia Commons

There could be no stronger evidence of the benefits of the 15-minute city than neighbourhoods like Coolidge Corner that already exist.

However, proximity must be implemented equitably. Brookline is accessible, but hardly affordable to all. Without safeguards, improvements in walkability and amenity—the creation of 15-minute cities—can accelerate gentrification, displacing long-term residents, or strengthen exclusivity. Central Paris, for so long a mixed-income area, is increasingly gentrified with lower-income residents pushed to the auto-oriented periphery. Relaxing zoning, rent stabilisation, enhanced transit, and affordable housing mandates are some of the strategies being tested to make the 15-minute city more affordable.

However, these measures, in the eyes of some, also threaten some of the qualities that make these areas attractive.

Proximity is not merely a spatial concept but a social one. From personal experience, I have seen how proximity in Brookline strengthens neighbourhood identity, supports local businesses such as the bookstore, and increases opportunities for casual social encounter, whether with neighbours or fellow shoppers. All of these encounters and experiences are determinants of mental well-being.

Retrofitting existing neighbourhoods will be critical. Most of the United States (US) is low density, where suburbs are built around car dependency and single-use zoning.

Such spaces can be incrementally reconfigured without wholesale redevelopment and there is evidence that some of these changes are already underway across the US. Examples include:

- Converting single-family homes to multifamily structures
- Transforming underused retail centres
- Introducing local health clinics
- Converting parking lots into green space
- Altering the transportation system that encourages car ownership



Ljubljana, Slovenia, is an ancient city that has become a city for all ages. Human-made and natural elements coexist in harmony, car use has been reduced, and barrier-free sidewalks and park spaces provide a comfortable space for the city's inhabitants. Slovenia is a rapidly ageing society, making Ljubljana's transition timely as well as beneficial.  
Image: Brent D. Ryan

### Streets, Green Infrastructure, and Climate Equity

Streets are often the most heavily used public spaces in cities, yet historically they have prioritised vehicles over humans. The design challenge is to rebalance streets to accommodate more than just cars. This transition will take time, but it also offers an opportunity for streets to serve as climate-positive elements of the city, while emphasising human activity at the same time.

How can streets be improved? Boston offers many examples of improvements that have changed the balance from auto dominance to human focus. Bicycle lanes, wider, barrier-free sidewalks, and enhanced shading accomplish many goals at once. Of course, such streets have historically been regarded as "great streets", to use

the terminology of Allan Jacobs' famous book. Street improvements also reduce auto dependence, improving air quality while reducing heat impacts and enhancing walkability for both older and younger members of society.

At a larger scale, as streets are transformed into shade-giving, pedestrian-friendly avenues, heat island effects can be mitigated by the creation of regional open space systems. Atlanta's Belt Line is one example of how abandoned infrastructure can become a framework for pedestrian activity for all ages and abilities, while enhancing tree coverage and providing opportunities for stormwater management and other environmental goals.

### Conclusion: Designing a City for All Ages

Urban planning designs not for the needs of today, but for the needs of the future where city populations in most parts of the world will be older, and the world a hotter place.

Can we accelerate the transition to generate cities for all ages? Reshaping the city is not a choice but a necessity. Progressive cities led by leaders who acknowledge reality, welcome the future instead of fearing it, and who understand that meeting people's needs is the best form of governance, will be essential partners. We live in exciting and challenging times, and the greener, safer, more comfortable and more equitable future is waiting for city designers and planners. 🌱



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ILLUSTRATION

## URBAN PLAY

# How Playful Cities Strengthen Health, Equity and Urban Resilience

**Play is serious in city-making. In dense, fast-changing urban environments, playful moments in streets, housing and public infrastructure shape how people experience the city every day. Play is not only fundamental for children, but it is also important for young people and adults as it supports learning, social connection and resilience across the life course. When cities make room for play, they create healthier, more inclusive and more liveable urban systems for everyone.**

TEXT: DR SARA CANDIRACCI (GLOBAL LEAD SOCIAL VALUE, EQUITY AND HEALTH, ARUP)

## The Power of Play

Play is essential to children's well-being, happiness and development. Through play, children build physical, emotional and social skills, while developing important qualities like curiosity, confidence and resilience. These benefits do not end with childhood. Playful environments also support young people and adults, offering opportunities for creativity, stress relief, social connection and informal learning. From teenagers using streets and squares as places to meet and move, to adults finding moments of joy or rest in public space, play contributes to well-being across generations.

Crucially, the benefits of play depend on who can access them. Inclusive play environments, designed for different abilities, ages and needs, enable people with disabilities, or neurodiverse users, caregivers and older residents to participate on their own terms. When play is embedded into everyday streets and spaces, rather than confined to specialised facilities, it becomes more visible, equitable and socially inclusive.



Interactive sports and games.  
Image: Lappset Group Ltd

## The Quiet Play Crisis

Despite growing evidence of its importance, play remains undervalued in many cities. Children today often have less time, freedom and access to play than previous generations, as everyday environments are shaped by traffic, risk aversion, commercial pressures and shrinking public space. Play is increasingly confined indoors or pushed to the urban fringes, rather than embedded in daily neighbourhood life.

This quiet erosion of space for play reinforces wider inequalities. Children in lower-income, informal or car-dominated neighbourhoods are often the least able to access safe, stimulating places to play.

66

Adults playing in the Net Pavilion at the Prostorja 10 in Zagreb, Croatia.  
Image: Numen / Domagoj Blazevic

## The Role Cities Play

Cities are uniquely positioned to reverse this trend, not just by building more playgrounds, but by treating play as essential urban infrastructure. The presence of children in public space, their ability to move independently and their everyday access to nature are powerful indicators of how well a city is working for everyone.

While playgrounds and parks remain important, cities can greatly expand opportunities for play by embedding it into everyday streets, transport hubs, schools and public institutions. By shifting from a facilities-based approach to an integrated children's infrastructure network, cities can create streets and spaces that support play, movement and connection across ages and abilities.

Tainan Spring, a public urban lagoon in Taiwan.  
Image: MVRDV / Daria Scagliola

Shade Parade—a street installation in Montreal, Canada, where moving parasols create playful shade and encourage movement.  
Image: Daily Tous Les Jours / LatrompetteStudio

## Tools and Practice: From Guidance to Delivery

Arup's *Playful Cities Design Guide* supports city-makers in progressing from including play as isolated design pilots to making systemic change. The guide helps cities identify where play can be added in everyday spaces, how to design inclusive, low-barrier play environments, and how different forms of play can build skills linked to education, social cohesion and climate action. Complementing this, Arup's *Nature-Based Play* publication highlights how integrating play into green and blue infrastructure can simultaneously support children's well-being and urban climate resilience.

Play-based design principles are reflected in Rome's City of Joy (*La Città della Gioia*) masterplan, where public space is reimagined as a network of interconnected "islands of play" linking markets, courtyards and community facilities. Co-designing with children and caregivers helped test playful, flexible interventions that support social interaction, informal care networks and local identity.



Urban Play Framework.  
Image: Arup / Real Play Coalition

## From Pilots to Playful Systems

For city leaders, embedding play is not about adding a new policy agenda: it is about maximising the impact of existing investments. Transport, housing, public space and climate adaptation projects all offer opportunities to integrate inclusive and nature-based play.

By designing cities that welcome children and by involving them in shaping solutions, cities can move from pilots to playful systems, creating healthier, more equitable and more resilient places where people of all ages can move, connect and thrive.

A render of a courtyard designed as a shared play space that encourages interaction in the City of Joy (La Città della Gioia).  
Image: Arup / ACPV Architects / Asset / P'Arcnouveau

Cities for  
what's next.

ARUP  
80 YEARS

The world is changing faster.  
Cities must be designed not just for one but multiple futures.

How do cities remain competitive today,  
resilient and investable for decades,  
and loved across generations?

Arup helps clients and partners navigate complexities,  
unlock opportunities, and make decisions that endure.

Let's shape what's next, together.





GLOBAL PLATFORMS



# Through the Years: World Cities Summit— the 10th Edition Special

In 2008, the inaugural World Cities Summit (WCS) was launched to address the challenges of liveable and sustainable urban development. The Summit has since attracted participation from more than 250 cities and launched key events such as the Mayors Forum and the Lee Kuan Yew World City Prize.

The biennial event is a global platform for government leaders and industry experts to share innovative urban solutions and forge partnerships. As cities' needs evolve, the open dialogue at WCS remains a vital catalyst for ideas that enable the cities of tomorrow to remain vibrant, inclusive and resilient.

2008



What makes a city successful? Then-Prime Minister of Singapore, Lee Hsien Loong, opened the inaugural WCS with a special address. He examined the factors contributing to a city's liveability (good environment, infrastructure and quality of life) and its vibrancy (economically competitive and culturally rich) to explore how cities can thrive as urban populations grow worldwide.

2010



In the wake of the 2009 global financial crisis and the increasing threat of climate change, critical topics discussed included balancing community needs, making public housing accessible, and celebrating diversity in a globalised world. The inaugural WCS Mayors Forum was attended by more than 50 mayors.

2012



The Summit celebrated cities that are environmentally, socially and economically sustainable, people-centric and underpinned by public-private partnerships. Delegates further considered methods to increase connectivity, mitigate the effects of climate change on urban landscapes, and support ageing societies.

2014



What does the ideal city look like? Key discussion themes put forward at the Summit ranged from advocating for integrated infrastructure and strengthening community bonds, to increasing civic engagement. The first WCS Young Leaders Symposium was held, paving the way for the next generation of leaders to shape the global urban agenda.

2016



Discussions centred on long-term planning through inclusive development amid rapid ageing and growing inequality. The Summit also emphasised the importance of public education on sustainability, and the need to build social capital. City leaders were urged to seize opportunities for collaborative dialogue.

2018



High-level speakers included Kristalina Georgieva, former Chief Executive Officer of the World Bank Group, and Ranil Wickremesinghe, former President and Prime Minister of Sri Lanka. To encourage people-centricity, they proposed adding a fourth "P" (people) to the traditional "3P" (public-private partnerships) to reflect an increasingly active and vocal citizenry.

2021



Delegates brainstormed on how cities could adapt to an increasingly volatile world, and shared insights on policies and strategies to ensure a resilient future. This was a hybrid edition held during the COVID-19 global pandemic, with over 4,700 delegates participating remotely.

2022



The COVID-19 pandemic and climate-induced crises intensified urban challenges but created greater impetus for building more resilient, liveable cities. This edition explored how cities could achieve sustainable growth while remaining cohesive and collaborative. Notable attendees included city and country leaders Oh Se-hoon, Bart De Wever and Patricia de Lille.

2024



Against the backdrop of stressors arising from social, economic and climate change, city leaders examined balanced and forward-looking urban governance approaches, and stewarded initiatives for ground-up innovation to develop inclusive, future-proof solutions for cities.

10<sup>th</sup> Edition

World Cities Summit



Liveable and Sustainable Cities: ACT Now!  
*Accelerate, Collaborate, Transform*

14 – 16 June 2026  
Suntec Singapore Convention & Exhibition Centre

This milestone 10th edition underscores the value of knowledge-sharing among cities, advances the importance of innovation for urban development, and encourages collaboration and partnership to shape liveable and sustainable cities of tomorrow.



NEW SOUTH WALES | URBAN TRANSFORMATION

# Powering Up the Neon Grid to Revitalise New South Wales, Australia

New South Wales' 24-Hour Economy Strategy demonstrates how place-based governance can help cities to revitalise the night.



NEW SOUTH WALES 



Michael Rodrigues is NSW's first ever 24-Hour Economy Commissioner, having been appointed in April 2021. In the role, Michael leads the Office of the 24-Hour Economy Commissioner in NSW Government and is responsible for delivering the NSW 24-Hour Economy Strategy.



Sydney Harbour during the 2025 festival, Vivid Sydney, NSW, Australia. Image: Destination NSW

### The Challenge

After hosting the 2000 Olympics, Sydney's nightlife and music scene boomed in inner-city districts, including Kings Cross, Surry Hills and Potts Point. However, by 2019, Sydney's after-dark scene had been decimated, with the city ranking 48th out of 48 cities worldwide for nightlife in *Time Out's* City Index.

The decline was largely attributed to the lockout laws introduced in 2014 to curb alcohol-related violence and was further exacerbated by the global pandemic which saw the capital city and the state of New South Wales (NSW) locked down. As people stayed in, at-home and on-demand services including Netflix and Uber Eats surged. NSW's going-out economy was facing an existential threat.

### The Response

The silver lining in NSW was that the lockout era prompted a shift in policy echoing a broader international reassessment of night-time governance. The NSW Government repealed the lockout laws and, in 2021, appointed the inaugural 24-Hour Economy Commissioner to lead the Office of the 24-Hour Economy Commissioner (O24HEC) and deliver the 24-Hour Economy Strategy for Greater Sydney.

In 2023, the world's first Minister for Music and the Night-time Economy, the Hon. John Graham, was appointed. In addition, the remit of O24HEC was expanded across NSW, with the ambition of, once again, elevating the state's nightlife and music scene, and unlocking the potential of a 24-hour economy.

# NSW 24-Hour Economy Strategic Pillars

1

## An Enabling Regulatory Framework

Regulatory and legislative amendments aimed at bringing back vibrancy to enable diverse, sustainable and safe night-time economies across NSW.

2

## Vibrant Coordinated Precincts and Places

Fostering collaboration among stakeholders to support precinct building and place-based economies.

3

## Night-Time Workers, Culture and Industry Collaboration

Collaborating across government and industry to support night-time workers, businesses and cultural entrepreneurs to thrive in the 24-hour economy.

4

## Safety, Mobility, Access and Inclusion

Enabling ease of movement to and from precincts while championing the wellbeing and safety of all within the night-time economy.

5

## Authentic Storytelling

Celebrating the unique stories of our districts and promoting the experiences they offer to locals, visitors and workers.

Image: 24-Hour Economy NSW

## The Solution

Significant parts of Greater Sydney bear witness to the “Great Australian Dream”: the post-World War II aspiration for a multi-bedroom house with a backyard and multi-car driveway. Combined with the geography of the city, this meant nightlife and entertainment was concentrated in two or three precincts, rather than spread out as it would have been in cities which were established before the invention of the motor vehicle.

The concentration of an alcohol-centred nightlife, although considered exciting and vibrant for some, led to negative outcomes. Lockout laws curbed these outcomes, primarily by reducing patronage, but triggered unforeseen consequences. The curfew mostly impacted clubs and live music venues, with knock-on effects for bars, restaurants and retail that relied on the footfall and revenue of pre-late-night crowds. As activity declined, investment capital—crucial to the evolution and innovation of culture and nightlife—moved elsewhere.

These insights led to the concept of the Neon Grid to decentralise nightlife to diverse locales. The Neon Grid concept is designed to tell the story of people and places as the state lights up at different times of the day and night.

The five key pillars of the 24-Hour Economy Strategy refer to a district-based approach (pillar 2), empowered by an enabling regulatory framework (pillar 1) led by our storytellers—the nightlife industry (pillar 3).

The state calibrates transport to ensure accessibility and safety (pillar 4) while sharing the outputs and experiences through authentic storytelling (pillar 5).

Vibrant and coordinated precincts or districts are the new players in the going-out economy. While they bear a resemblance to the Business Improvement District model found in the United Kingdom and United States, they are supported by a range of place-based initiatives. Such initiatives include the

- **Uptown District Acceleration Program:** A dedicated business-to-business support program
- **Special Entertainment Precinct (SEP):** Local authorities and councils can designate, by state legislation, later trading hours

and higher noise levels for areas with a primary entertainment purpose

- **Purple Flag Program:** An internationally recognised accreditation program which recognises mature going-out districts that are welcoming, vibrant and well-managed

A legislative reform agenda known as the Vibrancy Reforms has been supporting venues and precincts. The reforms are a cross-government initiative led by O24HEC that were passed in NSW Parliament from 2023 to 2025. In addition to the SEP intervention, the reforms incentivise the bringing in of live music and performances to dining and creative sectors while helping to reduce bureaucracy.



The 5,000-person welcome event in the Chippendale Collective, a district supported by the Uptown District Acceleration Program, as a result of a district-wide partnership with the 2025 International Astronautical Congress in Sydney.  
Image: 24-Hour Economy NSW



The Enmore Road SEP was the first in NSW and has been named one of the best going-out districts in the world (*Time Out*, 2023), with boosted foot traffic, business revenue and night-time visitation. Several areas within metro and regional NSW are planning new SEPs.  
Image: Inner West Council



Live performance at the Camelot Lounge in Marrickville, Sydney, one of four accredited Purple Flag precincts in NSW, with more to come.  
Image: 24-Hour Economy NSW

## || The Neon Grid is helping recalibrate the going-out experience in NSW, adapting NSW to the lifestyles and needs of post-pandemic consumers.



To some extent, the Neon Grid's decentralised approach has played to natural consumer behaviours prompted by the pandemic, specifically the move towards flexible or hybrid working. This is particularly significant in NSW; a state of over 8 million people spread across more than 800,000 km<sup>2</sup>, or 309,000 mi<sup>2</sup>.

Local, vibrant and interesting neighbourhoods with well-managed nightlife centres reduce travel time and associated cost. With a lower barrier to entry, neighbourhood nightlife locales provide an accessible alternative to the lure of the couch and encourage repeat going-out behaviour, essential to the sustainability of the night-time economy.

The Neon Grid is helping recalibrate the going-out experience in NSW, adapting NSW to the lifestyles and needs of post-pandemic consumers.

The state's network of over 30 (and growing) well-coordinated, self-sustaining precincts is helping, once again, to elevate NSW's reputation as a vibrant, globally acclaimed destination.

This status is reflected in Sydney's latest rankings:

- 5<sup>th</sup> in Time Out's Best Cities in the World for Culture (2025)
- 8<sup>th</sup> in Euromonitor's International Top 100 City Destinations Index (2025)
- 11<sup>th</sup> globally in Resonance Consulting's 2026 World's Best Cities report

NSW's experience demonstrates how place-based governance can help cities worldwide rebalance safety, culture and economic vitality after dark. 📍

To find out more about the NSW 24-Hour Economy Strategy, please refer to <https://www.nsw.gov.au/business-and-economy/office-of-24-hour-economy-commissioner/24-hour-economy-strategy>

SOUTH AFRICA | DISCUSSION PLATFORMS

# South Africa's National Urban Forum: Policy Dialogues on Sustainable Urban Development

The South African Local Government Association, an autonomous association of all 257 local governments in South Africa, coordinates the South African National Urban Forum. The forum is a strategic platform bringing together diverse stakeholders to address urban challenges through structured policy dialogue.



## 257 SOUTH AFRICAN LOCAL GOVERNMENTS

Number of local municipalities by province: Eastern Cape (39), Free State (23), Gauteng (11), KwaZulu-Natal (54), Limpopo (27), Mpumalanga (20), Northern Cape (31), North West (22), and Western Cape (30)



Tebogolo Matlou is Senior Manager: International and Stakeholder Relations at the South African Local Government Association. A Sustainable Development Goal (SDG) Champion, he advances partnerships for sustainable urban development, climate resilience and asset management. He holds B.Social Science, BCom Law, BCom Honours, and BBA Honours, and is pursuing an MCom in Programme Management focused on SDG implementation.



Seana Nkhahle is a Town Planner from the University of Witwatersrand. He is the Portfolio Head for Built Environment at SALGA. Besides his appointment at SALGA, he has played various leadership roles including at the Green Building Council of South Africa and Planact where he seeks to facilitate the transformation of cities and built environments to make them thrive for people and planet.



In South Africa alone, two-thirds of the population now live in urban areas, and it is projected that this will increase to 80% by 2050.



### Background and Challenges

Today, more people than ever live in cities—places of cultural, economic and political opportunities and intense social interactions. Cities, however, exert pressure on urban infrastructure and access to basic services and jobs. Moreover, they contribute to intensified and frequent natural and human-induced disasters and governance challenges.

In South Africa alone, two-thirds of the population now live in urban areas, and it is projected that this will increase to 80% by 2050. Urban governance in South Africa is shaped by a constitutionally defined three-sphere system (national, provincial and local government). While this system offers opportunities for multi-level

cooperation, it can result in coordination and planning misalignment. At the same time, although South Africa is one of the most urbanised countries in Africa, its cities continue to face deep structural challenges such as:

- Persistent spatial inequality rooted in apartheid-era planning
- Housing backlog estimated at over 2 million units<sup>1</sup>
- Infrastructure investment gaps at the municipal level
- High urban youth unemployment at above 40%<sup>2</sup>
- Increasing climate-related shocks including droughts, floods and heat stress

||  
**The National Urban Forum showcases good practices and approaches to confronting urban challenges through all-of-society and whole-of-government engagement.**  
 ||

South African Local Government Association (SALGA), Department of Human Settlements and South African Cities Network, supported by the United Nations Human Settlements Programme (UN-Habitat). The aim of the NUF is to align and localise global, regional and local actions for urban development as articulated in the New Urban Agenda, the IUDF and the United Nations SDGs.

Among other objectives, the NUF showcases good practices and approaches to confronting urban challenges. It does this through all-of-society and whole-of-government engagement, providing a platform for cross-thematic dialogue grounded in practice and empirical evidence.

**Implementation**

The NUF goals are operationalised through three key approaches.

1. Using a structured institutional design where SALGA working groups are established and aligned to IUDF priorities, regular engagement is maintained through the NUF and other thematic technical dialogues.
2. The NUF covers a broad spectrum of thematic focus areas, including urban resilience and climate adaptation, informal settlement upgrading, infrastructure finance and municipal fiscal sustainability as well as digital governance.
3. Participation metrics are tracked to ensure that a diverse group of stakeholders take part across NUF sessions, including ministers, mayors and councillors, academics, industry professionals, civil society and community groups. The most recent cycle in August 2025 saw over 800 participants, including female leaders, technical officials, and representatives from secondary cities and small towns.

To respond to these challenges, the South African Cabinet adopted the Integrated Urban Development Framework (IUDF) in 2016 as the national urban policy to manage urbanisation and achieve the goals of economic development, job creation and improved living conditions. However, implementation requires a structured mechanism and institutionalised platform for coordination, monitoring and inclusive dialogue.

Against this backdrop, it is critical for urban actors to come together to assess the efficacy of local, national and global efforts in addressing urban challenges. Stakeholders need to debate current policies and practices, test the understanding of each other's roles and responsibilities, showcase good practices and consolidate positions on critical urban matters for local and international advocacy.

To enable this, South Africa hosted its inaugural National Urban Forum (NUF) in October 2024 for stakeholders to work towards sustainable urban development. The forum has since become a regular platform convened by the



South Africa hosted its inaugural National Urban Forum from 9 to 11 October 2024, attracting a diverse group of delegates.  
 Image: SALGA



The 2024 NUF saw lively discussion by delegates.  
Image: SALGA

### Key Priority Areas

Through the NUF discussions, stakeholders have identified several key priority areas.

At the macro level, the focus is on strengthening institutional mechanisms. This was done by establishing a national mechanism to coordinate efforts of the whole of government and all of society, and by institutionalising accountability through the District Development Model. This has also led to improved alignment between national urban grants and municipal Integrated Development Plans.<sup>3</sup>

There has been better integration between policy and planning as well, such as with increased incorporation of spatial transformation principles and climate resilience measures in municipal planning. At the same time, municipal plans tackle themes such as urban mobility (by prioritising public transport) and urban safety, and aim to achieve a balance between rural and urban

growth. Of equal importance is efficient land governance and management systems based on authentic cadastral boundaries and spatial maps to support municipalities in institutionalising long-term development plans.

In terms of financing, there has been a review of the local government funding model. The emphasis is on streamlining inter-governmental fiscal instruments, pooling resources, encouraging public-private partnerships and exploring alternative funding models.

This is complemented by enhancing skills in municipalities. Such efforts include peer-learning exchanges among metropolitan and intermediary cities, and speeding up professionalisation of both the public sector and the built environment industry. In addition, to boost resilience, cities are developing capacities for disaster preparedness and management.

Citizens will be kept at the centre, with the mobilisation of communities in planning and implementation, especially youth, women and marginalised groups.

Another key priority is the empowering of youth in the shaping of cities, urban spaces and governance. Beyond including their voices in consultations, cities will promote youth-led initiatives and solutions. National youth policy and development strategies will also be implemented at the provincial, district and local levels.

Lastly, for global positioning, South Africa will have coordinated municipal inputs into urban platforms like the Africa Urban Forum and World Urban Forum. This also involves participation in global reporting and policy dialogues facilitated by the United Cities and Local Governments and UN-Habitat.

### Lessons Learnt

The NUF has yielded valuable insights that can guide future urban policy dialogue. Institutionalised dialogue platforms improve policy continuity, prevent fragmentation and ensure sustained engagement. The inclusion of stakeholders of various backgrounds enhances legitimacy while strengthening policy ownership and accountability.

Through SALGA's leadership, municipalities are being positioned not only as implementers, but also as strategic partners in shaping national urban policy. In contributing to long-term spatial transformation, fiscal sustainability and inclusive urban development, the NUF showcases South Africa's commitment and aspirations in achieving SDG11 which is to make cities and human settlements inclusive, safe, resilient and sustainable. 

[1] Department of Human Settlements. National Housing Needs Register and Backlog Estimates.

[2] Statistics South Africa (2023). Quarterly Labour Force Survey.

[3] Republic of South Africa (2016). Integrated Urban Development Framework (IUDF).



GLOBAL | CLIMATE FINANCING

# The International Finance Corporation's APEX Platform: Mobilising Sustainable Investment in Cities

Introduced in over 20 cities, APEX provides city leaders with data-driven insights and best practices from around the world to formulate climate solutions tailored to the local context.



VISAKHAPATNAM

JAKARTA

CAPE TOWN

The Advanced Practices for Environmental Excellence in Cities Programme (APEX) helps transform cities' plans into priority actions for structured, evidence-based investment pipelines that explore financing and engage the private sector.

Cities are hubs for job creation, driving economic growth and opportunity by attracting businesses and connecting people to essential infrastructure and services. However, extreme weather events are putting pressure on already strained infrastructure, forcing municipal leaders to think more strategically about their infrastructure planning and investment.

For many of these municipal leaders, the biggest barrier is not the lack of ambition in developing resilient, sustainable cities, but the difficulty in translating plans into

bankable projects that can attract private capital. A tool that helps bridge this gap is the Advanced Practices for Environmental Excellence in Cities programme, otherwise known as APEX.

Developed by the International Finance Corporation (IFC), a member of the World Bank Group and the largest global development institution focused on the private sector in emerging markets, APEX helps transform cities' plans into priority actions for structured, evidence-based investment pipelines that explore financing and engage the private sector.



Lorraine Sugar is APEX Cities Technical Lead and Operations Officer at the World Bank Group's Climate Department. She holds a BSc in physics and PhD in civil engineering.



Kelvin Tagnipez is APEX Cities Engagement Lead and Operations Officer at the World Bank Group's Climate Department. He holds a BS in economics and MA in urban and regional planning.

## APEX as a Transformative Tool

APEX is a free and easy-to-use web-based platform designed to help cities plan and invest in sustainable, low-carbon infrastructure. It provides city leaders with data-driven insights and best practices from around the world to formulate a Green City Action Plan, showing what achieving environmental excellence would mean for their specific context.

APEX focuses on four critical urban sectors: energy, water, waste and transportation, while also covering related areas such as the energy efficiency of buildings, wastewater and sanitation, renewable energy, solid waste management, and urban mobility solutions.

In practice, APEX guides municipalities in identifying sustainable investments and policy measures across key sectors, while quantifying their

impacts on greenhouse gases (GHGs) and other performance indicators. It allows cities to answer questions such as:

- What would it take to meet our climate targets?
- How much would it cost?
- And what tangible impacts, including emissions reduced, resources saved, or jobs created, could be expected?

Substantially lowering the carbon footprint of cities is a core focus of APEX. The platform explicitly aims to help cities achieve this by establishing emissions baselines and then charting long-term reduction pathways. The platform's goal is to translate a city's climate ambitions into a concrete pipeline of sustainable projects tailored to its local reality.



APEX is designed to help transform climate plans into structured, evidence-based investment pipelines. The tool has been introduced in over 20 cities.  
Image: International Finance Corporation



APEX provides an easy-to-use, affordable, and recognised climate action and investment planning tool for cities.  
Image: International Finance Corporation

||  
**APEX aims to lower carbon footprint of cities by establishing emissions baselines and charting long-term reduction pathways.**  
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An APEX training session by the IFC in Visakhapatnam, India.  
Image: International Finance Corporation



Cape Town's use of APEX is a benchmark for how cities can move from climate ambition to structured and actionable investment planning.  
Image: Unsplash

## Financing Climate Solutions in India, Indonesia and South Africa

In Visakhapatnam, India, APEX was used to develop a comprehensive Green City Action Plan. This plan builds on the city's environmental campaign and includes a GHG inventory and climate investment roadmap, specifying priority projects and policies to address on-the-ground issues and GHG reduction.

In Jakarta, Indonesia, APEX was used to analyse over 30 priority measures from the city's regional development and climate action plans. The tool also estimated that US\$33 billion of investment—with 70% needing

private capital—was required for the city to achieve its ambitions, such as the transition towards green buildings and electric vehicles.

But what makes APEX a truly strategic tool lies in its ability to connect planning with financing. In many cities, especially those in emerging economies, the challenge is not only in identifying what to do, but also how to pay for it.

The use of the APEX tool by the city of Cape Town in South Africa is a benchmark for how cities can move from climate ambition to structured and actionable investment planning.

Rather than treating APEX as a one-off diagnostic tool, Cape Town embraced it as a strategic planning engine to guide long-term infrastructure transformation, and APEX was used to integrate technical analysis with institutional realities. The prioritisation process accounted for the city's financial context, regulatory environment and governance structures. Collaborative workshops with city officials were conducted to validate key assumptions, refine implementation models, and confirm that the proposed measures were both effective and administratively feasible.

## By quantifying impacts and linking them to financing strategies, APEX helps cities make informed decisions, attract investment and deliver results.



Using APEX, Cape Town projected a 23% reduction in GHGs by 2030, with an estimated US\$6.3 billion investment needed for its climate strategy. The platform supported technical analysis and factored in financial, regulatory and governance considerations during prioritisation. APEX also organised interventions into five investment clusters:

- Zero-carbon municipal buildings
- Sustainable infrastructure
- Electric vehicles
- Private sector energy solutions
- Mobility solutions

For each cluster, the platform provided tailored financing models, including energy performance contracts, leasing mechanisms, public-private partnerships and sustainability-linked bonds, allowing the city to move from planning to implementation with a clear roadmap. In 2024, Cape Town secured funding from the IFC and financial institutions to improve its infrastructure. This included upgrading electrical and transport systems as well as expanding water, sanitation and wastewater management—all of which are key priorities in the city's 10-year infrastructure investment plan.

For cities with limited resources, this methodology is transformative. It shows that even in complex urban environments, it is possible to build a coherent, data-driven roadmap for sustainable infrastructure. By quantifying impacts and linking them to financing strategies, APEX helps cities make informed decisions, attract investment and deliver results.

## Partnerships Drive Scalability

Looking ahead, scaling APEX will depend on several enabling factors. Cities must show commitment to climate action and planning. Equally important is connecting cities to financing and private sector partners so that the identified pipelines of investments lead to real implementation. Partnerships, national government backing and global networks, such as C40 Cities, can facilitate adoption, while showcasing successful pilot cases will build momentum for replication.

By providing actionable insights to municipal leaders and directly linking climate ambitions to financing, APEX is well-positioned to be scaled globally and become a transformative platform to help build the resilient and sustainable cities of the future. 🌐

## GLOBAL | INTERNATIONAL PARTNERSHIPS

# International Urban and Regional Cooperation Asia and Australasia (Phase 1): City-to-City Partnerships

Funded by the European Union (EU), the International Urban and Regional Cooperation (IURC) Asia and Australasia (AA) was implemented from 2021 to 2024. It supported cities and regions from the EU, Asia and Australasia to cooperate on several areas of sustainable urban development and regional innovation.



**Pablo Gándara, Team Leader, IURC AA**  
For more than 20 years, Pablo has been leading international teams in Europe, the Americas, Asia, Australasia and Africa. He focuses mostly on promoting decentralised cooperation between European and non-European cities and regions as well as supporting local climate action.



**Jacqueline Chang, IURC AA Senior Expert**  
Jacqueline's 21 years of experience across 19 countries includes global EU projects: International Urban Cooperation Asia, IURC AA, and Global Covenant of Mayors for Climate and Energy. She is both Ambassador and Fellow at the Circular Economy Institute, London.

|| The IURC AA serves as a hub for knowledge exchange, policy dialogue, and capacity building, nurturing a vibrant community of practice for cooperation among cities.

### Aims and Objectives

Launched in 2021, the EU-funded IURC initiative promotes city-to-city and region-to-region cooperation on sustainable urban development and regional innovation, building partnerships between EU and non-EU sub-national entities on a global scale. Collaboration themes were aligned with the United Nations (UN) Sustainable Development Goals (SDGs), the Paris Agreement on Climate Change and relevant EU policies (Urban Agenda, Green Deal, Global Gateway). Using the Quadruple-Helix cooperation model, IURC AA encouraged the public and private sectors to work together with research, education and civil society institutions to develop pilot projects as proofs of concept.

Covering 84 cities, the first phase of the IURC AA regional project was the largest within the global IURC programme. Through a series of

cross-country webinars, workshops, networking events and study visits, city officials, policymakers, research, business and civil society representatives came together to address common challenges. These stakeholders engaged in dynamic discussions, sharing best practices and innovative solutions.

From 2021 to 2024, 42 pilot projects were delivered in diverse areas of urban development, such as post-COVID recovery, smart city, mobility, energy transition, circular economy, industrial transition, culture, education and tourism. The IURC AA thus served as a hub for knowledge exchange, policy dialogue, and capacity building, nurturing a vibrant community of practice for cooperation among cities. In addition, the experience fostered cross-cultural understanding among participating cities.

## The IURC AA programme delivered concrete results across three key areas: influencing urban policies, creating business opportunities and enabling stakeholder engagements.

### Impacts

Meeting its overall objective of leading and developing decentralised international urban cooperation, the IURC AA project resulted in:

- 35 Urban Cooperation Action Plans (UCAPs) that served as guidelines for project implementation. These were living documents that constantly updated the roadmap for cooperation and assessed how IURC project actions contributed to existing urban development strategies at local, national and international levels.
- Pilot projects that served as practical, hands-on examples of sustainable urban development cooperation.
- The enhancement of 48 cooperation partnership strategies via Memoranda of Understanding, Letters of Intent and Commitment Letters.
- Opportunities for local authorities to communicate their projects to a wider audience and forge collaborations with partners from research, business and civil society.

Besides ensuring coherence across different regions in the IURC programme, the UCAPs enabled the IURC Central Coordination Service to aggregate results and report them at international platforms such as the World Urban Forum 2022. Furthermore, the UCAPs contributed to the UN's New Urban Agenda and SDGs by referring to the National Voluntary Review and the Local Voluntary Review processes.

The IURC AA also showcased the key role played by the EU in the Asian and Australasian regions, with EU Ambassadors and European Mayors participating in online or on-site IURC events together with their counterparts. In addition, the IURC project actions were mostly implemented with the agreement or knowledge of the national authorities, increasing the vertical integration of sub-national sustainable urban development cooperation (in line with the EU and the UN Urban Agenda).

### City-to-City Partnerships

The IURC AA programme delivered concrete results across three key areas: influencing urban policies, creating business opportunities and enabling stakeholder engagements.

#### Influencing Urban Policies

Barcelona, Spain hosted the 1992 Olympic and Paralympic Games, which spurred urban transformation in the city. Through the IURC AA, Brisbane, Australia partnered with Barcelona to learn from their experience in preparation for the 2032 Brisbane Olympics and discuss how to make strides towards green sports.<sup>1</sup> Both cities also conducted exchanges on building innovative urban environments like the 22@ precinct in Barcelona and the Boggo Road Innovation Precinct in Brisbane.<sup>2</sup>

As a result of the cooperation, the Lord Mayor of Brisbane, Mr Adrian Schrinner, announced in May 2023 that "Brisbane should aim to be the Barcelona of the Southern Hemisphere".<sup>3</sup> In fact, *Brisbane's Inner City Strategy*, released in April 2023, refers to Barcelona's superblocks as an inspiration to implement walkable hearts.<sup>4</sup>

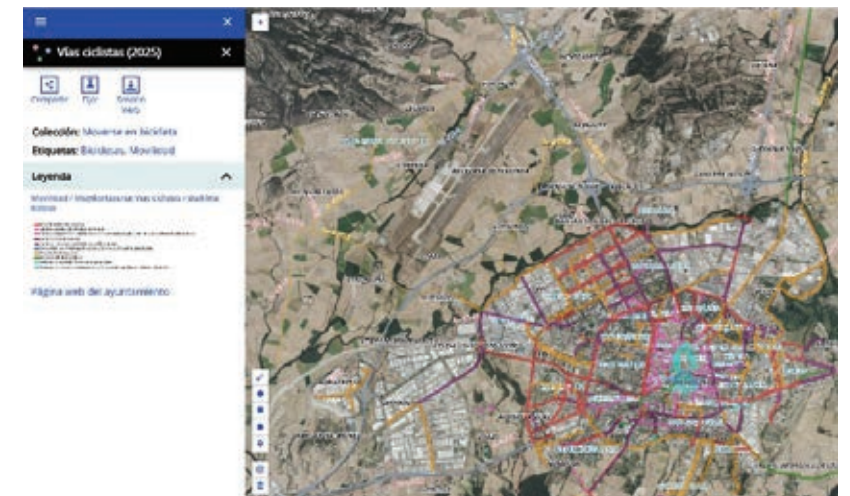
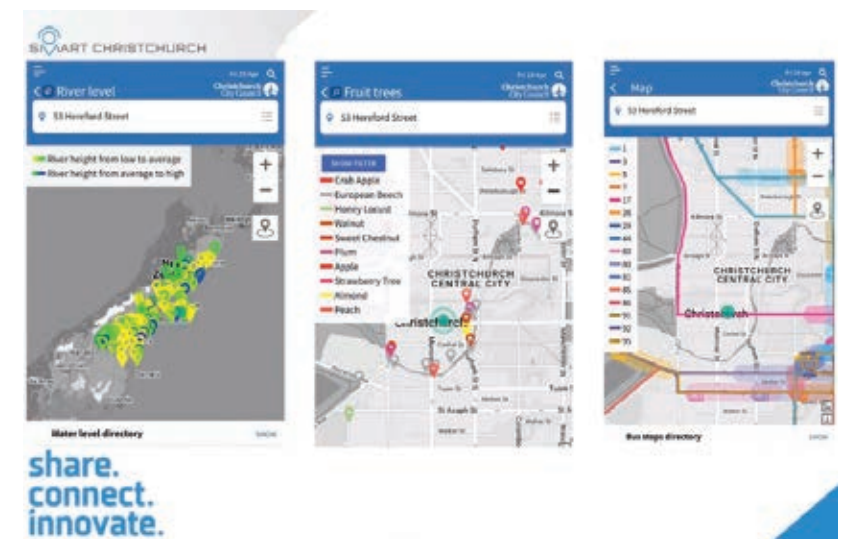
Meanwhile, Malaga and Vitoria-Gasteiz in Spain learnt from Christchurch, New Zealand's SmartView service—an easy-to-access portal for residents to understand, explore and engage with their city in areas like mobility, energy-saving green areas, incident alerts and urban play. The SmartView service served as a useful reference for Vitoria-Gasteiz's web tool known as GEO Vitoria-Gasteiz, for citizens to consult maps showing municipal services, facilities, infrastructure projects, cycleways and real-time traffic congestion.<sup>5</sup>

Bratislava, Slovakia and Tokorozawa, Japan cooperated on climate change adaptation using green infrastructure, with their exchange subsequently expanding to include renewable energy production. This exchange saw Bratislava learning from Tokorozawa's measures for solar power implementation, while Tokorozawa benefited from Bratislava's strategies for energy efficiency.

#### Creating Business Opportunities

The IURC AA brought about a myriad of business prospects, especially for cities in Australia, Japan, India, the Republic of Korea, Vietnam, Malaysia, Thailand and New Zealand. The business opportunities also covered several areas under the EU Green Deal, ranging from circular economy and energy transition to mobility and sustainable agriculture.

For example, Grenoble, France and Essen, Germany joined forces with the Japanese cities of Toyota and Koriyama to build an ecosystem in the energy transition sector.



SmartView (top) and GEO Vitoria-Gasteiz (bottom).  
Image: IURC

The four municipalities involved their technology innovators and industry stakeholders in co-hosted business seminars and networking events. Notably, there was also an online pitching series for companies to present their offerings. Not only were synergies achieved with the local and regional economic development agencies, but bilateral business relations were also developed to create joint ventures.

Similarly, collaboration between Leuven, Belgium and Gwalior, India saw Indian start-ups and incubation representatives in sustainable technology pitching their ideas at the 2023 technological innovation festival And& Connect. These touchpoints helped companies to identify technology and financial partners in Europe.



French and German experts at Fukushima Hydrogen Energy Research Field (top) and Indian start-ups in Leuven (bottom).  
Image: IURC

**Enabling Stakeholder Engagements**

The IURC AA project also encouraged cities to partner with the community.

To illustrate, Portuguese students from Vila Nova de Famalicão's Camilo Castelo Branco Eco-School participated in several virtual and in-person activities with counterparts from Seberang Perai, Malaysia. Joint community projects were developed in areas like e-waste, marine litter, energy saving and

school farms. Supported by municipal authorities and the IURC project, another group of students from Maia, Portugal produced a series of videos on circular economy initiatives to exchange best practices with their Malaysian peers.

Moreover, Turku, Finland and the Obuse town in Nagano, Japan engaged citizens and academia to promote climate resilience, territorial cohesion and a circular

economy. In 2021, youth and elderly representatives from both sides produced and presented videos on climate change at the UN Climate Change Conference in Glasgow in 2021.



Students from Vila Nova de Famalicão and Seberang Perai collaborated on circular economy and waste management initiatives, including hands-on community clean-up sessions.  
Image: IURC



Delegates from Turku, Nagano and Obuse in front of Zenkoji Temple in Nagano.  
Image: IURC

Besides achieving results in the three key areas, the IURC AA's efforts spanned a wide spectrum of urban systems, demonstrating the multifaceted nature of sustainable urban development.

	Examples
<b>Energy Systems</b>	<ul style="list-style-type: none"> <li>Sejong City, the Republic of Korea and Sofia Municipality, Bulgaria supported a partnership between their local companies on renewable energy.</li> <li>Regional and local authorities in New Plymouth, New Zealand invited energy storage and waste management technology providers from Vilnius, Lithuania to collaborate with their local businesses. Both sides agreed to leverage Horizon Europe's funding opportunities to support this research and business cooperation.</li> <li>The Trier University of Applied Sciences in Germany developed a sustainable campus concept together with the Hindustan Institute of Technology and Science in Chennai, India. This included the construction of a biogas pilot plant on the Indian campus.</li> </ul>
<b>Food Systems</b>	<ul style="list-style-type: none"> <li>Milan, Italy expanded the Urban Food Policy Pact to areas including the Rome metropolitan area (Colleferro) as well as Bangkok, Thailand and Seberang Perai, Malaysia.</li> </ul>
<b>Transport Systems</b>	<ul style="list-style-type: none"> <li>Rotterdam, the Netherlands cooperated with Busan, the Republic of Korea to promote innovative business technologies, such as the piloting of a high-speed transportation system hyperloop.</li> <li>Dublin, Ireland and Seoul, the Republic of Korea jointly issued a publication, <i>On Digital Transition in Sustainable Mobility</i>, that includes possible business solutions to achieve climate neutrality in mobility through the use of digital tools.</li> </ul>
<b>Digital Solutions</b>	<ul style="list-style-type: none"> <li>The University of Messina in Italy built Internet of Things water sensors as part of a flood management early warning system in Kochi, India.</li> <li>The Sapienza University of Rome in Italy worked with the Bandung Institute of Technology in Indonesia on a summer school programme on geographic and building information technologies.</li> <li>Experts from Hamburg, Germany shared digital twin solutions for urban planning and urban data management in Melbourne, Australia at the International Transportation Summit.</li> </ul>



A meeting between Sejong City and Sofia Municipality.  
Image: IURC

### Reflections: Tackling Urban Challenges and Key Learning Points

The outcomes of the IURC AA programme are far-reaching. Beyond facilitating peer-to-peer learning, the project has empowered cities to implement initiatives tailored to their specific contexts and make significant strides towards building resilient, liveable communities.

More importantly, the IURC AA has generated a rich array of outputs that underscore its impact and legacy. Through the publication of 24 case studies and 13 thematic reports, the project has captured and disseminated valuable insights and lessons learnt, serving as a knowledge hub for urban practitioners worldwide. Furthermore, the establishment of digital platforms and networking spaces like Christchurch's podcast series, "Smart(er) Cities—Conversations on Innovation", has facilitated ongoing collaboration and peer support beyond the duration of the IURC project, ensuring its sustainability and enduring relevance.

Through direct engagement and collaboration, European and non-European cities have transcended geographical and cultural boundaries, gaining deeper understanding of one another's unique challenges, perspectives, and solutions. This has laid the foundation for long-term partnerships and friendships. The IURC is in the middle of its second phase (2025-2027), with a new batch of 94 participating cities and regions, working in 24 Communities of Practice in Asia and Australasia and 12 in Latin America and the Caribbean. 🌐

#### NOTICE

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