ARUP

City Competitiveness Redefined

You can explore our analysis further by visiting our data visualisation tool. As well as giving more insight into our methodology/ approach, it offers a profile on each of our 63 cities.

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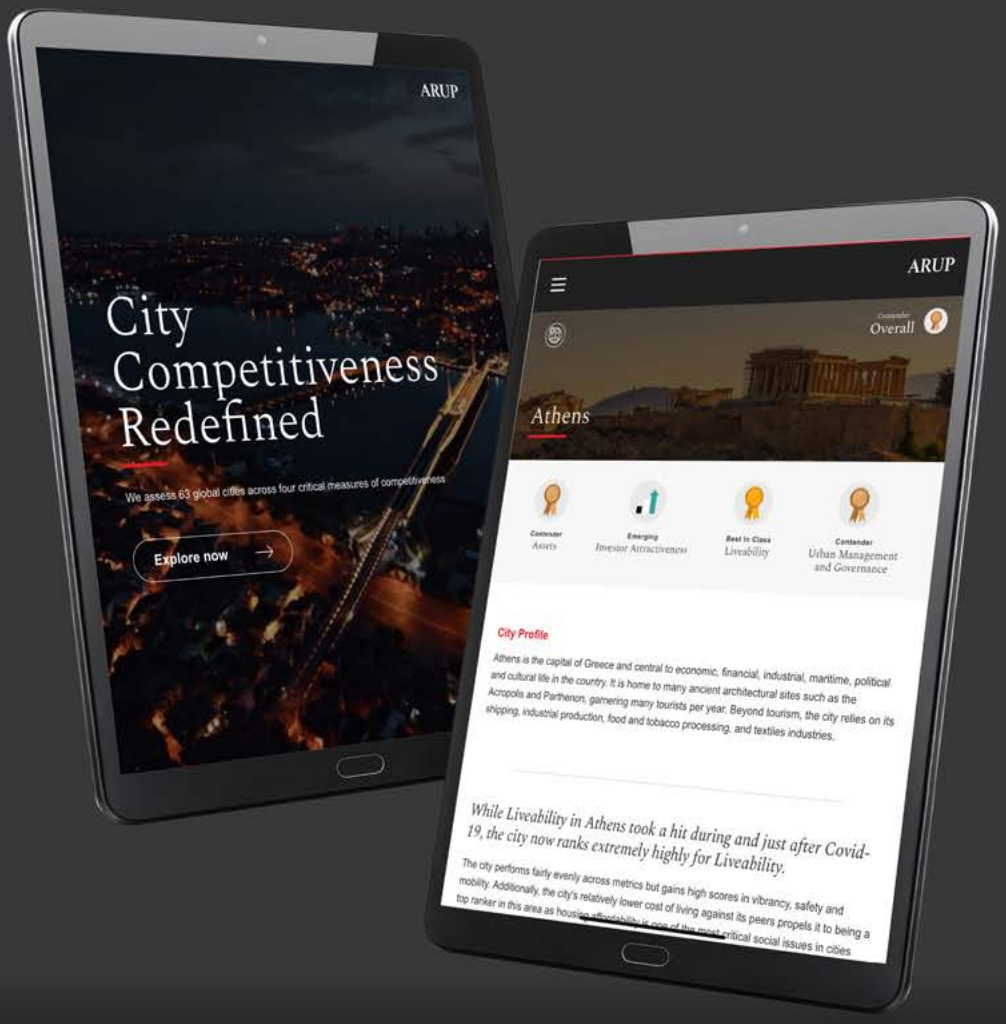

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Foreword

The power of collaboration

You can breathe the air. The public transport is efficient. Your home is affordable and there are stimulating things to do. Living and working in the city is something you're rather proud of. You're living in a competitive city.

In today's highly globalised economy, competitiveness is an outward expression of a city's widest aspirations and its commitment to achieving them. It manifests across investments in urban infrastructure, transport, public realm, education, the environment, focusing on the experience of today's population and planning tomorrow's.

Throughout the long collaboration between Arup and C40 Cities, we have both observed how the definition of city competitiveness has continued to evolve over the last decade. Now, you'll find the question of competitiveness underlying many different urban priorities: how to ensure the vibrancy of the city centre in the e-commerce driven, post-pandemic era. How to accelerate the shift away from fossil fuel vehicles and improve air quality. We hope that this report reveals the breadth of factors that intersect in the definition of a thriving, competitive city.

For city leaders, mayors and their administrations, becoming globally competitive is a sign their preparations and investments are paying off. Today, global CEOs and investors want to know that the city they choose to operate in has robust plans for the growing list of challenges cities face. Climate change, Covid-19 and conflict have brought new elements to this kind of decision making for everyone involved. This is why we believe that competitiveness will increasingly be understood as not merely a reflection of a city's commercial appeal, but of its tangible investments in every kind of preparedness and resilience.

For cities, competitiveness isn't so much about winning, as learning. Although there is always competition for the most talented workers and innovative companies, cities are also collaborating in a myriad of ways.

Of course, it isn't simply about copying tactics – you have to emulate other cities' ideas in ways that make sense in the local context. Successful cities draw inspiration and confidence from each other, based on long-term engagement and the sharing of their experiences.

Image: Vancouver, Canada

During the pandemic, for example, this would take the form of mass Zoom calls, where Mayors and their teams could learn from each other's attempts to respond to a crisis in real time. That ongoing commitment to openness and sharing is what enables long-term competitive success.

City competitiveness also has a national dimension. In many countries, major cities are central to the nation's identity and appeal. City leaders are closer to the needs of their populations, they can respond more quickly, more boldly. This can also provide useful policy insights for the country at large.

For all their flaws, our cities are places we love. While there is no single way to improve, every city possesses a wealth of experience we all can learn from. We hope this new report galvanises new thinking and the confidence to develop your city's people, infrastructure and promise to the full.

Mark Watts
C40 Cities
Executive Director

Andy Hodgson
Arup
Global Advisory Services Leader

Image: Cape Town, South Africa

City competitiveness redefined

How competitiveness is changing

Cities are home to half of humanity and contribute 80 per cent of global GDP.[1] They have always been magnets for talent, innovation and investment, but how they compete for these scarce resources is likely to change.

New challenges and evolving priorities, from global warming and pandemics to progressing on the United Nations Sustainable Development Goals (SDGs), are shifting what we value about cities. This means the attributes they need to succeed are being redefined. As the pace of change - and in particular technological change - continues to accelerate, it is transforming the foundations of all industries, politics, economics, our cities and society itself.

This study offers a refreshed look at a subset of global cities to assess their ability to navigate a changing world. It is a considered review of what is potentially driving a city's long-term positioning – its existential risks, its endowments and assets, its enablers and how all of this comes together in a holistic assessment of its competitive advantage.

It assesses a city's ability to attract, retain and grow businesses, talent and investment in the long-term, compared to other cities. It's a measure of a city's preparedness for the future to not only respond to risks such as climate, but also position to capture future opportunities and the ability to compete globally.

Image: Santiago, Chile

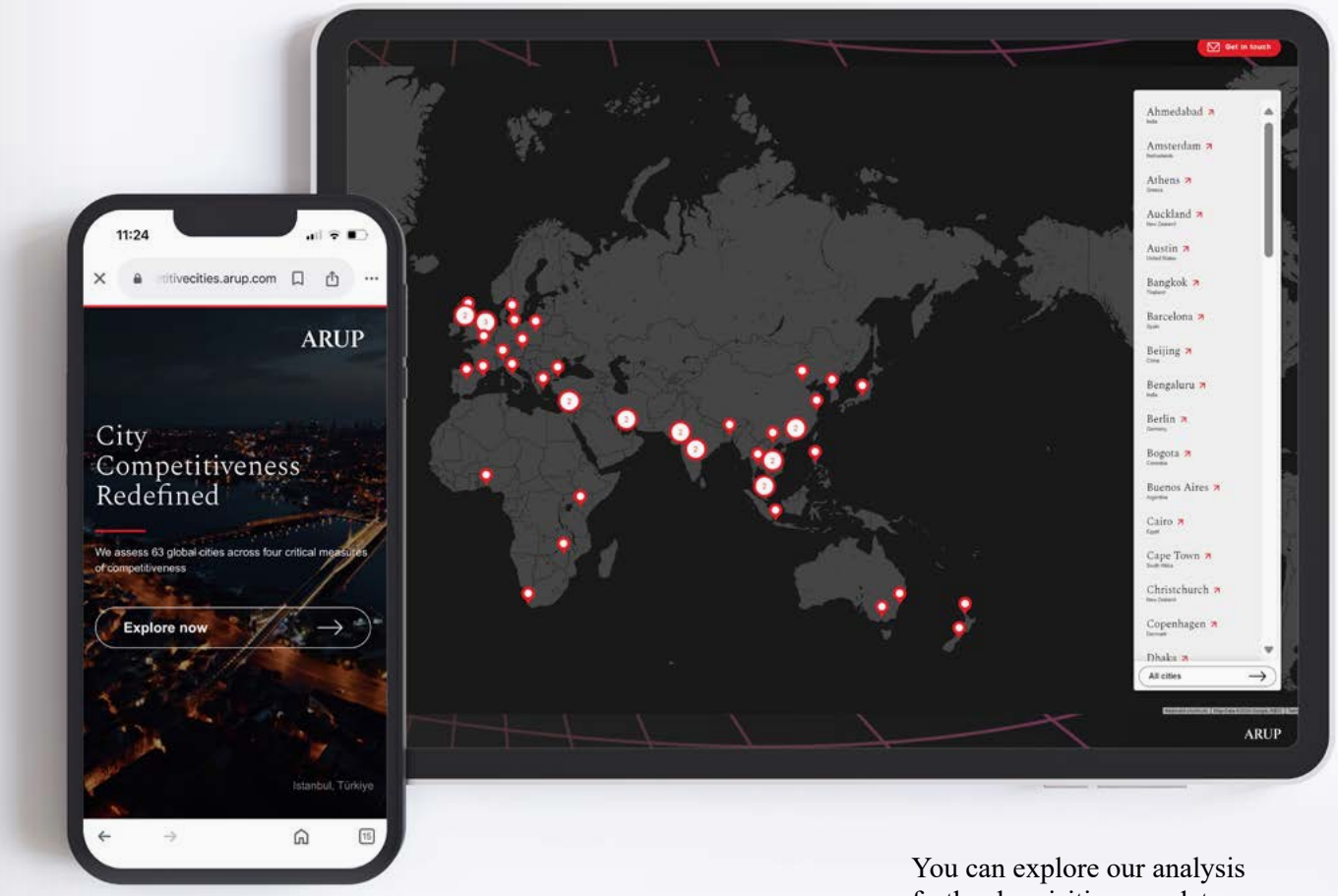
Assessing the changing nature of competitiveness

We conducted in-depth analysis into 63 cities from the Global North and South, ranging from traditional economic powerhouses to promising newcomers and from mega-cities to mid-sized ones.

Ahmedabad	Cape Town	Istanbul	Mumbai	Shanghai
Amsterdam	Christchurch	Jakarta	Nairobi	Shenzhen
Athens	Copenhagen	Kuala Lumpur	New Orleans	Singapore
Auckland	Dhaka	Lagos	New York	Sydney
Austin	Doha	Lima	Paris	Tel Aviv
Bangkok	Dubai	London	Phnom Penh	Tokyo
Barcelona	Dublin	Madrid	Rio de Janeiro	Toronto
Beijing	Edinburgh	Manchester	Rome	Vancouver
Bengaluru	Hanoi	Manila	Rotterdam	Vienna
Berlin	Harare	Melbourne	San Francisco	Warsaw
Bogota	Ho Chi Minh City	Mexico City	Santiago	Washington DC
Buenos Aires	Hong Kong	Miami	Sao Paulo	
Cairo	Hyderabad	Milan	Seoul	

63

Cities analysed



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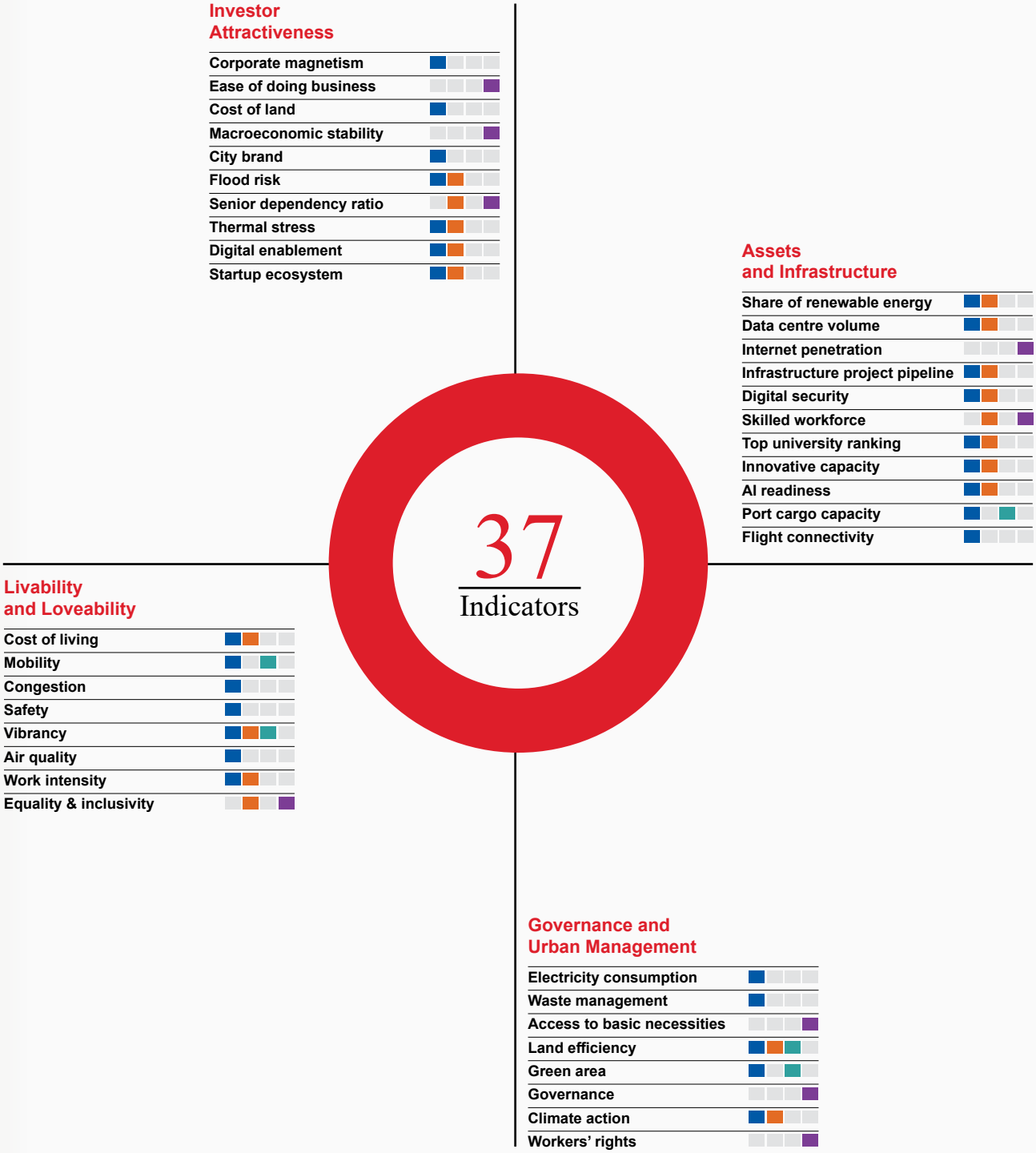
37

Indicators

We sought to identify the most important drivers of a city's long-term positioning and competitive advantage – reflecting its preparedness for the future, its ability to respond to upcoming risks and its readiness to capture opportunities and attract and retain talent and investment.

Drawing from our own experience in advising city leaders and shaping urban infrastructure, we chose 37 indicators from publicly available data to capture these variables. And in a departure from conventional competitiveness measures, one-third of these are non-traditional indicators that seek to capture a city's resilience to future environmental, climate and social challenges.

For example, some indicators measure a city's preparedness to withstand shocks and stressors. These include actions for climate mitigation or a city's vulnerability to major environmental and societal shifts like flood risk and aging demographics. Others reflect a city's readiness to capture future opportunities, for example, its ability to embrace AI, a favourable ecosystem for start-ups or a large share of renewables in the energy mix. The 37 indicators were sourced from publicly available data and existing indices[2] – supplemented with spatial analysis using data from Geographic Information Systems. We used city metrics where available, falling back on country-level data only when city-level data was not available.



View indicator descriptors →

City level | Future facing | Spatial analysis | National level

4

Dimensions

When analysing the key drivers of successful cities, we focused on four dimensions to assess competitiveness. To be globally competitive in future, we believe cities must pursue a balanced approach across these four dimensions. This will be very much driven by a city's individual strengths and weaknesses and by the particular opportunities and threats it faces.

Assets and Infrastructure

Assets gauge how well cities are connected globally, the capacity of critical infrastructure such as data centres or air and seaports and the share of renewable energy sources as part of the overall energy mix. As the world continues to digitalise, we also consider a city's AI capabilities and readiness as critical competitiveness factors.

Investor Attractiveness

Investor attractiveness looks at standard metrics such as macroeconomic stability – a composite of inflation, fiscal deficit, public debt and unemployment – and the ease of doing business. In addition, the analysis also includes the start-up ecosystem and the strength of a city's brand as a global city. It also factors in resilience to risk factors such as climate hazards and demographic challenges such as ageing populations.

Livability and Loveability

Liveability covers how suitable and comfortable a city is for its residents, including affordability, mobility, vibrancy and safety. We also explore factors such as public health, work-life balance and inclusiveness – increasingly important considerations for individuals and families when deciding where to live.

Urban Management and Governance

Urban management and governance explores a city's access to necessities, its efficiency in the use of land area and electricity and progress towards green sustainability goals. It also assesses how well a city is governed.

The changing nature of competitiveness

Our analysis shows that for cities the nature of competitiveness is changing in three main ways.

– Cities have a renewed imperative to focus on an ever-wider spectrum of urban resilience.

– They are experiencing ongoing demographic shifts impacting the needs of the residents and the future shape of their city.

– Finally, the importance of a city's intangible qualities, namely its lovability, is rising significantly.

This upends some traditional assumptions about globally competitive cities and reveal how tomorrow's leaders could be quite different from successful cities today. We explore these three major shifts, in detail, in the three chapters of our report.

Image: Sydney, Australia

The need for greater resilience

A mix of factors, including long-term trends and more recent events, are placing new demands on cities and creating additional priorities for local and national governments.

Three factors in particular – climate change, ageing populations and the legacy of Covid-19 – are shaping the future of cities in important and perhaps irrevocable ways.

Climate change presents both immediate and long-term risks. It affects people, businesses and physical and financial assets, and it will be a big factor in shaping the global competitiveness of cities.

Cities are both a cause of climate change – accounting for 70 per cent of global greenhouse emissions[3] – and are at major risk of a warming climate. Climate change is a long-term risk to cities that is also capable of inflicting devastating short-term shocks. As global temperatures rise, climate disasters are increasing in frequency and intensity, and the exposure of cities to climate risks is growing.

C40 Cities, a global network of the world's leading cities, estimates that by 2050, storms and sea-level rise will threaten more than 570 coastal cities that are home to 800 million people.[4] When cities in river plains are included, the population vulnerable to flooding rises to 1.81 billion, according to the World Bank.[5] In recent years, storms and hurricanes have caused many deaths and billions of dollars in damage from Seoul to New York, and from Lagos to Brisbane.

Rising temperatures and more frequent heatwaves are another threat to human health and economic productivity, particularly in cities, where buildings, concrete and other infrastructure trap heat and aggravate the problem. Arup's Urban Heat Snapshot,[6] which maps the vulnerability of urban areas to extreme heat, shows how densely built-up areas with little green cover can be more than 8°C hotter than the rural surroundings in a heatwave. According to the Intergovernmental Panel on Climate Change,[7] which brings together the world's leading climate scientists, almost 200 cities around the globe, half of them in India, will suffer from extreme heat stress if global temperatures continue to rise unchecked. In response to the dangers posed by heatwaves, some cities, such as Dhaka, have appointed "chief heat officers".[8]

When making investment decisions, for example, businesses now consider the share of renewables in a city's energy mix as an important enabler for the achievement of their own environmental, social and governance (ESG) goals and targets. Increasingly, climate preparedness is seen as synonymous with good governance.

Image: Dhaka, Bangladesh

Cities with a chief climate, resilience or sustainability officer can reassure investors that local governments have a vision and plan for how to respond to growing climate threats. CDP,[9] an environmental consultancy, included 119 cities in its "A List" of global climate leaders last year. CDP analysis of the 939 cities that report data shows "A List" cities report taking four times as many mitigation and adaptation measures as non- "A List" cities.

Our analysis found that cities that have mapped their vulnerability to climate risks, and have plans to build climate resilience and mitigation increase their attractiveness to investors, businesses and city dwellers. Failure to manage climate risks, by contrast, is now seen as detrimental to a city's global competitiveness. We explore this further in chapter one.

Demographic challenges and dividends

The United Nations describes population ageing as one of the most significant social transformations of the 21st century.[10] The median age in the majority of OECD countries is now above 40, compared with 32 in 1990.[11] In 20 countries, nearly 20 percent of the population is aged 65 and above.[12] Ageing populations will place more new and urgent demands on cities, from the need for adapted housing to fully accessible public transport and easy-to-use technology.

In tandem, many cities of the developing world, and rural areas globally, experience substantial brain drain as young, educated talent moves in search of new, higher paying opportunities. To combat this, cities need to pay close attention to the needs of younger generations, because so much of economic life, not to mention the health of city finances, rests on their shoulders.

The way each generation lives and works is dramatically different, shaped by experiencing different economic cycles (upticks or recessions), rapid technological advancement, geopolitical conflict and social change. The four generations we have in the workforce, from baby boomers to Gen Z, have varying motivations, communications styles and values shifting towards principles like greater flexibility, diversity and creativity. This shift has led to a move away from hierarchical structures toward more open and flat organizations, from traditional company loyalty and career consistency to career fluidity, and from fixed office-based work to flexible, remote, and digital collaboration.

The Covid pandemic exacerbated and accelerated changes to how we work and our connection to traditional workplaces such as the office. At a deeper level it prompted many to reassess their values and work-life balance. The capacity for remote working in many jobs encourages a much broader diversity of employee from a wider geographical location and enables more flexibility around working hours, all of which helps businesses attract and retain quality staff.

In addition to new ways of working, the developing world is experiencing a variety of other demographic shifts from rapid urbanization to the rise of the middle class, reshaping consumption patterns, adding pressure to constrained urban infrastructure, and demanding improved quality of life.

Demographic and behavioural shifts have physical and spatial implications. New ways of working challenge the standard assumptions and design principles of a city, sparking a rethink around the way central business districts (CBDs) are designed and used. In addition to luring people back to the office, cities are exploring strategies to revitalise CBDs, shifting from monofunctional commercial spaces to multifunctional facilities, or from rigid structures to flexible and modular spaces. This shift involves introducing more urban greenery, new entertainment options and more urban amenities to improve vibrancy. Beyond adapting cities physically, city practitioners are refining the proposition of a city to ensure the young and talented stick around through placemaking and programming of public spaces.

Liveability versus loveability

As recently as 10 years ago, competitiveness was all about efficiency and the economy. It was about prioritising commerce and businesses and strategies in order to win public funds for development and/or private capital for new business and investment opportunities. City governments focused on how to become more efficient, rather than how to nurture human connections. They scored high in global competitiveness rankings if they were well managed, investor-friendly and safe to live in. But with so many cities chasing the same things in the same way, there was little to distinguish one from another. While competitiveness is still largely about the economy, there is a growing recognition that a broader definition of economy that includes environmental and social factors is crucial for long term sustainability.

The ability to work from anywhere (thanks to advances in technology and digital connectivity) has introduced a new dimension to competition between cities. In addition to being liveable, successful cities must also be loveable. Digital nomads are gravitating to cities that are culturally rich and vibrant and offer a distinct lifestyle. It is obliging cities to rethink their unique selling points, invest in their brand and to promote their social and cultural offerings in addition to their economic advantages.

Image: Austin, Texas

View our analysis tool

Nusantara: Indonesia's new capital city

The planning, development, and delivery of Indonesia's new capital city, Nusantara in eastern Kalimantan is an ambitious undertaking. Its vision is to be a world-class city for all and will symbolise an important milestone in the transformation toward a modern and advanced Indonesia. Recognising the importance of shaping a unique urban experience right from the start to attract and retain residents and business to Nusantara, the city aims to be not just liveable, but also able to create a deep emotional connection between the residents and their living environment (lovable).

Arup, with the Asian Development Bank, has supported a study with the Nusantara Capital Authority to shape a definition of lovability for Nusantara, and use this definition to identify priority projects for Nusantara to implement early on in its development. Example lovability projects include flagship green spaces and "hidden gem" everyday places that are conceived by and for people and evolve to meet the needs of the community and spaces to develop a shared cultural identity around art, food and nature.

The power of collaboration

But it's not just about competing. It's also about uniting with peers and other stakeholders to tackle common goals. As cities seek to solve a growing roster of complex challenges, we are seeing a move towards greater collaboration to work out solutions together. Collaboration works at different levels. Within cities, institutions can pull together to promote local strengths or solve local problems; by forging regional networks, cities gain critical competitive mass; and they can collaborate across regions and national borders to exchange expertise and address global issues such as climate change.

Image: Jakarta, Indonesia

Chapter 1: Urban resilience

Protecting people and assets

1

In the coming decades, a city's ability to remain competitive while supporting the wellbeing of its citizens will depend on its ability to withstand shocks and stresses – not just against the effects of climate change, but also against pandemics, energy supply, cyberattacks and other vulnerabilities.

Urban resilience is the capacity of a city's systems, businesses, institutions, communities and individuals to survive, adapt and thrive, no matter what chronic stresses and acute shocks they experience. Resilient cities can better withstand and recover from natural disasters, and by preparing for and mitigating risks, cities can maintain economic stability even during crises. Resilient cities ensure that essential services such as healthcare, water and electricity remain available during emergencies. Climate impacts, meanwhile, have brought the importance of resilience planning to the fore.

By strengthening its underlying fabric and deepening its understanding of the risks that threaten its stability, a city can improve its overall competitiveness and the wellbeing of its citizens; it can prosper despite rising challenges. Urban resilience responds to three converging global megatrends: climate change, urbanisation and globalisation.

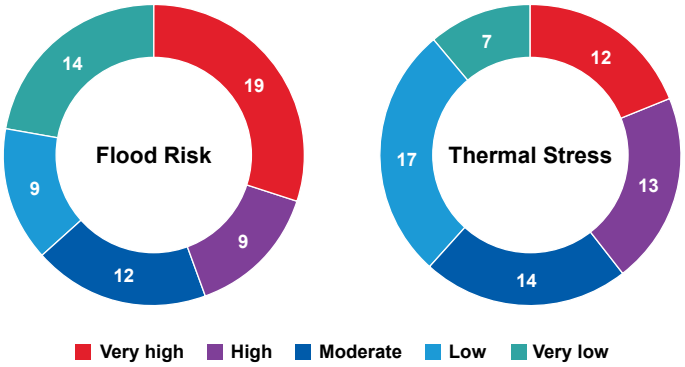
Later chapters will address the broader aspects of urban resilience, but for many reasons we regard climate resilience – measures to both abate a city's carbon emissions and adapt to the impacts of global warming – as the foundation for future competitiveness. Global warming is already having severe impacts on urban life – from overheating and flooding to increased migration and economic disruption. Climate risks are weighing more heavily on decision-making by businesses and investors and have already begun to affect the availability of essential business enablers, such as insurance[13].

Without climate resilience, cities will not be able to protect their citizens or their critical infrastructure from extreme weather events, which are growing in frequency and intensity, and the damage they cause. To continue attracting talent and investment and to protect existing assets, cities must plan for a rapidly changing climate.

Across the four categories of competitiveness, our analysis selected 11 indicators to measure climate preparedness. Arup paid particular attention to forward-looking factors such as flood risk, infrastructure readiness, share of renewable energy and climate action plans and land-use efficiency. We used spatial analysis to determine the availability of green areas in a city, which not only combat extreme heat and pollution, but also make life more pleasant for city dwellers.

Image: Shanghai, China

Fig. 1
Vulnerability to Climate-Related Challenges
A high proportion of cities globally are prone to climate-linked shocks and stresses, pointing to an urgent need for action. In this study, over 35% of cities face high or very high risks from flooding and thermal stress, placing them in a critically precarious position.



Sources: clima.cbe.berkeley.edu/ and Rentschler, J, Salhab, M and Jafino, B. 2022. Flood Exposure and Poverty in 188 Countries. Nature Communications

Image: Warsaw, Poland

Climate resilience begins with good governance

Good climate governance means cities have plans in place to protect their citizens and critical infrastructure against extreme weather events. Bangladesh's early warning system against typhoons and flash floods, for example, is capable of evacuating millions of people within 24 hours and is likely to have saved countless lives in recent decades, making the country a leader in disaster risk reduction.[14]

In terms of governance, most of the 63 cities included in the analysis are faring well in climate preparedness efforts: 90 per cent have set a renewable energy target, 76 per cent have a well-developed climate strategy plan and 50 percent have satisfactory national net zero target designs.

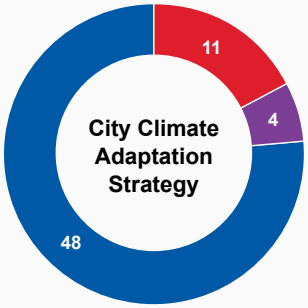
Cities can plan for a more liveable, resilient and economically vibrant future. The Singapore Green Plan 2030 takes a whole-of-government approach to guide urban development towards sustainable outcomes. Doing so encourages synergies and resource sharing, by aligning all ministries and authorities in Singapore to common goals, such as developing a green economy or ensuring a resilient future. Development planning helps shine a light not only on existing challenges, but on emerging ones, too. While addressing traditional priorities – such as efficient urban development – Singapore is also turning its attention to mitigating climate change and adapting to its potential risks, such as rising sea levels and urban heat-island effects.

In Eastern Europe, where cities are burdened with high-emission legacy assets, the challenge has been to manage the energy transition in a way that does not raise the cost of heating and electricity or exacerbate income inequalities. Warsaw's Green City and Climate Action Plan attempts to address this challenge by engaging with the public through social awareness campaigns, training and education programmes focused on saving water and energy, protecting biodiversity and understanding urban blue-green infrastructure solutions.

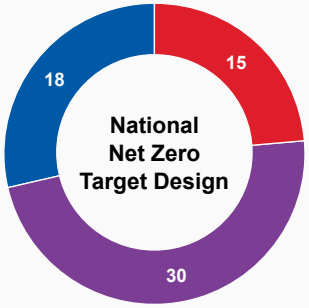
47%
of assessed cities have chief sustainability, resilience or climate action officers

57
assessed cities have renewable energy targets

Fig. 2
Climate Governance in Cities
Effective governance must be ensured at all levels—city, regional, and national. Cities around the world are showing great promise, with 76% in this study having developed complete climate action strategies. However, the true challenge lies in implementation, where strong leadership, sustainable financing, stakeholder engagement, and capacity building will be critical to success. 47% of cities have appointed a chief officer responsible for sustainability, resilience or climate action, which is a positive step towards effective implementation of these strategies.



Sources: climateactiontracker.org climatecentral.org



Source: data.cdp.net

A safe haven for investors

Climate preparedness reassures investors that cities have established a comprehensive response to present and future climate risks. It lowers the cost of doing business, facilitates finance and can translate into better credit ratings for city governments.

Even cities that face acute climate risks - such as Miami, where rising sea levels could make much of the city uninhabitable by the end of this century[15] - can defend their credit standing with well-executed climate resilience plans. In 2018, Miami launched a $400 million "forever bond" to finance climate resilience. The bond has financed projects such as installing more water pumps, raising flood barrier defences, elevating roadways, protecting parks and cultural facilities, and building affordable housing.

S&P Global Ratings has assigned an AA long-term credit rating to the City of Miami, in part thanks to the latter's strong mitigation response to climate risks. What's more, the city is booming. Miami has added 600,000 residents since 2010, construction activity is at an all-time high, and billionaires and big multinationals have moved there.[16]

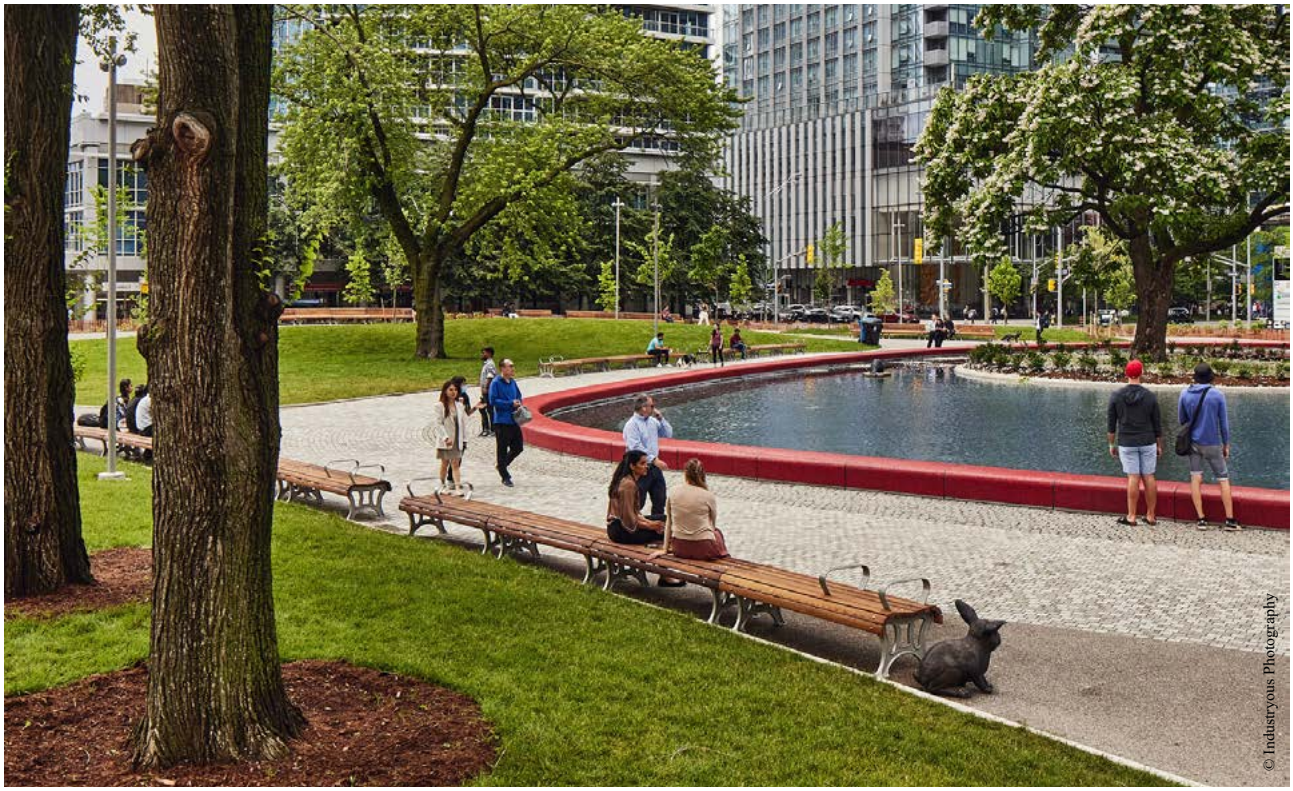
The International Monetary Fund has found a positive correlation between climate-change resilience and sovereign credit ratings, indicating the positive financial impact that preparedness can bring.[17] In addition to being a challenge, net-zero or decarbonisation targets can become a new source for economic growth, spurring innovation and new low-carbon businesses activities, particularly in areas with carbon-intensive industrial processes.

Further reading
Green Economy report

Fig. 3 Taking climate action can help protect a city's credit rating

	Christchurch **2011 Earthquake**	New Orleans **2005 Hurricane Katrina**	Toronto **Extreme weather risks**	Miami **High flood risks and sea level rise**
Credit Rating Prior	AA+	BBB+	AA	AA-
	↓	↓	=	↑
Credit Rating After	AA	BB	AA	AA
	Damages estimated to be 10% of the city's GDP. Policies and insurance schemes lacked coverage of natural disasters. Source: rnz.co.nz	One year after the hurricane, the city's population dropped by half and its value revenue dropped by US$4bn. The city was slow to gather and deploy aid. Source: nola.com	Demand for municipal bonds remains high owing in part to the city's bold climate action, seen through the launch of its sixth green bond worth CAD400 million. Source: toronto.ca	Miami has strong mitigative responses to climate risks, such as setting up an obligation bond measure for projects related to rising sea levels. Source: mcusercontent.com

Image: Miami, USA


© Industryous Photography

Protecting assets

Climate preparedness can also save cities a lot of money down the line. The Global Center on Adaptation, Rotterdam, estimates the overall rate of return on investments in improved resilience is high, with cost-benefit ratios ranging from 2:1 to 10:1 and in some cases even higher.[18] Climate-proofing infrastructure saves on the cost of rebuilding after extreme weather events; it helps households and businesses avoid future losses; and it can generate positive economic gains through innovation, in addition to other social and environmental benefits.

Earthquakes in New Zealand in 2010 and 2011 resulted in damage to 150,000 homes. Claims made to the government Earthquake Commission (EQC), net of reinsurance cover, exceed $7 billion. On top of these costs, the Government is also expecting to spend over $5.5 billion on earthquake related costs, including over $1.5 billion for local infrastructure, $1 billion for land purchase and remediation, and $230 million for welfare support.[19]

Protecting urban assets requires unique and creative solutions. In Shanghai, which has faced serious urban flooding and river pollution in recent years, Arup has worked on an urban drainage masterplan covering 640km^2 and 15 million people. It proposed a visionary "blue, green and grey" approach to support an integrated water cycle within the city, which will also benefit other aspects across greater Shanghai, including ecology, economy and public health[20].

Nature-based solutions can achieve more than climate resilience, and enhance a city's liveability and vibrancy as well. Arup worked with the City of Toronto to develop a resilient stormwater management system in Toronto's Love Park in order to protect and preserve the city's waterfront. Arup addressed groundwater clearance by designing a shallow yet extensive stormwater management system that enhances the site's potential for water retention and detention. Layers of bio-engineered soil buried beneath elevated grassy mounds are hydraulically connected and maximise the return of water to the soil. For added resilience, overflow connections discharge water into the local stormwater sewer system only after the bioretention network is saturated.

Images: Christchurch, New Zealand and Toronto, Canada

Image: Athens, Greece

Living with climate change

The diverse effects of climate change such as rising sea levels and higher temperatures, floods, droughts and fires are increasingly impacting all our lives.[21] Millions of people are facing recurrent heatwaves with well-reported lethal consequences, and the way our cities are designed may inadvertently be making them even hotter. Concrete buildings, tarmacked roads, steel and glass structures, air-conditioning units and traffic congestion can raise urban temperatures by several degrees compared to surrounding rural areas. This is known as the urban heat island effect[22]. In the summer of 2021, Greece experienced its most devastating heatwave in three decades[23], It recorded over 2,300 excess deaths (excluding registered deaths from coronavirus) between late July and mid-August compared with the last five years. Nearly 1,400 of the excess deaths took place in the first week of August alone. As a result, they appointed their first Chief Heat Officer[24].

The city has taken various other steps to address extreme heat. In 2018 they were a partner in the EXTREMA project[25] which uses smartphones to alert an individual to their heat-based health risk. It uses real-time satellite data, along with other model and city-

specific data to estimate the temperature, humidity, and discomfort index for every square kilometre in the city. Temperature estimates are updated every 5 minutes along with recommendations and routing instructions shared to nearby cooling centres. The application has been instrumental in protecting the vulnerable from extreme heat by improving the visibility and accessibility to water points (taps and sprays) and cooling centres. Moreover, it supports the city's risk management and planning capabilities.

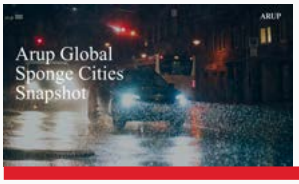
EXTREMA has also provided opportunity for cross-border and inter-city collaboration to further climate adaptation and resilience efforts in Europe, and has also been successfully implemented in Rotterdam, Paris, Mallorca and Milan with other cities, such as Lisbon, due to come online.

Cities can reduce urban heat risk with nature-based solutions, such as planting trees and installing green roofs, which have been shown to reduce temperatures by up to 4.5°C [26] over the summer months. In Madrid, for example, Arup's sustainability experts drew up guidelines for greening buildings, infrastructure and open spaces. The Madrid + Natural[27] report stresses the importance of integrating nature into the urban fabric as a tool to address climate change, reinvigorate neighbourhoods and improve the wellbeing of city dwellers.

City leaders, urban designers and planners need to better understand how their designs can mitigate urban heat hot spots. This is particularly so for the most vulnerable communities as it is better understood that low-income neighbourhoods are more at risk to heat exposure[28] due to factors such as a lack of trees and limited access to cooling technologies. City authorities can respond to the foreseeable need for more potable water and shade during heatwaves by installing more public drinking water fountains, for example, or cooling housing by painting roofs white and installing external blinds or shutters.

To help cities cope with increasingly heavy rainfall and other impacts of climate change, 44% of the cities in our analysis have a high level of flood risk. Cities will need to learn to cope with less predictable and more extreme heavy rainfall events. Arup uses artificial intelligence (AI) and Terrain, its land-use analysis tool, to measure the "sponginess" of cities[29]. The goal is to make cities aware of their natural capital – their green areas, lakes and ponds, types of soil and vegetation – which together can help manage flooding.

Further reading
Urban Heat Snapshot



Further reading
Global Sponge Cities Snapshot

Key urban resilience indicators

Here are some indicators that cities should track to build urban resilience.

View indicator descriptors →

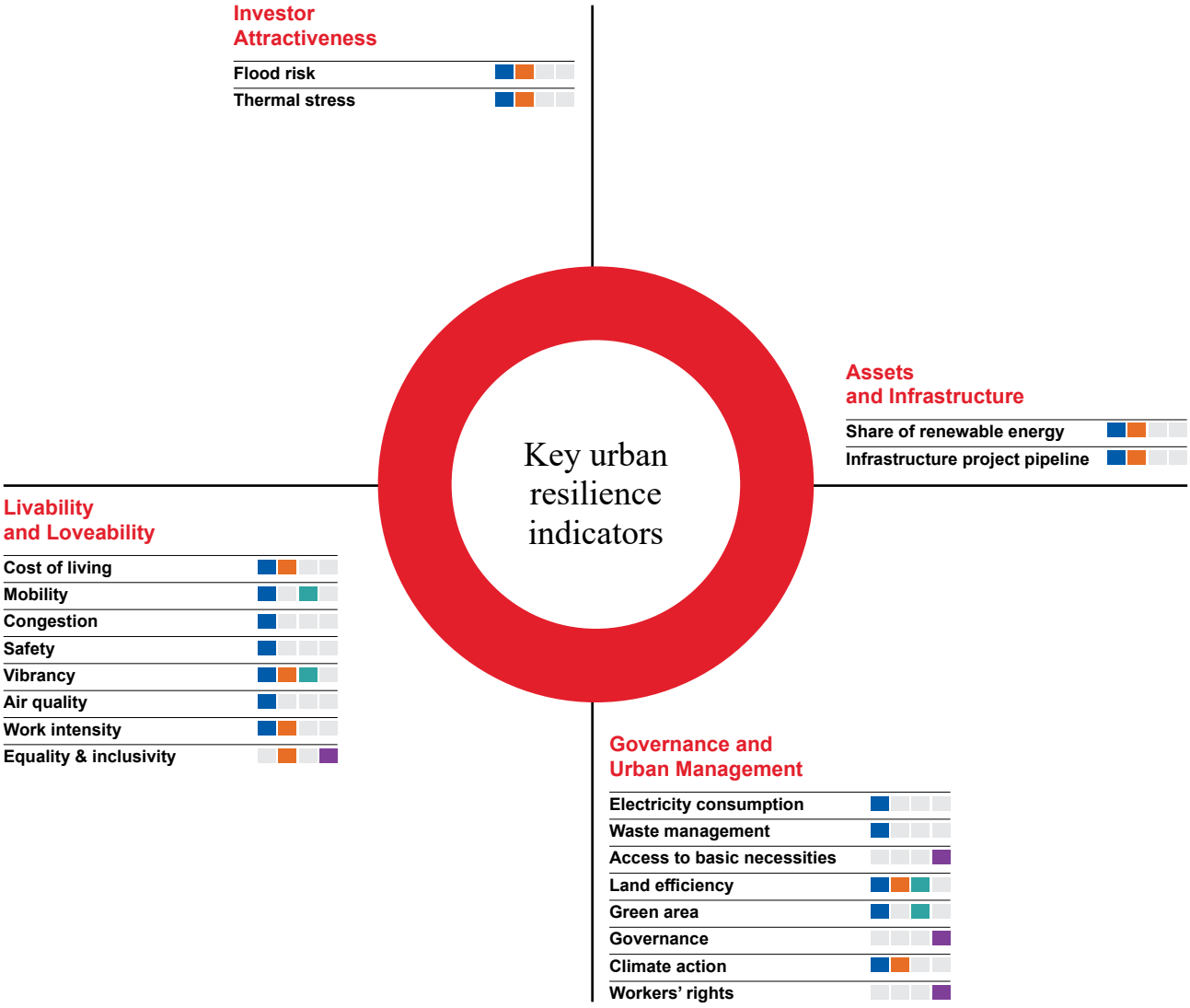
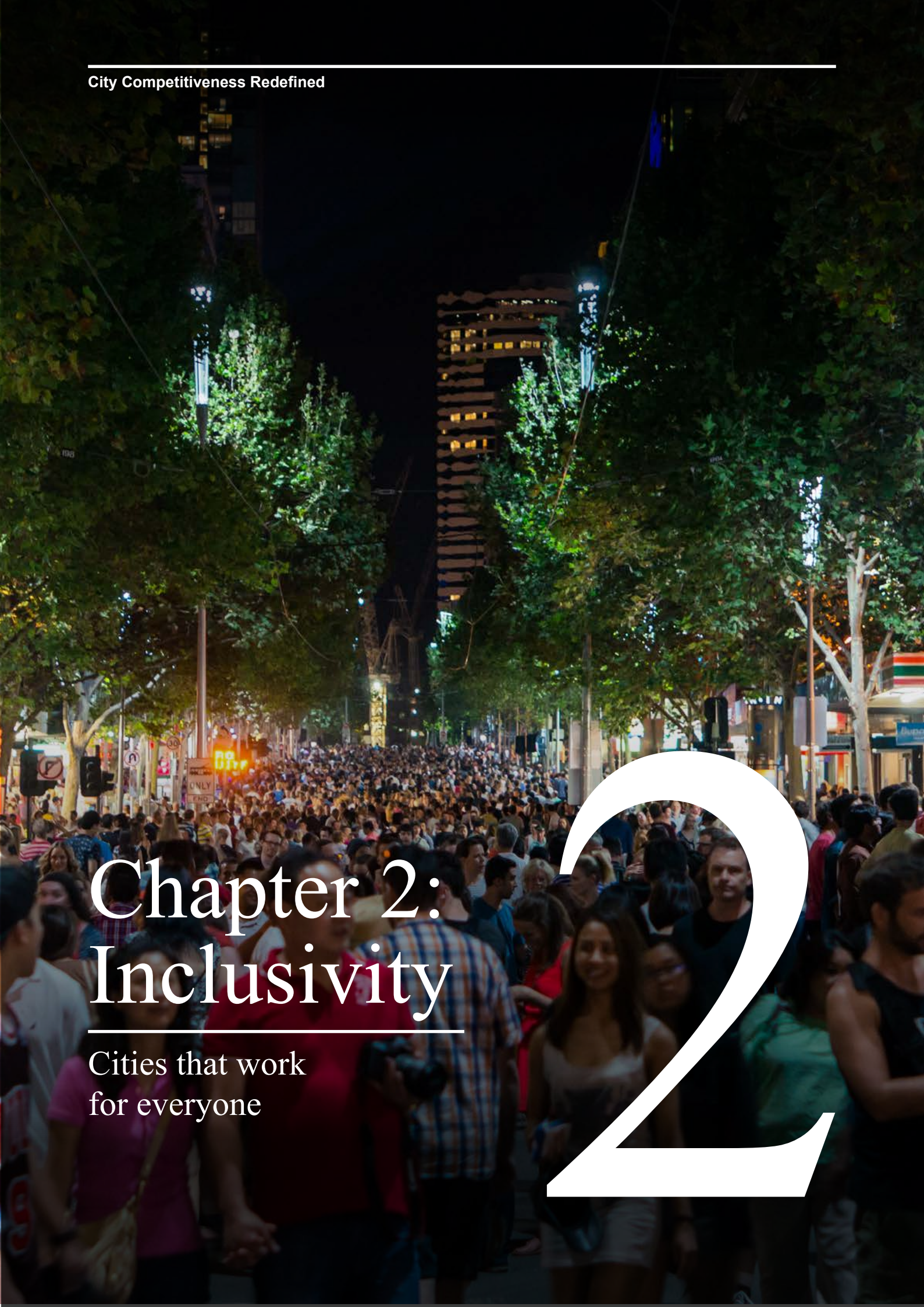


Image: Paris, France



Chapter 2: Inclusivity

Cities that work for everyone

2

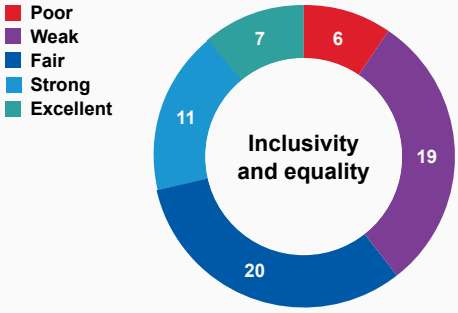
Successful cities need to be socially resilient. This means understanding and being able to respond to specific demographic challenges, such as population ageing or migration, while also generating opportunities to attract greater generational diversity and new talent. There's a lot to be gained from enhancing social resilience and much that city governments and urban planners can do to improve the cohesiveness and inclusiveness of urban living.

Planning inclusive cities means accommodating many more perspectives than in the past. Once the purview of architects and engineers, urban planning today is more likely to weave a tapestry of urban practitioners, including local government officials, ecologists and sustainability experts, health and education officials, as well as NGOs and representatives of various social groups. Cities around the world are increasingly leveraging data, technology and AI to enhance efficiency and improve the quality of life for their residents in areas such as smart infrastructure, transport planning, public safety, environmental monitoring and citizen engagement.

Bringing a gender lens to urban planning, for example, helps to improve the safety of public spaces – and not only for women.[30] Improving lighting and visibility can make cities feel safer, more accessible and liveable for everyone. From Melbourne to Quito to Las Vegas, this approach has helped address the wellbeing and security of women in public spaces.

In the cohort of 63 cities analysed, seven cities including Auckland, Barcelona, Berlin and Toronto, showed strong evidence of actions to promote inclusivity and equality, while a further 11 cities, including Vienna, Paris, Santiago and Manchester, also fared well. But taken together, only 29 per cent of our sample scored well on inclusivity (see fig. 4 below), meaning there's room for progress.

Fig. 4 Inclusivity and Equality in Cities



Sources: datapandas.org, coupleofmen.com, worldpolicycenter.org, and the World Economic Forum's Global Gender Gap Index worldpopulationreview.com

Image: Melbourne, Australia

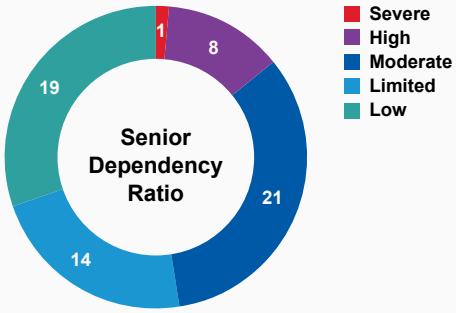
Senior concerns

Inclusivity means considering the needs of different age cohorts and interest groups, including senior citizens. The challenge of ageing populations – one of the defining megatrends of this century – has enormous implications for the economic and social vibrancy of cities. For the first time in history, there are now more people aged over 65 than there are children under the age of five.[30] Enabling senior citizens to lead healthy and active lives will require city authorities to adapt their public services, infrastructure and housing.

Where ageing coincides with falling birth rates or emigration, as in Tokyo, populations enter into decline, which brings an additional set of challenges for city leaders: how to maintain the economic and social vibrancy of a city when your population is not only ageing but shrinking. Tokyo has a comprehensive set of measures towards meeting its Society 5.0 vision where the older population is encouraged to stay healthy and active. It has also meant rethinking infrastructure, from asset recycling of schools into care facilities to repurposing community facilities to support multigenerational uses and disaster response infrastructure[32].

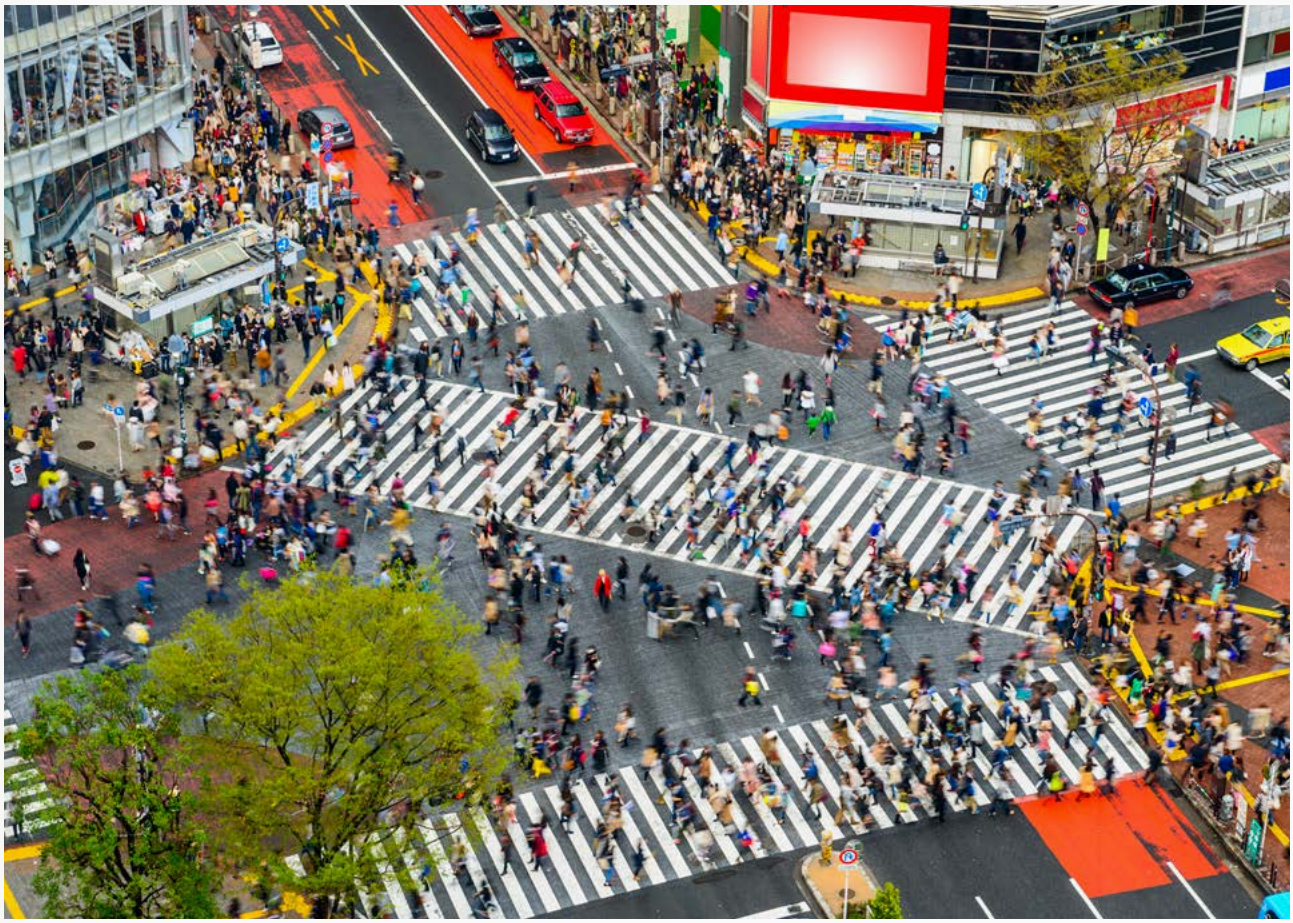
Images: Tokyo, Japan

Fig. 5
Ageing populations as a critical challenge
14 per cent of cities have a significant ageing population challenge (high to severe senior dependency ratio). As fertility rates fall and life expectancy ages increase, the number of cities that will face this challenge will only rise. Beyond pressures added to working-age populations, this challenges existing city infrastructure and systems that may not be accessible or designed to accommodate older adults. Inclusive planning approaches can help mitigate these challenges by actively involving older adults in decision-making to ensure urban environments promote mobility, safety and social interaction for all generations.



Source: oecd.org

14%
of cities have a significant ageing population challenge



Rethinking talent attractiveness

Part of the answer lies in revitalising the social and economic fabric of a city by attracting younger generations to live there. And because population ageing is a global trend, the battle for the best and brightest is set to intensify and the ability to attract talent will become a critical marker of a city's future competitiveness.

Wealthy cities, particularly those that are hubs for business, finance and tech, have little difficulty in attracting talent. Our analysis, however, finds that professionals today seek much more, including a better work-life balance.

When quality of life indicators are taken into account, new "world cities" such as Vancouver, São Paulo, Vienna and Copenhagen have the potential to match - or even surpass - global leaders such as Singapore, London, Paris, New York and San Fransisco. Figure 6 shows how rethinking the drivers of talent attractiveness results in a shift in cities that emerge as global talent magnets. Alongside traditional economic indicators, this perspective defines a new pillar that cities should consider.

Cities can enhance their quality of life in many ways. They can increase the supply of affordable housing and green spaces, for example, or invest in wider public transport networks. They can also promote culture, diversity and equality and workers' rights. Arup's City Competitiveness Redefined analysis incorporates these quality of life indicators to paint a fuller picture of what attracts skilled workers (particularly younger generations) to a city and what makes them stay.

While still offering a robust business environment, these cities have an added emphasis on the values that the new generation of workers tend to prioritise.

This may translate into targeted investment in immigration and diversity policies, such as Copenhagen's capacity campaign[33], or Vienna's public housing[34], transport and cross-city transport links.

Although these cities may not be able to compete with traditional global cities on magnitude of investments and talent inflow, the new focus on dynamism and liveability has allowed these smaller cities to gain an edge over their peers in specific industries by focusing on holistic city living.

Vancouver, consistently rated one of the world's most liveable cities, has seen a significant increase in the number of residents in their 30s, thanks to a fast-growing tech hub and migration policies that target young professionals from abroad. As a result, the city ranks highly in terms of its multicultural vibe and work-life balance, now a top priority for young talent.

Another strength is Vancouver's participatory planning[35]. The city takes a community-led approach, allowing residents to feel a part of the decision-making process. Nevertheless, Arup's analysis points to a future cost of living challenge that could affect Vancouver's ability to attract talent in the years ahead. The city's affordable housing projects are a good response to this.

Fig 6. Rethinking talent magnets

A city's capacity to attract talent is likely to shift when considering the new and evolving priorities of skilled professionals. Traditional talent hubs such as Tokyo, Mumbai, and Paris, which have been recognized globally and regionally as talent hubs in the past, may see a decline in their attractiveness as these emerging priorities are taken into account. Conversely, cities that align more closely with these priorities are positioned to excel in attracting future talent. Notably, cities like Nairobi, Manchester, Copenhagen, and New Orleans are expected to experience significant improvements in their talent attraction and retention capabilities. Fig.6 evaluates each city based on its historical standing.

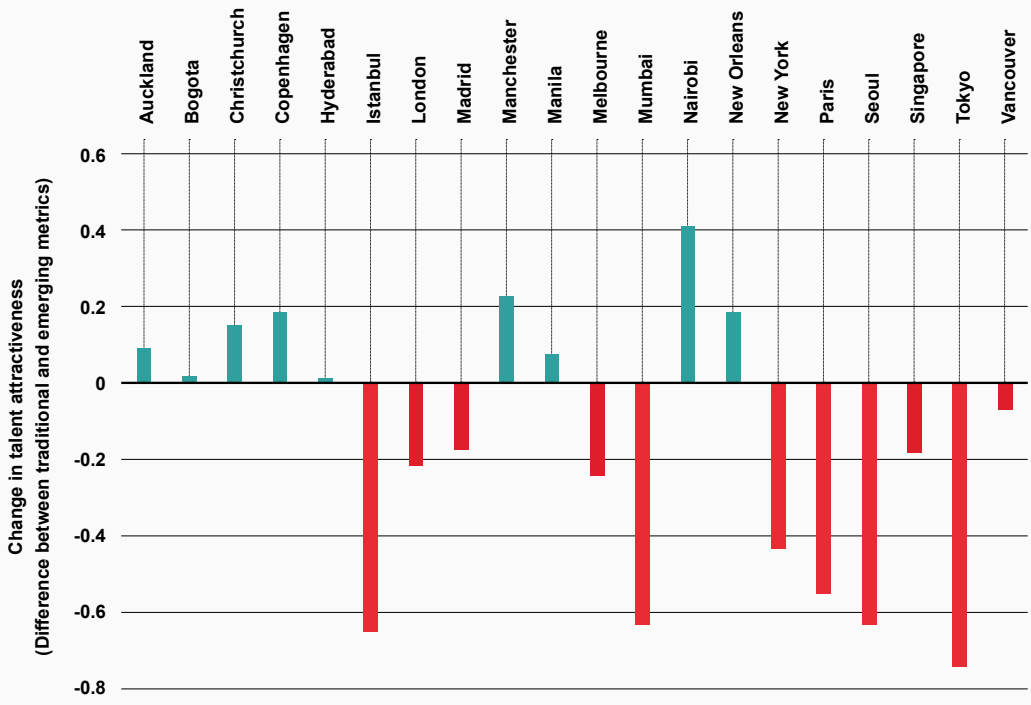


Image: Vancouver, Canada

Investors look at the broader picture

When weighing up cities against one another, investors consider a broad range of factors beyond the metrics of doing business. Increasingly, these factors will include the subjects discussed in this chapter: inclusivity, talent, and participatory planning. Businesses are paying attention to demographics and education, particularly when it comes to recruitment. Open communication and consultation channels with city governments are valued for facilitating the ease of doing business. A participatory approach to urban planning reassures investors that their needs are being taken into account – from having utilities and broadband connectivity in place to planning permission.

Our analysis shows that investors are interested in broad-based economic resilience, in social resilience, including having functioning schools and public services, and in climate resilience.

We are working with a number of strategic partners to take forward concepts such as the 15-minute city and Green and Thriving Neighbourhoods, which help to build strong communities alongside economically sustainable districts. Madrid Nuevo Norte is a major urban regeneration project that seeks to bring local voices to bear to help co-create this new part of the city.

Further reading
Green and thriving neighbourhoods

Image: Madrid, Spain

A holistic approach to liveability

Several cities in our survey did very well on liveability, with 17 rating as Best in Class, but there are two very distinct approaches to achieving this. Some cities do so by being incredibly good at specific aspects of liveability, for example, getting top scores for mobility or safety. Other cities may not achieve the highest scores against any one indicator, but perform very well across the board, taking a more holistic approach to liveability. The latter group includes Madrid, Copenhagen, and Christchurch in New Zealand.

Madrid takes a very holistic approach to liveability, with a top score for inclusivity and equality and high scores across all other indicators. Madrid's commitment to promoting inclusion of those with disabilities, equality between genders and minimising gender-based violence has raised the relative safety and attractiveness of the place[36]. Its community engagement platform Decide_Madrid promoted by Madrid City Council, allows citizens to present projects and proposals that are assigned a share of municipal budgets[37]. One area that may be a challenge for the city in coming years is the cost of living and the availability of affordable housing for young people.

Thriving cities balance the needs of multiple generations and many interest groups – women, children, families, immigrants, LGBTQIA+ – to create inclusive and cohesive places in which all people can live and work.

Image: Copenhagen, Denmark

Key inclusivity indicators

These indicators can help cities measure progress on inclusivity.

View indicator descriptors →

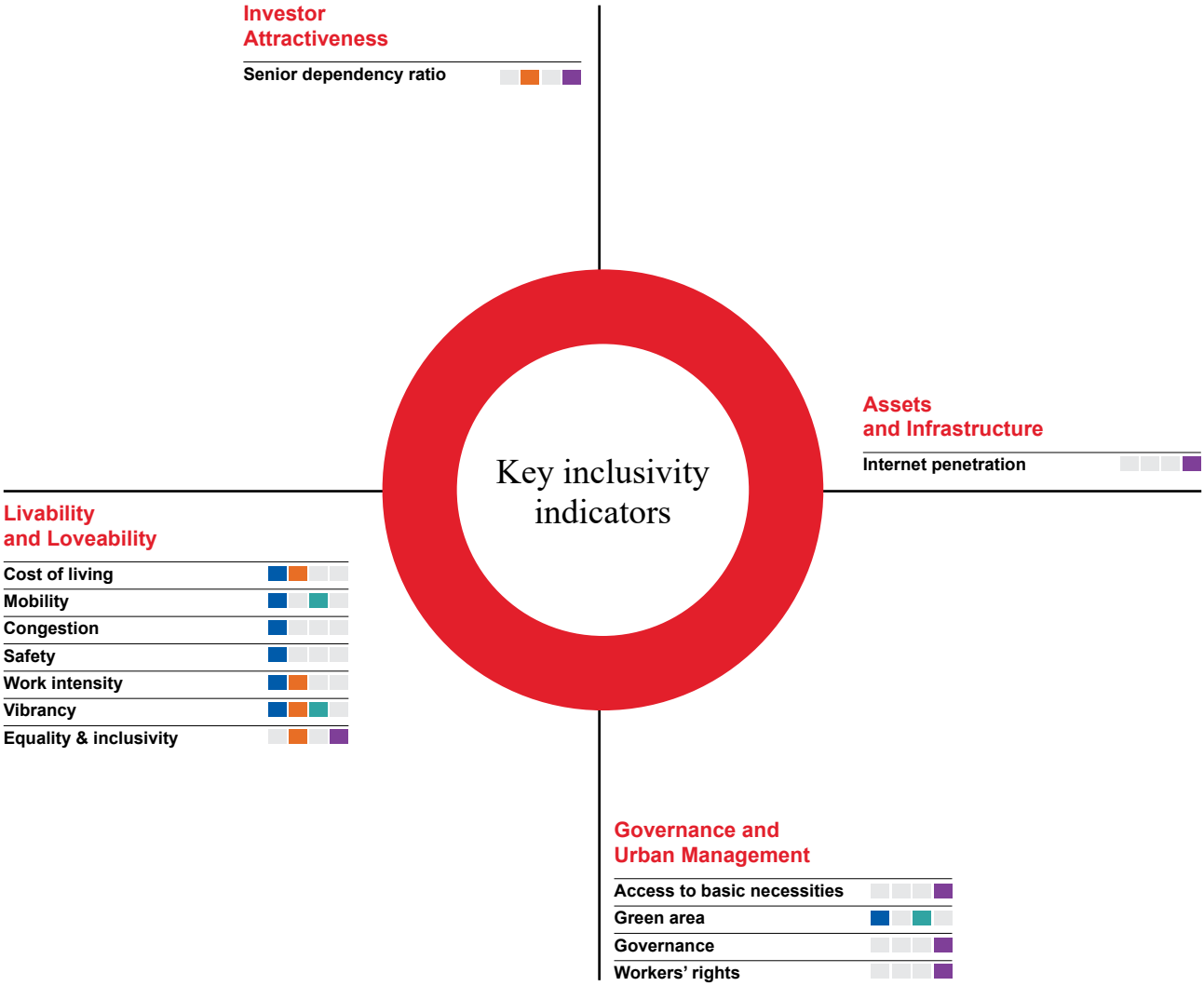
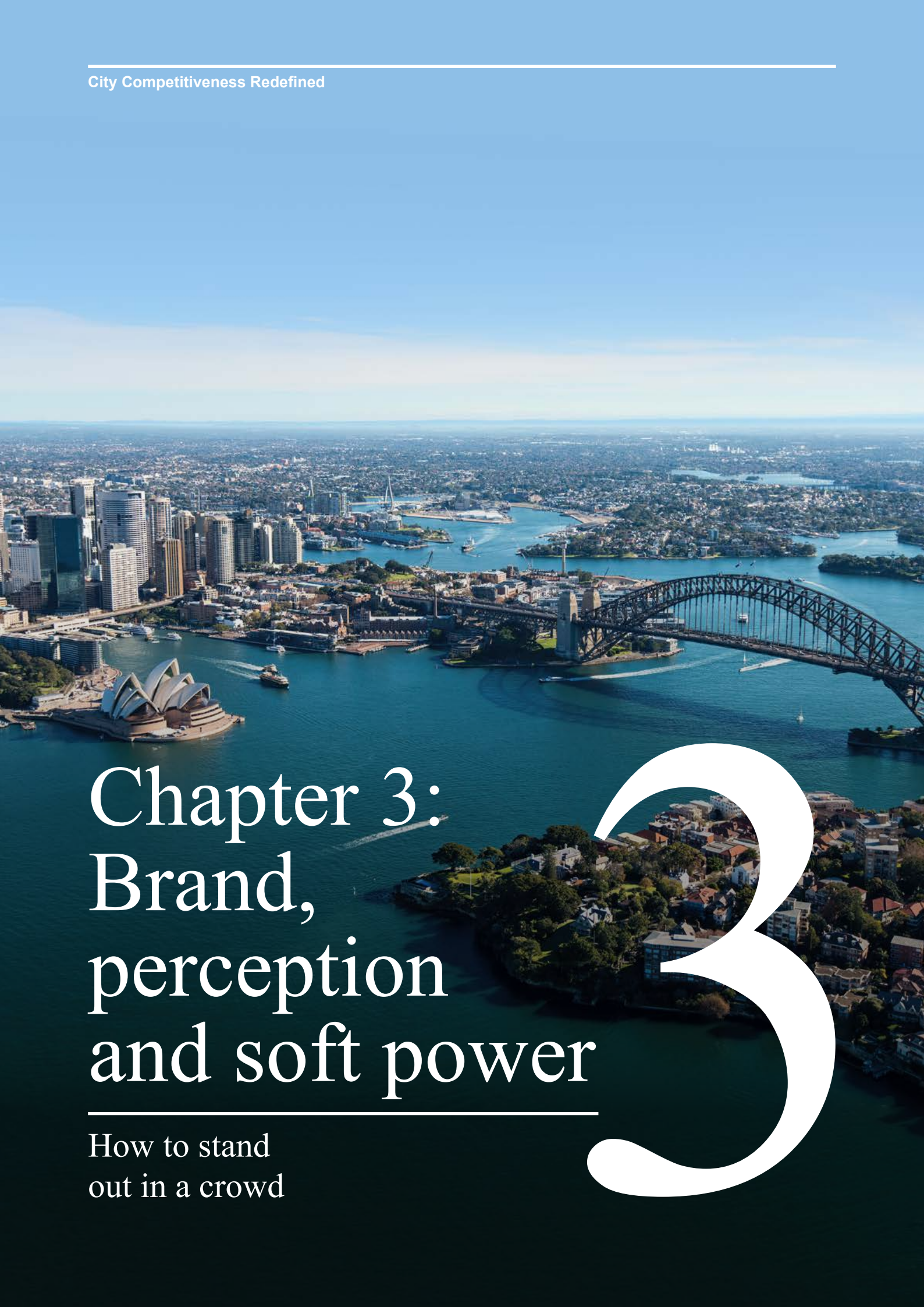


Image: Barcelona, Spain



Chapter 3: Brand, perception and soft power

3

How to stand out in a crowd

Arup's analysis of the future of global cities has sought to identify the most important drivers of a city's long-term positioning and competitive advantage, including investor attractiveness, social and environmental resilience, good governance and liveability. In addition, our analysis shows that a number of intangible factors are coming into play and that these are likely to have a bigger role in defining successful cities in the future.

These factors centre on the perceptions of a city – how residents, visitors and investors view it; whether it projects a strong city brand; how well its people, organisations and infrastructure work together and are connected to other cities; and how it wields soft power.

Positive perceptions and strong brands are particularly important for attracting and retaining talent. After all, one of a city's greatest assets is its people.

Arup's analysis aims to capture these intangible qualities through carefully selected indicators that measure – directly and indirectly – a city's dynamism, vibrancy and inclusivity.

We found, unsurprisingly, that high liveability scores and positive perceptions are strongly correlated. More surprisingly, we found that positive perceptions tend to linger even after problems, such as housing affordability, begin to affect a city's overall attractiveness and competitiveness. Vibrancy is very hard to measure. To capture a spatial proxy of vibrancy, Arup used a composite of different spatial metrics measured by our in-house GIS specialists. This indicator looks at land-use mix, cultural amenities and open-space density, as a proxy for vibrancy.

A city's position in university rankings can also boost its brand, as being a seat of learning has been part of a city's appeal for centuries. As competition for talent and resources increases, branding is a valuable tool that can help cities differentiate themselves and enhance their national (or international) positioning.

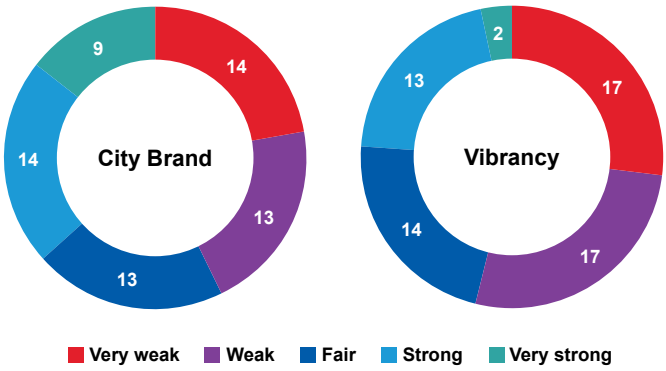
Arup uses the Brand Finance City Index[38] to speak to the strength of a city's brand and perception globally. This index is derived through an extensive global survey of adults aged 18-75 to assess familiarity, reputation and consideration of each city studied.

In previous chapters, we noted how investing in their city brands has enabled Copenhagen and Vancouver to attract and retain young talent. But a strong city brand does not have to be the product of great wealth or a concentration of talent. Soft power is a tool that can be wielded by cities in the Global South and Global North.

Image: Sydney, Australia

Fig 7 - Intangible Qualities of Cities
It's incredibly difficult to plan for and achieve success in the intangible factors of brand, perception and soft power. A mere 3% of cities have very strong vibrancy scores, and just 14% of cities have very strong global brands.

14%
of cities have excellent global brands



Source: brandfinance.com

Source:Arup Spatial Analysis

Image: Lima, Peru

Boosting confidence through soft power

A city's soft power focuses on its ability to attract, influence and collaborate with people, businesses and governments through influence and incentive rather than force. Examples of what makes up a city's soft power include cultural landmarks, vibrant arts scenes, prestigious educational institutions, economic opportunities, technological innovation, diversity, overall quality of life and strong, broad networks.

In our analysis Lima emerged as a Leader in Investor Attractiveness. The city has consistently built investor confidence by reliably delivering large and complex projects and programmes. For example, the city has successfully hosted the 2019 Pan American and Parapan American Games and has been asked to host them again in 2027[39]. International sporting events are a dynamic vehicle for projecting soft power, which is why many cities compete for them despite the huge cost. To prepare for the 2019 Games, which entailed building 15 permanent sports venues and 25 temporary ones, Lima leveraged government-to-government relations for technical assistance and brought in a consortium of partners (including Arup) to assist with the delivery of the sports infrastructure. Arup has also worked with the legacy organisation to implement a long-term maintenance and facilities plan for the venues.

The 2019 Games are considered by many to be the best in history[40]. The legacy organisation in Lima has worked hard to deliver lasting benefits to local communities by maintaining and making the venues available for local resident use, as well as elite athletes and more regional and international sports events. The Games gave Peruvians confidence and new skills which are now being used across the country, as it continues to deliver significant infrastructure. It has also resulted in the setting up of an Infrastructure Ministry that will focus on best practice. International investors have also noted Lima's heightened international standing. Net foreign direct investment reached 4.4 per cent of GDP in 2022, according to the World Bank[41], up from 2.1 per cent of GDP in 2019 and ahead of the 4 per cent average for Latin America and the Caribbean[42].

Positive perceptions and soft power are important for cities in the Global South for another reason: to stop the brain drain to wealthier cities in the Global North. A city that leverages its local assets, invests in vibrancy and elevates its brand inspires young talent to stay or return.

These lessons are also relevant for cities with strong brands, because fortunes change. Even successful cities can fall on hard times. To understand how cities can rebuild reputations and brands, it's instructive to look at those that have lost them and then come back fighting.

Leveraging local strengths

Pittsburgh in Pennsylvania, and Belfast in Northern Ireland are two cities that are successfully rebuilding their brands by re-examining and leveraging their unique assets.

Pittsburgh: A hub for “Eds and Meds”

When the steel industry went into decline in the 1980s, Pittsburgh was seen as a failing city. Jobs were scarce, talent was leaving in droves and the city coffers were empty. To turn itself around, Pittsburgh took a new look at its existing assets. These included strong academic institutions with a long record of R&D in the sciences, tech and medicine – such as Carnegie Mellon, Penn State and the University of Pittsburgh. Thanks to close collaboration between universities, the city administration and local business, Pittsburgh re-branded itself as a hub for “Eds and Meds”[43], which has been particularly effective in retaining research and start-up talent.

Belfast: A new innovation identity

The challenge facing Belfast was perhaps even more complex. A once thriving industrial port that had built RMS Titanic, Belfast struggled to attract new investment and talent. The 1998 Good Friday Agreement ended decades of civil and political unrest. It was a turning point that, coupled with a sustained programme of forward-focused incentives and collaborative approaches (such as Invest Northern Ireland[44] and the Belfast Region City Deal)[45] sparked a steady stream of foreign direct investment. Many global technology, professional services and finance companies now have a strong presence in Belfast. It's known as an ICT Hub and for life sciences. The creative industries, especially film and TV production, have played a huge part in changing the economy for the better. Significant regeneration projects such as the Titanic Quarter, the Waterfront redevelopment and a new University of Ulster location in the city centre have also been transformational.

In 2021 a coalition of six city institutions (Belfast City Council, Belfast Harbour, Belfast Met, Catalyst, Queen's University Belfast and Ulster University) together with Invest Northern Ireland, launched Innovation City Belfast to accelerate growth in areas such as cybersecurity, R&D, advanced manufacturing and cancer research. By leveraging the city's unique assets, Innovation City Belfast[46] is not only helping to forge a new identity for itself, but is also helping to retain the research and entrepreneurial talent that was previously migrating to Dublin and Silicon Valley.

Sydney and Singapore are examples of cities than have catapulted themselves onto the world stage through deliberate and considered planning, as well as making the most of their natural advantages to build their brands.

Sydney ranks consistently well on global indices. Its transformation into a global city began in earnest in the mid-1970s, when it began to brand itself as a tourist destination, leveraging natural assets such as Bondi Beach, and investing in iconic architecture like the Sydney Opera House. The city's global positioning grew stronger in the mid-1990s with the development of the CBD as a financial hub. The city promoted a distinctive "Sydneysider" lifestyle emphasising its character as a cosmopolitan, modern city. Events such as Mardi Gras, New Year's celebrations and the 2000 Olympics, boosted the city's international reputation.

In recent years, the city's focus has largely been on environmental sustainability and the city has released its vision for 2050 - Sustainable Sydney. The city has also sought to unify all city communications into one consistent visual identity.

As a young nation Singapore is agile and continually evolving its brand proposition to meet the needs of the people and global markets. The 1967 'Garden City[47]' tagline and campaign sought to transform the city into a lush green and liveable space to attract investment and bolster growth. This has since evolved in "City in a Garden[48]" representing Singapore's commitment to sustainability, where nature is embedded into the urban fabric through pervasive greenery and protection of biodiversity. Doing so has tied together well with the city's efforts to become a wellness hub in the region.

The city has managed to transition from a monofunctional identity to a multifaceted one, leveraging the strengths of its port and financial markets, to create a diverse value proposition.

Singapore: No stranger to re-branding

The city-state has continually evolved its city brand and positioning since the nation's conception in 1965. The founding of modern Singapore as a major port in 1819 was a result of leveraging its natural harbour, fresh water supply and timber for ship repair.

While Singapore is still home to one of the world's busiest ports, the city's identity has changed dramatically. Today, the city is considered a leading financial centre and a technological hub. Most recently it has been named the safest city in the world for tourists[49].

Singapore's strong brand is a result of significant and carefully considered investment into iconic architecture (e.g. the Merlion, Marina Bay Sands, Sentosa Island, Gardens by the Bay), infrastructure development (Changi Airport) and attracting international events (Formula 1 Singapore Grand Prix and concerts).

City networks: A vital vehicle for collaboration

Global connections and networks, another form of soft power, play an important role in driving positive perceptions, which in turn drive decisions on investments, partnerships and international cooperation. Cities have the scale, diversity and personality to leverage global connections in their own right and these have given rise to a number of effective organisations, from the ASEAN Smart Cities Network to C40 Cities, a global network for climate action that brings together nearly 100 mayors. Cities are substantial contributors to climate change, responsible for 70 per cent of global CO_2 emissions[50], and the C40 network has been an important vehicle for sharing knowledge, planning expertise and peer-to-peer exchanges in the service of climate-proofing urban centres.

For example, the C40 Water Safe Cities Accelerator[51] brings together major global cities in an effort to combat escalating challenges associated with flooding and drought. Each city has pledged a fundamental commitment to protect their most vulnerable communities from the severe risks of flooding and droughts by 2027. These cities can opt for one of three dedicated pathways and will be able to leverage technical expertise provided by C40 Cities. Not only does this initiative encourage multi-stakeholder collaboration within a city i.e. between public, private, civil society and communities, it also allows for deeper collaboration and knowledge sharing between cities that seek to achieve the same resilience targets.

Image: Buenos Aires, Argentina


BOLEO

The headaches that come with success

Success brings its own problems. The tech booms in San Francisco[52] and Dublin[53] have priced locals out of the housing market. Portugal amended its Golden Visa programme[54] for the same reason.

Barcelona's success as an international tourist destination has created resentment among residents, leading the city council to ban cruise ships from docking at the central city harbour[55] and impose restrictions on short-term tourist rentals. In the latest instalment in a multi-pronged campaign to control the number of tourists visiting and prevent over-tourism, Amsterdam is also stopping cruise ships from docking in the city centre.[56]

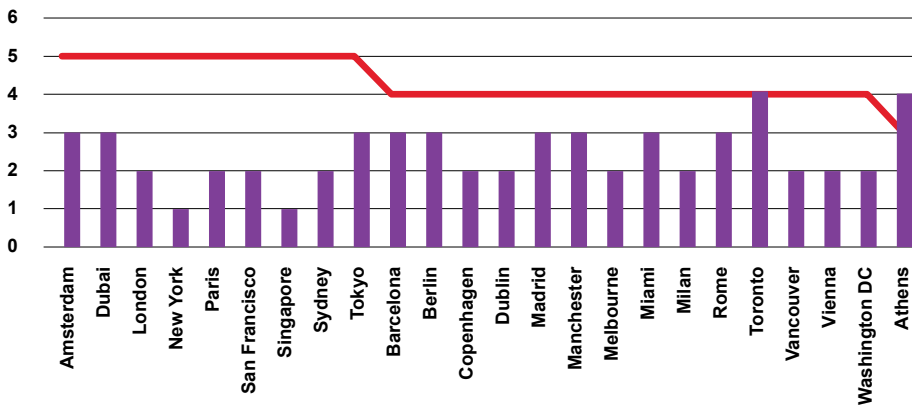
Venice has introduced a number of measures including an admission charge and a limit on the size of groups.[57] There has been widespread civil protests across Europe on over-tourism and how it impacts the availability of housing and general cost of living for local residents.[58]

Tourism has been a significant contributor to both Bangkok and Thailand's economy but has led to similar issues for locals, with many being priced out of their communities[59]. The rapid growth of tourism has not always been matched by the necessary expansion and improvement of infrastructure, which has contributed to uneven development & widening inequality.

Of all these examples, a shortage of affordable housing is perhaps the most pressing and complex to solve, affecting the cost of living, diversity and vibrancy of a city. Only 13 per cent of the world's cities have sufficient affordable housing[60], according to a 2016 survey by UN-Habitat. Of the 63 global cities in our analysis, four have a severe cost of living crisis stemming, in large part, from a shortage of affordable housing: New York, Singapore, Hong Kong and Tel Aviv. A further 17 – from Dublin and Austin to Seoul and Sydney – have a significant cost of living problem. This appears to be the result of resources,

Fig. 8 - Cities struggle to strike a balance between perception and liveability

In general, cities with a top brand have some of the poorest cost of living scores, namely London, Singapore, Paris, and New York. Very few cities have managed to strike the right balance between global perception and addressing liveability concerns at home. While Toronto appears to be well positioned across both, the city has experienced surging property prices spurring a trend of outward migration. Additionally, a subset of cities, such as Auckland, Rotterdam, and Seoul, rank as 'Best in Class' or 'Leaders' in overall competitiveness, with relatively favourable cost of living conditions but only average brand value scores. This highlights untapped potential for these cities to enhance their global city brands.

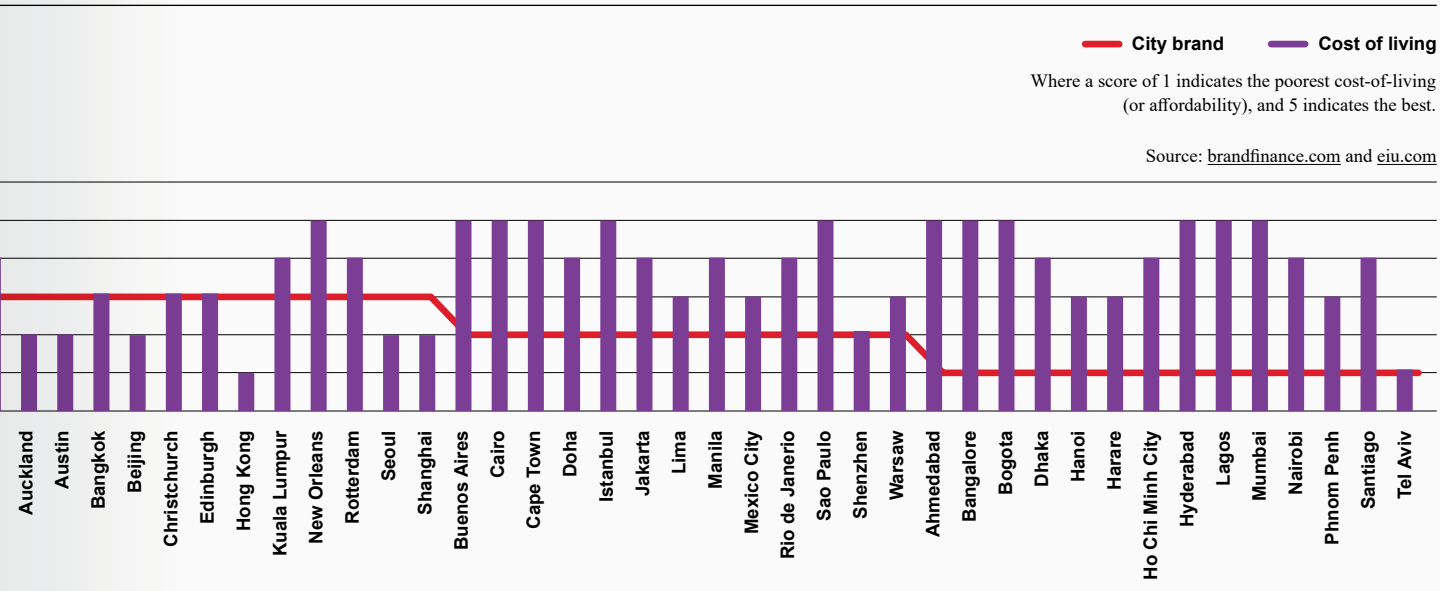


including housing, not keeping up with the influx of people in response to these cities' growing attractiveness. In all, 21 cities in our sample have cost of living challenges that require immediate action.

To address this global issue, it's helpful to separate immediate problems, such as the availability of affordable housing, from longer-term considerations around planning and incentives. Data analytics can be helpful to establish vacancy rates. For example, Melbourne analysed water-usage data[61] to pinpoint vacant properties and quickly established they were owned by absentee landlords who were holding real estate as an investment. This in turn informed policy, mainly through increased taxation, which helped to bring more empty properties on to the rental market.

Medium term, the challenge is land use, and cultural and social norms around what kind of housing is built. In the UK and many countries in Europe, for example, the construction of high-rise blocks for public housing has led to some segregation and ghettoisation of communities. How to build for liveability and social inclusivity is a key challenge.

City planners must align zoning, planning permissions and incentives to ensure that house availability matches demand. A proactive approach, and consultation with landowners, will help planners understand the incentives that are needed to make land available and put to the most efficient use. And when land is in short supply, cities also have the option of redeveloping brownfield sites. The regeneration of London's East End for the 2012 Olympics, for example, brought residents and new vibrancy to a depressed part of the city.



Where a score of 1 indicates the poorest cost-of-living (or affordability), and 5 indicates the best.

Source: brandfinance.com and eiu.com

Reimagining the future of Central Business Districts (CBDs)

Emptying CBDs or downtowns have diminished cities' brands and reputations, as these once-vibrant urban centres now appear deserted, leading to a decline in economic activity and liveability. To entice residents back to urban centres, city planners are also reimagining CBDs as vibrant ecosystems for work, housing and leisure, more aligned with the evolving needs of society and the planet, rather than the financial and corporate centres of the past. The pandemic accelerated this trend, but in reality, the redesign of CBDs started before Covid-19 brought about changes in workplace dynamics and disrupted demand for residential and commercial real estate.

The yardstick for assessing CBDs' success has expanded beyond economic metrics. Today, a CBD's vitality is gauged by its vibrancy, connectivity and cultural allure, a shift underscored by the pandemic's reminder of the importance of meaningful urban experiences. Urban competitiveness remains ever pertinent, with cities competing for investment, talent, visitors, events and reputation. As the dynamic core of a city, a CBD must stay agile, seeking improvement and innovation.

For some cities, such as Sydney, workers are settling into a pattern of working in the office from Tuesdays to Thursdays[62] and with the shift to hybrid work, commercial real estate is adjusting to the changing live-work dynamics. The night-time economy is expanding[63], and nearby commercial centres are considering relocation to the Sydney CBD due to lower rental costs[64]. The Central Sydney Precinct Redevelopment[65], which will expand and redevelop an area around the city's Central Station, aims to transform an unloved transit area into a vibrant mixed-use neighbourhood. And with affordable housing a growing concern, a further goal is to provide a range of housing options, such as student housing. The overall masterplan has allocated 82,000 square metres for residential use, with 30 per cent earmarked for affordable housing.

Ho Chi Minh City, Vietnam's most populous city, is reclaiming its waterfront space and enhancing connectivity both inland and across the waterways for a more accessible and inclusive CBD that doubles as an attractive urban destination for workers, residents and tourists alike[66]. Existing walls and fences have been removed to create a porous waterfront that connects to adjacent neighbourhoods. The District 4 old port area is gaining vibrancy by repurposing warehouses and port infrastructure into flexible spaces for arts and cultural events.

Flexibility and collaboration to achieve goals

The reimagining of CBDs is just one example of how cities are transforming their built environment to become more liveable, vibrant and inclusive. But many avenues can be explored to elevate a city's brand. Cities can re-examine and promote their local assets, particularly those that confer unique competitive advantages. They can project soft power by successfully hosting sporting and cultural events, and by supporting and promoting academic excellence. They can also become active members of regional and international city networks, which are proving invaluable in the exchange of commerce and knowledge and best practices in climate action, smart city transformations and much more. The future competitiveness of cities is therefore also one of collaboration, with cities leveraging local strengths for the benefit of all.

Image: Ho Chi Minh City, Vietnam

Key brand/soft power indicators

These indicators can help measure progress in building a city's brand and soft power

View indicator descriptors →

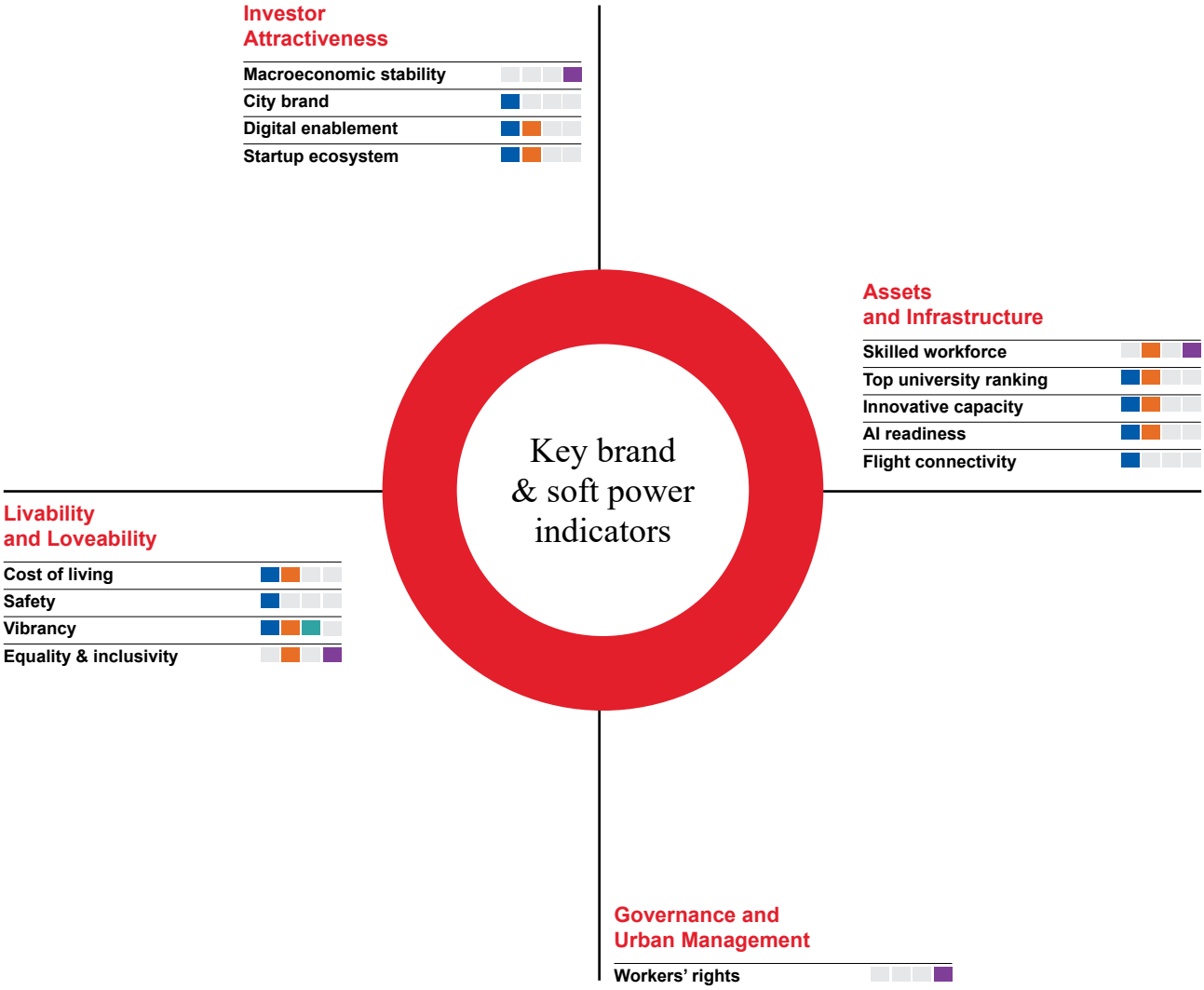


Image: Dubai, United Arab Emirates

Conclusion

By analysing the challenges and evolving priorities of 63 global cities, we hope to have shed light on the forces shaping their future competitiveness. Three challenges stand out: climate resilience, talent attraction and strategic branding.

Climate resilience

First, climate resilience must be integrated into every aspect of city planning and operations. This requires a fundamental shift in processes and practices, governance structures and infrastructure development. Cities that proactively build climate resilience into the heart of their urban growth strategies will be better positioned to thrive in the long term by protecting people and assets and attracting investment.

Linked to this is the need for cities to address their own climate impacts. Advanced economies have had more success in decoupling economic growth from greenhouse gas emissions, although more must be done to achieve net-zero growth.[65] The challenge of decoupling growth from emissions is perhaps greatest in South East Asia[68] (where cities remain largely dependent on coal for energy) and in the Middle East. These geographies have the potential to become centres of innovation around decarbonisation at city scale.[69]

Talent attraction

Second, the ability to attract and retain talent is emerging as an essential aspect of urban competitiveness. Modern talent pools are seeking more than just employment opportunities; they desire vibrant, inclusive communities with a reasonable cost of living. Cities must cater to these diverse needs to remain appealing destinations for skilled professionals.

Strategic branding

Third, cities need to enhance their global perception. While many cities excel in practical terms, they often fall short in having a long-term vision for how they want to be perceived. A strong city brand built by leveraging its assets and competitive advantages, enhancing its vibrancy and livability, and by unlocking collaboration with city networks can significantly influence the attraction of talent, businesses and investors.

Addressing urban competitiveness is inherently complex, requiring difficult trade-offs. Each city's path to success

will be unique, leveraging its distinctive strengths and strategic priorities.

In light of these insights, a collective effort is essential. Cities cannot tackle these challenges in isolation. Collaboration enables cities to solve problems and challenges they could not solve alone, and it works at different levels. Within cities, institutions can pull together to promote local strengths or solve local problems; cities can forge regional networks to gain critical competitive mass; and they can collaborate across regions and national borders to exchange expertise and address global issues such as climate change.

Collaborative platforms such as C40 Cities, the Resilient Cities Network and the Global Covenant of Mayors provide valuable support for cities navigating complex transitions.

Arup stands ready to facilitate these transitions, offering expertise and guidance to help cities achieve their competitive potential. We invite city leaders and stakeholders to engage with us as we work together to create resilient, vibrant and competitive urban environments for the future.

Image: Vienna, Austria

Appendix

Image: London, United Kingdom

Methodology

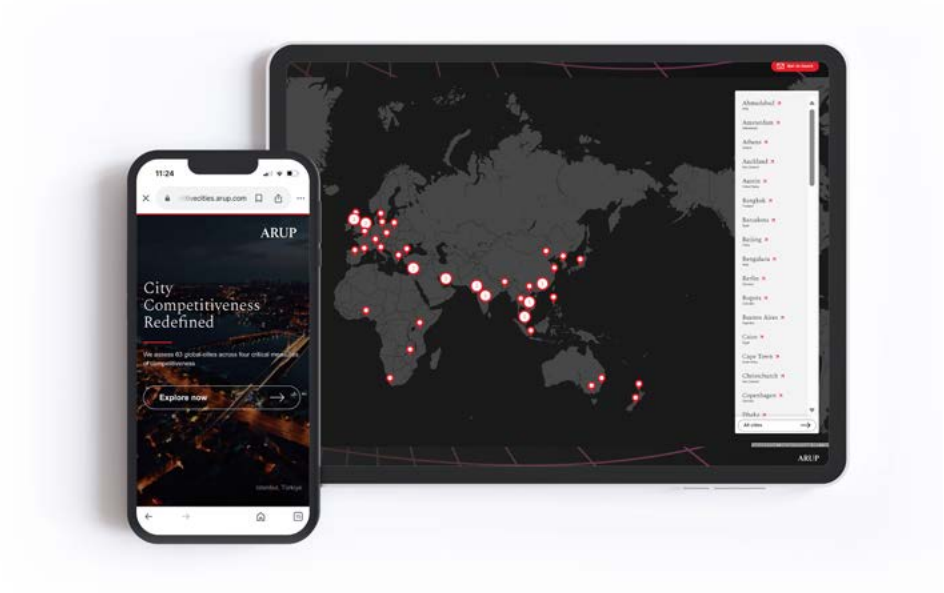
Thirty-seven indicators were used across the four categories of Assets and Infrastructure, Investor Attractiveness, Liveability and Loveability and Urban Management and Governance. These indicators were sourced from publicly available data and existing indices (e.g. IMD Smart City Index, Brand Finance City Index) and supplemented with spatial analysis using GIS. Metrics are primarily at a city-level (as indicated above). Country-level data was only used where city-level data was not available e.g. ease of doing business, or governance. Some indicators are composites of various sub-metrics. For example, mobility is a holistic metric utilizing GIS to assess walkability, density of transit stops and access to transit stops.

As per our definition, several indicators provide an assessment of how future-ready a city is to withstand shocks and stressors (e.g. senior dependency and climate action) or capture future opportunities (e.g. AI readiness). These are indicated in the table opposite.

Data across all indicators were normalized via the natural breaks method, or the Jenks Optimization Method, whereby datapoints are classified by grouping similar values together and maximizing the differences between classes. Each indicator was scored from 1-5 based on this methodology, after which they were averaged overall and per category to assess performance.

You can explore our analysis further by visiting our data visualisation tool. As well as giving more insight into our methodology/approach, it offers a profile on each of our 63 cities.

View analysis tool →



37 Indicator descriptions

Investor Attractiveness

Corporate Magnetism
How many of Fortune Global 500 corporations are headquartered in the city

Ease of doing business
How conducive the regulatory environment is to start and operate a company

Cost of Land
Composite of the price of procuring industrial land and cost of rent for office space

Macroeconomic Stability
A composite of inflation, fiscal deficit, public debt and unemployment

City Brand
Brand Finance City Index scores of a city brand based on how they are perceived

Flood Risk
The share of people living in high flood risk zones, coastal and riverine

Senior dependency ratio
The old-age (>65) to working-age (20-64) demographic ratio. Represents aging demographic.

Thermal Stress
Measures how much time over a year the city's weather is within the UTCI thermal comfort range representing the climatic conditions of a city and inherent heat or cold stress

Digital Enablement
IMD Smart City Index 'Technology' scores to measure how digitally enabled and optimized city activities and processes are

Startup Ecosystem
StartupBlink Best Cities for Startup Index scores

Assets and Infrastructure

Share of Renewable Energy
Share of renewable energy in total energy mix. Key enabler for green growth

Data Centre Volume
Total data centre capacity in the city. Key enabler for digital growth

Internet Penetration
Using internet penetration rate (percentage of population that uses internet) as a proxy

Infrastructure project pipeline
Number of infrastructure projects in pipeline before project completion or operational stage. Represents infrastructure readiness

Digital Security
Economist Safe Cities Index 'Digital' score to assess digital security of a city. A key enabler for digital growth

Skilled Workforce
Tertiary education enrolment rate

Top university ranking
Global ranking of the highest-ranking university in the city. Represents quality of education and knowledge creation

Innovative Capacity
Using number of patents filed by the top university in that city as a proxy

AI Readiness
Oliver Wyman Global AI Readiness Index – Assets Base score measuring how ready cities are to capture emerging opportunities in the age of AI

Port Cargo Capacity
Total cargo capacity of sea and airports within a 50km radius of the city to indicate trade and logistics capacity

Flight Connectivity
How well connected a city is by direct flights to rest of the world

Governance and Urban Management

Electricity Consumption
Electricity consumed per year in Kwh /capita, where a higher consumption rate is a marker for relatively higher resource consumption

Waste Management
Using proportion of waste that is recycled as a proxy

Access to basic necessities
Composite of access to safely managed sanitation, electricity and water services

Land Efficiency
Ratio of land consumption growth rate to population growth rate. Represents efficient land management

Green Area
Percentage of green area per person. Represents open and green area provision and access

Governance
Composite of Control of Corruption, Regulatory Quality and Government Effectiveness

Climate Action
Composite of availability of a city climate/resilience plan, chief sustainability or resilience officer, and renewable energy targets

Workers' Rights
Global Rights Index score to assess the strength of governance for protecting the rights and freedoms of labour

Liveability and Loveability

Cost of Living
EIU Worldwide Cost of Living Index

Mobility
Composite of walkability and access to public transit stops

Congestion
Average time taken to drive 10km via private transportation methods

Safety
Economist Safe Cities Index 'Health' and 'Personal' scores to assess public safety and wellbeing.

Vibrancy
A composite of cultural amenities and land use mix

Air Quality
World's Most Polluted Cities 2023 AQI Ranking (Average AQI over a year)

Work Intensity
Based on vacation time offered and parental leave policies to assess how a city meets the needs and priorities of young and skilled talent

Equality & Inclusivity
A composite of the Gini coefficient, LGBTQIA+ friendliness, disability rights and the gender gap

City level | Future facing | Spatial analysis | National level

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Contributors

Shruti Rathore

Shruti is a strategy consultant and an urban and transport planner with over fifteen years of experience in strategic advisory and planning across diverse transport and city infrastructure projects in Asia, the Middle East, and the USA. She leads the Strategies & Insights team within the Advisory practice in Singapore. Her expertise lies in urban and infrastructure strategy, with a strong emphasis on sustainability-driven planning. She enjoys leveraging her planning background to navigate intricate policy and urban system complexities, driving effective and actionable recommendations for businesses and public sector leaders.

Archana Kannan

Archana is a strategy consultant and urban practitioner based in Singapore. She advises governments, private sector clients, and multilateral organizations on addressing complex challenges such as sector decarbonization, green growth, and digital transformation. Driven by a passion for fostering holistic urban resilience, Archana is dedicated to enabling a just and sustainable transition for cities worldwide.

Andy Hodgson

Richard de Cani

Fiona Sheridan

Victoria Caffyn

Arina Koul

Yuh Ching Ang

Ankit Sati

Kay Lee

Nabila Sekarputri

Erica Lim

Alexis Maissant

Sophie Song

Wei He

Kulvinder Kakar

Katharine Horgan

With thanks to many other Arup colleagues around the world.

You can view a full overview of the analysis by visiting:

www.competitivecities.arup.com

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Cities contacts:

Jonathan Kinghorn
Global Cities,
Planning and Design Leader
jonathan.kinghorn@arup.com

Paul Moore
Americas Cities,
Planning and Design Leader
paul.moore@arup.com

Theresa Yeung
East Asia Cities,
Planning and Design Leader
theresa.yeung@arup.com

Léan Doody
Europe Cities,
Planning and Design Leader
lean.doody@arup.com

Vicky Evans
UKIMEA Cities,
Planning and Design Leader
vicky.evans@arup.com

Advisory contacts:

Andy Hodgson
Global Advisory Services Leader
andy.hodgson@arup.com

Tim Treharne
Americas Advisory Services Leader
tim.treharne@arup.com

Jonathan Griffin
Australasia Advisory Services Leader
jonathan.griffin@arup.com

Duncan White
Europe Advisory Services Leader
duncan.white@arup.com

Sophie Camburn
UKIMEA Advisory Services Leader
sophie.camburn@arup.com