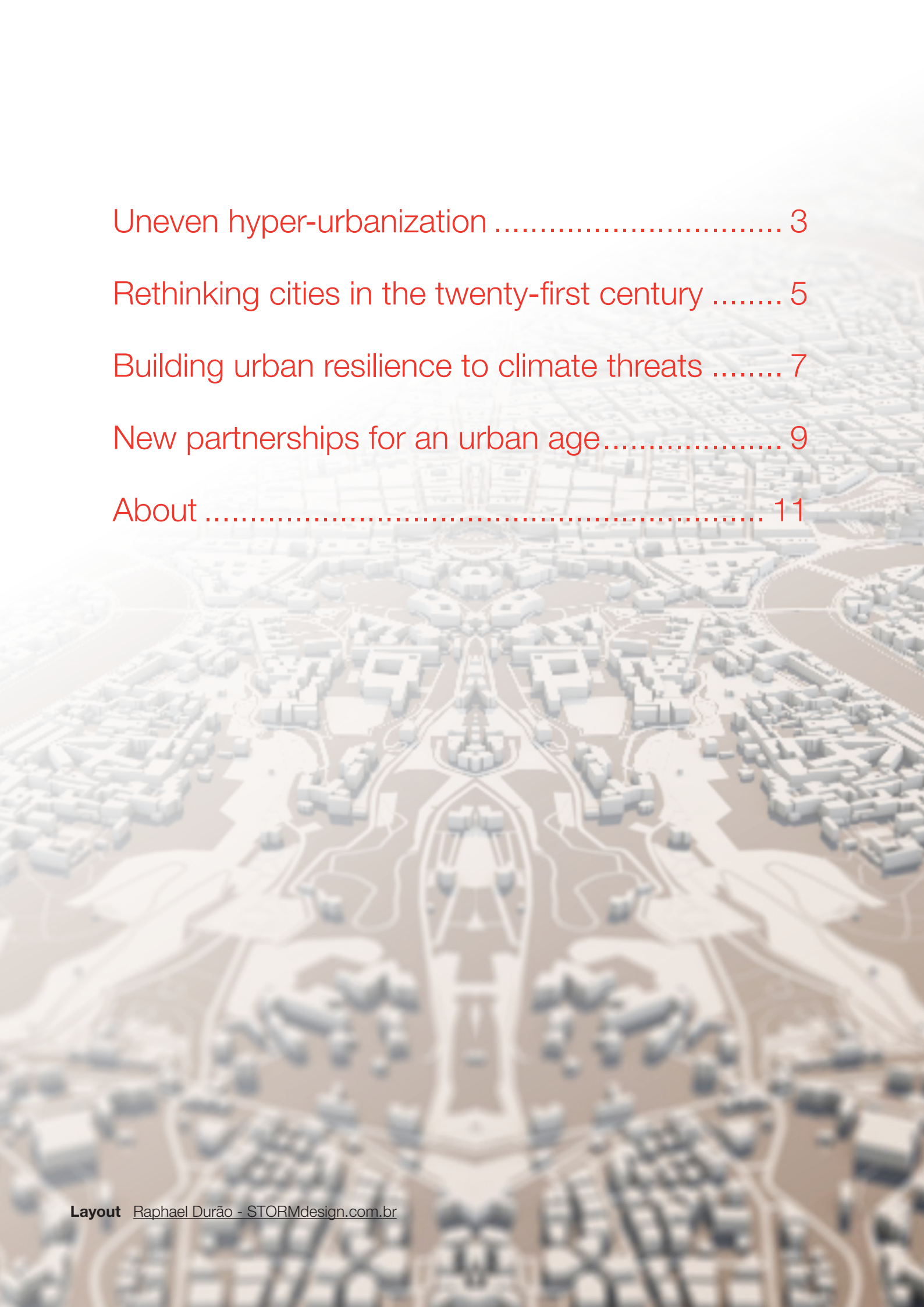


An aerial, top-down view of a city grid, rendered in a light, monochromatic style. The grid is centered around a prominent vertical axis that runs through the middle of the image. The buildings and streets are represented by simple, light-colored blocks. The overall aesthetic is clean and architectural. Overlaid on the lower half of the image is large, bold, red text.

# DESIGNING-IN URBAN RESILIENCE IN A RISKY WORLD

**SecDev**

2023



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# DESIGNING-IN URBAN RESILIENCE IN A RISKY WORLD

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Global systemic risks - from warfare and cyber attacks to pandemics and climate shocks and stresses - disproportionately impact cities. And the impacts are likely to grow even more severe in the future. One reason for this is that most of humanity, [well over half](#) of the world's population, currently lives in an urban setting. The share of the world living in cities will rise to [68 percent](#) by 2050 and reach over [85 percent](#) around 2100. Given the staggering increase in the size and number of cities, the imperative to design green, inclusive and digitally resilient urban spaces is more urgent than ever.



# Uneven hyper-urbanization

Turbo-charged urbanization is a recent phenomenon. At the beginning of the twentieth century less than a fifth of the world's population lived in cities. That started to change by the mid-1900s when fertility, longevity and rural-urban migration accelerated. Today the world is mid-way through an unprecedented century-long cycle that will result in a monumental transfer of the global population into large, medium and small cities. There are [currently 4.5 billion](#) city dwellers and this is expected to rise to over 7 billion over the next three decades. This urban transformation will coincide with other unstoppable trends ranging from aging populations, digital transformation and climate change.

Rapid urbanization is not evenly distributed. In wealthy countries, roughly 75 percent of the population is already urbanized. Indeed, 100 percent of the populations of Hong Kong, Singapore and Kuwait already live in cities. In North America and Western Europe, the proportion is closer to 85 percent. By comparison, just 50 percent of the population of lower- and middle-income countries live in cities. In many states the percentage is lower: 20 percent of Rwandans and Sri Lankans are urban dwellers. When factoring in demographic trends, virtually all future urban population growth will be in Africa and Asia. These two regions will register fast-paced city expansion, especially in secondary cities and informal settlements. By contrast, European and North American city growth will slow, and even contract.

Cities are both the source and solution for some of the world's most pressing challenges. On the one hand, they consume 80 percent of all energy, generate 75 percent of carbon emissions and concentrate multiple forms of inequality. Even some of the most successful cities are confronting unaffordable housing and social and economic immobility. Many cities around the world are caught in low trust, low investment equilibrium. On the other hand, cities have long generated positive externalities such as prosperity, innovation, creativity and wellbeing. They are also giving rise to new models of economic organization - from the circular and sharing to the experiential and innovation economies.





# Rethinking cities in the twenty-first century

Cities are facing a defining moment in a risky world. What local, national, regional and global decision-makers do next matters fundamentally. Precisely because cities are powerful contributors to overall economic productivity, greenhouse gas emissions, inclusion and equity and democratic values – cities matter. There are extraordinary opportunities to redesign greener, more sustainable and people-centered cities with new thinking from [procurement](#) and governance to [real estate](#), construction, and urban services. For instance, an estimated 65 per cent of the urban infrastructure required for emerging market cities has yet to be built. The smart city market alone is estimated to be worth as much as [2.5 trillion US Dollars](#) by 2025.

To capitalize on the urban advantage, it is essential that decision-makers, investors and entrepreneurs anticipate the pace, scale and dynamics of urbanization over the coming

decades. There were just a handful of cities with over one million people in the middle of the twentieth century. Today, there are over 600 cities with one million people or more, including 40 mega-cities with at least ten million inhabitants. By 2050, the most explosive urban growth will occur in China, India and Nigeria with 416 million, 255 million and 189 million new urbanites. The fastest growing cities will not be Austin, Lisbon or Melbourne, but rather Bangalore, Cairo, Dakha, Delhi, Kinshasa, Lahore and Lagos.

Tomorrow's cities cannot be designed or constructed in the same way as yesterday's urban centers. If China, India and Nigeria urbanize in a similar fashion as North America and Western Europe, emissions will double by 2050. If the model is closer to Hong Kong or Singapore, then emissions may rise by less than a tenth. The planning and physical layout, construction materials, operating systems and management of cities must be

reimagined. Concepts such as distributed density, multi- and micro-mobility, smart building and block design, and circular and nature-based solutions are fundamental. Decisions taken in the next decade will have profound consequences on urban climate and resilience trajectories.

A glimmer of the future of city design is emerging in the wake of COVID19 and escalating climate-related disasters. City authorities, urban entrepreneurs and impact investors are rethinking how cities - their buildings and homes - will be designed, managed and operated. Some cities are shifting away from built-up downtown cores, car-centricity and suburbanization. In a world where people are untethered from the office and the search for talent is accelerating, there is a greater focus promoting connectivity, creativity, quality of life and privacy.

The future of cities, including their capacity to adapt to uncertainty, is also linked fundamentally to pervasive digital transformation. The spread of 5G, IoT, cloud computing and digital devices accelerated in recent years, opening up tremendous opportunities and rising vulnerabilities as attack surfaces expand. Over 5 billion people are currently connected to the internet. Another 2.7 billion people are coming online. Digitalization is increasing the reach of services and improving efficiencies when it comes to work, school, health and commerce - with some cities leap-frogging and leveraging technologies in exciting ways. It is occurring in multiple ways - top-down and bottom-up, and lessons are emerging about how to define a strategic vision, consolidate digital governance, stand-up digital capability, protect infrastructure and foster digital skills and literacy at the urban scale.





# Building urban resilience to climate threats

Arguably the most important risk facing cities is climate change. Cities face a host of increasingly frequent and intense hazards - from sea-level rise and flooding to heat island effects and storms. Of course, some cities and neighborhoods are more vulnerable than others. Successive IPCC reports show how fast-growing and lower income cities are most vulnerable. And while awareness of these challenges is growing, most cities have yet to quantify their assets at risk and few of them are adequately investing in mitigation and adaptation measures.

A [recent study](#) of 800 cities found that while 90 per cent of cities faced significant threats of shocks and stresses, including extreme weather events, and at least 60 per cent are facing substantial water security threats, less than half have any kind of plan in place to meet these rising challenges. Another [assessment](#) of 500 cities found that urban centers in Asia, in particular, are on the front line, with cities in

India and China facing extreme air pollution. And [research](#) carried-out by the C40 found that at least 570 coastal cities with as many as 800 million residents are facing dangerous sea-level rise in the coming decades.

One reason why cities are exposed is because much of their built environment was designed for an earlier climate. Buildings, bridges and roads were installed using design standards and materials to withstand last century's atmospheric, geological and hydrological conditions. Climate change is changing average air temperature, humidity and rainfall patterns which means that buildings and roads are overheating and entire cities are being abandoned due to flooding. And as building materials like steel and bitumen get hotter, they may generate structural risks to sky-scrapers and highways. Wetter weather can also corrode concrete (concrete cancer), especially in coastal areas.



The green lining is that public, private, and non-profit leaders and citizens are [waking up](#) to the growing array of climate-related risks facing cities. Notwithstanding some holdouts, roughly [three quarters](#) of the world's population currently believes climate change is real and accelerated by human activity. Rising protests and declarations of [climate emergency](#) are a signal of public concern. What is more, networks of cities are also [ramping-up action](#). One prominent example is the [Global Covenant of Mayors for Climate and Energy](#), a movement of over 11,000 cities representing more than 1 billion people, that has committed to taking urgent steps to accelerate net zero and renewable energy commitments.

Even before the energy crisis prompted by the war between Russia and Ukraine, cities were taking [direct action](#) to accelerate their climate resilience. First mover cities are speeding-up decarbonisation efforts, including Oslo, Singapore, and Vancouver achieving net zero targets before 2030. Tens of thousands of [interventions](#) are underway in upper, middle, and lower-income cities alike from large-scale tree planting schemes and shifting energy grids to renewables to ramping-up public transport and micro-mobility solutions such as bike and scooter-sharing programs. Many of these strategies have multiple benefits, not just reducing emissions but also addressing congestion, improving health, and increasing public safety.

As cities work to mitigate risks and maximize resilience, [several priorities](#) stand out. First, cities must decarbonize energy systems (grid) and convert rapidly to renewable matrix (e.g. solar, wind, biomass, green hydrogen and other sources). Second, cities should work to decarbonize mobility, including through electric vehicles and increasing multi-modal alternatives. Third, cities can design more efficient buildings and residential homes. Fourth, and related, cities can encourage more compact and dense design and capture the economies of scale from infrastructure. Finally, cities must strive to be nature positive, including by protecting and strengthening flood plains and waterways, rewilding, and improving biodiversity and biophilia in real estate and design.



# New partnerships for an urban age

Cities are forging partnerships to mitigate risks and build resilience. There are over 300 inter-city networks around the world sharing strategic insights and practical lessons on how to fast-track innovation. Of course, cities need to get more creative to finance these aspirations. This is not always straight-forward. Even wealthy global cities are becoming too expensive and struggling to raise funds. Meanwhile, most cities in emerging markets are looking to grow but lack capital to meet their objectives. And while some international financial institutions are looking to bridge these gaps and de-risk investments, many cities struggle to absorb new resources. Virtually all cities also already face deficits and liabilities and need to come up with creative solutions to generate investment. They cannot tax more and need to look at innovative finance - including leveraging assets, creating new revenue streams and blended finance.

As cities become the dominant form of human habitation, the opportunity space for more innovative financing is shifting. This is a departure from the past. For decades, cities were not considered a “smart” investment and simply too risky. They often suffered from a limited pipeline of bankable projects, a difficult regulatory environment and lack of leadership and continuity. But the investment landscape is changing, especially given the volume of global capital available to invest, new opportunities and services in cities, the sheer number of cities, and their unprecedented growth. A combination of formal, informal and hybrid partnerships are emerging, often involving a combination of public and private actors, including start-ups, private equity and universities.



Ultimately, the future global risk landscape will be strongly influenced by the shape and character of cities and their networks. The world will be facing more shocks, including pandemics, massive cyber attacks, geopolitical tensions and environmental shocks and stresses. Innovative financing from international, national and local sources and strengthened city capabilities are essential. Cities will likewise need to become [more experimental](#), building tools from insurance to procurement, to build resilience. Cities will also need to build densely and at a human scale. Measures to radically reduce carbon footprints and promote nature-positivity are essential, and cost effective. And building-in the ability for city institutions and infrastructure to anticipate, respond to, bounce back and learn from shocks and stresses is more essential than ever.

# About

SecDev is an agile geopolitical forecasting and data science firm helping clients navigate digital-geopolitical, geospatial and geodigital risk. SecDev builds value through innovation in strategic foresight, data science and urban analytics. SecDev's team is fluent in technology, global in scope and results-oriented. SecDev empowers clients, such as national governments, technology companies and international organizations, to make informed choices that deliver value in the digital-urban age.

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