



CLIMATE FINANCING  
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# City Resilience in a New Investment Climate



The City Resilience Framework enables cities to measure and monitor the multiple factors that contribute to resilience, identifying vulnerabilities and points of action. Pictured: Semarang, Indonesia, is one of the cities where Arup's international development team delivered an assessment.  
Image: Arup

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**As I write this, it is New York Climate Week 2024 and Storm Boris—supposedly a ‘once-in-a-hundred-years’ phenomenon—has just blown through Europe, leaving devastation in its wake...**

A decade ago, with support from the Rockefeller Foundation, Arup developed the City Resilience Framework (CRF). Since then, much has changed and we have endured global events more intense than what we could have previously imagined. Yet, the definition that our work is based on still holds true:

*City resilience reflects the overall “capacity of a city (individuals, communities, institutions, businesses and systems) to survive, adapt and thrive no matter what kinds of chronic stresses or acute shocks they experience” (Rockefeller Foundation: 2013).*

As urbanisation continues across the world, with 70% of the global population predicted to be living in a city by 2050 and with many established cities already straining at their seams, it is critical that we move from measurement and planning of resilience to more direct action.

From Rockefeller Foundation's 100 Resilient Cities Challenge in 2013, which catalysed a global movement, the Resilient Cities Network was born, and hundreds of cities now have resilience strategies and even Chief Resilience Officers.

While CRF and similar frameworks remain invaluable in helping cities assess their resilience, the impacts of climate change, pandemics, and economic and political volatility are decisively shifting the focus from strategy-setting towards implementation.

Today, the most pressing task is not merely to understand what makes a city resilient but to take concrete steps to enhance that resilience. The era of cheap money and low interest rates is over, and the need for cities to invest in a climate-safe future is growing. Unlocking innovative financing for resilient infrastructure is, in my view, both our greatest challenge and our most potent enabler of positive action.

## Making Resilient Cities Investable

One of the most significant barriers to implementing resilience measures is funding. We are seeing an abundance of green finance, but often there is a mismatch between available funds and investable green projects. To bridge this gap, we need to engage financiers and insurers in the shaping stages of project development to ensure that such projects are truly attractive to investors.

Capacity building in cities is critical to delivering projects that are bankable and capable of being financed at scale. Stable and aligned policy, regulation, and standards are also essential if we are to attract city investment and innovative financing mechanisms such as green bonds, public private partnerships, and blended financing.

A prime example of innovative financing comes from Miami, whose citizens voted in 2017 to approve a US\$400 million "Miami Forever Bond" to finance climate resilience projects with both short- and longer-term impacts. This approach not only enhanced the city's resilience

but also safeguarded its long-term economic viability; in 2023, Miami increased its S&P rating from 'AA-' to 'AA'.

Of course, there comes a point where it becomes too costly to design for every provision against emergencies. It is impossible to create a perfect, infallible city with perfect infrastructure, and this is where the juxtaposition between physical and human resilience comes into focus. Following any disaster, recovery comes down to two things: the ability of a city to regain full operation, and the ability of its people to adapt and bounce back. Societies that are better able to respond to natural events are seen as more resilient and as such, more attractive to investors in an increasingly competitive global landscape.

## Technology Underpins Investor Confidence

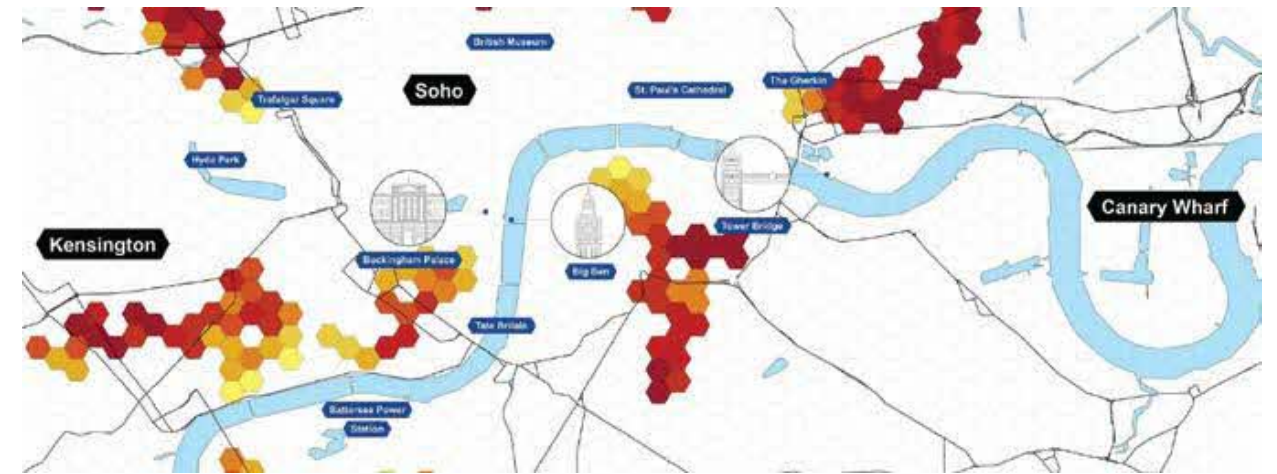
Technologies such as artificial intelligence (AI), digital twins, and advanced data analytics are improving the way we plan, build, and manage our cities.

Digital tools bring scale and acuity to the insights we develop. At Arup we have developed a digital tool called UHeat that uses satellite imagery to identify the sources of intensifying heat in our cities. We also have a tool called Terrain that reveals why and where cities face growing flood risks, to help them prioritise natural 'sponge city' solutions.

These innovations enhance our ability to model and simulate various scenarios, allowing cities to anticipate and prepare for a wide range of potential challenges, from natural disasters to economic disruptions. This predictive capacity empowers cities to make faster and more informed decisions as well as better allocate resources during unforeseen events, making it a more compelling destination for investment.



ARUP's Digital Twin of the Hague City Hall.  
Image: Arup



ARUP's heat detection digital tool—UHeat.  
Image: Arup

Moreover, digital tools also help to streamline project development and implementation. By providing accurate data and detailed analyses, these technologies help ensure that projects are both viable and attractive to investors. This, in turn, can unlock innovative financing mechanisms and attract substantial investment, driving economic growth and development.

Used effectively, digital tools also improve transparency and accountability. By making data accessible and understandable, they can engage communities, policymakers, and investors in

the urban development process. This collaborative approach builds trust and confidence, further incentivising investment.

The application of digital tools demonstrates a city's commitment to innovation and progressive thinking. Cities that embrace technology are seen as dynamic and forward-looking, qualities that are highly appealing to investors looking for stable and promising opportunities.

Nowhere is this more important than in our most fragile and vulnerable communities. Arup's

pilot study in the informal settlement of Surat, India, as part of the Roof Over Our Heads (ROOH) campaign, combines global and local expertise with technology to gather and analyse data to support the settlement in preparing for and dealing with extreme weather events.

But "digitalisation" is just one of the ways for making informed decisions and building resilient cities that can adapt to and mitigate the impacts of climate change. Working together, Decarbonisation towards zero emissions, Disclosure through transparent reporting, and



Roof Over Our Heads campaign.  
Image: Arup



Hunter's Point South.  
Image: Arup

Digitalisation help cities to not only reduce their environmental footprint but also enhance their overall resilience and sustainability. By integrating these three strategies—decarbonisation, disclosure, and digitalisation—cities can create a more attractive investment environment, showcasing their commitment to sustainability, transparency, and innovation.

### Embracing New Practices

Of course, realising this investment potential is not simply a matter of aligning investment and technology with the right intentions. What cities all over the world are now discovering is the need to develop new ideas and design interventions that can deal with the range of threats they are facing. Traditional assumptions underpinning urban development for the last century are no longer the best fit for a warming world, where extreme weather, higher temperatures, rising sea levels, and other risks have become part of everyday life. As designers and engineers, this baseline recognition of a changed environment and climate is also a spur to innovation.

One tangible example of the resilience challenge at scale can be seen through the work Arup has

been doing with the New York City Economic Development Corporation to strengthen local flood protection.

At Point South in Long Island, which was a victim of Hurricane Sandy in 2012, we developed new ideas for coastal resilience—ones that take advantage of nature-based absorption of potential flood risks while transforming a former industrial area into a parkland for the community. Our team adopted a “living with water” ethos across every element of this development, deploying solutions such as streetside stormwater planters, porous pavements, enhanced tree pits, and a constructed stormwater wetland, among others.

On a fundamental level, projects like this demonstrate how climate adaptation can drive innovation

Resilience is not just about robust infrastructure or efficient systems, but ultimately about improving quality of life and creating environments where all residents can prosper.

### The Challenge (and Opportunity) Ahead

that leads to beneficial city development—improvements for the community, with resilience embedded at all levels. By making resilience central to the DNA of a project’s scope, design, and implementation, we strengthen the business case for these investments, while also developing beneficial outcomes for communities and natural habitats.

Every city’s resilience journey begins at a different point.

To achieve resilience, every city needs to constantly challenge established thinking, embrace change, and deepen collaboration with other cities, governments, and private sectors. Otherwise, they risk making their cities un-investable.

I remain optimistic. In the last 20 years, our understanding of city resilience has matured, and there is

now an agenda for vital, scalable, and effective innovation. As cities develop their own resilience strategies, let us also remember that resilience is not just about robust infrastructure or efficient systems, but ultimately about improving quality of life and creating environments where all residents can prosper. By keeping this human-centred approach at the centre of our efforts, cities can truly become sustainable for generations to come. 🌱