2024 | 2025

CLIMATE RISK

GLOBAL CITIES OUTLOOK

CUSHMAN & WAKEFIELD

INTRODUCTION

In this foundation report, we take a global view on physical climate risk to highlight not only the variation in the level and type of climate-related hazard exposure in global cities, but also how this is forecast to change over time. In doing so, we demonstrate the importance of understanding both current hazard exposure and how it changes over time, across eight hazard types, to enact effective mitigation solutions.

Crucially, we also identify adaptation and mitigation strategies to address long-term risks. Given that the built environment typically comprises fixed assets in place for extended periods, it is likely that many assets and the areas around them will require some form of risk mitigation or adaptation to increasing risks over time.

This report looks at the below eight hazards types.

01

CURRENT HAZARD EXPOSURE

Cities are exposed to hazards - but most can mitigate and adapt.

Not all risk exposure is catastrophic. In fact, most of the 100 cities we looked at have numerous mitigation and adaptation measures in place. Against this backdrop, it is worthwhile to assess current city-level hazard exposure levels and understand how they vary. For the most part, very hot or cold cities tend to have well-designed buildings that can handle these extremes. Heat-exposed cities are typically located across Southeast Asia and Southern U.S. states, although Middle Eastern and African cities were not included in this analysis. At the other end of the spectrum, cold-exposed cities are mainly in Scandinavia, northern U.S. states and Canada. Europe's temperate climate means cities are less exposed to extreme temperatures. However, recent heat waves highlight that extreme events can and do occur.

It is well known that cities face varying levels of climate risk, with some cities at low risk for certain hazards. However, less understood is the type and, more so, the level of hazard exposure when risk rises.

For cities that regularly experience a climate-related event, awareness of the risk may be relatively high, and risk mitigation or adaptation measures may be in place. For example, areas prone to drought or water scarcity often have programs around water recycling, retention, reuse and waste reduction. However, these mitigation strategies are common but not uniform, so it's important to verify if the building location is supported by such adaptation measures.

In locations where events like floods haven't occurred for a long time, there may be a lack of preparedness because of a perception of low risk. Similarly, some terminology can be misleading.

A 100-year flood doesn't mean a flood will happen every 100 years—it means that based on historic averages, there is a 1% chance of a flood happening in a given year. Floods can occur quickly and can reoccur, so historical flood records are not always a good indication of current or future risk.

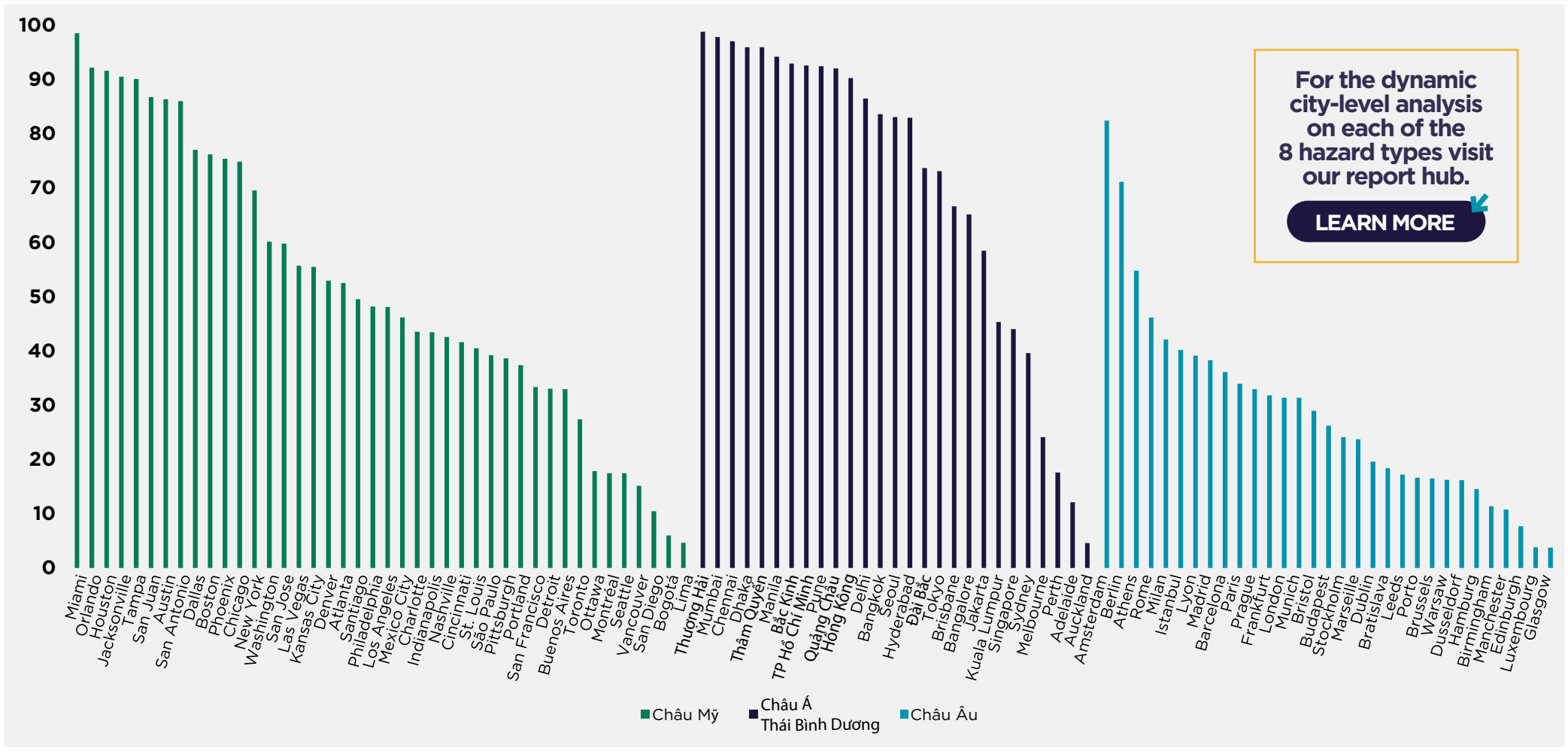
Mitigation or Adaptation?

Adaptation - anticipating the adverse effects of climate change and taking appropriate action to prevent or minimize the damage they can cause, or taking advantage of opportunities that may arise.

Mitigation - making the impacts of climate change less severe by preventing or reducing the emission of greenhouse gases into the atmosphere.

Source: European Environment Agency

Figure 1: Overall hazard exposure, 2020*

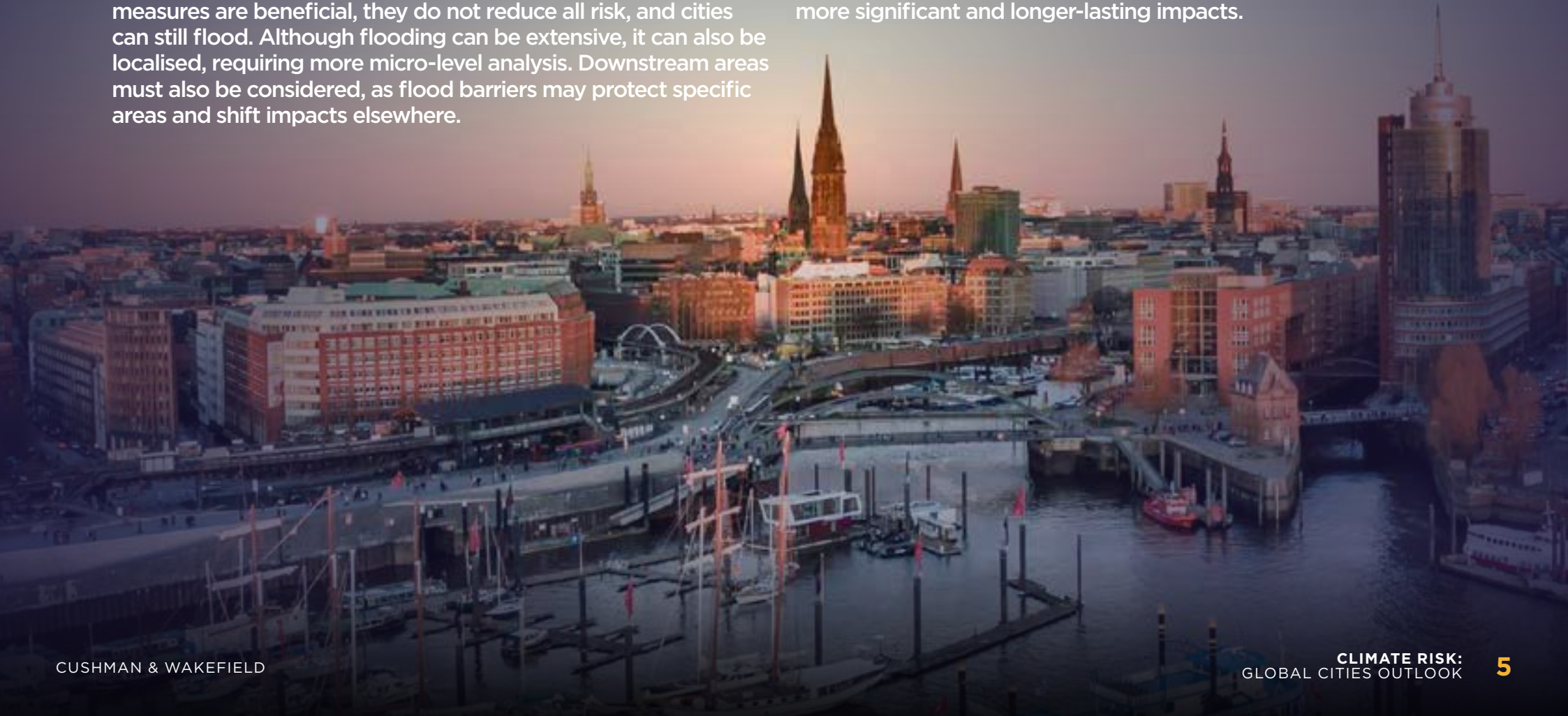


Underlying hazard risk exposure scores do not incorporate city-level mitigation. Find out more in the Methodology section

Hazards and adaptation measures vary by city

For acute events, the geographic distribution of hazard exposure is much more varied, particularly in cases of flooding. The most exposed cities are located on major waterways or in coastal areas, where flood management measures such as dams, sea walls, wetlands or overflow canals have been put in place by local governments for wider community protection. While such measures are beneficial, they do not reduce all risk, and cities can still flood. Although flooding can be extensive, it can also be localised, requiring more micro-level analysis. Downstream areas must also be considered, as flood barriers may protect specific areas and shift impacts elsewhere.

Similarly, the most storm-affected cities—especially those with distinct rainy or typhoon seasons—are often well known and typically have mitigation adaptation in place, such as typhoon-resistant buildings or underground powerlines, allowing for a quicker return to normal. In contrast, cities with high risk but infrequent occurrence may lack the same protections, leading to more significant and longer-lasting impacts.



02

REAL ESTATE STRATEGIES FOR TODAY

Given these current hazard exposures, the impacts are often already being felt. Globally, property insurance costs continue to increase at rates of at least double, and often much higher, than other insurance products. Other impacts are also becoming apparent, including downward pressure on valuations and more circumspect tenant or investor demand—clear signs that immediate action is needed.

Climate risk is financial risk:

WEATHER HAZARDS AND PERILS		EXAMPLE FINANCIAL IMPACT
WIND	→	COST OF DIRECT PROPERTY DAMAGE
FLOOD	→	INCREASED INSURANCE PREMIUMS
HEAT	→	LOSS OF PRODUCTIVITY
COLD	→	FUTURE IMPACT ON ASSET VALUES
WILDFIRE	→	LOSS OF EQUIPMENT
PRECIPITATION	→	RESTRICTED ACCESS
CONVECTIVE STORM	→	DIFFICULTIES LEASING OR SELLING
DROUGHT	→	IMPACT ON EMPLOYEES OR CUSTOMERS

Fundamentally, we advocate accepting that underlying climate-related risks exist. That is not to say a catastrophic event is imminent, rather that it is imperative to fully understand the level and type of hazards your asset or portfolio is exposed to and the potential impacts. This requires a tactical response.

What can real estate stakeholders do today?

1. Undertake a detailed asset/portfolio risk assessment

This initial step of the risk assessment can be done on a granular level, fairly quickly and efficiently, via desktop analysis for locations worldwide. The output provides real estate users with answers to key questions: What are the material hazards to my asset? How is the severity of that material hazard expected to change over time? What is the potential impact on the value of my building?

2. Understand government-led mitigation measures

Outside of individual asset and portfolio measures, it is important to acknowledge the role of government. Flood management, for example, may be more efficient and cost effective when deployed at a city level. Building owners should assess whether such measures are sufficient and identify actions to complement or boost city-level adaptation initiatives.

3. Identify highest risk assets and issues

The initial assessment identifies the most at-risk locations, both now and in the future. This helps decision-makers focus on both specific locations and hazards, such as flood or fire, so that if local plans are deemed inefficient, appropriate action plans can be put in place. Conversely, lower-risk locations are also highlighted, revealing opportunities for value enhancement or increased demand. Understanding the levels of risk informs next steps. Not all risks are catastrophic, and not all assets will require significant capital expenditure. In some instances, modest changes—such as increased maintenance programming, more robust business continuity planning, adaptability planning, or adopting common reporting frameworks—may be sufficient in the near term.

4. Enact operational changes and capital upgrades

For higher-risk locations and assets, capital upgrades may be necessary. With careful planning, these costs can be integrated into wider capex plans and spread over the life of an asset. The lifespan of a building is typically 30 to 40 years, so the benefits of any investment can be realised now, with costs amortised over the long term.

Potential building enhancements include moving low-lying plant and equipment to rooftops in flood-prone areas, strengthening or replacing large signage in high-wind zones, or adding active fire-fighting equipment in fire-exposed locations. It is critical for these solutions to be highly localised and matched to specific risk factors, and the way the building or location operates. These changes are best integrated into annual capital expenditure planning, prioritising the highest risk items first. Importantly, these upgrades can also improve building efficiency, reduce energy consumption, and lower maintenance costs, making them valuable considerations in wider financial planning for the asset.

03

FUTURE HAZARD EXPOSURE

The pace of climate change varies substantially by geographic location and hazard type. Just as current exposure levels differ across locations, so too will their experience of climate change. As highlighted in the methodology, change is examined to 2050 under the SSP5-8.5 scenario – a high-carbon scenario. Should carbon reductions occur more rapidly due to government policies or interventions, a less carbon-intensive scenario may be achieved. However, for preparation purposes, we have chosen a less optimistic and higher-risk scenario for this analysis. A 25-year outlook allows sufficient time for appreciable climate change to occur, but it sits within an actionable time, as corporate occupiers and institutional landlords often adopt multi-decade strategic viewpoints.

It is essential to consider both the current status and the magnitude of change over time. For example, a location already experiencing high levels of heat exposure becoming hotter will have less impact than a more temperate location facing the same increase. In the former, efficient HVAC systems are likely in place, whereas in the latter, systems may be non-existent or designed more oriented for heating than cooling. Another aspect to consider is the nature of change—whether it's a steady increase in hotter days or a rise in extreme temperatures.

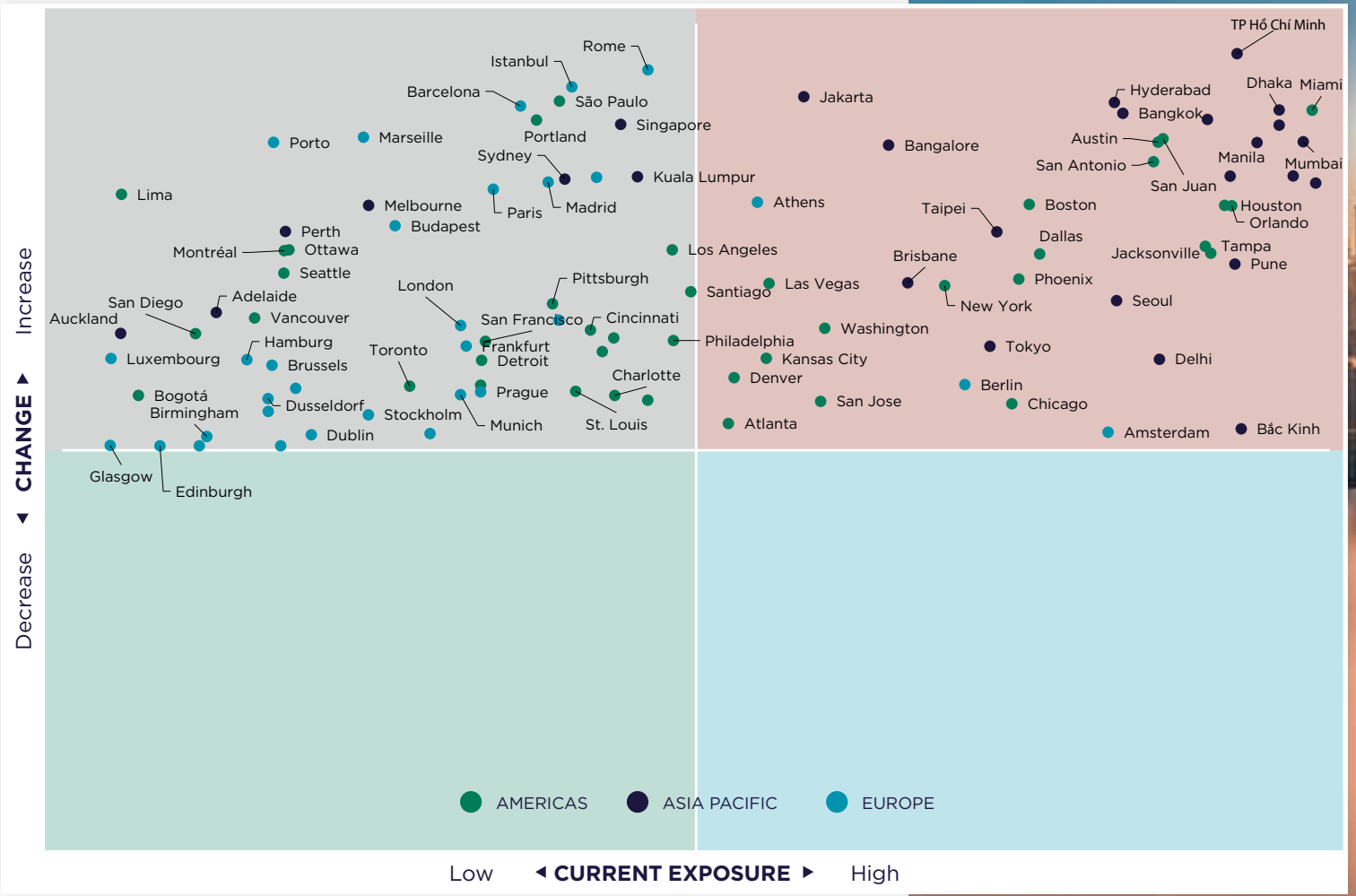
To aid city-level comparison, we simultaneously compared both the underlying hazard score as well as the change score. The intersection of the two axes represents moderate present hazard exposure and no change through 2050. Movement away from this intersection is then measured across four quadrants, as highlighted in the graph here on the right.

Overall: Climate change is placing all cities at greater risk of climate-related events in the future.

To view the dynamic results by hazard type, visit our Climate Risk Hub.

LEARN MORE

Figure 2: Overall hazard risk exposure and change to 2050*



Key risks explained

Heat & Cold

For cold exposure, cities that currently have low cold exposure are expected to see no change, whereas cities with moderate cold exposure (e.g., cold days) are forecast to experience reduced exposure, meaning fewer cold weather events. The same principal operates in reverse for heat exposure: All cities will become hotter, but from differing starting points, placing them in the upper two quadrants. In both scenarios, more temperate cities that are not accustomed to high heat are likely to experience more significant changes, including fewer cold days and more hot days.

Flood

Almost all cities are projected to experience greater flood risk, either through greater flood depth, wider flood coverage or both. This highlights the need for a more granular understanding of the change in underlying risk. A location with significant flooding may not be much worse off if floods deepen. The impacts are worse, but the local response to “some flooding and “more flooding” likely elicits the same response. However, an area previously unaffected by flooding that suddenly becomes exposed may face more severe impacts due to lower preparedness and protection. This highlights the need to understand both the current risk and what is driving the change in risk over time.

Wildfire and Precipitation

Forecasts indicate greater changes in wildfire and precipitation exposure, with some cities also facing significant increases in drought exposure. All cities are expected to experience more frequent storm events, with the greatest changes anticipated in Asia Pacific, where storm seasons are likely to intensify. Southern Europe, already experiencing a significant rise in heat exposure, is also likely to become more susceptible to wildfire risk and increased drought susceptibility. In contrast, despite rapid population growth, much of Asia Pacific, especially Southeast Asia, is projected to see a decrease in drought risk.

Overall

Viewed holistically, all cities are forecast to experience changes in their climate-related hazard exposure. For some, the change may be modest or an intensification of existing hazards. For others, the impact may be more severe, with greater event frequency or more extreme events.

The fundamental issue is the level of preparedness. Cities already experiencing high temperatures or frequent flooding may be somewhat prepared for these future changes. However, locations that have previously been spared from these hazards may lack the infrastructure to cope when changes occur. The key is to assess risks and be prepared.

04

REAL ESTATE STRATEGIES – FOR TOMORROW

Addressing future climate risks, like managing present-day risks, begins with an asset or portfolio assessment. However, unlike tackling present-day risks, planning for the future provides an opportunity to develop a long-term strategic approach to reduce risk through robust operational and capital expenditure plans.

It is imperative to be proactive and embed appropriate measures into business processes. For example, assessing climate risk is now a common part of buy-side technical due diligence and occupier space assessments. As an asset owner, understanding the level and type of asset-level risk can inform whether additional adaptive measures are required and can guide the narrative for potential occupiers, purchasers or valuers.

FUTURE HAZARDS –
REAL ESTATE MITIGATION STRATEGIES

- **Assess:** Understand your portfolio- and location-level climate risk exposure.
- **Audit:** Conduct on-site assessments to understand what measures are already in place.
- **Roadmap:** Develop climate adaptation and mitigation plans.
- **Uplift:** Implement pre-identified measures.

The responsibility for addressing climate risks extends beyond asset owners to all stakeholders that interact with the built environment. Depending on the risks and level of analysis, possible strategies include:

What can real estate stakeholders do in future?

Cities

Implement municipal-wide adaptation and mitigation measures, such as major infrastructure projects to address risks such as flooding. These initiatives require significant planning, capital and time for design, construction, or upgrades.

Developers

Adapt design and construction practices for new assets to strengthen protection against relevant risks. The economic dividends of adaptation steps can outweigh their costs by multiples ranging from 2:1 to 11:1* demonstrating the benefit of activity incorporating adaption measures during the design and build phase.

Portfolio Managers

Carefully select locations that align with business needs, while considering the global nature of climate change. It is not possible to "outrun" all impacts, so careful consideration of locations for key assets—like data centres, head offices, critical infrastructure and business continuity sites—is essential. Managing risks will require a nuanced, situation-specific approach.

*Source: Swiss Re | Changing climate: the heat is (still) on

The best management strategy for climate risk is to avoid these impacts. Hence, there is an urgent and ongoing obligation to reduce emissions. However, since not all risks can be completely reduced, appropriate safeguards must be put in place. As understanding and reporting climate risk becomes increasingly required around the world, the most successful companies will be those that understand their risks and find ways to turn them into opportunities.

RISK MANAGEMENT IN ACTION

WILDFIRE

Los Angeles - The California Wildfire Mitigation Program is part of a broader state initiative to enhance community resilience against wildfires. Collaborating with the California Department of Forestry and Fire Protection, the California Governor's Office of Emergency Services launched an initiative to retrofit, harden and create defensible space for homes at high risk to wildfires, providing financial assistance for low- and moderate-income households in vulnerable communities.

HEAT

Singapore - The Cooling Singapore project aims to build a Digital Urban Climate Twin to analyse future climate scenarios and assess the impact of mitigation measures. The project will develop guidelines that respond to Singapore's specific microclimates as well as facilitate more climate-responsive urban design and planning.

DROUGHT

San Jose - City authorities have long invested in maintaining a reliable water supply. The regional wastewater facility features backup power supplies for blackouts, cogenerates power to use gases that otherwise would cause air pollution, and recycles water to reduce dependence on imported water.

MITIGATION IN ACTION

PRECIPITATION

Mumbai - To address monsoonal flooding, the city government upgraded the storm water drainage system, widened and deepened existing water channels and causeways, and modified the river course by replacing sharp bends with longer, gentler curves.

Milan – Milan's Air and Climate Plan targets adaption, mitigation, resilience and sustainability strategies, including increasing urban green spaces, maximising the city's permeable surfaces, new governance models and community education.

FLOOD

Shanghai - The Shanghai municipal government implemented a comprehensive four-tier flood protection system, featuring seawalls, drainage systems, the Huangpu River Levee and advanced flood information control system.

Netherlands – The government's approach incorporates both prevention and preparation strategies. Prevention has included dykes, dams, sluice gates and storm surge barriers as well as preventing development in flood prone areas. Preparation has included developing robust community-wide evacuation plans.

WIND

Hong Kong - The Hong Kong building code was designed to withstand strong storms and high winds. Notably, as a major financial centre, Hong Kong benefits from a resilient financial market. As such, many insurance providers offer typhoon and storm-specific insurance coverage, which is more extensive than in many other regions where such coverage might be limited or excluded. This highlights the city's preparedness for extreme weather events.

METHODOLOGY

1,018 locations
100 cities
9 hazard scores

SSP5-8.5 climate change scenario to 2050

The city level analysis included in this report covers a total of 1,018 site locations across 100 cities. For inclusion, sites had to be located within 10km of the CBD area and a minimum of five sites were required for a city to be included in the analysis. Sites were taken from both Cushman & Wakefield's office locations as well as those of clients. As a result, this study is predominantly focussed on CBD (downtown) and inner-city office precinct locations. It is important to note therefore that hazard scores are relevant to those locations only. This is especially relevant when considering flood risk, which is likely to have a much greater degree of variability at the local level than, for example wind, heat or rain, which are more consistent across a wider area. In short, we acknowledge the presence of the Modifiable Areal Unit Problem (MAUP). Mitigation activities are not accounted for in the analysis as their efficacy, or the level of residual risk, is not universally quantifiable across cities.

Hazard scores were derived from Jupiter Intelligence's ClimateScore Global physical risk analysis software for each site and then averaged to provide a city score. The scores range from 0-100, with 100 being high risk. The hazard score is representative of the exposure risk for that location and does not take into consideration the specific building itself.

Change through to 2050 forecast under the SSP 5-8.5 scenario. Under this higher-risk scenario there are combined assumptions about high population growth and relatively slow income growth, with modest rates of technological change and energy intensity improvements. In turn, this leads over the long term to high energy demand and emissions in the absence of climate change policies. Change scores range from -100 to +100, representing lessening risk to increasing risk respectively.

Hazard scores can be broadly interpreted as follows:

WIND: 100 year return period wind speed

PRECIPITATION: The amount of rain on the "rainiest" day with a 1% probability

HEAT: The number of days above certain temperatures and the number of days air conditioning is required

FIRE: Annual probability of a wildfire

DROUGHT: Level of water stress based on supply and demand

FLOOD: Flood depth and extent of flooding

COLD: The number of cold days (below 0c) and the number of days heating is required

HAIL: The number of days of large hail

Overall:

Weighted scores of the above:

- 4 (4/18 of the score): flood
- 3 (3/18 of the score, each): heat, wind
- 2 (2/18 of the score, each): fire, precipitation, cold
- 1 (1/18 of the score, each): drought, hail

CLIMATE RISK GLOBAL CITIES OUTLOOK

CUSHMAN & WAKEFIELD

OUR CLIMATE RISK SERVICES

The Cushman & Wakefield sustainability team specializes in translating climate data into actionable strategies for the built environment. We help you understand how climate change could affect your assets or portfolio and guide you in managing and disclosing your climate-related risks and opportunities.

We work alongside you to:

ASSESS RISK: Our data-driven approach can be set up quickly to pinpoint issues that need deeper attention.

TRANSLATE CLIMATE RISK INTO FINANCIAL RISK: We undertake financial risk assessments, such as evaluating potential capital upgrades or operational changes.

REDUCE EXPOSURE: Our consultants work with you to develop and implement strategies, so you can begin making changes today.

TRACK AND REFRESH: Our people and systems enable regular reviews, so you stay updated on changes.

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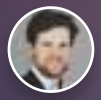

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INTERESTED IN MANAGING CLIMATE RISK? CHECK OUT OUR PRACTICAL GUIDE.