Urban Space for Climate-Resilient Cities

Urban Space

Structuring city morphology to protect lives, health and critical assets from climate change risk

As climate change hazards such as heat waves, cold waves, flooding, extreme storms and winds etc. in an urban context can impact every aspect of city development, services management, transport and services functions, as well as day to day activities and movement of its citizens, it has become a major issue for Tractebel experts to address in urban space studies.

Goal definition

In the assessment and analysis of a city's resilience against climate change risk, we engage with several stakeholders, sector specific authorities, public service providers, industry, welfare, tourist boards... and citizens, to fully understand the context and the issues to be addressed. What **risks or hazards** are specific to local conditions: drought or flooding, city heat islands or extreme cold, hurricanes, changes in monsoon behaviour, or landslides and wildfires? What is the **spatial extension** to be evaluated? A few city blocks or an entire city and outlying region? Or a single building? For our experts, the answers place a project in one of two subsectors: Public space or Buildings.

Public Spaces

In the Public Space, exposure and sensitivity to different climate hazards are evaluated both for the defined **urban population** and for **urban functions & activities**. The most critical/vulnerable people, districts, services activities etc. will be identified to define what actions need to be taken first to guarantee safety and continuity and how cities need to prepare to react in case of danger or discontinuity. Examples of cities' most critical and vulnerable functions & activities include healthcare, firefighting, police, water supply, and electricity, transport systems, communications, industry including dangerous industries, but also vulnerable housing, schools, old age homes, etc.

For each identified potential or recurring weather hazard, further data is collected: timelines, historical frequency, current and projected intensities, past impacts on specific groups or assets, the level of uncertainty or likelihood of future hazards.

The combined information allows our experts to create various tools such as hazard, vulnerability and risk maps, risk matrix and tolerance matrix.

As a result, prioritisation of investment and action can be addressed with mitigating or protective adaptive solutions.

Public Space studies can also draw on Tractebel's multi-disciplinary expertise such as Water, Energy, Transport, Mobility, Buildings and Sustainable Infrastructure to assess high level damage and economical costs, as well as define sector specific solutions.

Buildings

The protection of specific buildings from climate change risk follows a similar risk/tolerance/sensitivity analyses to Public Spaces but is focussed on **key city assets**, their stability, functionality and reliability.

Typical examples of critical Buildings are Crisis HQ, Government – city council, Fire department buildings, Police department buildings, Federal/national bank, 'Control' buildings, Hospitals, Museums and Embassies.

For both categories, public spaces and buildings, different types of solutions/measures are developed, according to the project requirements:

Governance measures: Development of measures, policies and legalities to address different actions that can be taken together to maximise effect.

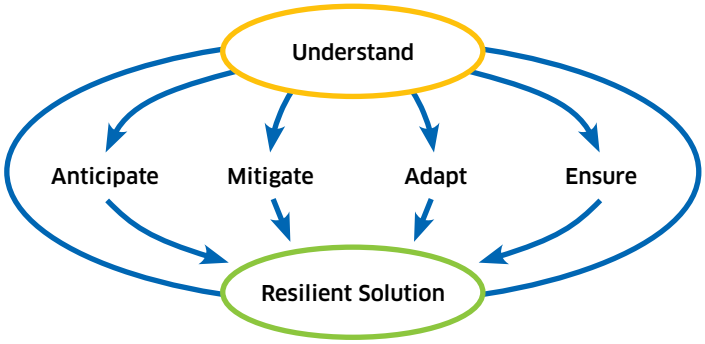
Technical solutions: Relevant solutions developed in line with the project context.

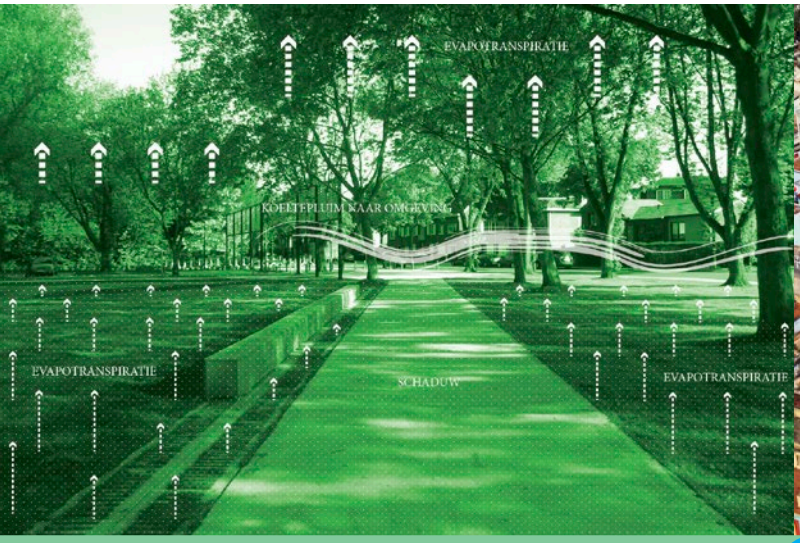
State-of-the-art applications: Project solutions based on the latest insights.

Cross-sectorial advantages: Synergies are often found in other projects in-development or on the agenda, and combining actions is often possible, to optimise investments and gain critical time.

Tractebel covers the full process-cycle of project development: analysis, planning, design and implementation of climate change adaption actions to help build the **resilience of specific assets, sectors, areas or complete territories**. Throughout the process, it is our goal to accompany and guide all stakeholders in deciding the best concrete **anticipation and adaptation measures** and actions needed to be taken to address the risks at different levels to assure greater city resilience.

Steps include stakeholders engagement, vulnerability and risk assessment, master planning and development of a resilience strategy, and finally the project preparation and implementation.





Some of our References

Urban Climate Resilience

Guidelines for climate change adaptation in relation to urban planning and design in Flanders (Belgium)

Objective: Develop qualitative and quantitative guidelines for climate change adaptation in relation to urban planning and design – addressing heatwaves, flooding, and droughts.

Result: A stakeholder-approved general vision developed on climate change adaptation; this vision, along with a "toolkit" of measures, guide future initiatives of the Flemish Spatial Planning Administration and form an objective reference on the need for adaptation measures and the way they can be implemented.

Strengthening Climate Change Resilience in Urban India - Smart Cities Mission Projects in Raipur and Kakinada

Objective: Improve climate change resilience in selected cities in India. Conduct key technical studies on the vulnerability and risk assessment, aiming at improvement of urban infrastructure and services in selected cities.

Result: Integrated climate change-resilient urban plans, and strategic and actionable recommendations to strengthen urban climate resilience of urban infrastructure and services (drinking water supply, sewage collection, wastewater treatment, drainage, sustainable urban transport, energy efficiency, etc.).