Reinventing Cities

Guidance to Design Green and Thriving Public Spaces

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This document provides guidance on key design approaches to consider when designing green and thriving public spaces. It also outlines the main strategies to reduce the carbon footprint of these spaces.

Two Imperatives

A green and thriving public space must be designed in an integrated way to address two imperatives:

- **'Green': Emissions reduction and climate resilience**
  A 'green' public space accelerates emissions reduction in the city. This includes solutions that support the transition to low-carbon mobility, reduce energy demand, use low-carbon construction materials and increase green spaces. A 'green' public space should also be resilient: meaning an adaptable space that allows individuals, communities and cities to recover quickly and bounce back efficiently when shocks and climate-related stresses occur.

- **'Thriving': people-centred place**
  A 'thriving' public space meets the needs of people by promoting quality of life and allowing communities to move easily around the city. It is designed to be safe and accessible for people of all backgrounds, genders, ages and abilities and it promotes active mobility such as walking and cycling. It also provides a vibrant and friendly environment to foster connectivity and social cohesion as well as healthy and sustainable lifestyles.

10 design approaches

Through Reinventing Cities, teams should strive to achieve a low carbon design and develop resilient and people-centred places. The competition defines 10 design approaches that participating teams are invited to consider:

1. Low-carbon mobility
2. People-centred streets
3. Adaptable spaces
4. A place for everyone
5. Smart and energy-efficient spaces
6. Clean construction
7. Urban nature and green spaces
8. Circular resources
9. Climate resilience
10. Sustainable living

The 10 design approaches defined above can be classified as follows:

How the space should function	What the space should promote	How the space should be designed
A place for everyone Adaptable spaces People-centred streets	Low-carbon mobility Circular resources Sustainable living Climate resilience	Clean cconstruction Smart and energy-efficient spaces Urban nature and green spaces
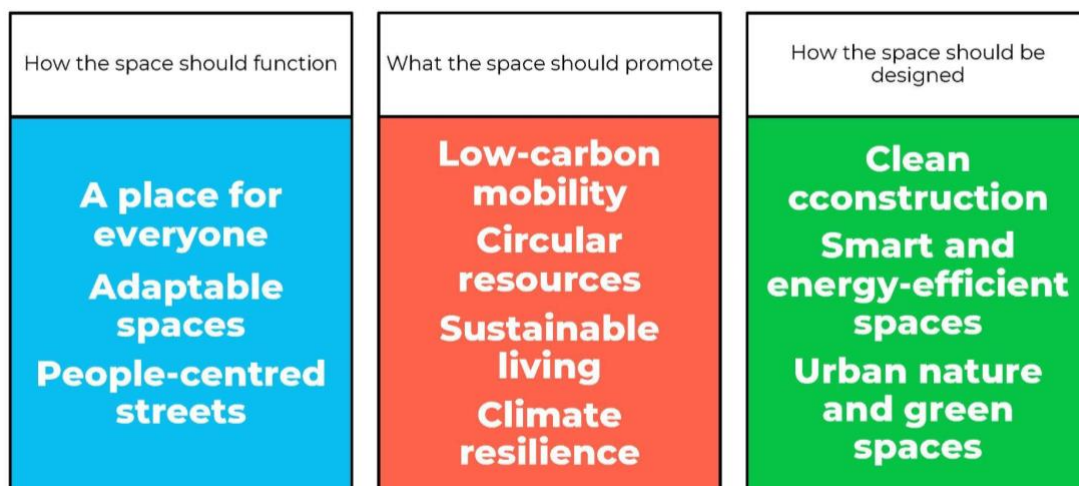
Figure 1. The 10 design approaches

Teams are not required to respond to all 10 design approaches. The information provided is intended to guide teams in developing their project and identifying concrete solutions for the site. Whilst all design approaches are relevant to the competition, teams should focus on those that are most appropriate for the area.

Furthermore, the examples listed for each design approach in this document are not exhaustive nor mandatory. Teams are not required to include all the examples set out in this document; instead, they are encouraged to use them as an inspiration for their proposal.

Please note the approaches are not in any specific order of importance.

1. Low-carbon mobility

Overview: Public spaces should be designed to encourage active mobility such as walking and cycling, de-incentivize the use of individual fossil fuel vehicles and encourage green transport options, public transport and vehicle sharing schemes. Placing active and green mobility at the core of design brings about substantial benefits in both public health and emissions reduction. Another aspect to consider when addressing mobility is the way goods are transported and distributed in the city, which must be sustainable and low-emission.

Key concepts and examples

Good street design: Well-designed spaces provide active travel solutions, whilst creating a public realm that fosters health and wellbeing. Such spaces should be well-integrated with public transport to promote other low-carbon mobility options as well.

Examples of solutions you may consider in your response
- *Design wide pavements for shared bikes and scooter facilities.*
- *Design wide footpaths and install physical infrastructure to promote walkability.*
- *Create dedicated cycle lanes and provide new cycle routes or links to existing ones.*
- *Use street design to promote the right of way for pedestrians and cyclists, for instance, colourful crossings, tactile pavements and interactive pavement markings.*
- *Improve wayfinding and signage, increase street crossings, or provide mid-block connections for walking and cycling.*
- *Improve intersections by providing traffic calming measures such as speed restrictions for cars.*
- *Integrate public transport options in the design, improving the accessibility to bus stops, metro or train stations.*

Re-prioritising street space for active mobility: By reducing the space allocated to motorised vehicles and re-assigning it for active travel, the use of private cars is discouraged, helping to minimise transport-related emissions.

Examples of solutions you may consider in your response
- *Transform surface parking into cycle lanes, parklettes or terraces.*
- *Design spaces to support pedestrians and cyclists, i.e. introducing key infrastructure such as cycle parking, bike-sharing hubs and hire schemes, to make cycling accessible.*

Green transport and logistics: Micro-mobility should be part of an integrated mobility solution, working in synergy with active travel options, to provide individuals with a wide range of sustainable travel choices. A green logistics system must also be considered and well-planned to reduce emissions and ensure everyone has access to goods and services.

Examples of solutions you may consider in your response:
- *Introduce micro-mobility schemes and EVs such as e-scooter hire schemes.*
- *Provide electric vehicle parking and charging points, as well as solar power carports.*
- *Provide spaces and facilities such as micro-logistic hubs to support the use of bikes, e-bikes and cargo bikes for the delivery of goods and groceries in the area.*

2. People-centred streets

Overview: Well-designed public spaces create cohesive communities which contribute toward resilience, health and wellbeing while building a strong identity and sense of collective ownership. Such spaces provide an active realm to allow people to easily access amenities, services and meet their daily needs within a short walk or bike ride from home, supporting the creation of a 'complete neighbourhood', a mixed-use and self-sustaining district.

Key concepts and examples

Diverse spaces for all: Streets should be designed for people, not for cars, so people are at the centre of the way the city is designed and experienced. Streets should be energised by permanent and temporary initiatives, creating a comfortable, dynamic and safe urban environment for all.

Examples of solutions you may consider in your response
- *Provide a mix of spaces that offer a variety of services and amenities from playgrounds to green spaces and transport hubs.*
- *Provide social furniture to foster interaction and facilitate communal activities.*
- *Provide sports facilities that are responsive to local cultures and ability groups.*
- *Provide diverse spaces which cater to various groups and accommodate different needs and preferences on how people want to meet and gather.*
- *Design spaces that are dedicated to public and collective use such as community hubs, shared gardens and other outdoor activities.*

3. Adaptable spaces

Overview: Public spaces should be designed to accommodate several uses as well as anticipate the changing needs of future users. Incorporating adaptability can reduce the need for future construction and eliminate unnecessary single-use facilities. It can also increase resilience, creating spaces that are more flexible in responding to shocks or changes.

Key concepts and examples

Multifunctional design: Adaptable, multi-functional spaces can be used for multiple purposes and can remain active throughout the day. Through interventions such as tactical urbanism and temporary uses, low-cost and scalable solutions that help foster long-term changes can be developed by adapting existing spaces to meet people's needs.

Examples of solutions you may consider in your response
- *Design adaptable spaces that will allow flexibility in their use and support a range of community activities such as holding public events and proposing temporary food or flea markets.*
- *Propose a range of diverse activities for different times of the day including nocturnal periods.*
- *Use hybrid street furniture to meet multiple needs such as kiosks and modular paving systems.*
- *Transform vacant plots to host 'meanwhile uses' such as pocket gardens and pop-up shops.*
- *Introduce transitory occupations such as project phasing and scalable activities with short-term interventions.*
- *Temporarily reclaim spaces from cars i.e. on weekends.*
- *Introduce temporary street furniture such as mobile tree planters and street games.*

4. A place for everyone

Overview: Public spaces should promote inclusivity and benefit local people of all backgrounds, ages, genders and abilities. They should also create a sense of connectedness, including well-designed places where people can come together. In this sense, engagement with the local community and stakeholders is essential to take into account local conditions and history and facilitate the transition to behavioural change.

Key concepts and examples

Social inclusion: Building inclusion is important for communities to thrive. Therefore all community groups should be taken into account when designing public areas.

Examples of solutions you may consider in your response
- *Design spaces that are safe and comfortable for people of all ethnicities, genders, classes, abilities and sexual orientations.*
- *Provide low-cost initiatives and services accessible to low-income groups such as water refill stations, community gardens and recreational spaces.*
- *Design spaces to increase social interaction and intergenerational exchange.*
- *Create inclusive play spaces or playable streets for children.*
- *Design spaces that are accessible for all users such as flat walking surfaces, tactile pavements or urban furniture that provide resting spots.*

Community engagement: The needs of the local community should be considered, focusing on the specific needs of different individuals and groups, to deliver a good quality of life for all. To this end, the local community must be involved and listened to in the planning and design.

Examples of solutions you may consider in your response
- *Undertake participatory initiatives during the design phase to identify the needs of the local community.*
- *Identify community spaces for street art, murals, forums and exploratory walks or participatory budget to foster creativity and citizen engagement.*

5. Smart and energy-efficient spaces

Overview: Public spaces provide the opportunity to reduce energy demand and harness green technologies and renewables. A smart, well-connected and energy-efficient space can help communities thrive, catalyse behavioural change, and enhance safety while curbing carbon emissions.

Key concepts and examples

Green energy and smart lighting: The use of green energy is a key element for a low-carbon environment, as is the integration of smart lighting design that also improves the user experience for residents.

Examples of solutions you may consider in your response
- *Install solar panels to generate energy and minimise energy demand.*
- *Consider solar-powered charging street furniture to charge devices such as smartphones and tablets.*
- *Pilot intelligent lighting such as LEDs, solar features and bioluminescence lighting.*

Smart technology: Digitalisation can transform public spaces by building resilience and improving the quality of life.

Examples of solutions you may consider in your response
- *Integrate smart technologies such as energy harvesting pavements.*
- *Install management systems that include sensors and controls to monitor usage and performance, such as air quality meters or temperature devices.*
- *Explore ways to enhance user experience through QR codes, apps, interactive panels and create links with existing city-wide digital platforms.*
- *Install live information boards or online dashboards to provide real-time transport updates and live alerts on temperature and air quality levels.*
- *Consider piloting free Wi-Fi hotspots in key areas within public spaces.*

KPIs to consider (not mandatory)**:**
- *Carbon footprint of energy consumption arising from public space in kgCO2e/m2/year.*
- *Share of low-carbon energy % proposed.*
- *Expected number of users benefitting from the apps/ services.*

6. Clean construction

Overview: It is important to utilise existing assets by optimising, reusing and repurposing existing infrastructure before building new. Where new construction is needed, it should be planned and designed for the long term. Furthermore, to minimise embodied carbon emissions, materials should be carefully selected and low-emission construction materials preferred.

Key concepts and examples

Optimising existing assets and building for the future: Where possible, existing assets should be optimised and reused to avoid underutilisation and improve asset function and efficiency. Everything should be designed and built to account for climate risks and changes in the structure's use in the future; materials must be re-used and recycled and buildings must be adaptable, flexible and modular.

Examples of solutions you may consider in your response
- *Optimise existing assets, through retrofitting, renovating, and refurbishing.*
- *Repurpose existing structures to provide a safe and comfortable public space.*
- *Plan and design products that are built to last to avoid the need for future replacement.*
- *Design and integrate products that are adaptable and have flexible uses.*
- *Reduce materials used by prioritising existing materials through repurposing and repair.*

Low-carbon materials: Ensure materials are used efficiently and that low-carbon options such as reused and bio-based materials are considered.

Examples of solutions you may consider in your response
- *Use low-carbon materials for all street infrastructure and urban furniture (wood and other bio-based materials, low-carbon concrete etc.).*
- *Choose materials with lower emissions from the extraction, manufacturing, transportation and end-of-life phase.*
- *Use materials with the potential to be dismantled, reused, and recovered at the end of their lifecycle.*

KPIs to consider (not mandatory)**:**
- *Quantity (m3 / m2) or percentage of low-carbon/recycled construction materials used (e.g. wood or low-carbon concrete).*
- *Quantity (m3 / m2) or percentage of modular and dismantlable structures proposed.*

7. Urban nature and green spaces

Overview: Urban nature plays an essential role in restoring ecosystems and increasing climate resilience. It serves as an effective carbon sink, providing carbon storage and sequestration as well as improving air quality. Public spaces provide an opportunity for urban nature and green infrastructure to be developed and thrive, creating spaces for social activities as well as boosting mental and physical wellbeing. It is therefore important that the design of public spaces is green at its core to serve and benefit communities.

Key concepts and examples

Urban nature and biodiversity: Increasing the number of green spaces promotes well-being and enhances resilience. Furthermore, to enhance biodiversity and pollination native and adaptable species play a key role and should be prioritised over exotic or invasive ones.

Examples of solutions you may consider in your response
- *Allocate road spaces and footpaths for street vegetation.*
- *Integrate green surfaces and walls where infrastructure allows it.*
- *Introduce biodiverse planting including native and indigenous species as well as heat and drought resilient planting species.*
- *Consider carbon sequestration and air quality potential in species selection.*

Accessible and multifunctional green spaces: Where possible, create new green accessible spaces that can be used by the whole local community.

Examples of solutions you may consider in your response
- *Design pocket parks which reactivate small or underutilised spaces and bring nature back into the community.*
- *Provide all residents with access to green spaces within a short walk or bike from their house.*
- *Dedicate land for food production and urban farming to promote local food.*
- *Provide community gardens to foster opportunities for communal activities as well as physical activity.*
- *Provide flat and accessible green spaces within areas for elderly communities and children.*

KPIs to consider (not mandatory)**:**

- *Number of trees planted.*
- *Number of native and indigenous species planted.*
- *Carbon sequestration linked to the planned green areas (tCO2e/year).*
- *Increase of green area over the total surface in %.*
- *% of the surface (sqm) dedicated to vegetation or urban agriculture.*

8. Circular resources

> **Overview:** Planning for sustainable and long-term resource usage is essential. Public spaces provide opportunities to instil circular economy principles by conserving, managing and creating a long-term value chain for all materials and resources used.

Key concepts and examples

Sustainable water management: To address the impacts of water shortage and droughts, water demand should be lowered and water usage managed sustainably.

Examples of solutions you may consider in your response
- *Introduce rainwater harvesting solutions.*
- *Design water-efficient landscaping and fixtures for public facilities.*
- *Install a purple pipe system to store recycled water for irrigation.*
- *Explore greywater treatment and reuse of wastewater for non-potable usage*
- *Implement smart water management systems such as smart irrigation systems to monitor moisture and reduce water consumption.*

Sustainable waste management: To build a circular economy approach, effective methods of waste collection and materials diversion are essential.

Examples of solutions you may consider in your response
- *Promote materials exchange sites, goods repairability and recyclability.*
- *Foster the use of reusable, compostable or recycled materials.*
- *Eliminate single-use plastics and provide drinkable water refill points.*
- *Provide spaces for waste segregation and composting of organic waste.*
- *Deliver community engagement programmes to promote circularity.*

9. Climate resilience

Overview: Resilience and adaptation to current and future climate hazards, specific to each city and location, are crucial. Therefore, local risks and conditions should be clearly assessed and tailored climate resilience measures should be integrated into the design of all public spaces.

Key concepts and examples

Risk assessment: Risk assessments are important to identify location-specific climate hazards, as well as possible climate adaptation and mitigation measures.

Examples of solutions you may consider in your response
- *Assess the site-specific climate shocks and stresses i.e. temperature rise, increase in intensity and frequency of winds and storms, flooding, sea level rise and droughts.*
- *Adopt risk management measures shaped to the area.*
- *Design spaces that can be can be efficiently used for emergency response when a climate hazard occurs.*

Nature-based solutions: Nature-based solutions play an important role in protecting and restoring ecosystems as well as building resilience to climate impacts.

Examples of solutions you may consider in your response
- *Integrate trees that optimise shading to help mitigate the risk of overheating and protect the community from the heat island effect.*
- *Integrate xeriscape landscapes to reduce the need for irrigation.*
- *Minimise hardscaping and introduce permeable surfaces such as vegetated façades and surfaces where possible.*
- *Integrate rainwater harvesting systems and sustainable drainage systems, such as stormwater parks, rain gardens, ponds, swales etc.*
- *Consider water evacuation mechanisms in flood-prone areas with water retention basins for instance.*

KPIs to consider (not mandatory)**:**
- *% of the surface (sqm) that is permeable.*
- *% of the surface (sqm) dedicated to Sustainable Drainage Systems (SuDS).*

10. Sustainable living

Overview: Public spaces should equip and empower individuals to make conscious choices on the way they live, consume goods and services and move around the city. Providing sustainable services and promoting a greener lifestyle are key elements to consider when designing urban spaces. This will support long-term behavioural change through effective and sustained awareness, education and appropriate incentives.

Key concepts and examples

Making sustainable choices easy: Public spaces should be designed to make sustainable behaviour attractive, affordable and easy to achieve.

Examples of solutions you may consider in your response
- *Facilitate the provision of green transport options such as installing storage spaces for bikes and scooters.*
- *Introduce pop-up terraces, street furniture or facilities that incentivise people-centred streets.*
- *Provide infrastructure to support segregated waste collection and composting of organic waste.*
- *Design spaces to allow the development of pop-up facilities such as zero-waste stalls and food markets dedicated to local and organic food.*
- *Introduce shared spaces that allow retailers and artisans to experiment and pool their resources. For instance, mobile kiosks such as fab-labs for sharing and pooling goods to minimise the need of buying new equipment and encourage DIY and reparability.*

Planning for emissions reduction

Public spaces should aim to minimise GHG emissions in an integrated way. Therefore, projects are expected to include multiple low-carbon solutions and actions to curb emissions. Teams are encouraged to carry out a carbon evaluation of their project which takes into account factors such as energy consumption, construction, transport, logistics etc. The evaluation should clearly define the scope and methodology of the analysis and use standard or conventional approaches. If a carbon evaluation is not possible, teams must provide a detailed emissions reduction strategy, including quantifiable information for the relevant KPIs listed within this document (additional KPIs relevant to the project can also be considered).

Teams are also expected to demonstrate how the proposed project performs better than a 'Business-As-Usual' (BAU) approach and demonstrate best practices of environmental/ social/ architectural practices. The BAU case refers to a standard project of similar dimensions and uses in the same city; local and national targets and standards that can be used in defining this scenario and the appropriate emissions difference.

There are several key aspects to consider when designing low-carbon public spaces. Among the 10 design approaches described above, the following aspects have the greatest impact on GHG emissions reduction:
- Support the transition to low carbon mobility.
- Cut energy demand consumed in the public space.
- Minimize embodied emissions from construction and infrastructure by using low carbon materials and optimising existing assets.
- Sequester carbon emissions by increasing green spaces.
- Reduce consumption-based emissions by empowering inhabitants to embrace more sustainable living.