



# Barcelona: Experience the Green Transformation

Welcome back to the streets of Barcelona! We invite you to explore the elements that feature in citizens' everyday life and to discover how the urban landscape is driving a green transformation. Within the framework of the **Climate Plan**, the Barcelona City Council is leading several projects that **merge technology and environment to move towards a future with zero emissions**.

This commitment to sustainability has been recognised by the European Commission, which granted Barcelona the label of “**Mission City**” for its efforts to achieve climate neutrality by 2030. Barcelona is now one of the leading cities in climate protection within the European mission “100 climate-neutral and smart cities by 2030”, thereby reinforcing its leadership in sustainability.

From innovative water management to the creation of shaded spaces, the innovations that you will discover do not only improve the quality of urban life, but they also reduce the environmental impact. Walk along this street and discover how sustainable mobility, clean energy and environmentally-friendly solutions make **Barcelona a global leader in sustainability**.

Each project is a step further towards a fairer, healthier and more liveable Barcelona. With the active collaboration of citizens, companies and institutions, climate neutrality is closer than ever. **Explore, interact and experience Barcelona's green transformation!**



## Experience Innovative Green Urban Spaces

### [Green Wall](#)

Barcelona has turned green infrastructure into a fundamental pillar of its urban transformation. The **Local and Interior Spaces Programme (PEPI)** is renewing unused spaces, such as sites and interior spaces between blocks, in all the city's districts, with the aim of creating new green spaces that improve the health and wellbeing of the residents. These measures include more than 71 interventions and the creation of 22.3 hectares of greenery. The new surface areas not only reduce the temperature and improve air quality, but they also promote biodiversity. The programme also includes measures to provide shade to 216 spaces in the city (such as squares and playgrounds), to promote the creation of 10 green rooftops on municipal nursery school buildings and to transform 60 party walls into urban façades to improve habitability, energy efficiency and visual appearance.

**Green party walls**, which inspired the green wall you can see in front of you, are an essential part of this strategy, an example of how Barcelona is responding to the climate emergency with sustainable solutions that embellish and regenerate the urban space.

### [Temporary Shade Solution](#)

Seasonal shade solutions have arrived to the streets of Barcelona as an innovative solution to respond to new climate scenarios, especially increased temperatures. These temporary, modular and sustainable structures provide a cooler shelter in spaces where vegetation cannot grow, ensuring people's thermal comfort.

As you can see, they provide more than protection from the sun: they are meeting and socialisation places, where the city becomes a more welcoming place, especially during intense heatwaves. Barcelona City Council is testing three winning prototypes from the urban innovation challenge "**Creating temporary shade**" within the Climate Plan in plaça Comercial, Parc del Fòrum and rambla Badal. This solution is one of the 3 winners, namely the project "Oasis, shade for everyone" by the team comprising Denvelops Textiles and Eurecat.

### [Solar Panel](#)

In Barcelona, solar panels are now a part of the urban landscape, integrated into both buildings and the public space. This commitment to solar energy is not only a technological solution, but a silent revolution that transforms the urban space. With a view to a threefold increase in photovoltaic power by 2027 and a fivefold increase by 2030, Barcelona is making steady progress towards climate neutrality. This strategy is part of the Climate Plan, and complements one of the main pillars of the Barcelona Climate Plan, which sets the goal of being a **carbon neutral city by 2030**.

### [21st Century TILE](#)

The 21<sup>st</sup>-century concrete tile represents an evolution that respects Barcelona's heritage, but also a step towards urban sustainability. This new tile, created in the framework of the city's urban challenges, preserves the iconic value of its design while using more sustainable materials and innovative laying techniques. The solutions which are being implemented around the city reduce the carbon footprint, promote reuse and improve durability.





Barcelona is testing the new 21st-century tile on its streets to promote decarbonisation and the circular economy in the city. These new pieces have kept the iconic design that is an intrinsic part of the city's landscape, but they incorporate innovative solutions and technologies to tackle climate challenges. All the proposals use recycled sand and gravel, low-carbon materials and modifications in the installation system to facilitate reuse. In addition, they promote noise-reduction, they reduce the urban heat island effect and neutralise pollutant gases.

### [Regeneration of Buildings](#)

Buildings are an integral part of the urban landscape and life in the city. The **regeneration of dwellings with sustainable innovative solutions** aims to renovate buildings of dwellings with low-carbon technology and benefits for health and the urban setting. The goal is to promote the efficient use of resources, reduce and adapt to climate change, and improve the resilience and habitability of dwellings. The projects, currently in a pilot phase in the Diagonal-Besòs University Campus, include the expansion of spaces, bioclimatic envelope models, rainwater collection, solar energy generation and built-in smart management.

### [Greywater](#)

Barcelona is taking a step towards sustainable water management with the reutilisation of greywater, a solution that responds to the growing climate emergency and is another feature that makes the buildings in our city more efficient and sustainable. This innovation reuses shower and bath water in buildings with more than 16 dwellings, reducing drinking water consumption by 30%. The system, already applied in 22@, will extend to the entire city as part of the Alternative Water Resources Plan, a firm commitment to sustainability. Thus, Barcelona is becoming a model of resilience, where technology and the environment meet to guarantee a more efficient and balanced future for all citizens.

## Experience the Future of Urban Services

### [Cleaning Cart](#)

The cleaning cart in front of you is much more than a simple urban utility car: it demonstrates the efficiency and innovation of the daily service in the city. Barcelona's fleet of cleaning and waste collection vehicles is equipped with position and work sensors that send data to the municipal systems. With the **VIGIA project**, which manages these and many other data from the service (the teams' routes, incidents, container lifts...), the municipal staff can monitor the quality of cleaning and waste collection in the city. This vehicle is an ally in the quest to have clean and healthy urban spaces. While you look at it, you can see how technology is transforming the city, optimising processes and improving quality of life, always with sustainability and efficiency at the core of Barcelona's future.

### [Recycled pavement](#)

The pavement you are walking on is Barcelona's new pavement, a perfect blend of innovation and sustainability, that is already transforming the city with materials that are redefining the public space. On Via Júlia, Via Favència and Rambla de Catalunya, among many other measures, the recycled pavement, made with iron manufacturing waste, plastic waste, tyre dust



and toner waste, represents the city's commitment to the circular economy. In addition, in the cycling lane on carrer Jordi Girona, the drainage pavement provides an opportunity to study how this material can reduce the risk of flooding and improve the safety of cyclists in the rain. These new materials do not only optimise urban management, but they turn the ground we walk on into an active part of the sustainable future that Barcelona is building, with a direct impact on the city's resilience and habitability.

## Experience the Future of Urban Services

### [Electric Machinery](#)

Barcelona and its Climate Plan are moving towards a cleaner and more sustainable future with the use of electric machinery in municipal works. This initiative, promoted in collaboration with Homs Rentals, does not only reduce CO<sub>2</sub> emissions by one third compared to conventional machinery, but it has also been proven to reduce noise by half, and energy consumption by one seventh. At present, pilot tests with electric machinery are taking place, and the town council is working to gradually incorporate this type of machinery into its projects, ensuring a lower environmental impact. The city of Barcelona signed up to a joint declaration with cities such as Oslo and Copenhagen, highlighting the city's commitment to obtaining 50% of machinery free of emissions before 2030, demonstrating how technology can lead the urban transformation.

## Experience the Future of Mobility

### [Bicing](#)

Bicing, a symbol of the Barcelona that is headed towards a greener future, has become an integral part of the rhythm of the city, connecting districts and people with shared and sustainable mobility. With the arrival of 500 new electric bicycles, the service will continue expanding until it has 8,000 units next year, 5,000 of which will be electric. This growth responds to the growing demand, with thousands of daily journeys crossing streets and avenues, providing a clean and efficient alternative. Barcelona is the European leader in the density of stations, and every journey reinforces the city's commitment to a future with zero emissions and shared and sustainable mobility for everyone.

## Experience the Future of Mobility

### [Rider Dome](#)

The project **Rider Dome** is a turning point in motorcycle safety in Barcelona. This innovative solution, the result of an urban challenge promoted by Barcelona Innova Lab Mobility, an entity formed by Barcelona City Council, BIT Habitat and Fira Barcelona, is testing a system to reduce the motorcycle accident rate in the surveillance teams of Zona Bus and DUM of Barcelona Municipal Services. Using lights installed in the rearview mirrors, drivers receive warnings of imminent collisions, blind spots or inadequate safety distances. These warnings give them more time to react, significantly reducing the risk of accidents. In addition, the system stores the data in real time on the cloud, enabling users to analyse the warnings and foresee future risks. Barcelona is progressing towards safer and more technological mobility, turning the streets into safer places for everyone.



### [Uldecona](#)

The public housing project on carrer Uldecona in Barcelona is an example of architectural innovation and sustainability at the service of the city. The building is notable for its commitment to energy efficiency, with the use of environmentally-friendly building materials and systems and a structure that reduces the carbon footprint. One of the key elements is what you have before you, the **Bubble Deck** system, which uses recycled PVC spherical balls to lighten the load of floor slabs by 35%, leading to a reduction in the need for concrete and steel. The building is nearly a zero-energy building and has a green rooftop, which reflects Barcelona's commitment to more sustainable construction, creating a habitable and pleasant space for its citizens.

### Experience Safer, Smarter Cities

#### [Underwater Drone](#)

The underwater drone has become a complementary ally for the city's Fire Service. This submarine robot provides a view under the water, transmitting vital information in real time to the emergency coordinator. In complex operations, in which submarine firefighters face risks or difficult challenges, the drone becomes their eyes underwater. This Chasing M2 robot, from the company BPS, has 8 rotors that provide maximum manoeuvrability. Whether in prolonged searches or dangerous interventions, contaminated areas or narrow cavities, this drone guarantees a safer and more efficient job. With this key piece of technological innovation, Barcelona demonstrates once again how technology can reinforce urban safety and resilience, always with innovation at the service of the city.

#### [Integrated Technologies in Public Space](#)

The municipal services that most impact the quality of life of citizens are developed in the public space, and that is why technology needs to be deployed in an integrated and efficient way. As Barcelona progresses towards being a hyperconnected city with zero emissions, the Municipal Institute of Information Technology, in collaboration with other areas of the City Council, is promoting innovative technological solutions to improve the urban services.

From the deployment of 5G technology to smart security cameras and electrical enclosures, each element contributes towards optimising public spaces. These structural initiatives allow a more efficient use of ICT infrastructures, increasing connectivity for vehicles and other mobile elements, and providing data collection services for a more precise management of the city. In addition, the development of the **Digital Twin of Barcelona** will provide a crosscutting perspective and an in-depth analysis of urban data. We encourage you to use the screen in front of you to explore first-hand the elements deployed in and connected to the public space, interacting with the technologies that are transforming Barcelona into a smarter, more sustainable city, prepared for the challenges of the future.

#### [Technological Solutions](#)

The Municipal Institute of Information Technology (IMI) of Barcelona is at the forefront of a technological transformation that is making the city more connected and efficient. The multifunction column in front of you is an innovative infrastructure that is built into existing elements in the city such as lampposts or traffic lights, making them micro-places of services





that incorporate advanced technology and reduce the visual impact. These columns house the following technological solutions that are key in Barcelona's transformation into a smarter and more sustainable city:

**Sonometer:** It is a device that measures the environmental noise (from a series of sources: traffic, leisure, activities...) in a certain place. The data obtained help to quantify the noise to then supply information to the city's Noise Map, quantify the value of mobility changes such as traffic calming, underground train tracks, noise reduction by applying innovative technologies to construction and paving, among others. If the maximum permitted values are exceeded, the necessary measures to reduce the levels must be implemented. These measures are listed in the noise pollution reduction plans of each town.

**Cameras:** support cameras for the management of the city's mobility and security services. The solution implemented facilitates management and image processing with the specific requirements for each use, ensuring the protection of people's privacy.

**5G connectivity solutions:** the America's Cup in Barcelona was an opportunity to explore new models of deployment of future mobile phone networks in the public space while also promoting the reinforcement of 5G on the coast. This reinforcement included the deployment of two different techniques that implement small antennae systems on street furniture and that enable the City Council to assess the efficacy of these to guarantee the quality of the service addressed to users, while also providing a learning experience and a benchmark for implementation in other areas of the city in the near future.

It is a pioneer project that is not only reducing the digital gap, but is also preparing Barcelona for a hyperconnected future. Through this commitment to sustainable technology, public spaces are becoming smart, providing solutions that improve quality of life and safety, reinforcing Barcelona's position as a leading city in urban innovation.

