



# Pavement irrigation to improve thermal comfort

**Métropole Nice Côte d'Azur, France**

## IN A NUTSHELL

*Métropole Nice Côte d'Azur has implemented the innovative solution of pavement irrigation in public areas to improve the thermal comfort of citizens and lessen the impact of the Urban Heat Island effect.*



## An innovative approach to reducing the Urban Heat Island effect

The Urban Heat Island phenomenon, higher temperatures in urban areas relative to their surroundings, is caused by human activity in cities. Mediterranean cities such as Nice, which is particularly sensitive to extreme heat, face even higher increases of temperatures through heat islands, which have been exacerbated by climate change. Nice Côte d'Azur has thus implemented a project to improve the thermal comfort of citizens in public spaces and limit the heat island effect through the wetting of pavements in a multi-modal transport station.

Modelling studies were first conducted to target areas of discomfort and identify the appropriate solutions. These studies identified that waiting areas for pedestrians in stations and at stops were a key issue, and where more traditional solutions such as tree planting and other nature based solutions could not be implemented, irrigating pavements was a possible solution.

Developing a pavement wetting system in waiting areas for pedestrians mitigated the urban heat island effect, stimulated the use of public transport, reduced health impacts of heat on vulnerable groups, and increased economic activities in the area.

Nice recognises the economic benefits of this technological solution, as a public space that is resilient to climate change increases real estate investments and the wetting of pavements helps limit the energy consumption of nearby buildings.

### MÉTROPOLE NICE CÔTE D'AZUR



**Population:**  
525,000

**Area**  
1,465.8 km<sup>2</sup>

**Signatory to the Covenant of Mayors since:**  
2008

**CO<sub>2</sub> emission reduction target:**  
-40% by 2030 & adaptation

## How it works

To improve the thermal comfort of pedestrians and limit the urban heat island effect, Nice Côte d'Azur has developed two solutions for cooling the air by wetting pavements. One of them involves wetting from below, the other from above. The first uses a system of porous paving in pedestrian areas which water seeps up through.

This solution, inspired by a device developed in Japan, uses permeable paving made from seashells. The pavestones are arranged on a mortar setting bed and water is injected into the mortar using pipes with small holes in them that water slowly drips through. This water is distributed throughout the mortar bed and rises to the underneath of the pavestones thanks to the specific characteristics of both mortar and pavestones. The ambient temperature and direct heat from the sun heat the pavestones, which causes the water to gradually rise up through them and evaporate into the atmosphere, cooling the air.

The second solution developed to wet the pavements is a spray humidification system. This system sprays water evenly on the surface of bus tracks to wash the surface while cooling the area.

The water used for dispersion across the bus lane with spray nozzles is treated and disinfected. The raw water treatment plant includes a pressure stabilizer, a booster, a filter, a softener and a UV lamp disinfectant.

## Monitoring the pavement irrigation system

The two innovative solutions implemented by Métropole Nice Côte d'Azur are managed through an automatised system in order to ensure their successful operation when the city experiences high temperatures. As soon as the temperature setpoints are exceeded, the porous pavestones and the spray humidification system are triggered. Sensors are installed under the paving to provide the necessary information, temperature and humidity, while other sensors are deployed to assess the thermal comfort of the area (solar radiation, ambient temperature, humidity and wind). This information can be retrieved locally via software connected to the automatic system.



Refreshed pavements surface: **600 m<sup>2</sup>**

Daily water consumption during the hot period: **3 m<sup>3</sup>**

Estimated temperature reduction in a day: **2°**



### FINANCING THE PROJECT

- + **Financing source(s):** ERDF (16%), Caisse de Dépôts and Consignation/Ville de demain (up to 20%), Ecovallée Public Development Agency Total amount: €320,000

### USEFUL LINKS

- ▶ <https://www.2ei.veolia.com/fr/actualites/rafraichissement-ur-bain-du-pole-dechanges-multi-modal-de-nice>



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