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Are Barcelona's climate shelters accessible to vulnerable residents? A mobility justice analysis



A recent study provides new insights into the accessibility of Barcelona's Climate Shelter Network, questioning whether the city's expanding system of shelters genuinely benefits those residents who need it most. Published in *Cities*, the research was conducted through a collaboration between the GEMOTT research group on mobility, transport, and territory at the UAB and the Data Analytics & Visualization Group at the Barcelona Supercomputing Center (BSC-CNS), as part of the vCity project.

Credit: Mariona Gil <https://goo.su/bgeqfcT>

Since 2019, Barcelona has established over 350 climate shelters to assist residents during extreme heatwaves. While this signifies considerable progress in climate adaptation, questions remain about whether the network is distributed and accessible fairly, particularly for vulnerable groups such as older adults, low-income residents, and migrants living in heat-prone neighbourhoods. To examine these issues, researchers from the GEMOTT research group on mobility, transport, and territory at the UAB and the Data Analytics & Visualization Group at the Barcelona Supercomputing Center (BSC-CNS), as part of the vCity project, combined GIS-based isochrone analysis with socioeconomic data to determine who could

realistically reach a climate shelter within a 10-minute walk. We considered slower walking speeds (around 3.28 km/h) to better represent the mobility constraints faced by some residents, and we employed an intersectional approach to explore how age, income, and migrant background intersect to create varying levels of vulnerability.

The findings present a complex picture. On paper, accessibility appears strong: around 92% of vulnerable residents live within a 10-minute walk of a shelter. However, this figure drops to 75% in August, when many shelters close—leaving large parts of the population without easy access during peak summer heatwaves. The gaps are particularly significant in low-income and migrant-dense neighbourhoods, emphasising ongoing spatial and social inequalities. Additionally, when slower walking speeds were taken into account, accessibility reduced further for people with limited mobility.

Overall, the study demonstrates that proximity alone is not enough to ensure fair climate protection. Effective policy must also tackle mobility barriers, socioeconomic inequalities, and seasonal gaps in service. By offering a detailed and evidence-based analysis, the research provide valuable guidance for Barcelona's 2030 goal of ensuring every resident is within five minutes of a shelter. Their framework also offers a model for evaluating the fairness of climate adaptation strategies in cities worldwide.

The study was led by Serena Mombelli, a PhD researcher at GEMOTT, with co-authors Roger González March, Dr Fernando Cucchietti, Prof Oriol Marquet, and Dr Patricio Reyes.

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