

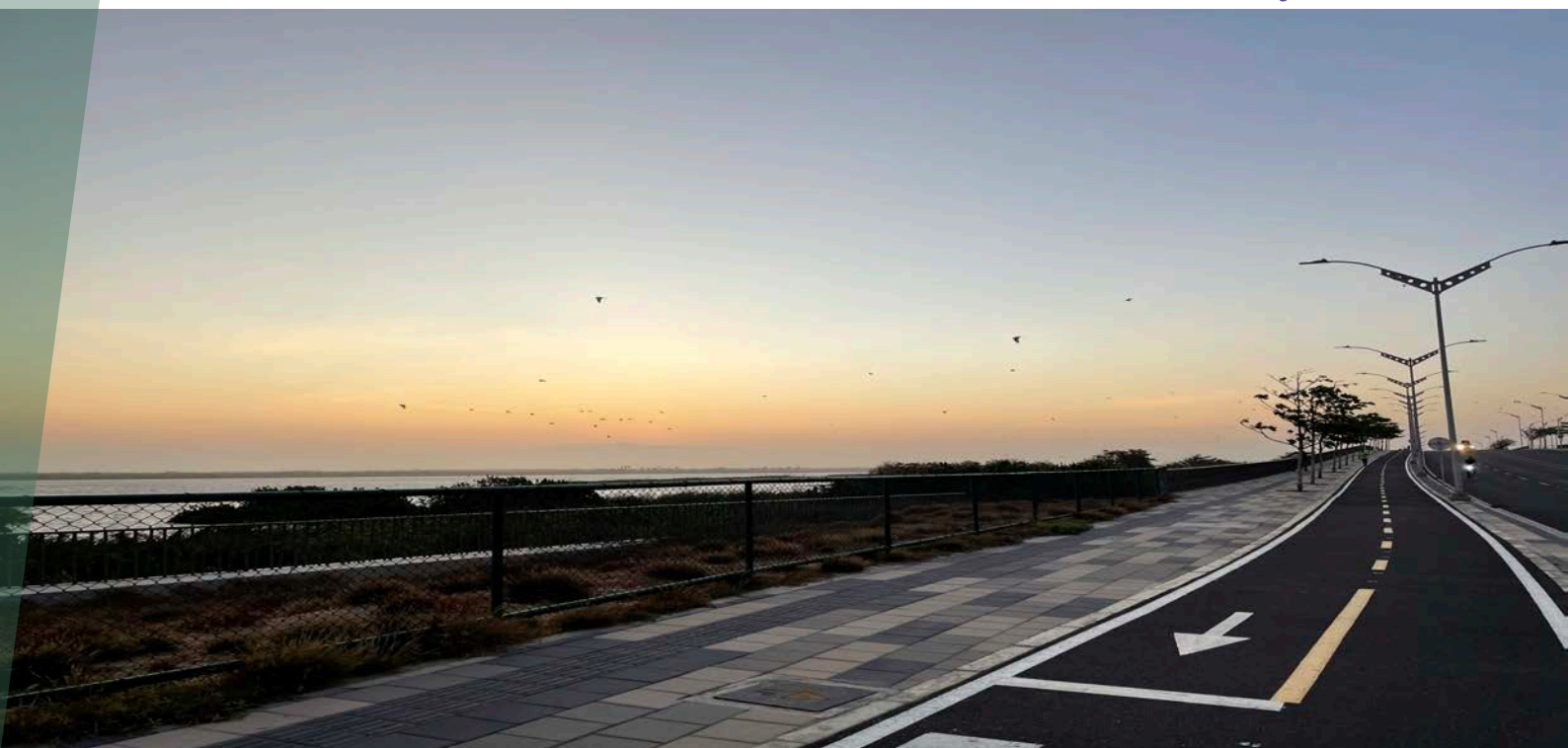


Global Observatory of  
**Healthy and  
Sustainable Cities**

# **Barranquilla Colombia 2023**

**Spatial indicators for healthy and sustainable cities**  
1000 Cities Challenge report

*Olga Lucia Sarmiento, 2023*



Full details of the data and methods are available at:

Global Observatory of Healthy & Sustainable Cities  
<https://www.healthysustainablecities.org>

Population data: Schiavina, Marcello; Freire, Sergio; MacManus, Kytt (2022): GHS-POP R2022A - GHS population grid multitemporal (1975-2030). European Commission, Joint Research Centre (JRC) [Dataset] doi: 10.2905/D6D86A90-4351-4508-99C1-CB074B022C4A

Urban boundaries: Florczyk, A. et al. (2019): GHS Urban Centre Database 2015, multitemporal and multidimensional attributes, R2019A. European Commission, Joint Research Centre (JRC).  
<https://data.jrc.ec.europa.eu/dataset/53473144-b88c-44bc-b4a3-4583ed1f547e>

Urban features: OpenStreetMap Contributors. OpenStreetMap.co (2023).  
<https://download.geofabrik.de/south-america/colombia-latest.osm.pbf>

Colour scale: Crameri, F. (2018). Scientific colour-maps (3.0.4). Zenodo.  
<https://doi.org/10.5281/zenodo.1287763>

## Global Healthy & Sustainable City Indicators Collaboration

City team members: Nicolás Guerrero Ayala, Nicolás Solorzano, Veronica Villadiego Lombana, Andrés Felipe Useche Luque, Andrés Felipe Aguilar Suarez, María Alejandra Wilches, Olga Lucia Samiento

Report design and editing: Carl Higgs, Eugen Resendiz, Melanie Lowe and Deborah Salvo

## Spatial indicators for healthy and sustainable cities

### 1000 Cities Challenge report

This report outlines how Barranquilla performs on a selection of spatial indicators of healthy and sustainable cities. As part of the 1000 Cities Challenge, we examined the spatial distribution of urban design and transport features that promote health and sustainability. The maps show the distribution of urban design and transport features across Barranquilla and identify areas that could benefit the most from interventions to create healthy and sustainable environments.

### Barranquilla context

Barranquilla is the capital city of the department of Atlántico and the fourth largest city in Colombia, located in the north part of the country. The city was established in the early XIX Century and as a coastal city it quickly became one of the main entry points to Colombia. Barranquilla is mostly flat and a dry tropical climate.

### Demographics and health equity

Barranquilla has around 1.2 million residents. The city shows inequalities, with higher population density in the south and wealth concentrated in the north and northwest. At the departmental level, disparities persist in maternal mortality, access to healthcare, and cervical cancer rates.

### Environmental disaster context

Barranquilla experiences environmental disasters like floods, landslides, heatwaves, and wildfires. Flooding and landslides occur near the Magdalena River basin, while heatwaves and fires worsen during droughts.

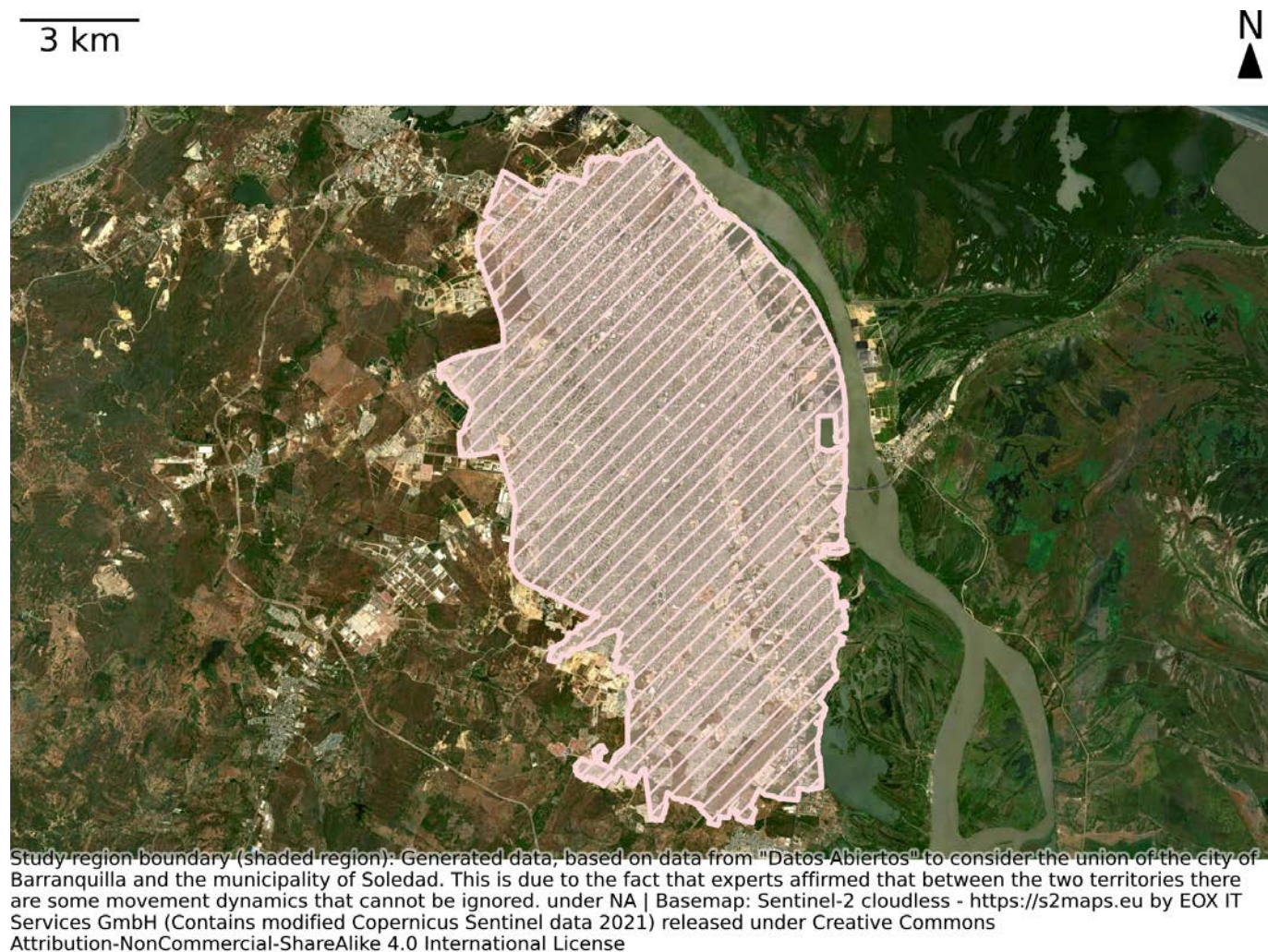
*Olga Lucia Sarmiento, 2023*





## Study region

The study region used to calculate spatial indicators for the population of Barranquilla presented in this report has been highlighted in the map below using parallel line shading.



## Map legend

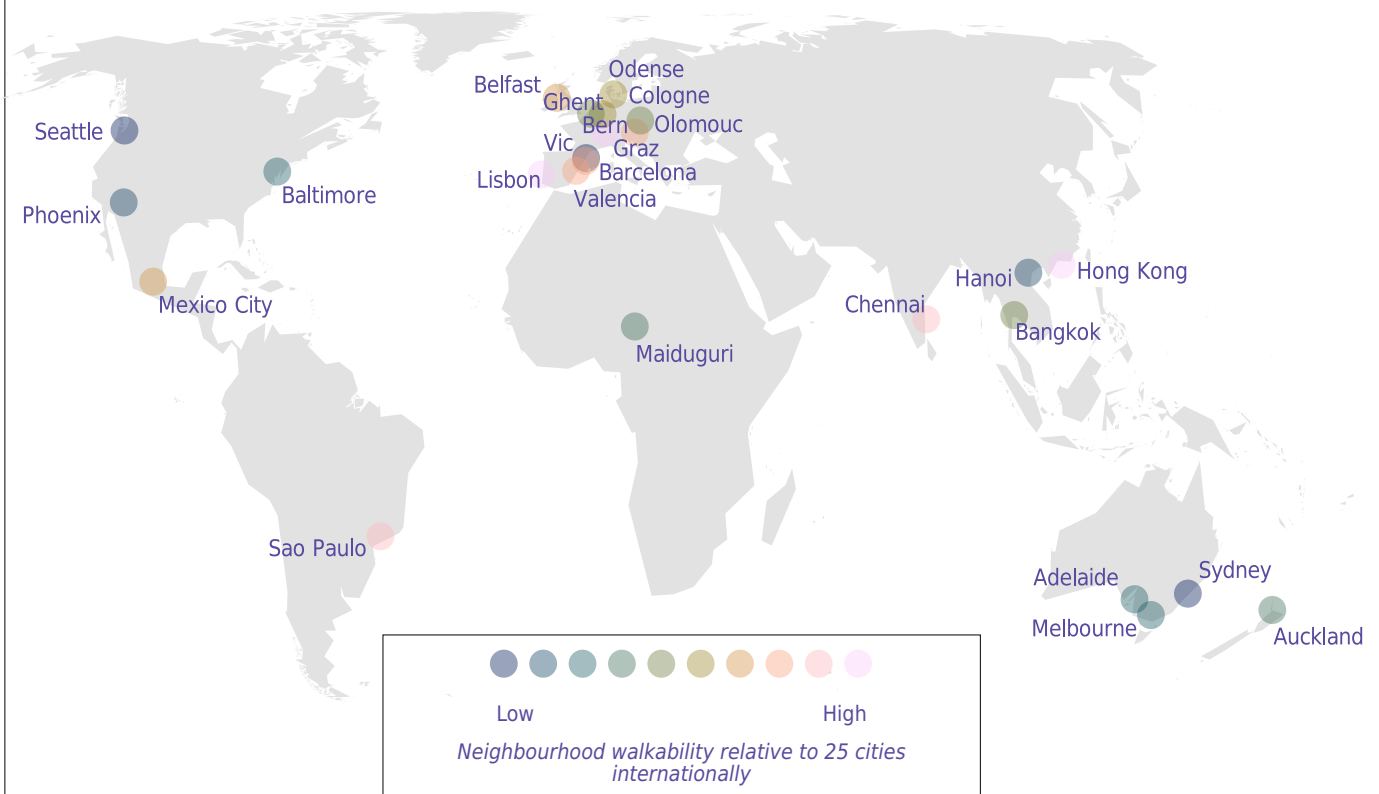


Study region boundary  
(Organización AMB (2019).  
Cartografía Catastral en formato  
geoDataBase del Área  
Metropolitana de Barranquilla.  
[https://www.datos.gov.co/Ordenamiento-Territorial/Cartografia-Catastral-en-formato-geoDataBase-del-r/jt5b-pjm4/about\\_data](https://www.datos.gov.co/Ordenamiento-Territorial/Cartografia-Catastral-en-formato-geoDataBase-del-r/jt5b-pjm4/about_data))

### Box 1: The Lancet Global Health Series study of 25 cities internationally

The 1000 Cities Challenge extends methods for assessing the health and sustainability of cities outlined in the 2022 Lancet Global Health Series on urban design, transport, and health. Policy and spatial indicators were calculated, analysed and reported in multiple languages for 25 diverse cities across 19 countries and 6 continents. These cities provide a useful reference for comparisons, but are not a representative sample of all cities internationally.

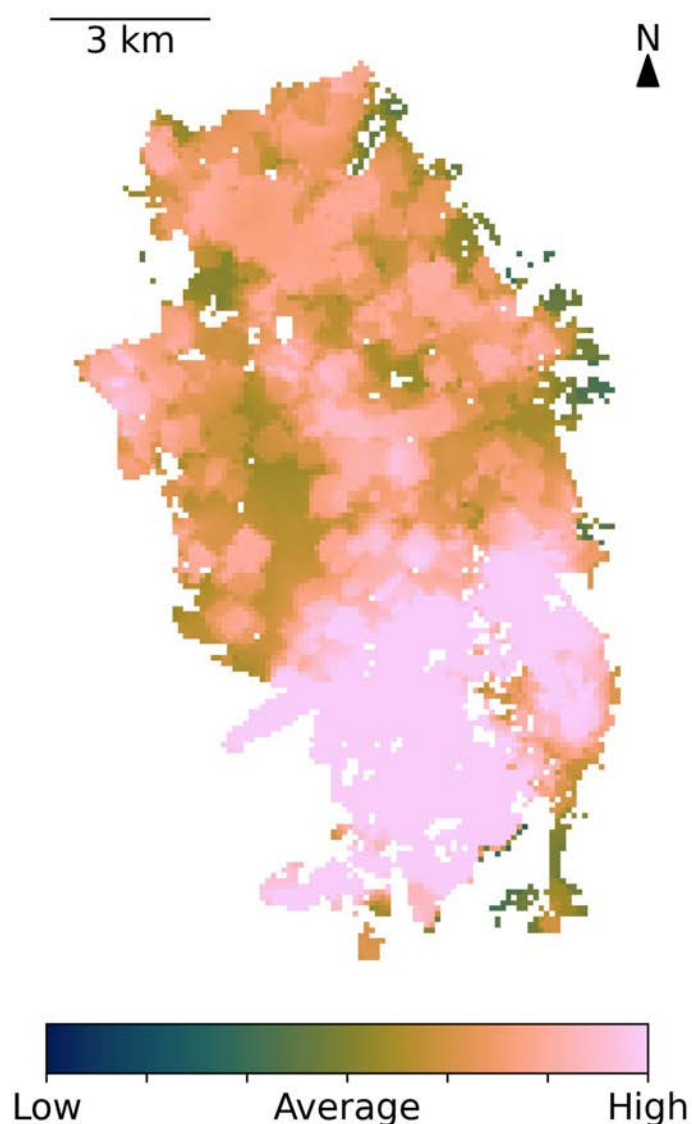
For more details, please see the 2022 The Lancet Global Health Series on Urban design, transport, and health (<https://www.thelancet.com/series/urban-design-2022>).



## Walkability and destination access

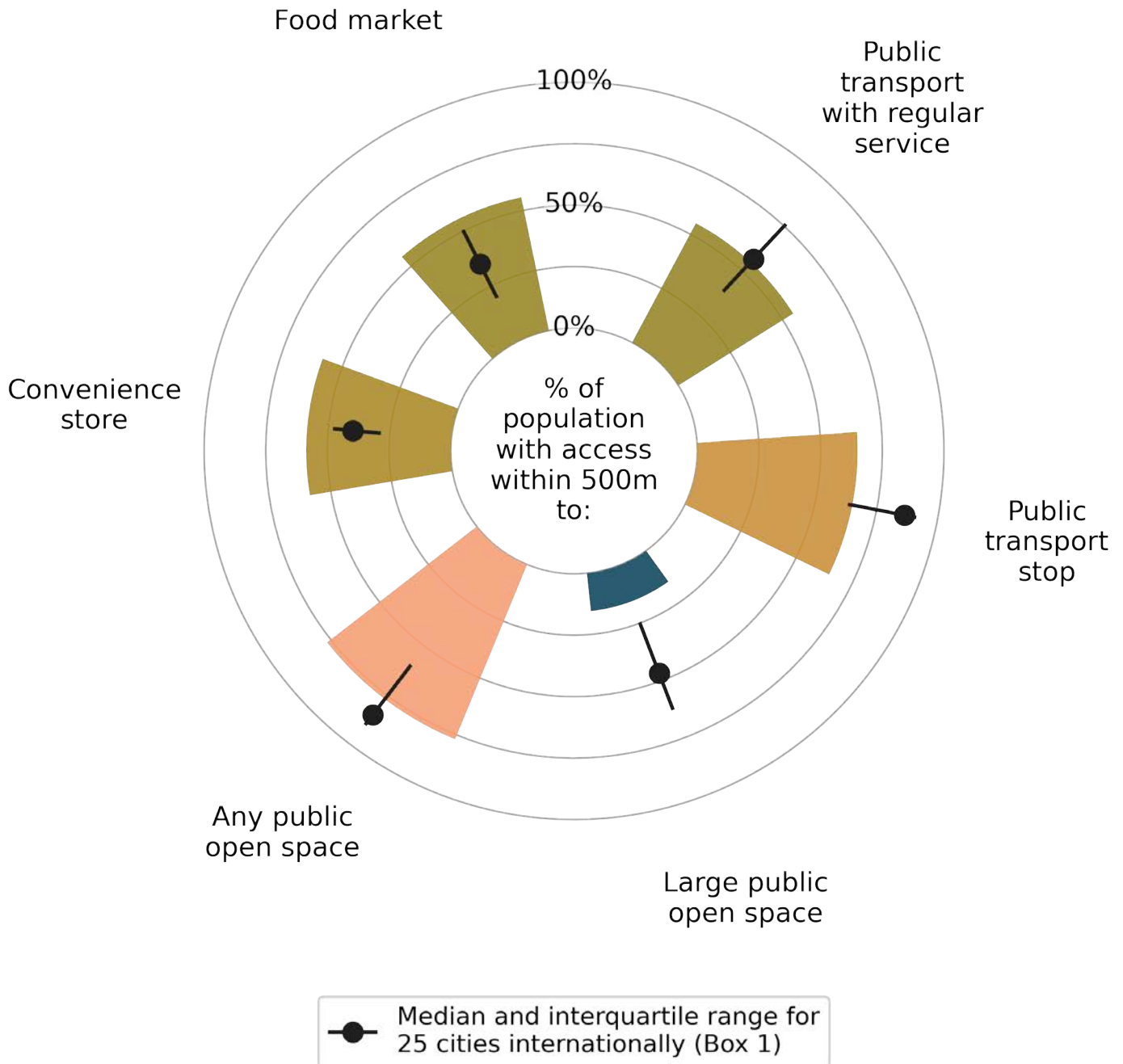
Walkable neighbourhoods provide opportunities for active, healthy, and sustainable lifestyles through having sufficient but not excessive population density to support adequate provision of local amenities, including public transport services. They also have mixed land uses and well-connected streets, to ensure proximate and convenient access to destinations. High-quality pedestrian infrastructure and reducing traffic through managing demand for car use can also encourage walking for transport.

### Neighbourhood walkability relative to 25 cities internationally



99.7% of the population in Barranquilla live in neighbourhoods with walkability scoring above the median of 25 cities internationally (Box 1)

## Percentage of population with access to amenities within 500 metres (m)



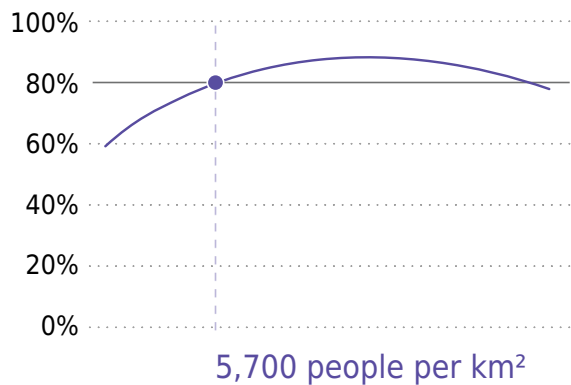
## Urban design thresholds to promote walking

The 2022 Lancet Global Health Series found that to achieve at least 80% probability of engaging in any walking for transport, an average urban neighbourhood would need a population density of at least 5700 people km<sup>2</sup> and street connectivity of at least 100 intersections per km<sup>2</sup>, approximately and depending on context. Preliminary evidence showed that street intersection density above 250 per km<sup>2</sup> and ultra-dense neighbourhoods (> 15,000 persons per km<sup>2</sup>) may have decreasing benefits for physical activity. This is an important topic for future research.



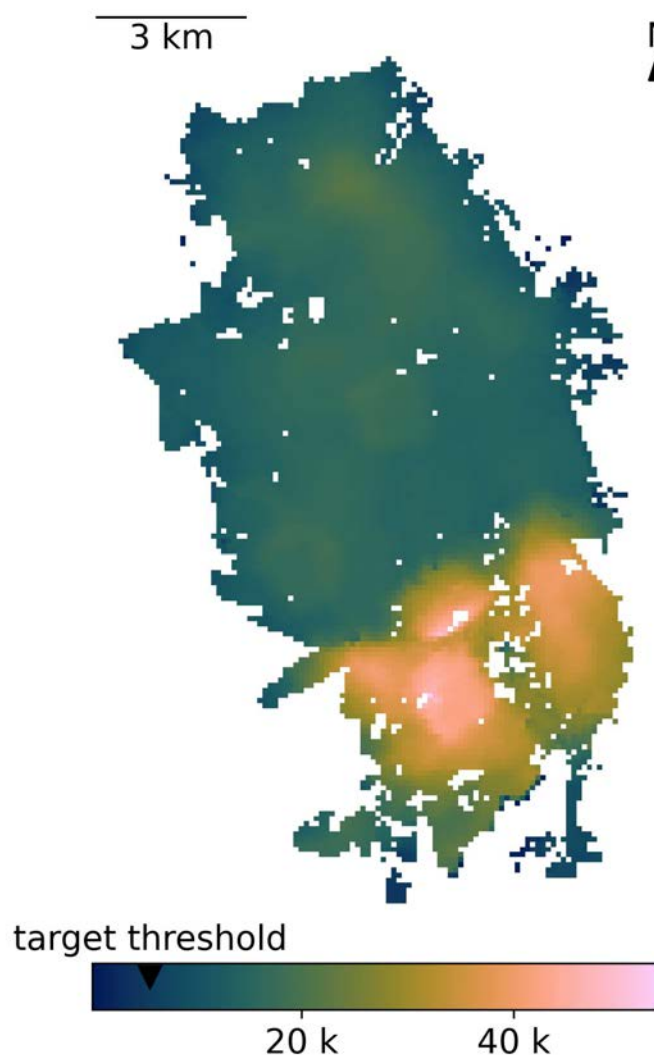
## Neighbourhood population density (per km<sup>2</sup>)

### Probability of engaging in any walking for transport



Adapted from The Lancet Global Health (2022):  
<https://www.thelancet.com/infographics-do/urban-design-2022>

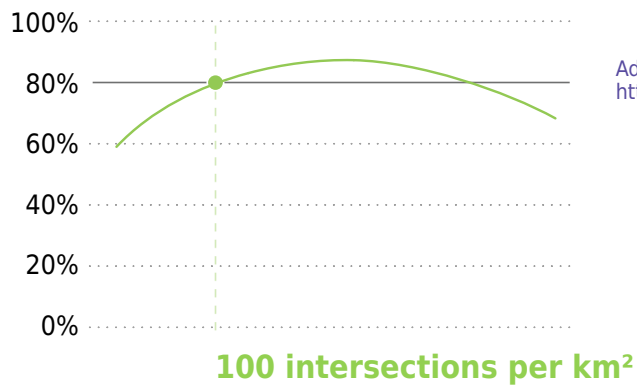
99.7% of the population in Barranquilla live in neighbourhoods meeting the population density threshold for 80% probability of engaging in any walking for transport (5,700 people per km<sup>2</sup>)





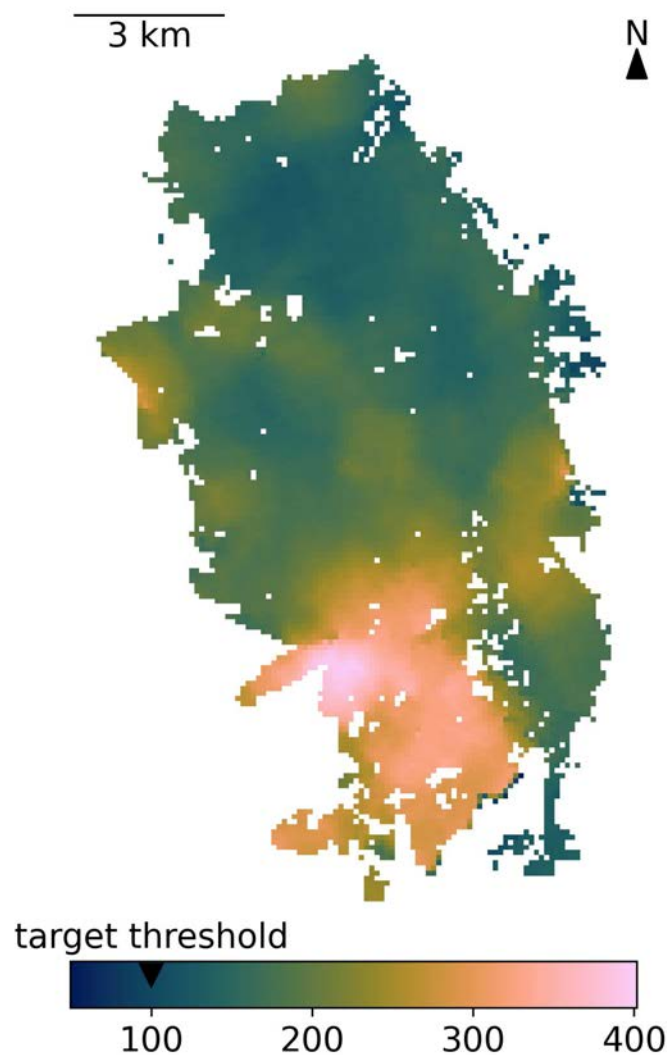
## Neighbourhood intersection density (per km<sup>2</sup>)

### Probability of engaging in any walking for transport



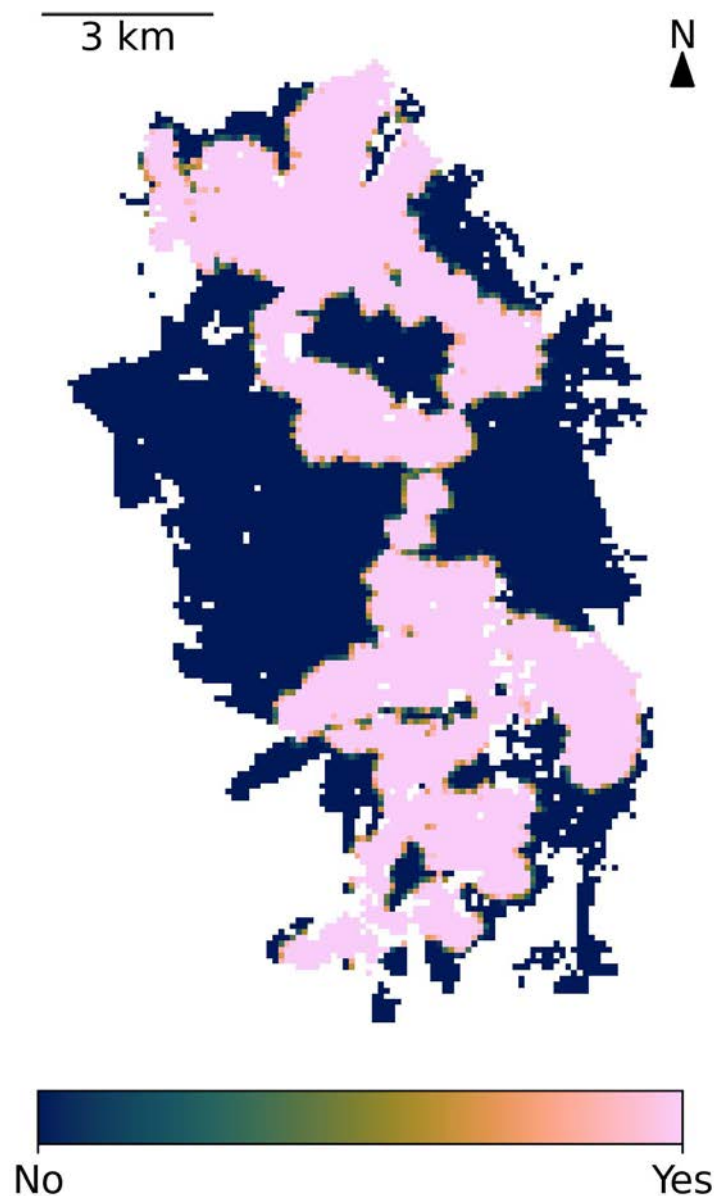
Adapted from The Lancet Global Health (2022):  
<https://www.thelancet.com/infographics-do/urban-design-2022>

100.0% of the population in Barranquilla live in neighbourhoods meeting the street intersection density threshold for 80% probability of engaging in any walking for transport (100 intersections per km<sup>2</sup>)



## Public transport access

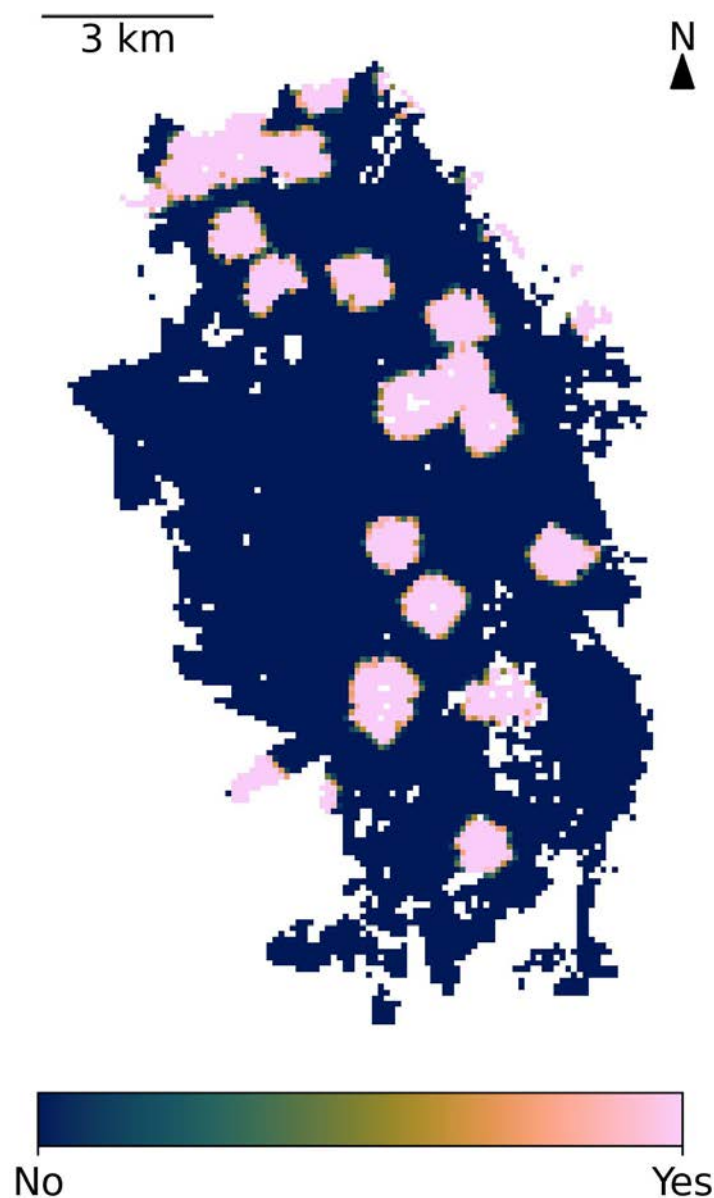
Easy access to frequent public transport is a key determinant of healthy and sustainable transport systems. Public transport near housing and employment increases the mode share of public transport trips, thus encouraging transport-related walking; offering access to regional jobs and services; improving health, economic development, and social inclusiveness; and reducing pollution and carbon emissions. The frequency of services also encourages public transport use, in addition to the proximity of stations or stops.



55.0% of the population in Barranquilla live within 500m of public transport with 20 mins or better average weekday frequency

## Public open space access

Local access to high-quality public open space promotes recreational physical activity and mental health. Nearby public open space creates convivial, attractive environments, helps cool the city and protects biodiversity. As cities densify and private open space declines, providing more public open space is critical for population health. Having public open space within 400 m of homes can encourage walking. Access to larger parks may also be important.



15.5% of the population in Barranquilla live within 500m of public open space of at least 1.5 hectares in size

## Summary

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### Citation

Nicolás Guerrero Ayala, Nicolás Solorzano, Veronica Villadiego Lombana, Andrés Felipe Useche Luque, Andrés Felipe Aguilar Suarez, María Alejandra Wilches, Olga Lucia Samiento. 2023. 1000 Cities Challenge report: Barranquilla, Colombia 2023—Spatial indicators for healthy and sustainable cities (English). Global Observatory of Healthy and Sustainable Cities.



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