

# Nuevas tecnologías y planeamiento urbanístico: su aportación a un planeamiento dinámico

Jornada anual socios AETU

TOLEDO 2017

URBANing  
people · space · cities

**UCL** Space Syntax

# the process of making cities, **from the development of the urban form to the informational age**



*“The chief function of the city is to convert power into form, energy into culture, dead matter into the living symbols of art, biological reproduction into social creativity.”*

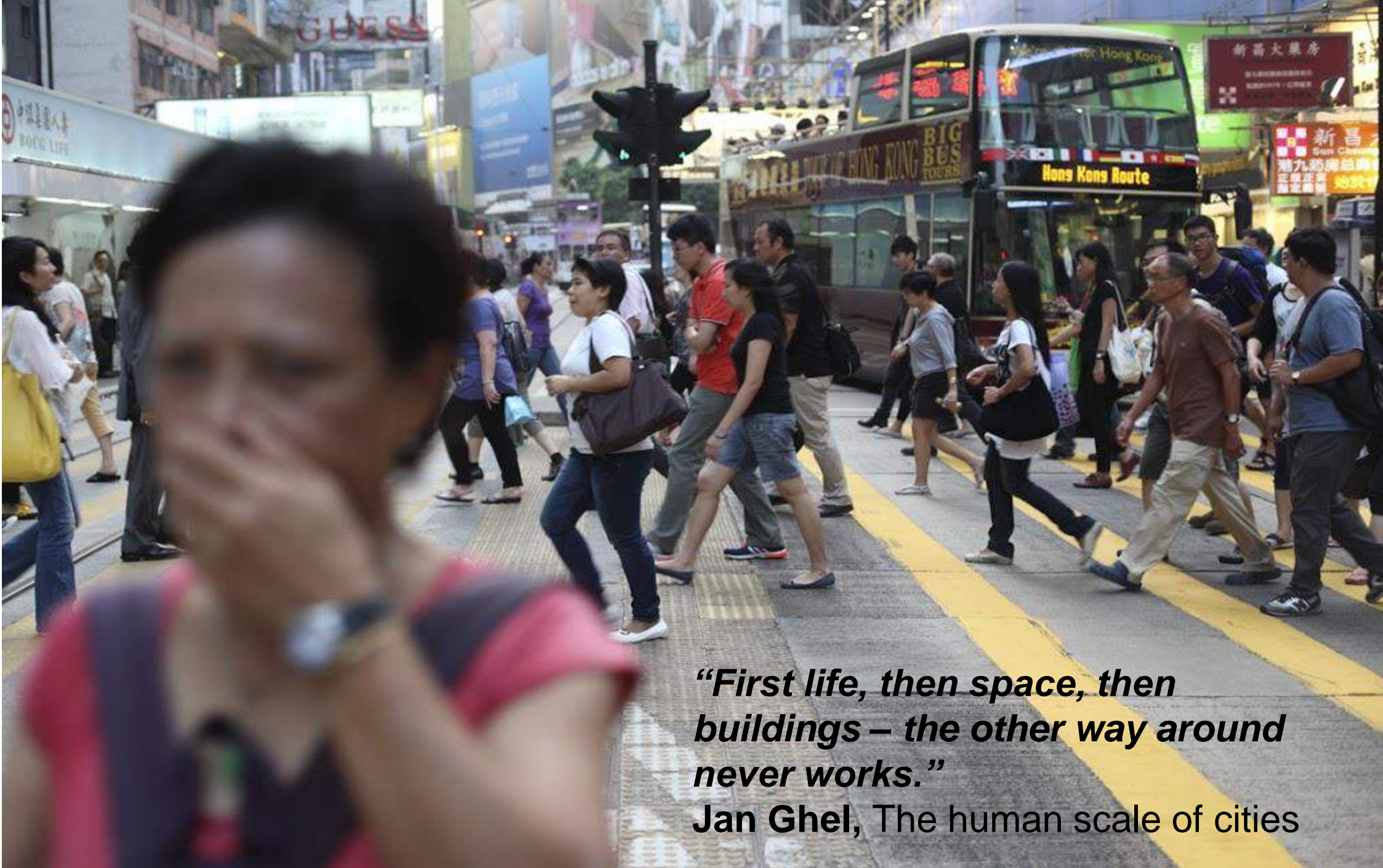
**Lewis Mumford,  
The City in History**



*“Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody.”*

**Jane Jacobs, The Death and Life of Great American Cities**





***“First life, then space, then buildings – the other way around never works.”***  
**Jan Ghel, The human scale of cities**

the process of making cities, **from the development of the urban form to the informational age**

A circular diagram showing urban morphology. It features a grid of streets with labels for 'BARCELONA', 'COPENHAGEN', 'NEW YORK', and 'PARIS'. The text 'Urban morphology' is at the top, and 'La Morfología Urbana' is in red below it.

Urban morphology  
*La Morfología Urbana*

A circular diagram showing data analytics for urban planning. It features a crowd of people holding up smartphones. The text 'Data analytics for urban planning' is at the top, and 'Análisis de Datos para la Planificación Urbana' is in red below it.

Data analytics for urban planning  
*Análisis de Datos para la Planificación Urbana*

A circular diagram showing social urban models for planning design. It features a network of orange lines on a dark background. The text 'Social Urban models for planning design' is at the top, and 'Modelos Urbanos para la Planificación' is in red below it.

Social Urban models for planning design  
*Modelos Urbanos para la Planificación*

**Data analytics for  
urban planning**

***Análisis de Datos  
para la  
Planificación  
Urbana***

**New urban planning?**

***Nuevas formas de  
planeamiento?***

**Urban morphology**

***La Morfología  
Urbana***

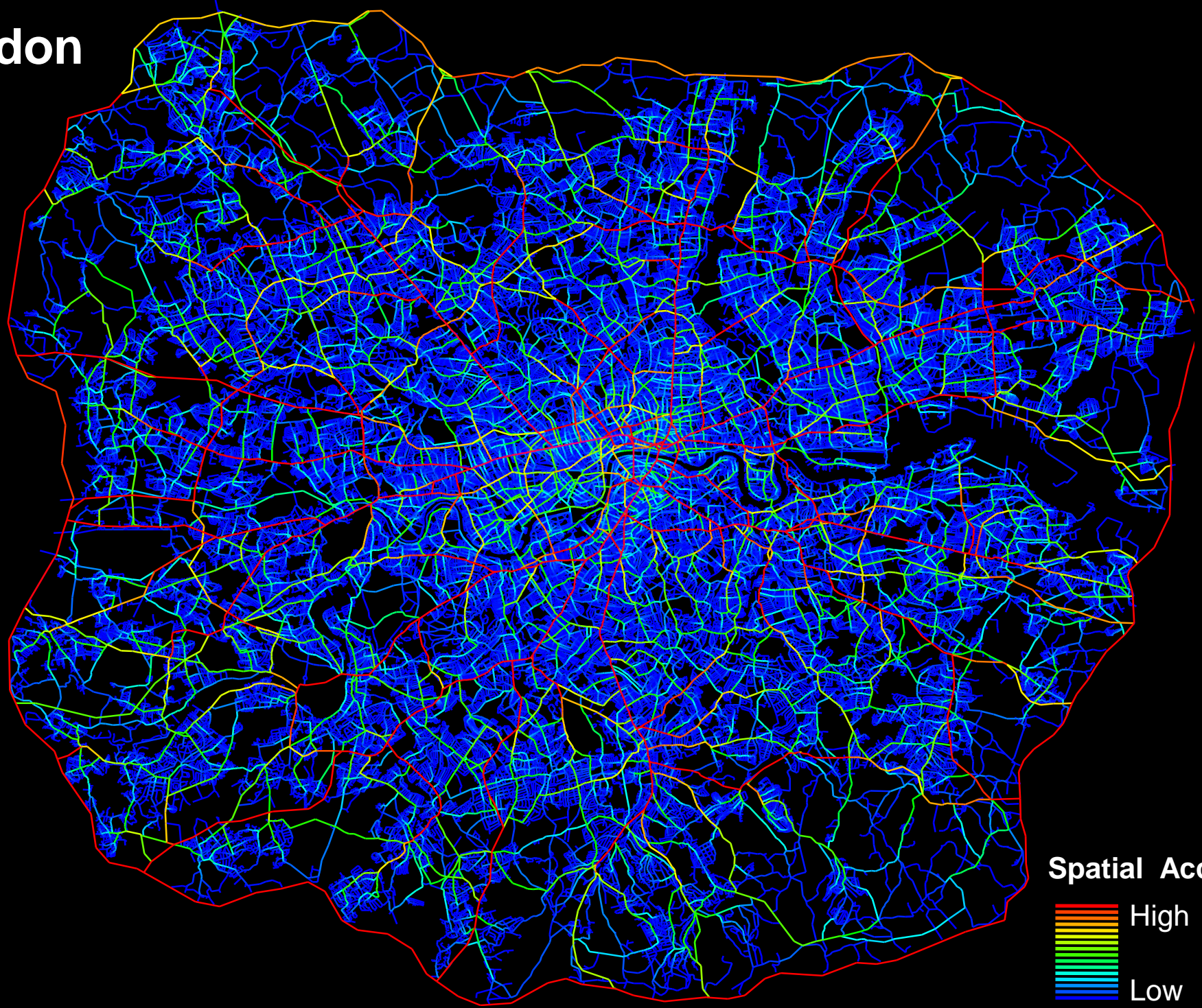
**Social Urban  
models for planning  
design**

***Modelos Urbanos  
para la Planificación***

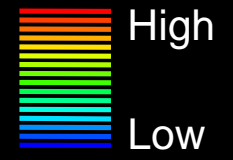
## La Morfología Urbana: el potencial de la conectividad de la trama



# London



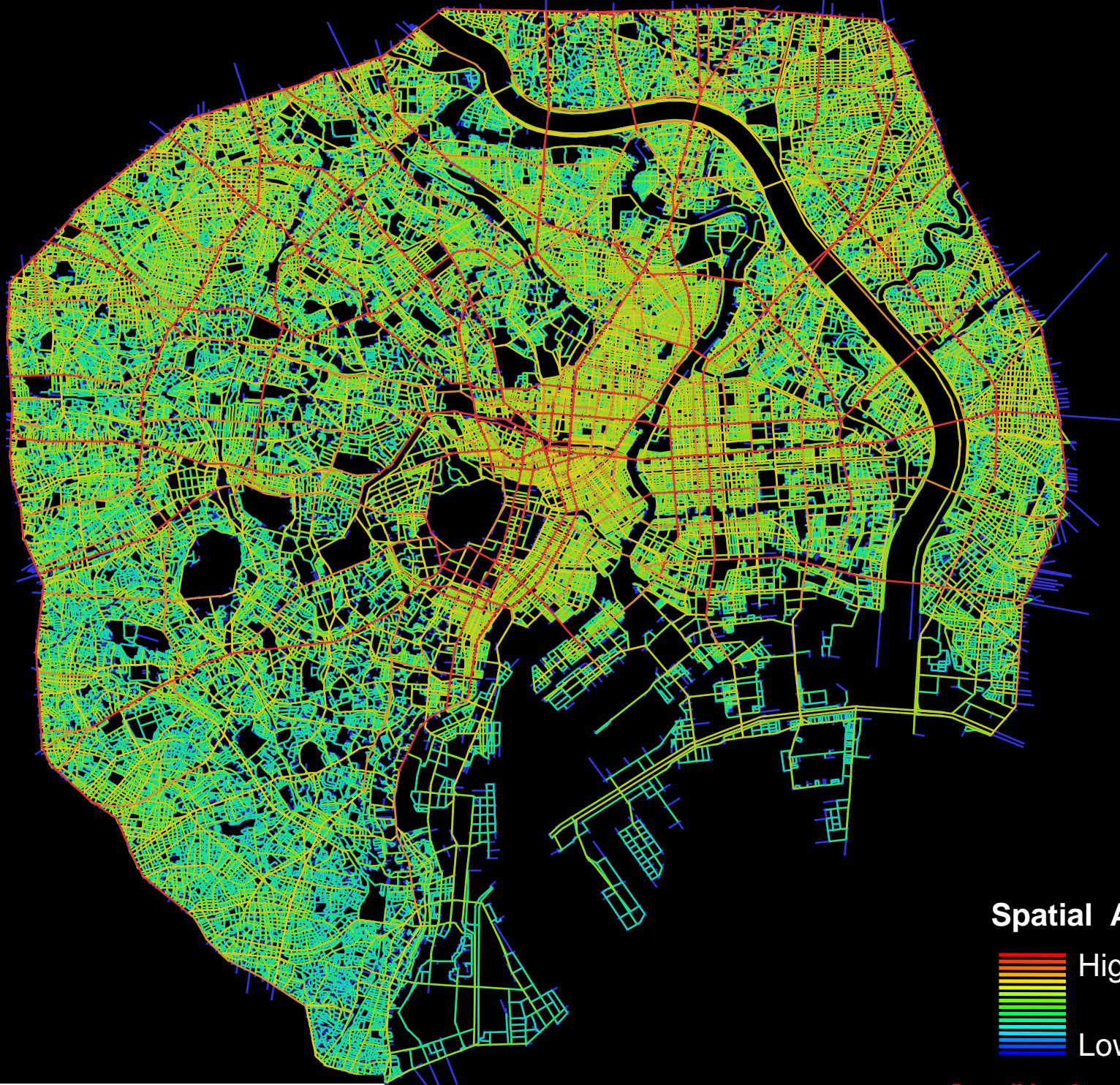
## Spatial Accessibility



# Beijing



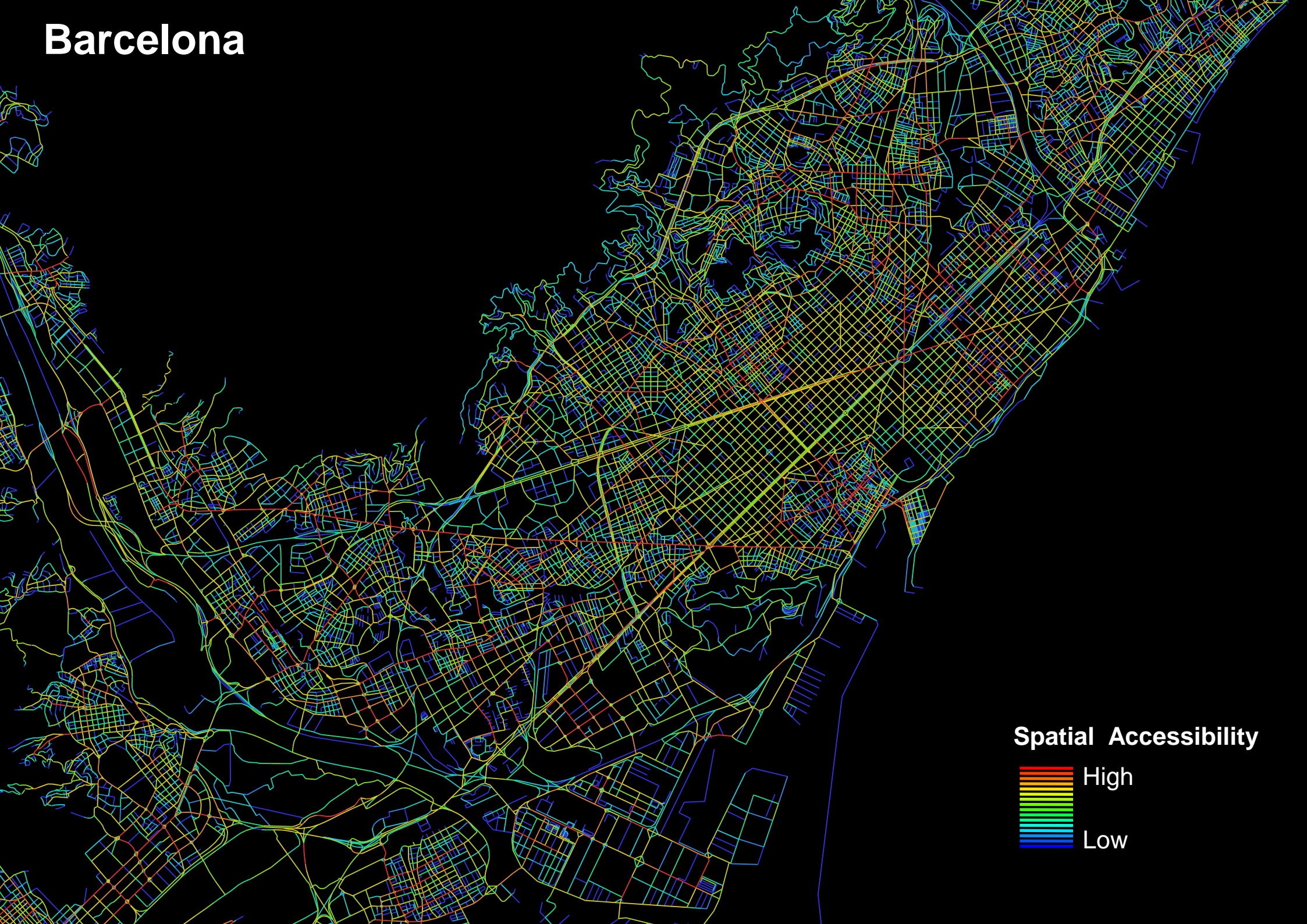
# Tokyo



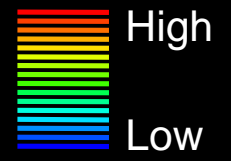
**Spatial Accessibility**



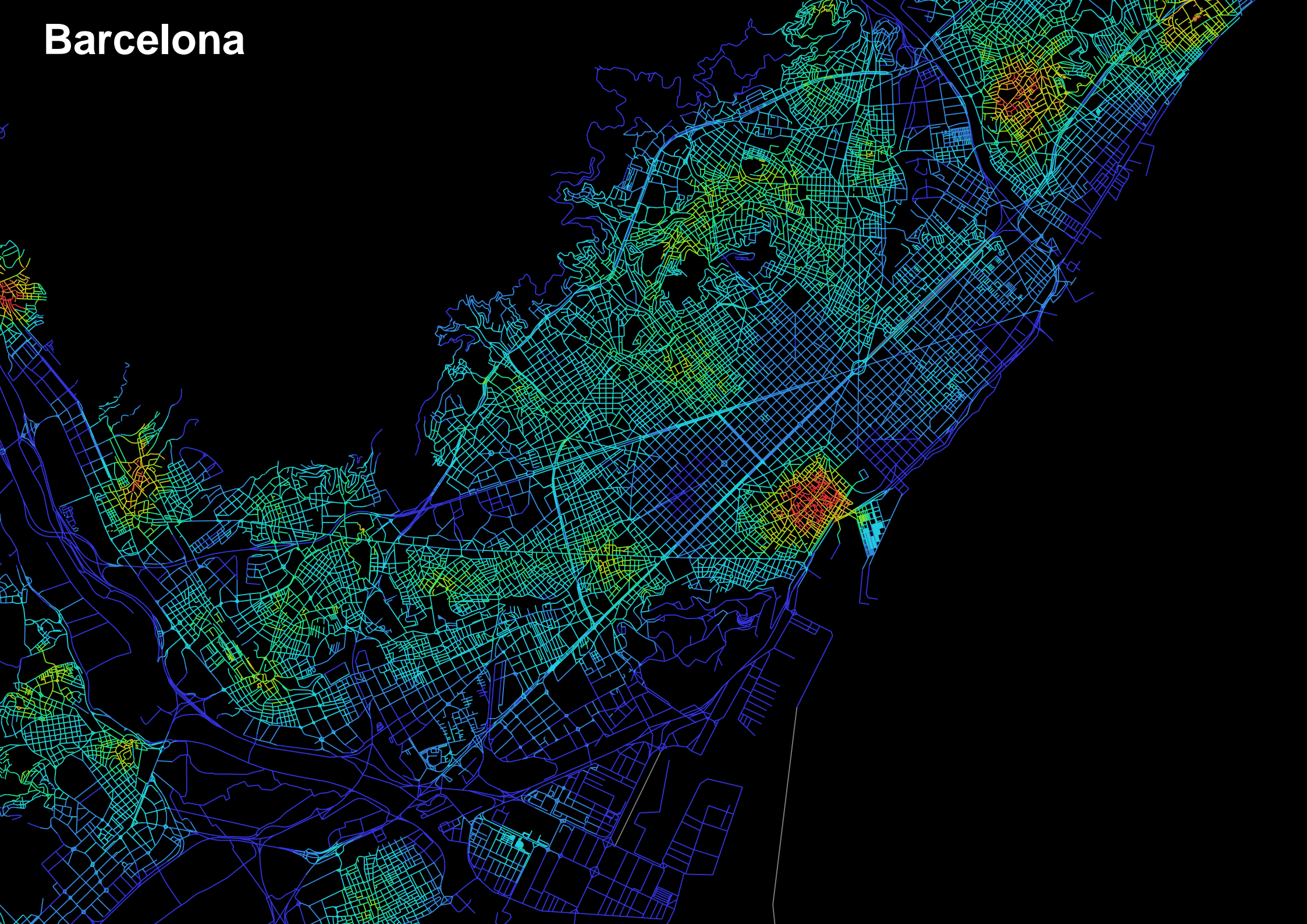
# Barcelona



## Spatial Accessibility



# Barcelona



# Barcelona

**What tools do we use?** Spatial accessibility analysis Nach 800



# Barcelona

**What tools do we use?** Spatial accessibility analysis Nach 5000

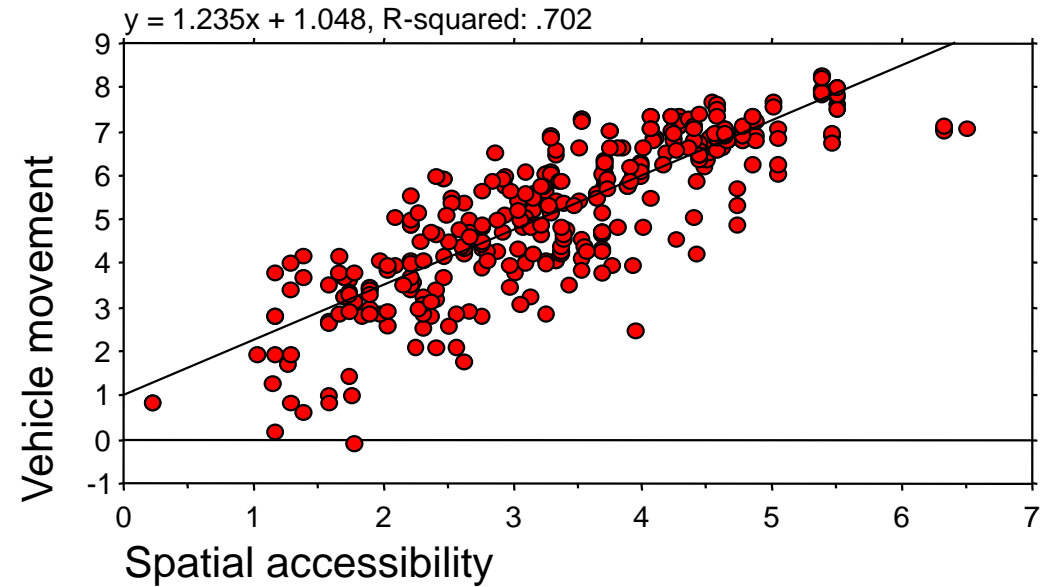
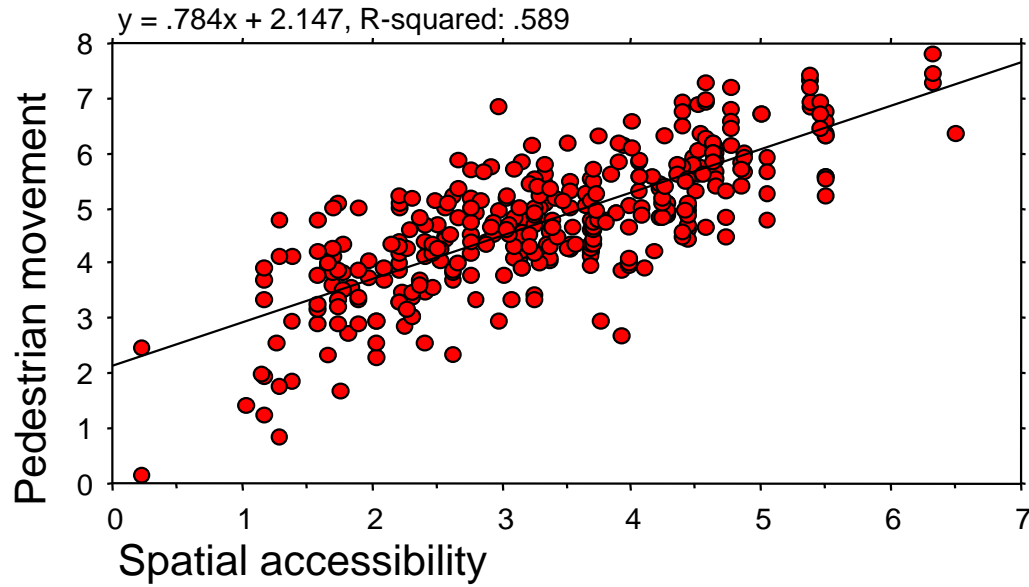


# Barcelona

**What tools do we use?** Spatial accessibility analysis Nach R



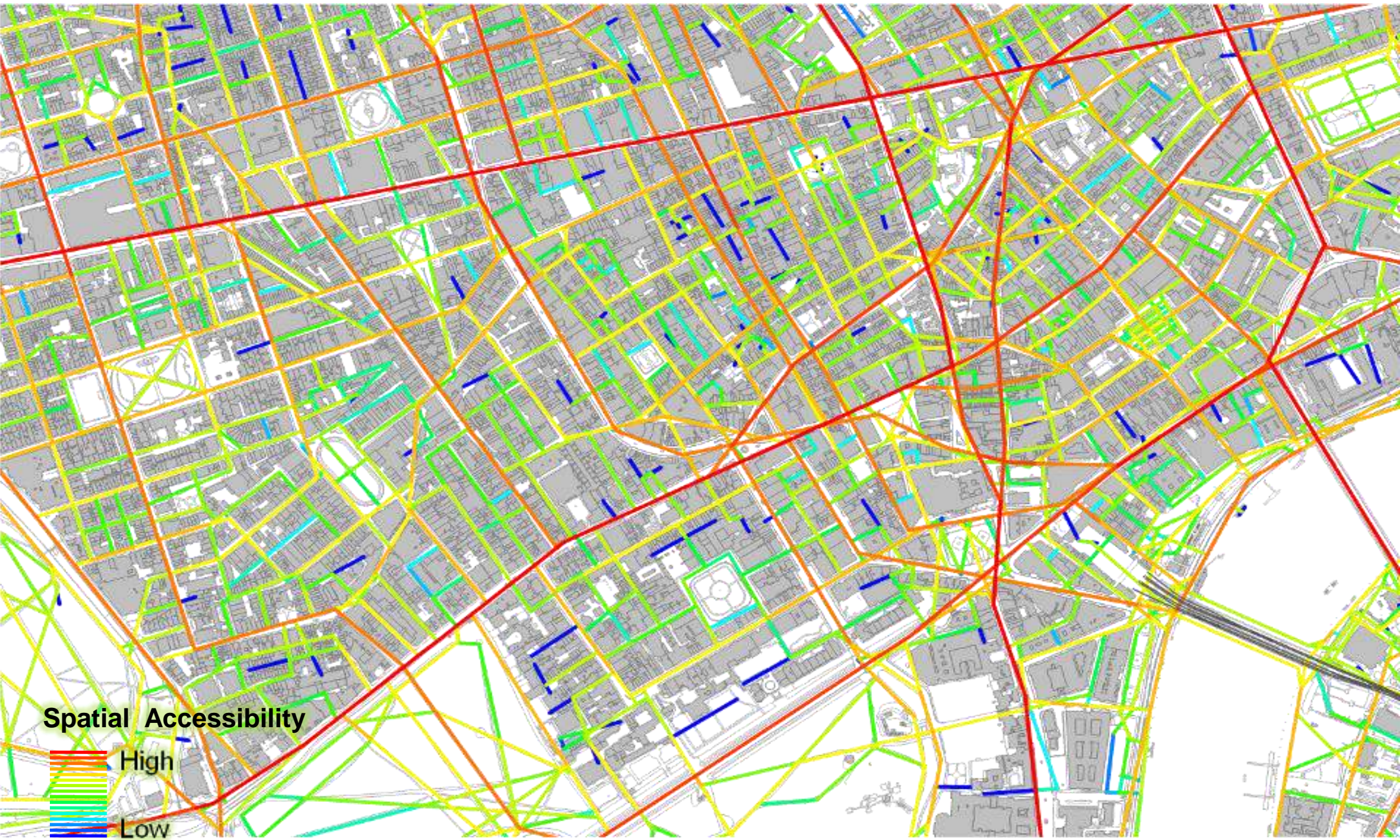
# The evidence base



Research shows that **60-80%** of movement flows are due to the structure of the network, measured by spatial accessibility.

More accessible places get more movement.

# La morfología espacial urbana y uso de la ciudad



# La morfología espacial urbana y uso de la ciudad



## What tools do we use?

We use a unique set of **spatial analyses** which measures the spatial and physical characteristics of places

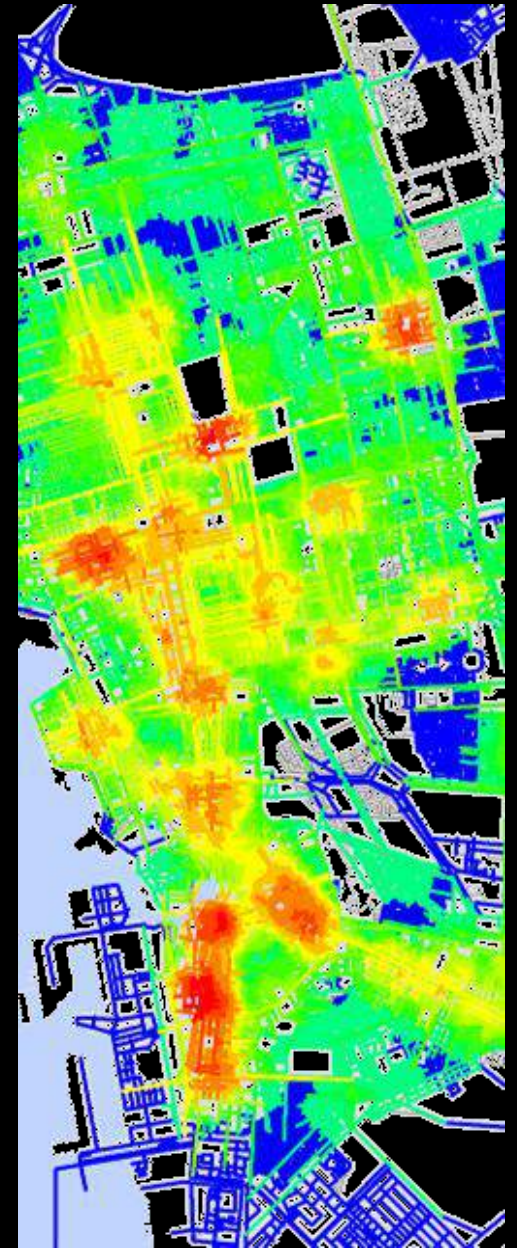
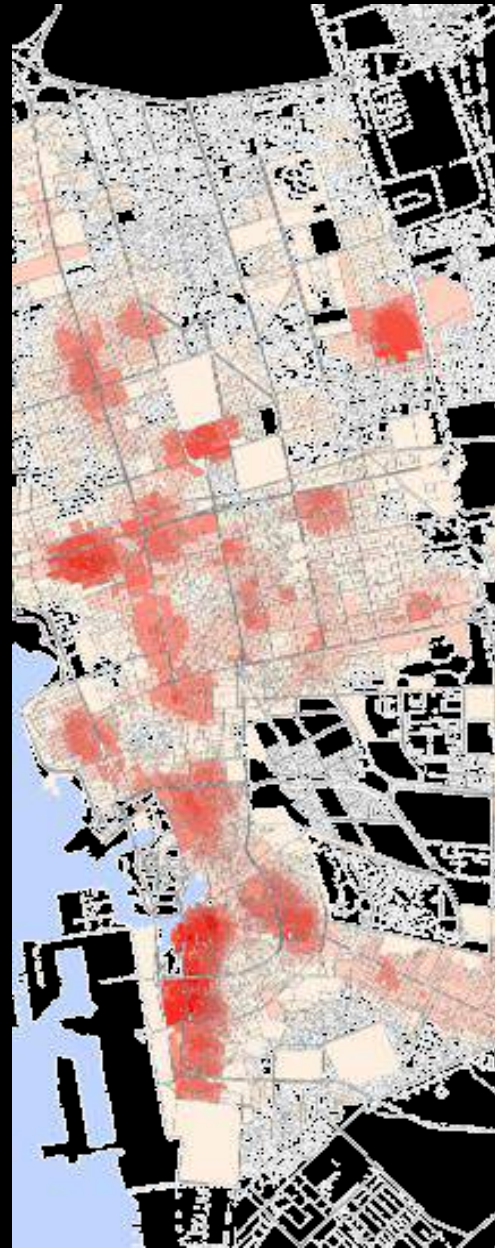
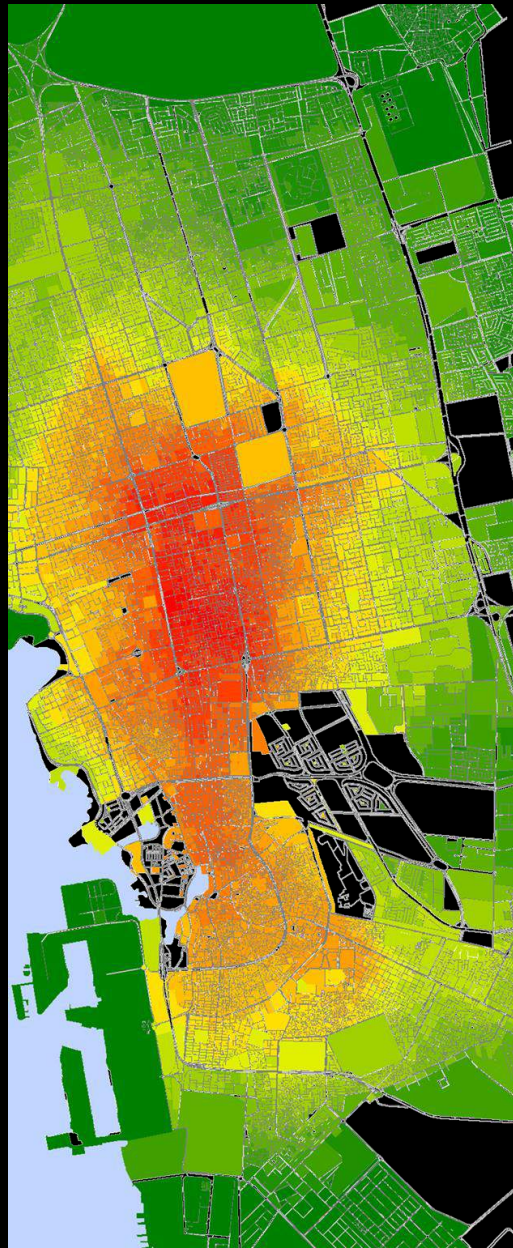
We link the physical configuration of buildings, streets and spaces with human behaviour, and use this to predict patterns of movement, land use, density, land value and social interaction

They can be used to:

- understand existing urban areas
- test the performance of design proposals
- generate strategic/concept designs
- measure the impact of development



# What tools do we use? Customisable components



## What tools do we use? Integrated urban models



# What scales do we work at?

**Macro**

**Urban strategies**

**Meso**

**Urban Development Frameworks**

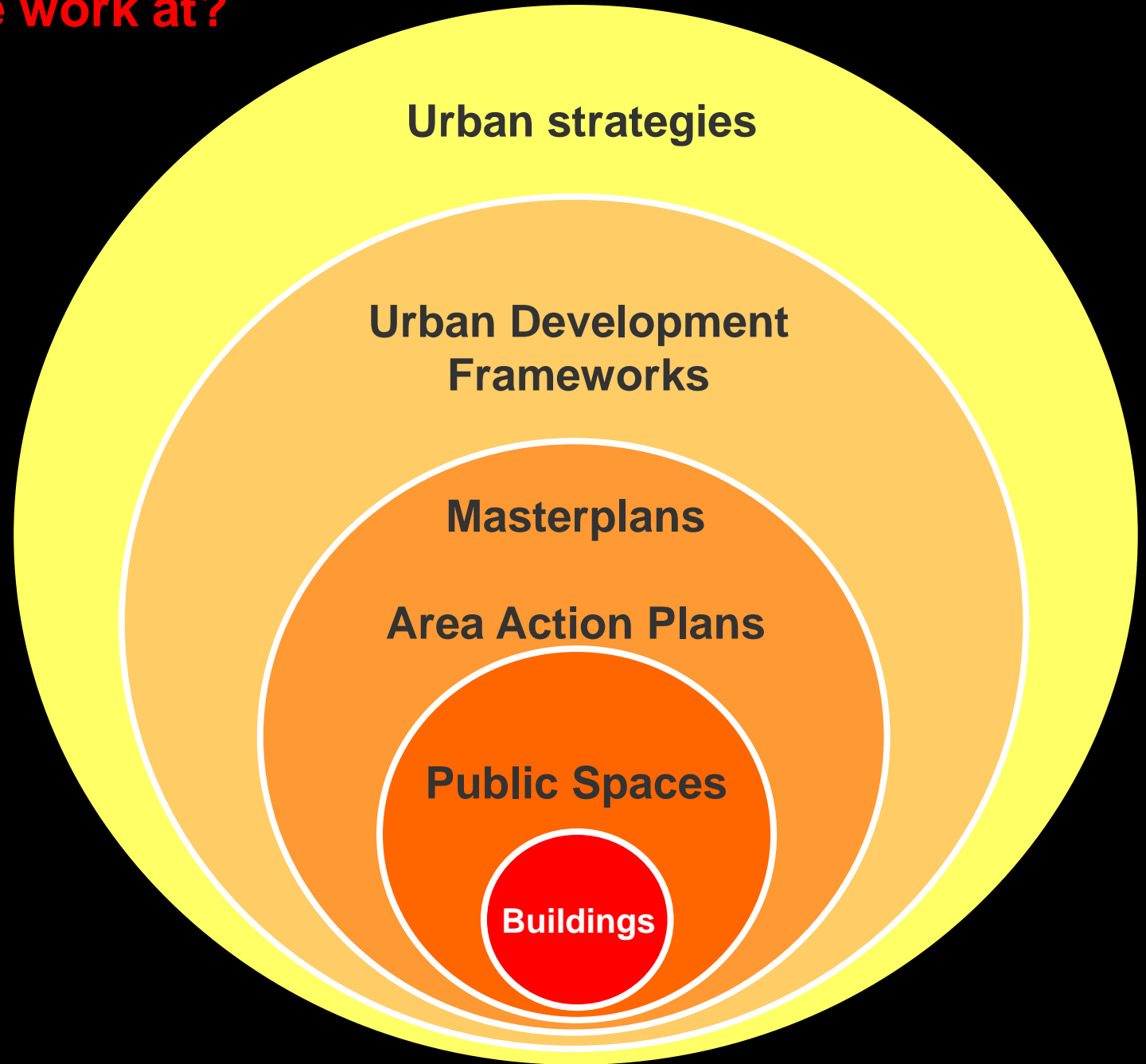
**Masterplans**

**Area Action Plans**

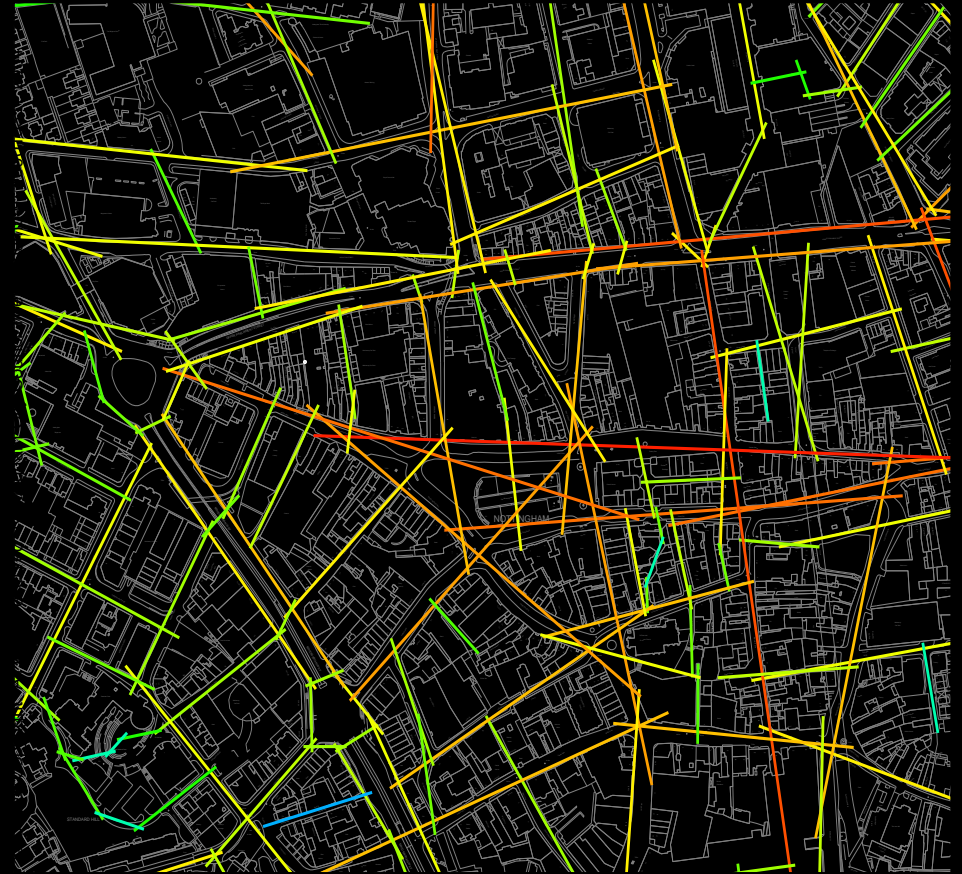
**Public Spaces**

**Micro**

**Buildings**

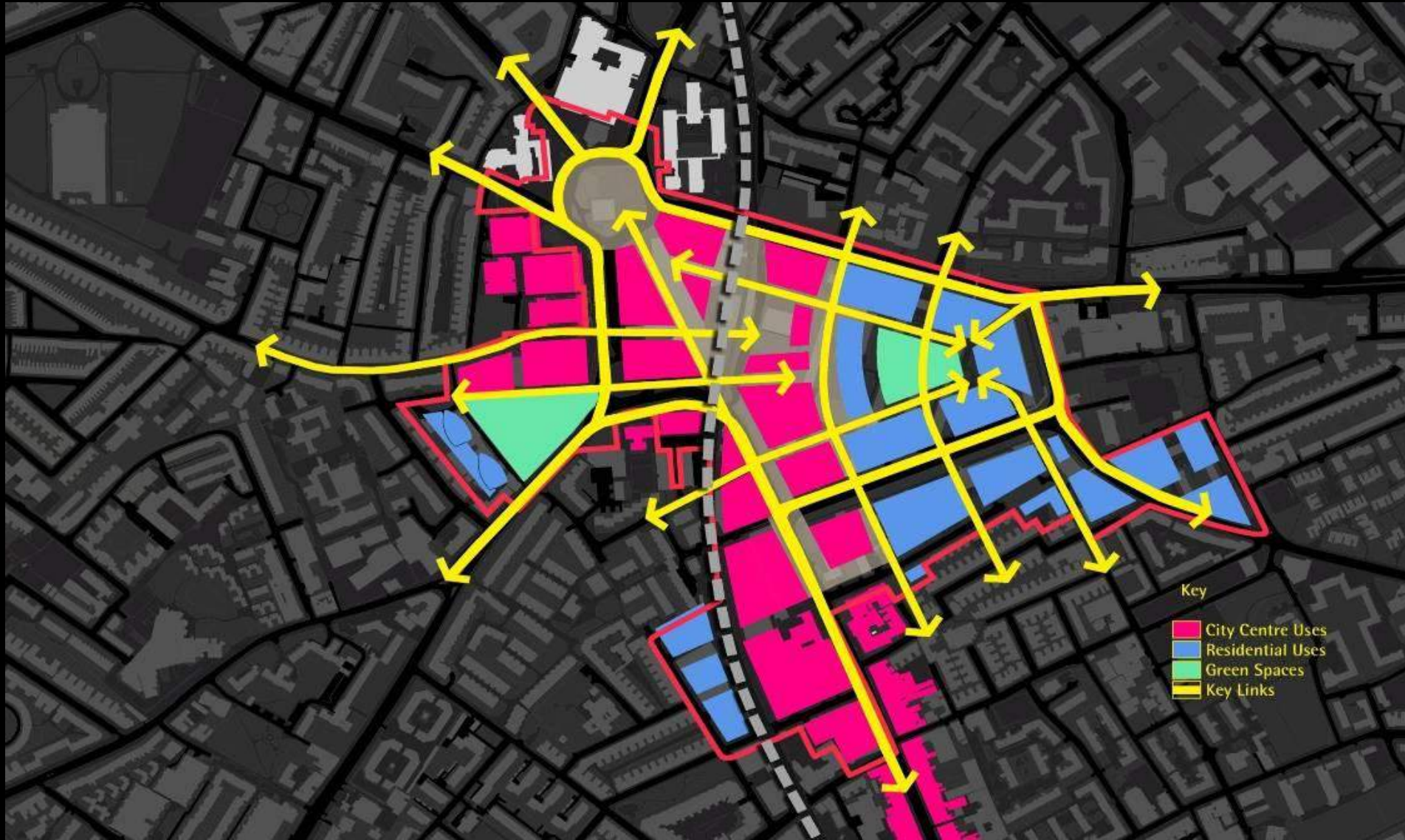


## What scales do we work at? Public spaces



**Re-integrate and activate public space**  
**Old Market Square, Nottingham**

## What scales do we work at? Masterplans/Area action plans



Repair poorly planned urban fabric  
Elephant and Castle, London

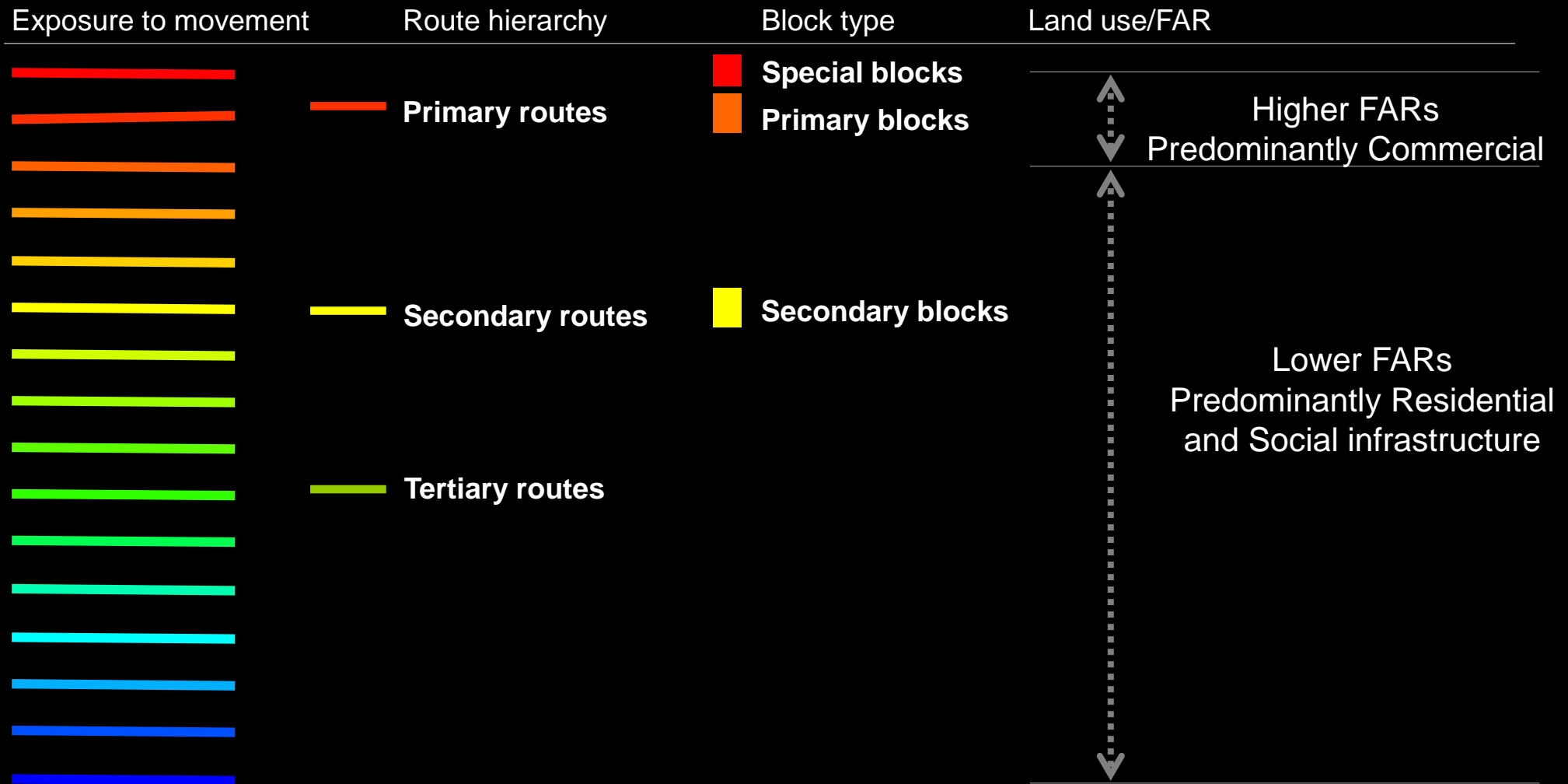
## What scales do we work at? Masterplans/Area action plans



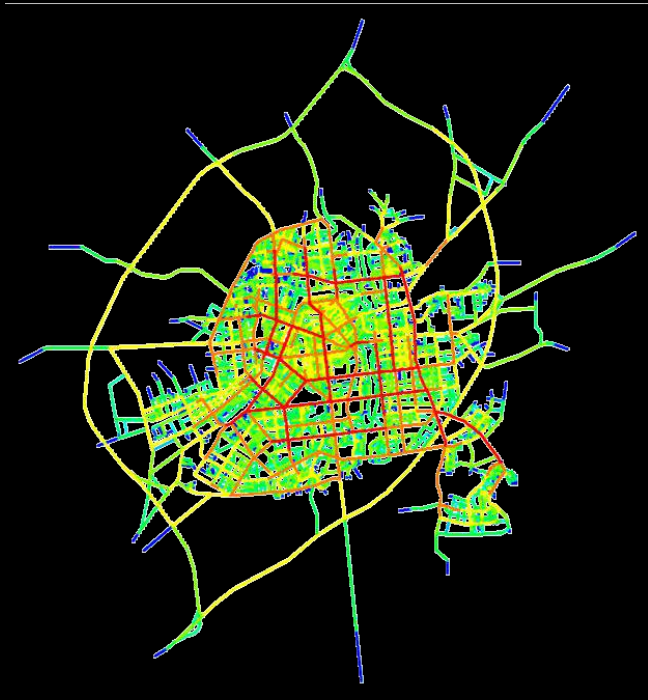
**Re-connect areas of potential**  
Jeddah Central District, Jeddah

# Design development FAR/Land use Distribution

Distribute land use and density in mixed use areas according to route hierarchy and exposure to movement (accessibility)

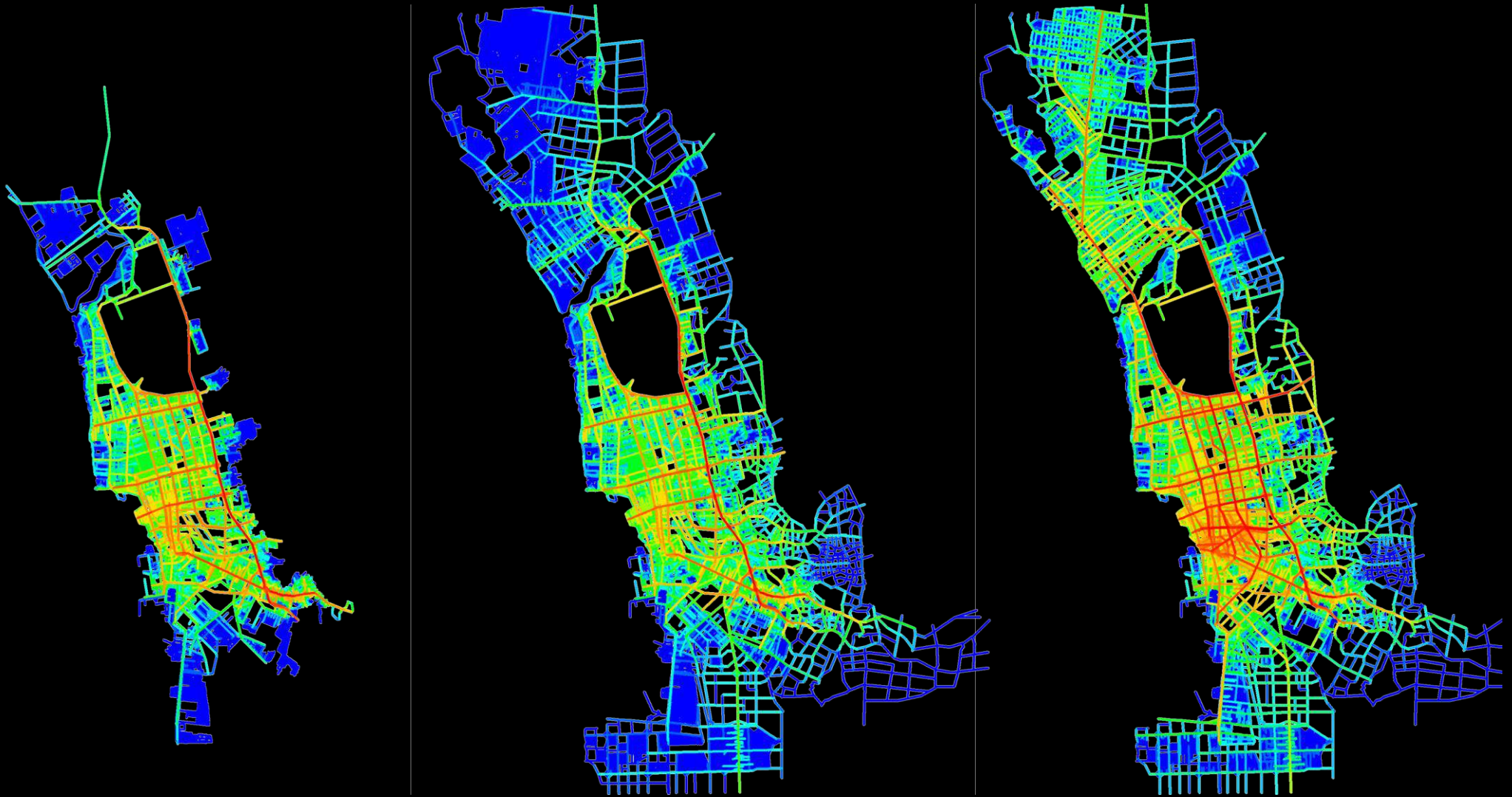


## What scales do we work at? Urban strategies

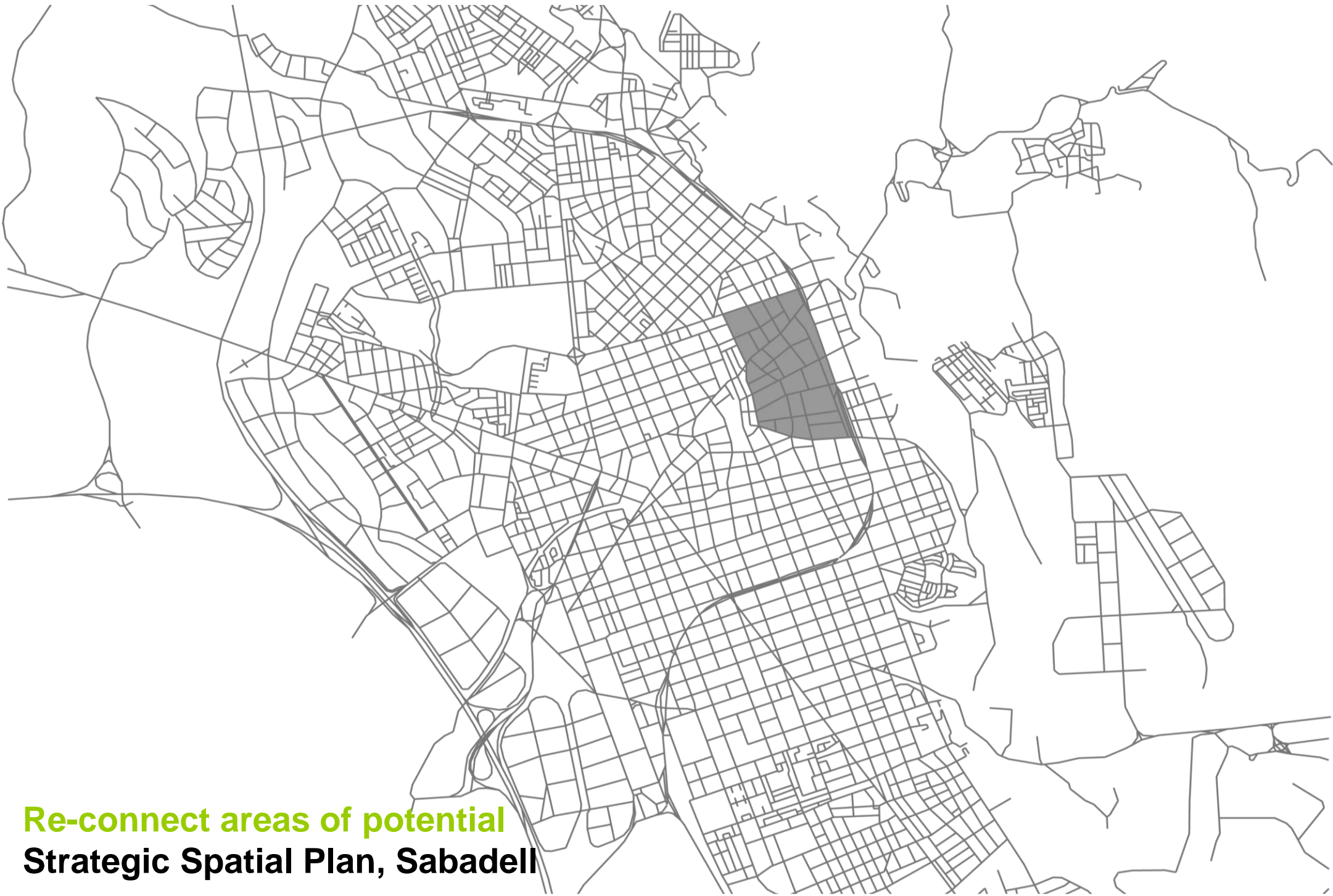


**Assess and refine urban growth**  
**Strategic Spatial Plan, Changchun**

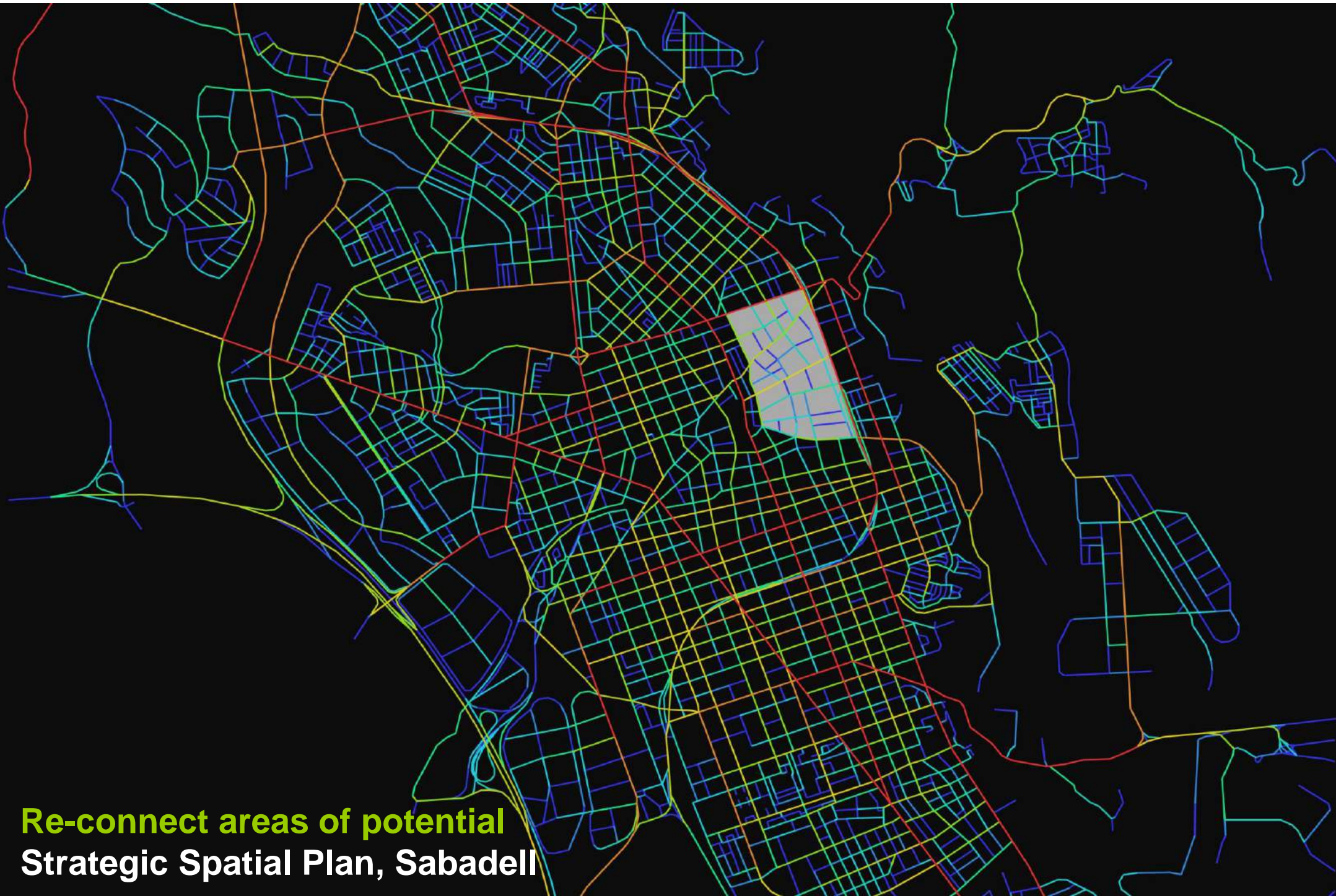
## What scales do we work at? Urban strategies



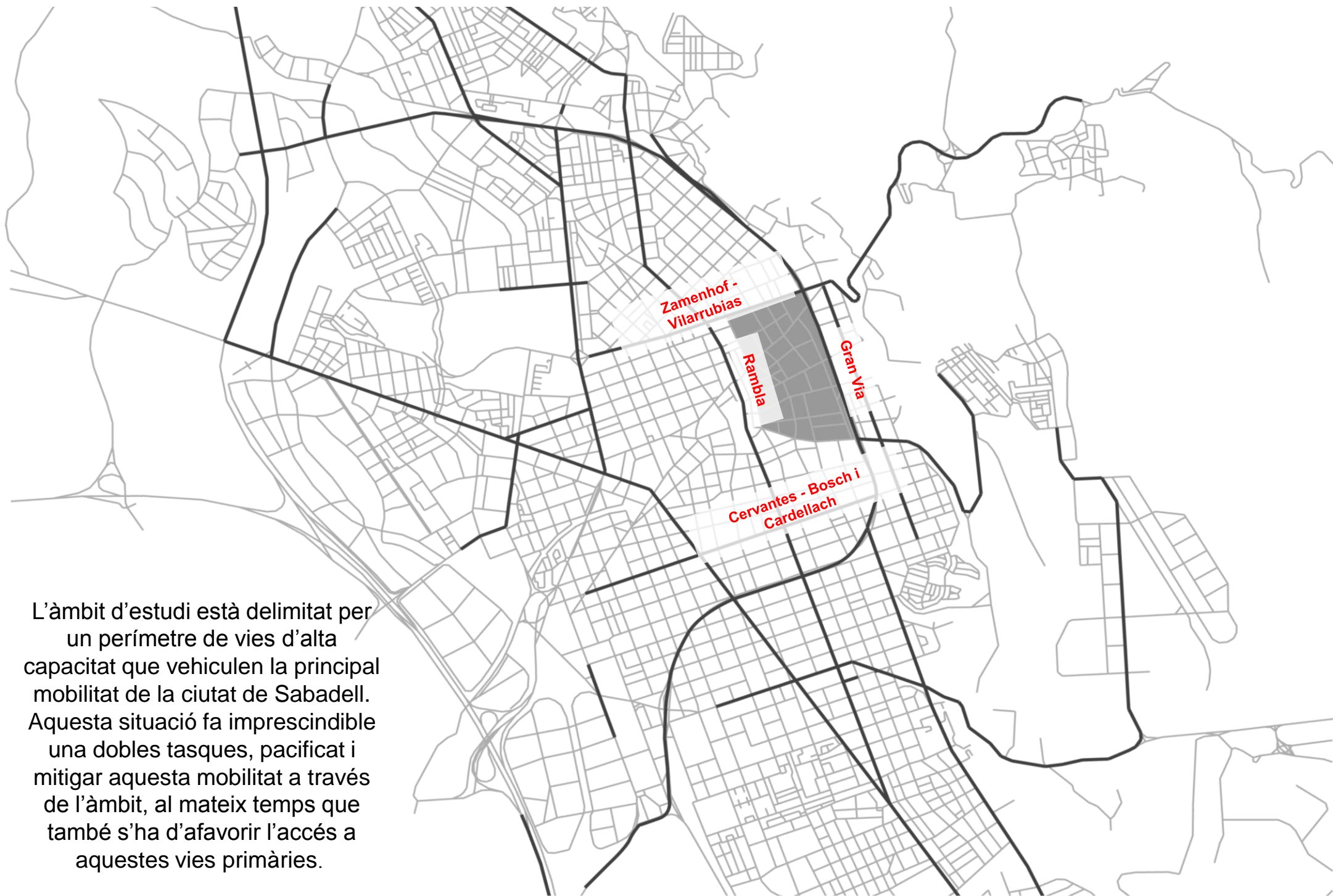
**Assess and refine urban growth**  
**Strategic Spatial Plan, Jeddah**



**Re-connect areas of potential**  
**Strategic Spatial Plan, Sabadell**



**Re-connect areas of potential**  
**Strategic Spatial Plan, Sabadell**



L'àmbit d'estudi està delimitat per un perímetre de vies d'alta capacitat que vehiculen la principal mobilitat de la ciutat de Sabadell. Aquesta situació fa imprescindible una dobles tasques, pacificat i mitigar aquesta mobilitat a través de l'àmbit, al mateix temps que també s'ha d'afavorir l'accés a aquestes vies primàries.



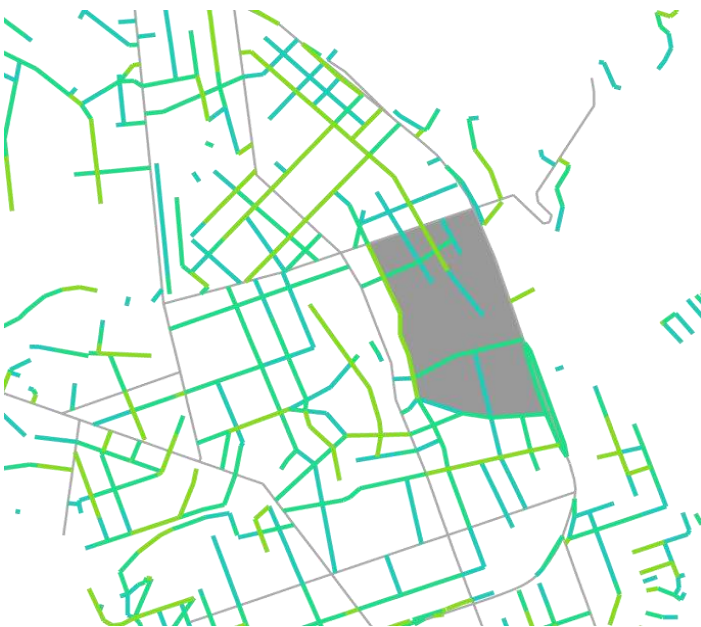
Carrers amb una **molt alta** potencialitat d'intensitat d'ús.

Carrers associats a una mobilitat vinculada al **transport públic** intern de la ciutat i la **mobilitat rodada externa** de la ciutat.



Carrers amb una **alta** potencialitat d'intensitat d'ús.

Carrers associats a una mobilitat vinculada a la **mobilitat rodada interna** i a **rutes bici** de la ciutat.



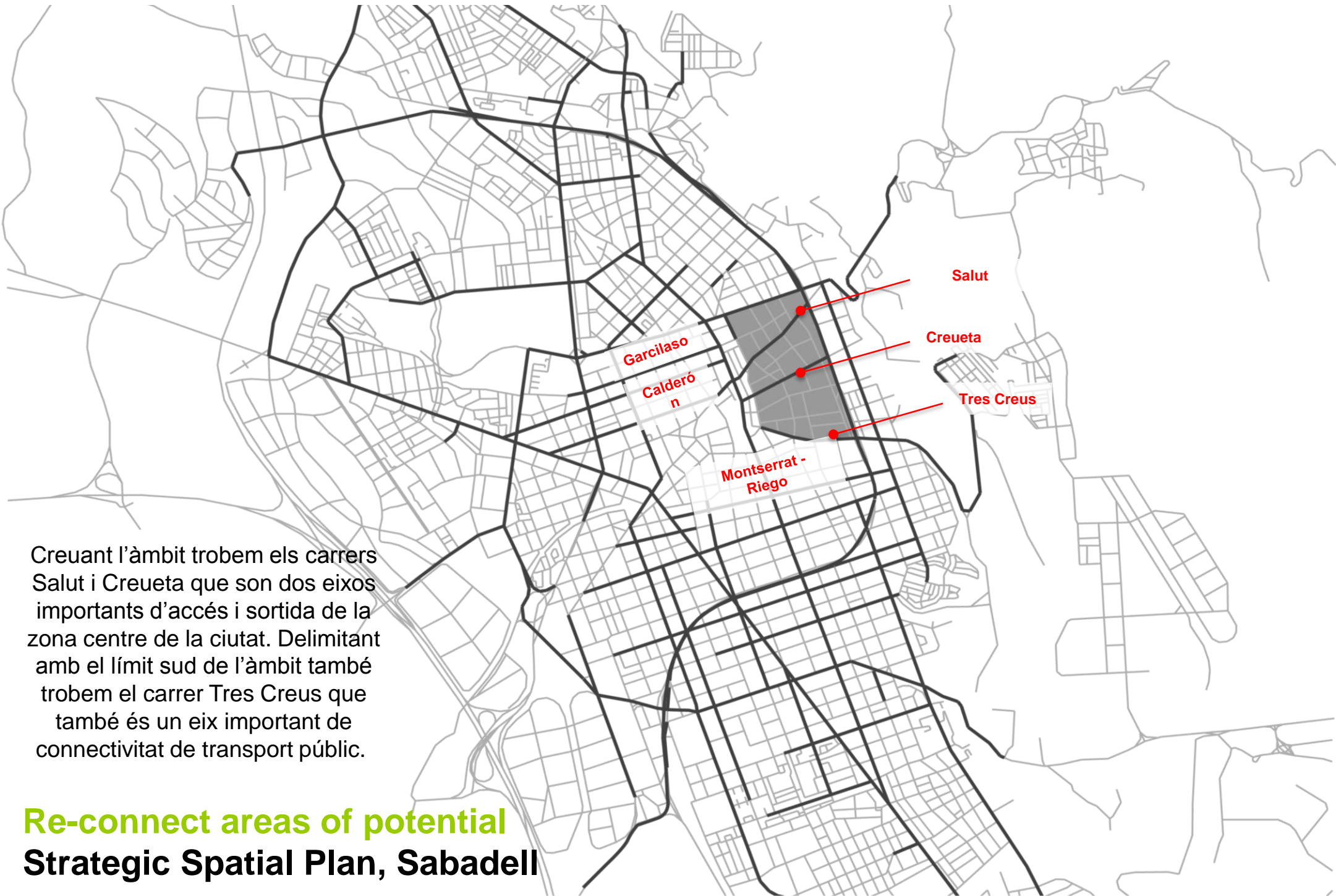
Carrers amb una potencialitat **mitja** d'intensitat d'ús.

Carrers associats a una mobilitat vinculada a la **mobilitat de barri**.



Carrers amb una **baixa** potencialitat d'intensitat d'ús.

Carrers associats a una mobilitat de **baixa velocitat** i **espais públics d'oportunitat**.



Creuant l'àmbit trobem els carrers Salut i Creueta que son dos eixos importants d'accés i sortida de la zona centre de la ciutat. Delimitant amb el límit sud de l'àmbit també trobem el carrer Tres Creus que també és un eix important de connectivitat de transport públic.

## Re-connect areas of potential Strategic Spatial Plan, Sabadell

**Data analytics for  
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***Análisis de Datos  
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***Nuevas formas de  
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*“Modern technology has become a total phenomenon for civilization, the defining force of a new social order in which efficiency is no longer an option but a necessity imposed on all human activity.”*

**Jacques Ellul**

## Análisis de Datos para la Planificación Urbana



# Urbanism Urban life **Social media**



01:36

# Social Media – What is it?



## Social Media – **What is it?**

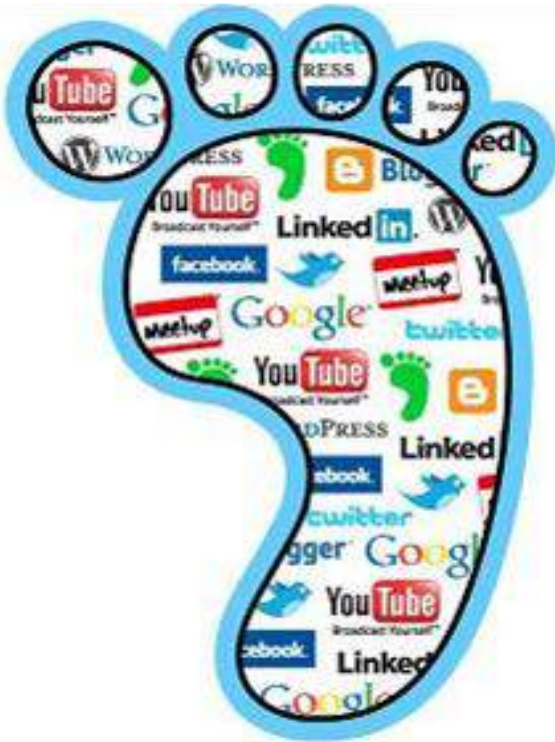
Social media is the **collective of online communications channels dedicated to community-based input, interaction, content-sharing and collaboration.**

A city and its citizens and visitors are continuously **generating information about where they are located and what are they doing through LBSN** (*Location-Based Social Networks*).



## Social Media – Digital footprint

With the increasing capabilities of mobile devices, **individuals leave behind footprints of their interaction with urban environments.**

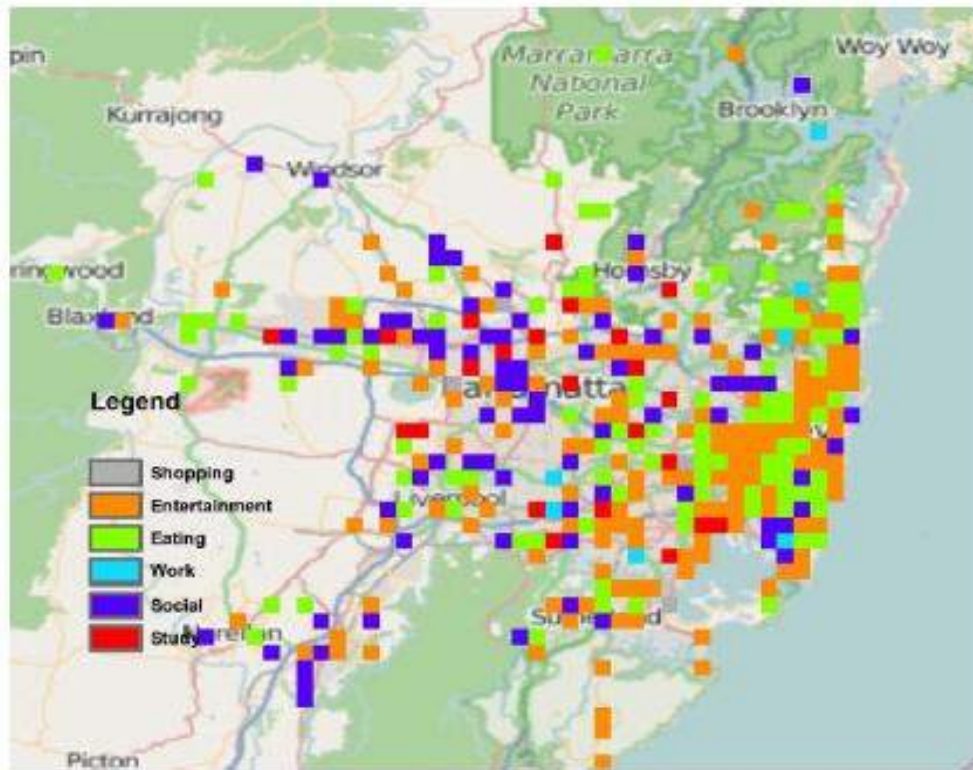


There are **two types of footprint: active and passive.**

**Passive tracks** are left through interaction with an infrastructure, such as a mobile phone network, that produces entries in locational logs; **active prints** come from the users themselves when they expose locational data in photos, messages, and sensor measurements.

## Social Media – What is it?

**LBSN** are excellent sources of information to capture the **pulse of an urban environment** and as such can be used for a variety of urban planning applications like land use identification, mobility patterns identification or transport planning.

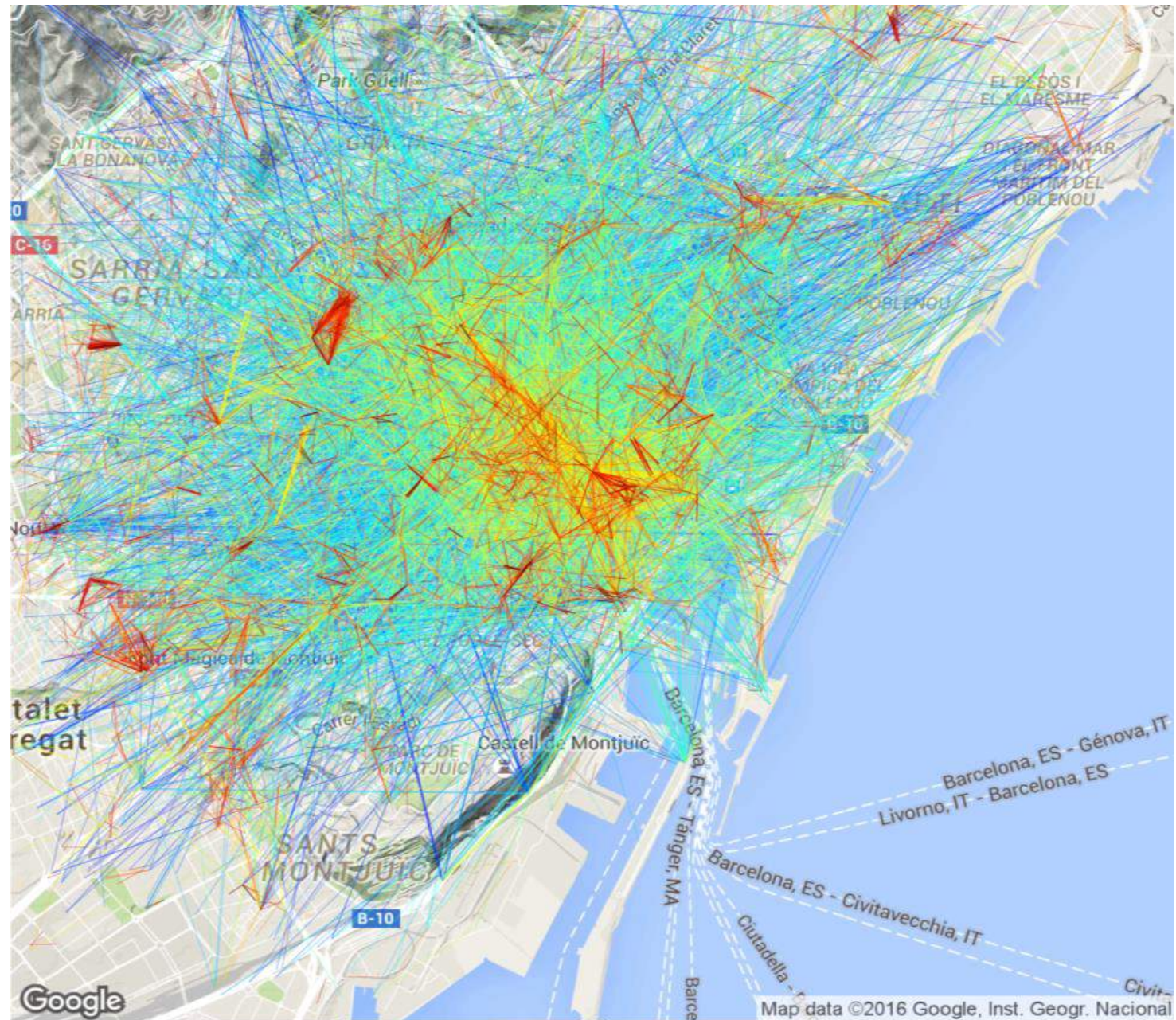


Spatial distribution of tagged activities (twitter) around the Sydney metropolitan area

A spatial analysis of the aggregate activity generated by such networks **can show us how social activity in a city is distributed**, revealing fine-grained spatial patterns evident in the social life of cities.

# Social Media – How can we use them?

There is an exciting opportunity for creating **new ways to conceptualize and visualize the dynamics, structure, and character of a city** by analyzing the social media its **residents and tourists** already generate.



# The impact of tourism on public space – **How do we analyze the touristic impact of a city?**

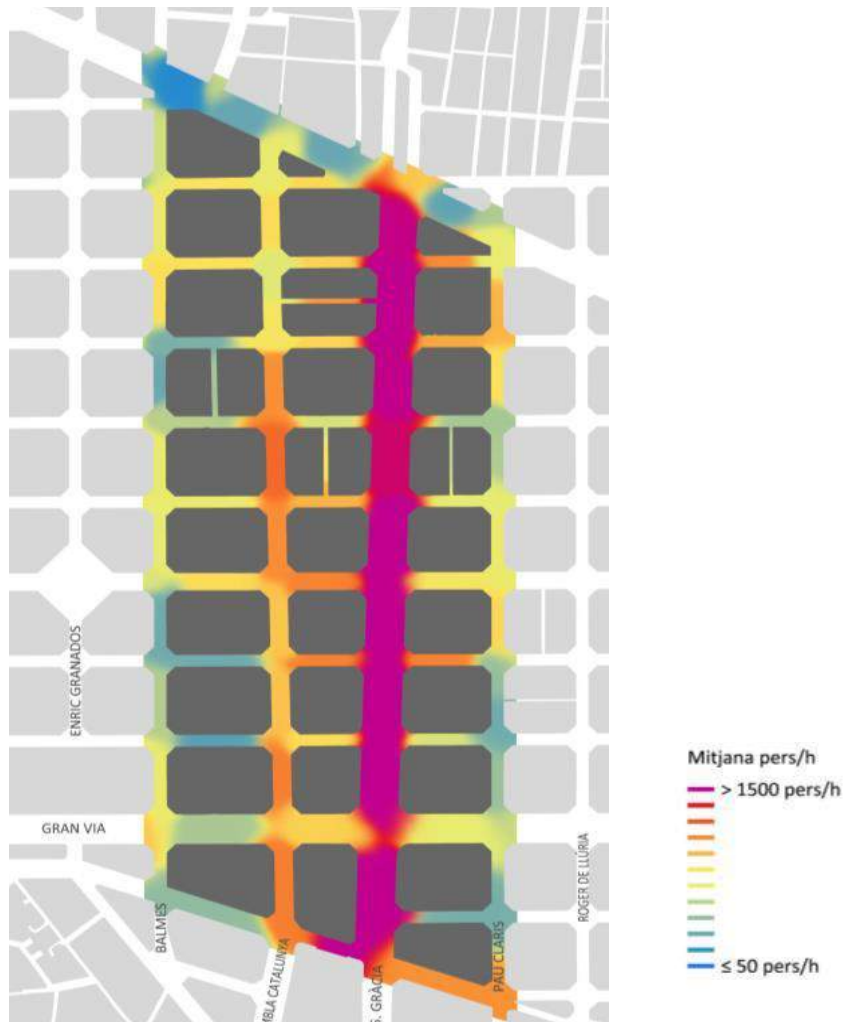
## **Tourists social network activity analysis**



# The impact of tourism on public space – How do we analyze the touristic impact of a city?

## Tourists mobility patterns analysis

Tourists mobility patterns

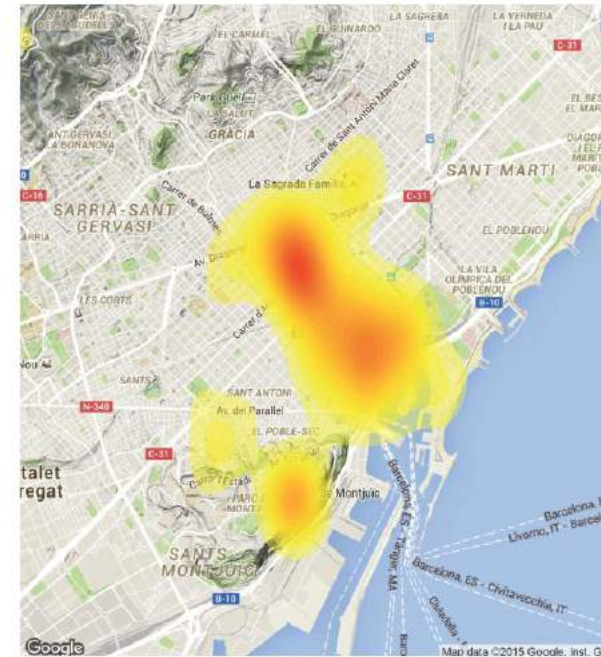
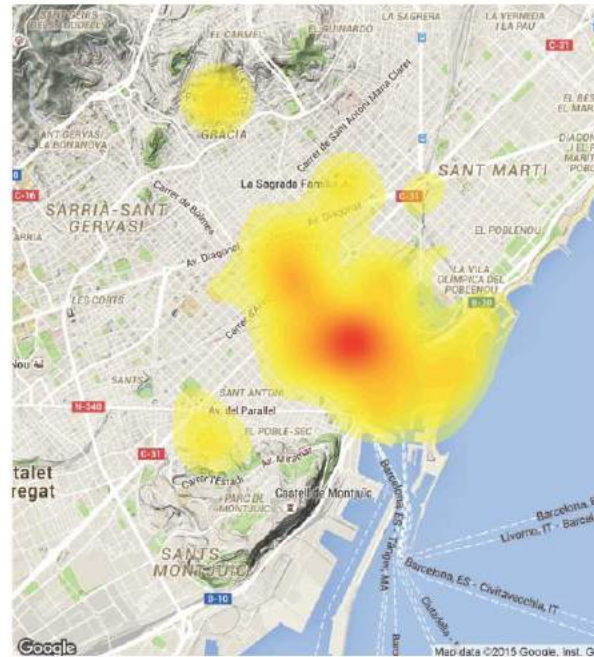
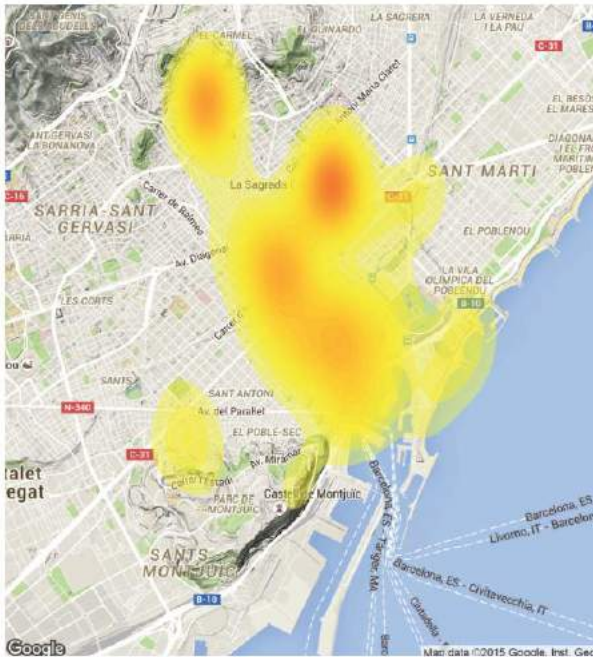
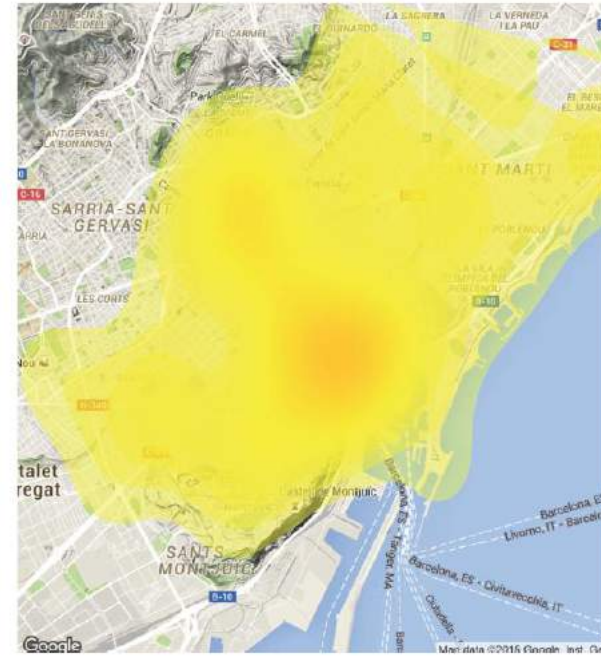
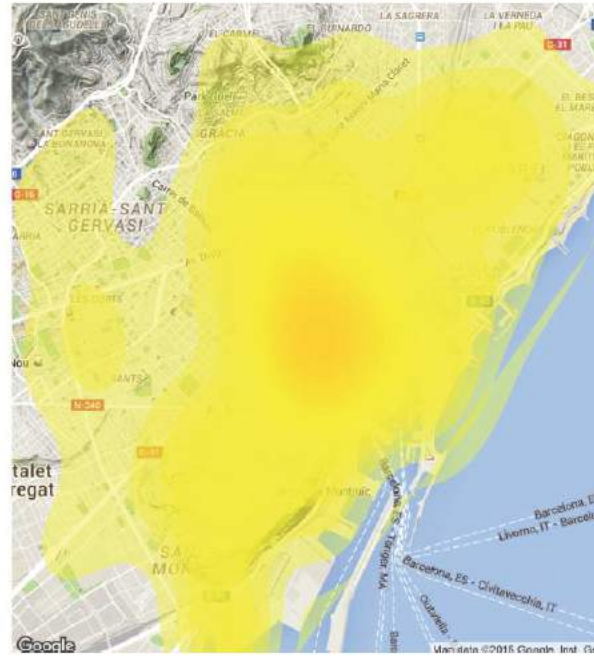
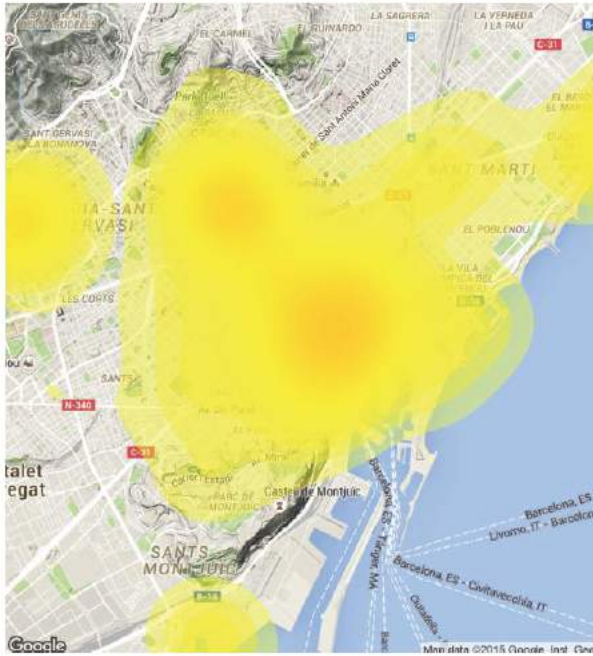


vs

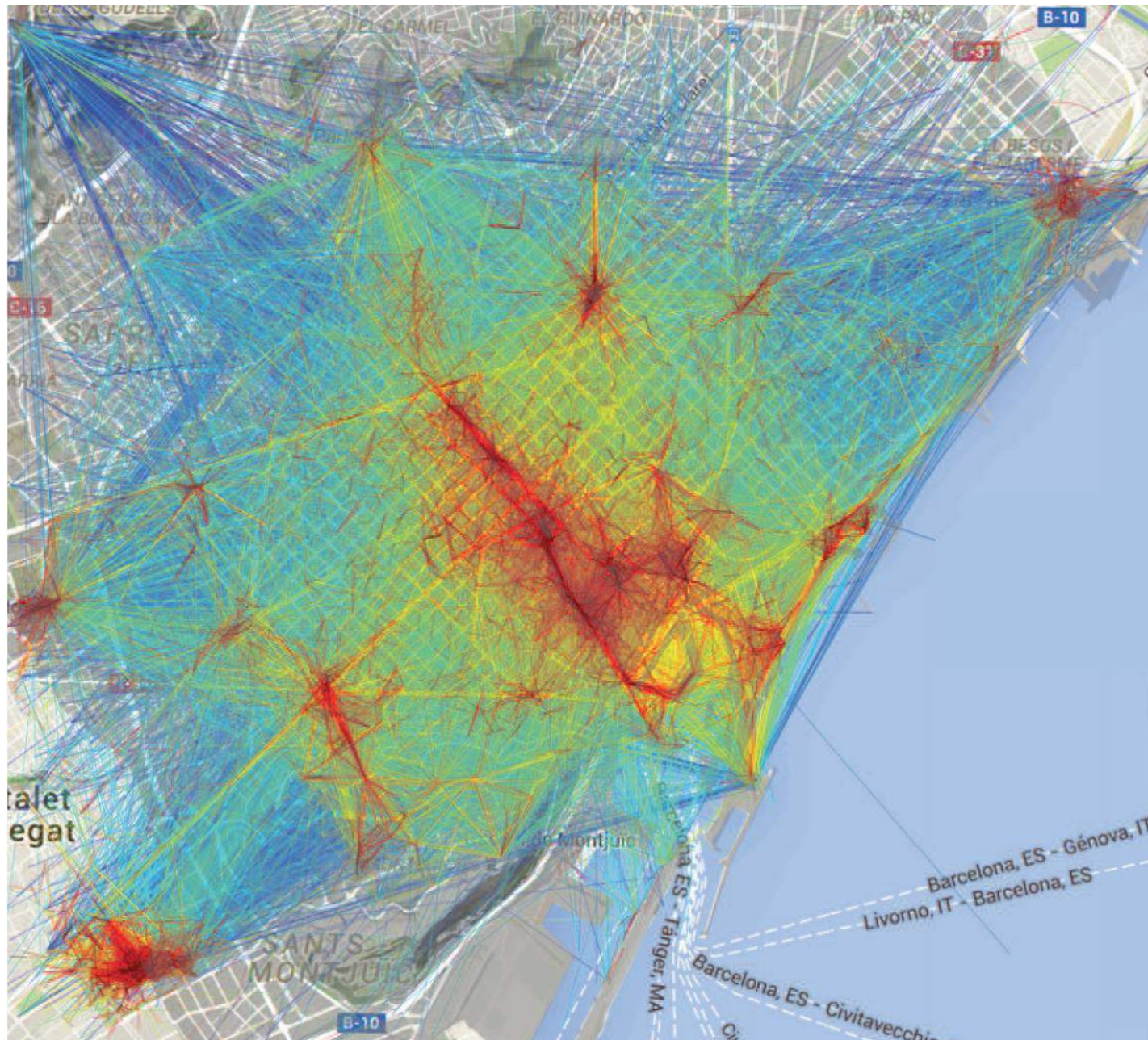
Locals mobility patterns



# Análisis de Datos para la Planificación Urbana:



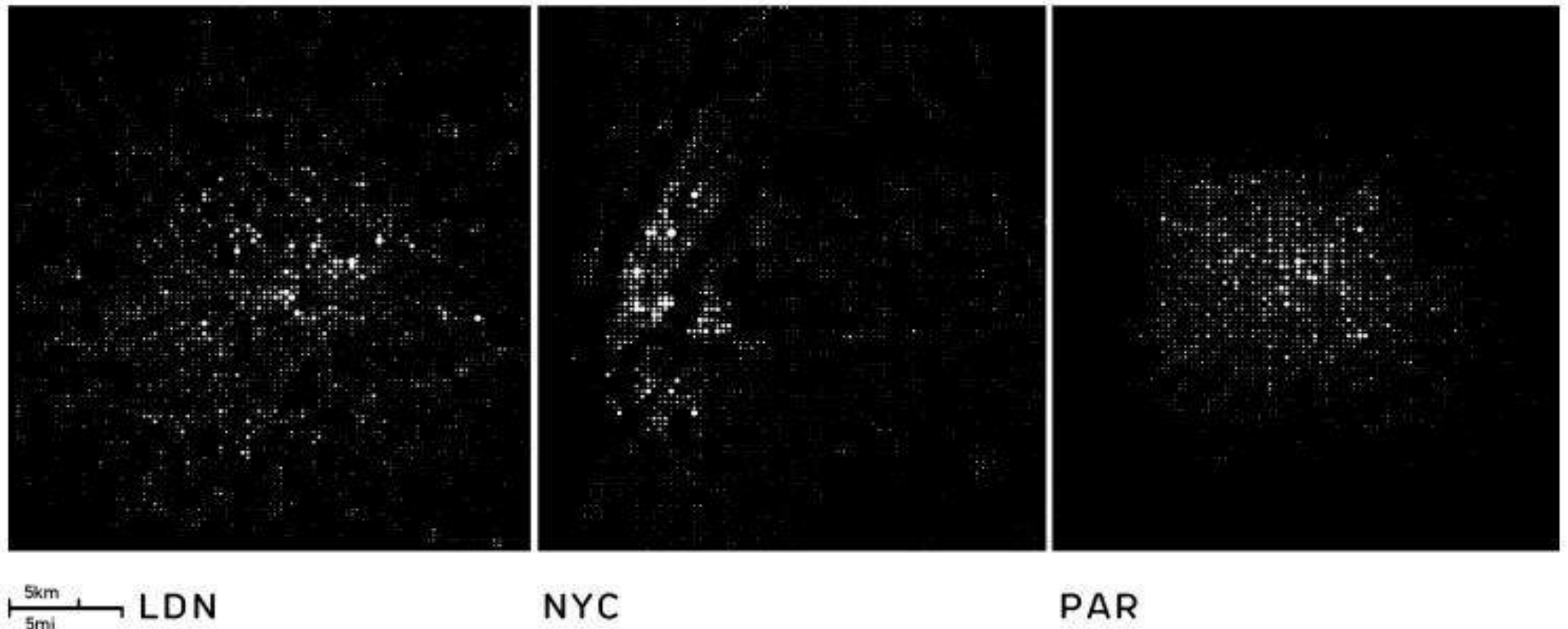
## Análisis de Datos para la Planificación Urbana:



## Social Media – How can we use them?

Anil Bawa-Cavia constructs three maps of the **social activity fingerprints** through 4sq data from three cities.

These spatial visualizations omit the usual topographic and cartographic details present in traditional maps, abstracting the city in order to focus on its *activity fingerprint*



**Data analytics for  
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***La Morfología  
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**Can we generate a model to represent urban life?**









# Social Urban models for planning design

## *Modelos Urbanos para la Planificación*

Qué criterios utilizamos para la generación de modelos urbanos

### **Criterios Morfológicos**

Considera el aspecto formal de la ciudad, estructura, organización y forma

### **Criterio Funcionales**

Se basa en los 'generadores de movilidad' locales. Puntos de conectividad y servicios que generan dinamismo de personas

### **Criterios Sociológicos**

Definido por rasgos de diversidad social, relaciones impersonales y anónimas

### **Criterio Espaciales**

Capacidad de la ciudad para organizar su espacio, y la influencia que ejerce sobre núcleos de población

## Functional Analysis - **Why do we study people?**

We make observations to see **what we can learn and extract** from the **behavior that people have in the urban environment.**



# Functional Analysis - **Why do we study people?**

Understanding the relationship between the build environment and open space is what we study through the functional analysis.

**Functional analysis** is an observational study on the **behavior of people in public space**, both in the activities that occur in an specific place (static activities) or in motion (dynamic activities).

Understanding this behavior and anticipate potential conflicts is essential when **planning, designing** and **managing public space**.



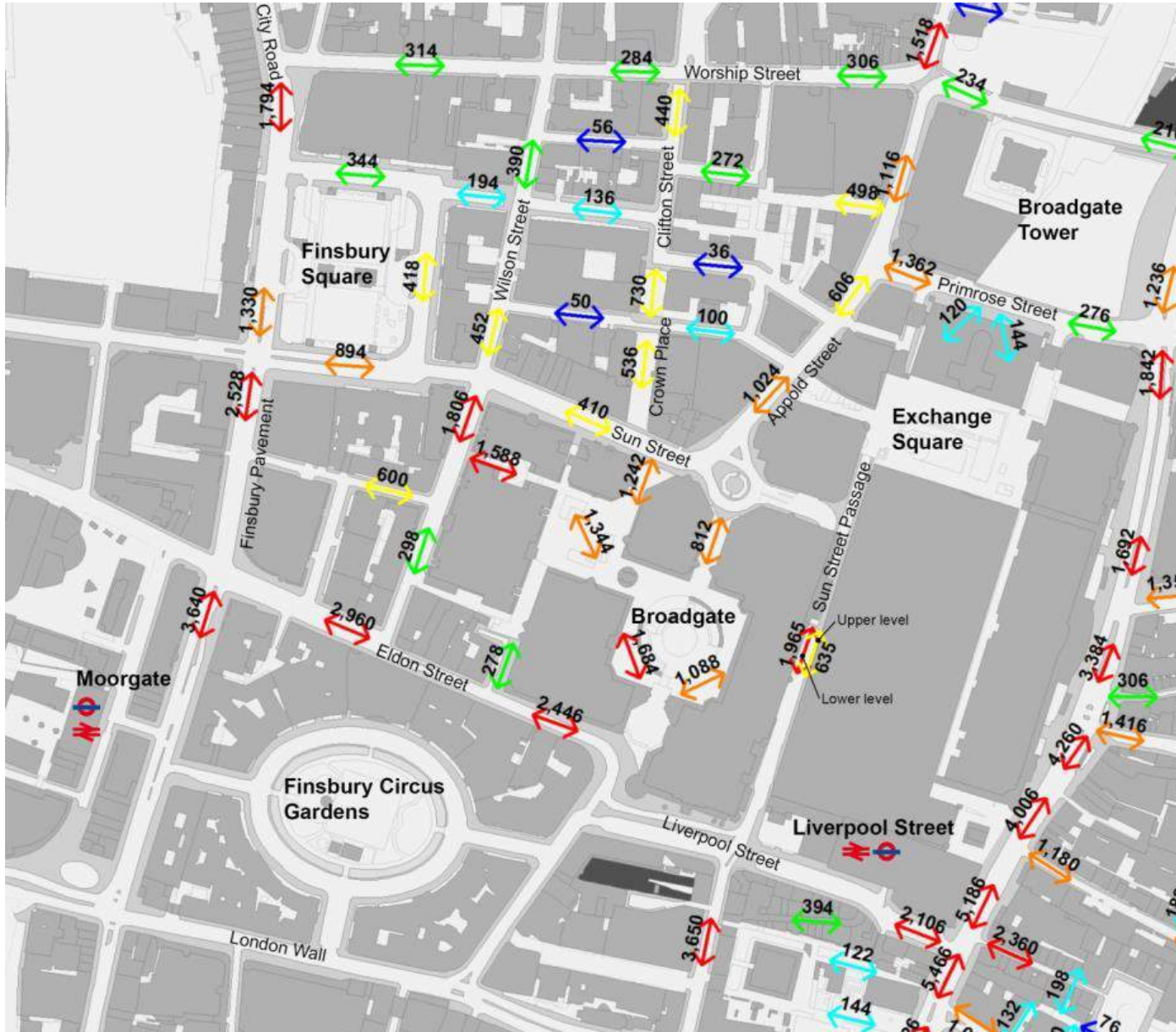
# Functional Analysis - **Why do we study people?**

To make these observations, we use two different methods:

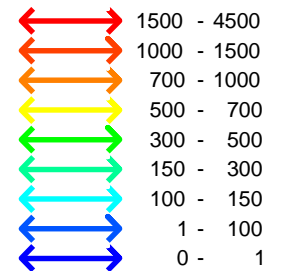
- Observation through **cameras**
- **Manuals observations** - the "doors" method



# Functional Analysis – Pedestrian movement flows



The way space is designed is directly related to the way that people move, interact and transact.

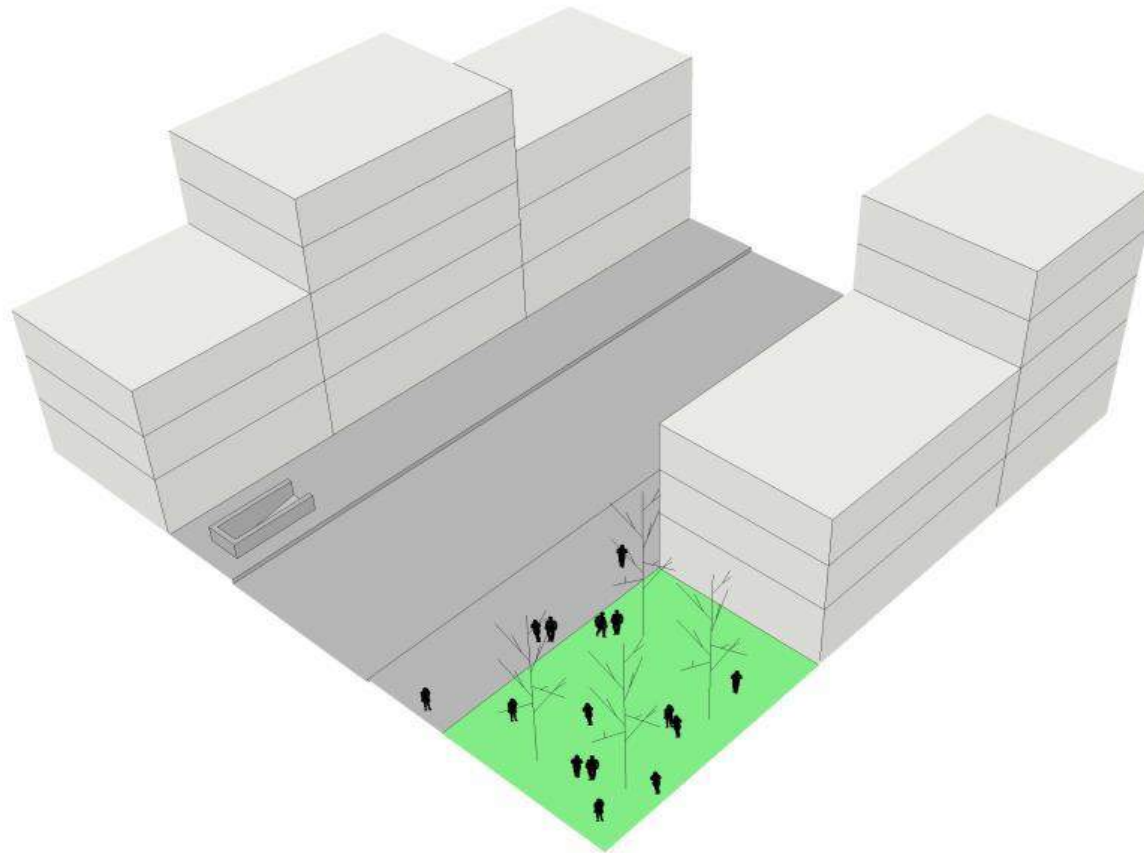


## Functional Analysis – **Pedestrian mobility model**

**Which components of the city influence the mobility of pedestrian?**

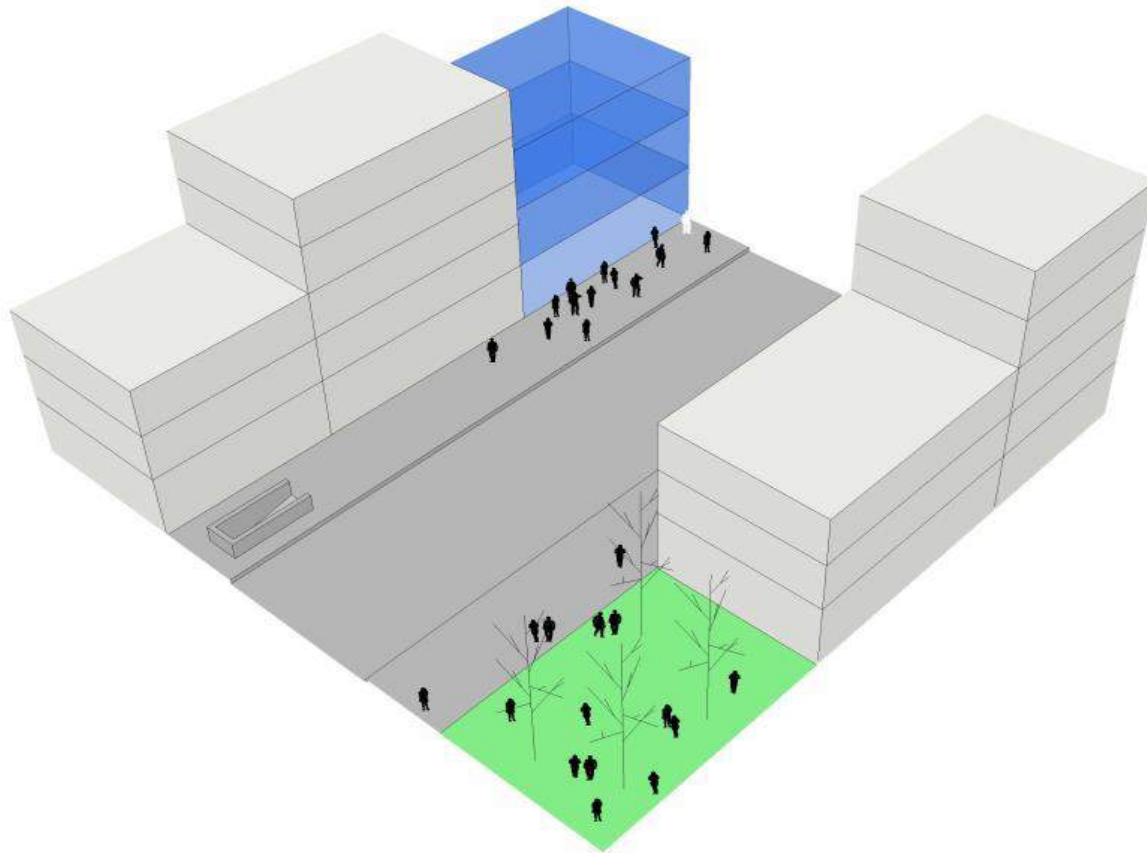
# Functional Analysis – Pedestrian mobility model

## Public Spaces



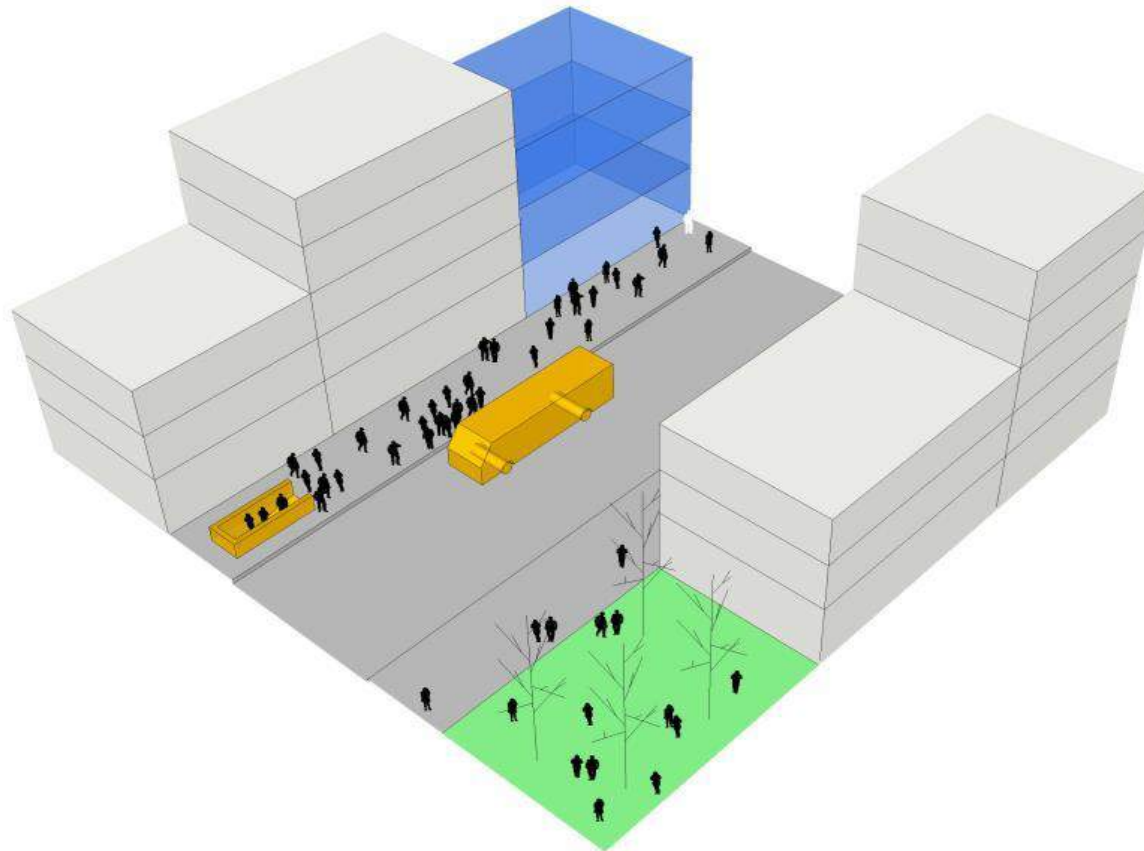
# Functional Analysis – Pedestrian mobility model

## Public spaces + Facilities



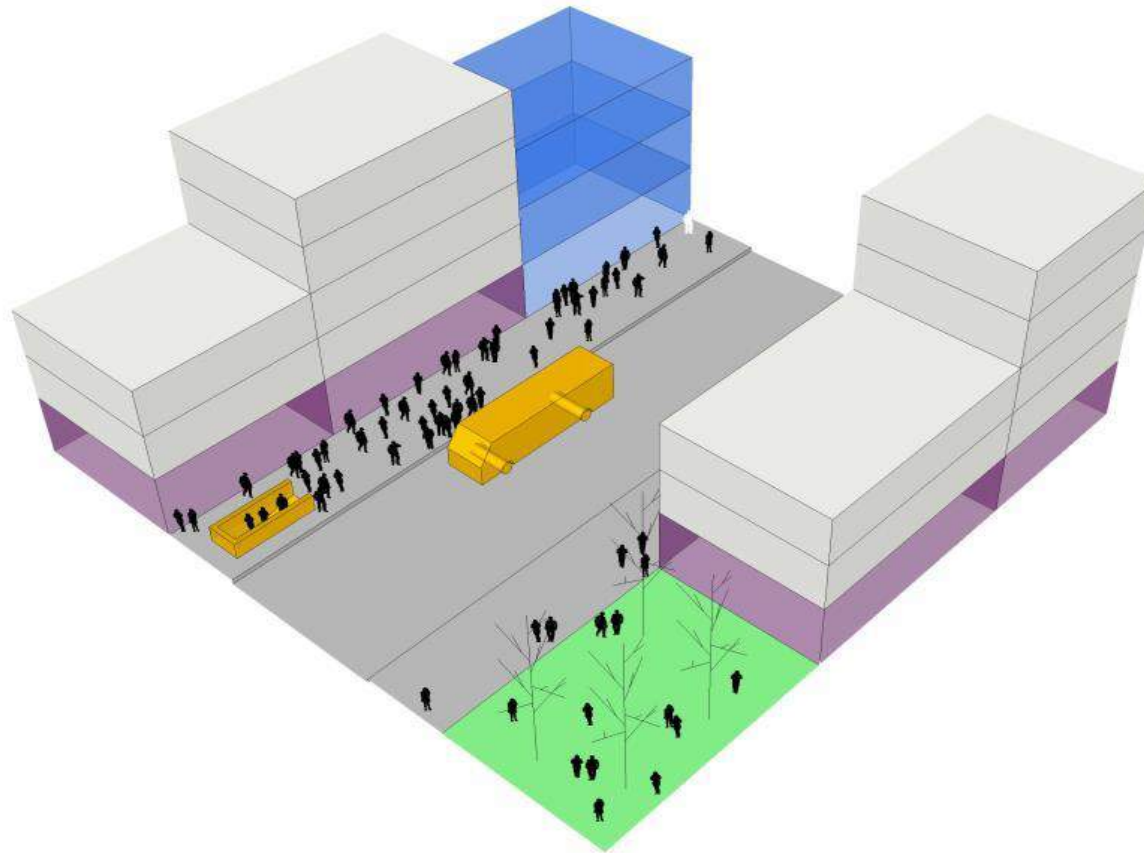
# Functional Analysis – Pedestrian mobility model

## Public spaces + Facilities + Public transport



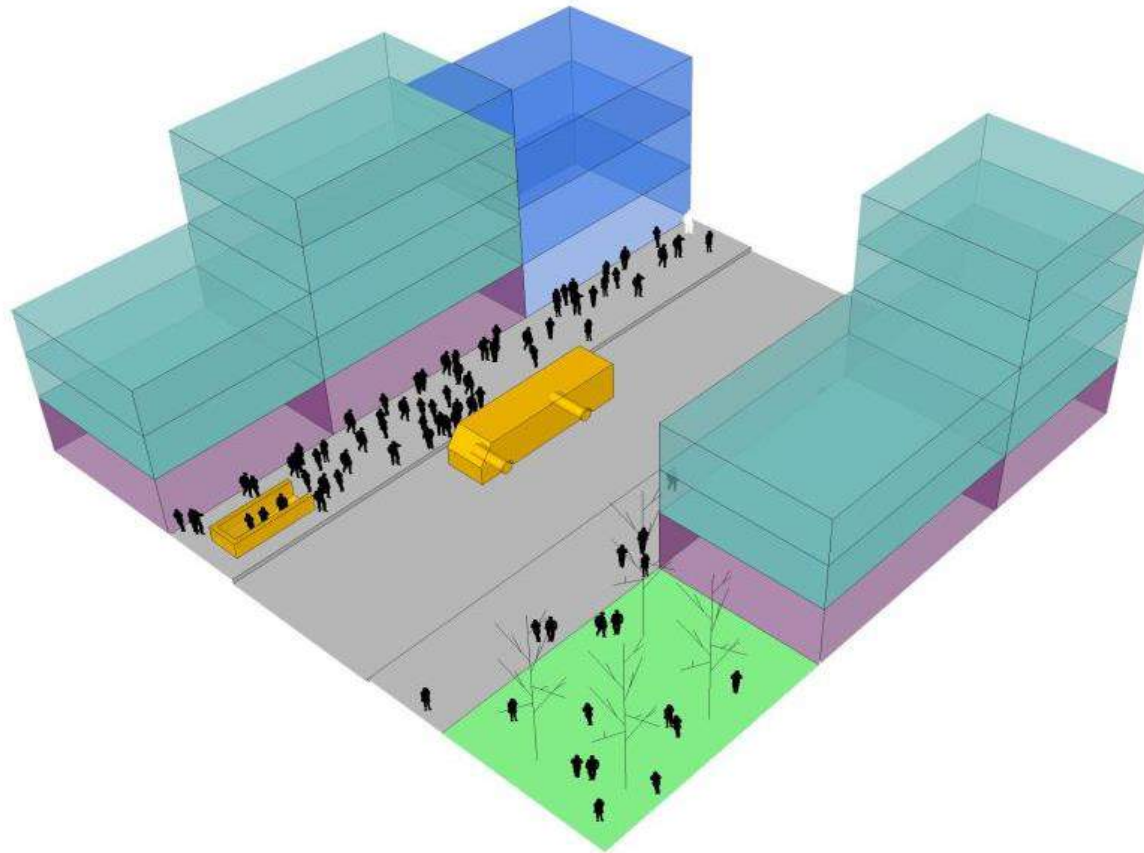
# Functional Analysis – Pedestrian mobility model

Public spaces + Facilities + Public transport + Economic activities



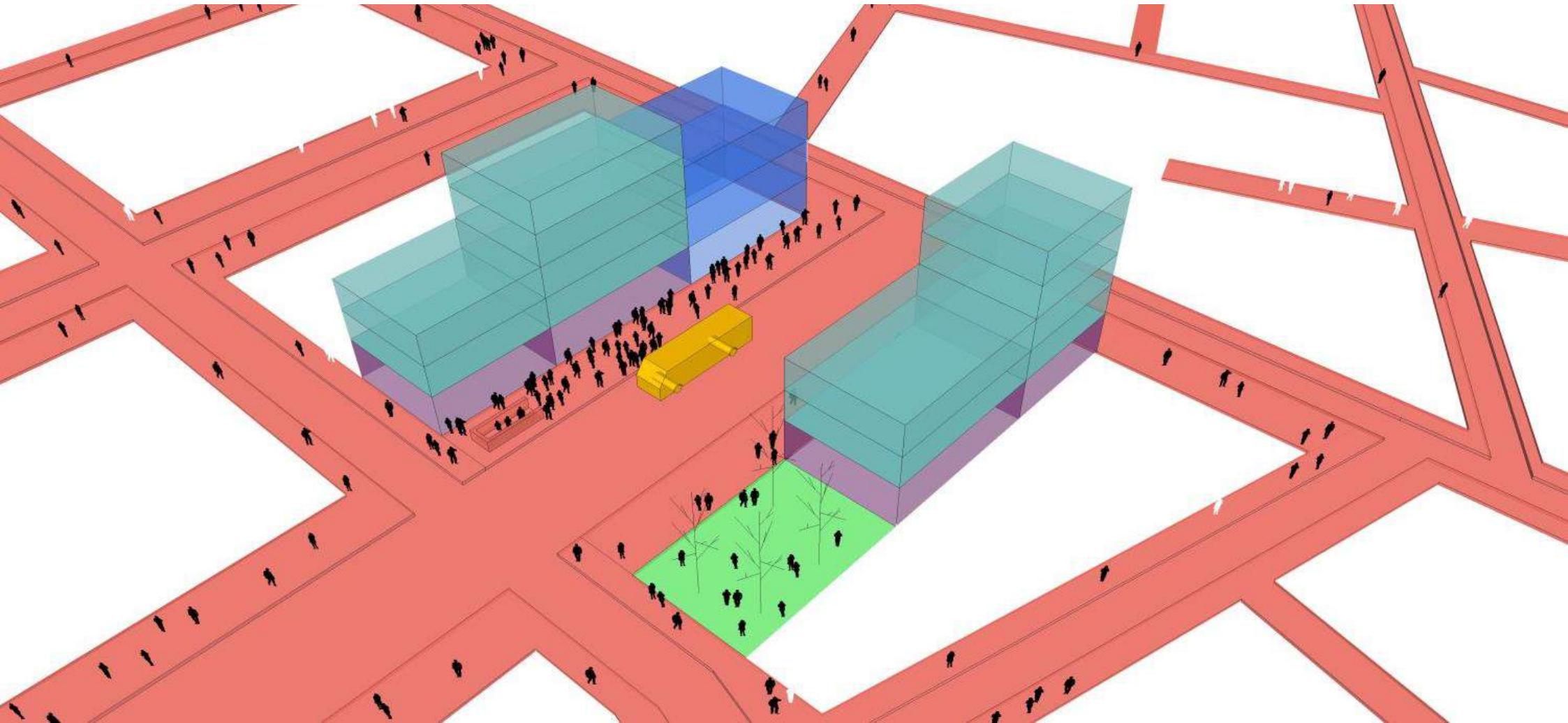
# Functional Analysis – **Pedestrian mobility model**

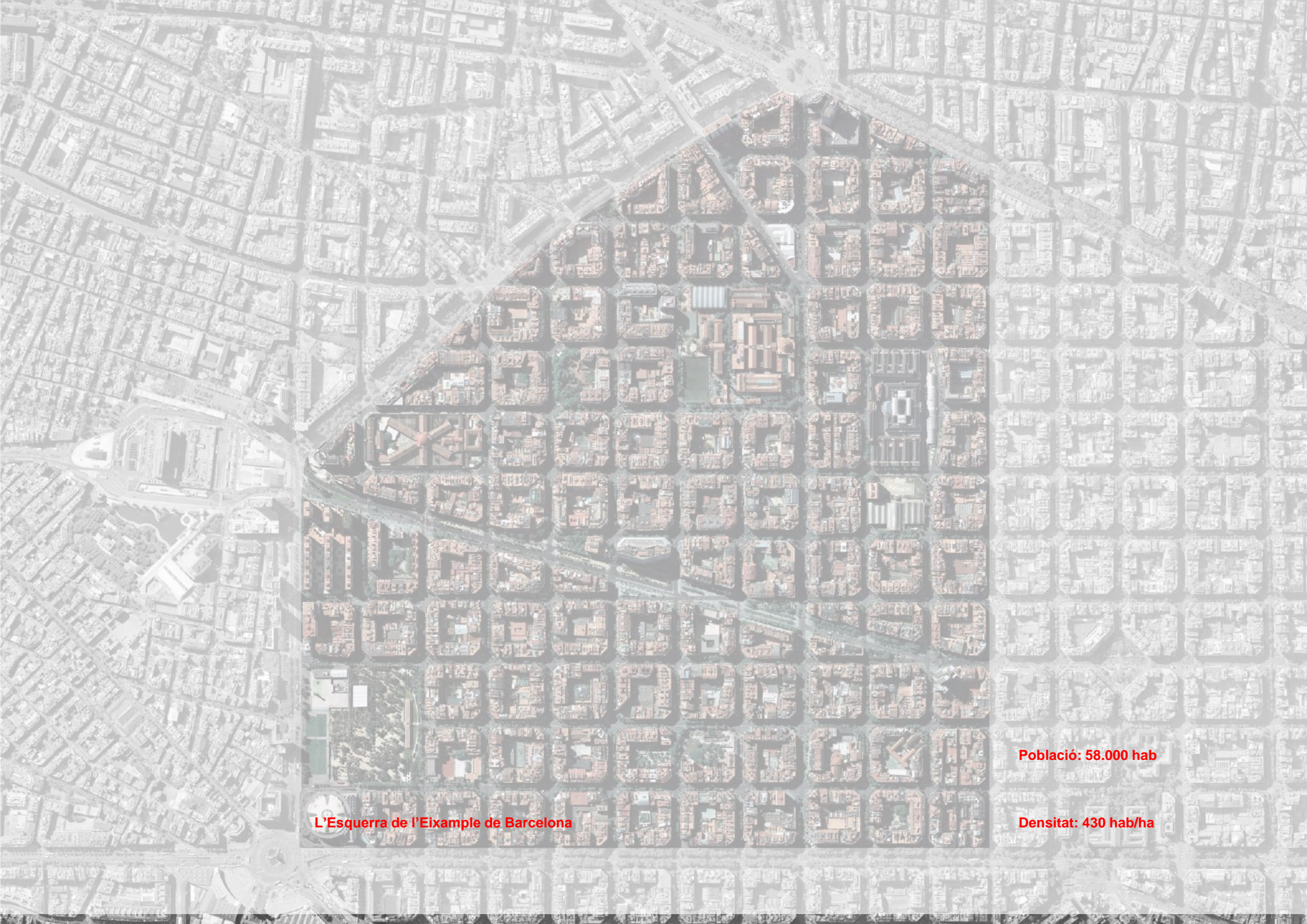
**Public spaces + Facilities + Public transport + Economic activities + **Amount of housing****



# Functional Analysis – Pedestrian mobility model

**Green areas + Facilities + Public transport + Economic activities +  
Amount of housing + Urban topology**





**L'Esquerra de l'Eixample de Barcelona**

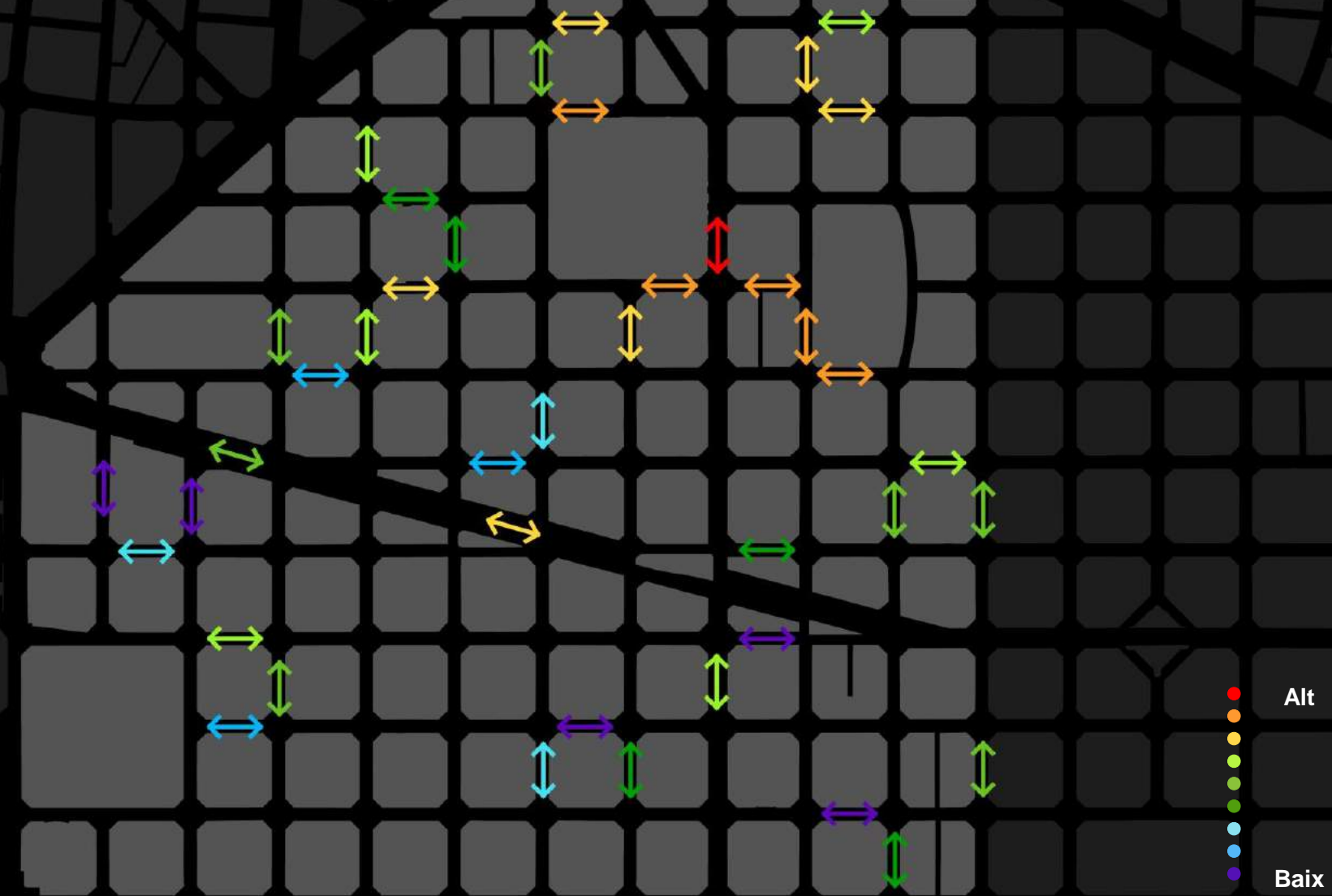
**Població: 58.000 hab**

**Densitat: 430 hab/ha**



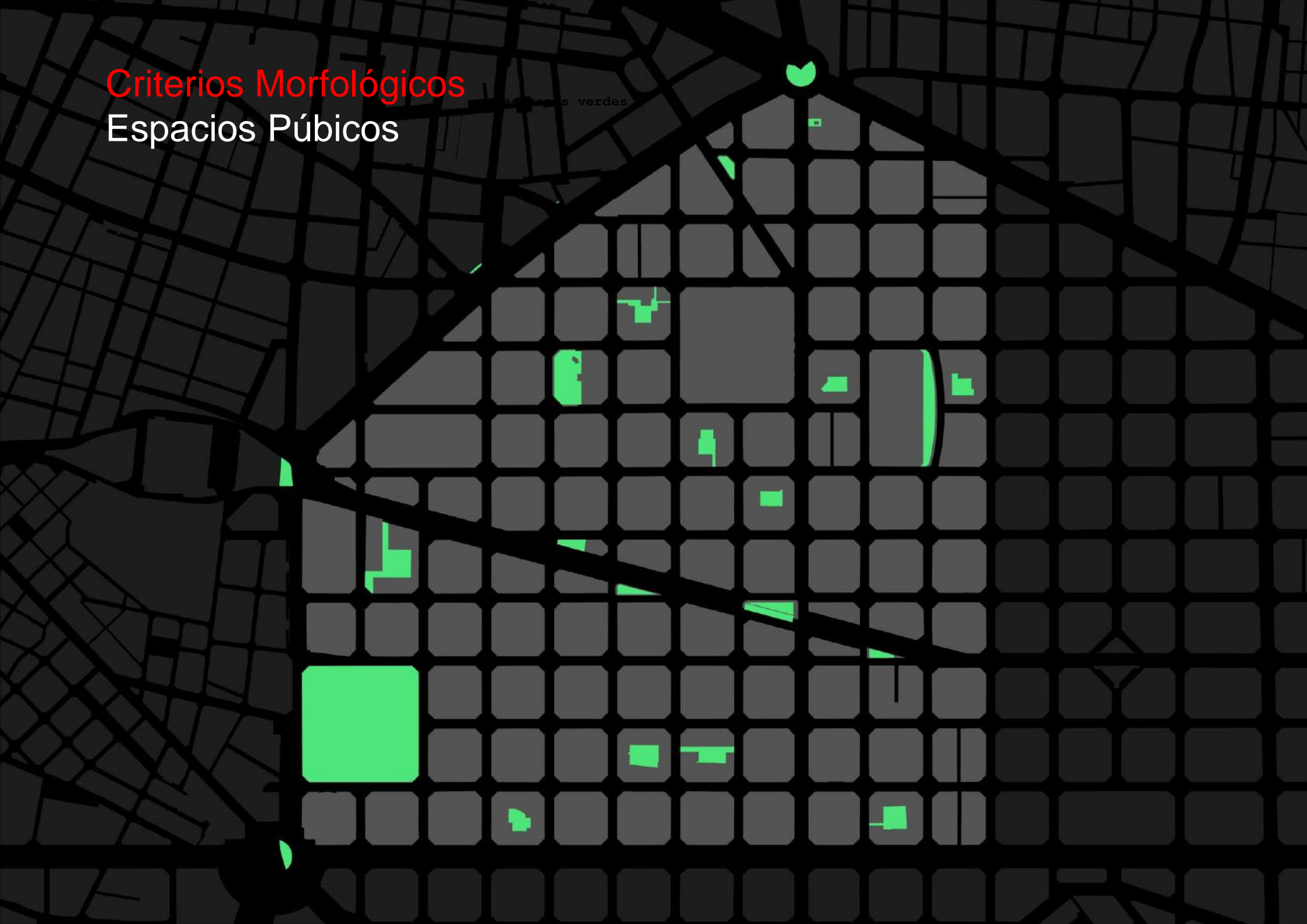
# Criterios Funcionales

## La movilidad urbana



# Criterios Morfológicos

## Espacios Públicos



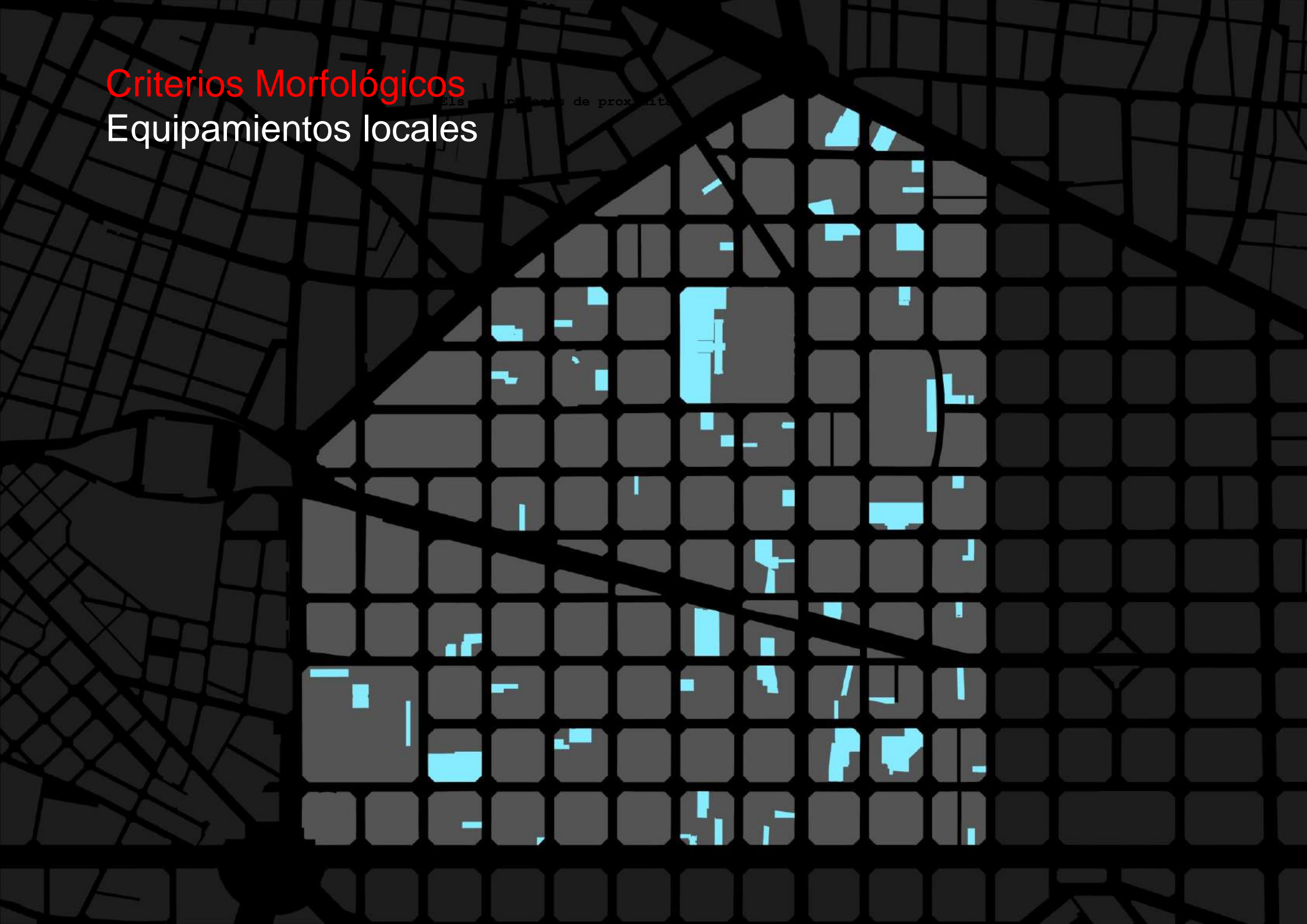
# Criterios Morfológicos

## Equipamientos metropolitanos



# Criterios Morfológicos

## Equipamientos locales



# Criterios Morfológicos

Intercambiadores de movilidad

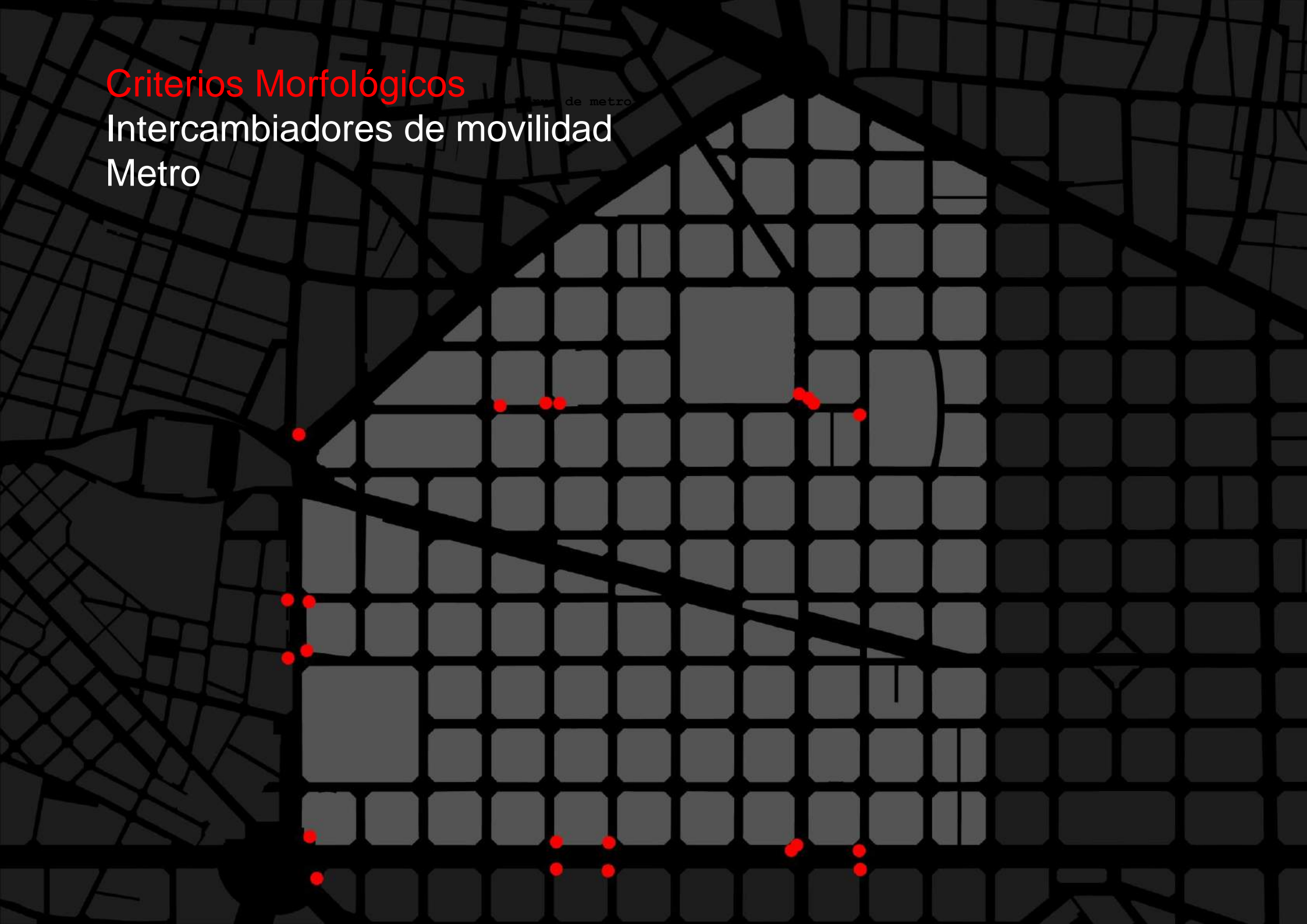
Autobús



# Criterios Morfológicos

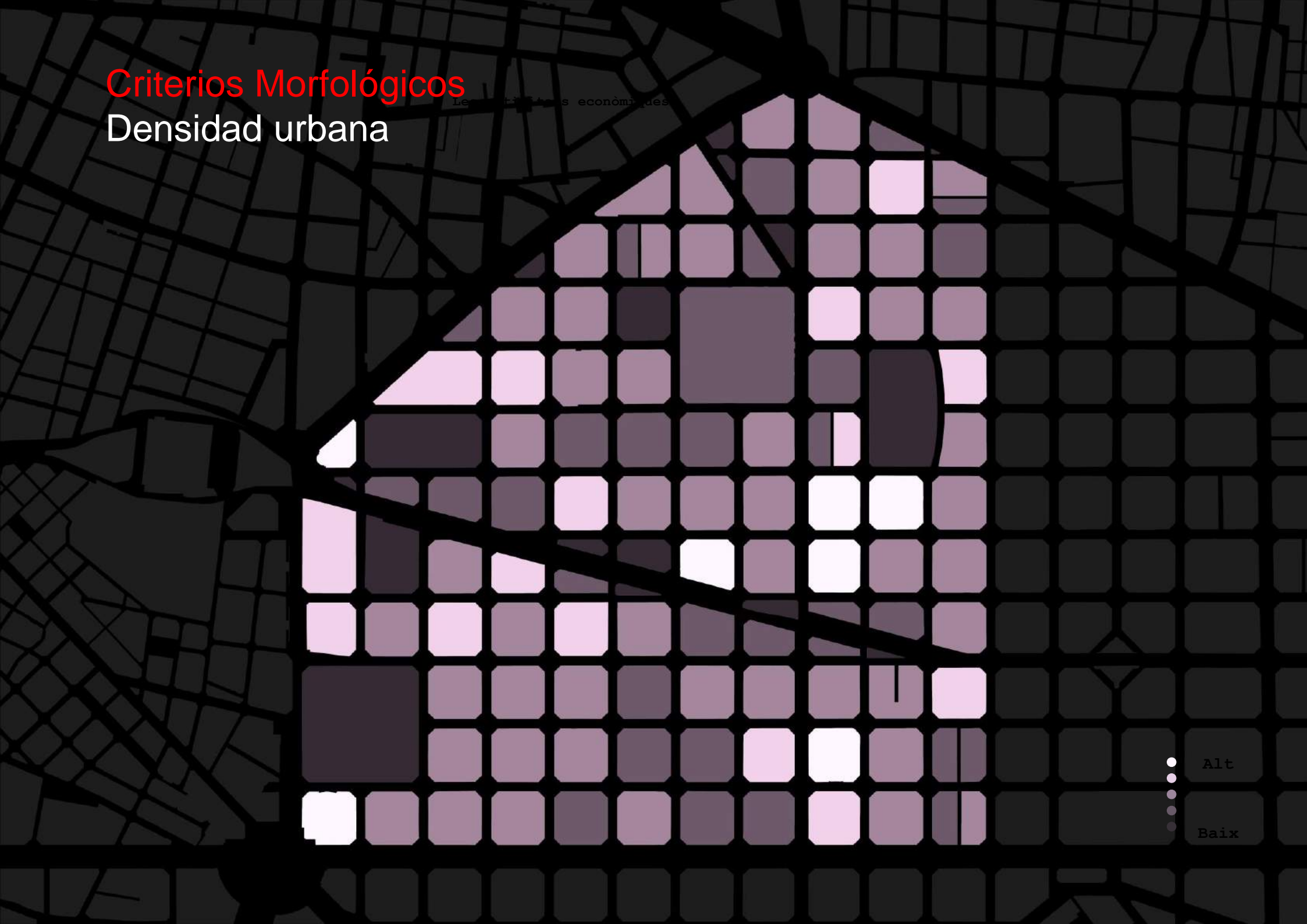
Intercambiadores de movilidad

Metro



# Criterios Morfológicos

## Densidad urbana



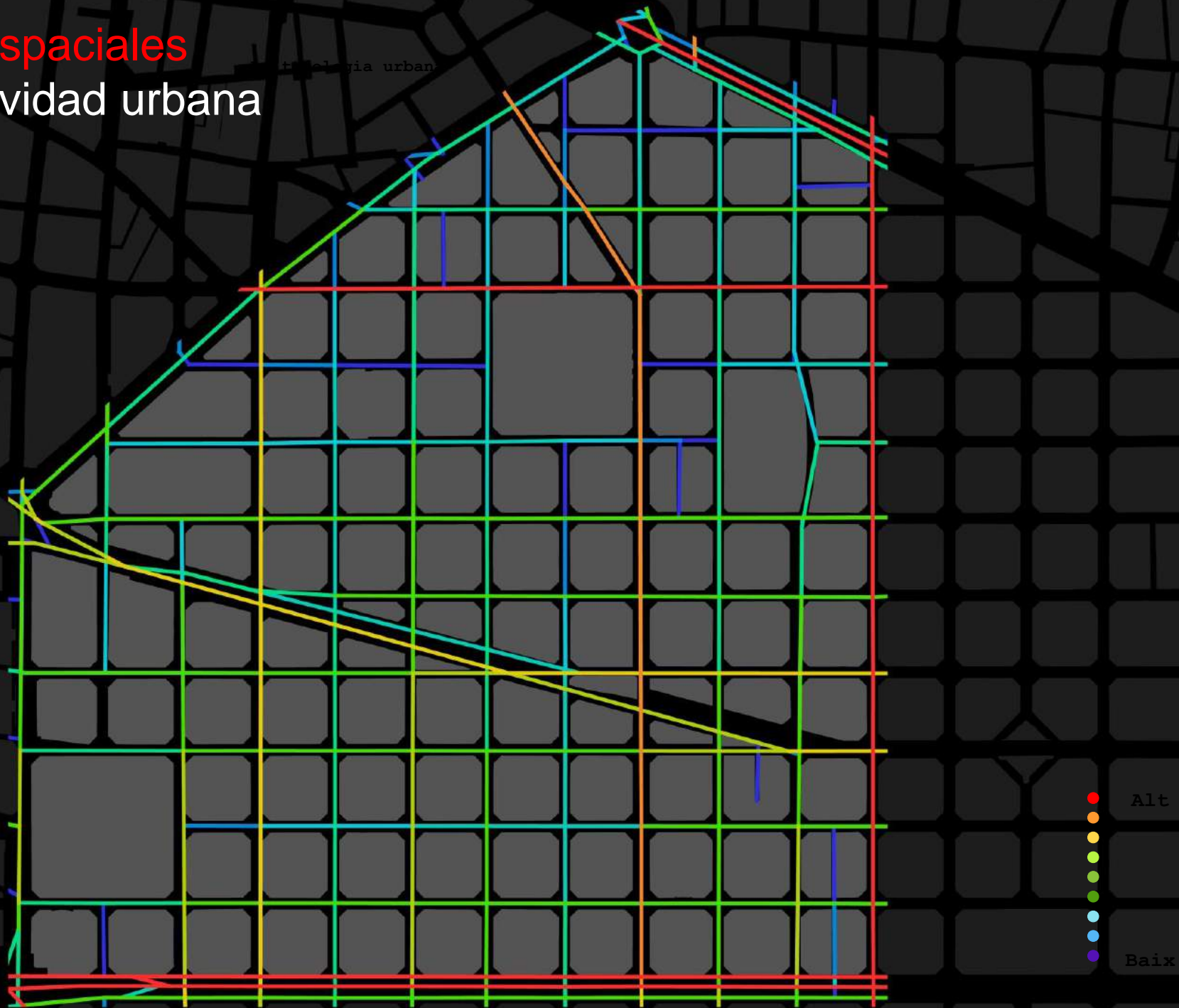
# Criterios Morfológicos

## Densidad económica



# Criterios espaciales

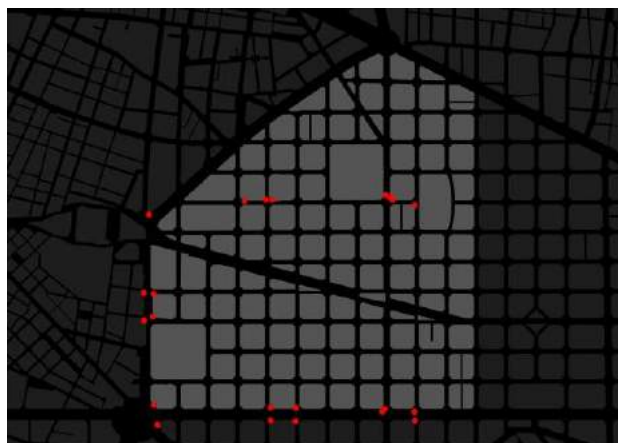
## La conectividad urbana



**Equipamientos metropolitanos**



**Red de metro**



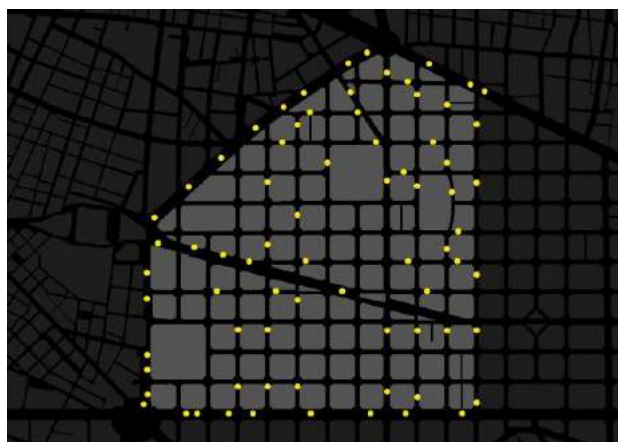
**Actividades económica**



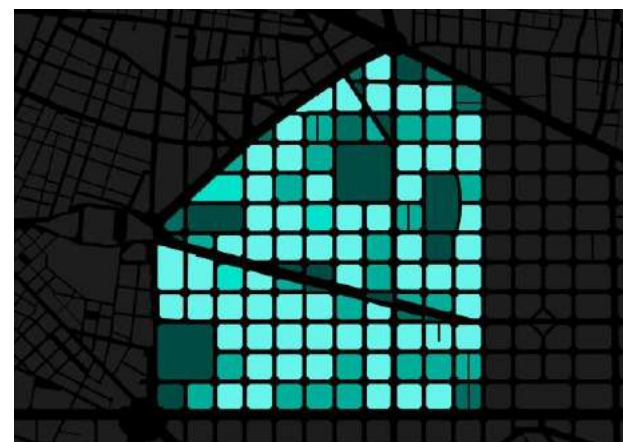
**Equipamientos de proximidad**



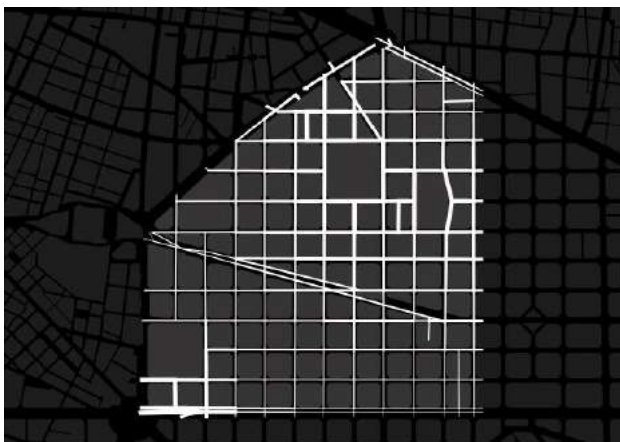
**Red de bus**



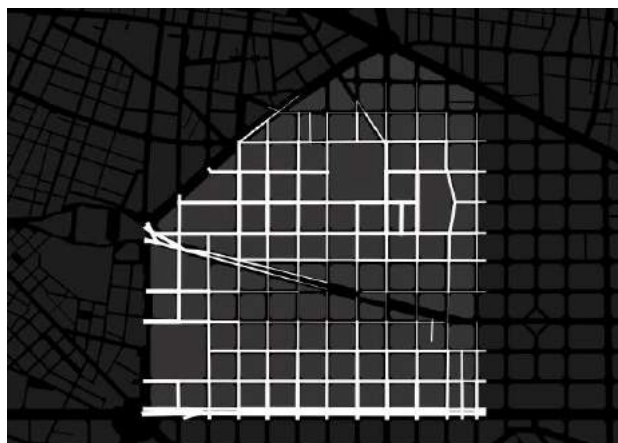
**Densidad de población**



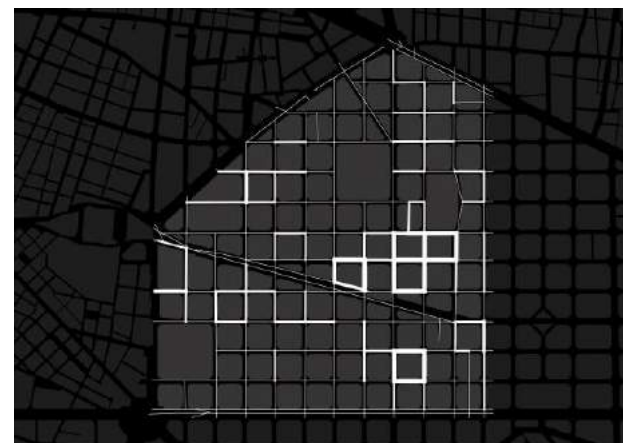
**Equipamientos metropolitanos**



**Red de metro**



**Actividades económica**



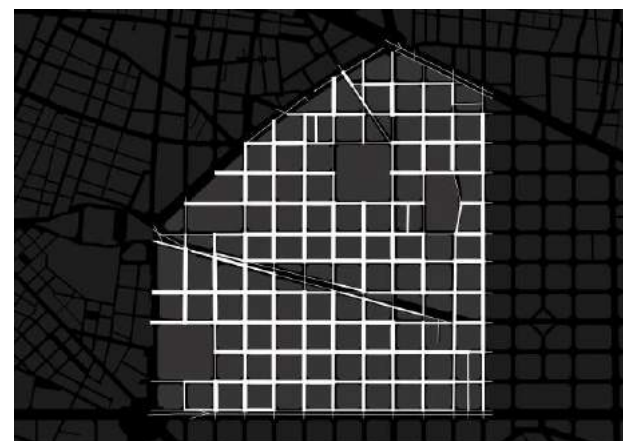
**Equipamientos de proximidad**



**Red de bus**



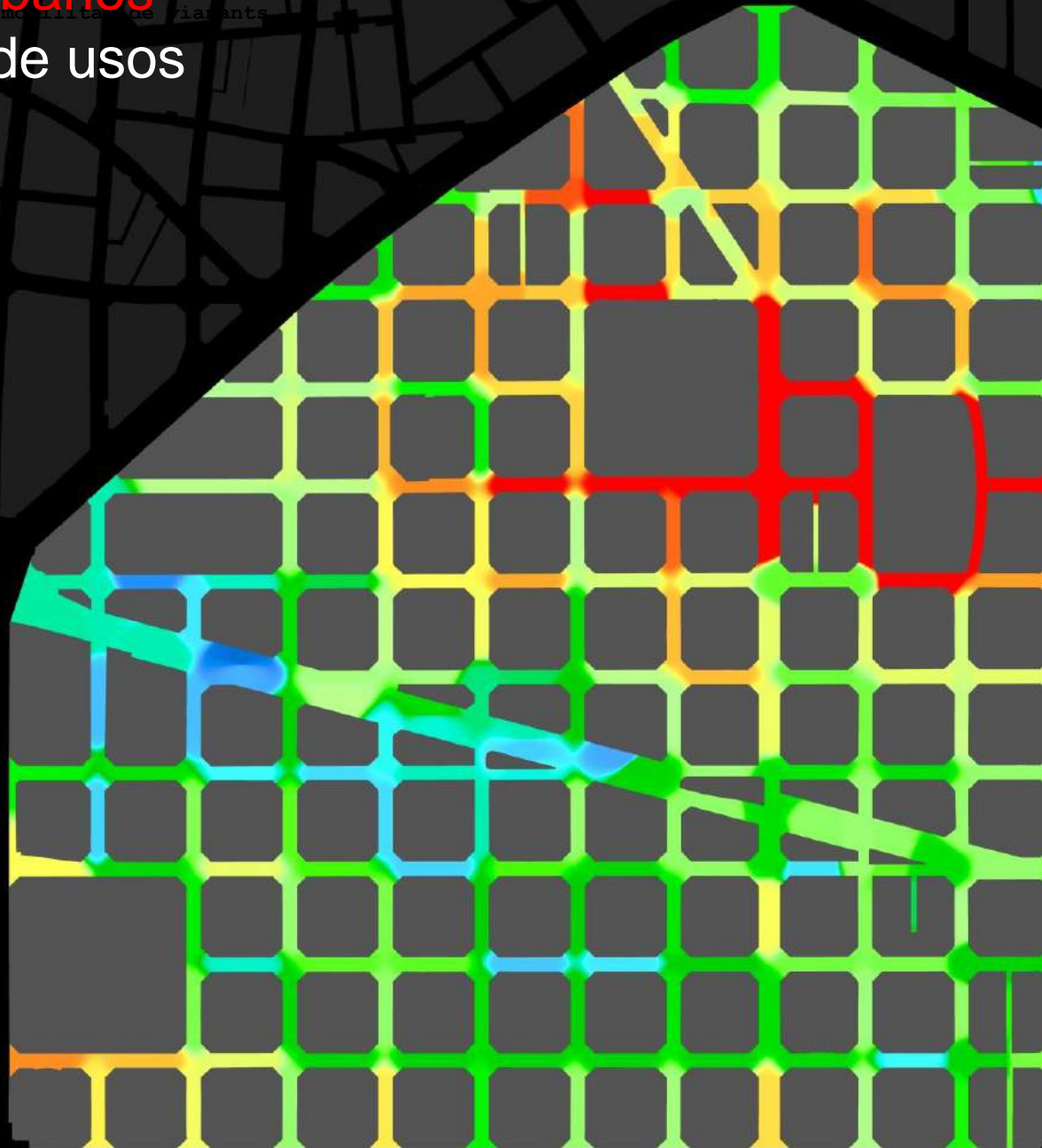
**Densidad de población**



# Modelos Urbanos

El modelo de la movilidad de usuarios

## Intensidad de usos



# Modelos Urbanos

## Intensidad de usos





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**Gracias!!**