MAPPING PROXIMITY
IDENTIFYING AND ANALYSING 15-MINUTE CITY SPACES

The 15-Minute City: The Challenge of Proximity and Polycentrism

In the face of contemporary urban challenges related to pollution, inequality, and competitiveness, cities must rethink their organization to reduce environmental impact and offer a more sustainable and pleasant living environment for residents. Numerous urban planning concepts have emerged over recent decades to address these issues. Among them is the «15-minute city» model, popularized by Franco-Colombian urban planner Carlos Moreno at the end of the COVID crisis in France in 2019. This crisis led cities to reconsider mobility, proximity, and local production concepts. Carlos Moreno proposes a paradigm in which each resident can access essential services—work, shopping, leisure, education, healthcare—within 15 minutes on foot or by bike.

This concept aims to reduce dependency on individual car use, which is now one of the primary challenges for cities. With population growth, car use no longer appears as a viable solution. It leads to traffic congestion and occupies a significant portion of public space. With the proximity-based approach inherent to the 15-minute city, car trips are replaced by more ecological modes of transportation, allowing new ways of designing cities.

This concept did not invent the principle of proximity, so we can assume that even without a formal '15-minute city' project in a given area, it may already exist. City centers are an example: they generally concentrate shops, facilities, and services that people can access without needing to use a car.

Our goal here is to propose a replicable method to identify, within a territory, all the areas that already fulfill the functions of a 15-minute city. In the long term, this will improve the quality of life for residents by bringing essential services closer, while reducing the costs of public infrastructure projects by optimizing the use of existing spaces and infrastructure

Hyper-proximity serving quality of life: ensuring access to essential amenities for every resident within a short time
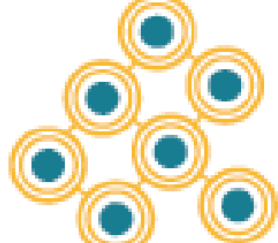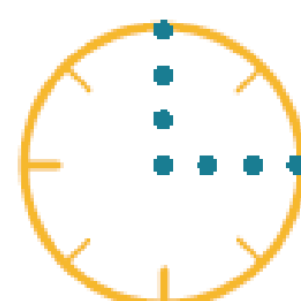
A concept that highlights polycentrism and breaks away from functionalist urban planning
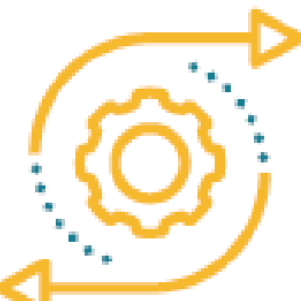
A planning Strategy Aimed at Reducing travel distances for a calmer urban environment
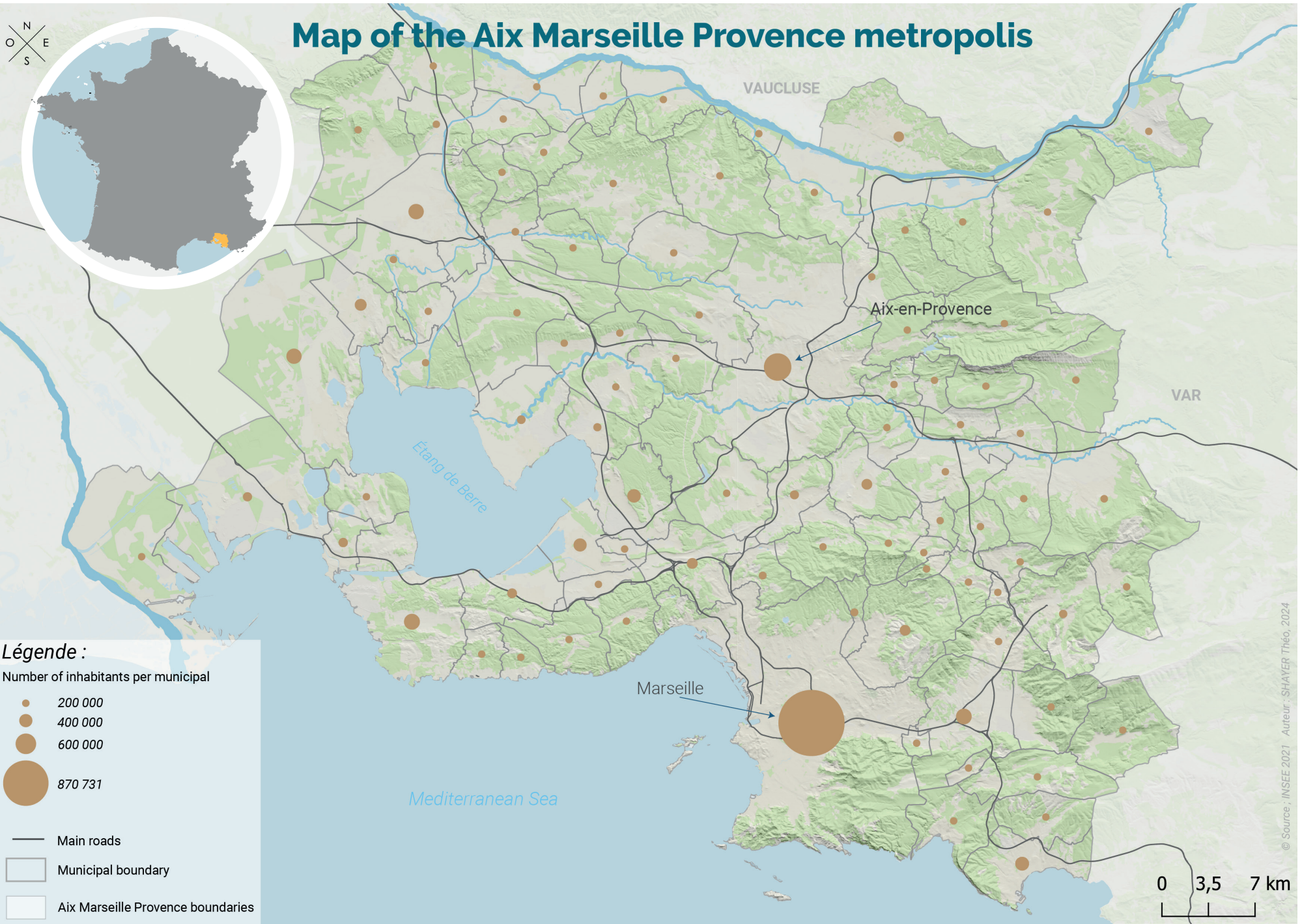
A concept to meet sustainable development goals

A new relationship with time through chrono-urbanism and chronotopy

The hybridization of uses and the modularity of buildings and facilities

The Aix-Marseille-Provence metropolis: a polycentric region conducive to the development of 15-minute centralities.

Map of the Aix Marseille Provence metropolis

Légende :
Number of inhabitants per municipal
- 200 000
- 400 000
- 600 000
- 870 731
Main roads
Municipal boundary
Aix Marseille Provence boundaries

1800000 inhabitants   **3148** km²

Our study area covers the entire Aix-Marseille-Provence metropolis. In France, a metropolis is a major urban area that exercises functions of command, organization, and development over a region, enabling its integration with the rest of the world within a competitive framework.

The Aix-Marseille-Provence metropolis is the largest in terms of area and ranks second in terms of employment and population. Created in 2016, it includes 92 municipalities with very different characteristics. It features major cities with international influence, such as Marseille and Aix-en-Provence, as well as smaller towns and villages.
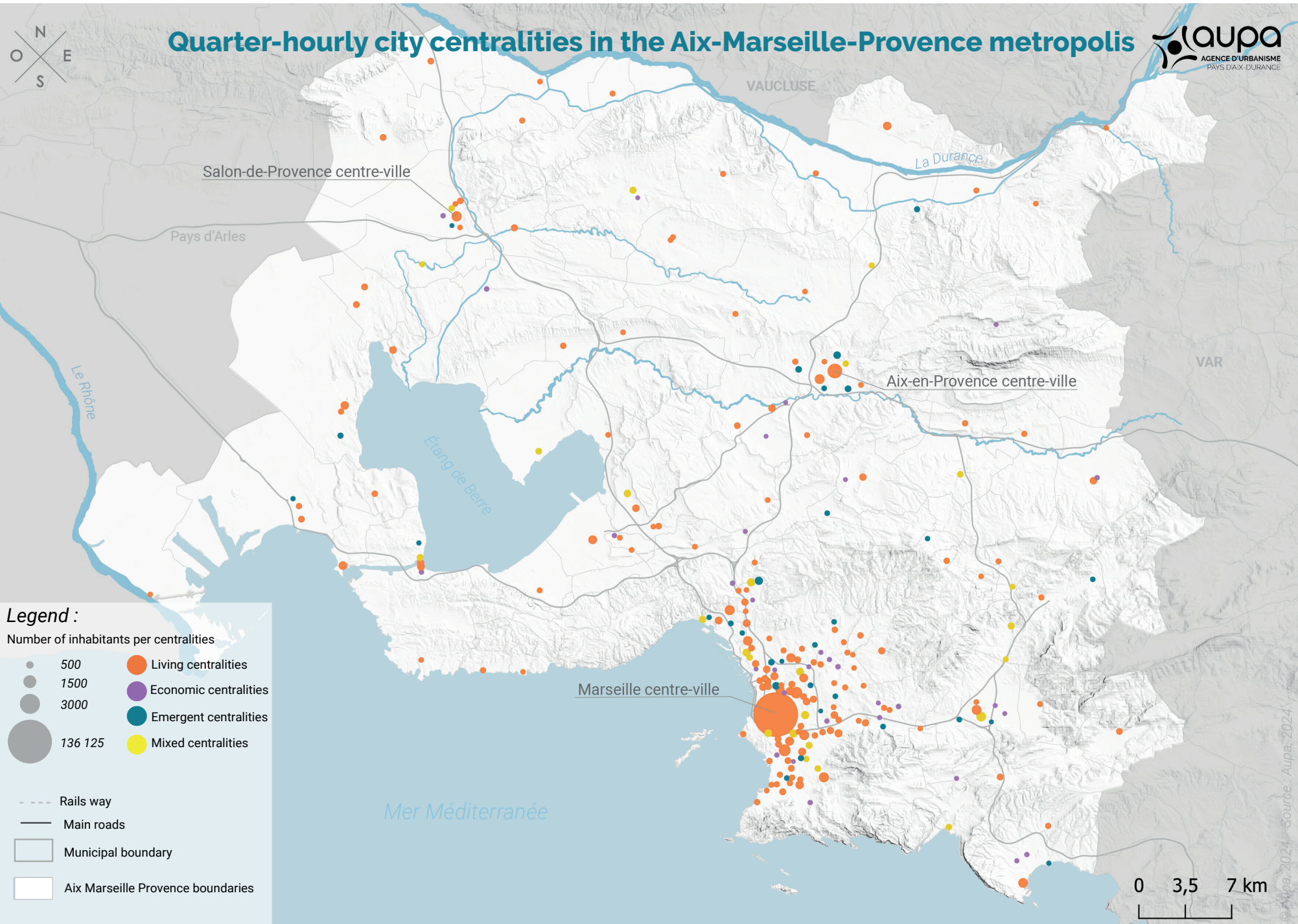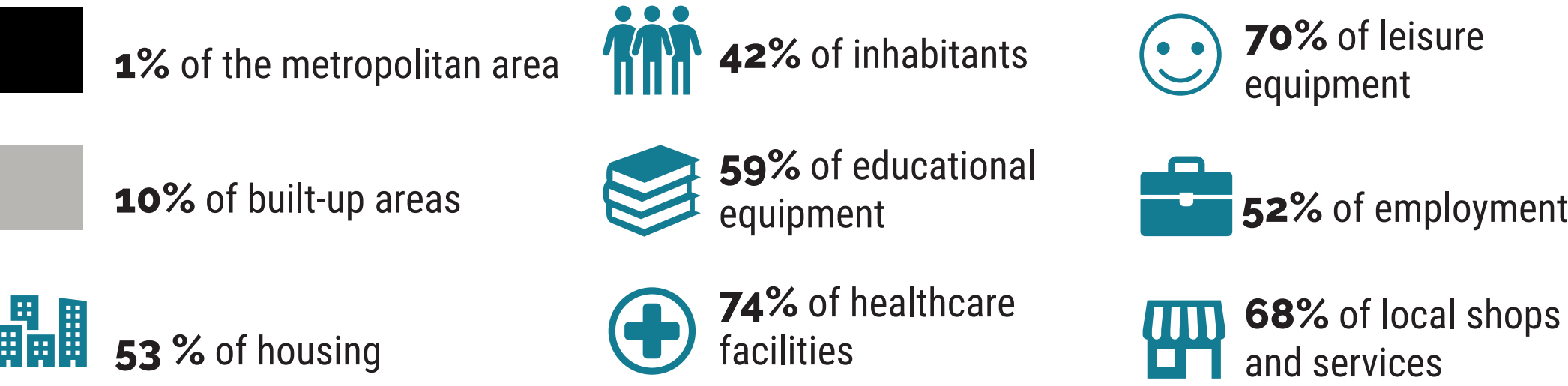
Unlike other metropolises, the Aix-Marseille-Provence metropolis has developed around multiple centers, following a polycentric structure. Marseille and Aix-en-Provence, the two largest cities in terms of population, shape the territory. Nevertheless, there are also secondary hubs around the Étang de Berre, Pertuis, and La Ciotat. This organization has encouraged the dispersion of businesses, services, and facilities across the territory.

The Aix-Marseille-Provence metropolis is a relevant area for studying the dynamics of the quarter-hour city due to its unique polycentric structure and urban diversity. Its sprawl and socio-economic disparities make it a representative example of the challenges linked to environmental and social transitions. Studying this metropolis allows for the exploration of innovative solutions for a more balanced and sustainable territorial organization.

The 15-Minute City's Centralities: Structuring Spaces of our Territory

We identified **237 centralities** across the metropolis. We find the major city centers, such as Aix-en-Provence or Marseille, which fulfill the main functions of the quarter-hour city. Then, we observe a large number of smaller centralities gravitating around the main centers. These areas may have fewer facilities but still play a central role, offering essential amenities for residents' daily lives. Added to this are the economic centralities, which are mainly commercial zones. Finally, these spaces already bring together a set of amenities where only residents are missing.

The study has made it possible to measure the significance of these centralities within the metropolis. Thus, they represent:

- **1%** of the metropolitan area
- **10%** of built-up areas
- **53 %** of housing
- **42%** of inhabitants
- **59%** of educational equipment
- **74%** of healthcare facilities
- **70%** of leisure equipment
- **52%** of employment
- **68%** of local shops and services

Quarter-hourly city centralities in the Aix-Marseille-Provence metropolis

Legend :
Number of inhabitants per centralities
- 500
- 1500
- 3000
- 136 125
Living centralities
Economic centralities
Emergent centralities
Mixed centralities
Rails way
Main roads
Municipal boundary
Aix Marseille Provence boundaries

Before its expansion, Marseille was characterized by a port center around which numerous small villages grew. With the spread of the urban fabric, these villages were gradually absorbed to form a single entity. Even so, their traces can still be seen today. The 111 districts of Marseilles are partly zoned according to the old villages. This has led to the emergence of many small, secondary centralities. Despite successive development projects, the various villages have retained their centrality within the commune, which is reflected in our study of the city of the quarter-hour.

Methodology : How to identify areas within a territory that fulfill the role of a 15-minute city?

1) SELECTION OF INDICATORS FOR IDENTIFYING CENTRALITIES

The first step of our method involves using databases to select all elements that allow residents to meet their daily needs, classifying them according to the **main functions of the 15-minute city** (living, working, healthcare, shopping, entertainment, and education). This includes amenities such as supermarkets, schools, bakeries, and pharmacies. No specific weighting is assigned to these amenities; what matters is their **accessibility** and **proximity,** rather than their size or capacity to accommodate people.

These elements were then counted within **a grid (200-meter by 200-meter cells)** to identify areas of concentration across the territory. The grid used covers all of France, thus ensuring that the method can be replicated on a national scale. However, any type of grid system could be used.

2) NOTION OF DENSITY

We then integrated the notion of density by setting thresholds to select only the cells with a certain density of amenities.
The thresholds were determined using different methods. For all functions except «living,» we calculated **a median value**, excluding cells with values of «0» and «1» as they skewed the average due to their high number.

For the «living» function, we set **a built density** threshold of 15 housing per hectare, as lower densities are no longer considered urban.

- Thresholds assigned to each category -

Shopping **>5**   Working **>14**

Education **>1**   Entertainment **>5**

Healthcare **>4**   Living **>60**

3) NOTION OF DIVERSITY

In the third step, we introduced the concept of diversity using a «diversity indicator.» This indicator allowed us to select only the cells where multiple thresholds were met. For example, if the thresholds for the functions of living, working, education, and health are met in a cell, it is defined as a centrality. The goal here is to perform a final selection to highlight the areas that best align with the definition of the 15-minute city. If a cell contains only housing and local shops, it does not fulfill all the functions of the 15-minute city.

Once this step was completed, we grouped adjacent cells to form a single centrality that better reflects real-world conditions. At this stage, we identified 237 metropolitan centralities, each assigned an identifier and a name.

4) TYPOLOGIE OF CENTRALITIES

Living centralities : These are the centralities that most closely resemble the 15-minute city, composed of residents and a sufficient number of amenities.

Economic centralities : These include all the amenities of the 15-minute city, but there are few or no residents.

**Emergent centralities :** These centralities do not fully fulfill their role and lack amenities.

Mixed centralities : These are composed of different cells and are therefore not homogeneous.
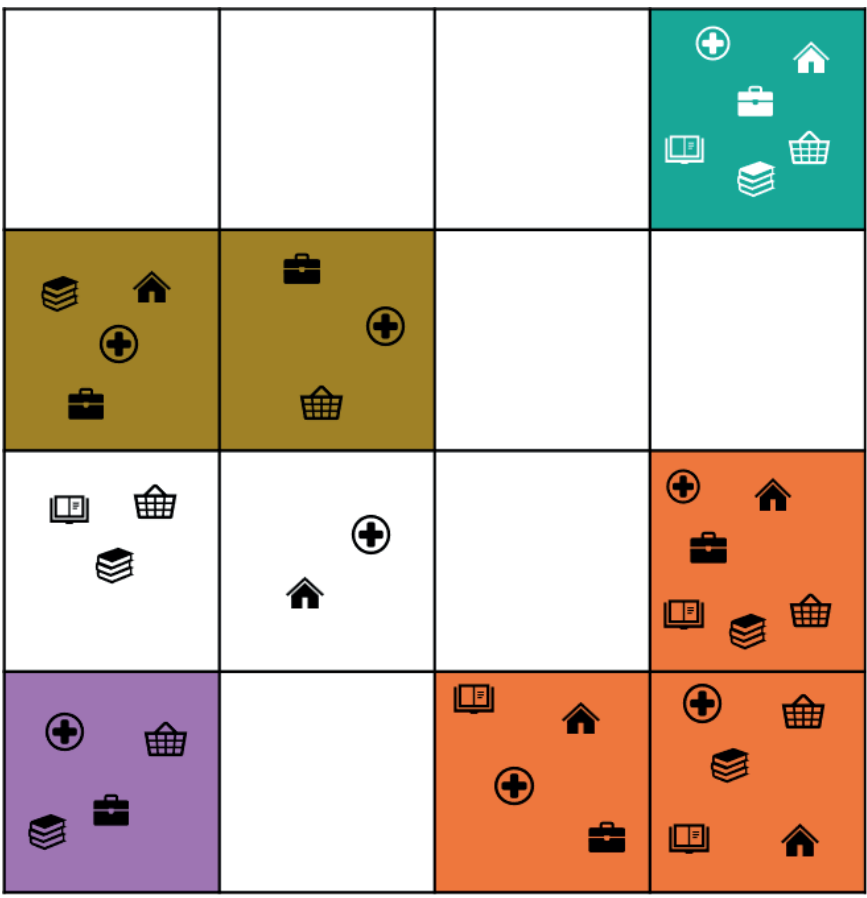
5) NOTION OF PROXIMITY

Then, using the concept of diversity, we selected only the cells where multiple functions of the 15-minute city met the thresholds. Indeed, a cell with only shops or local services is not sufficient to be considered a centrality. A centrality must meet a range of needs for residents, so it is essential that multiple functions are present.

- Example of a lived perimeter (isochrone) -

Légend :
- neighborhood living (isochrones)
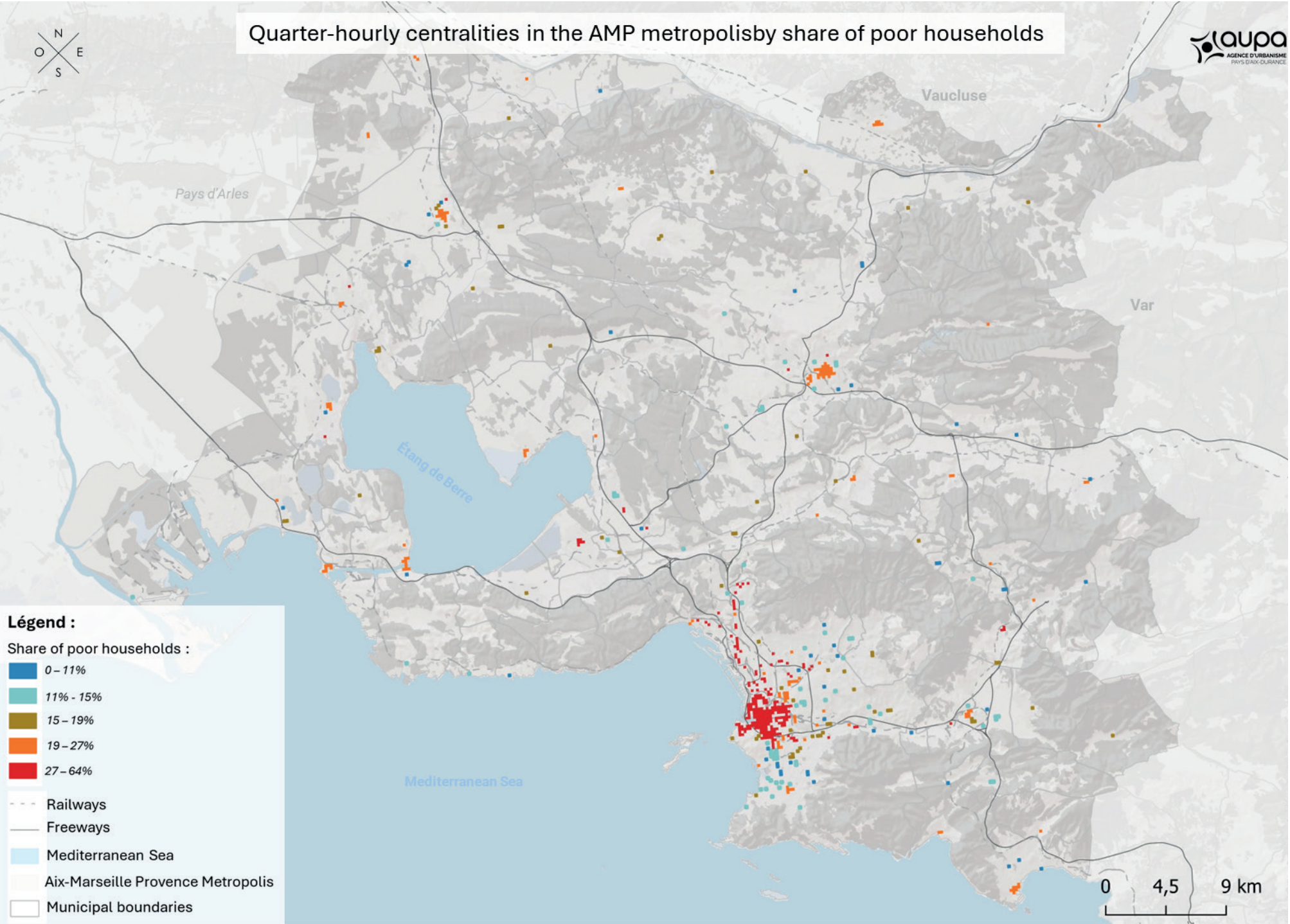- central point of centrality
- Walking time
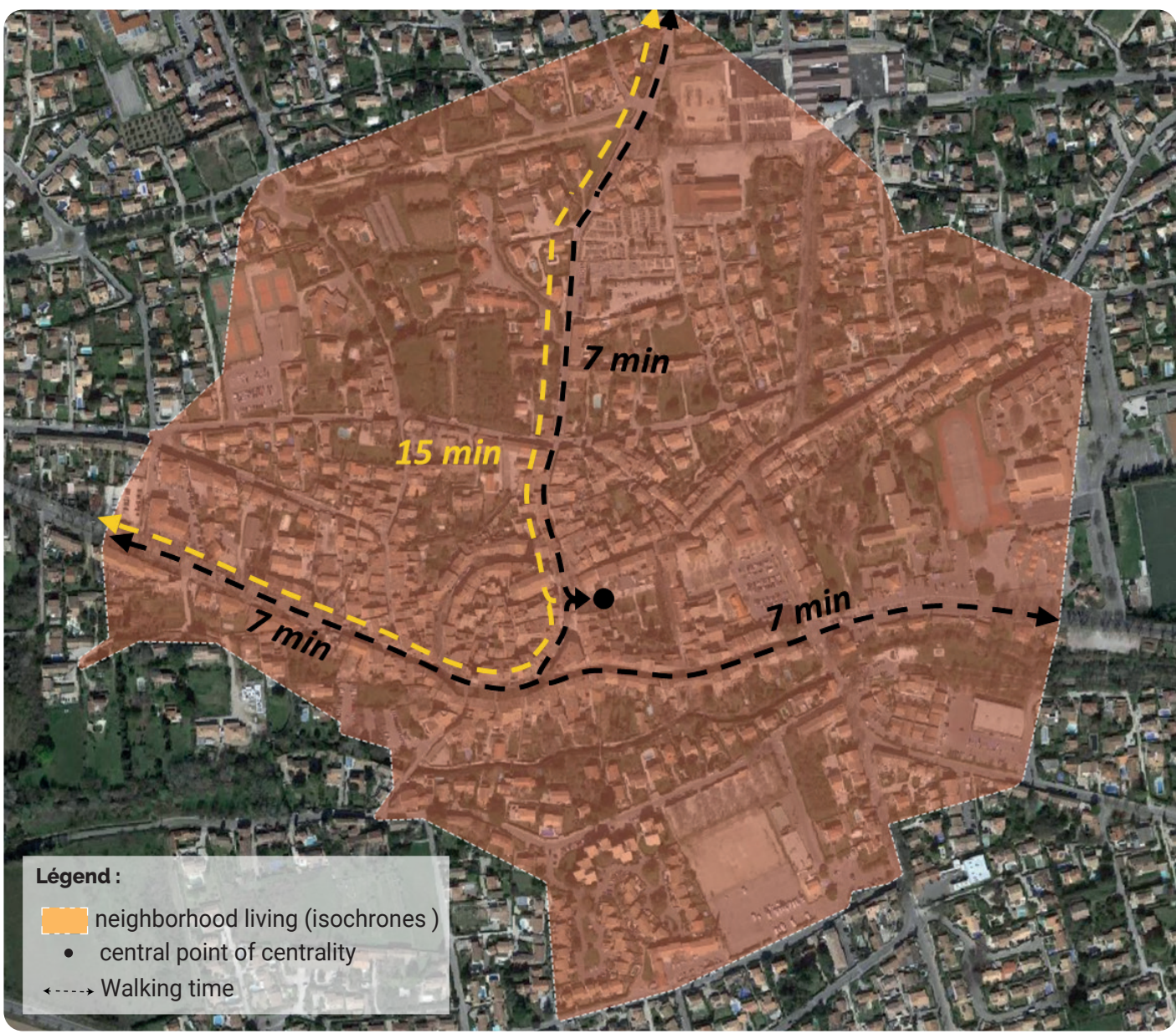
The Centralities of the 15-Minute City: Multiple Challenges

Based on our centralities and lived perimeters, we aggregated numerous data points to characterize them (age of the population, poverty rate, vacancy rate of housing, price per square meter, number of shops and local services per 100 inhabitants). Once processed and analyzed, this data helps us understand what defines each centrality. In the context of densification, this step is crucial to avoid designing projects disconnected from the residents' challenges and the functional needs of the neighborhood.

Our analysis shows that, contrary to popular belief, the 15-minute city is not exclusively intended for affluent populations. In France, the average poverty rate is 14.4% *(INSEE, 2023)*. However, we found that this rate is more than twice as high in the 20% of centralities with the most disadvantaged populations. Conversely, 20% of centralities have a very low

poverty rate, below the national average. These disparities reveal **significant inequalities** between centralities, highlighting a fragmented territory, particularly in Marseille. The northern part of the city is characterized by disadvantaged populations who, despite living in centralities, face compounded social and economic challenges. The southern part of the city, on the other hand, stands out with a wealthier population, a more pleasant living environment, lower housing density, but very high property prices.

Finally, 24 municipalities lack centralities. These are mostly **small villages** that rely on larger neighboring municipalities. The **low urban density** and **small population** in these areas have not allowed centralities to emerge. In these territories, the 15-minute city approach may not be the most effective strategy.

Quarter-hourly centralities in the AMP metropolisby share of poor households

Légend :
Share of poor households :
- 0 – 11%
- 11% - 15%
- 15 – 19%
- 19 – 27%
- 27 – 64%
- Railways
- Freeways
- Mediterranean Sea
- Aix-Marseille Provence Metropolis
- Municipal boundaries

0   4,5   9 km

The poverty rate corresponds to the percentage of people whose income is below a threshold set relative to the median income of the entire population. Unless otherwise specified, this threshold is typically set at 60% in most French and European statistics.(Géoconfluences 2024)

Conclusion

The concept of the 15-minute city is indeed present within the metropolis, where 237 centralities structure the territory by drawing together local amenities. Although the methodology includes certain biases, the results faithfully reflect the reality on the ground. The emergence of these centralities depends on urban characteristics: a dense urban fabric promotes their development.

In a densification approach, it is essential to understand the specific profile of each centrality. Our analyses have highlighted significant disparities: some centralities are marked by disadvantaged populations living in small housing units with limited real estate dynamics, while others exhibit opposite characteristics.

Our study also reveals areas that do not align with the concept of a «15-minute city»: natural and agricultural spaces, as well as certain rural communities with low building density. These low densities prevent both the concentration of amenities and the emergence of centralities. Additionally, the evolution of some municipalities has led to a dispersion of facilities across multiple development hubs, limiting the formation of 15-minute centralities.

Densifying already high-density centralities can be challenging. However, certain densification levers, such as rehabilitating vacant housing, redeveloping brownfields, or utilizing available urban land, can be applied.

This project is still underway. While the identification method is now complete, the analysis needs further development, and not all results could be included in this presentation. Moving forward with our study, we will explore aspects that have so far been under-considered, such as urban nature and public spaces. Additionally, we plan to take a closer look at these centralities through field studies.