SmartHubs Project:
Development of a DST to locate shared mobility hubs

eit Urban Mobility

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SmartHubs

SHARED MOBILITY SOLUTIONS

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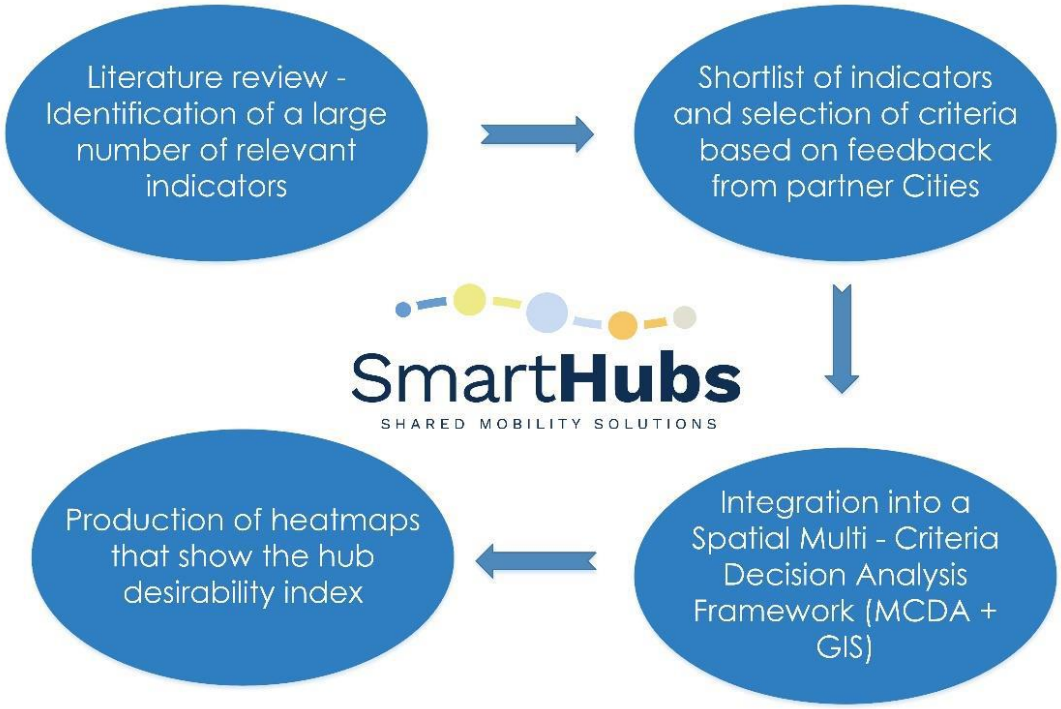
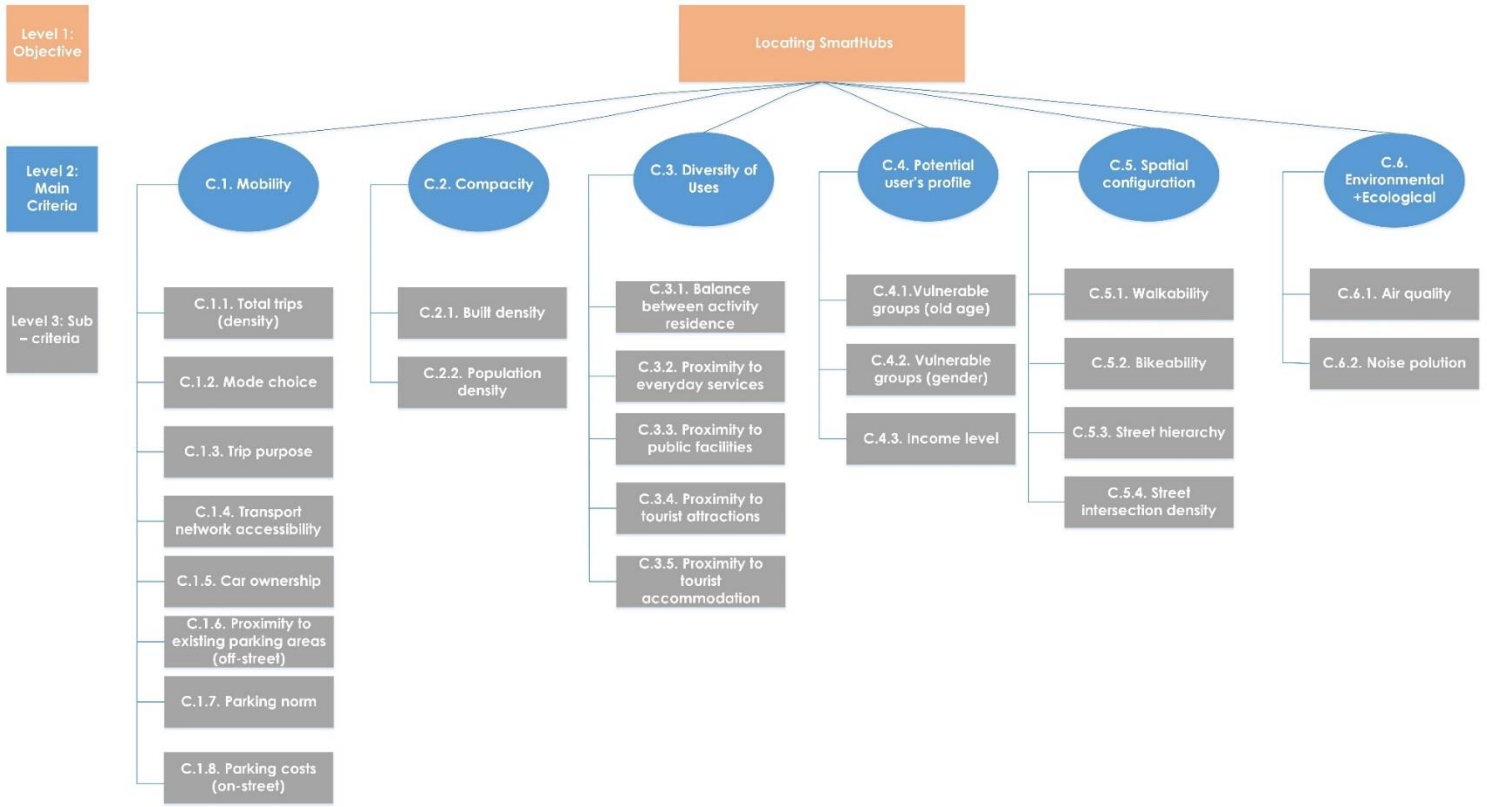
Decision – support tool: Methodological framework



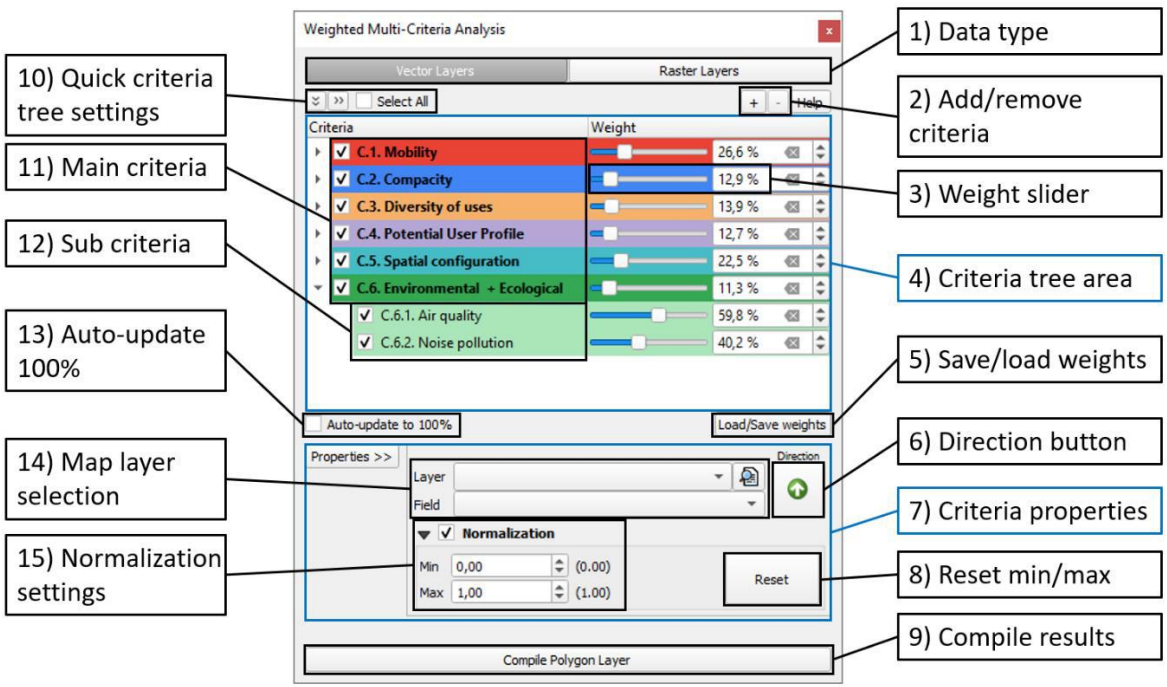
- Conceptual model of the DST: developed in 2021 by TU Delft and UPC/CARNET.
- In 2022 it was translated into a plug-in for QGIS, a powerful open source GIS software.
- Potential users: local public administrations (municipalities and metropolitan areas) or/and any other entity which is interested in locating shared mobility hubs.

Decision – support tool: Criteria and sub-criteria



Key novel aspect: the attempt to fully incorporate an interdisciplinary perspective, so to look into all possible factors that could affect a decision on where to locate a hub in a city, in addition to the ones related to mobility.

Decision – support tool: QGIS plug-in



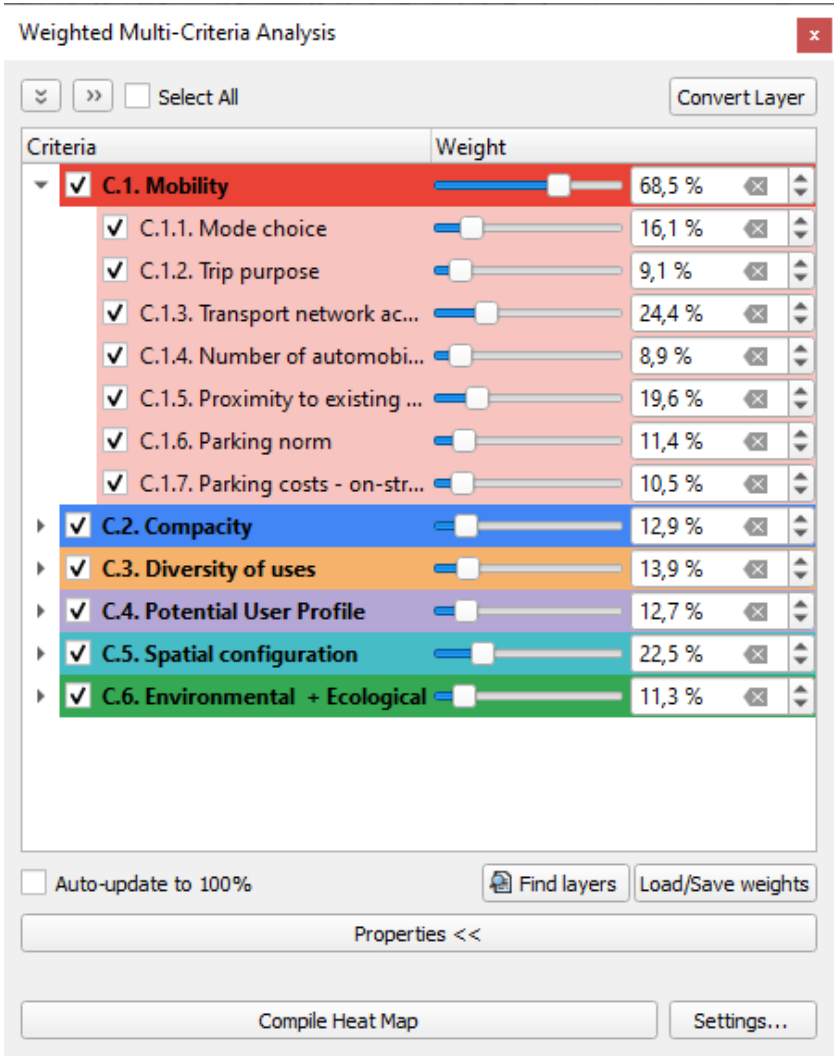
- **Flexibility** in the core of our model: the users can elicit weights, de-activate some sub-criteria or/and add new ones, based on data availability, as well as their **own objectives, strategies and priorities.**
- **Direction** of the criteria can also change.
- Works **both with vector and raster** input layers.

Weights can be adjusted by slide bars

- There is a **pre-set of weights** for the criteria that were estimated by the interdisciplinary team of the researchers, using the **Analytic Hierarchy Process (AHP**)

- **Users can easily change these weights** and select their own, from 0 to 100%, **based on their objectives and aspirations**

- Setting to 0% disables the sub-criteria
- A main criterion is disabled when all its sub-criteria are disabled



Criteria direction

The way to apply some of the criteria remains open: it depends on the **contexts, goals and aspirations of each city**.

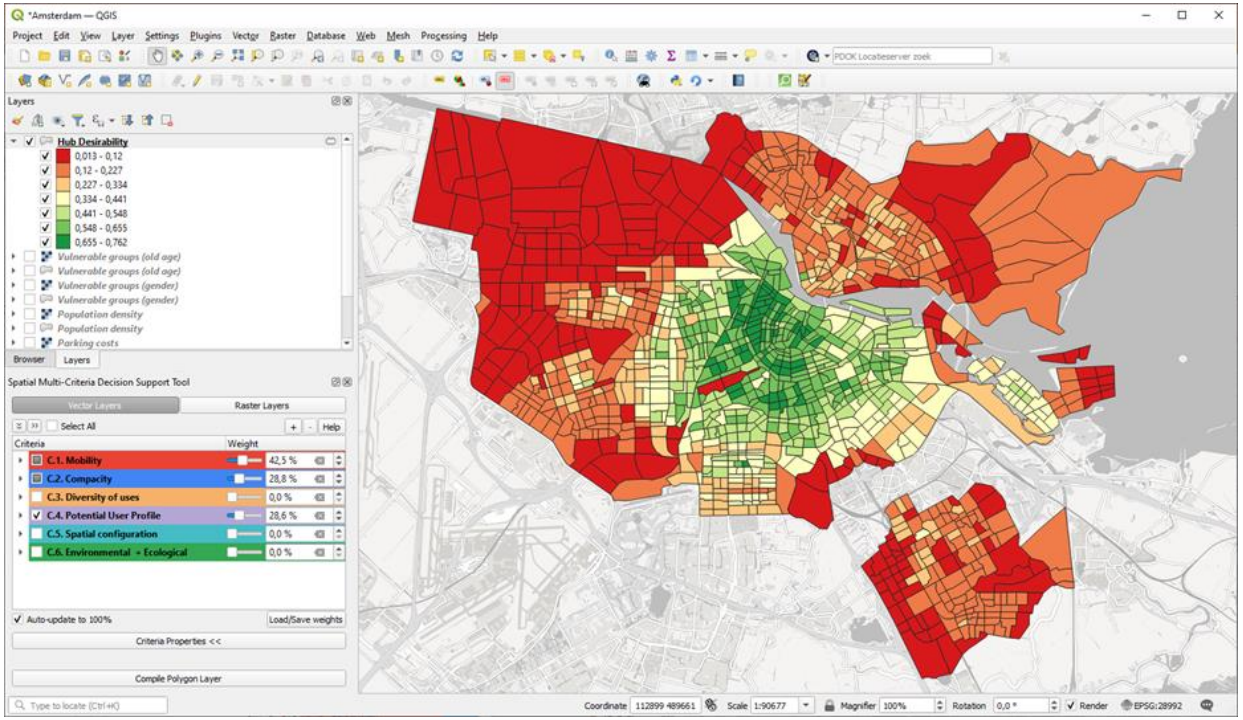
For instance: should smarthubs be located in places where currently most people use alternative modes of transportation to private cars because this is where we know they will be used?

In that case, the **demand factor would drive the decisions of the city**.

Or on the contrary, they should be in places where the use of private cars is still dominant in order to induce a shift?

In that case, the city action would be driven by the **principle of desirability**.

Output: Hub desirability heatmaps



- Demo data: **Amsterdam**
- Keep in mind: this is a tool to **assist decision making.**
- A red area in the map **is not a strict "no" – it just means "less desirable"** based on the selected criteria set and weights.
- The **type of hub also plays an important role**, already from the weight allocation stage.

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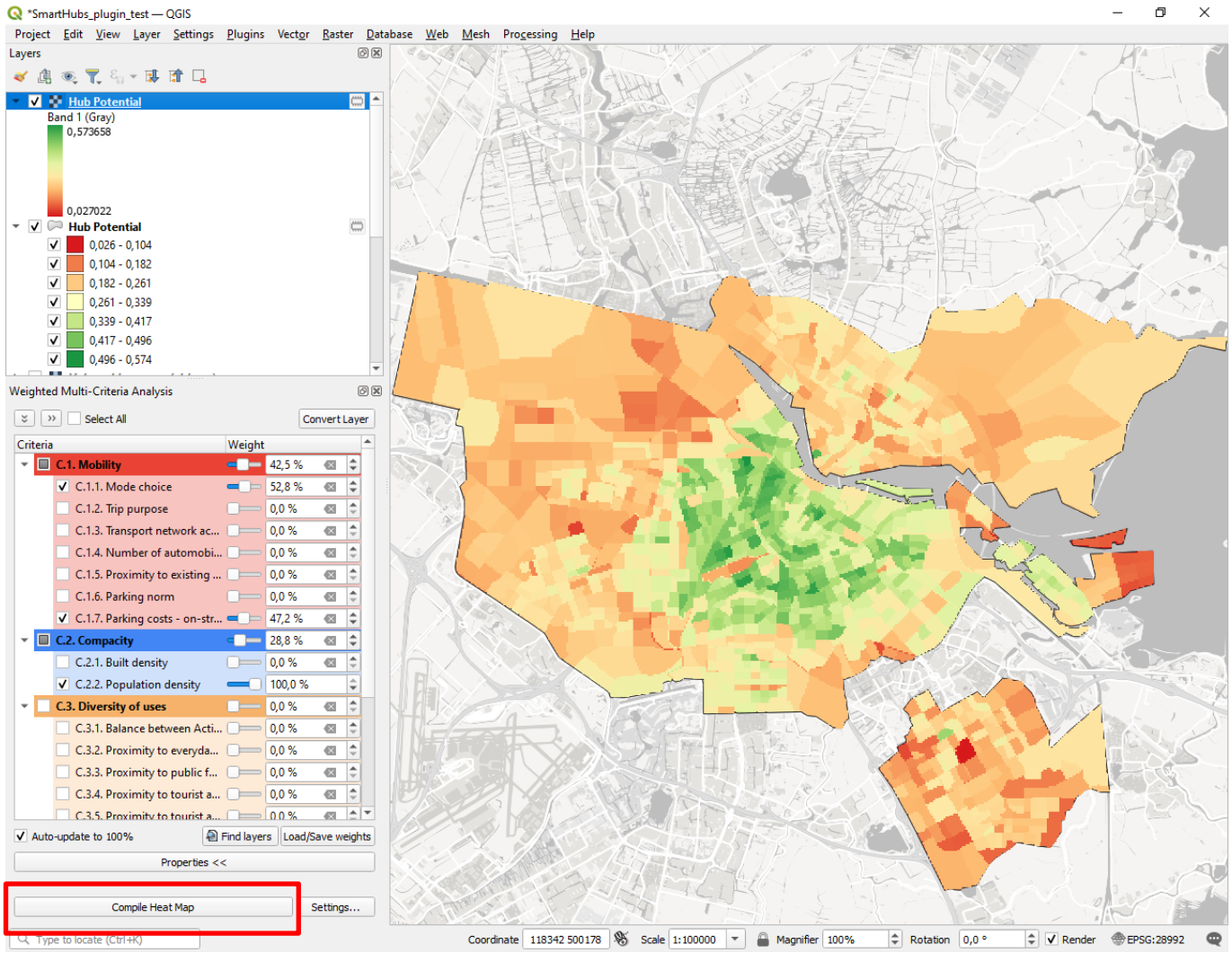
The raster approach

- The previous map consists of **vector units** (in the case of Amsterdam, **traffic zones**).
- Vector units are characterized of so-called "**hard limits**". This means that any attribute corresponds to the whole unit, without necessarily being the case in reality (for example, if a bus stop is located at the edge of the unit, that does not mean that the whole unit has the same level of accessibility, but still it appears so).
- In order to address this, the user will be given the possibility to work with **raster files** (following a process called **rasterization**.
- When the raster approach is used, the "hard limits" disappear and the heat map becomes more continuous.
- Very useful for the criteria that **do not use areas but isochrones or point data** (e.g. Related to accessibility, transport stops etc.).

Output using the raster approach



User guide

A user guide with step-by-step instructions accompanies the plug-in.

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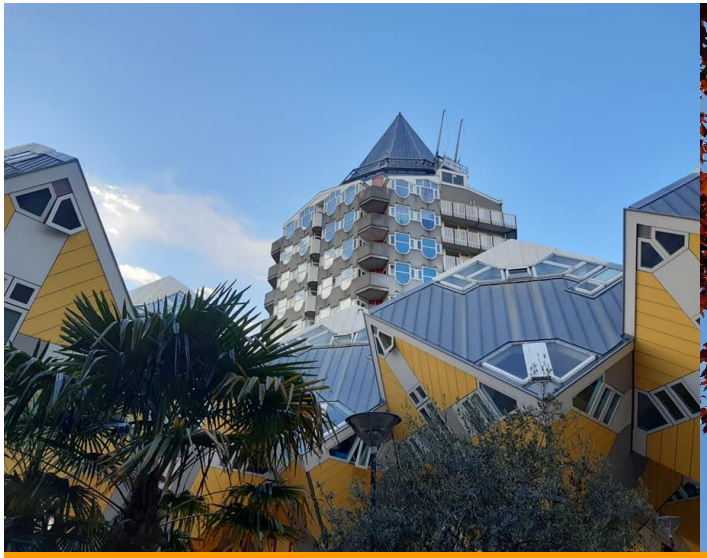
Thank you for your attention!



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