



Strategic method / procedure for selection /
implementation of eHUBs

DELIVERABLE T2.1

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Summary sheet

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Project partners

Organisation	Abbreviation	Country
Gemeente Amsterdam	AMS	The Netherlands
Promotion of Operation Links with Integrated Services aisbl (POLIS)	POLIS	Europe
Taxistop asbl	Taxi	Belgium
Autodelen.net	Auton	Belgium
Bayern Innovativ GmbH	BI	Germany
Cargoroo	CA	The Netherlands
URBEE (E-bike network Amsterdam BV)	URBEE	The Netherlands
Gemeente Nijmegen	NIJ	The Netherlands
Transport for the Greater Manchester	TfGM	Great Britain
Stad Leuven	LEU	Belgium
TU Delft	TUD	The Netherlands
University of Newcastle upon Tyne	UN	Great Britain
Ville de Dreux	DR	France
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Universiteit Antwerpen	UAntwerp	Belgium

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Table of Contents

Summary sheet	2
Project partners	3
Document history	4
1. Implementation approach	6
2. Location selection	6
2.1. Top-down locations selection	6
2.2. Bottom-up.....	14
3. At the location.....	15
3.1. Type determination	15
3.2. Shared mobility offer for an eHUB.....	16
3.3. Number of vehicles	17
3.4. infrastructure	19
4. Getting started.....	20
4.1. Making public decisions.....	20
4.2. Start-up	21
The eHUBS Consortium.....	22

List of figures

Figure 1: Leuven and its sub municipalities (by postal code)	7
Figure 2: Leuven population density per statistical sector	8
Figure 3: Leuven population density per area	9
Figure 4: Leuven circulation plan	10
Figure 5: Hills crossing Leuven from the southeast to the northwest.....	11
Figure 6: Topographical map of Leuven.....	12
Figure 7: Exercise locating existing shared mobility in the city centre of Leuven	13
Figure 8: Phases on the 'maak het mee' platform online (leuven.maakhetmee.be)	14
Figure 9: Planning bottom-up eHUBs Leuven.....	15
Figure 10: Leuven parking spot for shared cars only.....	19
Figure 11: Typical Leuven bike mounts.....	20

1. Implementation approach

A specific goal of the project is the design and deployment/adaptation of 92 eHUBs in 6 pilot cities with in total 2,395 shared light electric vehicles and 672 electric vehicles. Light electric vehicles (LEVs) are types referred to as low impact mobility options such as electric bicycles, scooters, cargo-bikes... Electric vehicles (or EVs) in general refer to electric cars or vans.

As leader of the work package eHUB pilot demonstrations (WPT1) Leuven represents a significant part of this goal with:

- 50 eHUBs
- 120 LEVs
- 50 EVs

Each city has its own characteristics. This is also the case for Leuven. Leuven is situated in a dynamic and fast growing region. It is the capital of the Belgian province Flemish-Brabant, at 20 km east from Brussels, with over 100 000 inhabitants and home to the catholic university of Leuven with over 50 000 students.

Leuven set itself the goal to become CO2 neutral by the year 2050.

Leuven is part of 'regionet', an ambitious project focused not only on Leuven city but the entire transportation region with focus towards the city of Leuven. It has the goal to facilitate the modal shift in the entire region with focus on the public transportation network and the cyclist infrastructure.

In addition to this, on the Flemish level, there is a vision towards the creation of hubs offering transfer options and/or shared mobility options. This translates to the Mobipunten network that is in development in several cities and communes over the whole of Flanders.

2. Location selection

2.1. Top-down locations selection

Different factors were taken into account when generating the first top down location selection:

Leuven is a combination of an **old city centre and four sub municipalities** surrounding it. The largest concentration of business activities is in the Leuven city centre with secondary centres in the four sub municipalities. Sixth and final pole worth mentioning is situated in the south east edge of the map: the business and industry centre of Haasrode.

Opdeling postcodes

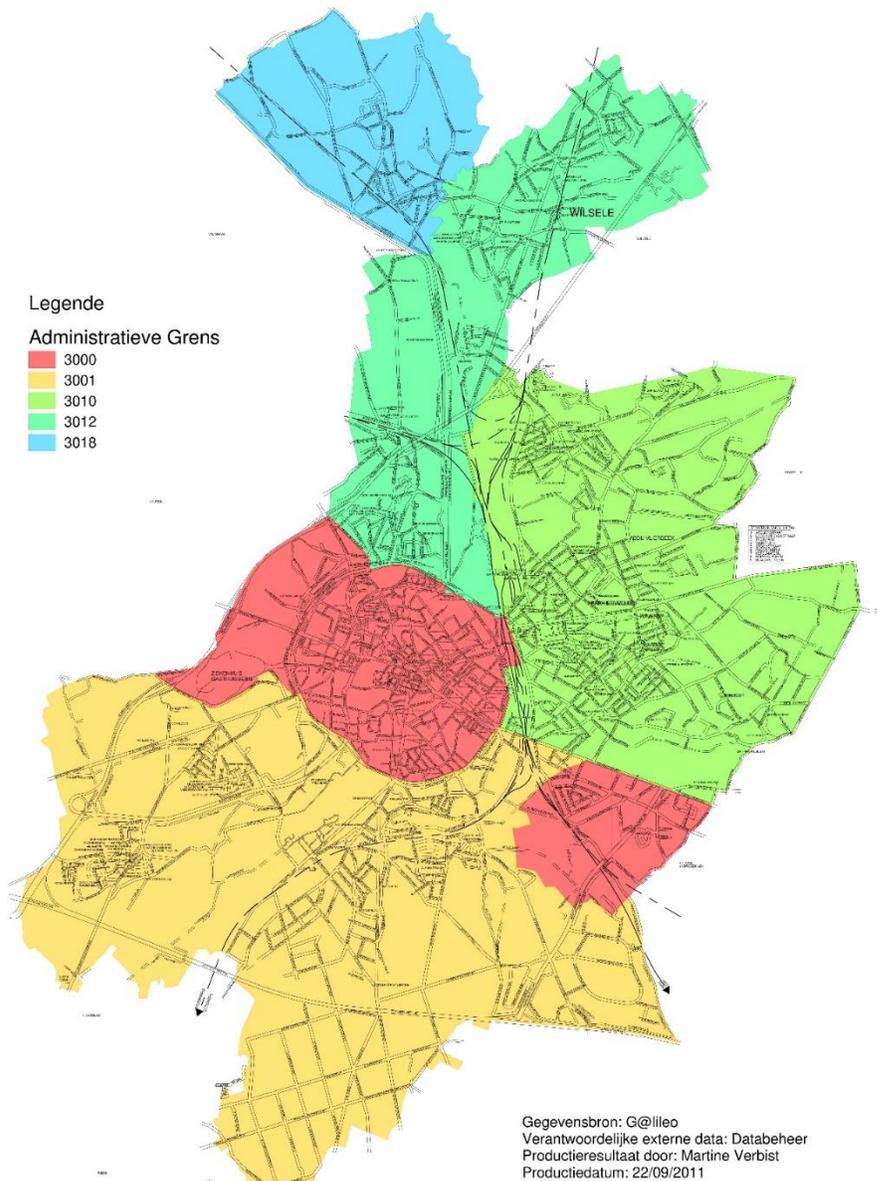
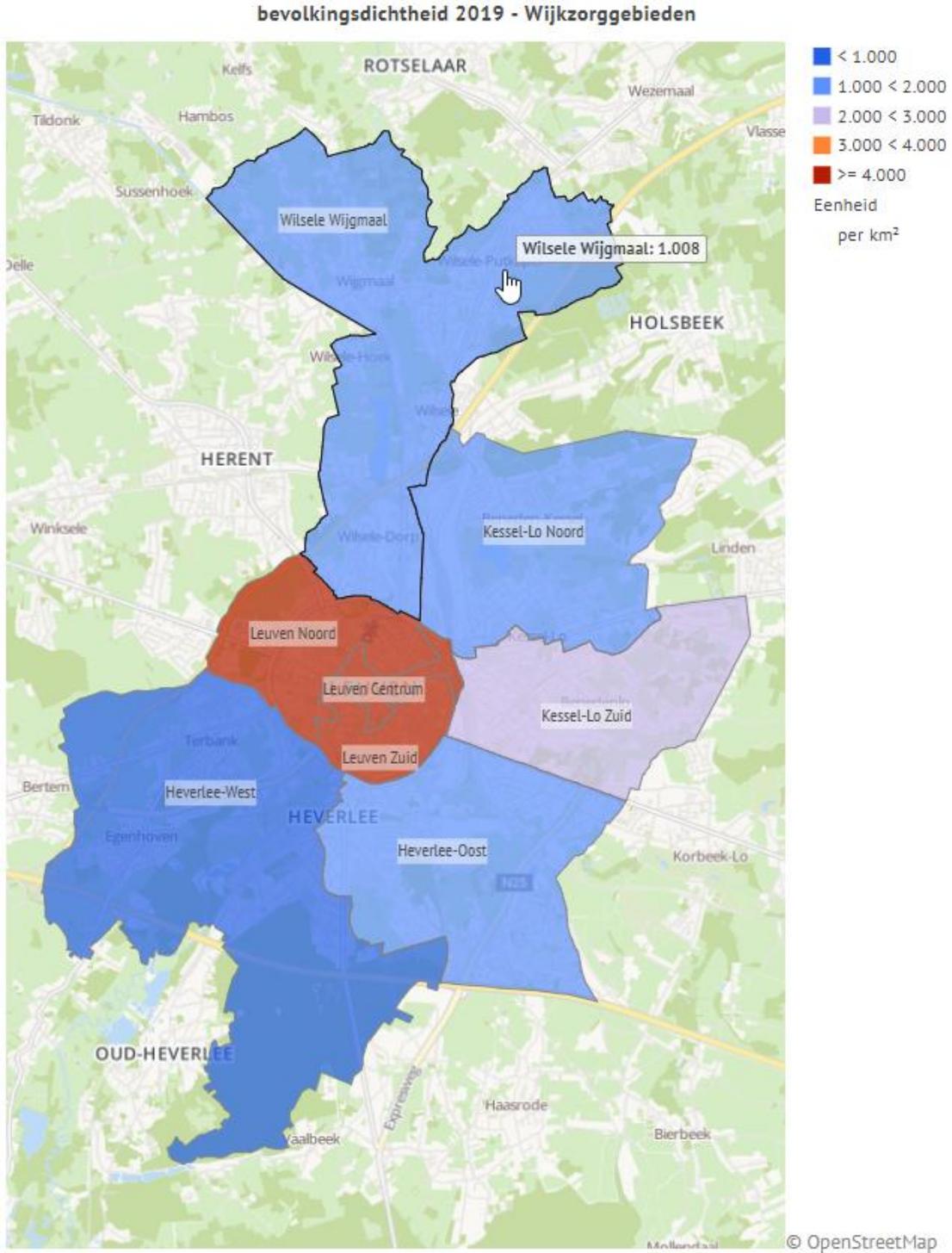


Figure 1: Leuven and its sub municipalities (by postal code)

Population of Leuven has increased strongly the last years and it does not look like this trend is about to stop. Leuven is about 57km², but with a population of over 100 000 inhabitant this leads to an average density of 1 773 inhabitant per km². The largest densities are found in Leuven centre with 5 531 inhabitants per km², not including the large student population. Sub municipalities Heverlee and Kessel-Lo have medium densities, and the lowest are found in Wilsele and Wijgmaal.

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Bron: Rijksregister | provincies.incijfers.be

Figure 3: Leuven population density per area

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The city centre does not only have a large population density is also a large cluster of activities: business, recreational, tourist etc. This translates to large pressure on the public domain and traffic congestion during rush hours. In 2016 the **Leuven circulation plan** was implemented. The city is divided in parts where automobile traffic cannot cross from one part to the other. To do a cross-over using a car, the ring-road needs to be utilized. City centre itself is a big car-shy zone (dark purple) and car free zone at the historical core (light purple).



Figure 4: Leuven circulation plan

Leuven is identified as one of the most hilly cities of Flanders. Wijgmaal and Wilsele, the northern part of Leuven, are geographically characterised as a low lying plain. Leuven is part of 'het hagenland'. It is a Flemish **geomorphological** region that consists of a row of hills (ironstone) with open spaces in between. These hills cross the city from southwest to the northeast. The south of Leuven is part of the Brabant

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plateau, characterised with slight rising height towards the southeast. The city centre is embedded in between the Hageland hills southeast and northwest.

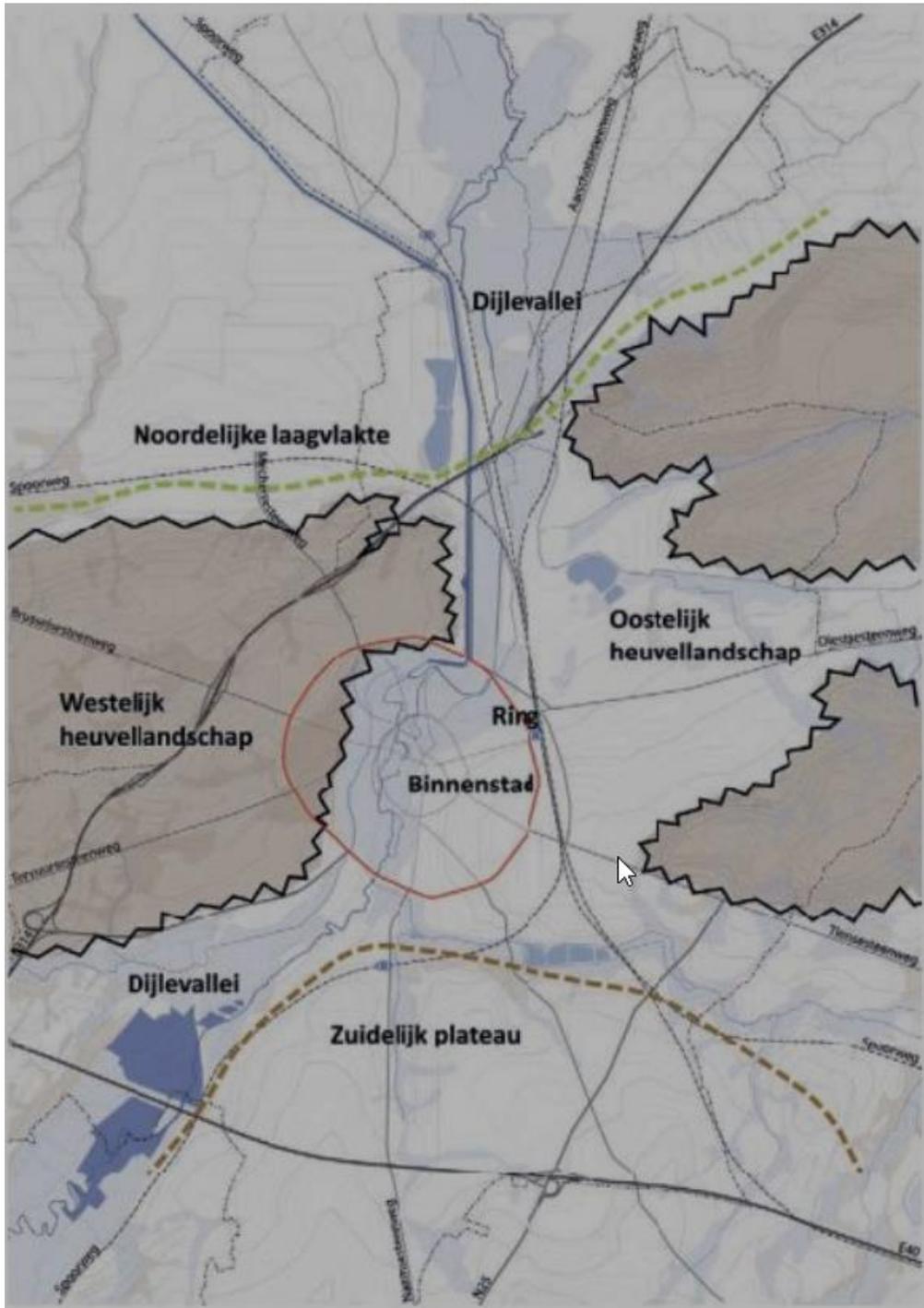


Figure 5: Hills crossing Leuven from the southeast to the northwest

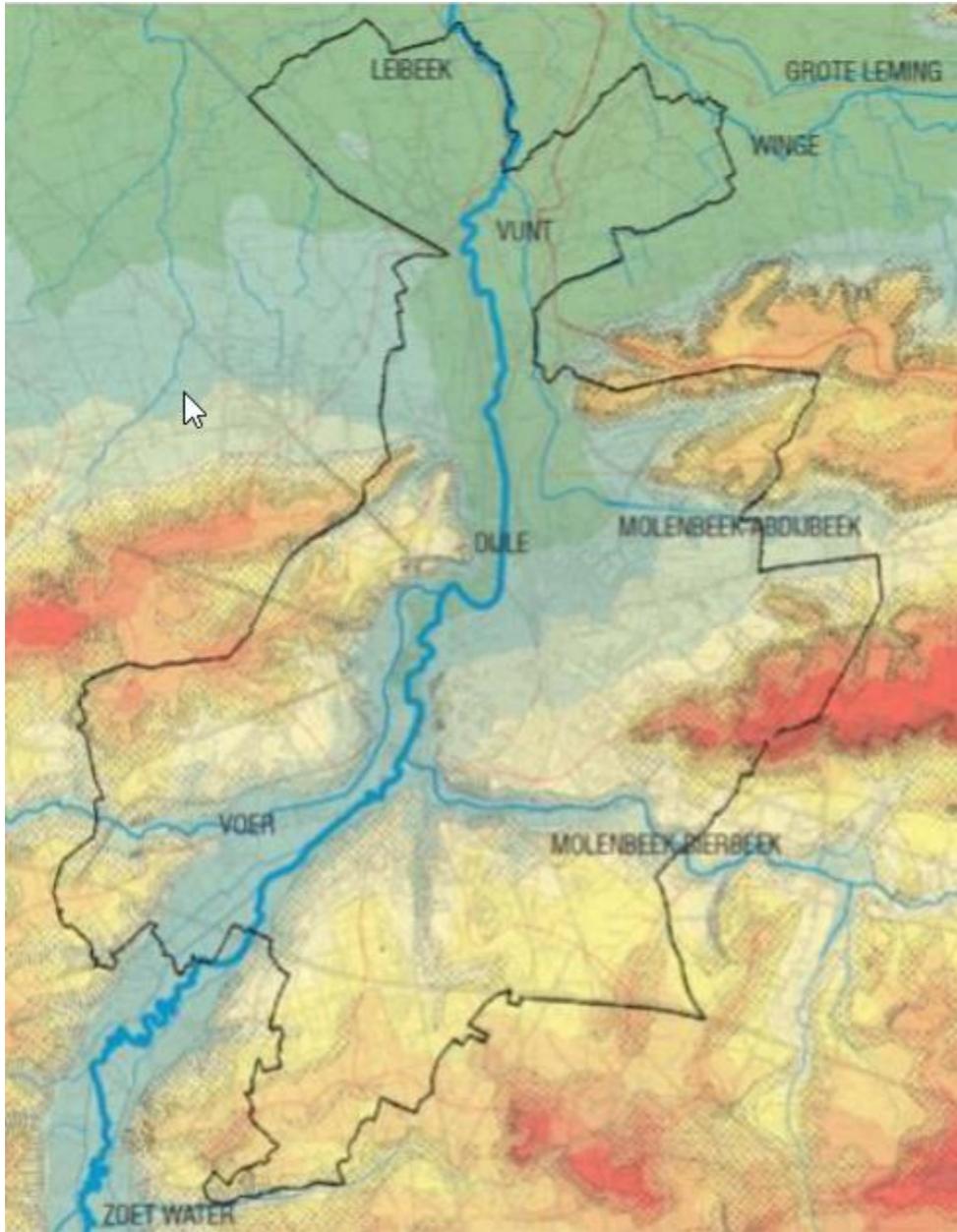


Figure 6: Topographical map of Leuven

Shared mobility already plays a vital role in the vision of Leuven on the transition towards sustainable mobility. Several shared mobility offers are already operational in the city:

- Blue Bike: a back to one (non-electric) bike sharing system, present all over Belgium at over 65 locations (train- tram-, busstations or park and ride parkings). In Leuven blue bike is based at the front as well as the back end of Leuven train station. Very recently a third location was added at the station of Heverlee (south of Leuven).
- Partago: a co-operative facilitating the purchase and (station-based) sharing of electric vehicles, they provide the insurance, maintenance and sharing of the car with a monthly compensation for the actual owner.

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Partago has 3 electric shared cars available in Leuven (December 2019).

- Cambio: the biggest station-based car sharing cooperation in Leuven, with over 100 vehicles present (December 2019). Most of these cars are fuel based. A limited number is electric. The plan is to provide incentives to the providers to extend only with electric vehicles. No more additional fuelled cars. They can be moved around on the existing base locations if preferred.
- Peer to peer car sharing (with Cozycar, CarAmigo, Tapazz or Drivy)
- Public transportation with de Lijn and NMBS: [De lijn](#) and its network in Leuven itself is at this time extensive. Within the 'regionet' planning it is planned to be altered to optimize with more transversal connection avoiding some of the lines to pass through the city centre. NMBS has three train station on the territory of Leuven: Leuven, Heverlee and Wijgmaal station. There are plans to extend the network with a possible train station at the business centre Haasrode (south-west of Leuven).

Other shared offers related to mobility in Leuven are:

- VeloKadée
- Velo at school
- Buggy Booker

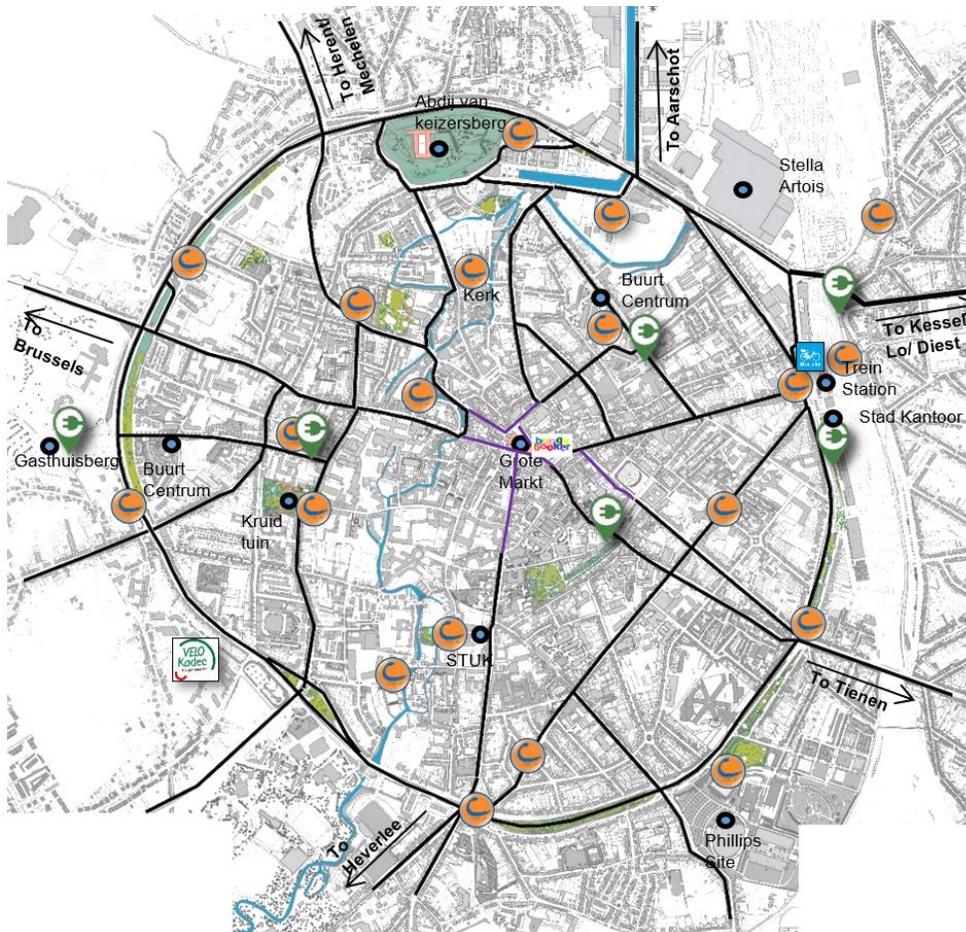


Figure 7: Exercise locating existing shared mobility in the city centre of Leuven

Determination of the first top-down location where done based on the factors explained above:

- Administrative boundaries
- Poles of activities
- Population densities
- Circulation plan
- Geomorphology
- Existing shared mobility offer and public transportation network

Based on the resulting locations or more accurately areas, more extensive research was done:

- Consulting the shared mobility providers in the consortium (Cargoroo and Urbee)
- Consulting shared mobility providers present in Leuven
- Looking for a suited location on the public domain, with potential to expand
- Within the city centre density of points should be higher then outside, first estimation on density of points is 4 points/km² for Leuven centre and about 0.5/km² outside of it

2.2. Bottom-up

Leuven opted for not only top-down, strategically selected eHUBs, but also some created with an by the Leuven-inhabitants themselves.

The Leuven policy has the goal to include the inhabitants in making Leuven a better place to work, live and be. There is a platform 'Leuven, maak het mee', roughly aimed to invite and facilitate people to provide input on specific aspects of policy.

This platform created the space to launch the concept of a 'neighbourhood mobipunt' (or eHUB). It was conceptualized during the summer of 2019 as a process, that very quickly turned out to be much more time intensive then the top-down selection.



Figure 8: Phases on the 'maak het mee' platform online (leuven.maakhetmee.be)

It was developed with 4 phases:

Phase 1: Submit a location

- indicate a specific location (in Leuven) on the map
- motivate why a neighbourhood mobipoint would be suitable and could be a success here with what offer of shared mobility (optional how extensive)
- optional actions was to add a picture of the selected location.

The city collects all submissions and makes a selection. When a submission is selected, the applicant is invited to create a more extensive submission file. Details on what is required are included in the invitation.

First selection is made by the city.

Phase 2: Create an extensive submission file

The city sends out the question to make the submission more concrete.

- Make an indication of the expected surface area that will utilize the eHUB
- Make a proposition of the exact location on the public domain
- What are the changes required on the public domain to realise the eHUB
- A plan to motivate the neighbourhood to make use of the eHUB and possibly counter the negative feedback
- Collect 12 signatures of neighbourhood inhabitants

Selection is made by the city based on:

- Place on the public domain
- Support of the neighbourhood
- Network logic within the entire (strategic) network

Phase 3: Neighbourhood meetings and swapping information

Based on the extended submission file the city organises a consultation with applicant and the neighbourhood to discuss the proposition. Providing information, possibilities, limitation of specific locations as well as for the composition of shared mobility offered.

Phase 4: Implementation of the neighbourhood mobipoints

Installation of the neighbourhood mobipoints with enough existing potential of succeeding.

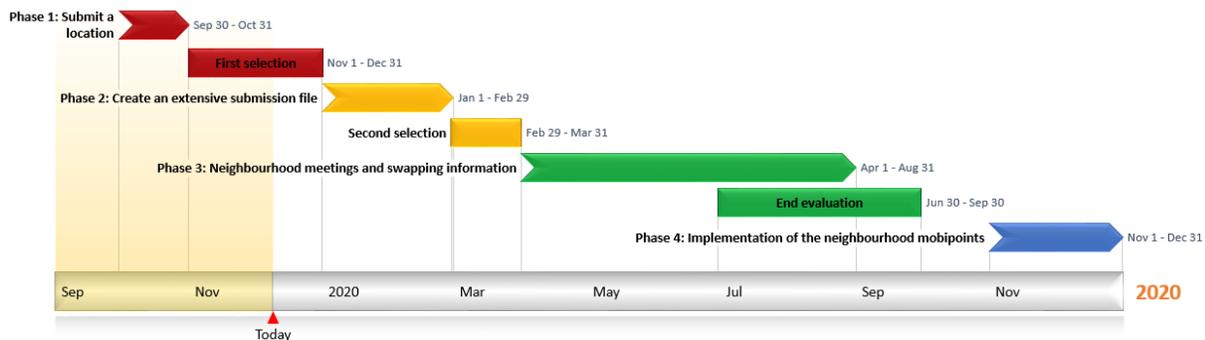


Figure 9: Planning bottom-up eHUBs Leuven

3. At the location

3.1. Type determination

Leuven will have four types of eHUBs.

- 'Grote mobipunten' - Large eHUBs: 2 locations strategically selected

This corresponds to a Type one eHUB, as defined in the project. For Leuven there is one, split in to two locations. The front as well as the back end of the interregional train station of Leuven has large flows of

travellers each day. The front end is slightly larger with its connection to the large bus transfer and connection to the city centre.

- 'Middelgrote mobipunten' – Medium eHUBs: 8 locations strategically selected

The selection of the medium eHUBs is based on the type two defined in the project. It are locations with multiple bus transfer possibilities and or very large numbers of travellers passing by each day.

There are points identified in Leuven that fulfil these requirements today (December 2019).

Some of them are not quite there today (December 2019), but within the vision of 'regionet', they will become larger public transport nodes (then they are today).

- 'Kleine mobipunten' – Small eHUBs:

These are the type 3 eHUBs that are strategically selected. The location are more based on the presence of a significant population density.

A minority is based at cores with business activities or location that have large passers-by, but limited connection to public transport (probably only one or maximum two bus lines passing by).

- 'Buurtmobipunten' – neighbourhood eHUBs: Bottom up selected mobipoints expected to be type 3 eHUBs.

3.2. Shared mobility offer for an eHUB

Leuven has a large base of shared cars, but limited in electric cars. Providers themselves are not always willing to place electric shared vehicles, especially at new location. The perception is that there is a large mental barrier for using an electric cars (instead of the more known fuel based cars).

Successful stations to be extended have more potential for an electric car. The Leuven electric charging station network provide potential here. This network is also consulted when looking at new (usually more peripheral) locations where Leuven want to stimulate the placement of electric shared cars.

Concerning low impact mobility option at first stage Leuven want to focus on electric cargo-bikes and electric bikes. At this time (December 2019) there are is no political willingness for e-scooters or e-mopeds. As addition to the electric offer Leuven want to extend its shared offer with non-electric bicycles in the future as well.

The urban centre of Leuven can roughly be identified to be what lies inside the ring-road of Leuven. This corresponds to the region where the circulation plan (Figure 3) is active.

The **inner car-free core** will not have shared cars provided.

The **car-shy zone** already has some shared (non-electric) cars offered (number?). Due to limited public space and the goal to minimize car traffic as much as possible it is opted to limit adding shared cars within this zone.

Shared (electric) cargo-bikes are very welcome in these zones. Stimulating people to utilize cargo-bikes instead of cars is very much the goal for these locations.

(Electric) bikes can offer alternatives for distances too large for walking. Electric bikes provide flexible alternatives to walking, especially for people who are less mobile.

The rest of the inner urban core is well provided with (cambio), station based, shared automobiles. Unfortunately not a lot of electric cars. Due to the existing pressure on the public domain here, it is opted to limit the extension of shared cars to the market based locations proposed by the car sharing providers themselves. Because of the success of the points in the inner city, willingness of the provider for placing electric cars is somewhat larger.

(Electric) bikes are expected to have more user-potential here, with people using them directly leaving there house or at the edge of the ring-road to avoid difficulties of entering the centre using a car.

The sub municipality **Kessel-Lo**. Next to the city centre this part offers the largest number of shared cars. Providers expanding there number are stimulated to add using electric cars. In the more peripheral locations it will be opted to add electric shared cars with financial support of the city (tender). The sub-municipality **Heverlee, Wilsele and Wijmaal** have a limited number of shared cars offered concentrated in and around one specific location per municipality. For these regions there is the option for extension planned to add electric shared cars with financial support of the city.

(Electric) bikes are expected to have more user-potential in the more peripheral sub municipalities, with people using them directly leaving there house. Distances towards the urban centres become greater creating added potential for electric support when cycling. Due to the geomorphology the hills (of the Hagenland) create added requirements for electric bicycles.

3.3. Number of vehicles

Large centres of combined activities: economic, commercial, residential, touristic have the largest potential for use of shared mobility and should be provided with the largest number of vehicles. This is especially the case for low impact mobility like the electric cargo-bikes and the electric bikes.

We used the number of residents as a starting point, calculating the number of **electric bikes** per inhabitant for the different parts of the city. Correction was made to compensate for other activities present in the city centre (the car shy/free zone), medium numbers for the rest of Leuven (the sub municipality) and the lowest number for the other sub municipalities.

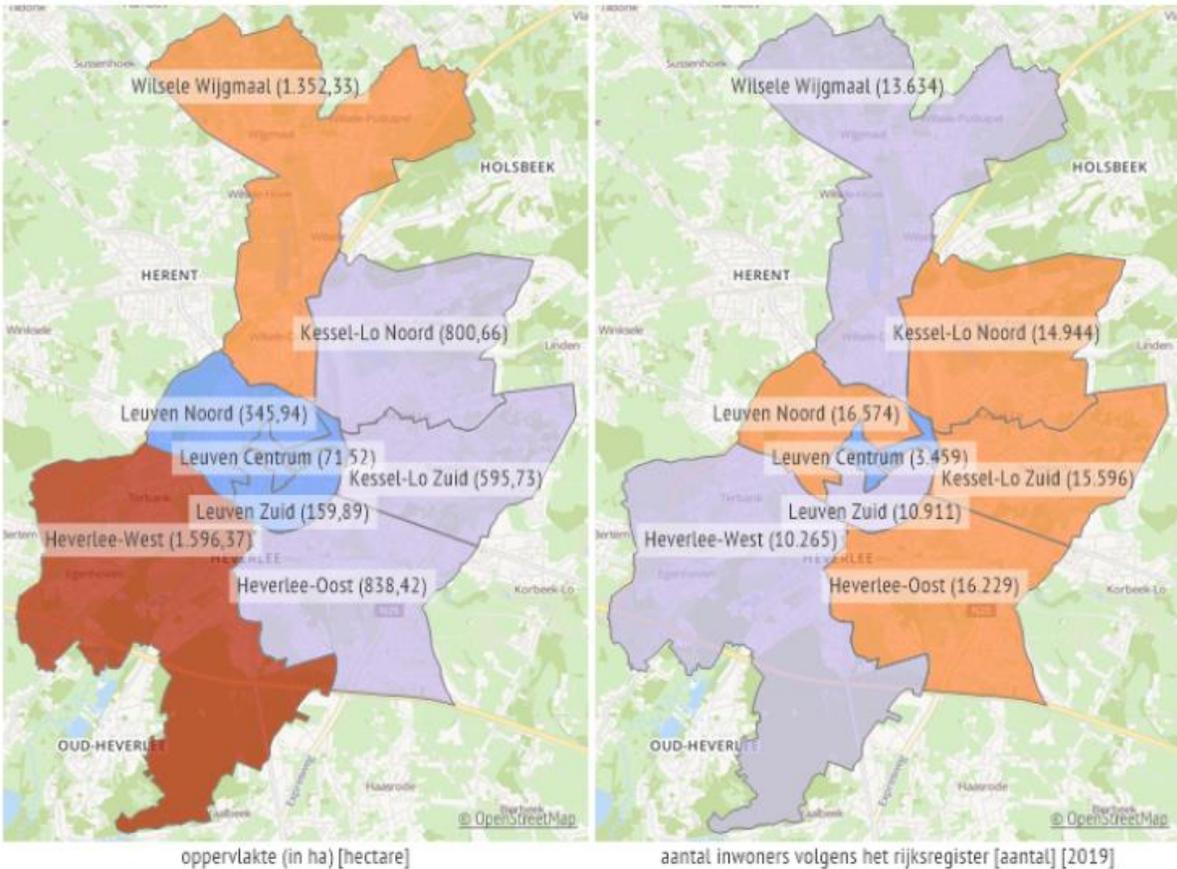
Leuven centre: 6 electric bikes / 1000 inhabitants

Leuven north and Leuven south: 4 electric bikes / 1000 inhabitants

The rest: 2.5 electric bikes / 1000 inhabitants

This means that we used the number of inhabitants to be able to calculate a first indication of numbers to be provided.

T2.1 Strategic method / procedure for selection / implementation of eHUBs



Bron: Statbel - statistische sectoren/officialle oppervlakte gemeenten | provincies.incijfers.be, Rijksregister | provincies.incijfers.be

This resulted in the following indicative total numbers of electric bikes to be provided:

Leuven centre: 66

Leuven north: 21

Leuven south: 44

Heverlee west: 26

Heverlee east: 41

Kessel-Lo south: 39

Kessel-Lo north: 37

Wilsele and Wijgmaal: 34

Number of electric bikes will be determined later.

For the **cargo-bikes** we are using a different method. The point of departure is 30 cargo-bikes in Leuven with most of them in the city centre and some outside to be able to estimate their success or lack thereof. This number of 30 corresponds with the foreseen number in the project proposal.

Third big part are **the electric cars**. Here the expectation or hope was that the shared car providers already in Leuven would help in meeting this demand for 50 electric cars. There are a lot of shared cars in Leuven already, more than 100, but willingness to expand with or replace existing shared cars with electric ones is limited. For this reason Leuven is looking at setting out a tender for 15 additional electric cars. These will need to be placed on locations determined by the city and a financial compensation can be provided when the use of the cars does not reach a break even limit.

3.4. infrastructure

Leuven has a specific way of organizing its public domain.

- Shared cars have specific parking spaces indicated with a green border and a blue traffic sign indicating 'car sharing' (autodelen in Dutch)
- A shared electric car does not only require a parking spot but one with charging infrastructure available.



Figure 10: Leuven parking spot for shared cars only

- In accordance to this parking spaces for other shared vehicles will also have this specific green border.
- Next to this a specific traffic sign indicating 'Bike sharing' (Fietsdelen in Dutch) will be added as an indication.
- Leuven has opted for stalling low impact mobility the Leuven mounts used for public stalling all over Leuven.



Figure 11: Typical Leuven bike mounts

- It is a possibility that the bike mounts will be coted in the same green colour as the border of the parking spaces.

The first phase of implementation does not foresee charging infrastructure for low impact mobility at the eHUB locations. There has been opted to work with a battery swap system to maintain enough freedom and flexibility to move locations that are not working or extend locations where demand is too high.

4. Getting started

4.1. Making public decisions

As part of the project the shared mobility providers cargoroo and urbee have the option to offer specific number of shared vehicles at the mobipoints in Leuven. This means that for the duration of the project they are allowed to provide a number of shared vehicles at each eHUB in Leuven.

For strategic locations Leuven provides a first proposal of locations. This is discussed with the shared mobility providers. When there is a consent, Leuven has to align the different departments with the proposal. There is an eHUBs working group consisting of colleagues from different departments such as: communication, neighbourhood operators, traffic safety, heritage, sustainability, public works etc. With

their consent the proposal is discussed with the relevant government official before asking the college of the mayor and aldermen permission to proceed to implementation.

4.2. Start-up

As soon as the vehicles are available they should be placed in the designated spots on the eHUBs. The city of Leuven provides communication with regards to:

- The available and future eHUBs on the website : <https://www.leuven.be/mobipunten>
- The vehicles and the providers will be named in the monthly e-newsletter of the city
- The city will determine available funds to go toward promoting the use of the provided shared mobility. The funds will probably be invested using a third-party payment system to directly benefit the end user, and indirectly promoting the use of mobility vehicles.
- Other start up activities or events will be organised in accordance to the plans of the providers

The eHUBS Consortium

The consortium of eHUBS consists of 15 partners with multidisciplinary and complementary competencies. This includes European cities, leading universities, networks and electric and shared mobility providers.



For further information please visit <http://www.nweurope.eu/ehubs>



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