Operational plan eHUBS Nijmegen

DELIVERABLE 4.1

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Summary sheet

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1. Introduction

In June 2020 Nijmegen and Arnhem launched 13 eHUBS, 10 in Nijmegen and 3 in Arnhem as part of the INTERREG North West Europe eHUBS program. This document describes the process through which these eHUBS were designed and launched. This document focuses on the operational level of the eHUBS locations. The strategic level has been described in deliverable 2.1. The document describes the eHUBS location determination process, the process to add vehicles to these eHUBS, the necessary infrastructure and location design, the opening of the eHUBS and the communication surrounding these various steps.

As mentioned in deliverable 2.1, Nijmegen/Arnhem apply a mix of top-down and bottom-up strategies in the eHUBS project. The determination of locations and design of the eHUBS was done by combining municipal policy goals as well as local information from community groups, entrepreneurs and local inhabitants.

2. Location determination

The strategic location determination of the eHUBS is described in deliverable 2.1. On the operational level, the main goal was to act in a pragmatic way, as the launching of the eHUBS was placed under a strong time pressure. During the determination of the locations, we found out that a pragmatic placing of the eHUBS was only possible in locations where sufficient public space was available. This was needed to prevent the removal of other facilities, for instance parking spaces, which could lead to resistance to the placing of the eHUBS.

As the general locations of the eHUBS (on a neighborhood level) were determined in the strategic plan (deliverable 2.1), this already limited the search area for suitable locations. The next step was to search for areas with sufficient public space available. Additionally, criteria that were taken into account were the availability of electric vehicle charging infrastructure, the vicinity of sufficient housing (within 300-500m), and the presence of general 'traffic', where the goal was to place the hubs in locations where people would see them on the street. For Nijmegen, the heat map provided by the TU Delft for potential locations for eHUBS was also used to determine which locations might be more suitable (see figure 1). This map includes not only population density in the direct vicinity, but also expected support within the community based on for instance sustainability profiles of the inhabitants. In Arnhem, specifically, the eHUBS were also targeted at locations where a change of mode of transport was expected: near two train stations and near a Park & Ride facility. An additional criterium for the choice of location could be the presence of community initiatives that requested an eHUB in their vicinity.

Apart from the criteria used by both municipalities, the locations were also discussed with the two mobility service providers included in the INTERREG program, Urbee and Cargoroo. Their input was used to further pinpoint the most suitable locations. For Cargoroo, this discussion was also used to determine where the first batch of five cargobikes would be placed in the period before more bikes were available. As the shared electric car provider, Amber, joined the project in a later stage, the locations were not explicitly discussed with them, although in the start of the project the lack of sufficient charging infrastructure near some of the eHUB locations was discussed in relation to which eHUBS would be serviced by Amber cars from the start of the pilot.
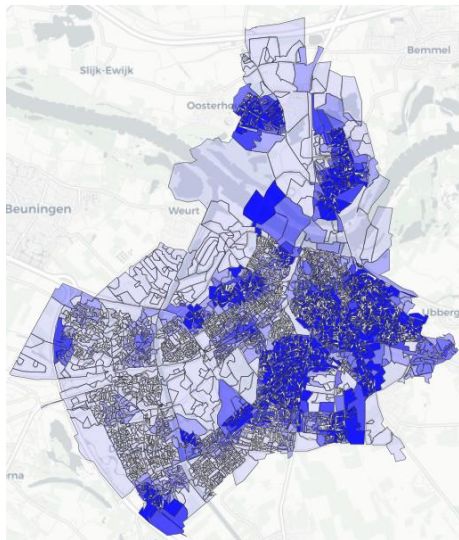
Figure 1: Nijmegen heatmap for e-carsharing potential

As is described in the strategic plan, the locations for the eHUBS are seen as flexible in the pilot phase of the eHUBS: each location is easily moved if this is deemed necessary, for instance based on input from the local community, or if experiences in practice prove this necessary or desirable. The decision to potentially relocate eHUBS can be made both based on the user uptake at these eHUBS (this is monitored regularly), based on practical issues that may arise at certain locations. Additionally, our efforts in terms of behavioral change can also be a reason to relocate eHUBS for various reasons; to increase visibility, to better cater towards specific demographic groups or related to other specific interventions that may be designed during the project. Finally, safety related issues could be a reason to relocate certain eHUBS, for instance in the case of vandalism or theft. All decisions for potentially relocating the eHUBS are made in the project group in which both municipalities, the mobility service providers and the marketing & communication and the behavioral change bureau participate. The 13 locations where the eHUBS have been realized at the moment of opening are visible in figure 2 (for Nijmegen) and figure 3 (for Arnhem).
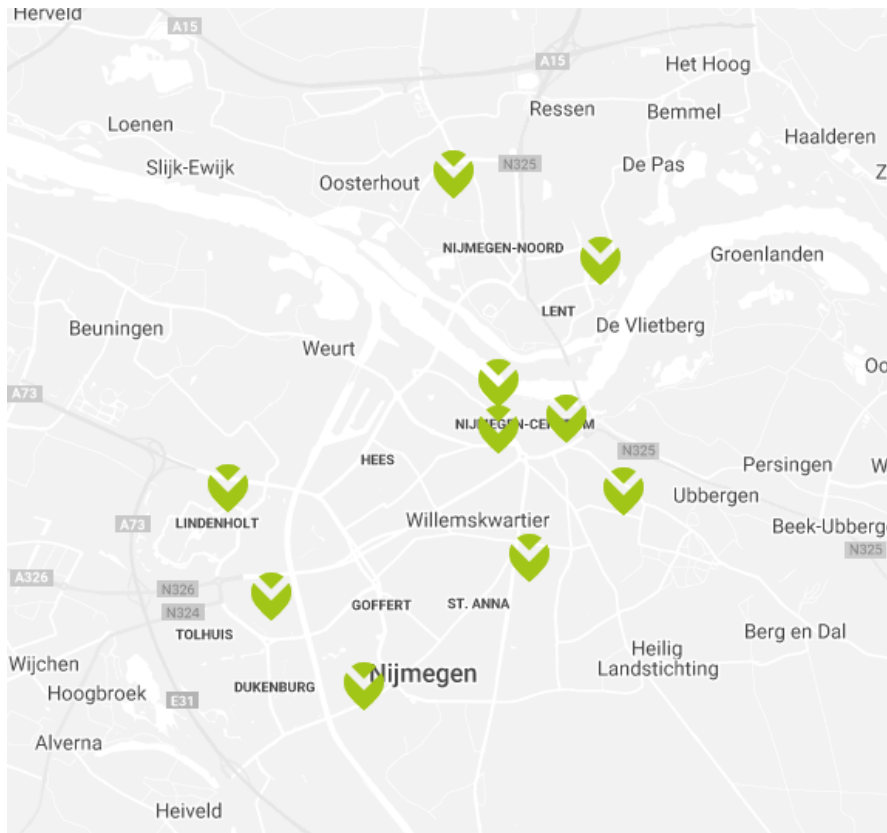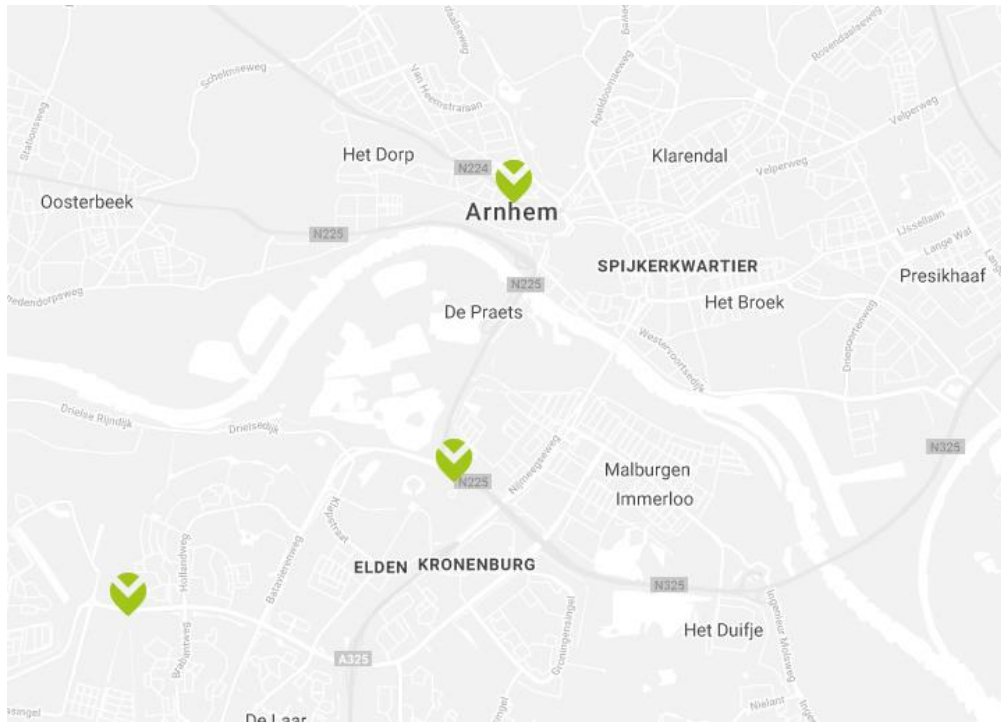
Figure 3: eHUB locations Nijmegen

Figure 4: eHUB locations Arnhem

3. Services determination

The service determination for each eHUB during the pilot phase is based mainly on pragmatic arguments. Each eHUB is equipped with e-bikes provided by Urbee. To start, we have placed 8 e-bikes at each eHUB. Based on user data, the amount of e-bikes per location may be changed.

Based on the availability of electric cargobikes from Cargoroo, we have attempted to provide an optimal service level for the eHUBS concerning the cargobikes. In practice, this means that with the first available Cargoroo bikes, we have determined a number of eHUBS most suitable for these cargobikes, with a decent spread in a both a geographical as a demographic sense. As soon as they are available, cargobikes will be placed at each eHUB in Nijmegen. Due to operational difficulties in placing limited numbers of cargobikes in one city, cargobikes will be added to the eHUBS in Arnhem when sufficient numbers are available, which is expected in spring 2021.

As to electric cars, a similar pragmatic approach has been chosen. Since the launch of the eHUBS, electric cars have been available at those eHUB locations where charging facilities were present and available. Placing new charging infrastructure for electric cars has proven difficult, due to the existing contracts between the municipality and the charging infrastructure provider, which insufficiently accounts for shared mobility. Placing new charging infrastructure is therefore not possible in each case. However, the business operation of the shared electric car provider, Amber, has allowed for making electric cars available at eHUBS without direct charging facilities available. This is possible due to the construction of a central charging hub, from where cars can be delivered to all other eHUBS on demand. The specific location of the electric car is geofenced to the area surrounding the eHUB, where the main focus is for the car to be visible from the main eHUB so that it can be easily found by the user. Additionally, the electric car provider Amber is able to guarantee the availability of a car within a specific time frame, regardless of whether a car is located at the hub at that moment. If multiple cars are rented simultaneously, Amber will provide additional vehicles at the eHUBS.

4. Infrastructure

The infrastructure at each eHUB is limited due to the flexible nature of the eHUBS. This means that we have limited the infrastructure for those measures for which a permit was not needed. In practice, the following facilities are provided at each eHUB:

- eHUB road sign
- eHUB sandwich board with instructions for use
- Urbee bike rack for 8 Urbee bikes
- Reserved spot for Cargoroo bike painted on ground
- If available: electric car charging location with eHUB sign

Figure 3 shows an example of how these facilities have been placed at an eHUB. The signs, sandwich boards and templates for ground paint were developed by the marketing & communication bureau. Placing these on the site locations was done by the municipality. The design of the eHUBS was discussed in the project group, in which the mobility service providers are also included.

An issue that arose during the launch of the eHUBS was providing electricity for the Urbee bike racks needed to charge the electric bikes. It was expected that this electricity could be arranged without problems, but in practice it turned out this was more of a challenge than expected. In Arnhem, the

municipality was able to arrange for the electricity herself, although the costs of this were higher than was expected upfront. In Nijmegen, the municipality did not have the opportunity to arrange electricity (the power grid for for instance street lighting is not owned by the municipality), so this task was left with the mobility service provider. However, arranging this in the end proved difficult, due mainly to restricted access to nearby power sources and to the necessity for permits. This has led to a delay of electric charging for the e-bikes. Urbee has chosen to solve this problem by working with a system of battery swaps, similar to the operational model chosen by Cargoroo.

Placing charging infrastructure for electric shared cars has proven a challenge due to existing contracts with a charging infrastructure provider not taking into account shared vehicles. To circumvent this problem, we are working on a central charging hub from which charged electric cars can be distributed to each eHUB. Additionally, at a number of eHUBS charging infrastructure is to be provided and existing charging infrastructure will be expanded.
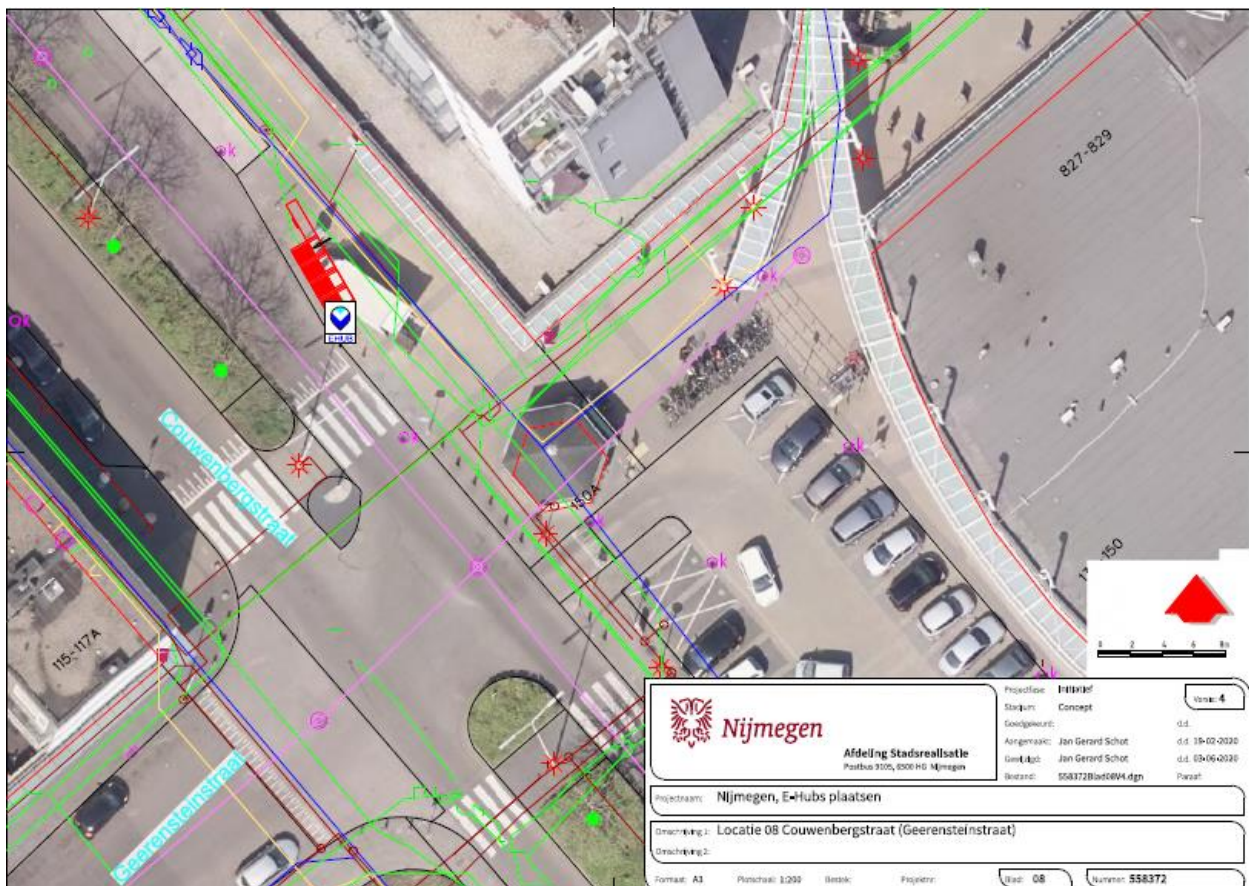

Figure 5: example of eHUB location (eHUB location in red)

5. Deployment

The eHUBS in Nijmegen and Arnhem have been opened on the 15th of June 2020. This was a delay of three months due to the COVID-19 pandemic. At the moment of deployment, electric bikes were available at each location, and electric cars were available at a limited number of these locations. New vehicles will be added as available, with Cargoroo bikes having been placed at five eHUBS in July 2020,

and Amber electric shared cars being made available to the remaining hubs as charging infrastructure becomes available.

Figure 6: eHUB at Arnhem Central Station

Based on user data, new vehicles may be added to the eHUBS if user demand requires. This is done in communication between the municipality and the mobility providers. If the mobility service provider wishes to expand the number of vehicles. The municipality can determine whether enough space is available. If this is the case, the flexibility of the eHUBS allows for these vehicles to be added without further need for intervention. The new vehicle numbers will then be updated on the eHUB websites. The mobility service provider is responsible for also updating the vehicle numbers in their own booking platform.

The choices made in terms of the infrastructure surrounding the eHUBS make it possible to make the step from planning to deployment of the eHUBS without having to overcome many obstacles. The main issues that have to be dealt with are those relating to charging infrastructure. In the case of battery swap, this is no longer necessary. Additionally, the option of working with a central hub from which vehicles are distributed to the eHUBS allows for a similar flexibility. However, if the eHUBS take on a more permanent position at a specific location, charging infrastructure, both for e-bikes and for cars, is desirable.

6. Implementation

Implementation of the eHUBS is an iterative process, where experiences from users, mobility providers and the municipality are combined to improve the eHUBS. An important aspect of this is the consumer behavior of end-users. To further adapt the eHUBS infrastructure, service levels and location, we will use the results from experiments concerning behavioral change to adapt the eHUBS. This can for instance relate to the visibility of the eHUBS.

7. Communication

Communication has been a central issue for the launching of the eHUBS. The launch event (figure 4) was accompanied by a small event (a larger event was foreseen but was made impossible due to COVID-19 restrictions). Multiple news oultets attended this opening, both in Nijmegen and Arnhem. Additionally, a campaign using billboards in public space (figure 5), flyers (figure 6), social media (figure 7) and the eHUBS website (ehubnijmegen.nl & ehubarnhem.nl, figure 8) was implemented.
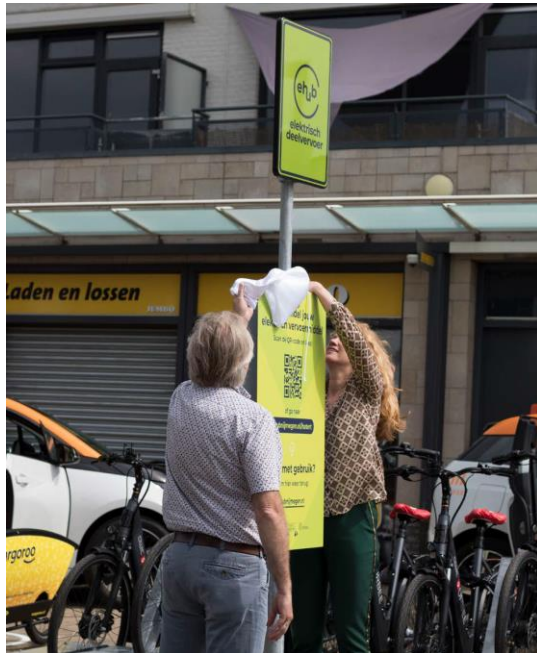

Figure 7: eHUB launching event

Figure 8: eHUB billboard

Figure 9: eHUB flyer

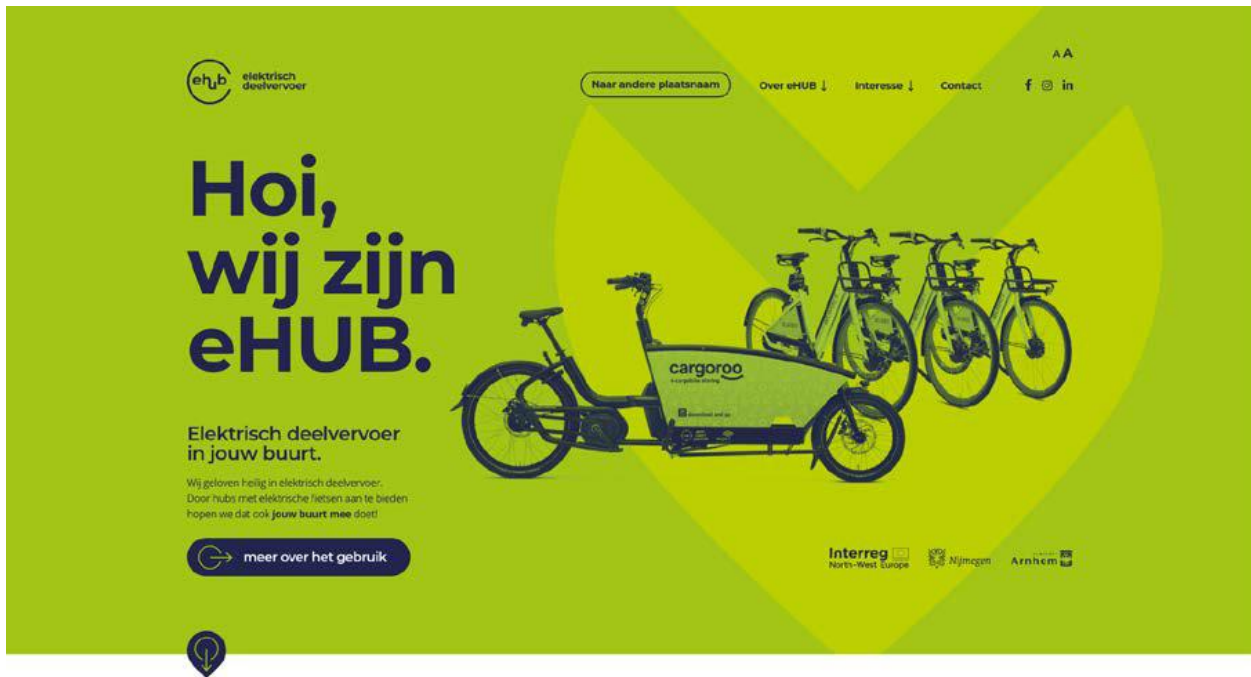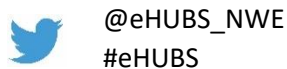Figure 10: eHUB Instagram/Facebook post

Figure 11: eHUB website

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.

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https://www.linkedin.com/groups/13711468/

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