



# MOVE

White Paper

**Interreg**  
North Sea Region  
MOVE

European Regional Development Fund



EUROPEAN UNION

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## Objective of this document

TO SHARE EXPERIENCES AND TO BE A POSITIVE FORCE FOR CHANGE, THE PROJECT PARTNERS IN MOVE DRAFT A WHITE PAPER TO BE SHARED ON THE EUROPEAN LEVEL WITH LOCAL, REGIONAL, NATIONAL AND EUROPEAN AUTHORITIES AND MOBILITY STAKEHOLDERS.

THIS DOCUMENT EVALUATES THE EXTENT TO WHICH THE OBJECTIVES OF THE PROJECT MOVE HAVE BEEN REACHED AND WHAT FACTORS ENABLED OR IMPEDED THE SUCCESS OF THE PROJECT. TO DO THIS, WE HAVE SELECTED FOUR OUT OF ELEVEN MOVE PILOT PROJECTS BASED ON THEIR APPLICABILITY IN EVERY REGION, WHICH WILL BE DISCUSSED IN MORE DETAIL LATER IN THIS DOCUMENT.





# 2

## Project objectives



### 2.1 Stimulate the development of new sustainable mobility solutions through co-creation processes

Different from the current, mono-disciplinary, approach, the project was meant to develop new, sustainable and economically viable business models for innovative multi-central and multimodal mobility services for rural areas and small and medium-sized cities. The intention was to develop and implement these innovations by involving different stakeholder groups, such as local SMEs, inhabitants/users, local and regional public authorities, higher education and research institutions and existing infrastructure and transportation service providers.

### 2.2 Validate sustainable and economically viable business models for mobility services to rural and mid-sized cities areas in the NSR

In a joint implementation process, identifying new and different mobility services, based on regional needs and challenges, have been tested, monitored and evaluated. Besides stakeholders and beneficiaries directly involved, local SMEs and the third sector will also benefit, demonstrating economic viability, sustainability and suitability for other NSR regions.

### 2.3 Improve the capacity of authorities and entrepreneurs in small and middle-sized cities/town areas and their rural surroundings in the NSR to uptake new sustainable mobility solutions

Through joint monitoring and evaluation of mobility pilots and their underlying business models, MOVE has delivered showcases demonstrating new, ecologically and economically viable solutions to other regions facing similar challenges. The experiences from validated pilots and business cases will feed into transnationally supported policy recommendations.

### 2.4 Increase the availability of mobility data

The availability of data is a necessary step to allow the development of a strong responsive and durable mobility market. The availability and sharing of data offers SMEs the opportunity to provide innovative solutions based on sustainable business models, reducing the dependency on public subsidies.

The availability of high-quality mobility data is important to support decision makers, allowing them to develop strong, responsive and durable mobility markets. To understand the current mobility situation, they need access to credible and timely data. Different categories and types of traffic data exist, and often a vast amount of data is collected every day by private companies, public transport providers, road authorities and regional or national governments. Sadly, this valuable data is often not easily available to local authorities wishing to research and develop new sustainable mobility solutions.

However, to give insight into the mobility demand of target groups in a region and to calculate potential service levels and the impact of proposed mobility solutions, it is important to increase the availability of mobility data. The availability and sharing of data also offer SMEs the opportunity to provide innovative solutions based on sustainable business models, reducing the dependency on public subsidies.

Therefore, throughout the project, we will show how important data can be for decision-makers, and train the pilot partners to more easily identify relevant and useful data sets for future endeavours.

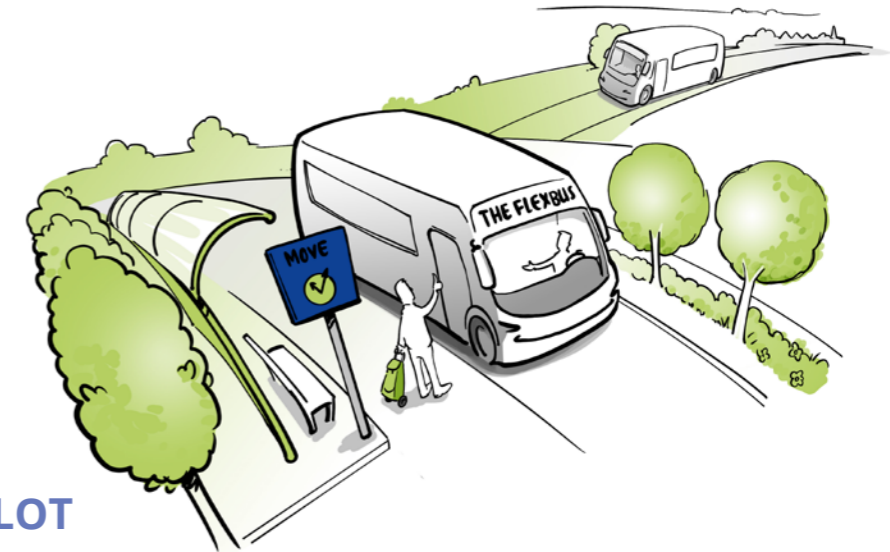
# 3

## New sustainable mobility solutions

THROUGHOUT THE PROJECT, SEVERAL NEW MOBILITY SOLUTIONS WERE TESTED. IN THE FOLLOWING PARAGRAPH, WE WILL DESCRIBE FOUR SPECIFIC PILOTS THAT WERE DEVELOPED AS PART OF THE MOVE PROJECT AND LOOK AT HOW THEY HAVE EVALUATED THEIR RESULTS.



A map view of each pilot region



### 3.1 FLEXBUS PILOT

#### 3.1.1 Description

The Flexbus is an on-demand bus service. It operates in a delimited area and travellers can take the bus between bus stops in that area. However, the bus does not follow a fixed route. Travellers have to book the trip they want to make in advance, either by telephone or through an internet application.

In Belgium, a Flexbus has been developed and piloted. In the area where we did the pilot, a similar service had been available (the Belbus), but this did not work well. The main cause of the poor performance of this service was the lack of flexibility in the booking. We improved the service by making it possible to book online, to book up to 30 minutes in advance, and the possibility to book on Sundays.

The pilot that IGEMO and local partners implemented from September 2019 to February 2020, was located in Klein-Brabant, an area that, from a European perspective, would be characterised as peri-urban. It is located in the South-West of the province of Antwerp in Belgium. This situates the pilot area right in between the major Belgian cities of Antwerp, Ghent and Brussels, and very near to the city of Mechelen. The area consists of two municipalities: Puurs-Sint-Amands and Bornem.

The area is mostly surrounded by water (North: River Rupel and West: River Scheldt), and in the West it is delimited by the A12 motorway. The number of water crossings is limited, which makes it a challenging area in which to provide transportation services.

The area could be represented as a circle with a radius of 4 to 7 kilometres around the main village of Puurs. Village centres are generally 2 to 3 kilometres away from the next village centre, further than a comfortable walking distance. These distances are also ideal for cycling since the landscape has no hills.

This service is meant for areas that are too sparsely populated to have fixed bus lines operating at fixed hours. Experience has shown that bus services that are scheduled at a rate lower than one per hour, do not deliver a satisfactory service. Therefore, buses in rural areas are often only used by disadvantaged and elderly people who have no other means of transportation.



Figure: geographical situation of the pilot area Klein-Brabant

By offering a bus service on demand the customer has three advantages:

- The bus would pick the traveller up at a convenient time.
- The bus trip would be shorter than a fixed-line service.
- The occupancy rate of buses would be increased.

By offering these advantages, public transport could serve rural areas more competitively than private cars. Although the modal shift would be limited, some of the advantages of public transport in terms of reduction of mobility poverty and environmental gains could be achieved.

### 3.1.2 Evaluation

The Flexbus certainly is a transport solution with a great potential for rural areas. It remains, however, that the organisation of collective transport in rural areas is a costly affair. There are good reasons for a public authority to spend money on such valuable solutions. These are:

- To provide transport services that are accessible by people who have no access to private means of transportation.
- To reduce the ecological footprint of people's transport by providing greener alternatives for the private car.

We have looked into ways to deliver the service in a more cost-efficient way and with increased performance on the ecological level. This has resulted in the following figures. These figures have to be used with appropriate caution since they are highly dependent on the geographical, political and demographic context of the pilot area. Moreover, several assumptions had to be made allow for knowledge gaps.

Table 1: overview of costs and ecological performance (yearly)

Type	Belbus	Flexbus	Flexbus	Flexbus
Status	Tested	Tested	Scenario	Scenario
Number of vehicles	1,5	1,5	1	1
Engine	Diesel	Diesel	Diesel	Electric
Cost per passenger	€ 20,61	€ 14,72	€ 10,29	€ 10,00
Number of passengers	10.738	16.102	16.102	16.102
Total Cost	€ 221.347	€ 237.013	€ 165.667	€ 161.063
Emissions (tonnes CO2E)	21,85	16,22	16,22	1,4 to 4,2

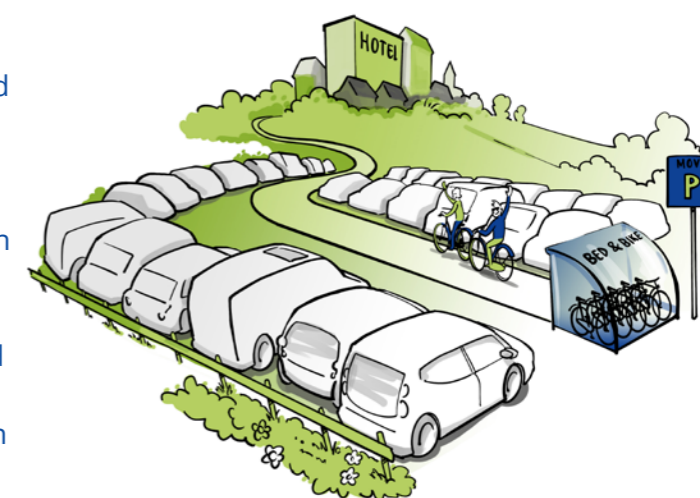
From Table 1 it appears that it is potentially more interesting, both from a cost and an ecological perspective, to invest in the greening of motorised transport, than to invest in a modal shift towards the Flexbus.

From the perspective of mobility poverty, Flexbus contributes in a very positive way to a solution of the problem, especially since very affordable subscriptions are available, with formulas for the less well off. The main improvement that could be made, is to extend the service for the disabled to a service where door to door trips or door to railway stations or bus stops would be made possible.

## 3.2 BED & BIKE PILOT

### 3.2.1 Description

The Bed & Bike service is an on-demand extra service for guests of hotels in the centre of tourist hotspots in rural coastal areas. The concept gives guests ( after booking a hotel room), the option of driving by car to the hotel on their day of arrival to drop off their luggage, parking their car outside the centre and then using the bicycle to return to the hotel, where there is a parking space on site for the duration of their stay.



In the Netherlands a Bed & Bike service has been developed and piloted for a hotel (Strand-hotel Zoutelande) in the centre of Zoutelande, called. Zoutelande is a tourist hotspot in the province of Zeeland, in which the pressure of many parked cars is high, especially during the busy seasons. Therefore, residents experience great inconvenience when looking for a parking space. In addition, guests of other hotels in the area mainly use the car as a means of transport to, from and in the region.



This new service has been developed in co-creation with (regular) guests of the hotel and in direct consultation and coordination with relevant stakeholders (municipality, local entrepreneurs and the city council).

Offering a Bed & Bike service on demand in the centre of a tourist hotspot has three advantages, both for the users of the service and for the residents of the tourist hotspot :

- the service would reduce parking pressure in the centre of a tourist hotspot;
- the service would limit search traffic in the center of a tourist hotspot.

The aforementioned advantages should encourage the guests to use an alternative means of transport more often and to travel in accordance with their wishes and needs when staying in the region.

### 3.2.1 Evaluation

The Bed & Bike concept is a service with a great potential for tourist hotspots in rural coastal areas in peak season. It remains, however, that not all guests of the hotel have used or have been able to use the service during the pilot period, despite the active communication (digital via pre-mail, on paper via flyer and verbally via receptionist) about the concept. Guests were given the opportunity to book the service both in advance of a stay and also on the day of arrival.

The limited use of the service can partly be explained by the limited number of parking tickets available. During the pilot period only five parking tickets were available. The fact that a conventional bicycle was offered with the service, instead of an e-bike, also helps to explain this lack of use.

Although offering a Bed & Bike service in Zoutelande is a relatively expensive affair, the involved entrepreneur should strongly consider continuing to offer the service in the coming years (from his stewardship role), ideally supported by fellow entrepreneurs (upscaling) and the local authorities (policy alignment), for two main reasons:

- To provide transport services that are easily accessible by tourists so they can experience the rural coastal area in a more sustainable way;
- To reduce the ecological footprint of tourist transport by providing greener alternatives to the private car.

If the service was continued in the coming years, it would be important to partly redesign the service by:

- increasing the number of available parking tickets, both for Strandhotel Zoutelande as well other tourist accommodation providers in Zoutelande (upscaling, policy alignment);
- offering the service as an integrated service (instead of an additional service);
- replacing the conventional bicycle (as a part of the service) with an e-bike.



## 3.3 MOPINO PILOT

### 3.3.1 Description

The County of Northeim, a rural district situated in central Germany, strives to establish sustainable mobility for all citizens in its region, both for today and for the future. With its pilot project MOPINO, the county set up an e-car sharing service in a medium-sized town, the city of Northeim.

MOPINO is a station-based car sharing system in the city of Northeim that can be used by everyone. The station-based approach means that a person has to return the vehicle to the station from which it was borrowed. The vehicles can be rented 24 hours, 7 days a week. The system includes three designated stations (parking space and charging station) with three Renault Zoe e-vehicles. All three stations are located in the city area of Northeim. One station is located as a multimodal connection point directly at the train station, where it is possible to transfer to or from numerous trains and buses. The second point is located directly at the border to the core city with its many shopping facilities. The last station is located in the northern area of the city of Northeim, not far from the Northeim city hall with its various offices.

The MOPINO e-car sharing offer is aimed at all persons with a valid driving licence. Generally, it is aimed at residents of the city and of the county of Northeim for whom a starting and end point within Northeim is practical, as the vehicles can only be borrowed from, and returned to, the stations in the city. The journey itself can also lead to destinations outside the city area. Private as well as business visitors can also rent the vehicles.

Another target group is students living in the city of Northeim. There is a housing association in the city that explicitly rents shared flats to students. Students often have a limited budget and do not need a car permanently, which makes e-car sharing interesting for this group. Also, this group is relatively open-minded towards new ideas and willing to try new things. This makes it easier to get them to give e-car sharing a try and to integrate it into their daily mobility routine.

Another potential target group is the employees of the Northeim County and City administration. The immediate proximity of the charging station at Medenheimer Platz to the district hall and the direct placement of another sharing station at the town hall offer

the possibility of using the two e-vehicles for both business and private purposes. In order to intensify the use of the e-car sharing system in Northeim, the employees of the County Administration have been using e-vehicles for business trips since July 2021. An important objective is to test the use of sharing vehicles for business trips in the course of the project and to increase the acceptance of the e-car sharing system among employees. In addition, the use of the vehicles by the employees and the increased number of journeys in the district area should increase the awareness and acceptance of the e-car-sharing system.

Consideration is being given as to whether and how commercial enterprises and/or the retail trade can be attracted as a user group for the e-car sharing system. A first approach is that larger commercial enterprises (Thimm, Continental/ContiTech), which regularly receive employees from their other branches, receive a company card for e-car sharing. The employees arriving at the station could then easily use the sharing car to get from the station to the commercial enterprise and back. Further considerations are bundling deliveries from retailers within Northeim and using an e-car sharing car for the delivery.

### 3.3.2 Evaluation

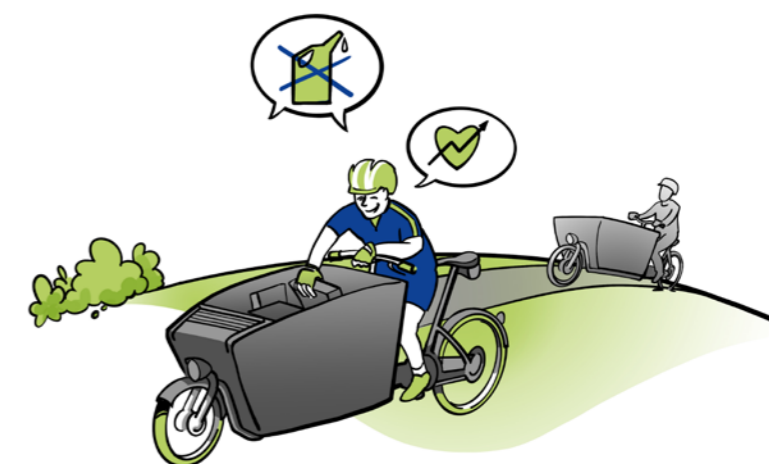
In order to assess the impact and benefits of the MOPINO pilot project in Northeim, an evaluation of the e-car sharing service was needed. The use of the sharing system was evaluated during the period from November 2021 to February 2022. This evaluation was based on data from the sharing service provider, and a survey of registered users and interested parties. In summary, the evaluation provided the following relevant findings:

- The vehicles have so far only been used to a small extent. However, since the county administration began using them for business purposes, at least one vehicle was used more regularly and the utilisation rate at Medenheimer Platz increased significantly.
- The private use of car sharing vehicles in Northeim corresponds on average to the usual purposes and parameters of classic car sharing trips. These often serve to complete everyday journeys over shorter distances, and usually for only a few hours.
- Considering the size of the district, the distances covered by the business trips were very short.
- The data evaluation shows a high synergy potential between business and private use. Private use mostly took place in the afternoon/evening hours and at weekends, whereas the need for business trips was highest in the morning, according to the experience of many city and district administrations.
- Contrary to original expectations, the age group up to 29 years was revealed as being of less importance in e-car sharing use.
- Reporting in the local press resulted in a high response from people interested in car sharing, and should be pursued as a matter of priority in the future.
- There has been a very positive response to the topic of electric mobility. Nevertheless, the offer could be expanded by using another vehicle class e.g. minibuses (9-seater), but these should be vehicles with combustion engine.
- Both the survey and the residence data of those registered indicated that there is also interest in a car sharing service in the other municipalities of the county. Based on the analysis and survey results presented above, the following fields of action emerged that are relevant for potential continuation of the e-car sharing service:

1. Communication measures via different channels (marketing)
2. Information events to address potential users
3. Acquisition of anchor customers (main or one major user within a car sharing service)
4. Expansion and further development of the sharing offer
5. Tariff design and discount campaigns

In summary, a successful implementation of a car sharing service requires good co-operation with all stakeholders, and well considered planning and organisation of work processes, resources and time. The implementation of car sharing services is only possible in co-operation with several actors. Especially in rural areas, where the degree of motorisation of private households is very high, the challenges facing up-take should be supported by municipal and economic actors. Financial and human resources play an important role in this. The implementation of a car sharing system (especially one using electric vehicles), is associated with high costs, especially in the initial phase. The duration of such a car sharing system should be at least 36 months so that the new mobility offer can establish itself and be accepted by the users.

The implementation of CarSharing systems presents municipalities with a number of problems for which there are still very few practical solutions. The experiences from the project provide a good basis for discussion and offer support for the development of further sharing solutions in the Northeim district.



## 3.4 ECARGO BIKE PILOT

### 3.4.1 Description

At a time when customer demand for same-day service and delivery is increasing, alongside expectations of sustainability, light electric freight vehicles such as electric cargo bikes (otherwise known as e-cargo bikes) are an appealing option to many businesses. E-cargo bikes fill the gap between traditional bicycles and delivery vans, and are a perfect option for transporting work equipment, light freight or completing 'last-mile' deliveries.

With electric pedal assistance, they have the capability and power for transporting significant loads with the extra benefit of being able to move freely through congested areas, avoid





E-cargo bike

parking tickets and truly achieve a door-to-door service. E-cargo bikes are easy to charge, with removable batteries that can be plugged into any ordinary wall socket. Charging generally takes around 4 - 8 hours, depending on the size of the charger, and most bikes will be able to provide at least 20 miles from a single charge, although many can achieve much more than this. Exact mileage depends on a number of factors, including weight of load and the terrain, but even if the battery does run flat the bikes are still able to be used normally without the electric assistance.

The eCargo bike project is open to any company within three key central trial locations in northern Scotland; Inverness, Oban and Orkney, in an attempt to promote a modal shift away from van/car deliveries towards a low carbon alternative. Due to Covid-19 more and more businesses offer delivery services but rely on traditional forms of transportation to do so. By trialling an eCargo bike these businesses have a sustainable, physically distanced and economically productive alternative. Bikes with varying specifications were purchased (see table below) and offered for short term loans of approximately 3 months to businesses.

Interested businesses completed a short survey outlining their previous delivery methods, what load capacity they required and included any further information such as insurance documentation and proof of a safe storage space for the bike. Following this a bike would be allocated to businesses based on their required functionality:

Bike type	Quantity	Load capacity (kg)
eBullitt e6100 XT	3	100
Tern GSD L10 LR	1	200
Ridgeback MK5 Trike	3	150
Ridgeback	5	150

HITRANS also purchased and provided each business with safety equipment such as helmets, lights, hi-vis vests, padlocks, etc. A bike shop was chosen for each of the trial locations to service and upkeep the bikes every three months or more frequently if needed.

### 3.4.2 Evaluation

Each eCargo bike user was sent a monthly survey to aid in tracking their progress and note any issues or queries. Moreover, at the conclusion of each business trial they were asked to complete an end of trial survey which contains more comprehensive questions. The first round of trials are coming to an end and although not all surveys have as yet been completed, we have 6 completed surveys. Of the 6 survey responses gathered so far the average usage by the businesses is 3-4 times per week. When asked, if applicable, why they used the bike less than expected, poor weather and restrictive load capacity were common themes. Furthermore, the topography of the regions was a factor with comments like: "the island's rural roads and pathways are not suitable for this type of transport" and "the bike is not really suitable for the rough tracks from the main road to the residents' homes on Rousay".

The range cycled per month for the 6 businesses ranged from 26-232 miles with a load capacity from 7-45kg. We have had very positive survey responses with some stating the bikes were, "a convenient means of delivering goods to customers who reside a long way from the main road" and "it has massive potential as an alternative to a small car/van, this is ideal for towns like Lochgilphead". Some responses suggested that the business would be keen to make a modal shift,

*"Firstly - I wasn't sure if an e-bike was what I needed - The road I travel is very steep and I'm not an accomplished rider. But using the e-bike has made me 100% sure that it's the right thing. It has helped my confidence on the road. My business has been able to expand because I can take more product to the post office. I am definitely getting fitter and saving money. I feel great not using petrol!"*

Overall, the project has been a success and HITRANS will be continuing to offer the bikes to local businesses and community groups. We are also exploring options for long-term leasing to groups that would cover the cost of any maintenance/replacement parts etc.



# 4

## Co-creation processes

THE PROJECT AIMED TO INVOLVE TRANSPORT USERS, AUTHORITIES, ACADEMICS AND CIVIL SOCIETY IN THE RE-THINKING OF MOBILITY SERVICES.

### 4.1 APPROACH

In the initial stages of the project, the research partners developed a common co-creation methodology alongside questionnaires to map the needs and satisfaction of the inhabitants in each rural area. Each pilot used this methodology as a solid starting point, but made small changes to their approach depending on the target group and the local situation.

#### 4.1.1 Flexbus pilot

In the Flexbus pilot, co-creation took place, primarily with the public transport provider, local and regional authorities. It was difficult to involve users, citizens, and civil society. In a more general way, we have gained insights from broad consultations with enterprises, sector federations, research institutions, civil society, local communities etc., but it was challenging to transmit these messages to authorities and companies.

To objectively measure the interest in the Flexbus model and to look at opportunities for improving the existing offer of transportation options in the Klein-Brabant region, a survey was set up by Ghent University in collaboration with IGEMO and the local public transportation authority. This survey, based upon the generic MOVE mobility survey template, consists of four parts;

- 1 Personal data: useful metrics to subdivide the population during the analysis (e.g. gender, diploma, size of household, age group). We also requested the (approximate) locations of their residence, workplace, school, main supermarket, etc. (see Figure 1a)
- 2 Travel behaviour of the respondent (and their family): useful to get an overview of which kinds of trips the respondents currently undertake within the region, and which modes of transportation they use and/or combine (see Figure 1b). Additionally, there are several questions related specifically to shared mobility system usage.
- 3 Mobility attitude: how do people feel about mobility, are they stressed when using certain modes of transportation, which factors contribute the most to their choice of mode, do they feel occasionally limited in their ability to travel and if so, why?
- 4 Specific questions pilot: useful to gauge the interest in the Flexbus alternative specifically.

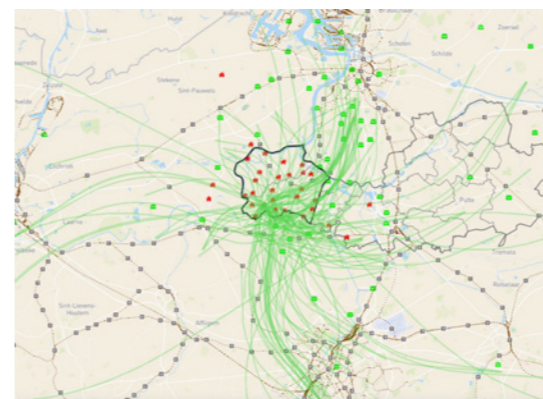


Figure 1a: Home-work routes in and around Klein-Brabant

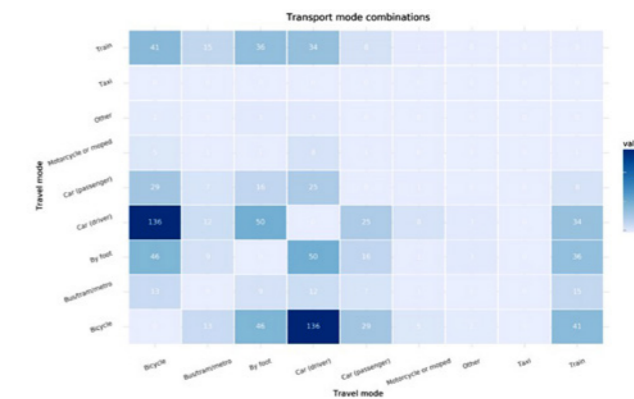


Figure 1b: Frequency of combinations of transport modes

#### 4.1.2 Bed & Bike pilot

In the Bed & Bike pilot, co-creation took place (to explore), at first via several interviews with the hotel general manager, the hotel marketing manager and guests of the hotel (as potential users of the service). In a more general way, we have also gained insights from broad consultations with other (local) enterprises, research institutions and local and regional authorities.

To measure the potential interest of tourists in this specific service, a GPS-dataset (collected in 2019) has been analysed in collaboration with Ghent University and HZ University of Applied Sciences, gaining insight into tourist mobility flows throughout Zeeland based on the smartphone sensor data.

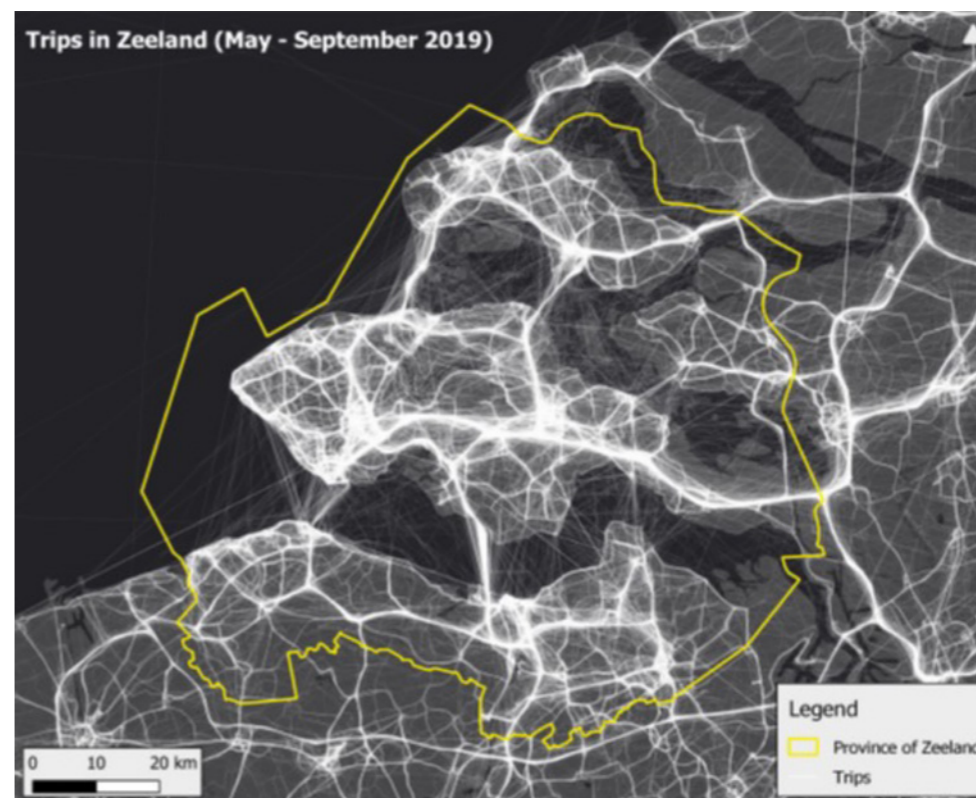


Figure 2a: Trips in Zeeland (May - September 2019)







From July 2021, two vehicles will be used by the employees of the County Administration for business trips. The aim is to gain even more capacity utilisation, a higher level of awareness and insights into the use of the e-carsharing system.



MOPINO pilot in Northeim: E-car sharing in the rural area



#### 4.1.4 eCargo bike pilot

Prior to the start of our eCargo bike trials, we gained advice from NESTRANS who had previously undertaken a similar project involving eCargo bikes. Their information and feedback regarding different bike models and specifications was invaluable before going out to tender for the bikes.

Initial discussion with Local Authorities, community organisations and Business Improvement District (BID) organisations identified an interest in exploring alternative delivery modes from which we narrowed our focus to three trial areas. Local shops, restaurants, bars and cafes are increasingly offering delivery services to retain their customer base through the pandemic, and most businesses are using petrol or diesel vehicles to make deliveries. eCargo bikes would provide a superior service at a lower running cost, and refrigerated compartments and other modifications could be added, according to demand. Delivery via eCargo bike means that those operating them need not have a driving licence - particularly suited to help young people jobless as a result of the pandemic.

In order to supply and maintain the eCargo Bikes in each location HITRANS published an invitation to tender on Public Transport Scotland. The tender included the Pricing Schedule for the Work Package and was weighted 60:40 price:quality during the selection procedure. As much as possible we wanted to engage local bike shops to the trial location.

The trials were promoted through BID and other local authority organisations as well as social media platforms. An Inverness eCargo bike was also made available to the public and local businesses at a HITRANS hosted Low Carbon Transport Day.

Each eCargo bike user was sent a monthly survey to aid in tracking their progress and note any issues or queries. Moreover, at the conclusion of each business trial they were asked to complete an end of trial survey which contains more comprehensive questions. The first round of trials are coming to an end and although not all surveys have been completed yet, feedback notes high levels of satisfaction with the bikes but highlights their difficulty navigating rural country roads. At the completion of the project we will have a wealth of data to analyse, however, we feel a number of trial users would like to have eCargo bikes as a feature of their businesses in the future.

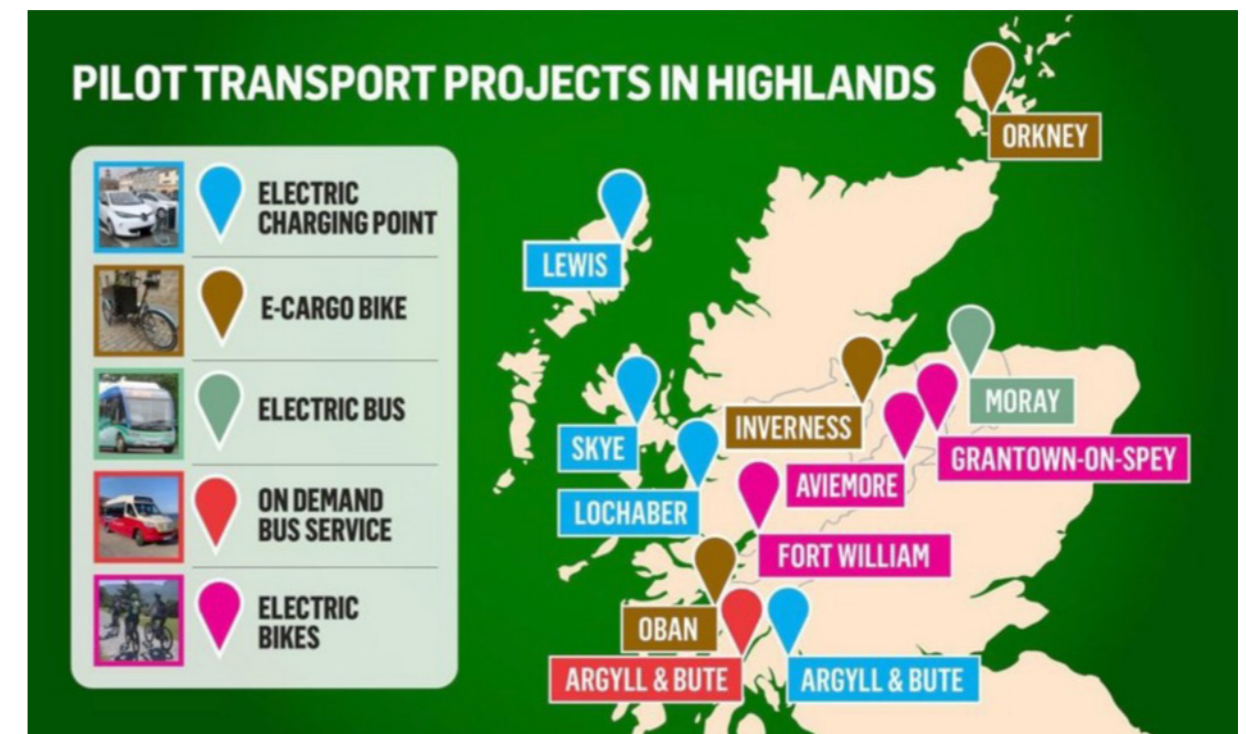


Illustration of pilot transport projects in the Highlands

#### 4.2 REFLECTIONS ON THE CO-CREATION AND PROCESS

The pilot partners have been able to develop alternative mobility concepts. The new and/or improved solutions that have been found, rely on collaboration with a large number of stakeholders, such as users of the concepts, entrepreneurs, governments, initiators/pilot partners, knowledge partners and social organisations.

In most pilots, one of the major stakeholders is a public authority (mostly at a local level), which plays a decisive facilitating role in most concepts.

The evaluation of co-creation within the MOVE project tends to focus on the number of stakeholders involved. This should not be the only parameter to follow. Within the project, we have found that there is a need to develop more methods to measure the quality of co-creation processes.



There is a tension between the willingness of companies and authorities to get to know the needs and insights of users and citizens on one hand, and their wish to keep up the image of organisations that are perfectly in control on the other hand. It is hard for both authorities and companies to share their internal processes with the outside world. This comes down to a matter of trust.

We have encountered a general lack of basic knowledge on mobility issues among citizens, local representatives, SMEs, associations etc. Therefore, we consider it our task to raise awareness on the subject matter before we can even start talking about co-creation. One way to do this is by the organisation of webinars and the production of communication material.

If new sustainable mobility solutions are unknown, it is hard for users to imagine the downsides and benefits for them. This makes a dialogue with users quite a challenge.

#### 4.2.1 Co-creation in COVID-time

The influence of COVID differed from pilot to pilot, depending on the stakeholders involved. For example there was a delay in implementing the marketing strategies of the shared car pilot MOPINO, such as the market appearances, because operation of the system was not possible. Additionally there were delivery problems of the vehicles.

COVID had no particular effect on the research activities, but did have an effect on the evaluation of the pilots which were delayed. The biggest issue is the change of situations before and after COVID. It made monitoring very difficult, because it is difficult to determine what influence COVID has had on the results.

A striking phenomenon is the delay and fear (cold feet) among representatives in the Province of Zeeland which caused delays. The argument was that the traffic situation was not representative. The use of shared bicycles decreased and it led to a revival of car use. The decrease in foreign holidays has also resulted in an increase in tourism in Zeeland, which means extra traffic.

One of the findings from the COVID period is that the intensive online gathering, especially between the research partners, has contributed to better collaboration. But as mentioned before, monitoring is difficult.

### 4.3 LESSONS LEARNED

#### 4.3.1 Mobility alternatives

Not to overrate the possibilities of technology or infrastructure. They are a means to an end. Organisation and communication are often more important.

Be modest in what to expect from the impact you can achieve. Start small. Build knowledge, networks, relations. Maybe you can only achieve a part of your ambitions. These could lay the foundations of future projects.

- Raising awareness of mobility issues is crucial
- Developing methods that allow measuring the quality of the co-creation process
- Start small
- Take your time to create a network of stakeholders
- Bring along (potential) users of the design process
- Have an eye for all social values of a concept (ideally according to the principles of social return on investment)

### 4.4 VIABLE BUSINESS MODELS FOR MOBILITY SERVICES TO RURAL AREAS AND MIDDLE-SIZED CITIES

#### 4.4.1 Car sharing

Currently, there is a window of opportunity for car-sharing services since more people want to start driving electric cars for environmental reasons. But since the procurement of such a car is quite expensive, the total cost of ownership only becomes advantageous for car owners who cover large distances. People who drive less than 10,000 km per year could find a cheaper alternative in car sharing. Also, people who cannot park their car near their residence, have to pay for more expensive current from public charging points. This too improves the attractiveness of a shared car. For businesses that offer car-sharing services, the low mileage costs and reduced need for maintenance are financially attractive. Therefore, electric driving and car-sharing are currently a good marriage.

People in rural areas often need a car to be able to reach several types of services. In the analysis phase of the Flexbus pilot, the University of Ghent, partner in the project MOVE, has plotted the time needed to reach several types of services. A distinction was made between basic services (e.g. elementary schools, bakeries, pharmacies etc.), regional services (hospital, secondary school, a lawyer etc.) and metropolitan services (e.g. movie theatres, specialised medical treatment, larger shopping areas, and higher education). It was clear that people in the pilot area are highly dependent on cars to reach metropolitan services. This often leads to a high rate of ownership of cars. Sometimes families own three or four cars to have the accessibility they need. It is quite expensive to have your own cars in case of need and therefore shared cars can be attractive instead of the extra cars in the households.

However, this requires the need for people to adopt two new behaviours. The main drivers for behavioural change are money and the conviction that driving a car is polluting. It is important to find out how the costs of car-sharing services can be reduced.

We have found that a viable business model is that a local government shares its fleet with citizens. There is proof from another Interreg project (Share North) that this also works in more rural communities. Especially outside office hours, cars in the governmental fleet represent an unutilised resource and simply take up space. It makes sense to share them with inhabitants, not only because it's financially attractive (by renting out fleet vehicles outside of office hours, governments can lower their operating costs) but also because, in many communities, it can be the first contact that citizens have with the concept of sharing cars. This can also contribute to better social inclusion in a town. A threshold for this practice is the know-how on car-sharing and as the way to define it in a public procurement process.





Partners visiting Flexpack designer

Car sharing appears to be viable in peri-urban areas. Prerequisites for this are:

- Car-sharing in areas with a lower density should be station-based or with drop zones. Free-floating services are not suitable.
- Services should be offered as a network. At least, shared cars in several villages should be available with interoperable apps. Routines to book, open the car, to start, pause and stop your trip should be similar.
- It is not recommended to offer a single-vehicle. At least offer vehicles in twos, next to each other or within walking distance. This decreases the possibility that a car would be unavailable.
- It is strongly recommended that the participating municipalities use their means of communication to promote car-sharing. In addition to publications on social media, the website and news media, it is also recommended to actively inform citizens at tipping points in their lives, for example when getting a driver's licence or when changing address.
- People have their transportation habits and they don't change overnight. Some time is needed before an offer of shared cars can be judged on its merits. It is therefore strongly recommended that municipalities commit to car sharing for at least two or three years.

Other interesting business models for car-sharing rely on peer-to-peer schemes and cost-sharing. They require a small trusted community of users, which is probably easier to establish outside of metropolitan areas.

#### Case: Launch customer in Middelburg

A company enters into a commitment with the e-car operator by means of the purchase of x number of kilometers per year. The company will receive the e-shared car, but this e-shared car can also be used 24/7 by citizens/residents (eg via a subscription construction). If residents use the e-share car so much that the company is in trouble (no or too little access to the e-share car), a second car is simply placed next to it, etc..

#### 4.4.2 Bike-sharing

A business model of a regional bike-sharing system in a lower density area has been developed. The essence of the envisioned bike-sharing system is that bike services paid by enterprises would cover some of the fixed cost of bike-sharing services for the general public.

#### Case: Bike-sharing at Pfizer

An interesting example that we have found is the bike-sharing scheme of the pharmaceutical company Pfizer. This case has been presented by Griet Dillen, mobiliteits coordinator at Pfizer in Puurs, on 24 February 2021 at the regional conference (webinar) on bike sharing in the context of climate policies that IGEMO has organised.

More than 3,300 people work at the manufacturing plant in Puurs-Sint-Amands, near Mechelen in Belgium. The health of employees is very important for a pharmaceutical company and so is sustainability. The Puurs-Sint-Amands branch also had to contend with excessive parking pressure due to the growth in the number of employees.

That is why a Ten-Point Plan for employee mobility was drawn up. This demonstrably leads to a shift in the modal split towards sustainable alternatives. A necessary point of contact for employees, local authorities and social partners in the mobility coordinator. An important element is also the flexible homework allowance. This has replaced the classic commuting allowance or bicycle allowance. Employees can now rely on a combination of means of transport (on days when they cycle being given a bicycle allowance and on other days the classic allowance).

As a part of the plan the company also:

- Introduced a bicycle lease plan. The agreement is that employees come by bicycle at least 20% of their working time.
- The company has also invested in bicycle infrastructure: bicycle sheds with a service pole (with equipment for minor bicycle maintenance), charging infrastructure, lock bar, space for cargo bikes, showers, lockers, and so on.
- To encourage employees to come by bicycle, they are encouraged with events (for example, Car Free Day and bicycle applause day), and cyclists are encouraged with small incentives (for instance a mobile coffee bar, saddle covers).

Shared bicycles have been given a place in the mobility strategy for 3 years now. They were created at the request of train users. The last mile is a high threshold. Some had their own



bicycle at the station, but occasional train users did not. A start was made with an offer of electric shared bicycles at four stations: Puurs, Temse, Bornem, Ruisbroek. This has proved successful. Later, this offer was supplemented with 10 regular bicycles at Puurs station.

There are currently 150 employees who use this system (bicycle pool) for free. They must apply for this. They are strongly reminded of their rights and obligations: that is important for it to work for all users. For example, a reservation is required, a maximum of 3 days in advance. This is no longer possible in advance because bicycles are over booked and are then not used.

A clear choice has been made for smart locks: no hassle with keys. Anyone who takes a bicycle to a train station in the morning must also put it back there in the evening. Charging the battery is done at Pfizer, where the chargers are located. Employees must also do this consistently. The smart lock makes it possible to address negligent employees.

Bicycles and batteries are susceptible to theft. The sensor in the lock notifies you when the bike moves without being unlocked. For safety, an extra cable lock is provided for the electric bicycles. Damage is reported via the provider's app. The local social economy company Flexpack is responsible for follow-up and maintenance. That works well and in this way, Pfizer also creates work in the social economy.

#### **Towards a hybrid bike-sharing scheme**

To offer this service to Pfizer, Flexpack has to operate a bike workshop, drive around to pick up bicycles that are out of order, train staff to work with bicycles etc. These represent fixed costs that can be carried by a private company so that the general public or the municipalities only have to carry the variable costs. This could make bike sharing a lot more affordable for users and municipalities in a peri-urban area. Moreover, if bicycles that are used during weekdays for commuting, could be used during weekends for recreation, this could represent an effective way to make the investment in bikes more profitable.

During the MOVE project, an opportunity presented itself to set up a bike-sharing scheme in a peri-urban area. We have received the question from local authorities to support them in setting up a local bike-sharing scheme. At the same time, we found an opportunity to relate our more rural ambitions to an initiative that has been taken in the neighbouring region of Antwerp, which is urban. This opportunity opens up the possibility to start a bike-sharing scheme simultaneously, with the same service provider. This would make the scheme available to urban users that use the bikes for recreational purposes, whereas locals could use the bikes for more functional purposes. Even though locals most often have a bicycle, they seem to be interested in using a shared bike as a first-mile solution towards public transport.

This experience suggests that being part of a large network of mobility services offers the opportunity to not only make services available to locals but also to open up the area for recreational trips to and from nearby cities.

#### **Case: Bikes and Trikes for Highland Carers Pilot**

This existing project was originally funded by Cycling Scotland: folding e-bikes to a variety of health & social care professionals – social workers, school nurses, care home workers –

then to GP surgeries with a specific focus on getting other members of staff cycling, particularly non clinical staff at weekends and evenings.

This project has been extended through MOVE project pilot for a further eight bikes to five rural and three urban GP surgeries of the NHS Highland area. The pilot aims were to provide an electric "pool bike" to practices with the goal of undertaking home visits by e-bike thus reducing the car use and to allow the electric "pool bike" to be borrowed by lower paid practice staff to experience e-bike use when the bike is not being used for home visits, by borrowing bikes for commuting or at weekends.

Overall, the pilot has a positive impact. All practices, bar one, wish to retain their bikes and continue to use them. Certain practices have applied to have a second bike or have already acquired one of their own. There is a waiting list of other practices wishing to join the e-bike sharing scheme. In total currently 17 GP surgeries have participated in the scheme across NHS Highland area and only one rural practice has returned their bike due to poor use.

All practices have approached maintenance of e-bikes slightly differently. Some used a local bike workshop's voluntary help, while others relied on staff and their families. One practice was willing to pay £500 repair for a cracked battery as they felt they had got excellent use out of it and that it felt like "their" practice bike – fostering ownership.

Across those 17 practices, the heaviest use is in urban areas especially for home visits, community hospital visits, attending A&E for seeing Designated Patient Scheme patients, and semi-rural for home visits. Bikes have a varied use of business, commuting and leisure, though often more by clinical than non-clinical staff. Medical students and trainee GPs have often particularly benefited from using the bikes. Some staff members have proceeded to go on to buy their own bikes or e-bikes for commuting.

All users report a great feel good factor, especially for leisure use at weekends or evenings. The pilot will feature in Sustrans's Bike Life Inverness report with interviews from frequent users. Several practices have gone on to apply for Cycle Friendly Employer status on the back of this project.

#### **Learning points from the pilot**

In some areas a mountain bike was a more popular model than a folding e-bike for staff to borrow for weekends and evenings. The folding model was valued by staff not confident enough to ride home on the bike for weekend leisure use.

Most practices aimed to "normalise" bike riding by making it easy for staff to use the bike. The practices wanted to remove all barriers to the bikes being used that they could, within budget, so making it an easy "light touch" non-paperwork clutter approach worked best, so measuring distances travelled was impractical as was a log book.

Covid-19 significantly impacted on the pilot in that home visits changed categorically for many practices over that time. The necessity to carry personal protection equipment made it impossible to use an e-bike for home visits. Also, the number of home visits dropped significantly.

It was challenging to get non habitual bike riders to use it though there were some successes. One staff member decided she didn't get enough exercise with it and elected to get her own pushbike instead! Staff valued the pilot for "nipping to the shops" trying out an e-bike, "nipping across town". For some practices, it fitted alongside other measures in being more environmentally friendly similar to the Green Impact for Health toolkit, or the Cycle Friendly Employer award.

#### 4.4.3 Bus services

Bus services are very expensive. The cost per passenger for the Belbus amounts to 21 EUR. This is comparable with the cost that was observed in the Breng Flex pilot in the Arnhem-Nijmegen Region in the Netherlands, which was around 20 EUR per passenger (source). The Flexbus Klein-Brabant in Belgium is cheaper: at 15 EUR per passenger, mainly since the number of passengers has significantly increased. From this analysis, it appears that the fixed costs are very high, whereas marginal costs per extra passenger are limited. This implies that an increase in the number of passengers can reduce the cost per passenger significantly.

The main cost factor is the wages of the driver, the maintenance personnel and the dispatching staff. These costs are hard to reduce. We have identified several ways to cut costs:

- Reduce the number of vehicles. Since trips are booked, it is possible to postpone some of them. However, postponement of the requested trips would considerably decrease the quality of the service.
- One of the possibilities to reduce costs is to choose electric vehicles. The investment cost for these vehicles is considerably higher than that of diesel buses, but operating costs are expected to be considerably lower.
- Another way to reduce costs would be to limit the times when the service is offered. The Flexbus is used very little before 7 a.m. and after 18.00. and on Sundays. Since the wages of the drivers are one of the most important costs, it would certainly mean a significant reduction of costs to reduce service hours. Moreover, overhead costs (cleaning, dispatching, management and maintenance) would also be reduced.
- In the pilot area, several organisations offer transport services for the disabled and the elderly. Many social organisations (schools, retirement homes, social economy etc). have their own means of transportation (cars, vans), which usually drive small distances. An interesting way to cut costs would be to pool drivers, vehicles, bookings etc. This implies that there would have to be a common dispatching capacity. This is something that we could not deliver as a pilot. The difficulty is that such a project does not start from scratch. There are contracted drivers, paid and volunteers, who would have to be put into a completely different organisation. This is a complex change project.

Another way to make the business case of the Flexbus more financially sound is to increase the revenues. There are three classic sources of income to pay for the services:

- Ticket sales to travellers.
- Advertising in and on vehicles and bus stops.
- Subsidies.

From the evaluation of a Flex Bus service in the Netherlands (Breng Flex), we know something about the willingness to pay. The price for a trip was 3,50 EUR in that case. A survey from 2019 pointed out that 16% of the respondents would travel with Breng Flex for short trips if they became cheaper. A possible price increase to 5,00 EUR for longer rides is acceptable for one-third of the Breng flex users. Only 7% say they are willing to pay more than 5,00 EUR (in 2017 it was 2%).

In the pilot, no use was made of the possibility of using advertisements as a source of income. It is unlikely that in rural or peri-urban areas, that advertisers would be willing to pay the amounts that would be required to achieve a break-even situation.

So the most efficient way to pay for the deficit when operating a FlexBus is public funds. In comparison to other mobility services, this is expensive for public authorities.

However, this is money spent for a growing target group of elderly people that is unable to get around on a bike or by car. If this enables elderly people to live autonomously for a longer time, this would also save a lot of expenditure on social care. It would be short-sighted to look at mobility services only as a means of transportation. They are means to an end in people's lives and thus also social services. In the section on the business cases, this type of link between added value at a societal level and at an economic level will be discussed at a more theoretical level.

#### 4.4.4 Conclusion, future

In retrospect, several questions can structure a conclusion, for instance:

- Do mobility solutions proposed here have a real impact?
- Are the proposed mobility solutions sustainable?
- Are they scalable and transferable to other contexts?
- To which extent are mobility alternatives technological in nature, and to which are they organisational?
- Are mobility alternatives inclusive?

##### **Do mobility solutions proposed here have a real impact?**

When we measured the impact of the pilots, we have observed that the pilots have not really changed a great deal in the communities where we have implemented them.

When working to improve and develop sustainable mobility solutions through pilots, working on a small scale allows us to better understand the effects of the solutions developed. Moreover, by learning from the pilots, we can implement the solutions more effectively on a larger scale.

However, partly due to this limited scale, the economic benefits are logically limited in the pilot cases. To be able to interpret the actual impact of pilots, it is important that non-economic benefits, such as socio-cultural and ecological values, are also taken into account.

Car users will at first show little interest in mobility alternatives. Most alternative mobility solutions imply thresholds that keep large numbers of people from trying them: people would have to be able to ride a bicycle, use a smartphone app, register online, etc.



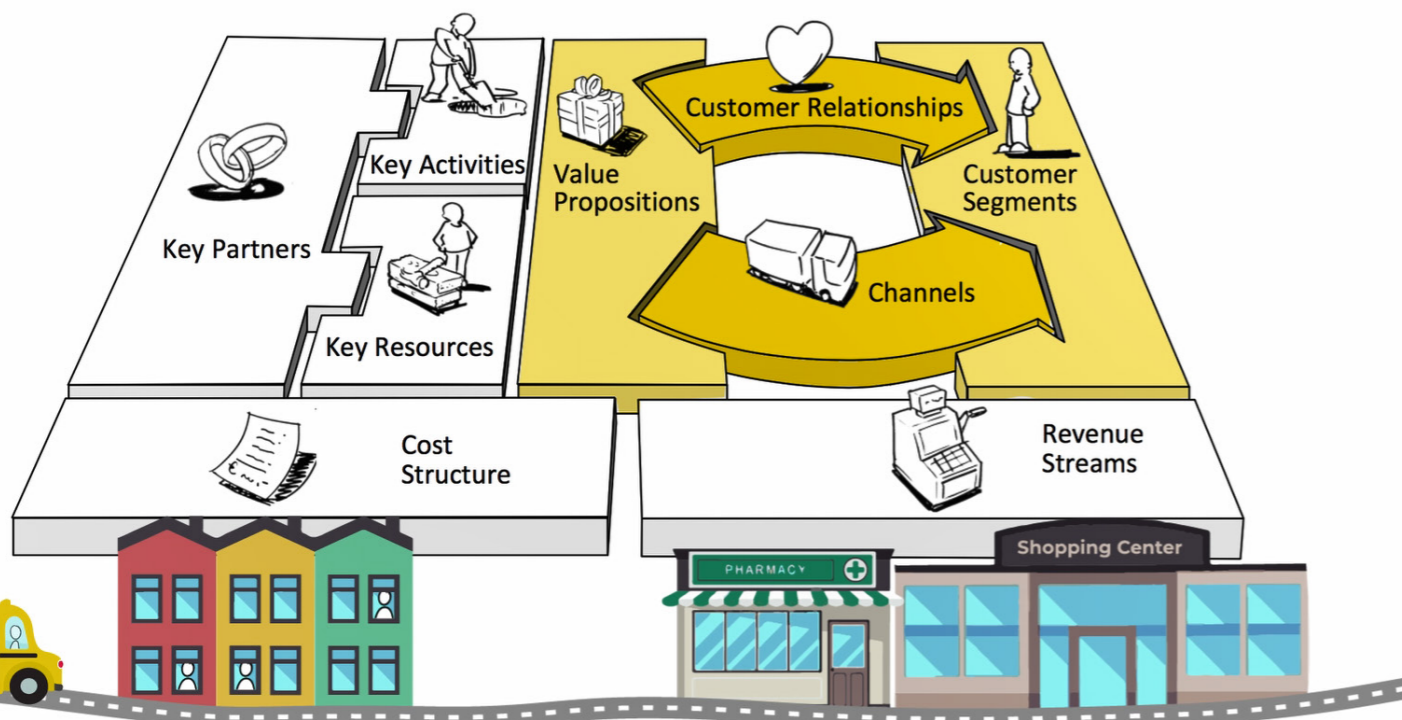
Moreover, these were only pilots. People did not have the time to fundamentally change their travel habits.

But despite the limited impact now, the potential of mobility solutions could be starting points for future mobility transitions. It is therefore important to keep on looking for solutions.

The focus on trips, modal split or avoided car trips gives a limited insight into the importance of mobility in peoples' lives. If an expensive mobility alternative enables an elderly person to keep living at home with little assistance, this has an impact on this person, on the community and on the local economy. These impacts are hard to measure in a quantitative way, but are nonetheless very real.

**Are the proposed mobility solutions sustainable from an economic perspective?**

There seem to be no viable business models just for mobility services in rural areas that are targeted solely to the inhabitants of a rural area. The costs for the services are too high and there is less need to reduce car use because there is enough space to park cars and the car is by far the most effective modality in rural areas from the user point of view. The target group for commercial shared services is not large enough and there are no other sources of income like advertising, data, etc. To create a positive financial business case for the service provider extra income is needed from the passenger, the government or extra passengers such as tourists.



Example multi layered business canvas

**Are the proposed mobility solutions sustainable from other perspectives?**

Looking to the future working together with inhabitants, local organisations and creating more social involvement would create a better business case. Governments should perhaps focus less on mobility solutions and more on social cohesion by co-creating solutions from the user point of view.

**Are solutions scalable and transferable to other contexts?**

Within the partnership, in the very beginning of the project, a major observation was the enormous diversity in what we qualify as "rural". In Scotland, this term has a completely different meaning than in Belgium and The Netherlands. Densities, distances, accessibility of services, the political complexities, and economic activities are very different in rural areas in different parts of Europe. This has an impact on everything, foremost on economic factors, but also on the possibility of co-creation with communities.

This would imply that the pilots that we have tested within the MOVE project, cannot be transferred to other contexts without going through the process of co-creation within the targeted context. This considerably reduces the potential for scalability.

**To which extent are mobility alternatives technological in nature, and to which are they organisational?**

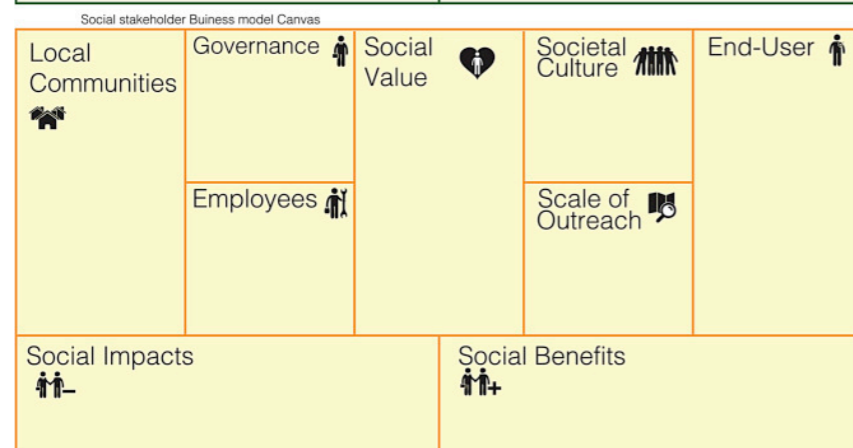
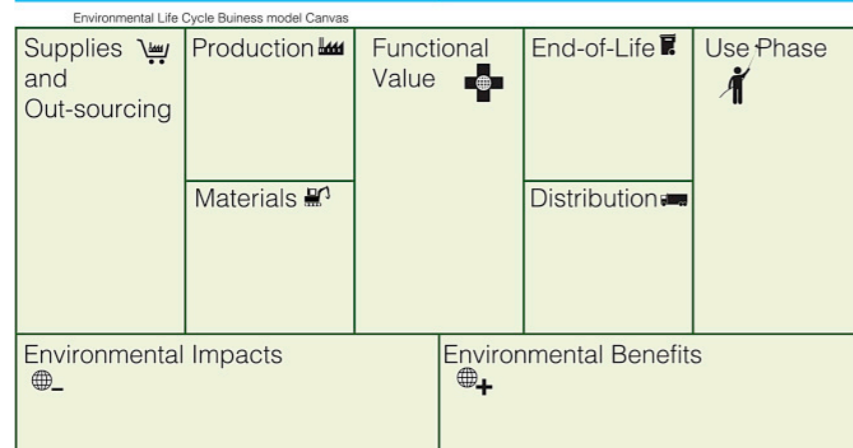
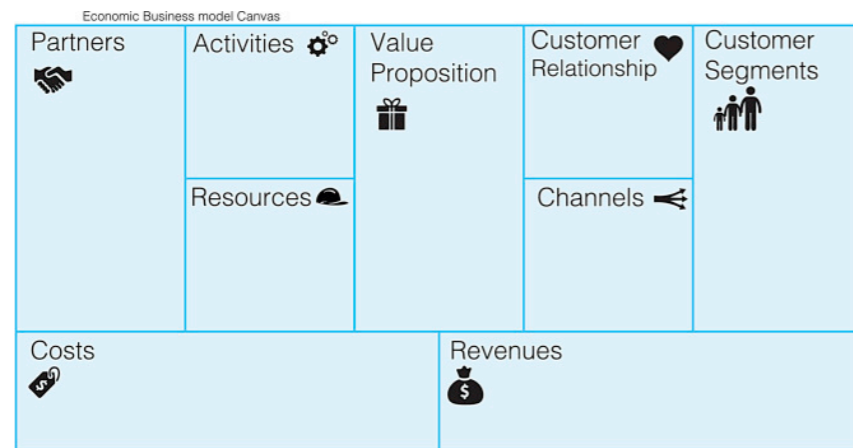
When we started the project, many of the mobility solutions seemed to have a strong technological component. While we were carrying out the project, it appeared that most of the problems we encountered were not of a technological, but of an organisational nature.

The example of the Flexbus pilot was the possibility of integrating several bus services that we explored. This could considerably reduce the number of drivers needed, of vehicles and of staff supporting, dispatching and maintaining buses. It means that voluntary drivers would have to deliver services to regular passengers during late hours, and that professional drivers would assist handicapped people not only to get onto the bus, but in some cases to get from their front door to the bus. These seem to be small adaptations as to how drivers operate, but legally and from an organisational perspective, these drivers work under entirely different legislations, systems of funding, insurance, not to speak of the overhead needed to perform such an integration. It could not be done within the context of the pilot, but in the context of reform on a longer term, integration of these bus services is an organisational challenge.

Another experience where a technological solution is more difficult than it seems, is found in the experience with the app for the Flexbus. It is technologically not difficult to produce a smartphone app. However, since an app already existed, we did not want an additional one. We wanted to integrate new functionalities into the existing app. But as this app works for everyone in Flanders, not just for the pilot area, it was not possible to make the flexbus functionalities only available to users in the pilot area, other than during the pilot period. This is why we have limited the online booking to a web application. It would have been too complex otherwise.

### Are mobility alternatives inclusive?

To be inclusive for each target group is not easy. Cycling is a low entry mode from a financial point of view but not for all elderly and disabled people. Another way to make mobility solutions accessible is to make it possible to plan, book, pay etc. by smartphone, called MaaS. Almost 79 percent of European inhabitants have a mobile phone subscription. That is the highest percentage in the world. Moreover, 63 percent of the population has access to 4G. Of these 63 percent, a large number are unable to install apps and use the smartphone for anything other than making phone calls and sending text messages. So MaaS is not the "holy grail". The conclusion is that in most cases local parties have to create tailor made solutions for their own regions and population. Of course co creating these solutions with the local people is the best way to develop the tailor made solutions!



# 5

## Factors that enable, change or impede the uptake of new sustainable mobility solutions

THE FACTORS THAT IMPEDE THE ACCEPTANCE AND IMPLEMENTATION OF NEW MOBILITY SOLUTIONS ARE NOT ALWAYS AT THE FRONT OF THE MIND OF RESPONSIBLE (EU-) PROJECT MANAGERS. THIS INSIGHT IS ONE OF THE LESSONS LEARNED FROM WHICH FUTURE (EU-) PROJECTS CAN BENEFIT.

### A. Probably open doors

Because (Interreg) projects are often defined in the application phase we noticed that the real project start-up for the Pilots/living labs is often skipped. The focus is on the Interreg project and deliverables causing the pilots to be implemented without thinking it through.

The basic questions like:

- 1 Is the end of the (EU-)funding the end of the pilot, even if it is successful
- 2 Define the project owner: put yourself in the position of the project-owner (the person who's income depends of the succes)
- 3 The government can be a project owner or a (structural funding) partner for social benefits
- 4 Define your customer
- 5 Ask the question: how do you organise your project
- 6 Ask the question: what do you need for good cooperation
- 7 How effective is your pilot
- 8 How efficient is your pilot
- 9 Etc.

A lot of these questions are not answered. This is why lots of pilots and living labs end as an orphan of the EU project instead of the start of something innovative. Within MOVE we used the Business Canvas Model as a structure for the Pilot Partners. By asking questions to the project partners based on the Business Canvas Model we learned about the confusion of language and terminology, even by fellow workers.



For example, most of the project partners were not in contact with the end customer. Their customer mostly is another public authority.

Lessons learned: within the project start-up the focus should also be on robust “living lab / pilot management”.

## B. “the personal lessons learned”

### The value of international teammates

Working together in an international group offers many advantages, including providing insight into new perspectives and inspiration, and thinking along both within the conference room, and in the corridors or during a dinner. This collaboration contributes to the co-creation process in projects. It provides a basis for reflection, partly through the learning outcomes from other contexts. Including experiencing a different way of working, such as a difference in approach for projects in urban regions and rural environments. The wide variety of skills and experiences brought in by the project partners in the implementation contribute to an interdisciplinary collaboration.

### Personal lessons learned:

*Harm Ijben HZ University;*

‘it helps to participate in a project from multiple roles in order to better understand the ecosystem (lead partner, knowledge partner and pilot partner)’

*Casper van Geluwe University of Ghent;*

‘The collaboration with partners who have experience with the rural area has been very valuable’.

*Rob Kösters Municipality of Middelburg;*

‘The Design Think method has made me realize that a project can change color enormously, both in terms of content and costs’.

*Pieter Dresselaers IGEMO;*

‘the importance of tight project leadership and the great goals that emerged from the shared car meeting’.

*Felix Kegel University of Göttingen;*

‘It has become clear to me that there are differences in regions and countries, but the needs and challenges are often the same, such as a patient wanting to visit a hospital or a tourist on the way to accommodation’

*Anna Thormann Gate21;*

‘Many MOVE projects work on involving people and jointly creating solutions’.

*Jayne Golding Hitrans;*

‘The co-creation aspect that MOVE brings as a basic element in the projects’.

*Lee Heaney NHS;*

‘Being part of MOVE helped us focus on our projects’.

*Markus Martin Menge ZVSN;*

‘Many things take longer than expected at the beginning. Therefore, it is important to develop a good and realistic time schedule for yourself’.

*Elke Kroft Advier;*

‘Working in an interdisciplinary international partnership offers the opportunity to look beyond one’s own field. Regular contact with each other helps to gain a better understanding of the local challenges of other partners and even discuss issues that are not directly linked to this EU programme.’

### Valuable for next projects

From the many learning points of the MOVE project, there are a few that are valuable to take with you to future projects:

- Frame your project very sharply towards the next project to find the pilots that are similar. Search for more cohesion between the pilots.
- Do not try to transfer concepts 1 on 1 to other contexts, the Mobility concepts should be adapted to regional specificities.
- When developing new concepts, do not start from (only) technical innovation
- Be aware that the time factor can also play a role - are there any new developments or new trends in the meantime.
- A specific partner who is responsible for the project communication is helpful. Experience around projects to create dynamics for project and visibility could possibly also be introduced into pilots and communication regarding its results.
- On content and working level it is valuable to meet each other regularly.
- To exchange information about pilots during the project meetings, use working methods to create interaction.
- Combine the research days and project meetings to reduce travel time.
- Try to meet up in person more times a year than only the project meetings.
- Don’t underestimate the time to get more out of it. The whole project costs a lot of stafftime.

## 5.1 USERS

There are a number of ways in which user behaviour is problematic for the uptake of new mobility solutions. Below is a non-exhaustive list of thresholds that we have experienced.

<b>Sense of responsibility:</b>	Consumers tend to take their behaviour for granted. If it causes problems (such as congestion, pollution and traffic accidents), they tend to consider it someone else's problem to solve them.
<b>Chicken and the egg:</b>	If services do not exist, it is hard to prove that people need them. Partners that make inquiries into the market potential of new mobility solutions have to help potential users to imagine these solutions before they can ask them to co-create solutions.
<b>Knowledge gap:</b>	Users do not know how much their car costs, compared to other means of transportation. Car use is often more expensive, but people tend to choose to keep on driving cars because they are unaware of the costs.
<b>Ability to ride a bicycle/ drive a car:</b>	Not everyone can ride a bike. Not everyone can use a shared car. This could be due to physical disabilities or never being taught how to do it. It seems particularly interesting to teach people how to ride a bike. IGEMO has explored the possibilities of a bike school. For the bike school, social services in 6 municipalities have been consulted. There was a large support for the idea, especially when we shared positive results obtained from similar experiences in Louvain. A bike school is an initiative that reinforces bicycle oriented initiatives by making them also accessible to target groups. Moreover, it has a great potential for social integration.
<b>Ability to use online communication:</b>	Not everybody can book, pay and give user feedback mobile or online.

## 5.2 AUTHORITIES

Public authorities have to make choices. Mobility is often not the most pressing problem, which delays or impedes the uptake of new mobility solutions. Below is a non-exhaustive list of thresholds that we have experienced.

- Ability to change: Existing systems have been designed, contracted and have to be paid for during a predestined timespan. Meanwhile, it is hard to put anything else in place.
- Ability to finance innovation: Authorities deal with limited financial means, with which they cannot take risks.

## 5.3 ENTERPRISES

Enterprises can also hamper the uptake of new mobility solutions. Below is a non-exhaustive list of thresholds that we have experienced.

- Sense of responsibility: Enterprises focus on optimising their profit. If it causes problems, someone else will have to solve them. The challenge is to convince entrepreneurs of corporate social responsibility.
- Ability to finance innovation: small and medium enterprises especially cannot take supplementary financial risks, so it is hard to convince them to do so. Even though efforts do not always have a financial return, they could have a positive impact on public relations or on employee motivation.
- No one is in charge: Often, good solutions are available and managers are aware. But it costs time and takes some skills to implement them in a company, and those people or skills may not be available for these purposes.

## 5.4 INCREASE THE AVAILABILITY OF MOBILITY DATA

The availability of high-quality mobility data is important to support the decision-makers. To understand the current mobility situation, they need access to credible and timely data. Different categories and types of traffic data exist and often a vast amount of data is collected every day by private companies, public transport providers, road authorities and regional or national governments. This valuable data is however often not (immediately) available to local authorities wishing to research and develop new sustainable mobility solutions.

However, to give insight into the mobility demand of target groups in a region and calculate potential service level





and the impact of proposed mobility solutions it is important to increase the availability of mobility data to achieve the following two goals;

### 1. Give insight into the current mobility situation in the pilot site.

Based on both socio-economical and mobility data of the pilot site, a description of the area can be drawn. Which (target) groups live in this area? What is their travel behaviour? What are their attitudes towards different ways of travelling? What are the main mobility problems in the area, and where are they located specifically? Are there any (public) transport gaps? Between which zones are the main flows of mobility situated? Where are the main travel demand clusters situated? What is the current service level at basic, regional and metropolitan services? By answering these questions, a general overview of the current mobility status of the pilot site can be drawn up.

### 2. Model the impact of a mobility solution on the given site.

Given the travel demand description of the pilot site, the impact of a given mobility solution can be calculated. This way, the number of trips between each transport analysis zone, the use of different modes of transport and the exact routes used between each origin and destination pair are estimated. By forecasting the future travel demand of a region, the future performance of both the existing and newly proposed transportation systems can be assessed. This way, the effectiveness of the proposed pilot initiatives can be estimated before implementation. Post-implementation, the correctness of the model can be re-evaluated by using observed travel data of the region.

## 5.4.1 Availability of data

To achieve the above stated objectives, several data sources are needed from the target region. Figure 3 provides a complete overview of the required data for modelling the future travel demand, working towards different mobility scenarios and effecting a desired change in travel behaviour. The blue circles represent the data to be (possibly actively) collected. Part of this data is usually collected at a higher level (e.g. regional, national or European administrations) and made available for each region. Yet this does not appear to be the case for all the data and all regions. Moreover, this data is often collected and made available independently, making it hard to use in an integrated fashion. This, alongside the need to work with the most recent data possible, increases the need to additionally collect data independently.

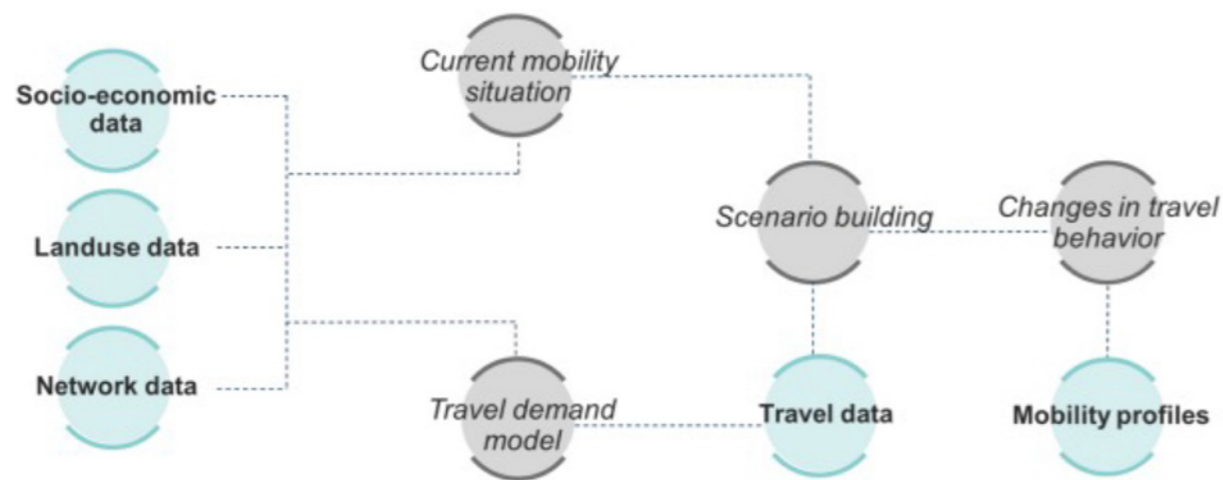


Figure 3: Typical data sources needed for modelling and scenario building for a given pilot

## 5.4.2 Production of new data

When credible, high-quality, relevant mobility data is not available to the local authorities, it is possible to set up campaigns to produce new data to assess the potential for a plausible mobility solution, or to evaluate the success of a running pilot program. Two potential ways to gather additional data are described in the following section.

### 1. Survey data

One fairly straightforward and affordable way to collect the aforementioned data in a rather simple and independent way, is to distribute a (web)survey among the residents of the given pilot region. During the MOVE project, Ghent University designed a complete survey, which could be adapted according to the chosen mobility solution. This survey is divided into 4 parts, bringing together the data needed for this project: travel behaviour, room for specialised questions related to the pilot, the citizens' mobility profiles and personal data. In the first part, the actual travel behaviour of the inhabitants is questioned in detail. How often do they travel? What transportation modes do they use? How long does their journey take? In addition, the use of the increasingly important shared mobility systems is questioned, as these may play an important role in the future of rural mobility.

Both the use of these systems and the reasons for not using them can provide important insights into the potential of these services. Since this type of data is often lacking in existing mobility surveys, this information can also be important for other projects and decision making processes.

Subsequently, some space was left for each partner to draw up their own questions. These questions may be related to existing rural mobility services within the study area, their willingness-to-pay for proposed mobility solutions, and any other information that each partner considers necessary to bring their pilot project to a successful ending.

The third part of the survey attempts then to draw up mobility profiles of the participants, based on a series of attitudinal questions. Here, the respondents are asked to answer a series of 'golden questions', which reflect the respondents' attitudes towards car use, cycling, electric vehicles but also climate change and health. The respondents are presented with a series of statements, and are asked to evaluate them by scoring them with a number between 1 and 5 (1 stands for 'I strongly disagree' and 5 for 'I strongly agree'). Based on these answers, each respondent would be classified into one of the six segments from the SEGMENT project. This helps the partners to assess the potential of their proposed mobility solutions, and to effect changes in travel behaviour of specific target groups. In addition, this section also asks for possible limitations that people might experience to travel. This can be physically, mentally, financially and practically, and attempts to map possible transport poverty in the region, which is often seen in rural areas.

Finally, the fourth part is dedicated to the personal data of the respondent. This includes age, gender, educational level, income, employment situation, household composition and the possession of car(s) and bicycle(s). In addition, each respondent is asked about the locations of their frequent travel patterns. Thus, among other things, the respondents are asked for the location of their place of residence, work/school, shop (groceries), etc. For each regular trip that the respondent earlier stated (in the first part, an exact origin and destination location would be asked. Due to privacy issues, the respondents are free to

choose their own degree of detail in answering these questions, e.g. by zooming in on the proposed map of their area in the web survey. The link between this personal data, travel patterns, travel behaviour and the established mobility profiles will be important in drawing up a first mirror of the region, calibrating the travel demand model and subsequently making mobility predictions towards the near future.

## 2. Smartphone tracking GPS data

A more complex solution for collecting travel behaviour data is the use of a smartphone application. Although this method might be more expensive, the resulting data will be of remarkably higher quality. Every user installs an app on their smartphone and completes the registration process, where one is given the option to allow continuous (location) data collection in the background, or to actively register their travel behaviour through some kind of travel diary. In addition, every user is also asked to complete the 'Golden questions' survey, giving the partners a complete and detailed overview of their travel behaviour and attitudes.

GPS smartphone tracking has the advantage of yielding richer results through continuous data collection, allowing both automated and manual mobility profile clustering at the cost of higher up front investments and potential privacy concerns.

It offers detailed insight into the mobility flows of the target group, the modal split, certain interesting mobility patterns and possible incentives that can be applied to entice the target group to change their mobility behaviour.

One possible way to collect GPS mobility data with a limited investment, is to attach the location tracking to an existing initiative or existing app, such as the VVV Zeeland Tourism app in 2017, 2019 and 2020. This data has been used to find the busiest locations in Zeeland at a very local level. Parts of cities were identified, but also certain beach crossings. The beauty of GPS data is that they can be combined with other data sources which contain GPS coordinates. This allows one to analyse visits (to nature reserves for instance). How long do people visit a nature reserve? Which paths do they take? Another possibility is looking at the use of official cycling routes by visiting cyclists. With enough data the possibilities are endless.



## Colophon

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This White paper was developed by all beneficiaries of the project MOVE.

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MOVE develops innovative and sustainable mobility initiatives and co-create practical solutions in pilots based on unlikely combinations. Mobility Opportunities Valuable to Everybody inspires local authorities, knowledge centres, local economic players and (temporary) inhabitants.

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