FLEXBUS PILOT

Evaluation, December 2020

Schoutetstraat 2
2800 Mechelen

www.igemo.be
info@igemo.be

015 28 50 50

Schoutetstraat 2
2800 Mechelen

www.igemo.be
info@igemo.be

015 28 50 50

CONTENT

Schoutetstraat 2
2800 Mechelen

www.igemo.be
info@igemo.be

015 28 50 50

1 GENERAL IDEA

The Flex Bus 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. Travelers have to book the trip they want to make in advance, by telephone or by means of an internet application.

This service is meant to service 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 pace lower than one per hour, do not deliver a satisfactory service. Busses in rural areas therefore are often used only by disadvantaged and elderly people who have no other means of transportation.

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

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

By offering these advantages, public transport can service rural areas in a way that is more competitive with the private car. Although the modal shift will be limited, some of the advantages of public transport in terms of reduction of mobility poverty and environmental gains can be achieved.

Public transport generally is not a profitable activity, but public services have to spend the financial means in an ever more efficient way. The Flexbus is meant to provide a public bus service at a cost, similar to a regular bus, but to an extended group of customers.

2 CONTEXT

2.1 Geography

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 to provide transportation services to.

You could represent the area 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, beyond walking distance. These distances are ideal for bicycling, also since the landscape has no hills.

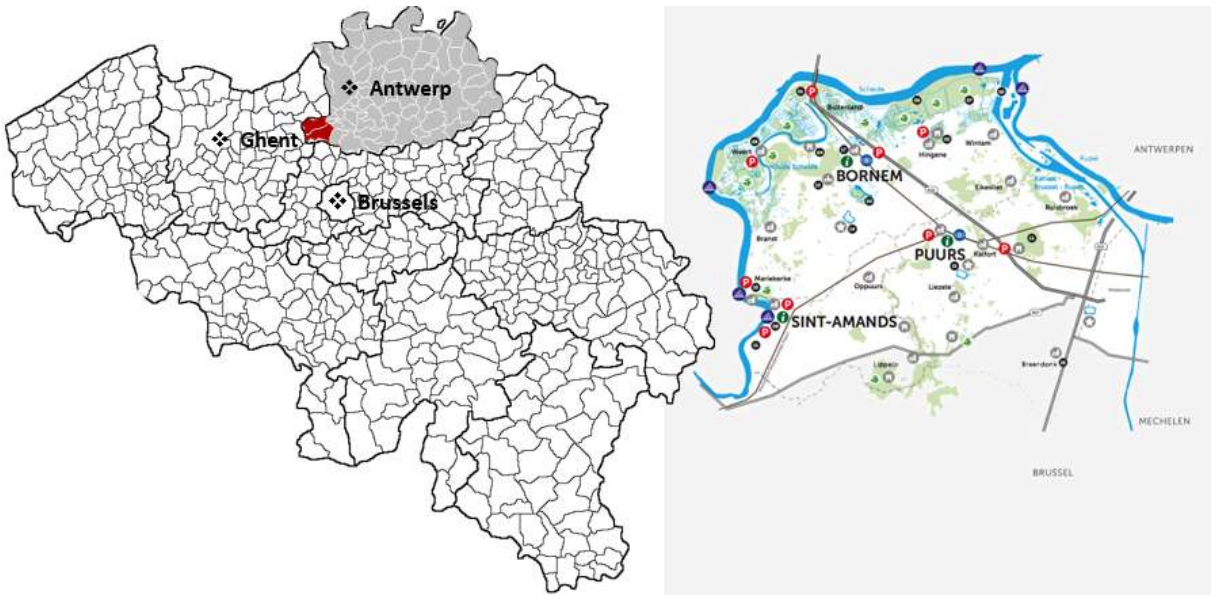

Figure 1: geographical situation of the pilot area Klein-Brabant

The area features several villages, a few main roads (N16 and N17) which are the backbones for industry, agriculturural land, and some very picturesque waterfront areas.

Figure 2: Impressions of the Klein-Brabant area

2.2 Climate change

As in any other region, climate change is a core issue in regional policies. Figures poin out that transport is the main field in which CO_2-emissions continue to grow. In the graphs below, the trendline for the different sectors and municipalities in the region is shown in absolute numbers and per capita. This points out that Puurs-Sint-Amands is a municipality with a particularly high level of CO2-emissions. Moreover, the growth in emissions from transport is far greater than in other communities. This is a motivation to focus on this municipalities.

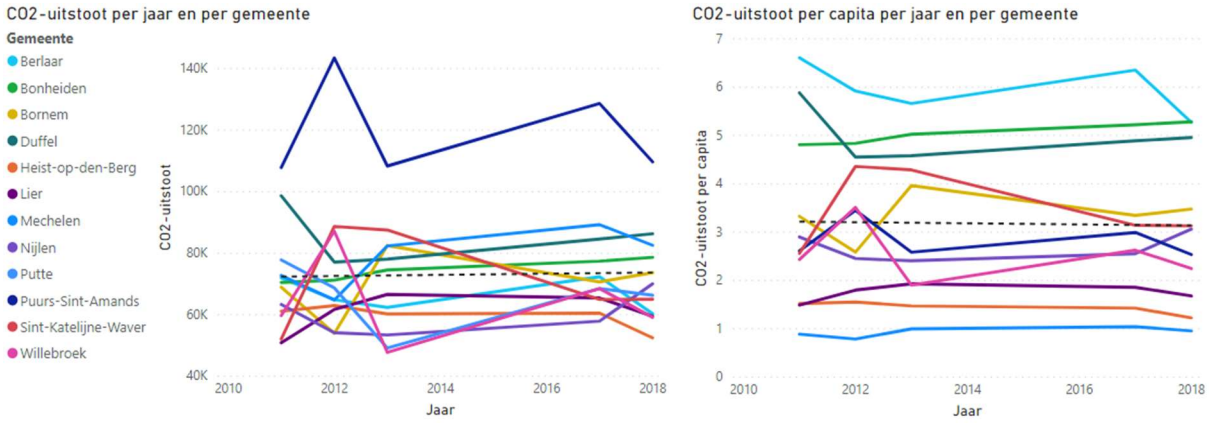

Figure 3: CO2-emissions for municipalities in the region of Mechelen for non-transport sectors, right gross emissions, left emissions per capita (Source: open data from the Convenant of Mayors http://www.burgemeestersconvenant.be/open-datasets-burgemeestersconvenant)

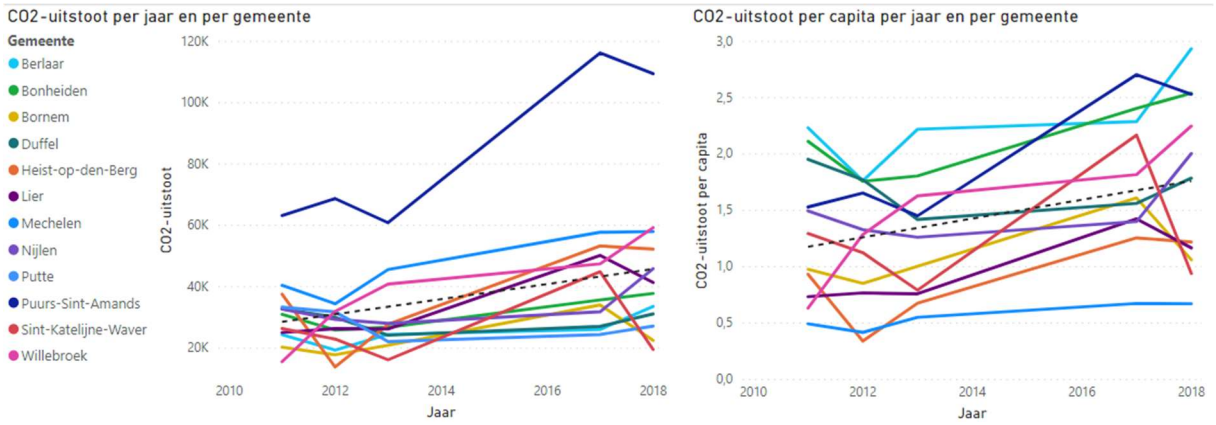

Figure 4: CO2-emissions for municipalities in the region of Mechelen for non-transport sectors, right gross emissions, left emissions per capita (Source: open data from the Convenant of Mayors http://www.burgemeestersconvenant.be/open-datasets-burgemeestersconvenant)

2.3 General statistics

The population density of Klein Brabant is higher than the EU, Flemish and Belgian averages. The population is rather old. Car ownership is rather high. Most families have at least one car, but many families own more than one car. The percentage of households that has at least one bicycle is also over 90%.

Table 1: Basic facts on the pilot area

	Puurs-Sint-Amands	Bornem
Population (2019)	25.882	21.366
Age 0-17	19,6%	17,6%
Age 18-64	60,2%	60,5%
65 and older	20,3%	21,9%
Surface (km²)	48,99	45,76
Open space (2017)	66,3%	68,7%
Residential area	14,5%	11,2%
Other (mostly industry)	19,3%	20,1%
Population density	528,31	466,91
Employment (2016)	10.613	8.222
Registered cars (2017)	12.939	14.932
Households with at least one car (2017)	94,8%	93,2%
Households with at least one bicycle (2017)	92,4%	92,9%

A survey conducted by the University of Ghent within the project MOVE, has shown that for most purposes, the car is the preferred means of transportation for more than half of the respondents to go to work, school/day-care, medical appointments, to go shopping, for leisure and to attend social activities. This area is so to speak addicted tot he use of the private car. The bicycle is the main means of transportation for around a quarter of the respondents for several purposes.

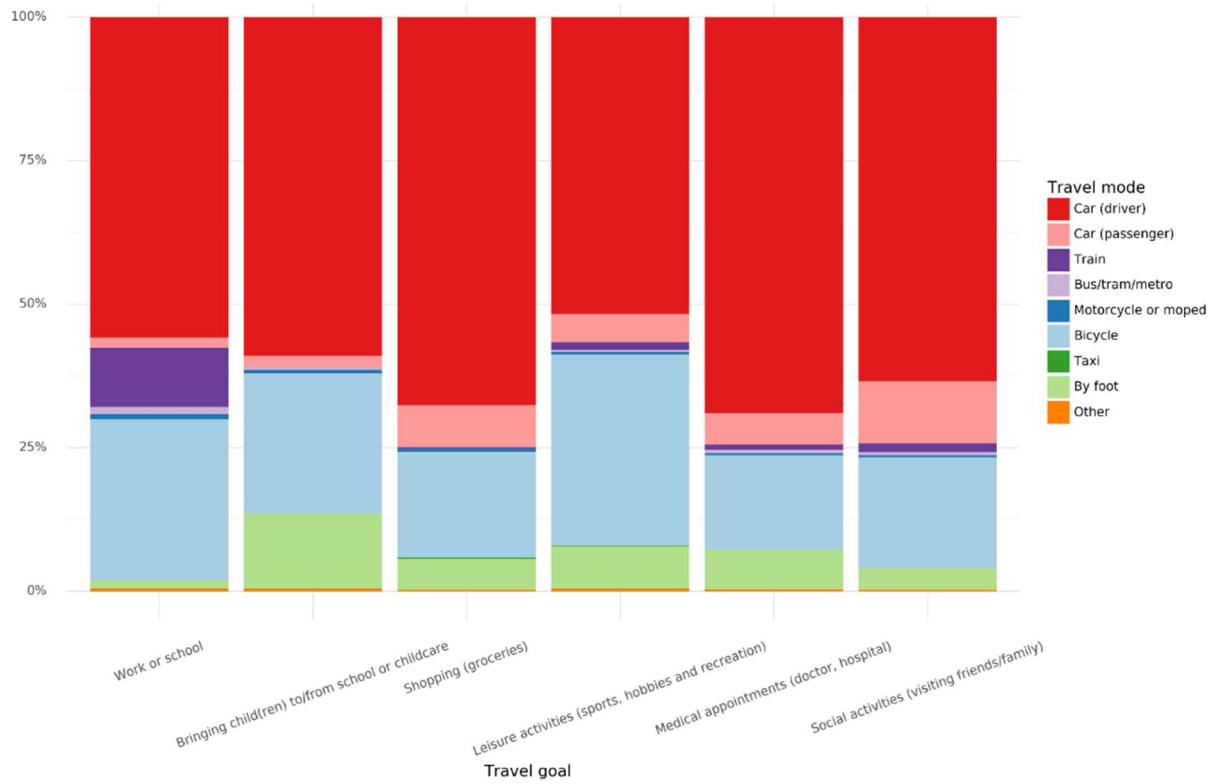

Figure 5: Modal split per travel goal (relative)

2.4 Political context

In its 2014-2019 Coalition Agreement, the Flemish Government first expressed its intention to thoroughly reform public transport in Flanders. This would involve moving away from "basic mobility", which has been one of the foundations of the Flemish mobility policy since 2001 and which involved guaranteeing a minimum provision of public transport close to home for everyone, and making way for the new concept of "basic accessibility".

This new Flemish vision for mobility policy aims in the first place at a shift from supply-oriented public transport to more demand-driven public transport on the basis of actual transport flows.

In addition, the emphasis is placed on "combi-mobility", in which different means of transport are combined to reach a certain destination. In order to make such combi-mobility somewhat workable, an integrated multimodal mobility network with seamless interconnection needs to be put in place to ensure a smooth flow between the various means of transport.

Finally, local authorities must also be involved in the organisation of public transport, and innovative information and communication technologies must be promoted.

This political shift implies that the offer of publicly available transport services will be redrawn. One of the consequences is that the Belbus will no longer be organised by the Flemish government, but a Regional Transport Council decides on the budgets and priorities.

The shift from basic mobility to basic accessibility, and thus the introduction of the new vision for mobility into the regulatory framework, was anchored in the decree of 3 April 2019 on basic accessibility, which entered into force on 22 June 2019.

2.5 Integration into the public transport network

2.5.1 From an organisational perspective

For any service, it is important to define a clear vision on the role it takes in a global public transport architecture. The Flexbus is a service that is part of the local network. There it is situated at the same level as shared bikes, steps, taxis, small ferries, etc.

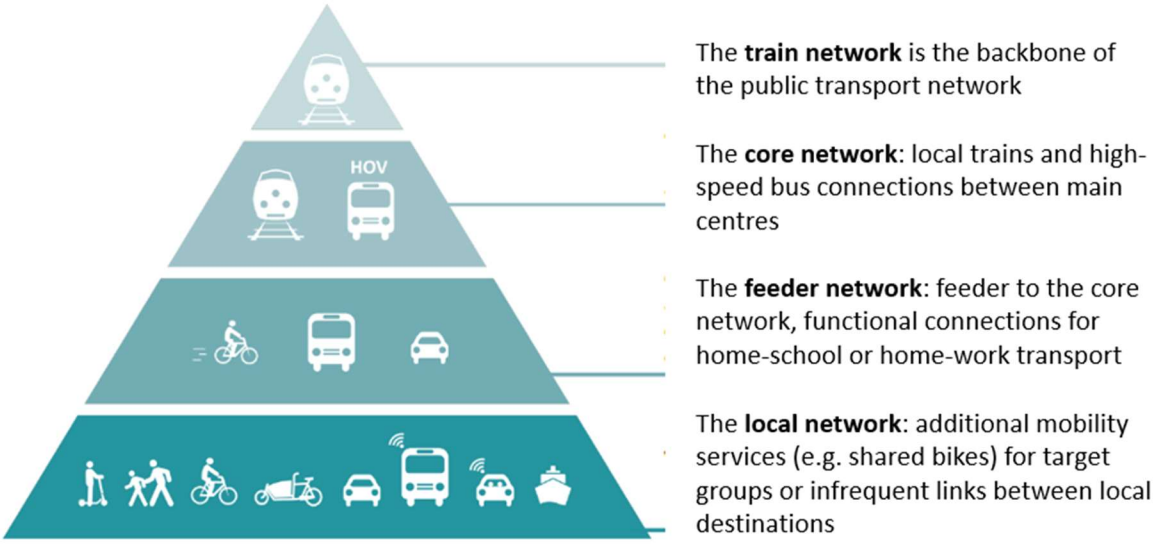

Figure 6: public transport architecture in Flanders

This is the theoretical architecture. In reality, the Flexbus serves as a feeder towards the train and core networks too.

The Flemish government is working on a MAAS platform to offer these functional layers of mobility services in a single customer oriented application. This is expected to be ready in 2021. The Flexbus will be part of this.

2.5.2 Existent transportation services

2.5.2.1 General accessibility by public transport

The bus routes in Belgium are handled by three different companies. De Lijn is responsible for the Flanders network, while TEC handles bus travel in Wallonia. The STIB buses cover the Brussels metropolitan area.

In the starting situation, public transport services are available. The main feature is the Dial-a-bus service or “Belbus”. This is a demand-driven bus, for which the numbers of passengers and trips were declining over the latest few years. In the next section, we inquire more in-depth why this service did not work well.

There are two bus regular lines:

- Bus 252 Boom – Puurs – Bornem - Dendermonde
- Bus 257 Dendermonde - Bornem – Boom

The area also has three train stations:

- Puurs, with direct trains to Sint-Niklaas, Louvain and Mechelen (railway line 54) and Antwerp (railway line 52).
- Bornem, with direct trains to St.-Niklaas, Leuven en Mechelen (railway line 54).
- Ruisbroek, with direct trains to Puurs and Antwerp (railway line 52).

Moreover, there are dedicated transportation services available for special target groups (school children, handicapped). When the pilot started, the municipality of Bornem offered a local bus service on a fixed tour, free of charge. This service was succesful but it was too expensive to be sustained. Figure 7 shows current bus stops (blue dots) and train stations NMBS.

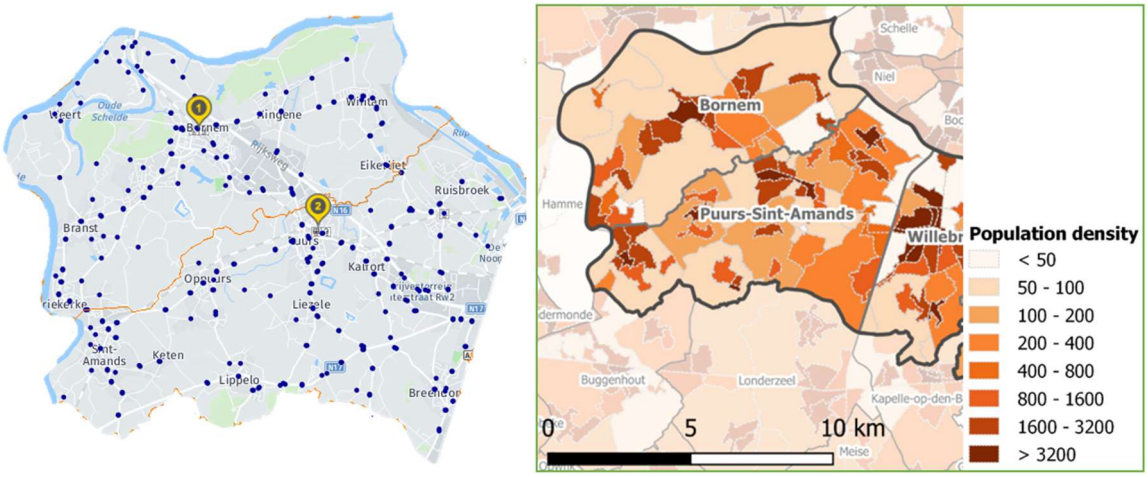

Figure 7: Service area Klein-Brabant and population density
Source: https://www.geopunt.be/

This offer, however, does not provide a sufficiently efficient possibility to travel. The University of Ghent, partner in the project MOVE, has plotted the time needed to reach several types of services. The maps below, show the entire region in which IGEMO operates.

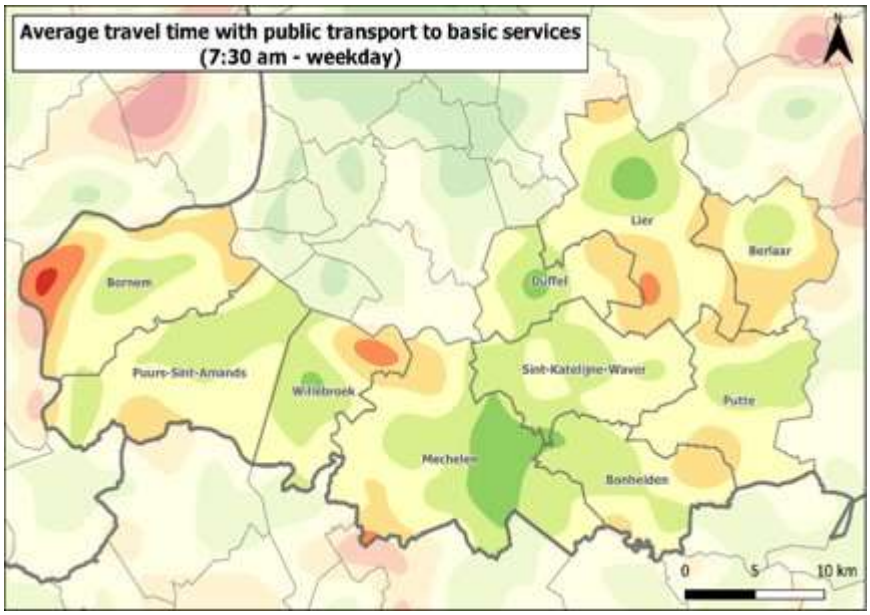

Figure 8: Average Travel Time to basic services by public transport (7:30 a.m. on week days)

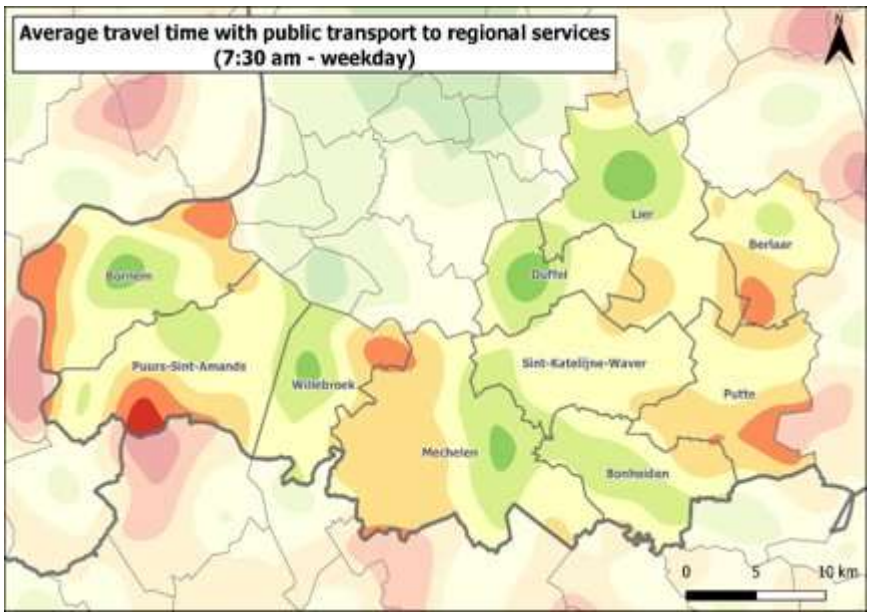

Figure 9: Average Travel Time to regional services by public transport (7:30 a.m. on week days)

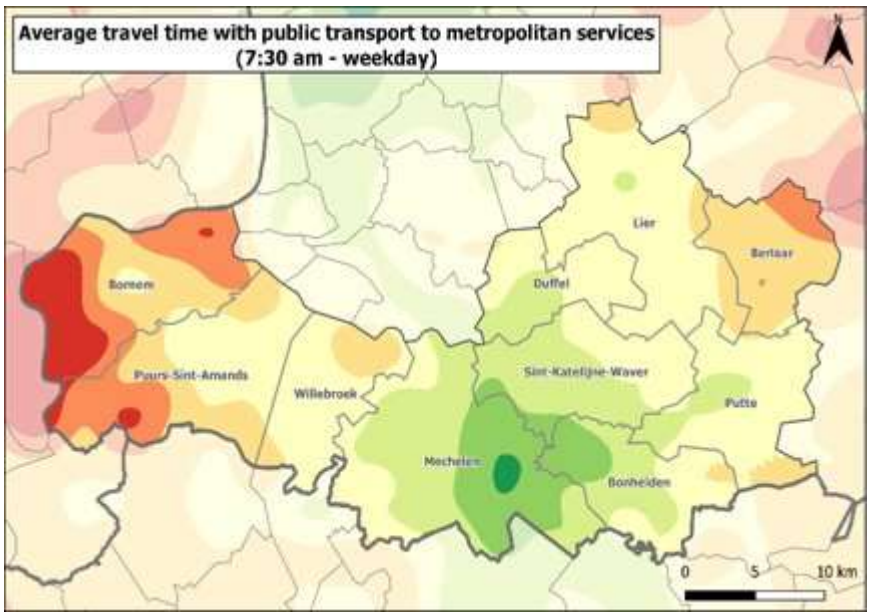

Figure 10: Average Travel Time to metropolitan services by public transport (7:30 a.m. on weekdays)

The survey by the University of Ghent thus pointed out that for the larger area Klein-Brabant was an area in which was eligible for a mobility solution.

2.5.2.2 Experience of mobility poverty

The survey also gave an insight in the reasons why people experience restrictions on travel. The nature of these restrictions is merely practical (Figure 11). It is striking that travel restrictions are mainly felt by respondents from generations Y (millennials) and Z (teens). These groups are supposed

to be very skilled in finding information online and are supposed to be able to find solutions. We assume that they are willing to make more use of urban services and are less able to use the private car than other generations.

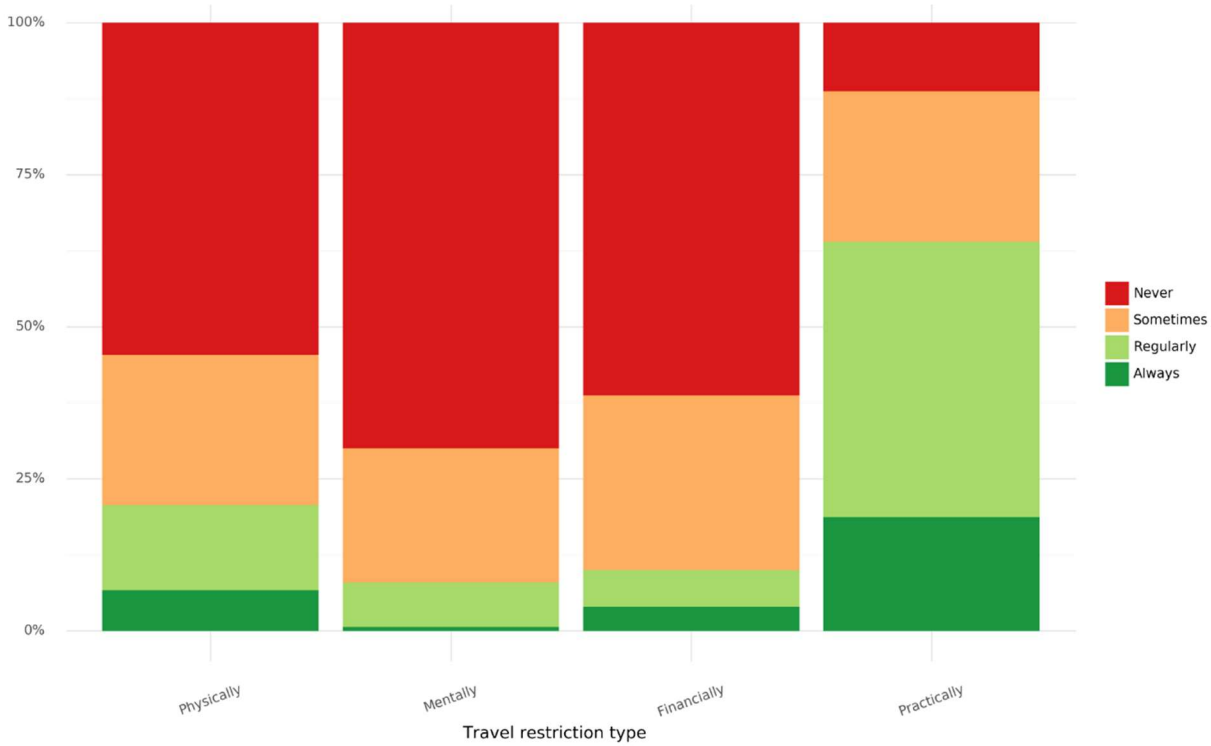

Figure 11: ***Frequency of the travel restrictions***

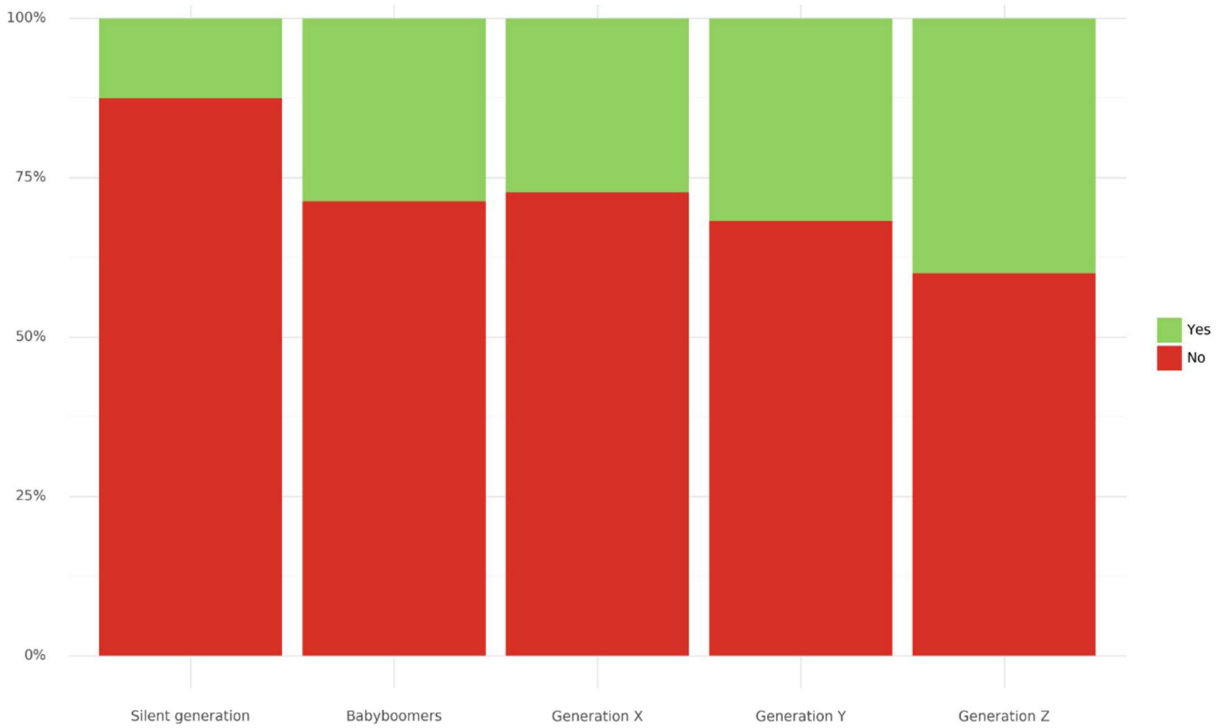

Figure 12: Feeling of travel restrictions per generation

2.5.2.3 The Belbus service

The Belbus is was an on demand bus service that was available in the Klein-Brabant area. Whoever wanted to use this service, could call an operator, register and book. Trips were between bus stops in a delimited area that roughly coincided with the Klein-Brabant area. Payment is performed with the same tickets that are used on any public bus in Flanders. The Belbus service also exists in other areas in Flanders. There were no means to register or book online. That is the main difference with the Flexbus.

The survey made clear that most users were not very satisfied with the Belbus service. Moreover, many people never make use of this service. The Ghent University survey dug deeper into the

underlying reasons for this.

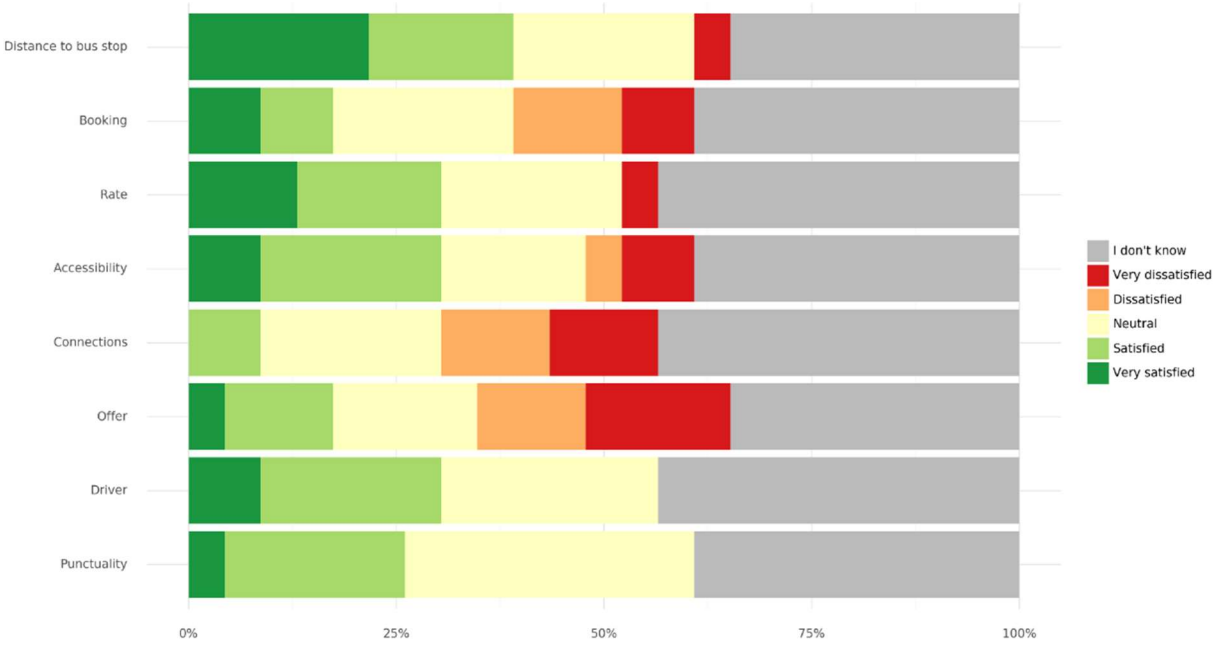

Figure 13: Aspects of satisfaction with the Belbus (by users)

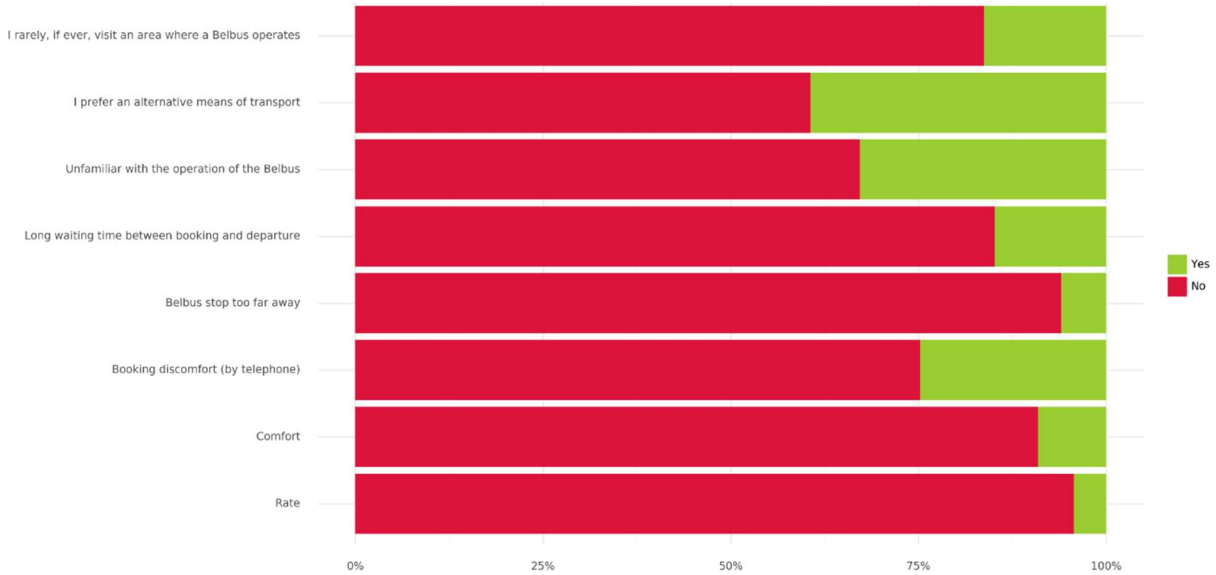

Figure 14: Reasons not to use the Belbus (by non-users)

In the group of users, as well as in the group of non-users, we could detect a dissatisfaction with the booking system. This was also an often heard complaint among inhabitants of the area. The operators making the bookings had a bad reputation. One of the employees of the public transport company confirmed that the telephone operator making the bookings had an impact on the number of trips.

This is where the idea of implementing an online booking system stems from, moreover since we detected that the younger generations, which are handy with online applications, experience restrictions to travel.

3 PILOT DESCRIPTION

3.1 Target groups

The user group of the Flexbus has not been surveyed specifically. The survey by the University of Ghent confirmed it is mostly an older public, not very well off, not highly educated. Another part of the users consists of teenagers. Most users are known on a first name basis by the bus drivers. This indicates that the users are a relatively stable group and that this group is hardly growing.

In the Segment Toolkit (Intelligent Energy Europe)[1] mobility profiles of the potential users are defined for targeting potential sustainable mobility users. Demographical characteristics of this group are mostly:

- Women
- Elderly people
- Young people
- Low-schooled people
- People working part time

The kind of trips people make most, are towards and from the train stations in Klein-Brabant. The Flexbus could thus be an aid to increase the number of combined bus-train trips over a longer distance by making the train stations more accessible.

Market research was not the main motive to start this pilot. The research served mainly to support a preference for action that already existed. It was interesting and important to do research in order to find confirmation that the booking system of the Belbus was limiting the full potential of the service. However, the signals that local aldermen picked up from the people living in their villages, were more decisive in the selection and concept of the pilot.

In this phase, following the MOVE-approach, we should have organised a co-creation session. The idea of a third party talking to customers of public transport provider De Lijn or voters for the local council was not welcomed. As a consequence, the potential users of the Flexbus were represented by the municipality and by the public transport provider. Other than that, several people in the IGEMO team live in the Klein-Brabant area and have gathered inputs from informal contacts.

This experience is a major lesson for anyone who would want to set up a co-creation session. We recommend that you check out if the group of people you would like to consult is important in any way.

[1] https://ec.europa.eu/energy/intelligent/projects/en/projects/segment#results

3.2 Organisation

Since this was a pilot, no new organisation or legal structure was set up. The pilot was implemented merely by a partnership of existing organisations.

Figure 15: Partnership

At a political level, the Regional Transport Board was responsible. Flanders is divided into fifteen transport regions or "Vervoerregio's". This recently founded structure was set up to improve interadministrative cooperation. Each transport region council consists of representatives of various mobility stakeholders such as the Flemish public transport company De Lijn, the Agency for Roads and Traffic and the municipalities of the region concerned.

The existing public transport company (De Lijn) was responsible for operational elements: the contract with the bus companies, bookings (including the development of booking app), ticket sales, provision of information. The pilot has been implemented with the budget this company has for the Belbus. Limited budget has been added by the Flemish public authorities, for communication.

The municipalities played a key role at the local level: they provided information and took up ambassadorship towards citizens, gathered reactions by users and forwarded this feedback to the pilot team.

The role of IGEMO was to initiate the pilot and embed this experience in the project MOVE. For instance, the evaluation part of the pilot has been mostly carried out by IGEMO. IGEMO has put the partnership together and managed a process that allowed the pilot to be implemented. The role in communication was to co-ordinate the communication that was published by the other partners.

3.3 Communication

The Flexbus was communicated with budgets from the public transport company, the Regional Transport Council and the municipalities. The reason why IGEMO or the project MOVE, which could provide budgets for communication, could not communicate according to the communications guidelines. The bus company paid for operating the bus service and thus did not allow to have anything but their own communication on the busses or bus stops.

Figure 16: Communication on the bus stop and on the bus

The most successful communication efforts were made by the municipalities. These acted as ambassador of the Flexbus project. They used their regular means of communication: social media, a web site and the monthly magazine. The alderman of the Puurs-Sint-Amands municipality has actively been promoting the project at several meetings with locals.

Supplementary the Regional Transport Council has paid for a flyer and for a Facebook campaign.

As will be pointed out further in this paper, we consider the communication on the Flexbus as a key element in its success.

3.4 The service

3.4.1 Service times

The service was delivered with two small busses, accessible for up to 15 people including one person with a wheelchair. The vehicles were deployed as follows.

Vehicle	Week days	Holidays	Saturday	Sunday
KB10	6 a.m. – 9 p.m.	6 a.m. – 9 p.m.	8 a.m. – 11 p.m.	10 a.m. – 7 p.m.
KB2	7 a.m. – 6 p.m.	9 a.m. – 6 p.m.	-	-

Figure 17: Children boarding the Flexbus

3.4.2 Bookings

Since the comfort and flexibility of booking seemed to be the problem of the Belbus service, we improved the possibilities to book in several ways. We made it possible:

- To book on Sundays (before not possible).
- To book online (before only possible by phone).
- To book until 30 before the trip (before it was 60 minutes).

Bookings can be made through a web form or a call centre. In the trial phase, reservations with the app must be made during the opening hours of the call centre:

- Weekdays: 6 am to 7.30 pm
- Saturday: 7.30 am to 5 pm
- Sundays and public holidays: 7.30 am to 3 pm

When the trip required by a passenger is also delivered by the regular bus service within a time frame of 20 minutes before or after the required time, the passenger will be referred to the regular bus service. This is in order to avoid that a Flex Bus would drive behind a regular bus.

3.4.3 Ticketing

Tickets are the same as the regular bus service. Tariffs vary from 1 EUR to 2.20 EUR for one hour. Tickets are sold both online, on the bus, or at sales points. The tickets for 1 EUR are sold locally in Puurs-Sint-Amands and partly financed by the municipality as a third party. Bus passes from De Lijn were valid on the Flexbus.

Children under 6 years old travel for free but must always be accompanied by a paying traveller of at least 12 years old. There are numerous formulas to give access to needy, handicapped and elderly people at reduced tariffs or for free. All of these were valid on the Flexbus.

3.5 Financial aspects

3.5.1 Costs

The operations of the Flex bus were financed by the public transport company De Lijn. They were not entitled to give us precise data on the cost of the development of a web application, nor on the cost of operating the Belbus or the Flexbus. The only indication we received was that the cost is around 150.000 EUR per vehicle per year. This covers the cost of having the bus driven by a contractor, without overhead costs of De Lijn.

On this basis, we made the rough estimation of the costs in the table below. It appears that the Flexbus is more 2.675 EUR more expensive, because of the higher fuel consumption, which is a result of the increase of user numbers.

Table 2: Itemised overview of costs, yearly, comparison Belbus and Flexbus

	Belbus	**Flexbus**
Depreciation of vehicle	€ 16.500	€ 16.500
Rent of the depot	€ 750	€ 750
Insurance of vehicles and passengers	€ 1.500	€ 1.500
Fuel (9l/100km at 1,35/l)	€ 5.348	€ 7.924
Vehicle maintenance and repairs	€ -	€ 4.905
Technical inspection of vehicles	€ -	€ 750
Cleaning	€ 1.500	€ 825
Driver's salaries and allowances	€ 75	€ 75
Vehicle registration	€ 7.283	€ 7.647
Yearly road taxes	€ 145.659	€ 152.942
Depreciation and maintenance of bus stops	€ 1.500	
Telematics	€ 100	
Backend informatics	€ 10.000	€ 10.000
Planning and organization	€ 750	€ 750
Dispatching	€ 500	€ 500
Uniform of the driver	€ 9.711	€ 10.196
	€ 19.421	**€ 30.588**

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. The Flexbus Klein-Brabant is cheaper: 15.31 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.

Since a bus company, which will try to make profit, delivers some of the services, the cost could be up to 20% higher. This depends largely on the market and on the scope of the services delivered by private companies. This should be added to the overall cost.

Supplementary sources on costs and benefits of public bus services can be found in the following sources.

- CROW. (2015). Kostenkengetallen regionaal openbaar vervoer 2015. Ede: CROW. (CROW, 2015)
- Rebel Group. (2013). Standaardmethodiek voor MKBA van transportinfrastructuurprojecten – Kengetallenboek. Brussel: Vlaamse Overheid, Departement Mobiliteit en Openbare Werken (Rebel Group, 2013).

3.5.2 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.

As already mentioned, the tariffs on the Flexbus were the same as for any public bus in Flanders. This means that the revenues from tickets are impossible to calculate precisely. If we make a rough estimate of 1 EURO revenue per trip, the Flexbus pilot would have had a revenue of 8 051 EUR over 6 months.
In the pilot, no use was made of the possibility to use advertisements as a source of income.

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 form 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%).

It is unclear from the pilot whether passengers are willing to pay more for the increased flexibility, but since few are making use of it, flexibility does not seem to be a valuable selling proposition.