C Public bicycles in Brussels: Assessment, Scenarios, Recommendations

April 2024

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BRUSSELS-CAPITAL REGION

Funded by the European Union
NextGenerationEU

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Mission	Preparatory study for the public bicycles service of the Brussels-Capital Region in 2026: Benchmark and Recommendations.
Quote	BEROUD B., VAN ZEEBROECK B., PEDUZZI E, (2024), Public Bicycles in Brussels: Assessment, Scenarios, Recommendations | Preparatory study for the public bicycles service of the Brussels-Capital Region in 2026: Benchmark and Recommendations, [Brussels-Capital Region, Brussels Mobility], April 2024, 122 p.

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Summary

Glossary

Cycling

BS	Bike Share (service or system)
e-PB	Public e-Bicycles (Public pedelecs)
e-SB	Shared e-Bicycles (Shared pedelecs)
GBFS	General Bikeshare Feed Specification
LTR	Long-Term (cycle) Rental
PB	Public (funded) Bicycle
SB	Shared Bicycles
SSEB	Social and Solidarity-Based Economy Bicycle

Stakeholders

BCR	Brussels-Capital Region
BM	Brussels Mobility
GBCR	Government of the Brussels-Capital Region
STIB	Brussels Inter-Municipal Transport Company

Vocabulary

B2C	Business to Customers
B2G	Business to Government
B2G2C	Business to Government to Citizens
CAPEX	Capital expenditure
ET	Excluding tax
KPI	Key Performance Indicator
MAAS	Mobility-as-a-Service
OPEX	Operational expenditure
PI	Performance Indicator
PSD	Public Service Delegation
PT	Public Transport
SGEI	Service of General Economic Interest
SLA	Service Level Agreement
T&C	Terms and Conditions of sale

1 Preamble

1.1 A thwarted history. Is it worth persevering beyond 2026?

After the failure of *Cyclocity* between 2005 and 2009 in Brussels, *Villo !* became the Brussels-Capital Region's public bicycle (PB) sharing service. *Villo !* faces many challenges:

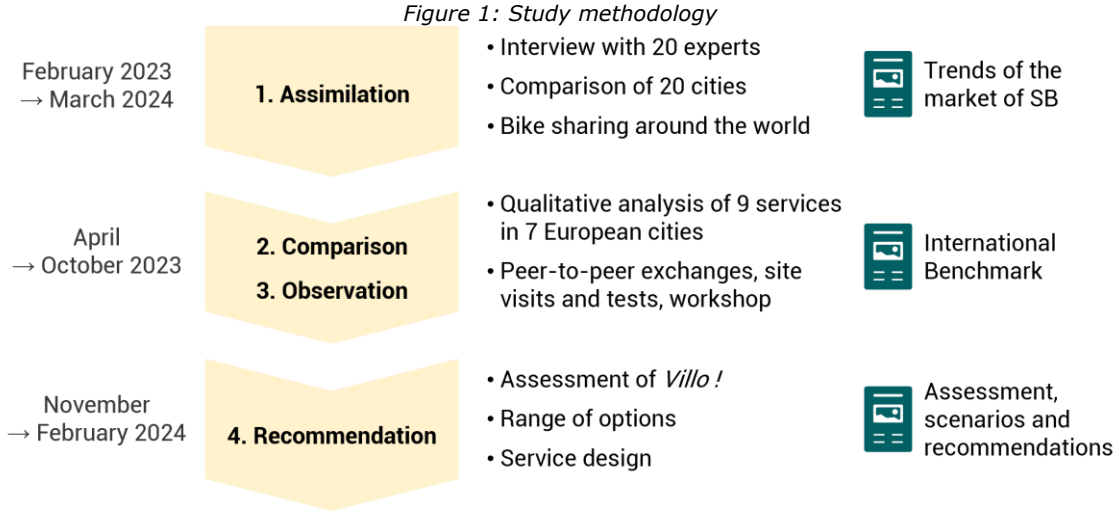
- number of rentals/bike/day declining steadily and among the lowest in Europe.
- weariness of an 18-year concession (15 + 3) and limited room for manoeuvre.
- strong cycling policy, in which PB is not seen as the best investment.
- failure of portable batteries, competition from private shared e-bikes (SB) and the supervision of micromobility via private licences.

With the *Villo !* concession with JC Decaux coming to an end on 16 September 2026, Brussels Mobility's mobility authority is looking ahead to the future with this study. The study's steering committee is open to all scenarios and had a number of questions:

Purpose	What is the point of an PB service? Why invest public money?
Service	PB, LTR (Long Term cycle Rental), both or neither? What about e-scooters?
Operators	How many operators are needed: 0, 1, 2, 3?
Governance	Could private players be trusted? What role can public authorities play? What role for STIB, the Brussels public transport operator? Are PB a public service to be financed or a private service to be supervised?
Bikes	Are pedelecs essential? If so, in what proportion? How is charging carried out: at the station or by swapping batteries on the street?
Station	Is it better to have stations with furniture or just virtual stations?
Contracts	Should the PB service continue to be linked to outdoor advertising space contract? How much will it cost the public authorities? How long should the contract be?

A robust methodology involving benchmarking, investigations and explorations was implemented to inform decision-making *(Figure 1)*. This report presents the assessment, scenarios and recommendations.

Figure 1: Study methodology



1.2 Political ambition

To provide access to a bicycle and develop shared mobility, in line with Good Move the regional mobility plan for 2020-2030, the Government of the Brussels-Capital Region considers "public bicycles to be the fourth pillar of public transport in Brussels (metro, tram, bus and bicycle)". This ambition has been a guiding principle throughout this study.

2 Assessment of Brussels' Public Bicycles

2.1 History and deadlines

2005 The City of Brussels launched Cyclocity, with 250 bikes and 25 stations.

2009 End of Cyclocity. The Brussels-Capital Region awarded JC Decaux a contract to supply and operate 5,000 *Villo !* units, 360 stations and 347 advertising spaces, in two-phase.

2017 Billy-Bike and Obike were the first private free-floating SB, joined in subsequent years by Gobee.bike, Dott, Jump, Lime, Pony, Bolt, Dott, Voi, Tier, Poppy *(Figure 2)*.

2018 Bike share ruling | 30% of *Villo !* vehicles are electrified with removable batteries.

2024 Awarding of three-year licences to Bolt, Dott and Voi to deploy up to 7,500 bikes in 3,000 dropzones, shared with scooters (1,600 deployed by end of 2023).

2025 Cohabitation of 12,500 theoretical bikes: 5,000 *Villo !* + 7,500 private SBs.

2026 16 September: end of the *Villo !* concession; next step is to be decided in 2024 *(Figure 3)*.
31 December: end of the three private licences.

Figure 2: Arrival/departure of micromobility players in Brussels from 2017 to 2024 (Brussels Mobility)

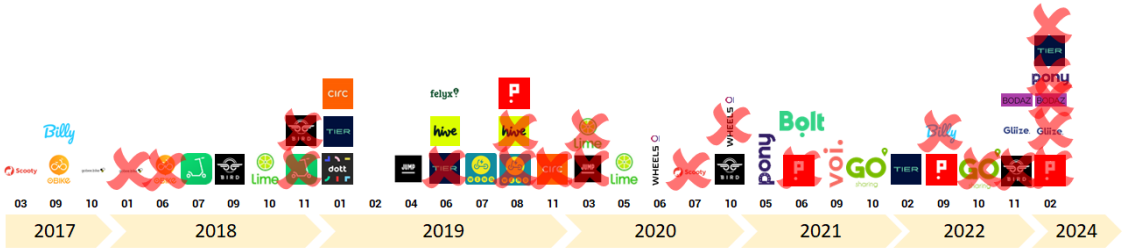


Figure 3: A tight schedule for smooth installation and operation

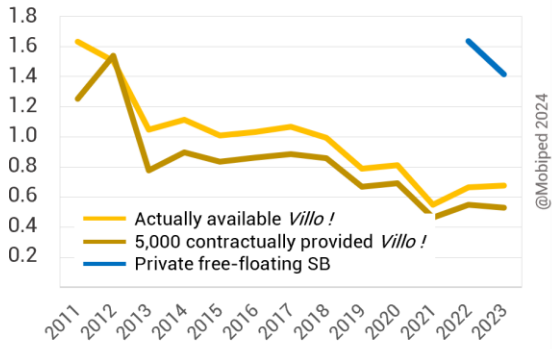
2.2 Usage rates have been falling steadily for over ten years

Public Bicycles: since its launch, the number of *Villo !* rentals per bike per day has been falling steadily *(Figure 4)*. In 2023, there were 970,000 rentals, i.e.:

- 0.53 rental/contract bike (5,000)/day (brown line).
- 0.67 rentals/bike available for rent (3,935)/day (orange line).

Private Shared Bicycles: with an average of 2,346 bicycles available in the street in 2023, private shared e-bicycles generated 1,212,000 rentals, or 1.42 rentals/bicycle available/day (blue line).

Figure 4: Theoretical and actual rentals/day/PB from 2011 to 2023



2.3 The opinion of associations

Brussels-based associations BRAL, GRACQ, FIETSERSBOND and CYCLO shared their feedback and perspectives on PB and Long-Term cycle Rental (*Source 33*), summarised below.

2.3.1 *Villo !*, a service to be improved

Several difficulties were shared: heavy bikes not always in working order, users not listened to enough (customer service, committee), poor image of the service, complex process for a single use/test.

2.3.2 Consider PB as a tool

PB can be a tool to facilitate acceptance of the Good Move plan's traffic changes, for example by organising a consultation on the location of stations and supporting the transformation to a calmer public space *(Photos below)*. Furthermore, PB contributes to the functionality economy. However, PB does not allow people to get cycling for the first time of their life.

2.3.3 PB, a public service

The associations prefer a public governance to abandoning the service to the private market, with its more precarious working conditions. The associations:

- warned of the digital divide in public services.
- consider that PB could be integrated into the public transport offer.
- call for consultation before setting up stations in working-class neighbourhoods. This can be seen both in the target audiences and staff recruitment *(Source 35)*.

Transformation of a car street (Credit: NYC Department of Transportation, Source 20)

Consultation between authorities and residents (Credit: NYC Department of Transportation, Source 20)

2.3.4 Diversifying bicycle investments

The associations are in favour of the idea of a LTR and call for continued investment in the bicycle "system" to promote cycling.

2.4 Feedback from user and non-user surveys

2.4.1 2017 user survey

In 2017, the user survey (*Source 52*) provided the following results:

- 70% of users and non-users felt that *Villo !* boosted cycling in Brussels.
- 47% of those interviewed had intermodal PT + *Villo !* practices.
- 17% started cycling thanks to *Villo !* compared with 50% in 2012.
- 25% of users in 2012 and 2017 had less need for a personal bike because of *Villo !*.
- 3% had acquired a personal bicycle to become regular cyclists.

2.4.2 2023 user and non-user surveys

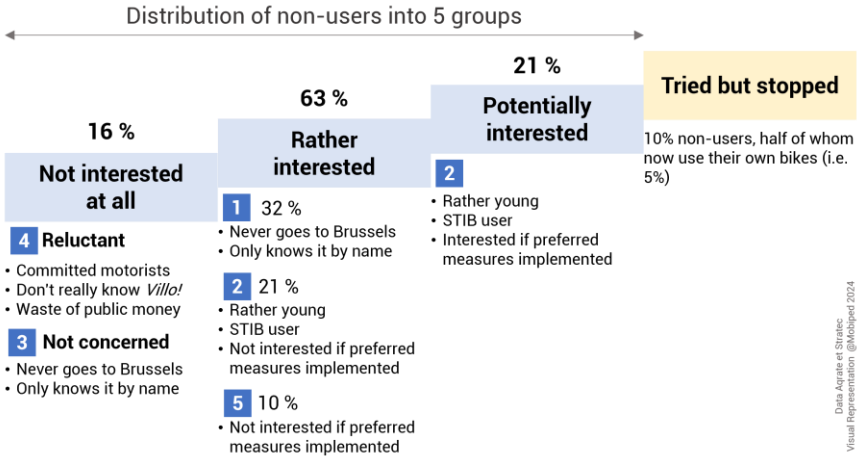
Surveys published in 2023 of micromobility users *(Source 43)* and non-users *(Source 44)* help to identify obstacles and possible improvements *(Figure 5)*:

- access time and the type and condition of the bike were the main obstacles to *Villo !* use.
- *Villo !* had a positive image among users. Among non-users, the image was rather neutral. However, 62% considered it positive to keep in Brussels an PB service in stations.
- integration with STIB is welcomed.
- 21% of non-users interested in case of a more attractive offer *(Figure 6)*.
- beyond the 30% who did not ride a bike because they did not have one, *Villo !* use was primarily dependent on the cycling insecurity feeling: risk of accident, lack of facilities.
- 86% of *Villo !* respondents in 2023 had a driver's licence *(Source 43)*.

Figure 5: Opinions of Villo !- and micromobility users and Villo !-non-users living in the Brussels Region

Survey participants	Barriers to using *Villo !* (1 answer)	Barriers to using *Villo !* (Several answers)	Villo ! image	Future user if …	Other comments
Regular users *Villo !* [15] *660 responses*	42% Bike condition 22% Access time 17% Bike weight	73% Bike condition 69% Access time 64% Bike weight	79% 15% 6%		87% of *Villo !* users cite "saving time" as a reason for using it. It is the main reason for 56% (*1,350 responses*).
All micromobility users [15] *2,411 responses*	30% Access time 24% Bike condition 12% Type of bike + No e-PB	50% Weight + bike condition 40% No e-PB 38% Access time	42% 36% 22%	61%: Rates < free-floating 56%: Pedelecs 35%: Basket	A declared interest in: > 60%: STIB-MIVB bicycles > 70%: PB + STIB-MIVB offers > 80%: PB in STIB-MIVB fares, shared mobile app, stations closed to the STIB-MIVB network.
***Villo !* non-users, BCR residents** [16] *304 responses*	33% Access time 18% Bike type 15% Bike condition	40% Transport of children and goods not possible 32% Bike weight 31% Bike type (No pedelecs)	33% 49% 18%	With a more attractive offer 35% 25% 40%	Keep a PB with docking stations: 62% | 23% | 15% Do not cycle because 55%: Risk of accident 32%: Weather 30%: No bike 25%: Lack of facilities

Figure 6: Distribution of Villo ! non-users who may or may not live in the BCR (Data 44)

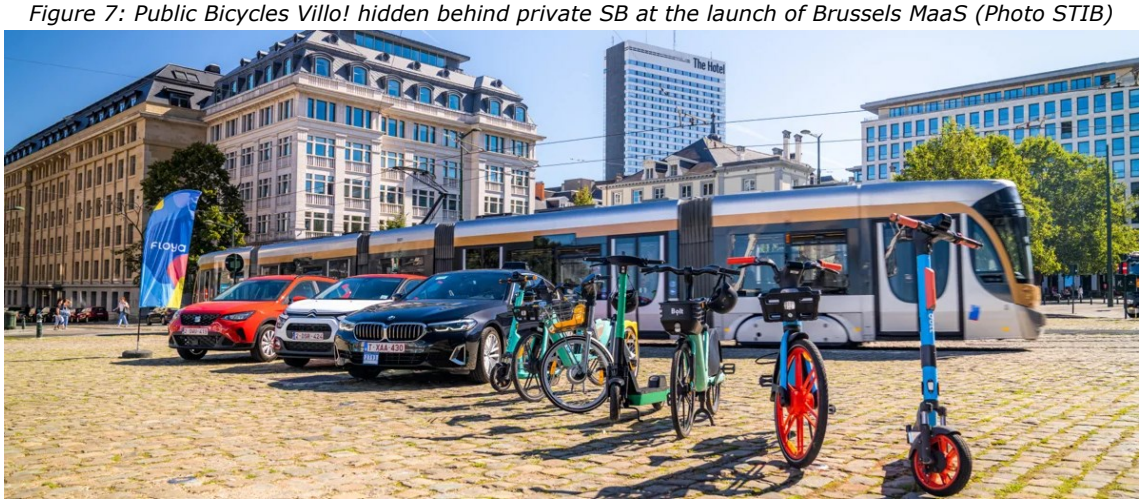


2.5 *Villo !*: disappointing results but real improving opportunities

The following SWOT (Strengths Weaknesses Opportunities Threats) analysis is the result of taking a step back after learning from the benchmark and analysing market trends, as well as the SWOT of cycling in Brussels (*Appendix 10.1*). These opportunities call for a closer look at the subject, and a questioning of the public objectives of such a service.

***Villo !* Strengths**	***Villo !* Weaknesses**
• Region-wide coverage • Good user value for money • 16% of Brussels residents have tried *Villo !* [3] • *Villo !* a brand familiar to 98% of Brussels residents [3] • 15 years of experience • Public space footprint, with power supply	• Insufficient station density • Unsatisfactory user experience • Competition from free-floating SB (highly visible shimmering colours, positioned on paths, pedelecs, simpler user experience, absence of architectural constraints, promotion by public authorities - *Figure 7)* • Women and low-income earners under-represented • Low direct impact on cars and bicycles • Disadvantageous contract for local authorities • Inadequate and non-assessable objective
Opportunities	**Threats**
• Weaknesses identified and can be improved • Improve access to a bicycle to 50% of Brussels residents, and to 90% to a pedelecs. • Integration with public transport • Pedelecs, better adapted to topography • Many service providers interested • Complementary with Long-Term Rental	• Feeling unsafe cycling in traffic • Transition and electrification at risk • Competition from private SB in dropzones • Unsecured budget and risk of vandalism • Disregard for vulnerable profiles • Culture, budget and limited resources of the mobility authority to supervise a service operator.

Figure 7: Public Bicycles Villo! hidden behind private SB at the launch of Brussels MaaS (Photo STIB)



Despite the current low level of use, there are real opportunities to be explored for a future attractive public bicycles service.

3 Public Bicycles possible objectives

3.1 Need to temper the expected impact of bike share

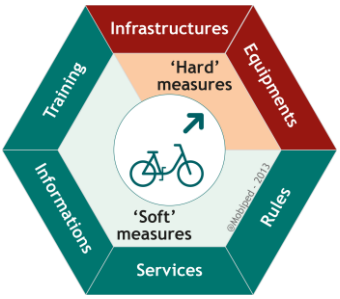
While bike share contributes to more sustainable mobility, it is not THE solution for reducing car use, developing cycling or providing access to a bicycle.

3.1.1 "Reducing car use": too ambitious for bike share alone

"Aiming for a modal shift towards soft mobility", as with the *Villo !* concession, is too ambitious for bike share on its own. Rather, it is a goal for the Good Move[47] regional mobility plan, with measures to restrict car use and the development of a wide range of alternatives to be used in combination or alternatively. The PB contribution to the Good Move plan remains modest, with three actions out of 50 *(Appendix 10.2)*:

- C1: Support the development of MaaS.
- C3: Develop cycling services and other light means of transport.
- C11: Strengthen shared mobility services.

3.1.2 "Develop cycling": bike share does not remove all obstacles



To travel by bike, a number of obstacles need to be overcome: access to a bike in good condition, knowing how to cycle in an urban environment, feeling safe, and having a journey time that is competitive with other modes. It is therefore essential to provide safe, attractive and comfortable cycling conditions. To this end, the Brussels-Capital Region's 2020 Bicycle Plan helps to create to a bicycle system as part of a mobility management approach *(figure right)*. As a result, bike share is a sub-action within the "Good Service" focus *(Figure 8)* with more or less impact on each Good Move focus.

Figure 8: Cycling actions declined with the Good Move approach (Data 48 | Author: Mobiped)

	Good Move focus	Description
A	Good Neighbourhood	Neighbourhoods that make keen to ride by bike (links and 30-zones).
B	Good Network	A high-performance network for cycling everywhere, by creating a coherent, hierarchical cycle network with good intersections. The comfort bike network will be completed in 2025 and the Vélo plus (structural) network in 2030.
C	Good Service	• Bicycle services to eliminate the need to own a car • Bicycle identification to prevent theft • Secure parking • Cycling as a Service: - cargo bike sharing - *Villo !* optimisation - other rental systems (long-term, free-floating, etc.) - Infovélo in Mobility Points - Routeplanner.bike.brussels - bike points in major stations - accessibility and transport of bicycles on metro trains and trams
D	Good Choice	Add bikes to the options catalogue
E	Good Partners	Create partnerships within the administration
F	Good Knowledge	Ongoing policy evaluation

3.1.3 "Provide access to a bicycle": one solution among many

One of the initial motivations for the study was to give the people of Brussels access to a bicycle. Bike share provides rapid bicycle access from public spaces throughout the country. But to really enable access to a bicycle, a number of measures are required to enable people to own, use or hire a bike, with varying levels of intervention by public authorities *(Figure 9)*. To reach different audiences and usages, Bike share needs to be integrated into a mobility management approach while complementing other bike rental services *(Figure 10)* and be accompanied by investments to reduce the obstacles it addresses *(Figure 11)*.

Figure 9: Bicycle access systems as a whole

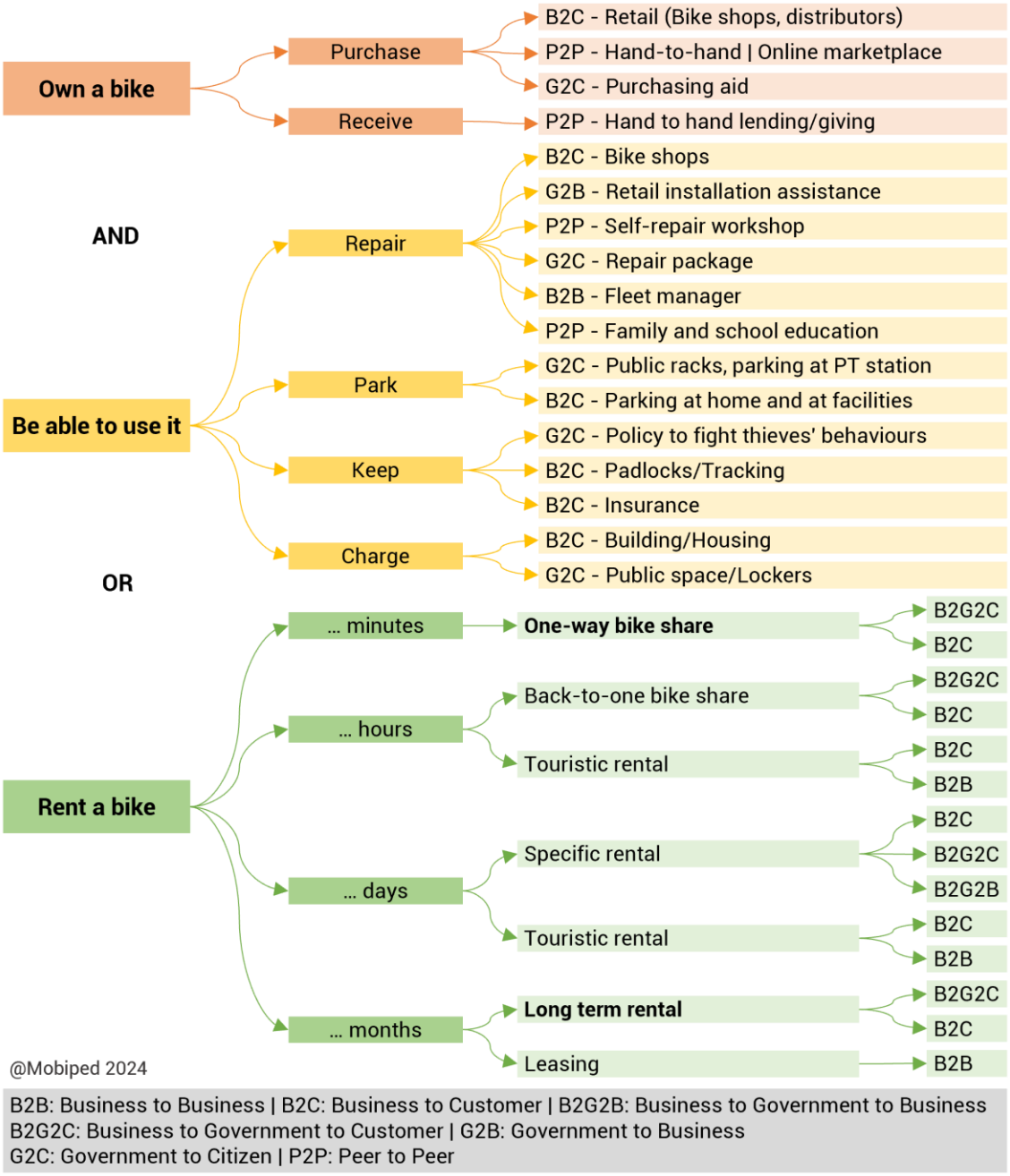


Figure 10: Diversity of bicycle rental services

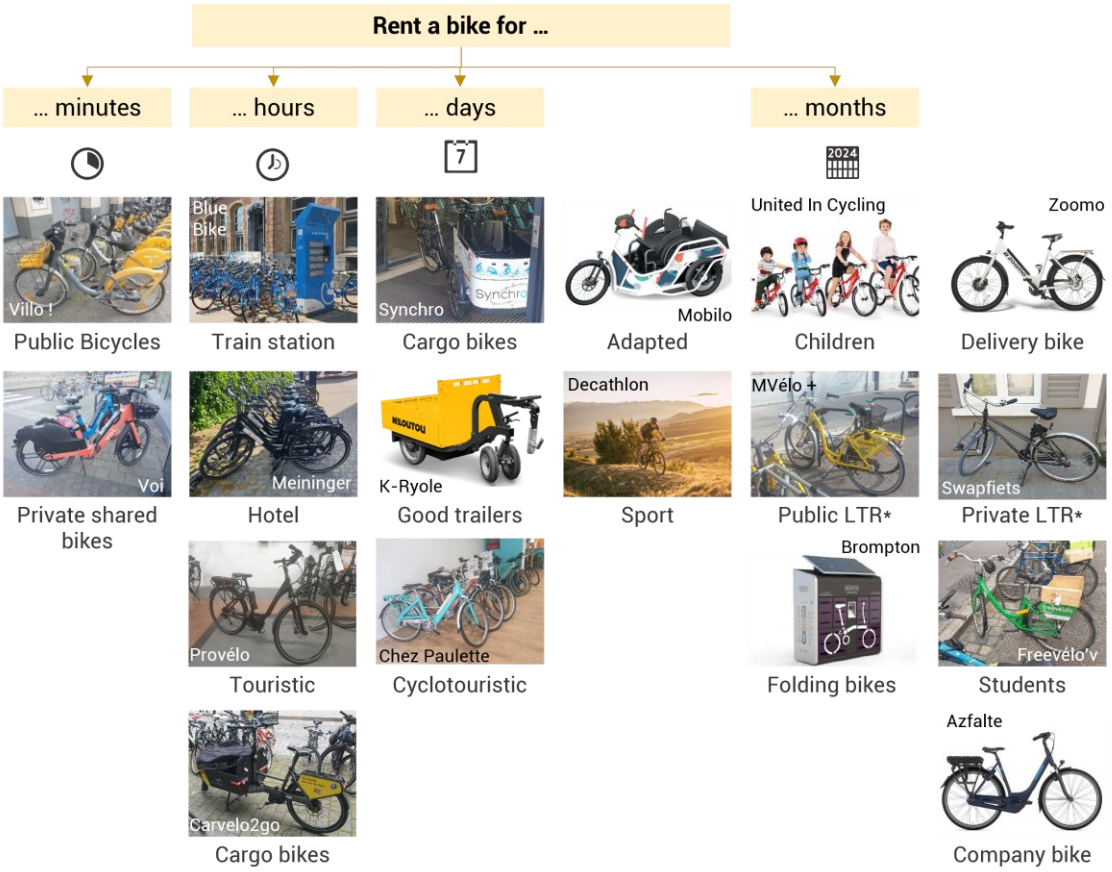


Figure 11: Actions to remove obstacles to accessing a personal bicycle

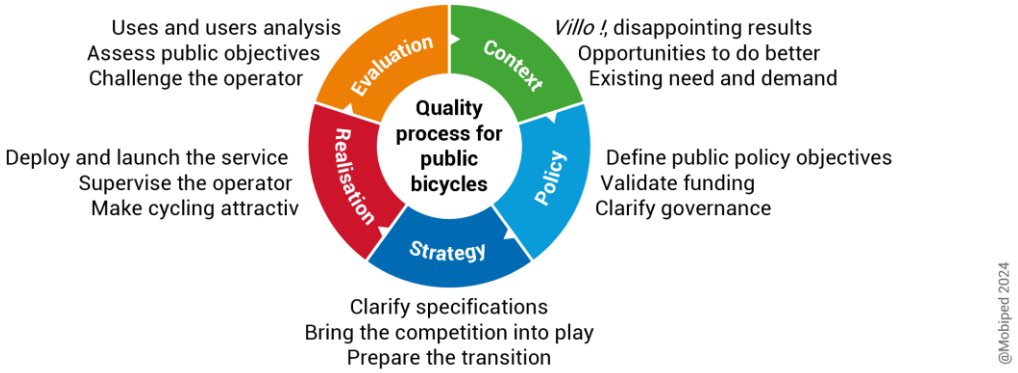
The obstacles removed by bike share	Cycling policy investment to address problems at source
Ownership	Purchasing aid Support for bicycle retailers.
Repairs	• Business financial support for the creation of bicycle repair shops. • User financial support to repair the bike stored and not used for years. • Fair financial support for bicycle self-repair associations, such as a SSEB services (Social and solidarity-based Economy Bicycle) *(Source 61)*.
Bike theft	Fight against bike thieves.
Easy-to-use parking	• Public areas: racks, secure racks (e.g. Bikeep, Edock, Locky, Sharelock etc.), stalls. • Intermodality: large parking areas at train stations, Metro, P&R, etc. • Building: local parking areas, parking areas in residential and office buildings.

3.2 How to fix precise, appropriate and measurable objectives?

3.2.1 Implement a quality-focused approach

With a view to public investment in a new PB service, a quality approach applied to PB, in the spirit of BYPAD [38], helps to define and evaluate public policy *(Figure 12)*.

Figure 12: Proposed quality-focused approach applied to PB in Brussels



3.2.2 List and prioritise possible performance indicators

To be evaluated, an objective must respect the SMART principle (Specific, Measurable, Acceptable, Realistic, Time-bound), with a precise collection and analysis methodology that may already exist (STIB Barometer, Good Move Indicators). For example, *Vélib'* in Paris has over 170 quality indicators, due to the complexity of the PB systems and their semantic subtleties. Potential indicators are listed in the appendix, including some inspired by Good Move and the International Transport Forum *(Appendix 10.3)*.

The method is to distinguish and prioritise the indicators, striking a balance between:

- efforts to collect/update data (e.g. contradictory field survey, counting, annual survey, user committee, automated data, observatory).
- utility and interdependencies: assess public policy, define contractual relationships, monitor service quality, generate knowledge, communicate *(Figure 13)*.
- data temporality, taking into account implementation times (order date, vision at a given moment, once implemented).
- deployment phases (different requirements in the first year).

To avoid being bike share centric approach and weight the impact of bike share, the indicators are also compared with those of the bicycle, mobility and territory sectors *(Appendix 10.5)*.

Figure 13: Categories of Key Performance Indicators (KPIs)

Topic	Type	Purpose
Public policies	KPI	Translate the public investment political ambition, with a view to evaluating and improving public policy.
Contractual	KPI	Incentivise the delivery of a high-performance service by distinguishing between resources/results and penalties/remuneration to specify the amounts paid. They are extremely precise, limited in number and can have an indirect impact on other sub-indicators. They can be discussed with candidates during the selection process.
Quality of service	PI	Improve user satisfaction and the service's image. These criteria can be ranked in order of perceived service quality.
Knowledge	PI	Conduct studies to understand how the service works.
Communication	PI	Communicate with the public.

3.3 Possible public policy objectives for a public bicycles service

In the Brussels-Capital Region government's vision of an bike share as the 4th pillar of public transport in Brussels, public bicycles would be a cross-reference:

- of the City Vision and Good Move focus areas *(Appendix 10.6)*.
- of BCR values.
- of STIB's mission (Figure 14).

Figure 14: Fundamentals of Good Move, the Brussels-Capital Region and STIB

Public policy objectives can be stated:

- for each Good Move focus *(Figure 15)*.
- by major PB theme *(Figure 16)*.

Figure 15: Possible public policy objectives of a public Bicycles service for each Good Move focus area

	Good Move focus	Challenges and objectives to be assessed annually
A	Good Neighbourhood	**A useful service for the people of Brussels** 50% of female subscribers and 10% of Brussels residents are subscribers.
B	Good Network	**A dense network** 50% of households are less than 150 m from an PB station.
C	Good Service	**A high-performance service** PB rentals account for more than 2% of STIB journeys.
D	Good Choice	**Multimodal practices** 20% of STIB subscribers use PB at least once a year.
E	Good Partners	**Local players gather around and thanks to cycling** Elected representatives, BM, STIB, Sibelga, etc. work together to ensure a smooth transition.
F	Good Knowledge	**Continuous improvement** Assessing usage and public policy.

Figure 16: Possible public objectives for efficient and effective PB, by theme

SERVICE EFFICIENCY	NUMERICAL CRITERIA
Annual rentals (> 2 min)/(contractual) bike/365 days	> 2 (relevance of shared parking compared to private bicycles) > 3 (minimum ambition) > 5 (European example)
PB rentals as a proportion of STIB journeys	> 2 %
POPULATION PENETRATION RATE	
Subscribers	> 10% of over 14s
Gender	> 50% female subscribers
People with up to secondary education	> 30% of subscribers
Former users who now ride their own bikes	> 5% of people surveyed
MULTIMODAL PRACTICES	
% of Brussels residents who consider cycling an integral part of the STIB offer	> 75 %
% of Brussels residents who have used PB at least once a year	> 20 %
% of new STIB customers thanks to bicycles	> 1 %
EFFICIENCY OF PUBLIC INVESTMENT	
Remaining cost (CAPEX + OPEX)/TRIP	< €2.58/trip (STIB reference) < €1/trip (ambition)
Remaining cost (CAPEX + OPEX)/KM	< €0.38/km (STIB)
Coverage rate (CAPEX + OPEX) of user revenue	> 18% (STIB) > 30% (low benchmark average) > 50% (high benchmark average)
OTHER IMPACTS	
Carbon footprint (Life cycle)	> 0 tons avoided (minimum)
% of users who would have travelled by car	10% of subscribers surveyed
Sale of a vehicle or not buying one	10% of subscribers surveyed
Average journey distance	> 3 km
Number of deaths, serious injuries and minor injuries per km	< than cyclists with their own bikes
Public healthcare spending avoided	To be defined

Before considering the contractual criteria to be required of the operator, the public authorities set their own public policy objectives.

4 Scenarios explored

4.1 Requests from the study steering committee

4.1.1 Public service ambitions

The steering committee invites an exploration of scenarios with PB and/or LTR. PB would be part of a public service perspective that includes:

- territorial coverage of the Brussels-Capital Region.
- guaranteed long-term service continuity.
- a fast, simple user experience that is as inclusive as possible.
- a public authority service with a public brand.
- a range of prices including social pricing.
- 100% pedelecs with an integrated battery.
- the integration of PB as a 4th mode of public transport service to:
    - extend the range of public mobility services, bicycles included.
    - aim towards a shared experience.
    - develop complementarity between PB and PT.

4.1.2 Why have a 100% pedelecs fleet with integrated battery?

First, pedelecs with integrated battery are:

- more widely used than pedal PB in mixed fleets, generating premature wear and tear, higher operating costs and less well-charged bikes.
- more high-performance than those with removable batteries like *Villo ! (Figure 17)*.

Second, and even if they present a number of challenges *(Appendix 10.4),* pedelecs have many benefits relevant to the Brussels context:

- a boost in hilly areas like Luxembourg and Marseille *(Figure 18)*.
- longer distances travelled in the hope of shifting journeys previously made by car.
- audience diversification: +9% women, +7 years average age in the examples studied.
- 89% of Brussels residents do not have access to a pedelecs *(See section 5.1)*.
- a credible offering in the face of comparison from privately-licensed SB.
- having electric *Villo !* is citizen request no. 10 in the Good Move plan *(Source 47)*.

Lastly, a homogeneous rather than a mixed fleet is preferred:

- on the user side: clarity and readability of the pricing structure.
- on the operator side: simplified control and maintenance, without double logistics.
- on the public authority side: lighter contractual monitoring without having to track and distinguish the actual proportion of pedal and pedelecs available for rental.

Figure 17: Overuse of pedelecs with integrated batteries and underuse of removable batteries

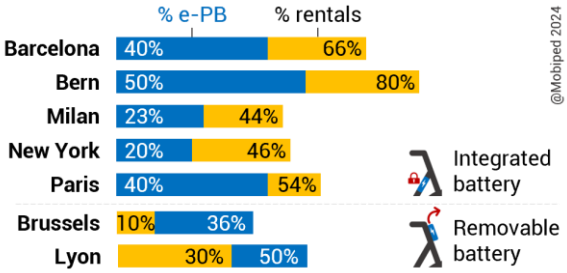
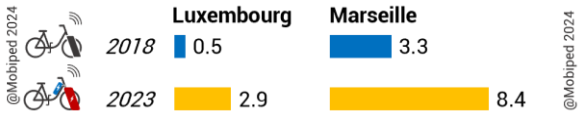


Figure 18: Rental trends before and after PB electrification



4.2 Proposal and presentation of five scenarios

The scenarios and recommendations are explorations by the consultants to inform the political and technical decisions taken, to be taken later. One LTR scenario and four PB scenarios are studied *(Figure 19)*, with a detailed presentation (*Figure 20)*, a description of the distribution of risks *(Figure 21)* and possible governance arrangements *(Figure 22)*.

Figure 19: Overview of the five scenarios up to 2027

1 | LTR + training + sales

- At home, at the destination or in racks in public places
- 2,100 pedal bikes (1,600 + 500) and 2,400 pedelecs (+ cargo bikes, longtails, accessories)
- Subsidised user price
- Home or in facilities
- 1 B2G2C public service. Other private services possible.
- Classic LTR: Liège (*Vélocité*), Paris (*Véligo Location*)
  Social LTR: Brussels (*Vélo Solidaire*), Leuven (*Fietsschool*)
- Rental for up to six months, with the option of home delivery | Vulnerable groups can take part in training courses to learn how to ride a bike or get back in the saddle, then purchase the bike at a reduced price.

2 | Private e-SB in dropzones (DZ private SB)

- 3,000 dropzones in public spaces shared with shared e-scooters
- 7,500 SB
- Battery swapping by operators
- 0 B2G2C public service
  3 licences granted to B2C players, like the 2024-2027 licences.
- Amsterdam, Brussels, Ghent, Geneva

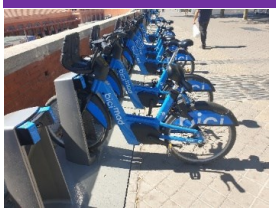
3 | e-PB in dropzones (DZ public PB)

- 3,000 dropzones in public spaces shared with shared e-scooters
- 7,500 PB
- Battery swapping by the operator
- 1 B2G2C public service to meet the requirements of a public service (accessible pricing, territorial service, white label) such as a subsidy per journey, km or bicycle. 0 B2C private services.
- Rouen, Gdansk

4 | e-PB stations + dedicated rack (Hybrid PB)

- 350 stations + 350 dedicated rack batteries in public spaces
- 7,500 PB
- In station + battery swapping by the operator
- 1 B2G2C public service with macro-subsidies
  1 to 3 B2C private services in licences
- Stuttgart

5 | e-PB charging stations (Dock-based PB)



- 600 dedicated stations in public spaces
- 7,500 PB
- In stations
- 1 B2G2C public service with macro-subsidies
  0 to 3 B2C private services in licences
- Luxembourg, Madrid, Marseille, Paris

Figure 20: Detailed presentation of scenarios

	1 | LTR + training + sales	2 | Private e-SB in dropzones	3 | e-PB in dropzones	4 | e-PB in e-stations + parking racks	5 | e-PB in e-stations
SYSTEM					
Bikes	4,500 (2,400 ⚡ & 1,600 pedal bikes) + 500 pedal bikes	7,500 ⚡			
Stations	1-5 premises	0		350	700
Dropzones	-	3,000	3,000	350	0
Parking in public spaces	Bicycle racks	Dropzones		E-stations + bicycle racks	Dedicated stations
Pedelecs charging	Home, work	Swapping		In-station and swapping	E-stations
SERVICE					
Rental period	6 - 12 months	~ 30 min			
Transaction	Human	Human-machine interface			
Training	Specific	Possible	Service ownership assistance		
Bike purchase	Possible	No			
GOVERNANCE					
Initiative	Public	Private	Public		
Public financing	Yes	Possible	Yes		
B2G2C player *	1	0	1		
B2C players *	Possible	3	0	0 to 3	
PUBLIC SERVICE					
Affordable prices	Prices set by BCR	✖ Decided by operators	Prices set and capped by BCR		
Brand	Public	✖Commercial	Public brand		
Territorial coverage with SLA	Delivery possible + events	~ Reduced availability criteria	Yes		
Fight against the digital divide	Yes	✖ 100% App	✖ Return of bicycles with smartphones, in the racks		Yes

* As in Lyon, setting up a monopoly for Public Bicycle with the cessation of private SB in option 3 (and potentially in scenarios 4 and 5) would make it possible to:

- promote the service in which public money is invested, rather than promoting private SB offers, as in the communication to launch Floya *(see part 2.5)*.
- generate a mass effect, increase the visibility of the service in public spaces (a single bike colour) and simplify the user experience with a single interface and app available. 26% of Brussels respondents use all micro-mobility services without distinction, 44% sometimes a different one and 30% only one *(Source 43)*.
- reduce walking distances with a nearby bike available. 61% of micromobility users look for the nearest bike, regardless of service *(Source 43)*.
- reduce the complexity of multimodal alternatives to the private car, with more than 35 distinct offers counted in Brussels in mid-2023 *(Appendix 10.12)*.
- increase peace of mind for the operator, who can be more transparent without the presence of competitors at meetings with public authorities.

Figure 21: Risk distribution for each scenario

RISKS	1 | LTR + training + sales	2 | Private e-SB in dropzones	3 | e-PB in dropzones	4 | e-PB in e-stations + parking racks	5 | e-PB in e-stations
Industrial	BCR (purchase of bikes)	B2C operators	B2G2C operator		
Commercial (if concession)	LTR operator	B2C operators	B2G2C operator		
Commercial (if public contract)	BCR	Not applicable	BCR		
Policy (GBCR)	Reaction of private B2C players	Complaints from citizens if bikes are incorrectly parked, especially with a public brand.			Impact of the transition
			Criticism if low usage and lack of money for other cycling measures *(Source 61)*.		
Image	BCR	B2C operators	B2G2C, BCR and STIB operator		
Bike theft	LTR customers	B2C operators	If bike not properly attached or returned: PB customer If little theft: BCR (included in initial price) If a lot of theft: B2G2C operator		

Figure 22: Governance options for each scenario

	1 | LTR + training + sales	2 | Private e-SB in dropzones	3 | e-PB in dropzones	4 | e-PB in e-stations + parking racks	5 | e-PB in e-stations
Initiative	BM	Private	BM	BM	BM
Financing	BM	Private	BM	BM	BM
Consultation	BM	BM	BM or STIB	BM or STIB	BM or STIB
Supervision	BM	BM	BM or STIB	BM or STIB	BM or STIB
Provision	Private	Private	Private	Private	Private
Installation	Private	BM	BM	BM + STIB or private	STIB or private
Operation	Private	Private	Private	Private	Private
Customer relations	Service operator	Private	Private	Private	Private

BM: Brussels Mobility | STIB: Brussels urban public transport operator

4.3 Quantitative analysis

4.3.1 Preamble

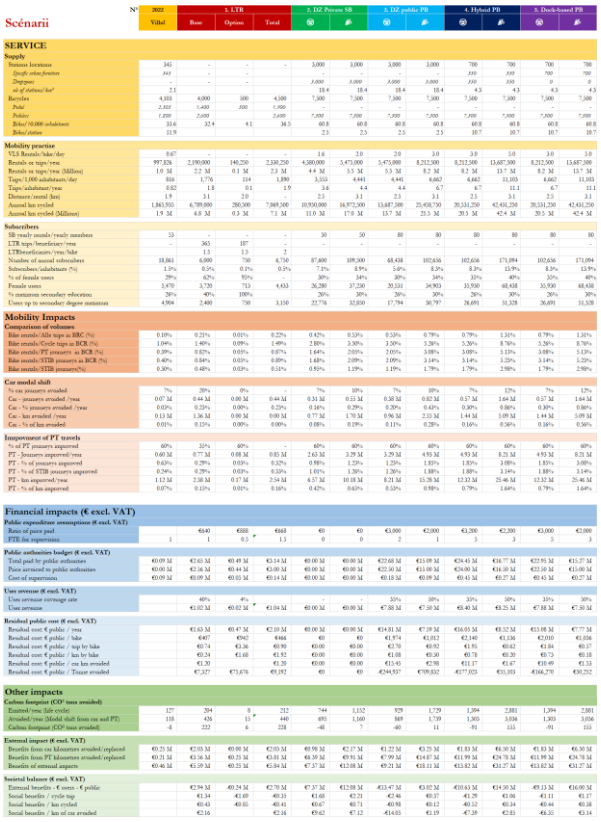
The socio-economic analysis provides a simplified view of the cost-effectiveness of each scenario. Predictive in nature, with inherent uncertainties, the calculation model is based on simplified assumptions and estimates, with certain factors not parameterised.

The results should therefore be considered as orders of magnitude only, in the knowledge that they depend on the assumptions and ambitions adopted. All the data in the table *(Figure 23)* is available in *Appendix 10.7*.

The analysis distinguishes between the basic LTR and the social LTR, which have different characteristics, allowing the qualitative social aspect to be highlighted.

As there are very few international studies on LTR. Many assumptions are based on the results of the AAVP (French Public Bicycles players network) study carried out by Inddigo among over 200 PB and LTR services in France and over 4,500 users of bike share and LTR services *(Source 17, Appendix 10.8)*.

Figure 23: Overview of scenario socio-economic evaluation table



For bike share options, conservative and ambitious variants are designed to explore possible extremes *(Figure 24)*.

Figure 24: Variants applied to SB and PB services

	Conservative	Ambitious
Turnover rate	↘	↗
% under-represented audiences	↘	↗
Car modal shift	↘	↗
Revenue coverage	↘	↗
Costs for public authorities	↗	↘
HR supervision	↗	↘

4.3.2 Service sizing

Basic LTR

The assumption is 4,500 bicycles, or 32 bicycles per 10,000 inhabitants *(Figure 25)*. This is a reasonable assumption in the light of French and Belgian experience, bearing in mind that the fleet can easily evolve over time. In Belgium, 15% of the LTR fleet is powered by pedelecs. The assumption used is that of the French market, with an average of 65% pedelecs and 35% pedal bikes (*Source 17*). Special bicycles are recommended, but not included in this analysis for the sake of simplicity.

Figure 25: Number of LTR bike per 10,000 inhabitants in Wallonia and France

Small towns in Wallonia	15
Average in France	33
Liège Vélocité*	40
Grenoble	250

** Services operated by Pro Velo*

Social LTR

The social LTR is inspired by the experiences of *Vélo Solidaire* in Brussels and *Fietsschool* in Leuven *(Appendix 10.8)* with training to learn to start cycling, the provision of a bike for a long period at a low price, and then the possibility of buying a cheap second-hand bike. The assumption is 500 light pedal bicycles, divided between:

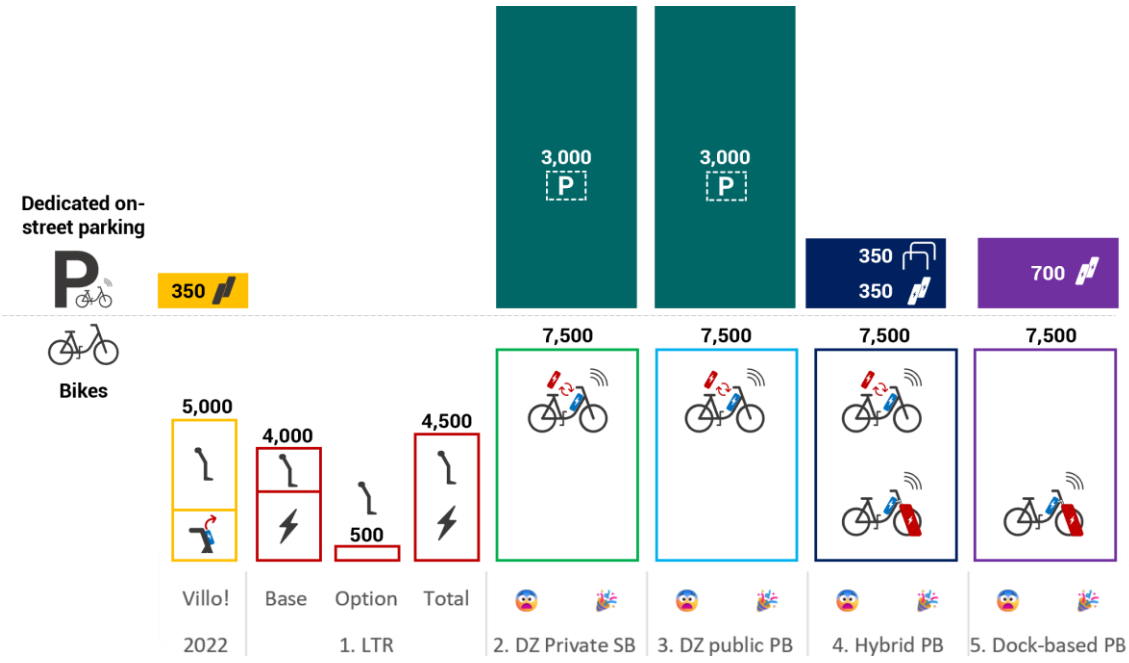
- 300 *Vélo Solidaire* bikes, which seems excessively low given the waiting list.
- 200 *Fietsschool* bikes, which, extrapolated to the Brussels population, would represent 1,500 bikes.

Bike share

To provide a more ambitious service than the current *Villo !* and in a perspective where there could be only private SB, the assumption made is 7,500 bicycles, as the maximum for private licences *(See 2.1)*. The fleet would be 100% electric *(See section 4.1.2)*. The scenarios differ in terms of parking facilities, with either:

- the 3,000 dropzones planned for the end of 2026 *(Appendix 10.10)*.
- 700 charging stations to massively increase network density, either 100% charging or in a hybrid format with 50% charging stations and 50% bicycle rack batteries dedicated to PB. In a utopia of simplification, it was imagined proposing a simple, easy-to-understand rule: "Each bicycle rack is a virtual station. As with private bicycles, free-floating bikes could be attached to bicycle racks". But this idea has been ruled out *(Appendix 10.10)*.

Figure 26: Assumptions for bicycle fleets and dedicated parking areas in public spaces



4.3.3 Uses

4.3.3.1 Assumptions

Basic LTR

Average distance (km)	3,7	Assumption corresponding to the average distance for all types of bicycle journeys in OVG 6, compared with 3.9 km for pedelecs as the main mode *(Source 41)*. This is a low assumption, given that the Brussels Bike Observatory indicates an average distance of 6.86 km for pedelecs and 5.47 km for pedal bikes. Cyclists who stop during their commute to be surveyed are probably motivated, and their commute trip is a long one *(Source 36)*.
Bike trips per year	365	Corresponds to seven bike journeys per week. This would represent: • a third of all journeys made by bicycle, since each inhabitant of the BCR travels an average of 3*/day, or 21*/week *(Source 41)*. • fewer than the 10 journeys/week made by 79% of the cyclists surveyed by the Bike Observatory *(Source 36)*. In France, 73% of LTR beneficiaries use it frequently to go to work and study (*Source 17)*.
Female beneficiaries	62 %	Average percentage of LTRs in France *(Source 17)*.
People up to secondary degree max	40 %	Managers and senior professionals are over-represented in LTR surveys, and even more so for SB and PB. *(Source 17)*. This assumption is therefore higher than the *Villo !* subscriber rate of 26%.

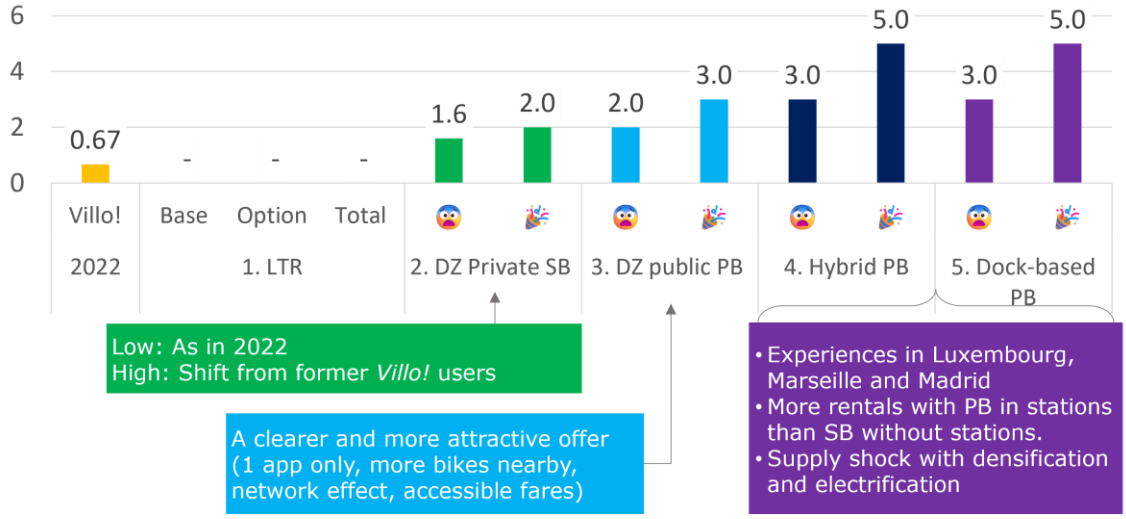
Social LTR

Potential audiences		The social LTR meets the huge challenge of getting people on bikes who are often forgotten by cycling policies, and who face several obstacles: • never learned to ride a bike *(> 6% of Brussels residents, See part 48)*. • cultural and social representations far removed from cycling, linked to the social environment of origin or a link with a country where cycling is not widely practised. • limited schooling and economic vulnerability.
Number of trips/year	0.5	By the time beneficiaries have gained the confidence to get around independently, they rarely travel by bike. *Vélo Solidaire*'s observations show one travel/week during the support period, i.e. two trips/week. The assumption of 3.5 trips/week, or 183 trips/year, is more optimistic, as it also takes into account journeys made during training.
Average distance	2	In the absence of available data from the Brussels and Leuven experiments, the average distance is estimated at 2 km, as the beneficiaries have limited use and are less likely to venture out on long journeys.
End-of-rental purchase	65 %	Data observed for *Vélo Solidaire* and *Fietsschool*.
Female beneficiaries	95 %	Data observed for *Vélo Solidaire* and *Fietsschool*.

Bike share

Turnover rate	1.6 to 5	Description in *Figure 27* on next page.
Rentals per subscriber	80	Ratio of the total number of rentals to the number of long-term subscribers. It is 43 for *Villo !* and over 100 in Antwerp and Paris *(Appendix 10.11)*.
Female subscribers	30-50 %	In 2022, 29% of *Villo !* subscribers were women *(Source 22)*. The goal is to reach 50%, given that they account for only 40% of cyclist counts *(Source 36)*.
People up to secondary degree max	26-30 %	In 2022: 26% *(Source 43)*. Objective: 30%

Figure 27: Assumed turnover rate (trips/bike/day) spread over one year



4.3.3.2 *Impacts*

As results are directly dependent on initial assumptions, it is difficult to draw conclusions. However, it appears that:

- a LTR reaches fewer people, but has a qualitative impact, as women and people with few qualifications are better represented among subscribers than bike share. But in nominal terms, there are more female or low-education subscribers to a successful PB service. Bike share has a quantitative impact, reaching a large number of residents *(Figure 28)*.
- the social LTR generates few kilometres travelled. But that is not its primary objective.

Figure 28: Share of Brussels' population to subscribe in the scenarios

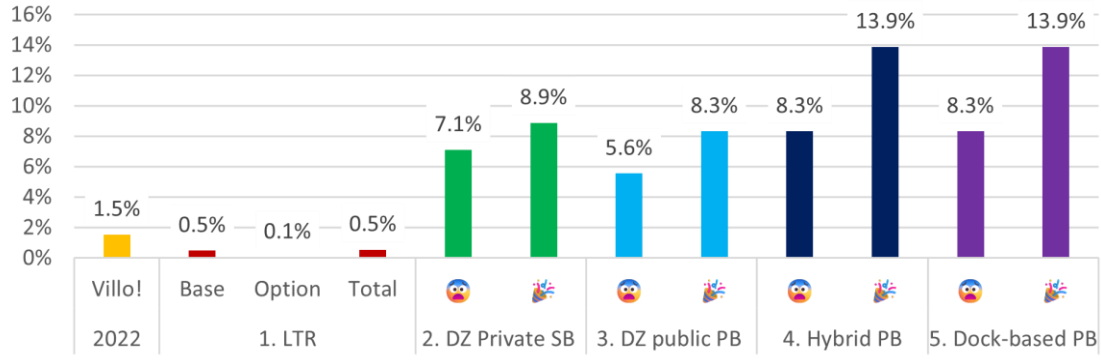


Figure 29: Main usage impacts of the scenarios

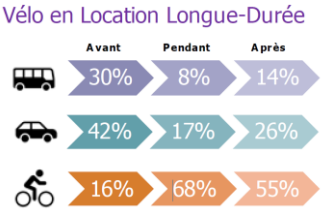
	LTR 6 months	LTR social	Bike share 100% pedelecs
USAGE			
Trips/bike/day			1.6 ↔ 5
Trips/year (millions)	2.2 M	0.14 M	4.4 ↔ 13.7 M
Trips/1,000 inhabitants/day	1,776	114	3,500 ↔ 11,100
Kilometres travelled (millions)	6.8 M	0.3 M	11 ↔ 42.4 M
% subscribers in the population	0.5 %	0.1 %	5.6 ↔ 13.9 %
Number of subscribers	6,000	750	68,000 ↔ 171,000
Female subscribers	3,700	713	20,000 ↔ 68,000
People up to secondary degree max	2,400	750	18,000 ↔ 51,000

4.3.4 Mobility impact and modal shift

4.3.4.1 Assumptions

Basic LTR

From the car	20 %	Firstly, modal shares for home-to-work journeys before, during and after LTR rental show a clear increase in bicycle use in France *(Source 17)*. The modal share of bicycles increases by 52% during LTR rental. To calculate the shift, these 52% represent 100% of new bicycle journeys. On this basis, the 22% drop in the modal share of public transport corresponds to a 42% modal shift from public transport. And the 25% drop in the car modal share corresponds to a 48% modal shift from the car. Secondly, respondents to the Brussels Bike Observatory 2023 considered that without a bicycle (pedal or electric), 13% would travel by car, 68% by public transport and 15% on foot *(Source 36)*. Although pedelecs has the greatest potential for convincing car drivers to choose cycling, and the service could deliberately target these profiles, the assumptions made are very conservative, with a modal shift of 20% from the car and 35% from public transport.
From PT	35 %	
To bikes	39 %	After leaving the service, the modal share of bicycles on the home-work journey increased by 39 %, from 16% to 55% *(Source 17)*.



Social LTR

New bike journeys	100 %	The beneficiaries did not know how to ride a bike before. Those who buy a bike will probably use it more. But this is not guaranteed in Brussels, where the cycling culture is less deeply rooted than in Leuven.
From the car	0 %	These audiences own few or no cars.
From PT	60 %	Data for *Fietsschool*, but not available for *Vélo Solidaire*.

Bike share

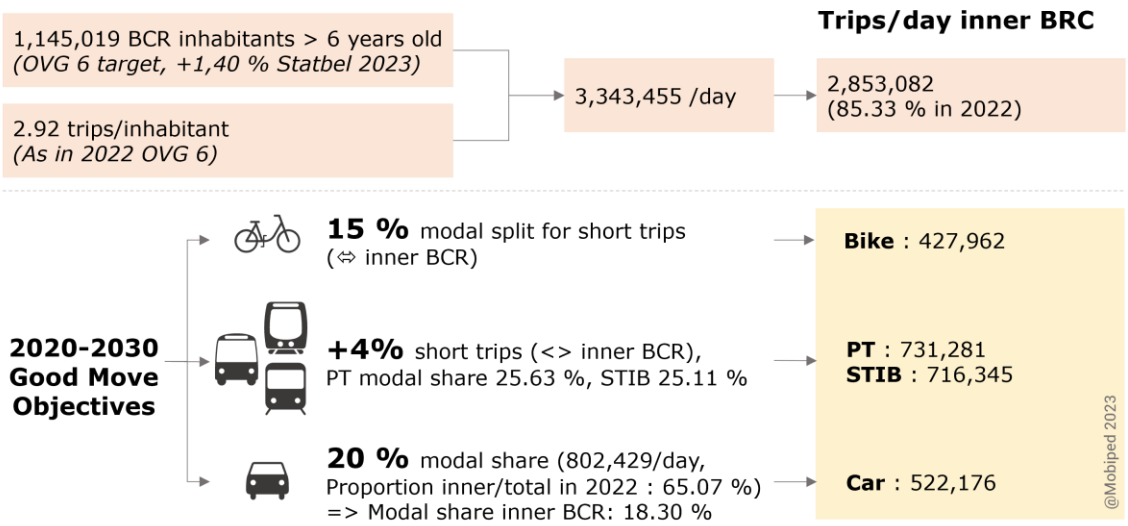
From the car	7-12 %	*Villo !* 2017 data *(Source 52)* and hope for an increase thanks to a more attractive service and pedelecs.
From PT	60 %	*Villo !* 2017 data *(Source 52)*.

Brussels mobility context in 2030

To simplify forward-looking calculations (population, Good Move targets), 2030 is used as a representative year for LTR and bike share services.

As the origins-destinations of journeys made using the PB service are all within the Brussels-Capital Region (before perhaps considering an extension to neighbouring municipalities - *See section 5.3.3*), PB is positioned in the intra-regional travel market. This market accounts for 85% of the volume and 37% of the km of journeys estimated in OVG 6 *(Source 41)*. For the 2030 timeframe, the assumption is the achievement of the Good Move targets, which have been translated into the number of trips for each mode *(Figure 30)*.

Figure 30: Estimated mobility context and journey volumes in 2030



4.3.4.2 *Impacts*

LTR, trips induced over time

Over and above the short-term impact during the rental period (52% increase in cycling), LTR is particularly interesting for its long-term effects, since 39% of the journeys made using another mode prior to rental are now made by bike *(Source 17)*.

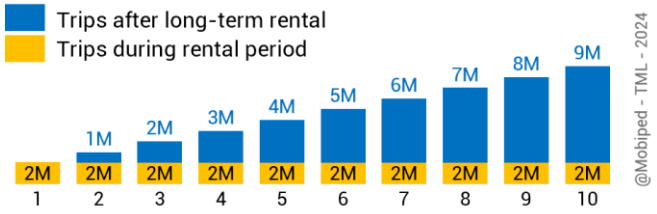
This means that beyond the trips made during the rental period, former users continue to ride by bike - the induced effect *(Figure 31)*. Applied to the 2.2 million trips generated per year by LTR beneficiaries, around 40 million trips in ten years will have been made by bicycle by people who did not cycle before using a LTR. People who would have taken up cycling without a LTR are not included.

Figure 31: Long-term induced trips calculations for a LTR service

		Years										
		1	2	3	4	5	6	7	8	9	10	TOTAL 10
Annual trips when renting a LTR bike	1	2.2 M	2.2 M	2.2 M	2.2 M	2.2 M	2.2 M	2.2 M	2.2 M	2.2 M	2.2 M	**21.9 M**
Induced personal bicycle trips by former LTR beneficiaries (19%)	2		0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	**7.7 M**
	3			0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	**6.8 M**
	4				0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	**6.0 M**
	5					0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	**5.1 M**
	6						0.9 M	0.9 M	0.9 M	0.9 M	0.9 M	**4.3 M**
	7							0.9 M	0.9 M	0.9 M	0.9 M	**3.4 M**
	8								0.9 M	0.9 M	0.9 M	**2.6 M**
	9									0.9 M	0.9 M	**1.7 M**
	10										0.9 M	**0.9 M**
TOTAL INDUCED TRIPS		0.0 M	0.9 M	1.7 M	2.6 M	3.4 M	4.3 M	5.1 M	6.0 M	6.8 M	7.7 M	**38.4 M**
CUMULATED TRIPS		2.2 M	3.0 M	3.9 M	4.8 M	5.6 M	6.5 M	7.3 M	8.2 M	9.0 M	9.9 M	**60.3 M**

Rounding up the number of trips generated during the rental period to 2 million, and increasing the number of beneficiaries who would continue to cycle thanks to improved cycling conditions in Brussels (39% to 50%), induced trips would be one million per year *(Figure 32)*.

Figure 32: Trips/year during LTR rental (yellow) and cumulative induced trips after rental (blue)



Social LTR, helping to improve individual quality of life

The social LTR is not intended to have a direct quantitative impact on mobility. However, its qualitative impact for beneficiaries is a clear improvement in their living environment, with an increase in self-confidence, a new mobility option and greater freedom of movement, as some testimonials attest *(Appendix 10.8)*. Cycling by women also has an impact on the representation and cycling practices of other household members.

Even with very affordable pricing and in-depth support, long-term cycling remains a complicated proposition in Brussels. In Leuven, the impact on beneficiaries' cycling habits is greater than in Brussels, as cycling is a factor of integration into local Flemish culture and cycling conditions are much better. Improving cycling conditions is essential for developing cycling among all sections of the public.

Bike share, a strong direct quantitative impact but weak compared to other modes

Even with the highest assumptions, PB would represent:

- less than 10% of all bicycle trips *(Figure 33)*. The available data does not allow robust extrapolation to estimate the long-term impact of PB. However, feedback from the UK shows that PB has an interesting impact on getting people back on the saddle over a number of years *(Appendix 10.13)*.
- the equivalent number of trips on a single bus line with high usage *(Figure 34)*.
- less than 1% of intra-regional trips are made by car and km by car. These calculations relate to direct impact only. They do not take into account demotorisation or the decline in car use over the long term.

Figure 33: Share of rented bike trips in regards with all intra-regional bike trips

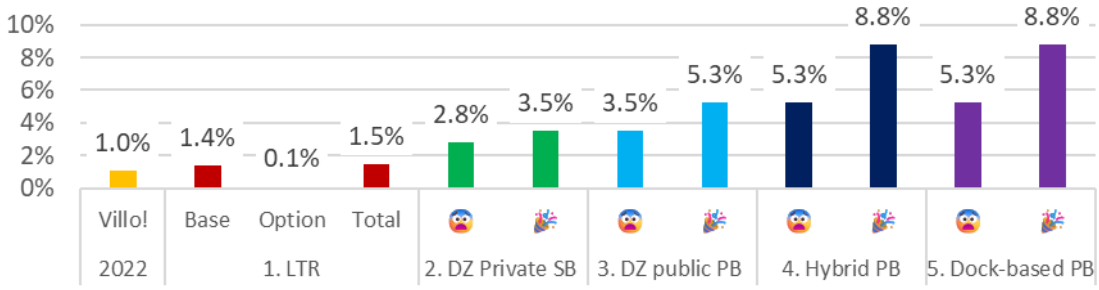


Figure 34: Comparison of daily trips volumes between public transport (STIB data) and PB

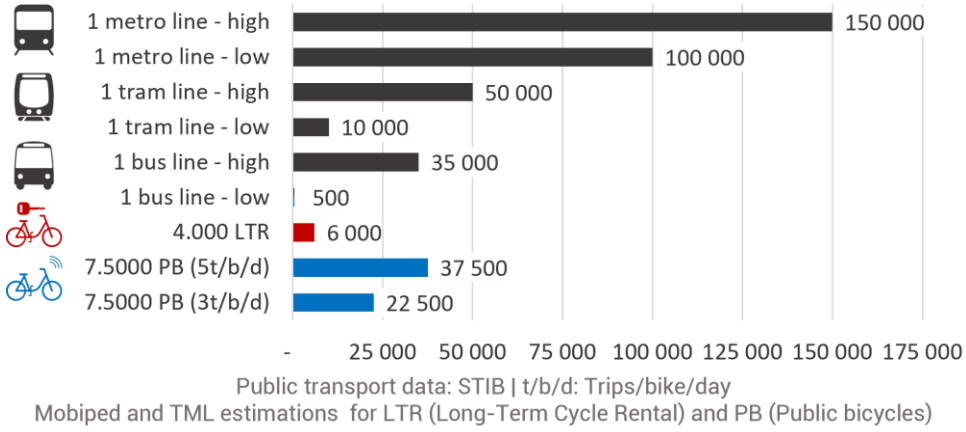


Figure 35: Main impact data for mobility scenarios

	LTR 6 months	LTR social	Bike share 100% pedelecs
IMPACTS ON MOBILITY			
% modal share all modes	0.2 %	0.01 %	0.4 ↔ 1.3 %
% of bicycle trips	1.4 %	0.09 %	2.8 ↔ 8.8 %
% STIB totals trips	0.5 %	0.03 %	0.9 ↔ 3 %
% car trips avoided	0.2 %	-	0.2 ↔ 0.9 %
% car km avoided	0.2 %	-	0.1 ↔ 0.6 %
% INTRA-BCR car trips avoided	0.2 %	0 %	0.2 ↔ 0.9 %
% STIB trips improved	0.29 %	0.03 %	1 % ↔ 3.1 %
Public transport trips improved	0.8 M	0.1 M	2.6 ↔ 8.2 M
PT km improved	2.4 M	0.2 M	6.6 ↔ 25.5 M
% PT km improved	0.2 %	-	0.4 ↔ 1.6 %

4.3.5 Financial features

The data below is considered in € excluding VAT and constant 2023, without taking inflation into account. The budgetary decision will be taken in 2024, with budgets to be allocated from 2026.

4.3.5.1 Assumptions

Basic LTR

Price €/bike/year for the community	Weighted average: €640/bike	To calculate this ratio, it is assumed that the public price of private rentals, without subsidies, covers all service costs and the operator's margin. The average is weighted according to the number of bikes *(see 4.3.2)*.
	Pedal bikes: €250 incl. VAT/year	The unsubsidised user price of a pedal bike rental is: • €240/year for Swapfiets. • €250/year for Fietsambassade in Ghent. The assumption is €250 incl. VAT/year.
	Pedelecs: €850 incl. VAT/year	In France, the remaining cost to local authorities is €490 (excl. VAT)/year/bike (*Source 17)*, but the data available does not allow a distinction to be made between the remaining cost for pedal bikes and pedelecs. Moreover, there is always some doubt as to whether the price of facilities, which may be partly owned by the local authority, is included or not The assumption used is €850 incl. VAT/year, based on the unsubsidised user price of a pedelecs rental in Belgium, which was: • Between €760 and €900 at Swapfiets at the end of 2023. While Swapfiets is not yet profitable on a group-wide scale (the main costs are caused by user negligence), it appears to be profitable in certain cities. • From €990/year for Fietsambassade in Ghent. Assuming 15% economies of scale for the thousands of LTR, the price would be €840.
Cover	**40%**	Average, according to experts.
User prices	Pedal bikes: €67 incl. VAT/6 months, i.e. €11/month Pedelecs: €227 incl. VAT/6 months, i.e. €36/month Average: €171/6 months.	The proposed prices are based on the following assumption: • of 40% revenue coverage. • that each bike is actually rented for eight months out of 12, with a maximum rental period of six months and periods of non-rental (average of €640/bike (all types)*40%*8/12= €171/bike (all types). These prices are well below those of non-subsidised services (Swapfiets, Pro Velo Brussels, Fietsambassade in Ghent excluding students) and close to those of subsidised services (Vélocité in Liège, Véligo Location in Paris, MVélo + in Grenoble, Fietsambassade for students in Ghent *(Appendix 10.14)*. At this stage, the scenario does not take into account social tariffs, training or purchase assistance.

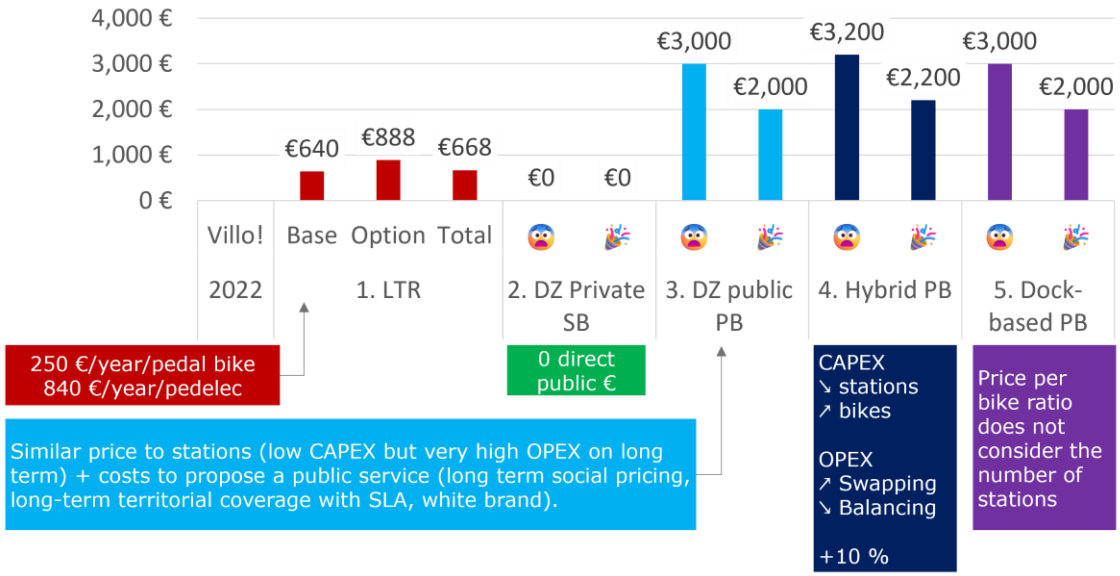
Social LTR

User prices		• Rental: €13/6 months or €2/month for a pedal bike, i.e. a social rate of 20% of the LTR rate. • Bike sale: €25 incl. VAT, as with *Vélo Solidaire* • Rental + Purchase: €38 inc. VAT.
Training	€400 incl. VAT	High assumption of €400/trained beneficiary, given that: • *Fietsschool*: €250/beneficiary (30 hrs training in groups of 20). • *Vélo Solidaire*: €105,000 budget in 2023 to train 300 people (30 hrs training in groups of 10), i.e. €350/beneficiary. The cost of training is higher because the associations cover part of the cost.
Bike value/year		€250 incl. VAT.
Bicycle residual value	€150	Estimated value after two years of use: €150 *(based on an exchange with Pro Velo)*. It would be possible to use bikes reconditioned by people on a professional reintegration programme. But information on costs is too divergent to be used.
Total cost before revenue	€888 excl. VAT	Bike price (€250 inc. VAT) + 1.5 training courses/year (€600 inc. VAT) + 1.5 bikes sold/year (€225 inc. VAT) = €1,075 inc. VAT, i.e. €888 excl. VAT/bike/year. In practice, an additional budget is needed to enable district associations to reach their target audiences.
Coverage rate	4 %	Estimate based on expert opinion, due to very low user prices.

Bike share

User prices		Non-price-elastic scenarios. The assumption made concerns only the user revenue coverage rate for PB, as it is not known for private SB.
User revenue coverage	35-50 %	• 35%: low benchmark assumption (before obtaining figures for the first year of Marseille in 2023). • 50%: high assumption close to 49% in Paris in 2022.
€ public/bike/year	From 0 to €3,200	This ratio is equal to the price invoiced to the public authorities (initial investment + operation over the contract period)/number of bicycles/number of contract years. This ratio is not very sensitive to the number of stations. Numerous exchanges with the bike sharing market players have highlighted: • price disparities of +/- 50% depending on business skills, amortisation periods, usage, governance, etc. The figures used are therefore the result of simplistic arbitration. • the costs for a public service, whether 100% with swapping (scenario 3) or 100% with charging stations, are close (scenario 5). It was decided to: • add a 10% margin to scenario 4 to take into account certain unknown factors: no feedback from experience, widely differing opinions on the optimum percentage of charging stations, increased CAPEX and OPEX costs for the station and the bicycle. • leave scenario 2 at €0, on the simplifying assumption that the occupancy fee paid for licences covers all the hidden authority supported costs and supervision costs for this type of service.
HR supervision	€90 k	Employer cost of one FTE with a Master's degree *(Source 58)*. Three FTE planned for PB. The FTE cost for private SB is diluted in the fee for the use of public space.
Contract duration (years)	5 to 10 years	• Dropzones: five years to increase the visibility of the operator(s) and better amortise the bikes. • Charging stations: ten years to amortise stations and work.

Figure 36: Price ratio assumptions € excl. tax/bike/year for public authorities, before revenues



4.3.5.2 *Impacts*

Here are a few conclusions:

- The ratio of € excl. VAT/bike/year is lower for the basic LTR and the social LTR than for bike sharing.
- Private SB is more economical than PB, but the impacts are lower *(see previous section)*.
- The remaining cost per trip is less than €1 for the LTR and for the optimistic assumptions of PB. Even with pessimistic assumptions, the remaining cost per journey for PB is lower than for STIB in 2022 *(Figure 38)*. If the trips induced by the LTR service are considered, public investment becomes increasingly profitable looking ahead.
- The remaining cost per km is less than €0.30 for the optimistic assumptions of PB and the basic LTR, and slightly less than that of STIB in 2022. However, the negative assumptions of PB are two to three times higher than those of STIB.
- The solidarity aspect of LTR has a very high cost per kilometre covered. This is understandable, since the beneficiaries start from scratch in terms of cycling skills and confidence.

Figure 37: Estimated remaining cost to public authorities (€ excl. VAT 2023/bike/year)

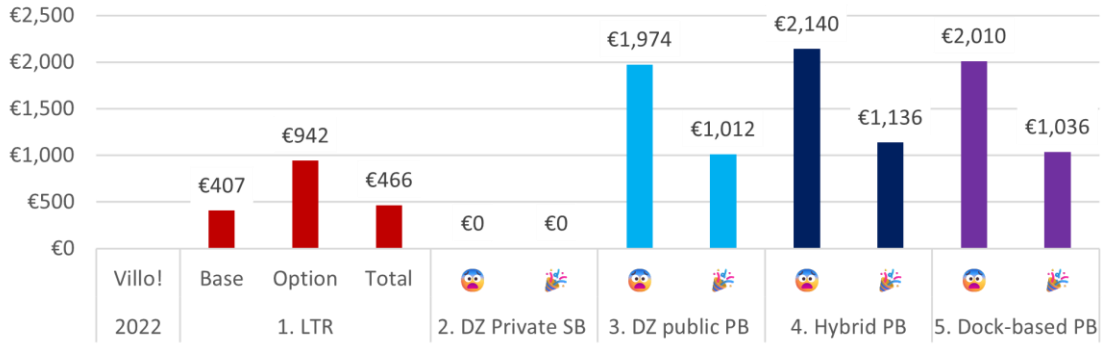


Figure 38: Estimated remaining cost per journey

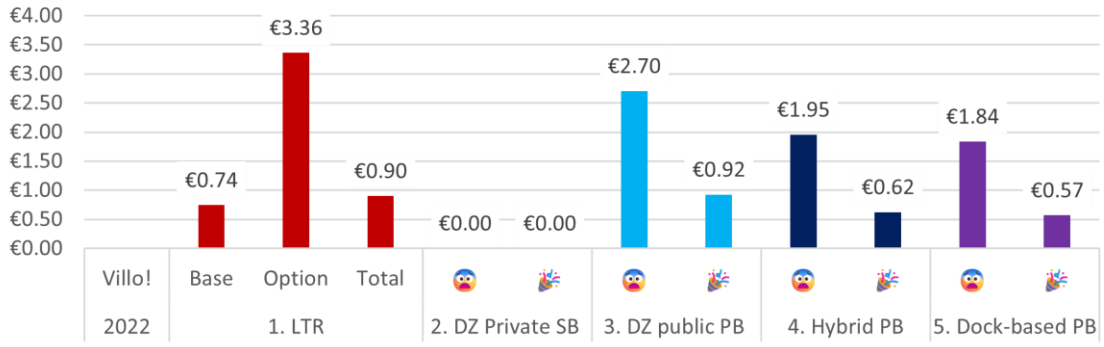


Figure 39: Estimated remaining cost per bicycle km completed

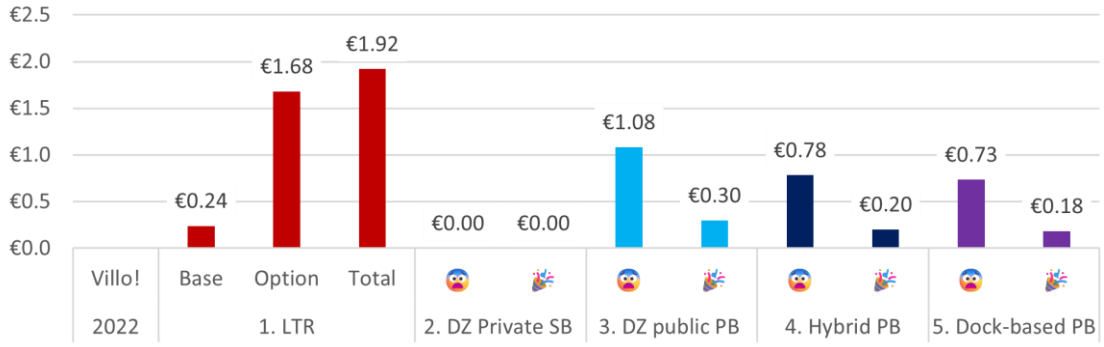


Figure 40: Main financial impacts of the scenarios

	LTR 6 months	LTR social	Bike share 100% pedelecs	PT STIB
FINANCIAL IMPACT (€ EXCL. VAT 2023)				
Ratio € excl. VAT/bike/year (CAPEX+OPEX)	€640	€888 M	€2,000 ↔ 3,200	
Price to be paid (without user revenues)	€2.7 M	€0.5 M	(€0) €15 ↔ 24 M	
Market supervision	€0.09 M	€0.05 M	€300 ↔ 500 k	
Coverage rate (CAPEX+OPEX)	40 %	4 %	35 ↔ 50 %	18 %
Annual revenue	€1 M	€0.02 M	€7.5 ↔ 8.4 M	
Remaining cost/YEAR	€1.6 M	€0.5 M	€7.6 ↔ 16 M	
Remaining cost/year/BIKE	€407	€942	€1,000 ↔ 2,150	
Remaining cost/TRIP	€0.74	€3.36	€0.57 ↔ 2.70	€2.58
Remaining cost/KM	€0.24	€1.68	€0.18 ↔ 1.08	€0.38
Remaining cost/CAR KM AVOIDED	€1.20		€1.53 ↔ 15.45	

4.3.6 Carbon footprint

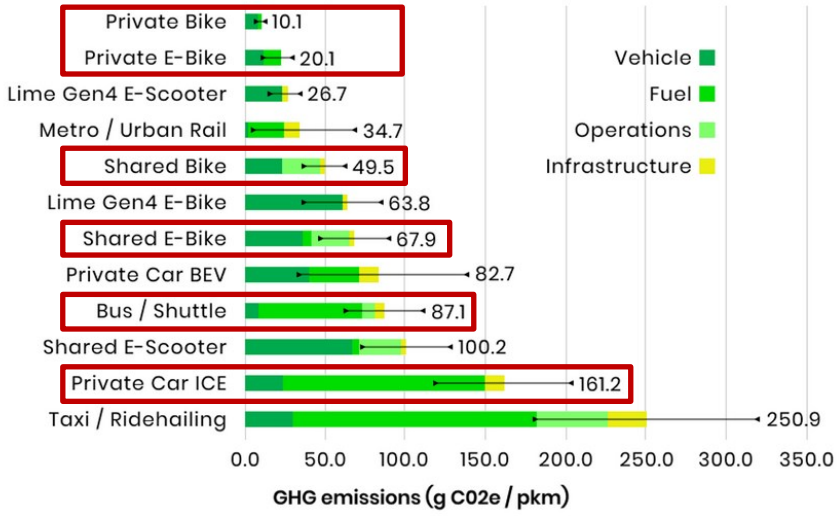
4.3.6.1 Assumptions

There is no precise data on the number of PB trips that replace car or public transport journeys. Thus, the simplifying assumption adopted is as follows: the percentage of users who declared in the survey that they would have made a trip by car or public transport is identical to the percentage of trips.

The carbon impact per km is based on the life cycle analysis of 12 modes in Stockholm, Paris, Melbourne, Berlin, Seattle and Düsseldorf, published in 2023 *(source 23, Figure 41)*.

- The modal shift generates 161 g of CO_2 per car km avoided and 87 g of CO_2 per public transport km avoided.
- Shared e-bikes emit 68g of CO_2 per km.
- LTR emit 20 g CO_2 per km for pedelecs and 10 g CO_2 for pedal bicycles.

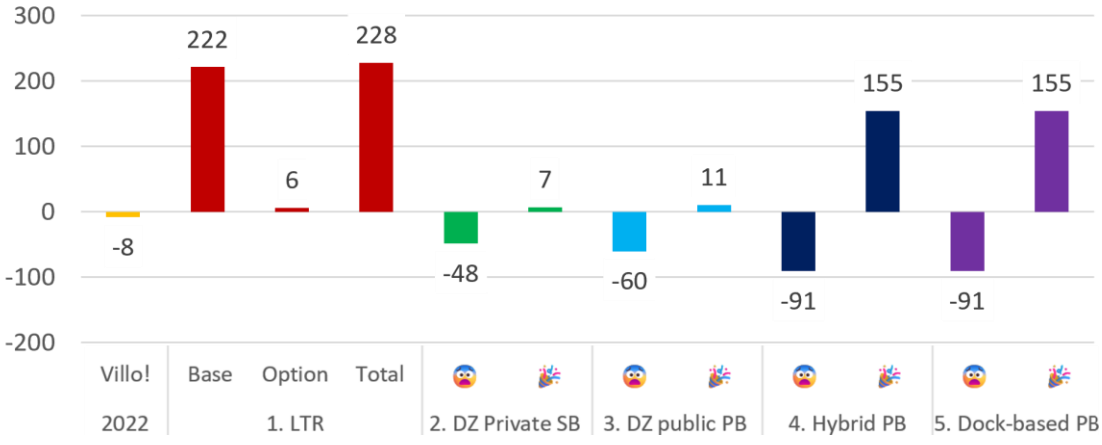
Figure 41: Life cycle assessment carbon footprint (Visual from source 72)



4.3.6.2 Impacts

The basic LTR has a favourable carbon footprint, with 222 tonnes of CO_2 avoided. The impact of social LTR is almost neutral due to low modal shift and low volumes. For bike sharing, *Villo !* is expected to have a negative carbon footprint in 2022. The carbon footprint of the scenarios is highly variable, depending on the average distance covered to replace car or public transport journeys *(Figure 42)*. The bike industries are working to improve their carbon footprint.

Figure 42: Carbon footprint of scenarios



4.3.7 Social impacts

4.3.7.1 Assumptions

The cost-benefit analysis corresponds to the external benefits (health, quality of life), minus the external costs associated with congestion, accidents, air pollution, climate change, noise and infrastructure, per kilometre travelled per mode. Assumptions are based on published results for 2022, for which figures are available for Belgium *(Figure 43)*. The societal balance is obtained by adding the price paid by public authorities and users.

Figure 43: Cost-benefit analysis of six modes in Belgium (Source 53)

	Data for Belgium (Per km travelled)					
	Pedal bike	**Pedelec**	**Speed pedelec**	**Auto**	**Bus**	**Train**
Congestion				-0.36 €	-0.07 €	
Health benefits	1.50 €	0.88 €	0.37 €			
Accidents	-0.05 €	-0.05 €	-0.07 €	-0.02 €	-0.00 €	-0.00 €
Air pollution				-0.02 €	-0.01 €	-0.00 €
Climate change				-0.02 €	-0.01 €	-0.00 €
Noise				-0.02 €	-0.01 €	-0.02 €
Infrastructure	-0.00 €	-0.00 €	-0.00 €	-0.00 €	-0.02 €	-0.03 €
Living environment	0.03 €	0.02 €	0.01 €			
Total external external	**1.48 €**	**0.85 €**	**0.31 €**	**-0.42 €**	**-0.12 €**	**-0.05 €**

Source: Van Pée, 2022, Cost-Benefit analysis of cycling in Benelux and North Rhine-Westphalia.

4.3.7.2 Impacts

All scenarios have a positive external impact balance thanks to the health benefits linked to the use of pedal or pedelecs *(Figure 44)*. For publicly funded services, performance determines the positive or negative side of the societal balance sheet. The results for private SB are overestimated because the user financial contribution is unknown *(Figure 45)*.

Figure 44: Estimated external benefits

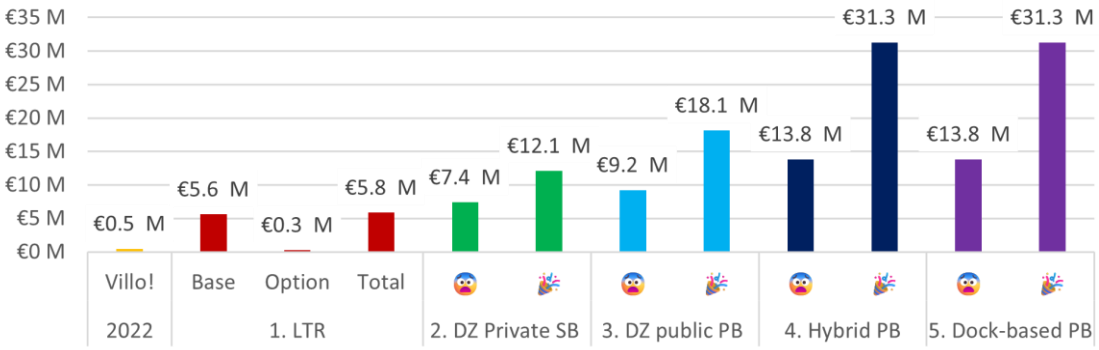
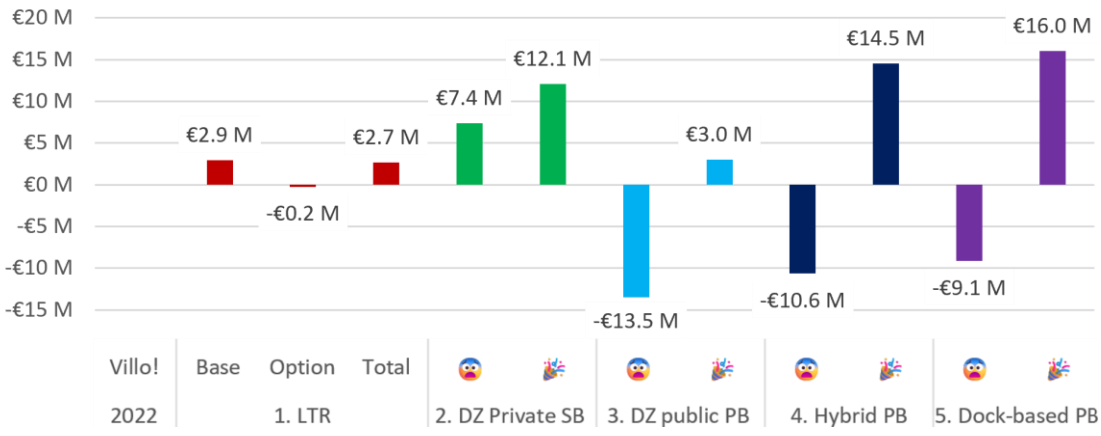


Figure 45: Estimated societal balance sheet



4.3.8 Summary table of quantitative impacts of scenarios

	LTR 6 months	LTR social	Bike share 100% pedelecs	PT STIB
SERVICE OFFER				
Number of bicycles	4,000	500	7,500	
Bikes/10,000 inhabitants	32	4	61	
Number of spaces (dropzones or stations)			3,000 ↔ 700	
USAGE				
Rentals/bike/day			1.6 ↔ 5	
Annual trips (millions)	2.2 M	0.14 M	4.4 ↔ 13.7 M	
Trips/1,000 inhabitants/day	1,776	114	3,500 ↔ 11,100	
Kilometres travelled (millions)	6.8 M	0.3 M	11 ↔ 42.4 M	
% subscribers in the population	0.5 %	0.1 %	5.6 ↔ 13.9 %	
Number of subscribers	6,000	750	68,000 ↔ 171,000	
Female subscribers	3,700	713	20,000 ↔ 68,000	
Up to secondary school maximum	2,400	750	18,000 ↔ 51,000	
IMPACTS ON MOBILITY				
% modal share all modes	0.2 %	0.01 %	0.4 ↔ 1.3 %	
% of bicycle trips	1.4 %	0.09 %	2.8 ↔ 8.8 %	
% STIB Totals	0.5 %	0.03 %	0.9 ↔ 3 %	
% car journeys avoided	0.2 %	-	0.2 ↔ 0.9 %	
% car km avoided	0.2 %	-	0.1 ↔ 0.6 %	
INTRA-BCR car trips avoided	0.2 %	0 %	0.2 ↔ 0.9 %	
% STIB trips improved	0.29 %	0.03 %	1 % ↔ 3.1 %	
Public transport trips improved	0.8 M	0.1 M	2.6 ↔ 8.2 M	
PT km improved	2.4 M	0.2 M	6.6 ↔ 25.5 M	
% PT km improved	0.2 %	-	0.4 ↔ 1.6 %	
FINANCIAL IMPACT (€ EXCL. VAT 2023)				
Ratio € excl. VAT/bike/year (CAPEX+OPEX)	€640	€888 M	€2,000 ↔ 3,200	
Price to be paid (without user revenues)	€2.7 M	€0.5 M	(€0) €15 ↔ 24 M	
Market supervision	€0.09 M	€0.05 M	€300 ↔ 500 k	
Coverage rate (CAPEX+OPEX)	40 %	4 %	35 ↔ 50 %	18 %
Annual revenue	€1 M	€0.02 M	€7.5 ↔ 8.4 M	
Remaining cost/YEAR	€1.6 M	€0.5 M	€7.6 ↔ 16 M	
Remaining cost/year/BIKE	€407	€942	€1,000 ↔ 2,150	
Remaining cost/TRIP	€0.74	€3.36	€0.57 ↔ 2.70	€2.58
Remaining cost/KM	€0.24	€1.68	€0.18 ↔ 1.08	€0.38
Remaining cost/CAR KM AVOIDED	€1.20		€1.53 ↔ 15.45	
INDIRECT IMPACTS				
Carbon footprint (Tons CO_2)	222	6	-91 ↔ 155	
External benefits (€m excl. VAT)	€5.6 M	€0.25 M	€7 ↔ 31 M	
Societal benefits (€m excl. VAT)	€2.9 M	€0.2 M	€-14 ↔ +16 M	

4.4 Qualitative analysis

4.4.1 Scenario 1 | Is a LTR advisable? Yes.

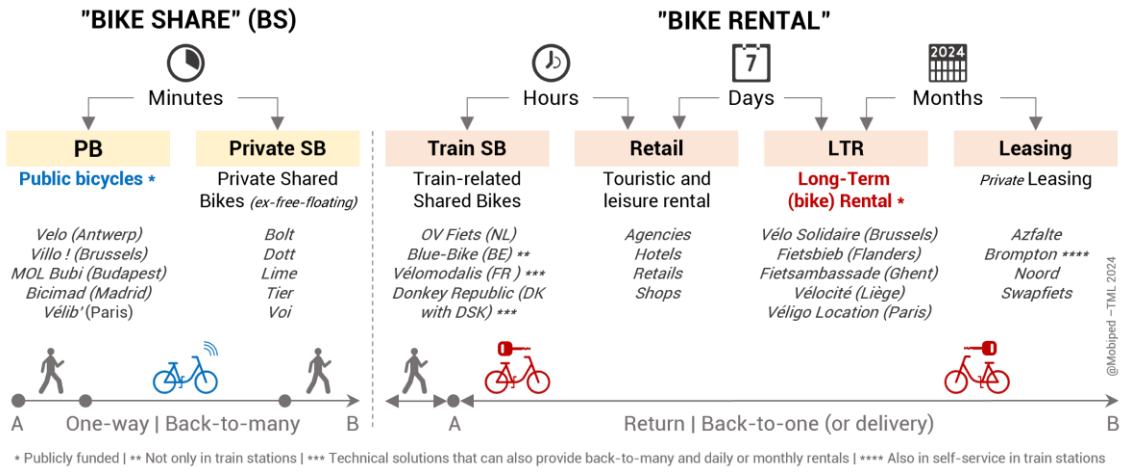
LTR and BS are two complementary services

A LTR service allows users to rent a bike and accessories (luggage rack, child seat) for several months, and benefit from services (repairs, insurance against theft). LTR removes the disincentive to buy a quality bicycle and encourages people to adopt a cycling lifestyle, before considering the purchase of a bicycle *(Figure 46)*. Compared with private LTR services (e.g. Swapfiets, Noord), a public LTR would make it possible to:

- offer a variety of bike types/sizes/models: pedal, electric, folding, cargo, adapted, children's, etc.
- invite thousands of Brussels residents to adopt a cycling lifestyle by learning how to become cyclists through a range of services and human support (with fewer commercial ulterior motives) to inform, train, test, rent, equip and advise on the purchase of a bike. *Vélo Solidaire*'s actions (training to start cycling, purchasing assistance) are perfectly in line with this approach.
- invest public money in a highly targeted way to reach vulnerable groups and avoid the need to drive kilometres, in particular by devising offers aimed at car drivers.

Bike share services (Cyclopartage in Belgium) allows people to rent a bike for the length of their trip. BS removes some of the obstacles to buying a bike, parking at home and at the destination, maintenance and the risk of theft.

Figure 46: Overview of bicycle rental services



LTR and BS, different targets and impacts

As a preamble, the term "non-cyclists" needs to be clarified between those:

- who have never cycled, for whom LTR is more suitable. Independent cycling learning through bike share seems illusory, even if it does exist in the UK *(Appendix 10.13)*.
- who know how to ride a bike but do not ride it for a several years.

PB and LTR have different targets *(*Figure 47***Erreur ! Source du renvoi introuvable.)*** and impacts. If a financial trade-off between the two is questioned, it must first be put into perspective with the overall financial trade-off concerning all modes of transport *(see section 6.5)*.

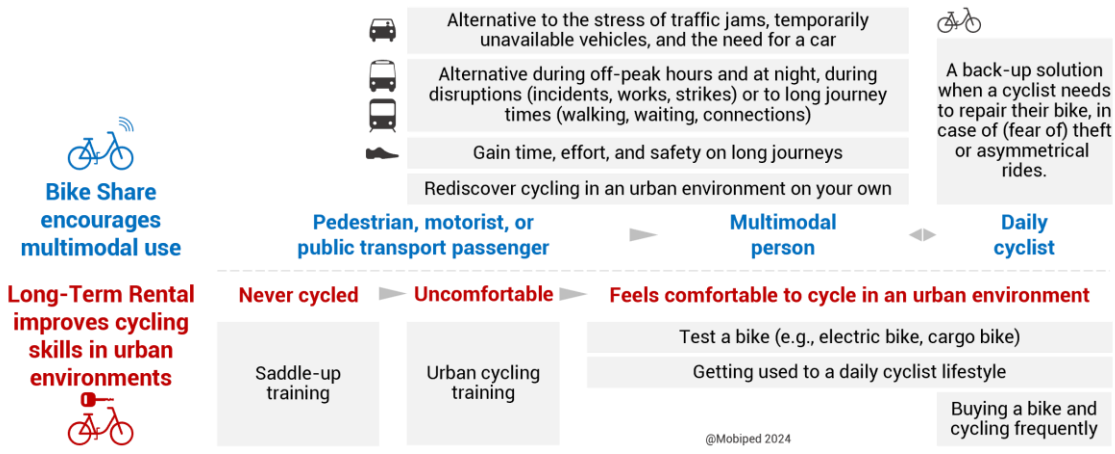
LTR enables targeted groups to try out a type of bike and the life of a cyclist, before becoming a cyclist with their own bike. It has a qualitative impact on the mastery of urban cycling by beneficiaries. Quality bikes can therefore be rented by people who:

- are new to cycling. These people need a lightweight bike and a framework of trust, such as a "Savoir rouler" training course via the social component of a LTR *(Appendix 10.8)*.
- know how to ride a bike, but need human support for urban cycling.
- are families and need special bicycles.
- have insufficient financial resources to buy a bike.
- need time and experience before considering an investment of hundreds or thousands of euros.
- stay several months: students, trainees, fixed-term contracts.

Bike share provides rapid access to bicycles from public spaces, like a mobility "insurance" and a multimodal offer option. It has a quantitative impact on the number of citizens who cycle at least once a year, including among under-represented groups. The presence of an PB service offers the possibility to:

- re-experience cycling, and even inspire people to refurbish their own bikes.
- access a bike by paying for a service, either because of a lack of knowledge and skills, a lack of budget and motivation, or a desire for comfort and simplicity.
- meet the needs of a population that does not want to adopt a cycling lifestyle with their own bike, but prefers to use bicycles on an occasional basis.

Figure 47: Uses of BS and LTR services



4.4.2 Scenarios 2 to 5 | Is a bike sharing service appropriate? Yes.

More than 1,600 cities worldwide have a bike sharing service, including some initially reluctant cities that have authorised the deployment and installation of private SB (Amsterdam, Ghent, Grenoble). So the question is no longer should bike share be deployed? but "what role should public authorities play?". To answer, it is necessary to:

- analyse the ability of private SB players to provide (or not provide) a level of public service on their own.
- set out the pros and cons of investing public money.

4.4.3 Scenario 2 | Do private SB players provide a public service on their own? No.

The presence of private SB services could lead to the conclusion that PB is useless and that private PB are self-sufficient. Private SB and PB are compared to identify each criterion that could theoretically justify local government intervention:

✓	Market failures. Private players cannot do it themselves. Need for public intervention *(Appendix 10.15.3)*.
~	Ambitions for better public service. The results of PB are not significantly different from those of private SB. But proactive public intervention could improve this parameter.
✘	Criteria for which private players perform well *(Figure 49 on next page)*.

Here are the main criteria identified to illustrate that private SB players do not meet the need for a public service, requiring significant intervention by public authorities:

- uncertainties about service continuity and sustainability. And even within the licensing framework, private SB players seem to need public money.
- evolving, uncapped pricing, particularly in the ultimate perspective of the hypergrowth model, which consists of squeezing out the competition, then raising prices to finally achieve profitability.
- exclusive use of smartphones and an app for private SB, contributing to a growing digital divide.
- lower performance on free-floating than on station *(Figure 48)*. PB stations form a network industry, generating a natural monopoly to be regulated by local public authorities *(Source 7)*.

Figure 48: Comparison of rentals/vehicle/day between PB in station, SB without station and shared e-scooters [15, 16, 30, 31]

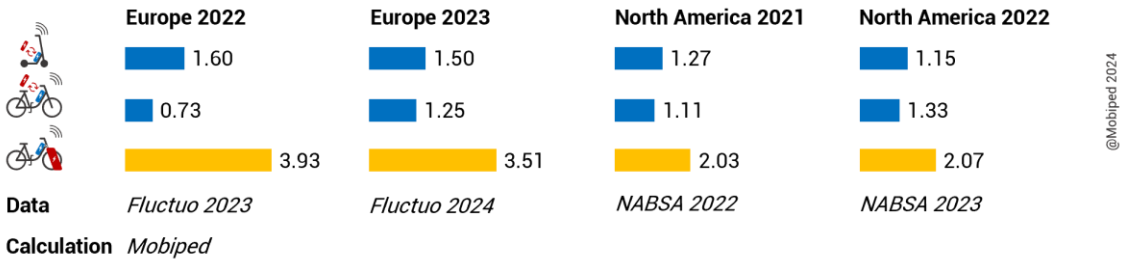


Figure 49 : Valid (✓) and invalid (✗) arguments to justify public intervention in the face of private SB

PUBLIC SERVICE GOAL (See section 5.1.4)	
Territorial equity and time availability	~ All BS are accessible 24/7. But the territorial availability of private SB is uncertain and is often too restrictive for PB.
Affordable, stable pricing	~ Price gap (usage and subscription) is narrowing between private and public BS. ✓ Private e-SB prices are not time-capped.
Payment	✗ Public and private services require a bank card.
Service continuity	✓ The hypergrowth business model of private e-SB is unstable, with bikes appearing and disappearing overnight. Tier and Pony, selected in Brussels in early 2024 for cargo bike licences, refuse to deploy them.
Equality	~ Children under 14, blinds persons and wheelchair users cannot use BS. The heavier the bikes are to handle; the more adults of smaller stature are excluded.
Under-representation of certain groups	~ Women and people with few qualifications are largely under-represented in both PB and private SB.
Digital technology	✓ Private e-SB require the use of a smartphone app, accentuating the digital divide for those with no internet access, no smartphone or limited digital skills.
Languages	✗ Private and public BS communicate in the local official languages.
Clarity of information	✗ Private and public services have little regard for the quality of access to information for visually impaired or cognitively impaired people.
Efficiency	✓ Services with stations perform better than those without.
MaaS integration	✗ All players can be integrated into Floya, the Brussels MaaS.
Public brand	✓ Only the PB makes it possible to brand the public mobility service.
GENERAL INTEREST	
Need in the general interest	✓ The promotion of an alternative means of transport to car pressure is an objective of Community interest *(Source 10)*.
Existing legal framework (Appendix 10.15)	✓ *Villo !* is defined as a SGEI (Service of General Economic Interest) by the European Commission 2012 and 2019 *(Source 10)* and as a public passenger transport service in 2010 by the Brussels-Capital Region *(source 24)*.
No offer	✗ Existence of public and private pre-offers.
ECONOMIC CRITERIA	
Economic balance and coverage of user revenues	✓ No private or public BS provider is able to cover all its investment and operating costs from user revenues. The PB benchmark shows coverage rates of between 26% and 66%.
Natural monopoly	✓ The long-term investment + operating balance is more advantageous with charging stations, which also generate more usage. A network of stations installed in public spaces is, in business jargon, a "network industry generating a natural monopoly" and requires public intervention and funding. The absence to date of a universal standard for the bike-rack-station triptych makes it impossible to subsidise the network layer of the stations, and to put only the operation of the bike fleets out to tender.
Negative externalities linked to parking	✓ GPS, cameras, photos, fall detectors, Bluetooth and penalties seem insufficient to guarantee accurate and orderly bike parking.

4.4.4 Scenarios 3 to 5 | Is it worth investing public money in PB? This is a political decision.

The intervention and investment of local public authorities in PB can be justified by the market failures mentioned above *(Figure 49)* and by the desire to increase negotiating power. However, like all public policies and mobility services, PB has its limits and benefits *(Figure 50)*. The decision is therefore a political one. The rest of the study explores the possibility of public investment.

Figure 50: Limits and benefits of investing public money in an PB

	Limits	Benefits
	Cycling is very popular in Flanders and the Netherlands, despite theft and parking constraints. The PB budget could be invested in addressing barriers to using a quality bicycle by making it easier to acquire, maintain, and store a bicycle theft-free.	PB eliminates the barriers to access a bicycle for 100,000 to 500,000 Brussels residents, like a "mobility insurance". Even with massive investments in dismantling these barriers, many citizens will continue to face them. However, PB should not be a pretext for not investing in better cycling conditions.
	PB accounts for only a small proportion of bicycle trips compared to its share of the cycling budget, with a risk of underfunding other cycling measures *(Source 61)*.	Public investment in cycling is not in line with the objectives of increasing the modal share of bicycles compared to cars (e.g., leasing company cars, tunnels). And the €/trip ratio is lower for a well-used PB than public transport *(see section 6.5)*.
	Less efficient than LTR in terms of public euros excl. tax/km travelled.	Complementary to LTR and more effective in terms of the number of citizens reached.
	Accentuated sociological gaps with under-representation of vulnerable groups for a so-called "public" service.	Although underrepresented, several thousand of vulnerable people have access to a bicycle.
	Presence of private SB at lower public cost, but need to accept that it is not a public service.	• The "bicycle" component of Brussels' public transport service, visible in public spaces and consolidating the culture of "multimodality". • Bicycle project, shared mobility, data, MaaS, parking, marketing. • Contribute to the virtuous circle of rapid demand creation to put pressure on supply development.
	Overall carbon footprint potentially negative, if low usage and few former motorists.	Overall carbon balance potentially positive, in contrast to many public financing schemes.
	Derisory direct impact on car km avoided.	• Development of multimodal practices and skills among tens of thousands of people who use bicycles even though they would not have done so without PB. • On average in France, 18% of PB subscribers forgo the purchase of a car and 7% part with their car (*Source 17*). • Transformation of a street easement dedicated to car parking into an easement for bicycles parking. • Creation of a database of tens of thousands of residents to communicate with about cycling, alternatives to the private car and cycling policy, inviting them to become individual cyclists.

4.4.5 Scenarios 3 to 5 | Comparison of the three technological solutions

The choice of dropzones (*battery swapping*), hybrid or charging stations (connected to the electrical grid) service has an impact on street easement, operating and regulation methods, the need for local government intervention, budgets and cash flow financing. Here is a summary of the comparative analysis *(Figure 51, source 2)*.

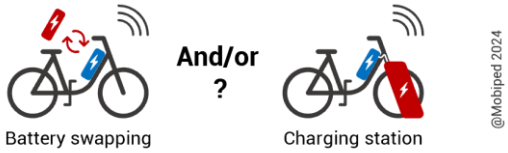


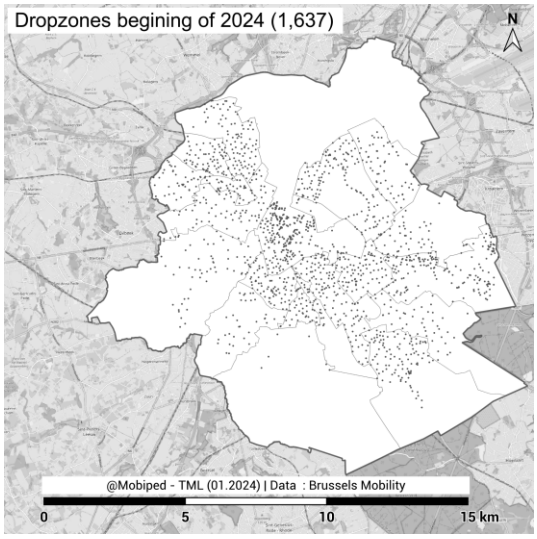
Figure 51: Thematic summary of options for a e-PB with dropzone, hybrid or in-station.

↗ risk of uncharged bike	• Swapping depends on the volume and cost of human resources. Stations increase the likelihood of charged bikes.
Battery life	• Swapping requires two batteries for each bike: one in the bike and one charging, and weakens the battery connectors.
Shared e-scooters	• Dropzone parking can be shared. In stations, there is a need for the same proprietary technology and complex dual operation.
Offer clarity	• Difficulty for users to grasp the large numbers of players and the complexity of the hybrid format.
Visibility in public spaces	• The stations are landmarks, but the furniture "suffocates" the bikes. • The colours of the bikes in dropzones are very eye-catching.
Sharing public space	• Bicycles parked outside dropzones are an obstacle to pedestrians, wheelchair users, the visually impaired and people with pushchairs.
Hidden costs	• Theft, vandalism and complaints to police are lower with stations. Dropzones has hidden costs: impounding (bikes in the way), water services (collecting bikes from the bottom of the canal) and citizens (annoyance).
Territorial deployment and access times	• Stations require works on public spaces (administrative procedures, underground networks, connection to the power grid), which means negotiating long stretches of road to replace car parking spaces and a more costly subsequent relocation. Since dropzones are smaller, their deployment is faster and more flexible, enabling very fine territorial coverage for better access times *(Figure 52)*.
Works	• Heavy works for the charging station and light works for the dropzones.
Contract duration	• Dropzone: three and five years | Heavy station: minimum eight years.
CAPEX versus OPEX	• Stations have very high CAPEX, but then lower OPEX. • Dropzones have lower CAPEX, but high OPEX (Human Resources costs for swapping), making this option less attractive over time. • This has an impact on the financing model for stations (contract duration + call for credit) and dropzones (fundraising and user revenues).
Timeframes	• Dropzones take a few months to set up and stations a few years.
Carbon footprint	• Investment: bikes and batteries for dropzones. Bicycles and street furniture with electronics for the stations. • Operations: data, servers and shuttle journeys (battery swapping for dropzones and regulation for stations).

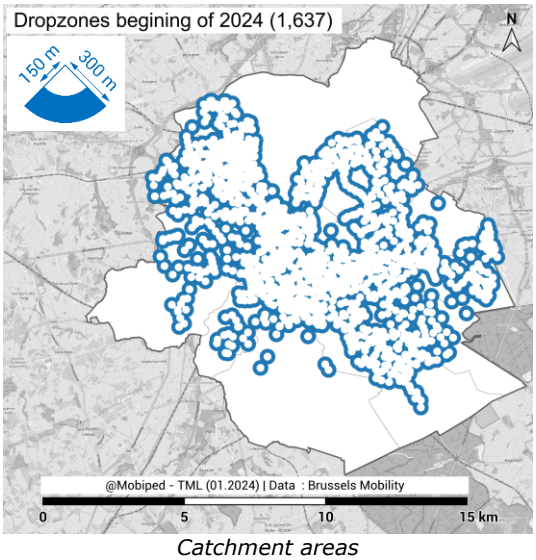
Figure 52: Maps of the dropzones and station-based scenarios

Scenarios 2 and 3: 1,637 dropzones in 2023, 3,000 estimated in 2027

18.4 dropzones/km² | 114 metres "observed" between two nearest stations (calculated for 1,637 dropzones)



Locations

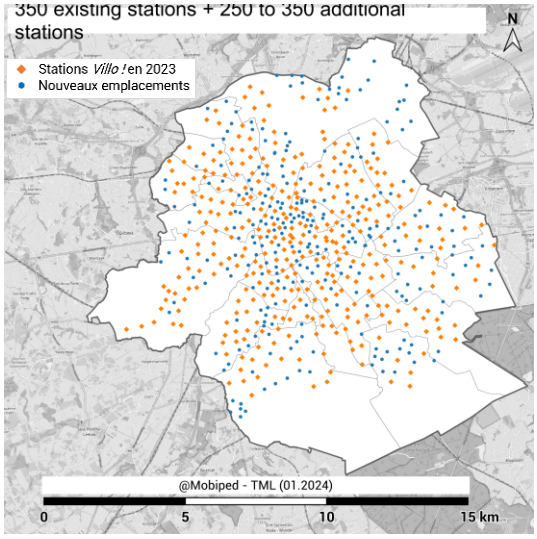


Catchment areas

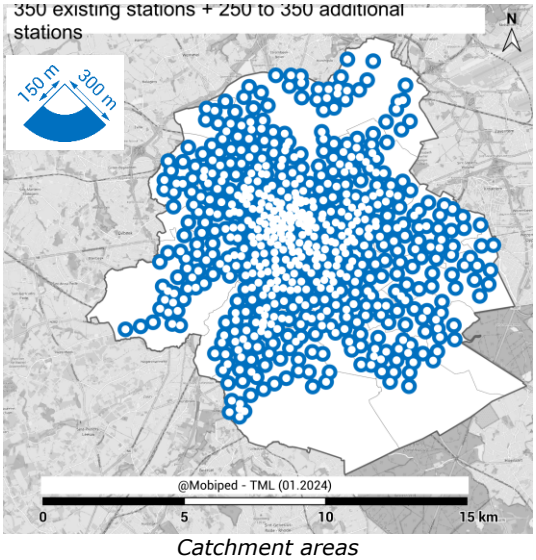
Scenario 4 - Hybrid (350 current stations + 350 batteries on dedicated racks)

Scenario 5 - Station: 700 stations by 2030

4.3 locations/km² | 322 metres "observed" between two nearest stations (Calculation for 600 locations shown below)



Locations



Catchment areas

4.4.6 Scenario 3 | What if PB were only in dropzones? Not that interesting.

A PB in free-floating would be deployed in the 3,000 dropzones envisaged *(Appendix 10.10)*, replacing *Villo !* and private licences. This scenario would enable rapid deployment, while avoiding the challenge of electrifying stations during the transition. But it also entails economic and political risks.

On the one hand, this solution offered the prospect of savings on stations. However, the total price would be close to that of an PB with a station, due to operating and battery swapping costs (duplicate batteries, human resources). The constraints of public objectives and the presence of a monopoly would improve attractiveness, thus increasing usage volumes and consequently costs.

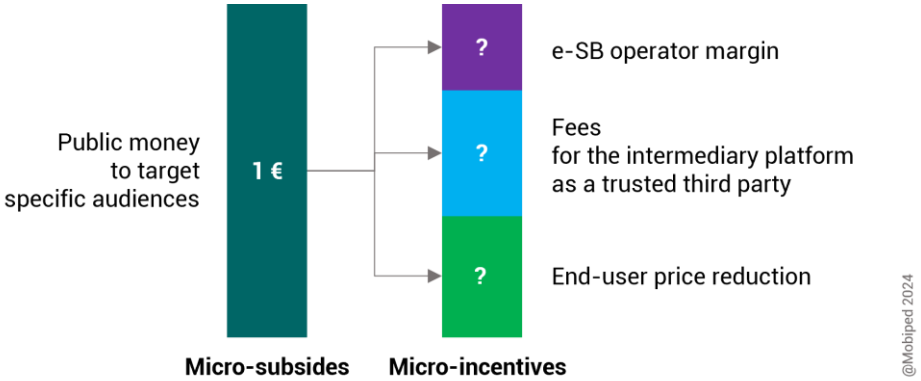
On the other hand, dropzone parking increases the risk of theft, vandalism, and bicycles lying on the ground or clogging up walkways. Technological solutions (GPS, camera, photos, fall detector) do not seem satisfactory at this stage, as they are either inaccurate, only available on a smartphone, or dependent on the operator's responsiveness. And even with penalties, parking outside dropzones persists (5% in Antwerp Region). "Already, the private and unsubsidised nature of free-floating services has not prevented municipalities from being held responsible by their constituents for the slightest fall or obstacle on the pavement" *(Source 62)*, so bicycles stamped "paid for with taxes" on the ground or parked in a disorderly manner would be difficult for citizens and elected officials to accept *(Figure 53)*.

Figure 53: Commercial visual inviting decision makers to use a charging station solution (Duckt)

In addition, micro-subsidies were not retained. The micro-subsidy per bike, as in Ghent (€125/bike/year), does not meet all the goals of the public service desired by the GBCR. The micro-subsidy per trip, tested as part of the Molière Project via reductions on Dott Bike trips in disadvantaged neighbourhoods, does not yet seem convincing enough for the following reasons:

- 3.72% increase in bicycle journeys via 70% reduction, costing €2.90/trip.
- the offer is based on the beneficiary's geolocation, not on their financial capabilities.
- the model lacks transparency on the margins of intermediaries, who will reduce the allocated amount to offer the final beneficiary a discount *(Figure 54)*.

Figure 54: The uncertain process of transforming a micro-subsidy into a micro-incentive



4.4.7 Scenario 4 | Is the best of both worlds possible? Hmmm, still too uncertain.

The mixed scenario of "charging stations + dropzones with dedicated racks" is a tempting way of limiting investment and operating costs, and ensuring orderly parking. Furthermore, the market is converging in this direction with new charging stations and connected bikes. This requires bike manufacturers to retrofit and adapt the frames and forks of their bikes.

But a number of unknowns remain:

- no player does both jobs well.
- experience feedback is scarce, and there is no consensus among service providers on the optimum percentage of stations and dropzones (ranging from 10% to 90% according to the players contacted).
- a more costly investment, since the requirements apply to both the bike (Internet of Things, resistance to impact, vandalism and theft) and the station (secure parking, charging).
- confusion for users between parking for personal bikes, PB and private SB in dropzones.
- difficulty checking that the bike is properly attached to the dedicated rack, with the possibility of PB on the ground or on paths.

4.4.8 Scenario 5 | Is station-based PB still relevant? Ultimately, yes.

With a 100% electrified fleet *(see section 4.1.2)*, the 100% charging stations option seems the most relevant and reassuring PB scenario in terms of:

- performance, with more rentals with station than with free-floating *(see section)*.
- quality of service with automated battery charging that does not depend on the cost of human resources.
- cost control, with less exposure to vandalism and theft, and no variable battery swapping costs.
- image, with orderly PB.

There are, however, some constraints to be taken into account:

- a long and risky transition, dependent on the decisions and schedule of the electricity grid operator and the planning authorities.
- long-term contract to amortise investment, so that the total cost ratio (investment + operation)/bike/year becomes relevant.
- limited flexibility to move stations, but with possible intermediate solutions: platform station, temporary station driven by human.
- limited station capacity with the cost of regulating bikes between stations.

4.5 Advantages and disadvantages of each scenario

Figure 55: Main advantages and disadvantages of each scenario

	1 | LTR + training + sales	2 | Private e-SB in dropzones	3 | e-PB in dropzones	4 | e-PB in e-stations + parking racks	5 | e-PB in e-stations
☺	• Efficient investment and trips induced over time. • Diversity and equity of user profiles with adapted bikes. • Progressive service development.	• No direct public expenditure. • Fast procedure and deployment. • Reactivity to integrate commercial offers and innovations.	• A simpler, clearer offering from a single operator. • Increased number of users. • Affordable pricing.	• CAPEX-OPEX optimisation for comprehensive service in the territory. • Attract audiences who prefer dropzones or stations. • The best of the B2C and B2G2C worlds.	• Many cities know its works. • Bikes parked, secured and tidy. • Optimised pedelecs charging.
☹	• Public intervention to be clarified with existing private offers (e.g. Pro velo and Swapfiets). • Limited number of people reached. • Success in France and Wallonia. And in Brussels?	• Hidden costs for local authorities • Fewer rentals than stations. • Unprofitable business, uncertain service continuity and future price rises in a hypergrowth business model.	• Harder to justify public intervention given existing private services. • Big risk of explosion in battery swapping costs. • Risk of uncharged bike	• No player does both well. • Combined risks of theft, vandalism and illegal parking. • Costs probably higher, with unknowns in terms of operation.	• Less innovative and "old-fashioned". • Increased investment for a denser network. • Potentially perilous transition.

4.6 Guidance from the steering committee

Based on the advantages and disadvantages *(Figure 53)*, the study's Steering Committee validates the appropriateness of scenarios 1 of LTR and 5 with e-PB in charging stations. While the introduction of a LTR service is a coherent, qualitative and efficient option, it is not explored further in this study. On the one hand, the initial study budget did not include a detailed analysis of two separate services. However, a more detailed analysis is needed, in particular to examine the legal dimension in relation to existing private LTR services, and to guide the marketing mix, especially for young people who do not cycle much *(Source 41)*. On the other hand, it was conceivable to combine the PB and LTR services in a single public contract, as in Nantes and Rennes. However, there are several reasons for separating these two contracts (*see section 8.1.4*).

The feasibility study therefore focuses on PB, exploring the political will to make public bicycles the fourth pillar of the public transport offer through:

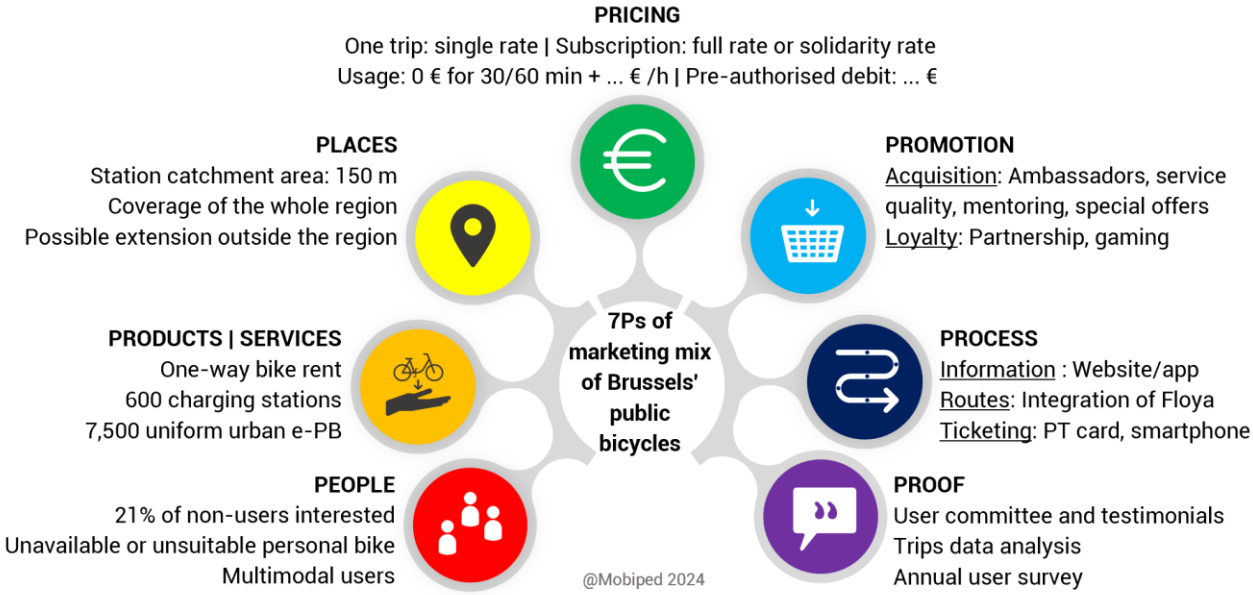
- a single, shared PB-PT user experience.
- the involvement of STIB, the BCR's urban public transport operator.

Long-term rental and public bicycles are both useful. The preferred scenario for public bicycles is with 100% charging stations. A political decision must be taken on whether or not to invest public money.

5 Marketing mix proposal

At this stage, no political or technical decisions have been taken. The proposals below are the result of an exploratory approach to the integration of PB and PT, with the aim of creating a single user experience. They are structured around the 7Ps of the marketing mix *(Figure 56)*, a basic private-sector approach to drawing up a business plan to determine the market positioning of a product or service.

Figure 56: Simplified view of the 7Ps of the user-oriented marketing mix for a future PB in Brussels



5.1 PEOPLE | Many potential beneficiaries

5.1.1 PB removes the obstacles for many Brussels residents

For hundreds of thousands of people in Brussels, PB removes the obstacles that prevent them from accessing a bicycle *(Figure 57)*. Some express an interest and may become users *(Figure 58)*.

Figure 57: Share of Brussels population in 2022 with difficulties accessing a bike.

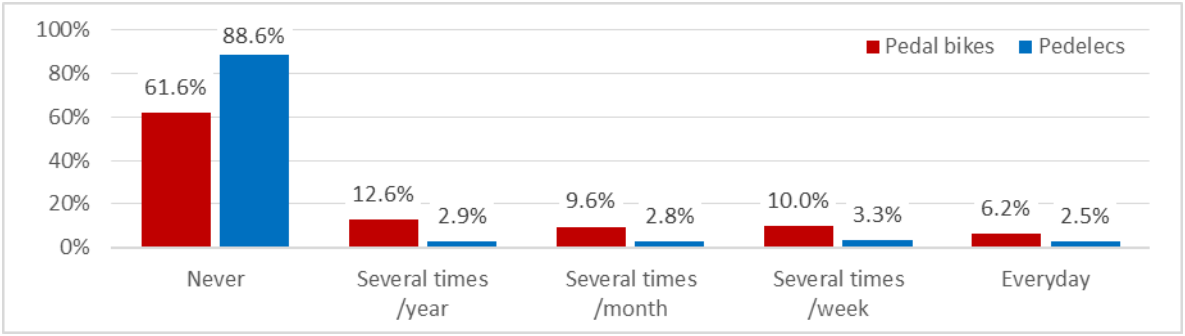
Barriers to accessing a bike	% of Brussels population	Households	Adults
"I live in the Region of Brussels"	100%: 1,220,000 inhabitants 2.17 inhabitants/household 1.38 adults/household *(Appendix 10.16)*	564,000	777,000
"I don't have a pedal bike".	53% of households have no bicycle in Brussels [41], compared with 15% in Antwerp [32] and Ghent [27]	300,000	410,000
"I don't have an electric bike".	89% of households do not have an electric bicycle [41]	500,000	690,000
"I can't buy a bike"	6% of households do not own a bicycle due to a lack of financial means [49]	34,000	47,000
"I can't park a bike"	Of the 53% of households that do not own a bike, 43% have no place to park one at or near their home. As a result, 23% of households are unable to park a bike and do not own one [41]	129,000	176,000
"I'm a cyclist, but I have parking problems"	24% of cyclists do not have a secure parking place for their bike at (close to) their home [36]		
"I'm afraid of bike theft"	29% of cyclists were robbed less than two years ago [36]		
"I'm not used to cycling"	In 2022, 60% of Brussels residents had not cycled during the previous year [41] *(Figure 59)*. 59% of people in Brussels, 58% in Wallonia (in 2010) and 24% in Flanders (in 2009)[1] had not cycled during the last year.		680,000 > 6 years
"I travel less than 5 km"	60% of intra-regional journeys 48% of car trips [41]		
"I don't have a car"	54% of households have no car [41]	305,000	420,000

5.1.2 The potential market of future users

Figure 58: Potential market and prospects for PB in Brussels

Travel practices	Potential prospects	Adults
"I already use *Villo !*"	23,000 *Villo !* subscribers and 45,000 non-subscriber rentals in 2022 [22]	
"I might be interested"	21% of non-users of *Villo !* in Brussels say they are interested in PB [44]	
"*Brupass* + PB? Ok"	9% of STIB subscribers are willing to pay €17/year more. 21% of STIB subscribers are willing to pay €3/month of their choice [51]	

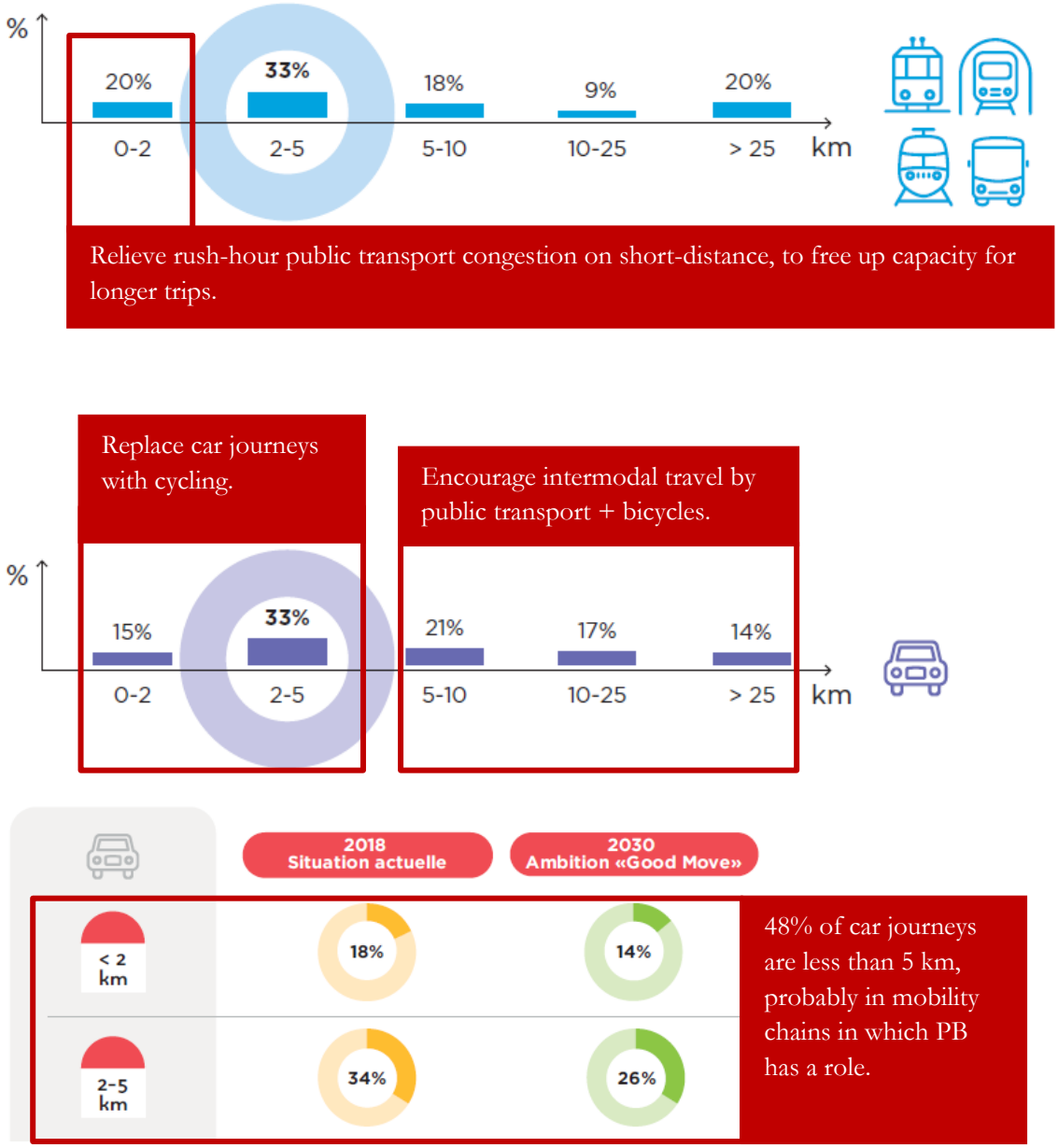
Figure 59: Frequency of bicycle use in the Brussels Region (Source data 41)



5.1.3 Target trips

While PB does not meet all mobility needs, it does have a role to play in some trips currently made by car and public transport *(Figure 60)*.

Figure 60: Contribution of PB to trips made by car or public transport (source graph 47)



5.1.4 Identifying the needs of specific audiences

To fulfil public service obligations and justify the presence of a Service of General Economic Interest *(Appendix 10.15)*, the universal design approach makes it possible to meet the needs of the most vulnerable members of the public, while improving service quality and comfort for as many people as possible. Universal design is structured in three stages *(Source 3)*.

1	Inclusive consideration of the needs of all groups in the broadest sense.
2	Correct or provide an environment that reduces disabling situations.
3	Compensate for disabilities when needs are too specific.

Women account for 51% of the Brussels population. But they are under-represented:

- In the use of PB services, where men and higher education graduates are over-represented (29% of *Villo !* subscribers are women).
- On the study's steering committee (2 women out of 9).
- Among the main contributors to the study.

The needs and recommendations of the DIAMOND project devoted to women and PB *(source 13)* are integrated across the board below to make PB as inclusive as possible. Generally speaking, women suffer more than men from these stressful situations *(Figure 61)*.

Figure 61: Inclusive PB design (1: Audiences | 2: Inclusion | 3: Compensation)

Audience (1)		Possible actions
Removed from public services	2	• Consultation in disadvantaged or remote districts. • Design workshop to produce flocking and strengthen the sense of community.
Little represented	2	• Better representation on decision-making bodies. • Inclusive communication with all profile types.
Car, the only credible solution	2	• Coverage of the entire Brussels-Capital Region, including remote areas. • Consideration to be given to extending to neighbouring municipalities.
Low revenues	2	• Solidarity prices: students, low-income earners and single-parent families.
Age	3	• > 14 years: authorised. • < 14 years: Fietsbieb-type LTR service.
Journey chains	2	• Density of PB stations close to public transport. • More than 65,000 single-parent families in Brussels *(Appendix 10.16)*.
Atypical size	2	• Open frame, adjustable saddle, manoeuvrability on the bike or for moving/pushing the bike on foot, electric bike.
Transport of persons	3	• Prefer a homogeneous fleet *(see section 5.2.2)*. Tandems, bicycles with baby/child seats, cargo bikes, cycles are available in a LTR service. • Allow multiple bikes to be rented with one account. • Sponsor new registrations. • Invite people to cycle in groups.
Transport of objects	2 3	• A basket can be used to carry a bag or even a cabin luggage. • Larger objects and goods can be transported using a shared cargo bike or a variety of LTR cargo bikes.
Far removed from employment	2	• Training and employment programme with the PB operator.
No bank account or card	3	• Possibility of paying by cash at a specialised counter, within a framework to be defined based on feedback from Chicago.

Audience (1)		Possible actions
Far removed from the digital world	2	• Allow people to identify via a non-digital ticketing device (card) and return the bike just by engaging the bike, all without a smartphone. • Signage on furniture. • Access to all information on the website without downloading the app or creating an account. • Provide a humanised welcome and on-site activities. Among Brussels residents aged 16 to 74 in 2022, 38% had low or no digital skills, i.e. around 300,000 adults *(Appendix 10.17, source 16*).
Culturally far removed from cycling	2 3	• Communicate via the PB to question social representations. • Enhance the social LTR service with specific training: 6.73% of Brussels residents over 16 have never learned to ride a bike, i.e. over 50,000 people *(Extrapolation of data from the survey on non-use of micromobility, source 44).*
Difficulty understanding	2	• Communicate in Belgium's three official languages (French, Dutch and German), English and possibly other minority languages. In 2023, 63% of Brussels residents were Belgian, 23% from a European Union country and 14% from another country *(Source 73).* In 2022, the language breakdown of *Villo !* subscribers was 82% French, 10% Dutch and 8% English *(Source 22).* • Name the service with a multilingual phoneme.
Low level of education	2	• Respect the basic principles of accessible communication and interface design (e.g. UNAPEI guide). • Among 15–64-year-olds in 2022, 46% had a higher education diploma, and 54% had no more than a secondary school diploma *(Source 56).*
Visually impaired	2	• Respect the basic principles of colour contrast and font size.
Unsighted	3	• As part of a LTR service, propose tandems with a companion.
Wheelchair users	3	• Propose adapted cycles as part of a LTR service.
Potential discomfort or danger	2	• Propose safer cycling infrastructures and less stressful routes (traffic, feeling of insecurity). • Density of stations to reduce walking distances. • Option to share an itinerary with a friend or family member. • Illuminated stations. • Quick registration and identification process to avoid long waiting times in public spaces. • Protocol for dealing with harassment.

5.2 PRODUCTS | e-public bicycles rental service

5.2.1 Rent a bike for the duration of a trip

Users over 14 years of age can rent a bike (or several bikes) 24/7, from a station in the public space, for the duration of their trip by dropping the bike off near their destination. Having a bike nearby or a parking space close to the destination is no guarantee, just as there is no guarantee of having a seat on public transport or driving a car at the maximum speed allowed during rush hour.

5.2.2 100% pedelecs

In Brussels, pedelecs is justified on the grounds of:

- hilly territory, including in the centre.
- comparison with private e-SB.
- the lack of quality of the current bikes and the image of the current service to revitalise it.
- the interests of female audiences.
- motorists' attraction to a motorised mode.

A single and homogeneous 100% pedelecs fleet *(see section 4.1.2)* is recommended, bearing in mind that LTR is better suited to offering a diversity of bike sizes and models *(Figure 62)*.

Bike with child seat option

It is possible to have an option in the contract for bikes with child seats. However, this imposes constraints on the reinforcement of the bicycle frame and twofold logistics, for an impact that seems to be limited to a communication element.

Shared cargo bike (SCB) option

Cargo bikes are very useful as part of a multimodal offer to reduce the need to own a car. However, shared cargo bikes (SCB) are quite distinct from PB *(Source 2)*:

- mainly back-to-one service.
- vehicles from the private market, but not designed for intensive self-service use.
- different players. Including SCB in an PB market risks reducing competition and diverting choice to the thousands of PB rather than the quality of the SCB.
- questions have been raised about the risk of free-floating SCB theft, given their price (Lyon), and of those with stations, which are parked in reverse on different dock to traditional PB.

Whether or not SCB are included in the contract, API integration will enable SCB to be rented from the PB app, without the need to create a second account (Lyon).

Figure 62: Distribution of bicycle types between PB and LTR services

	PB	LTR
Pedelecs with integrated battery	✓ (100 %)	✓
Bikes with portable battery	✓	
Shared Cargo bikes	Option or different contract	✓
Pedal bikes		✓
Bikes with child seat option	Possible option	✓
Tandem bikes		✓
Children's bikes		✓
Adapted bikes		✓

5.2.3 100% charging stations + occasional human-stations

The stations are connected to the power grid so that all bikes can be charged even when the station is full. The audit report on Vélib's transition difficulties in Paris pointed out that the usefulness of electrifying all the stations had not been questioned. However, electrifying all stations seems a good idea. The extra cost is low compared with the cost of the station, and remains a one-off installation. It sounds easier to make this connection when changing the furniture than later. The challenge lies more in coordination with the electricity grid operator *(see 9.2)*. As in Paris, human-presence stations would be provided for major events.

5.2.3.1 What would be done with old furniture?

Charging and secure parking are based on the triptych "Bicycle <> Lock <> Dock" whose design is interconnected. The current *Villo !* triptych is the exclusive property of JC Decaux and is protected by patents. Acquisition by the Region' would involve:

- negotiating with the outgoing candidate and signing a maintenance contract.
- keeping the bikes for an efficient bike-lock-dock furniture triptych since part of the lock is included in the frame, or retrofitting another provider bike (a costly process with no guarantee of results, given that JC Decaux's e-PB power supply is 24 V and 36 V for other bikes).

As this would give the outgoing competitor an undeniable advantage, which is unthinkable under public procurement law, the future incumbent will supply the entire bike-lock-dock triptych, with its own furniture to secure and power the bike. If JC Decaux were to bid for and win the future contract, it would retain the furniture with certain adjustments:

- the terminal: adapt the electrical switchboard.
- the dock: replacement of the electronic board, replacement of power cables, addition of a power supply, installation of a contactor.

To ensure fair competition and avoid giving an advantage to the outgoing competitor (savings on furniture and work, shorter lead times), the existing value of furniture production and installation could be added to the value of the outgoing candidate's bid.

5.2.3.2 Suggested features for automated charging stations

Basic functionalities

- One parking slot per bike to secure the bike and ensure that it remains stable.
- They are connected to the electrical grid to charge the pedelecs.
- There are a number of possible layouts for integrating into constrained public spaces (ground integration, curved configuration, historic heritage areas), or even being relocatable at lower cost (less civil engineering, rapid installation/movement/removal).
- Ownership of the stations may be transferred at the end of the contract to the local authority.
- An information medium is used to communicate on the service operation.

Other possible functionalities

- Contactless bankcard payment terminal.
- A digital interface for disseminating information, like a mobility portal.
- External electrification device waiting to be connected to the power grid.
- Temporary stations that can be deployed very quickly, with dedicated charted bicycle racks and a post integrated a Bluetooth box.

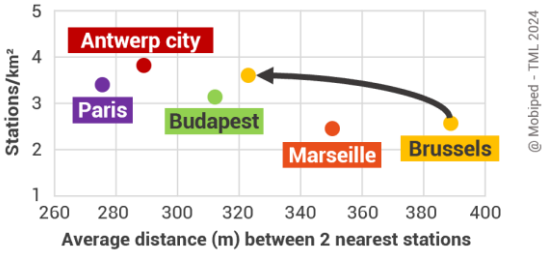
5.3 PLACES | a denser network of stations

5.3.1 Network densification

Network densification is necessary to:

- maintain the regional coverage of the current service and serve all 19 municipalities in the Region.
- reduce the average distance between 2 nearest stations, which is currently lacking, with the possibility of further densifying the network to below 300 metres *(Figure 63)*.

Figure 63: Shortened distance between two neighbouring stations of the future PB



- improve the attractiveness of the service, bearing in mind that access time is the main obstacle for non-users and the second biggest obstacle for users.
- target longer trips previously made by car, thus ensuring a positive carbon footprint for the service, in line with the cycling network.
- improve intermodality with public transport *(Figure 64 and Figure 65)*.

Figure 64: Station density comparison between current (2023) and imagined (2026) networks

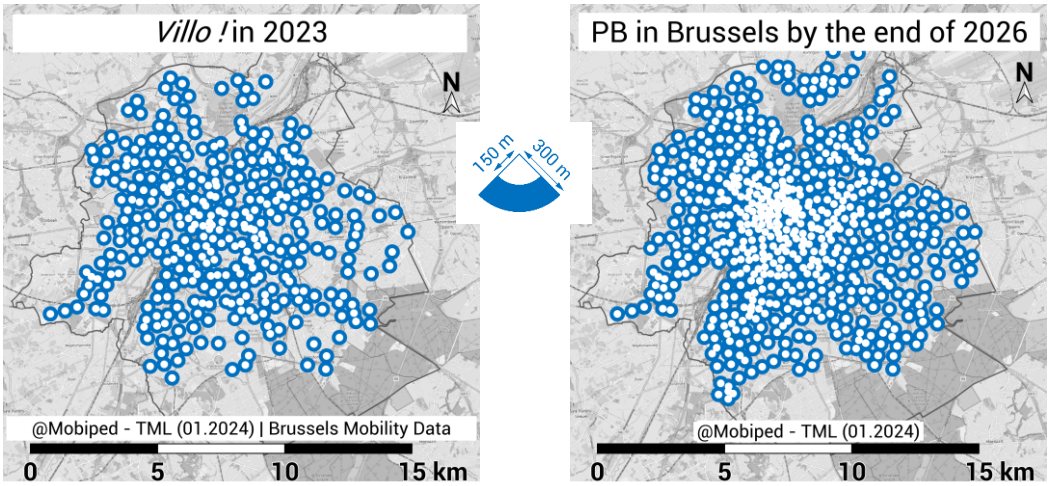
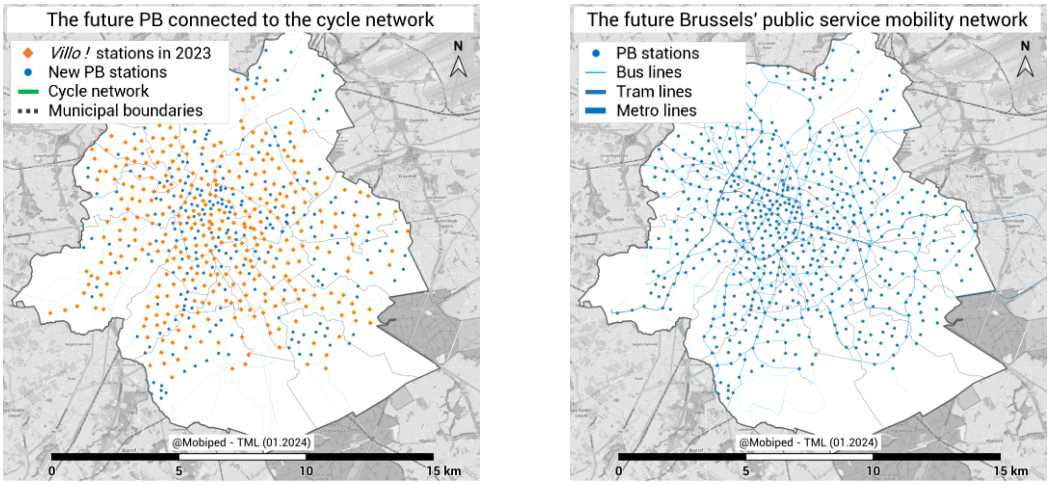


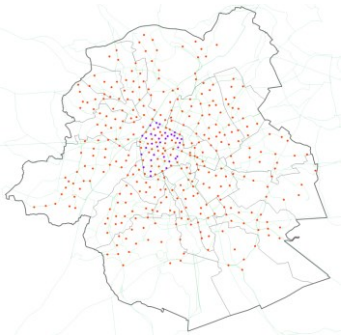
Figure 65: PB stations on cycle networks (left) and public transport (right)



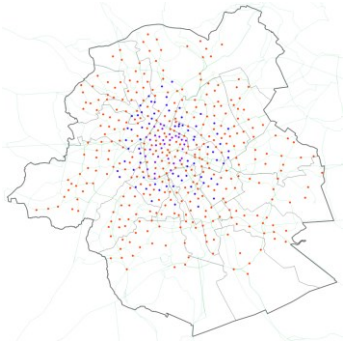
To achieve this, a minimum of 600 stations is required. The current 350 locations are retained (orange), with the addition of 30 stations in the Pentagon (purple), 70 in the inner ring (dark blue) and 150 in the outer ring (light blue) *(Figure 66)*.

Figure 66: Proposed densification and evolution of the PB stations network in Brussels

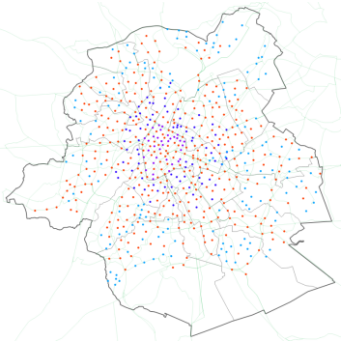
Villo ! in 2023 (350)



Densification in the Pentagon (+30)



Densification in the inner ring (+70)



Densification in the outer ring (+150)

5.3.2 Station location principles

Negotiation Lower resistance	Retain the current station locations to avoid too many negotiations, while trying to move the stations currently on pavements to existing car places.
Pedestrian access	• Located at intersections with several branches, to reduce the average pedestrian access time for as many potential users as possible. • Provide pedestrian walkways.
Road safety	• Close to the crossroads to reduce co-visibility barriers during interactions between users of the public space. • On the road to avoid legitimising cyclists on the sidewalk and contributing to pedestrian-cyclist conflict. The locations of the former sidewalk stations are transformed to benefit pedestrians: trees, flower boxes, benches and comfortable walkways.
Modal shift	• In place of car parking, the main lever for the modal shift. • On the road, as a tactical urban planning tool to redefine the traffic plan.
Group cycling	Positioned near bicycle racks to facilitate cyclists group parking (composed of private cyclists and PB users), create a visual mass effect and contribute to informal anti-theft surveillance.
Cycle network	• Ensure continuity for cyclists by reducing traffic speeds and providing cycling facilities in all directions. • Provide a setback zone for bikes, with floor markings and obstacles.
Regulation	Anticipate the need for temporary parking spaces for regulation shuttles, without penalising traffic flow for all road users.
Lighting	Station lighting for informal anti-theft surveillance and to reduce feelings of insecurity regarding possible harassment.

5.3.3 Expanding outside the BCR

5.3.3.1 To integrate as an option

Initially, it seems wise to focus solely on the administrative territory of the BCR. However, an extension to certain neighbouring municipalities (e.g. Dilbeek, Grimbergen, Linkebeek, Machelen-Diegem, Sint-Pieters-Leeuw, Vilvoorde, Wemmel, Wezembeek-Oppem, Kraainem, Zaventem) can be included as an option in the contract to:

- avoid the development of two no seamless services (e.g. Vélib' 1/Vélo Plaine Commune or Bicing/Ambici in Barcelona).
- give these communities access to this type of service (under pre-established conditions that are identical for all), as they are unlikely to be able to develop and finance it themselves.

5.3.3.2 Conduct an opportunity study

Beforehand, an opportunity study will be required to identify:

- dialogue and governance framework with neighbouring municipalities and the Flanders Region, based on the Paris example *(Figure 67)*.
- needs, distances and journey practices.
- the cycling culture of the inhabitants of these Flemish cities (practice, bicycle ownership), compared with the use of an PB to and from Brussels centre (parking issues at destination).
- the deployment of structural cycling infrastructures to reach the BCR.
- the deployment of Hoppin-Punten, Flemish mobility hubs.
- the relevance of a LTR service branch with pedelecs.
- the compatibility of electricity distribution networks.
- the operating costs and additional travel time between stations and warehouses.
- the provisional test possibilities based on temporary stations before considering the installation of charging stations.
- The legal framework differences.

Figure 67: Extension of Vélib' beyond the administrative boundaries of the City of Paris

Vélib' 1	The City of Paris financed the installation of the stations and the related operator costs within a 1.5 km perimeter beyond the territorial limits of the City of Paris. This limit was mainly due to the constraints of the outdoor advertising legal framework.
Vélib' 2	Creation of the Syndicat Mixte Autolib' Vélib', to which each commune belongs. The cost of installing a station is estimated at €20,000 excl. VAT/year, co-financed 50% by the Paris Metropolis and each commune. Advertising on the bikes was firstly considered, but the different local legal framework did not allow it.

5.4 PRICES | Multimodal pricing

5.4.1 Towards fully integrated multimodal pricing?

Ideally, a single ticket would enable both PT and PB to be used. But to charge for the rental period and reduce the risk of theft, the user must be identified, or at least a solvent account must be provided. Moreover, single paper tickets and *Mobib basic* are anonymous Contactless payment is possible, but it would require double payment for each. However, STIB subscribers are already identified in the digitalised pass or on the *Mobib Personnelle* card. To activate the PB option, the customer must authorise prepayment and accept the Terms and Conditions (T&C) during an update or proactively. There are a number of challenges involved in converging and harmonising PT and PB into a single offering *(Figure 68)*.

Figure 68: Challenges in converging STIB public transport and PB into a single-fare experience

	PT (STIB)	PB (market)	Convergence challenges
COMMON (Single journeys or subscriptions)			
Accept the Terms and Conditions (T&C)	In situ (no signature) | App (checkbox)	Checkbox	Common Terms and Conditions, including PB and PT
Identification of a solvent account	Ticket: No Subscription: Yes	Indispensable for reducing theft and charging by usage	
Deposit, security deposit, post-payment according to end-of-trip length of use	None	• Debit pre-authorisation (reserve frozen during rental period) • €150 deposit for *Villo !*	• Low-level direct debit pre-authorisation (Marseille: €15 on account) • €50 max deposit to consider open-payment option • High price range
Age declaration		✓	
TICKET			
Journey time (ticket)	60 min + transfer	30 to 45 min + ...€/minute	Harmonisation at 60 min
Number of journeys	One ticket or discount for 10 tickets	One trip, return trip or several trips possible by the day	Harmonise the number of journeys
Open payment	€7.5 maximum cumulative over 24 hours	In its infancy (Freebike, Ecovélo)	Legislation limiting the maximum amount per operation to €50
SUBSCRIPTION			
Duration/number of journeys (Subscription)	Unlimited	30 to 45 min. + … €/min	Need to limit the number of PB trips to avoid overuse by meal delivery cyclists
Age limits	6, 12, 18, 42, 65 years	14 years	Harmonise or add an intermediate class.
Regular debit	SEPA request	SEPA request	SEPA request
Identity card	✓		Also to be requested for PB to identify the user in case of non-return of the bike?
Passport photo	✓		

5.4.2 Pricing: a sensitive trade-off

Bike sharing fare structures can be very complex *(Source 2)* and difficult to compare between PB and private SB services in the same city. They include the notions of unlocking, journey, duration, type of bike, PT subscription, promo code, social prices, one-off discount, advance purchase of credit or parking locations.

Ideally, pricing is attractive, simple, supportive, an incentive to return the bike, restrictive to avoid abuse (e.g. over-use by meal delivery staff), adapted to encourage multimodality and balanced to finance the service. Rather than prohibiting certain uses, it would make more sense to offer premium subscriptions at a higher cost *(Figure 69)*.

Figure 69: Simulation of a potential simplified PB pricing structure (Author: Mobiped)

	Subscription	Unlocking	Usage
1 trip	€0	€2.10	1st hour free + €5/additional hour limited till 12 h *(Figure 70)*
10 trips		€16.80	
24 h		€8.40	
Basic subscription	PT subscribers: €0 or €50/year? Solidarity: same as PT? Student: same as PT? No discount: €100/year?	2 releases: €0 +2 releases: €3 per release	
Premium subscription	€400/year	4 releases: €0 +4 releases: €3 per release	

5.4.3 Pay-per-use

With a view to simplification and clarity, pay-per-use is:

- identical for all users. Benefits for certain groups are provided with subscriptions.
- the first hour is free (rather than 30 or 45 minutes). This makes it possible to match the length of time spent using public transport, to make long journeys without the stress of switching to the paying part, and to increase the likelihood of influencing journeys previously made by car over medium or long distances (with a view to a positive overall ecological balance).
- round numbers per hour started as a mnemonic.
- lower than private e-SB to justify public intervention
- dissuasive to encourage people to return their bikes.
- less than €50 (including release fee), to set up open payment. The bike would de facto be remotely locked after a certain rental period: 6 hrs, 12 hrs, 24 hrs depending on the chosen rate. This could avoid the need for a deposit or guarantee, which are disincentives to use *(Figure 70)*.

Figure 70: Usage-based pricing ideas

Rental	€ / additional rental hour			
lenght	€2	€3	€5	€10
1h	€0	€0	€0	€0
2h	€2	€3	€5	€10
3h	€4	€6	€10	€20
4h	€6	€9	€15	€30
5h	€8	€12	€20	€40
6h	€10	€15	€25	€50
7h	€12	€18	€30	
8h	€14	€21	€35	
9h	€16	€24	€40	
10h	€18	€27	€45	
11h	€20	€30	€50	
12h	€22	€33		
13h	€24	€36		
14h	€26	€39		
15h	€28	€42		
16h	€30	€45		
17h	€32	€48		
18h	€34			
19h	€36			
20h	€38			
21h	€40			
22h	€42			
23h	€44			
24h	€46			

5.4.4 Pricing and financing of the service

PB can be included in an offer directly combined with PT or can be separated. If PB is included in the basic public transport subscription at the current price, no user revenue will contribute to financing the service. Moreover, tariff variation cannot be used to regulate usage. If it is included with an increase justified by improving the public mobility service offer, then all subscribers will contribute to financing the service *(Figure 71 and Figure 72)*. In February 2016, a survey of stated preferences gave indications of a pedelecs subscription *(Figure 73)*. In May 2022, 30% of STIB users expressed a potential interest in using the current *Villo !* system via an annual or monthly subscription with very attractive pricing offers (*Figure 74)*. New surveys based on the value proposition proposed from this study would allow the testing of willingness to pay.

Figure 71: Tariff integration and service financing scenarios

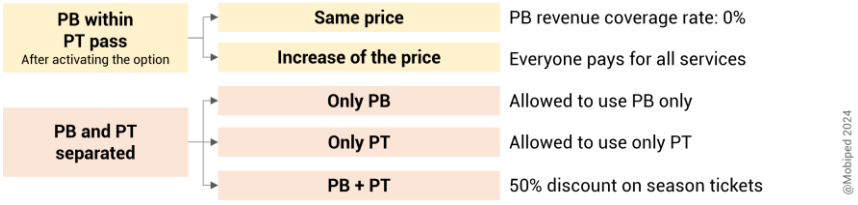


Figure 72: Exploratory visualisation of PB and PT fare integration (Author: Mobiped)

	STIB	BRUPASS	BRUPASS XL	SNCB + STIB	BIM	Bike
	B+M+T+PB	B+M+T+Train+PB	B+M+T+Train+PB	B+M+T+Train+PB	B+M+T+PB	PB
Tickets						
Open paiement	€2.10					€2.10
Brupass 1 travel		€2.40				€2.40
Brupass 2 travels						€4.00
Brupass 10 travels		€16.80				€16.80
Brupass 1 day		€8.40				€8.40
75 travels		€105.00				€105.00
Seperated membership, with reduction						
STIB normal price	€549/y (+ €50) €54/month (+€5)	€650/y (+ €50) €65/month (+€5)	€890/y (+ €50) €89/month (+€5)	€549/y (+ €50) €54/month (+€5)		€100/y €10/month
Discount price					€95/y (+10) €9/month (+1)	€36/y €3/month
18-24 years old price	€15 /y €1,2 /month (+ €0,25)					
PB and PT fully included in the same pricing						
STIB normal price	€499/y €49/month	€600/y €60/month	€840/y €84/month	€499/y €49/month		
Discount price					€85/y €8,1/month	
18-24 years old price	€12/y €1/month					

Figure 73: Stated preferences for an annual pedelecs subscription (2016, 169 responses)

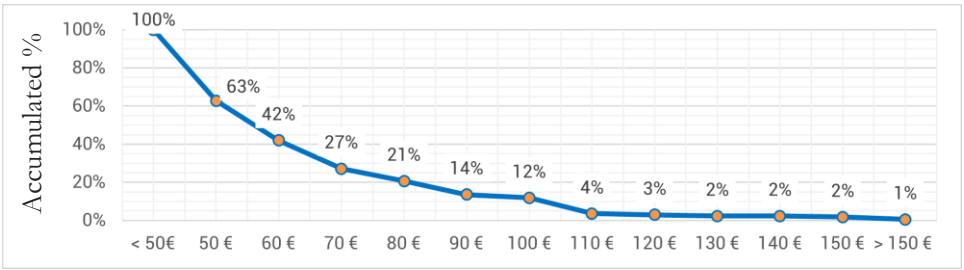
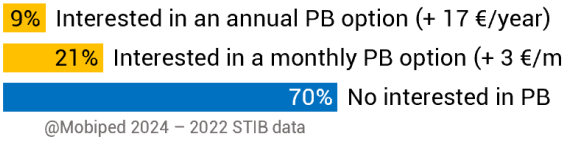


Figure 74: Interest of STIB subscribers in paying for an PB option in addition to their PT subscription [21]



5.5 PROMOTION | Willingness to attract users

The multi-channel strategy should attract car customers, build their loyalty and convert them into occasional or regular cyclists.

5.5.1 Acquisition of new users

Attract	• Make bicycles visible and identifiable from a distance, day and night. • Save time: proximity, availability and ease of use. • Good value for money. • Attractive design.
Communicate	Multi-channel strategy with headline ambassadors (music stars, influencers, local personalities) for each target group.
Identify	• Public brand: purchase the current brand name *Villo !* to the current incumbent *(Source 65)*? Derivation from STIB? Other? • If naming, loss of public service spirit.
Favour	• Special commercial offers (first 30 minutes free). • Card offered by default to newcomers on proof of change of address, to be activated with a few free journeys (Opt-out approach). • Cross-partnership offers for beneficiaries of other membership cards (e.g. cinema, PT, cycling or car-sharing association members).
Get people back in the saddle	Human support in the appropriation of the service (bike, price, digital interfaces) for people who know how to ride a bike.
Disseminate	Floya widget to enable journey generators to share multimodal infomobility in their "practical information" and "access map" pages *(Appendix 10.18)*.
Unite	Allow multiple bikes to be rented with one subscription. Receive sponsorship or a gift card.

5.5.2 User and cyclist loyalty

Convert	Invite people to subscribe after the test.
Maintain	Useful accessories for urban cyclists *(Figure 75)*. News and practical advice.
Stimulate	• Gaming, challenges and individual statistics at the end of the trip. • Bring people together around events.
Listen	Users' Committee.
Promote	Invite people to ride their own bikes.
Reward	• Loyalty programme with benefits on other services. • Partner benefits (e.g. reduced PT subscriptions).
Sponsor	Discount on subscription for referrals.

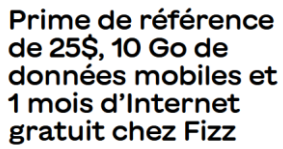
5.5.3 Convert

Transform	If more than 50 trips/month, invite to shift to long-term rental or increase the subscription price.
Relay	Communicate about services for getting around with another rented bike (e.g. LTR) or private bike (repairs, purchase assistance, etc.).

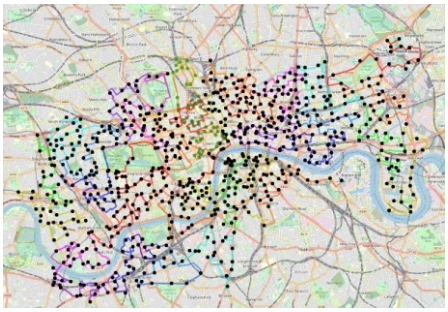
Figure 75: International inspiration

Gift Card (Rouen)

Folding jacket (Los Angeles)

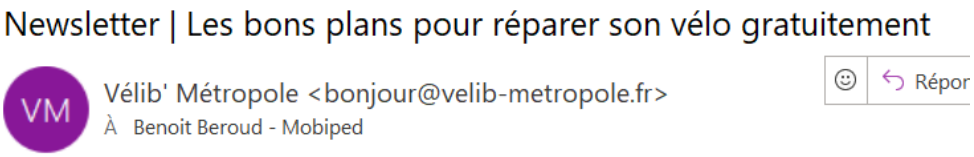


Partner benefit (Montreal)



All the Docks Challenge (London) [74]

42 km challenge (Barcelona) [63]



Encouraging people to use their own bicycles (Paris)

5.6 PROCESS | An optimised user experience

5.6.1 Global vision

In line with the universal design approach *(see section 5.1.4)*, each link in the travel chain is treated with care, at the risk of a single blockage preventing the experiment from being completed *(Figure 76)*. Access with a Bancontact card, which is widely used in Belgium, does not yet appear to be very smooth in terms of user experience *(Figure 77)*.

Figure 76: Stages of an PB journey

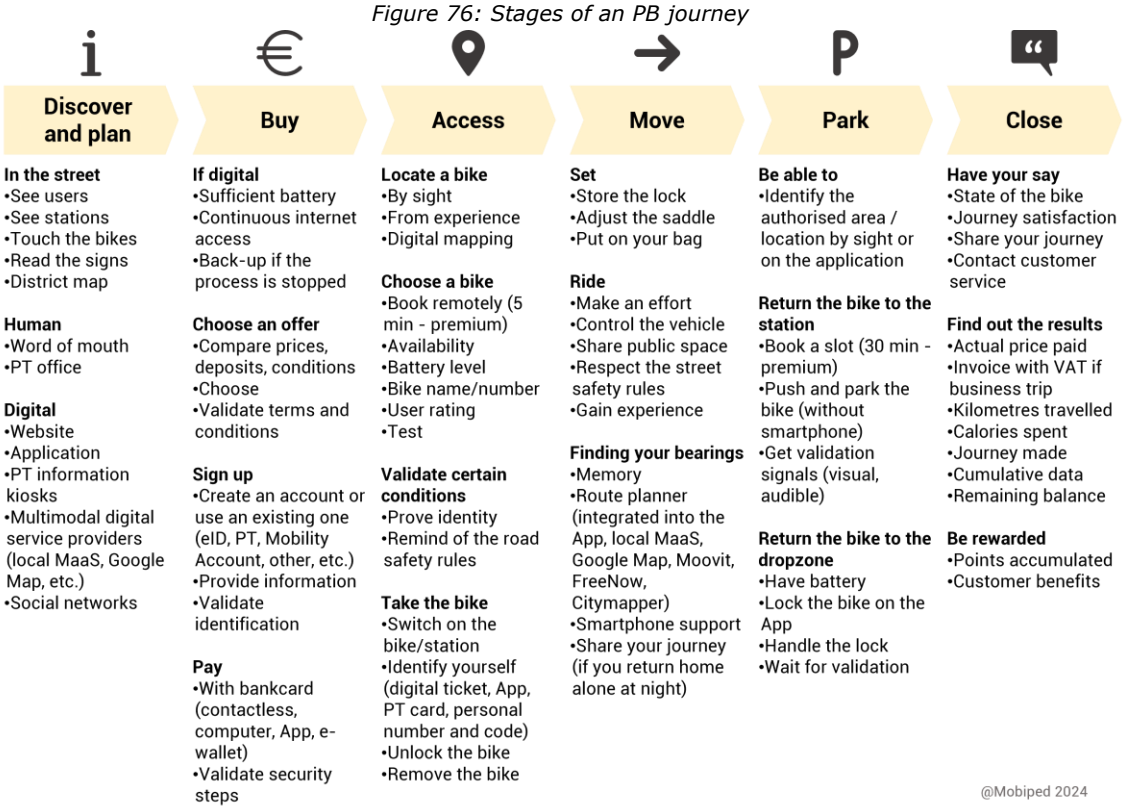
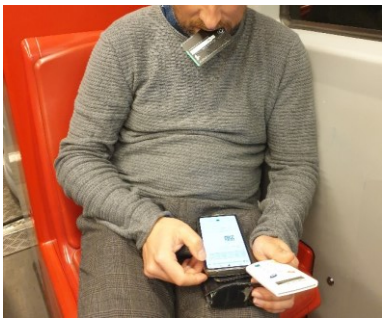
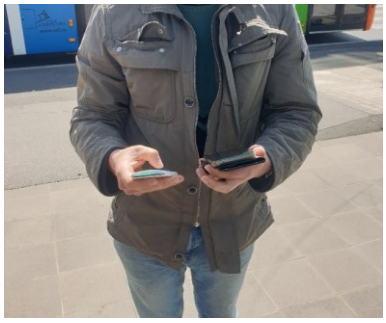


Figure 77: Bancontact payment with a card machine in public transport (left) or on the street (right)





5.6.2 Exploring the integration of PB into PT communication media

To open up imaginations and avoid the cultural bias observed in several European cities *(Source 2)* and to look ahead to the equitable integration of PB and PT in Brussels, an indicative prospective approach is proposed involving:

- a possible evolution of the STIB website homepage *(Figure 78)*.
- disturbed situations, inspired by Wiener Linien in Vienna *(Figure 79)*.
- network presentation, name, map, real-time information and Google search results *(Appendix 10.18)*.

Figure 78: Proposed evolution of the STIB website homepage banner if PB is integrated, from travel to move or rent

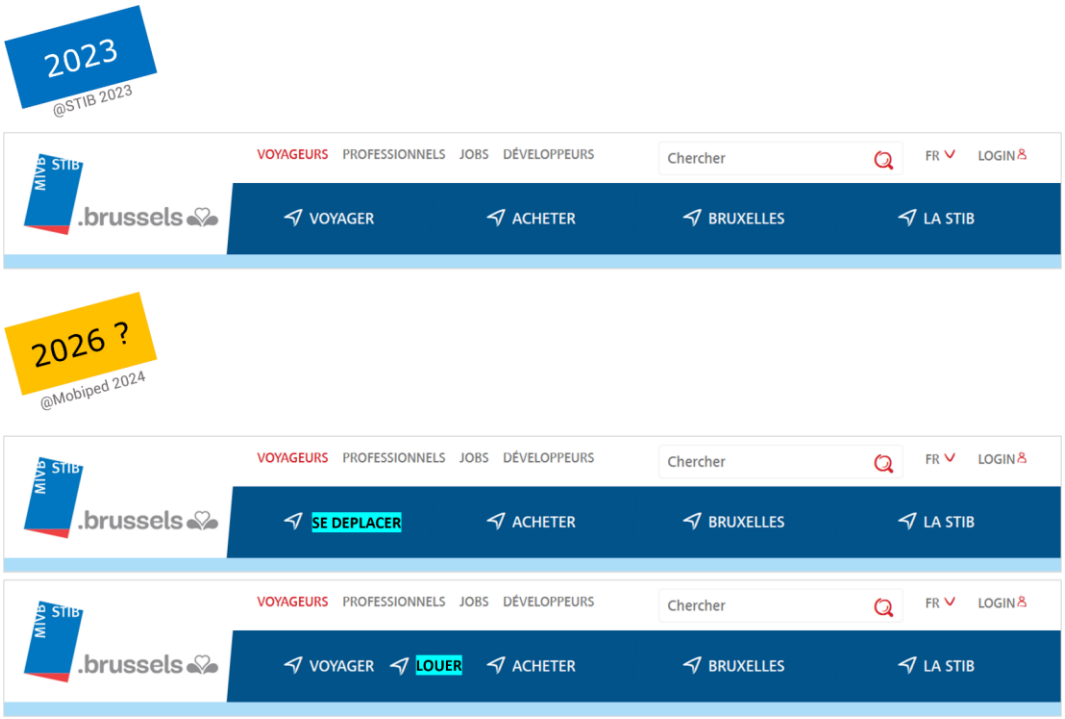
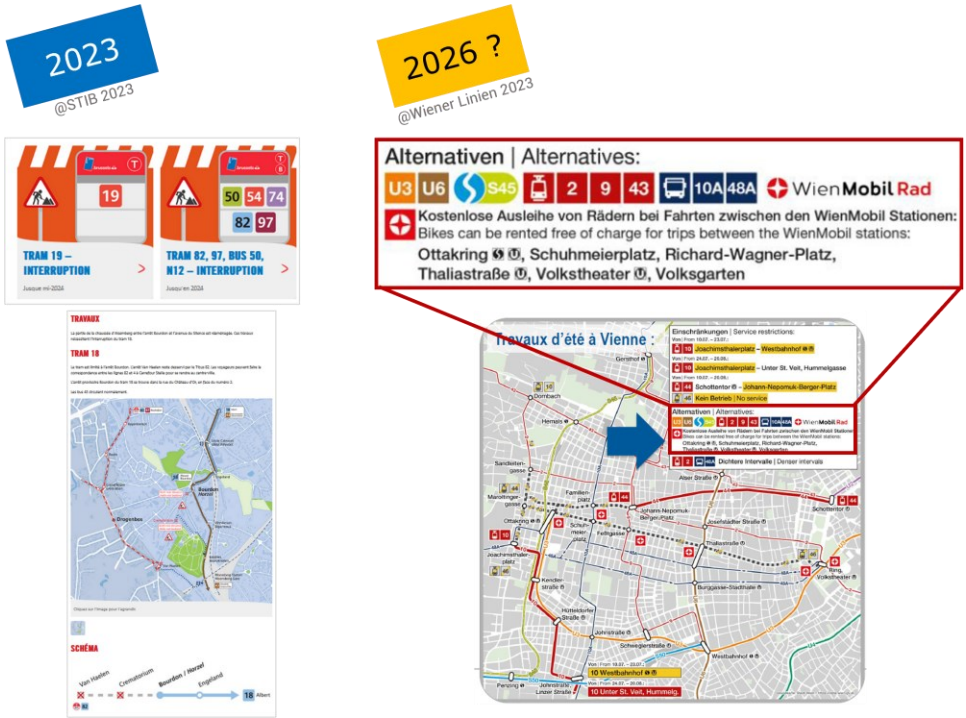


Figure 79: Cycling option proposed during road work on PT lines



5.7 PROOF | Usage evaluation

To improve the service and evaluate public policy in relation to the initial objectives, it is essential to understand and know usage patterns. This can be done via:

- a users' committee that meets regularly.
- putting PB on the agenda for meetings with associations.
- an annual user survey.
- a single owner of the PT and PB customer databases to analyse the reality of inter- and multimodal practices.
- big data analysis, making data available and sharing results *(Figure 80)*.

Figure 80: Public statistics

Annual statistics (Lyon)

Daily statistics made public (Budapest)

There is a potential demand and the possibility of offering a suitable PB service.

6 Suggested size

6.1 600 stations minimum and 7,500 e-PBs

Generally speaking, the size of an PB service is based on the number of bicycles. Three perspectives were initially identified:

- Perspective I - A steady stream of 5,000 e-PBs, like the current number of *Villo !*
- Perspective II - Proactive with 7,500 e-PBs to improve and boost the service.
- Perspective III - Very ambitious with 10,000 e-PBs.

But the government's desire to maintain good regional coverage and the low density of the current network *(see section 5.3)* mean that the number of stations should be the first consideration. This means that a minimum of 600 stations would be needed to supplement and densify the network.

To maintain a good balance of bikes per station (10 to 14 in the benchmark), 7,500 e-PBs would be envisaged *(Figure 81)*, i.e. one PB for every 165 inhabitants of Brussels and 12.5 bikes per station. To increase the probability of finding a parking space, the rate of expansion would be increased from 1.7 to 2.5, a figure now planned for *Vélib'* in Paris *(Figure 82)*.

Figure 81: Proposed evolution of the PB offer in Brussels between the two contracts

	***Villo !* in 2023**		**Future Brussels PB**
Stations	360	→	600
Bikes	5,000	→	7,500
Parking slots	8,435	→	18,750

Figure 82: Key service offer performance ratios

Offer performance ratio	**Benchmark**	***Villo !* in 2023**		**Future Brussels PB**
Contractual bikes/Station	10 - 14	14	→	12.5
Parking slots/bike	1.7 – 2.7	2	→	2.5
Parking slots/Station	20 - 32	24	→	31
Contractual bikes/km² (System area)	4 - 50	31	→	46
Inhabitants/Contractual bikes	114 - 500	245	→	164
Stations/km² (System area)	2.4 – 5.2	2.7	→	3.7
Average distance between two neighbouring stations	277 - 387	387	→	322

6.2 Envisaged impacts

Based on a simplified socio-economic analysis, the carbon and societal footprints will only be positive with high usage rates, a modal shift from the car and a high average distance travelled *(Figure 83)*.

Figure 83: External impact of 7,500 e-PBs and 600 stations

	Villo ! 2022	Pessimistic PB 😨	Optimistic PB 😀
SERVICE			
Number of bikes	5,000	7.500	7,500
Bikes/10,000 inhabitants	41	61	61
Number of stations	350	600	600
Rentals/bike/day	0.55	2	5
Annual trips (millions)	1 M	5.5 M	13.7 M
Trips/1,000 inhabitants/day	816	4,441	11,103
Average trip distance (km)	1.9	2.5	3.1
Kilometres travelled (millions)	1.9 M	13.7 M	42.4 M
% of subscriber population	1.5 %	5.6 %	13.9 %
Number of subscribers	20,000	68,000	171,000
Female subscribers	5,500	24,000	86,000
Maximum secondary school graduates	5,000	18,000	51,000
MOBILITY			
% modal share all modes	0.1 %	0.53 %	1.31 %
% of bicycle trips	1.04 %	3.50 %	8.76 %
% STIB totals	0.30 %	1.19 %	2.98 %
% car trips avoided	7 %	7 %	12 %
% car km avoided	0.03 %	0.2 %	0.86 %
% INTRA-BCR car trips avoided	0.01 %	0.11 %	0.56 %
% STIB trips improved	60 %	60 %	60 %
Public transport trips improved	0.6 M	3.3 M	8.2 M
PT km improved	0.13 M	0.96 M	5.09 M
% PT km improved	0.01 %	0.11 %	0.56 %
FINANCIAL IMPACT (€ EXCL. VAT 2023)			
Ratio € excl. VAT/bike/year (CAPEX+OPEX)	Unknown	€2,400	€1,800
Price to be paid (without user revenues)	Unknown	18.5 M	13.8 M
Contract supervision	Unknown	€0.45 M	€0.27 M
Coverage rate (CAPEX+OPEX)	Unknown	25 %	50 %
Annual revenue	Unknown	€4.50 M	€6.75 M
Remaining cost/YEAR	Unknown	€14 M	€7 M
Remaining cost/year/BIKE	Unknown	€1,860	€936
Remaining cost/TRIP	Unknown	€2.55	€0.51
Remaining cost/KM	Unknown	€1.02	€0.17
Remaining cost/CAR KM AVOIDED	Unknown	€14.56	€1.38
OTHER IMPACTS			
Carbon footprint (Tons CO_2)/year	- 8	- 60	155
External benefits (€M excl. VAT)/year	Unknown	€9.2 M	€31.2 M
Societal benefits (€M excl. VAT)/year	Unknown	-€9.2 M	€17.5 M

6.3 How much public money invested in PB and LTR services?

The following data are constant 2023-euro figures, with no inflation assumption. The € excl. tax/bike/year ratio includes the initial investment and operating expenses over the duration of the contract.

With no other source of financing, the BCR would pay:

- €16 M excl. VAT/year (+ or - 15%) for the 7,500 PBs.
- €3 M/year for the 4,500 LTRs *(Figure 84)*.

Figure 84: simplified estimates of PB and LTR in Brussels from 2026

	7,500 PB			4,500 LTR
	😲	😐	😊	
Per bike (€ excl. VAT/bike/year)				
Public budget*	2,400	2,100	1,800	530
User revenue coverage	25 %	38 %	50 %	33 %
Net expenditure**	1,800	1,350	900	
Per year (millions of euros excl. VAT/year)				
Public budget*	18.5	16	13.8	3
User revenue	4.5	5.7	6.8	1
Net expenditure **	14	10.5	7	2
Over 10 years (millions of euros excl. VAT)				
Public budget*	185	161.5	138	30
User revenue coverage	45	56.5	68	
Net expenditure **	140	105	70	

**If public procurement contract and revenue collection, and with an investment and operating assumption of 10 years.*
*** Without European funding, naming or other source of revenue.*

6.4 High cost in relation to the bicycle trips volume generated

The budget for public bicycles and LTR would be added to the 16 million euros annual regional budget dedicated to cycling (including facilities). Before deducting revenues, the average estimated costs of these services would then represent around half of the total cycling budget and around 5% of cycling trips *(Figure 85)*. But acquiring a new customer would cost five to ten times more than building loyalty. These public investments are therefore more coherent if they generate new cycling practices.

Figure 85: Cycling regional budget (PB and LTR before deduction of revenue) versus cycling trips

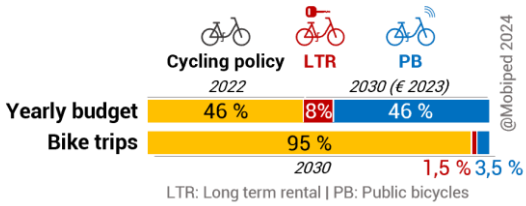
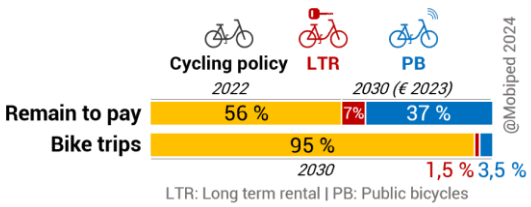


Figure 86: Remaining cost (cycling regional budget for PB and LTR) versus cycling trips



6.5 But a cycling budget that falls short of mobility objectives

The share of PB in the cycling budget seems high. But in reality, it is the budget for cycling that is low compared to other modes *(Figure 87, Figure 88, Figure 91)* and modal share targets *(Figure 90)*.

Figure 87: BCR regional modal budget in 2022

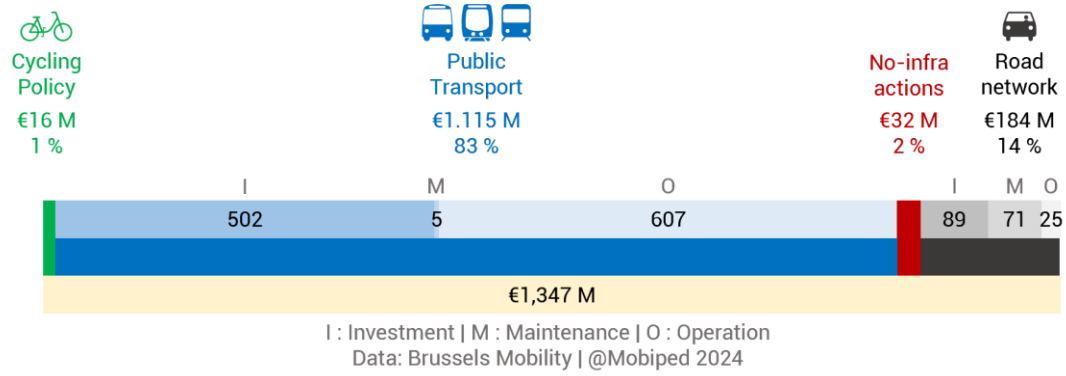


Figure 88: Breakdown of regional mobility budget, before user revenues for PB and LTR

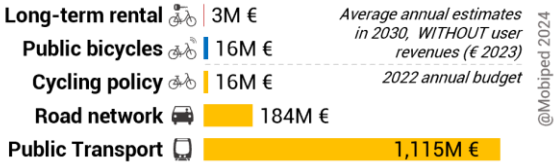


Figure 89: Breakdown of regional mobility budget, remaining costs for PB and LTR

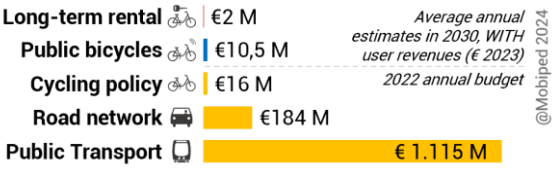
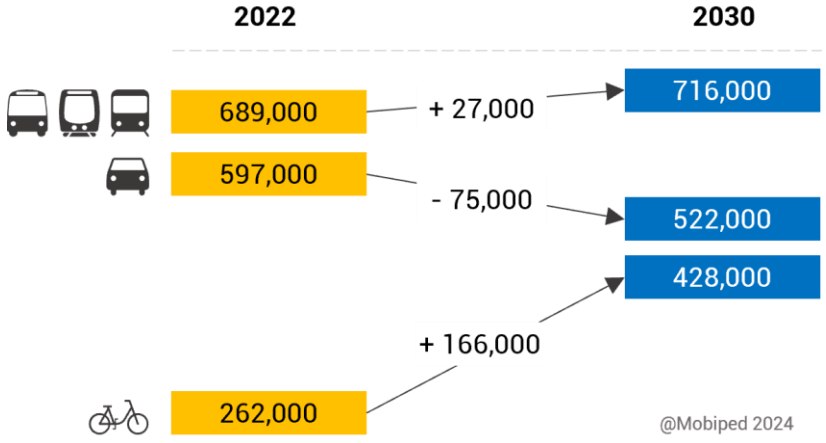


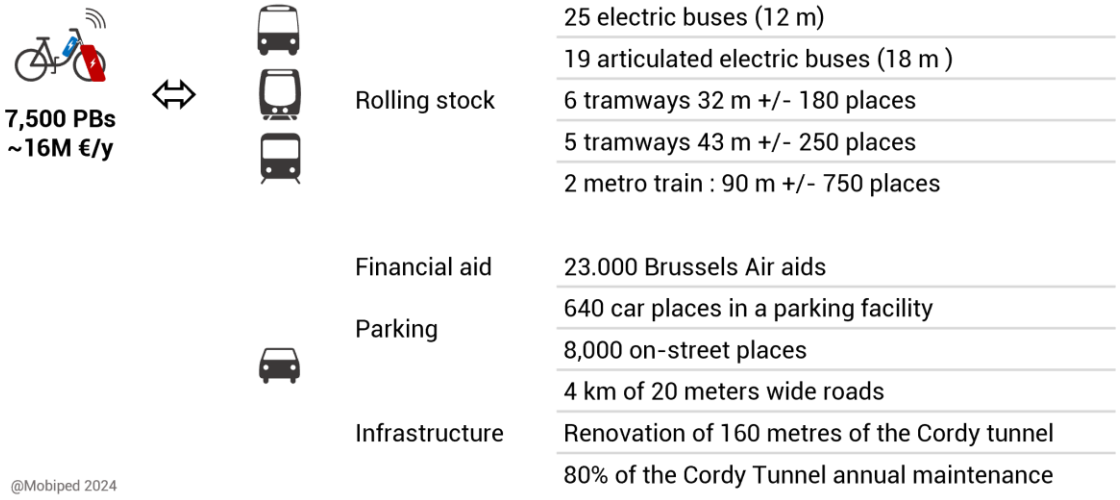
Figure 90: Good Move objectives for 2030 translated into number of INTRA Regional trips



This imbalance in modal budgets is also illustrated below:

- the 16 billion in reductions at the pump in Europe between February and May 2022 could have financed 5.3 billion public bicycle journeys, assuming a very high cost of €3/trip *(Source 70)*.
- in France, €30/year/inhabitant is invested in cycling, compared with €271 for cars and €473 for public transport *(Source 19)*.
- "In Germany, cities spend €6 on bicycle infrastructure, €38 on pedestrians, €128 on motorists and €148 on public transport. And then we are surprised that there are not more cyclists" *(LinkedIn post by Marco Te Brömmelstroet)*.

Figure 91: Order of magnitude of investments (before revenue) for a budget equivalent to 7,500 e-PBs (BM and STIB data)



Infrastructure	40 km of cycle tracks
	107,000 bike racks
Parking	29 to 64,000 shared secured parking
	6,400 bike places in a parking facility
Communication	16 yearly communication budget
Rolling stock	25 electric buses (12 m)
	19 articulated electric buses (18 m)
	6 tramways 32 m +/- 180 places
	5 tramways 43 m +/- 250 places
	2 metro train : 90 m +/- 750 places
Financial aid	23.000 Brussels Air aids
Parking	640 car places in a parking facility
	8,000 on-street places
	4 km of 20 meters wide roads
Infrastructure	Renovation of 160 metres of the Cordy tunnel
	80% of the Cordy Tunnel annual maintenance

Overall, the total budget allocated to the development of cycling is insufficient to meet the Good Move objectives.

6.6 Potential financing sources

As with PT, the financing of PB relies first and foremost on local government funding, with the potential support of European funds. Users then pay part of the service cost, sometimes with the help of their employer via the mobility budget. Lastly, private funding can be sought through *naming* (oil company MOL Bubi in Budapest or banks Santander Cycles in London and Citibank/bike in New York), advertising on bicycles (airline in Milan) or the financing of stations (Antwerp Region) *(Figure 92)*.

Figure 92: Possible sources of financing

	Description/Example	Brussels context
User revenues	Coverage rate estimated at between 26 and 66% in the benchmark.	This coverage rate should be treated with caution. Employers could pay for PB subscriptions as part of mobility budgets.
Local, regional and federal taxes	Contribution of 34% to 74% in the benchmark.	BCR budget and Budget of the public administration in charge of health expenditure, a beneficiary of the societal gain *(part 4.3.7)*.
Naming	The name of the service is a trade name (Santander Cycles in London, Citibank in New York, MOL Bubi in Budapest).	As the capital of Europe, the Brussels market has obvious market value. The question is how to reconcile this with the values to stand for, particularly from the point of view of the offer included in STIB.
Carbon credits or energy saving certificates	Sale of carbon credits (price per tonne fluctuates) or polluter-pays compensation.	Need to replace car trips to have a positive carbon footprint.
European subsidies	Budapest and Madrid (+€40 m), and many Spanish cities have acquired their CAPEX via European funds, such as the Next Generation Fund [59].	PB could be eligible for the CEF (Connecting Europe Facility) programme. The European Declaration on Cycling, signed on 3 April 2024, is likely to open up new funding opportunities, with Articles 22, 29 and 31 mentioning bike sharing *(Source 11)*.
Cross-subsidisation	Car parking revenues are earmarked for PB (Barcelona).	
European taxonomy [67, 68]	Classification system for economic activities that have a positive effect on the environment, adopted by the European Union in 2020, to encourage financial players to prioritise the allocation of financing to projects linked to the energy and ecological transition.	PB seems to be one of these. The service provider may be asked to qualify for this taxonomy to benefit from a lower cost of borrowing.
VAT	To bring VAT down to 6%, Antwerp gives a subsidy per subscriber.	This system can probably be adapted to the Brussels context.
Advertising on bicycles	Advertising on bicycles, parking slots and terminals, but revenues seem low in relation to the efforts made.	• Ensure that the same rules apply to the 19 towns and to neighbouring towns in the event of an extension. • Respect the charter of virtuous advertisers.

7 Possible governance structures

7.1 The Brussels players

One of the main challenges of an PB service is striking a balance between the often-conflicting needs of the three main players involved in an PB service:

- **citizens**: regular or occasional users, observers and those who do not like SB.
- **the mobility authority**: the mobility authority department of Brussels Mobility is the administrative entity of the Brussels-Capital Region that defines the public mobility policy.
- **PB provider(s)**: company or group of companies holding the PB contract *(Figure 93)*.

Figure 93: Challenges and interactions between the main players in an PB service

Among the many players concerned by PB, the following Brussels players will have a direct impact on the success of PB *(Figure 94)*. The coordination procedures should be defined before or in parallel with the drafting of the call for tenders.

Figure 94: Role of premium partners

STIB	The Brussels Inter-Municipal Transport Company (STIB) is the public-law association responsible for operating the urban public transport service in the Brussels-Capital Region. Its level of involvement in PB governance is explored in the following pages.
SIBELGA	SIBELGA, the electricity grid manager, will connect each station to the grid, opening a dedicated meter with sufficient power to charge the bicycles.
URBAN DEVELOPMENT	A department of the regional administration, the urban planning department issues building permits for every removal and installation of furniture.
POLICE	In charge of public order, the police receive regular complaints from the operator in the event of obvious system components deterioration or theft.
MUNICIPALITIES	Interface with local populations, to unite them around the service.

7.2 Which relationship between Brussels Mobility and STIB on PB?

7.2.1 Organising authority for mobility, Brussels Mobility has the initiative

As the mobility organising authority supporting the Government of the Brussels-Capital Region, Brussels Mobility:

- initiates the PB project and consolidates funding for the service.
- defines public service obligations: prices, coverage, ticketing, accessibility, MaaS, etc.
- participates in project evaluation and development, in line with cycling and mobility policy actions.

7.2.2 Role of STIB, a level of involvement to be defined

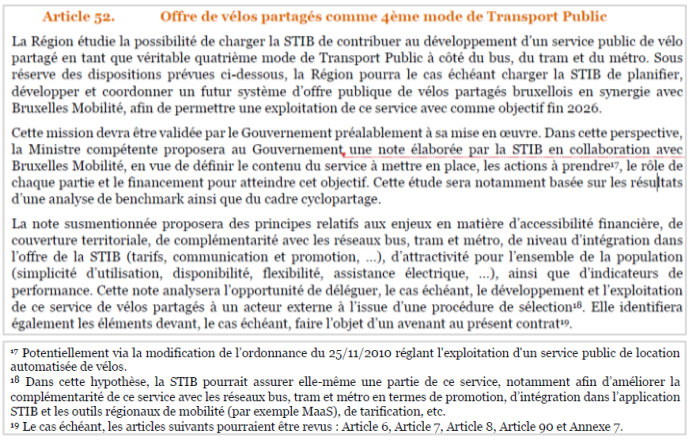
Specific features of the Brussels context

The benchmark illustrates governance specific to the local context, with no particular more or less effective model, and sometimes with the involvement of the public transport operator.

STIB has invested energy in the present study, to gain a better understanding of the possible interactions between PT and PB, and to identify possible implications. In particular, it has:

- taken part in the steering committees and bi-weekly follow-up meetings.
- participated in all benchmark visits.
- hosted partner cities on its premises for benchmark feedback.
- organised and led an Innov@atelier workshop, a design sprint on PB *(Appendix 10.20)*.
- commented on reports.
- co-drafted the content of an article in the Management Contract at the end of 2023 *(Figure 95)*.

Figure 95: Public Service Contract 2024-2028 between the BCR and STIB (14 December 2023)



Article 52. Offre de vélos partagés comme 4ème mode de Transport Public

La Région étudie la possibilité de charger la STIB de contribuer au développement d'un service public de vélo partagé en tant que véritable quatrième mode de Transport Public à côté du bus, du tram et du métro. Sous réserve des dispositions prévues ci-dessous, la Région pourra le cas échéant charger la STIB de planifier, développer et coordonner un futur système d'offre publique de vélos partagés bruxellois en synergie avec Bruxelles Mobilité, afin de permettre une exploitation de ce service avec comme objectif fin 2026.

Cette mission devra être validée par le Gouvernement préalablement à sa mise en œuvre. Dans cette perspective, la Ministre compétente proposera au Gouvernement une note élaborée par la STIB en collaboration avec Bruxelles Mobilité, en vue de définir le contenu du service à mettre en place, les actions à prendre[17], le rôle de chaque partie et le financement pour atteindre cet objectif. Cette étude sera notamment basée sur les résultats d'une analyse de benchmark ainsi que du cadre cyclopartage.

La note susmentionnée proposera des principes relatifs aux enjeux en matière d'accessibilité financière, de couverture territoriale, de complémentarité avec les réseaux bus, tram et métro, de niveau d'intégration dans l'offre de la STIB (tarifs, communication et promotion, ...), d'attractivité pour l'ensemble de la population (simplicité d'utilisation, disponibilité, flexibilité, assistance électrique, ...), ainsi que d'indicateurs de performance. Cette note analysera l'opportunité de déléguer, le cas échéant, le développement et l'exploitation de ce service de vélos partagés à un acteur externe à l'issue d'une procédure de sélection[18]. Elle identifiera également les éléments devant, le cas échéant, faire l'objet d'un avenant au présent contrat[19].

[17] Potentiellement via la modification de l'ordonnance du 25/11/2010 réglant l'exploitation d'un service public de location automatisée de vélos.
[18] Dans cette hypothèse, la STIB pourrait assurer elle-même une partie de ce service, notamment afin d'améliorer la complémentarité de ce service avec les réseaux bus, tram et métro en termes de promotion, d'intégration dans l'application STIB et les outils régionaux de mobilité (par exemple MaaS), de tarification, etc.
[19] Le cas échéant, les articles suivants pourraient être revus : Article 6, Article 7, Article 8, Article 90 et Annexe 7.

Opportunities

With the political ambition of integrating PB into the PT service in Brussels, and aiming for the smoothest possible user experience, STIB is the ideal partner because it:

- knows the area and has experience of operating a mobility service.
- implemented a similar approach to deploy the Floya MaaS, launched at the end of 2023.
- is gradually initiating a cultural shift from passenger transport to mobility services, and observing the development of new shared mobilities.
- has a very positive image among the people of Brussels and a high penetration rate (70% of residents over 6 years old have a STIB subscription) to reach people who are far from cycling.
- is entrusted by micro-mobility users, who are in favour of STIB bicycles, joint communication and commercial offers, integration into STIB fares, and a joint mobile app for route calculation *(see section 2.4.2)*.
- could take advantage of PB to speed up certain topics (e.g. account-based ticketing).

7.3 Four possible governance options

Four governance options with different roles for Brussels Mobility (BM), STIB and PB providers are identified in terms of consultation, supervision and customer relations *(Figure 96)*.

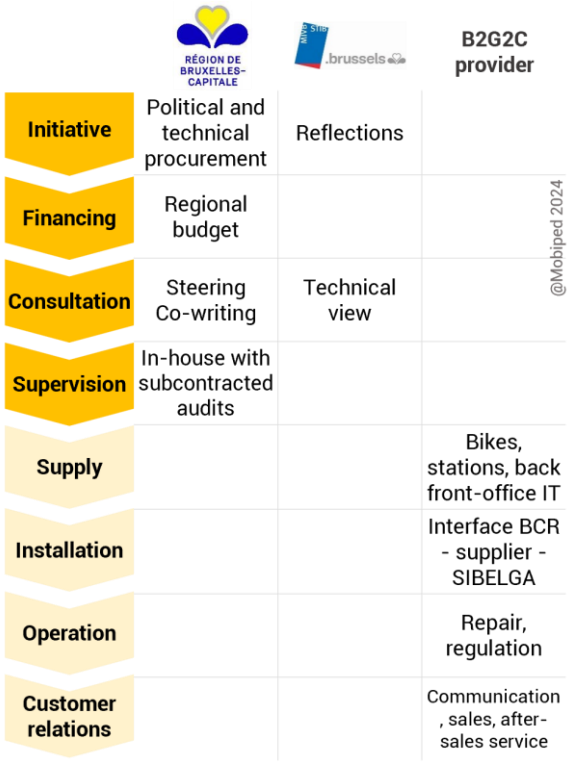
Figure 96: Four governance options for the future PB with progressive involvement of STIB

	1 | BM pilot	2 | STIB coordinates	3 | STIB in contact with customers	4 | In-house public management
Inspirations	Paris, Marseille, Antwerp		Vienna, Cologne, Bordeaux, Lille	Madrid
Initiative	BM			
Financing	BM + Users			
Consultation	BM	STIB (BM support)		
Supervision	BM	STIB (BM support)		
Supply	PB service provider			
Installation	PB service provider			
Operation	PB service provider			STIB
Customer relations	PB service provider	STIB (communication and customer relations level 1)		

7.3.1 Option 1 | Managed by Brussels Mobility + partnership with STIB

As with *Villo !* and many other PB services in Europe, Brussels Mobility would issue the call for tenders and supervise directly the service as the mobility authority *(Figure 97)*. However, the outlook within the Brussels administration means that another way should be found of ensuring that the human resources required to carry out this work are available. In addition, STIB is proving to be a preferred partner with a view to integrating PB into the public transport service in Brussels, drawing on the experience of Floya MaaS.

Figure 97: Governance 1 - Managed by Brussels Mobility



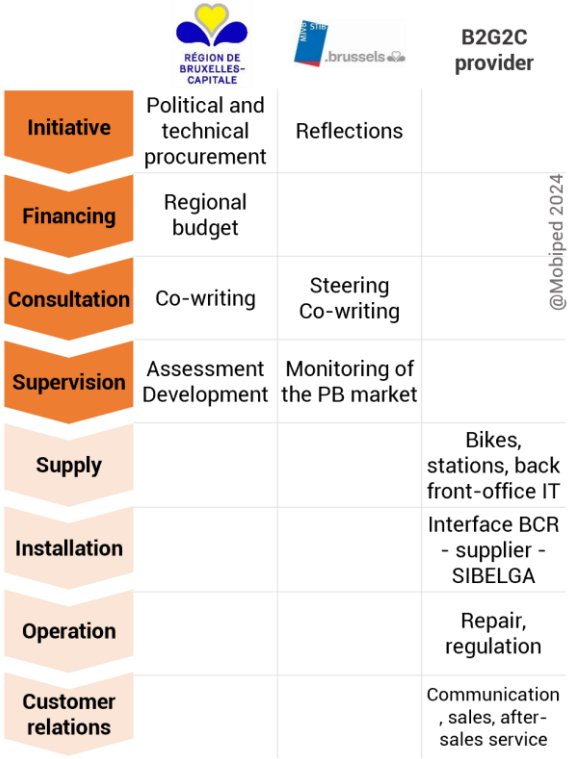
7.3.2 Option 2 | STIB as technical coordinator

STIB's role would be that of an intermediary, one of the tasks performed by KVB in Cologne (Germany) and Wiener Linien in Vienna (Austria). It would only be in charge of:

- consultation by contributing its technical experience to the selection process.
- supervision of the contract on behalf of Brussels Mobility, with regular exchanges between STIB and Brussels Mobility on the evaluation of the service (offer, usage, performance of the service provider) and its improvement (prices, consistency with the evolution of regional mobility policies).

The operation of the PB service would be entirely entrusted to a private provider *(Figure 98)*. In all cases, STIB could be an ideal partner for pooling ticketing media (e.g. *personal Mobib* card with *Villo !)* and offering cross-subscription discounts for PB subscribers.

Figure 98: Governance 2 - STIB as technical coordinator



7.3.3 Option 3 | STIB in contact with PB customers

In addition to drawing up the specifications and overseeing as in option 2, Brussels Mobility would ask STIB to act as the commercial intermediary, integrating PB into its interfaces (website, app, passenger information, etc.) with a brand based on that of STIB *(Figure 99)*. In this way, STIB could become partly involved in operations *(Figure 100)*.

Figure 99: Governance 3 - STIB in contact with PB customers

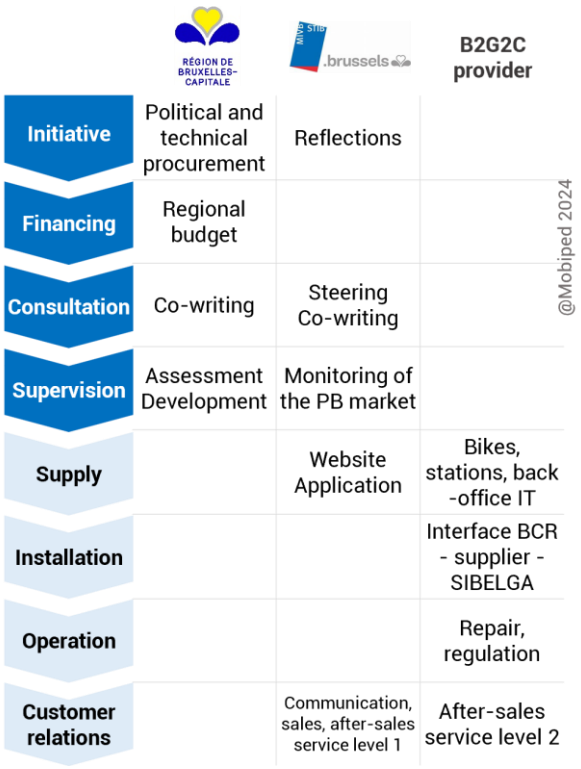


Figure 100: Potential actions by STIB if it becomes involved in operations

Themes	Possible actions
Locations	Station locations linked to the PT network, potentially on STIB land property.
Information	Mention of PB stations on all STIB network maps (internet and paper), real-time availability of PB on the STIB website and app.
Communication	Possible use of the STIB brand, PB advertising campaigns and integration of PB into STIB social networking topics.
Pricing	Integration of PB pricing into the STIB fare structure, and creation of transport tickets (subscriptions) combining PT and PB.
Sale	Use of STIB sales and customer care channels for PB in the same way as for PT.
Ticketing	Use of the *Mobib* card to access PB, and use of the STIB/Floya app to access PB.
Proof	• Inter- and multimodal journey tracking with communicating databases to better understand travel practices. • Use of data to improve STIB services and integration of PB in the satisfaction barometer.
Resources	Provision of personal, material and infrastructure resources by STIB for the PB provider.
T&C	Common Terms and Conditions to streamline the customer experience.

7.3.4 Option 4 | STIB operates in-house

This is a model used for PB on very rare occasions (Buenos Aires, Hangzhou, La Rochelle, Madrid). Even with a public service, the provision of a robust system, and in particular the bike-lock-dock triptych, is acquired from private market players.

In terms of operations, the benchmark showed that there are few synergies between PT and PB, particularly in terms of repair and regulation. The operator of an PB service requires more flexibility than for PT *(Source 2)*. Furthermore, STIB would prefer to use a specialised white-label service provider with more experience.

7.4 The steering committee favours option 3

7.4.1 Distribution of roles

To offer as many opportunities as possible for a seamless experience between PB, bus, tram and metro, option 3 is favoured, with strong involvement from STIB:

- Brussels Mobility defines public service obligations (e.g. prices, accessibility, MaaS).
- The Regional Government consolidates funding.
- STIB coordinates the selection process and contracts with the PB provider.
- STIB supervises the contract and Brussels Mobility participates in evaluation and development.
- The PB provider supplies, installs, repairs and redistributes the bikes.
- STIB interacts with users (website, app, level 1 customer relations, communication, sales) for a unique public Bike + Bus + Tram + Metro experience.

7.4.2 Legal notices

Awarding these tasks to STIB without going to tender would have legal and accounting implications that would need to be anticipated and legally validated *(Figure 101 and Appendix 10.15)*.

Figure 101: Potential actions by STIB if it becomes involved in operations

Actions	Legal status of the assignment	Legal and accounting implications
STIB organises the consultation and supervises the contract (in options 2 and 3)	Non-economic	• STIB's costs for this mission could be 100% offset by the BCR. • The compensation paid to the private operator may be paid directly by the Region or pass neutrally through STIB without constituting State aid. • The choice of contract (public procurement or concession), the type of procedure (open with competitive dialogue or restricted with negotiated procedure), the nature of the delegated mission and its non-economic nature would not be affected.
STIB in contact with PB customers (in option 3)	Economic	• By intervening, even partially, STIB would be considered as co-operator. • By awarding this contract without competitive tendering in accordance with Altmark case law, the public funding which STIB would receive for its tasks can be qualified as State aid unless four conditions are met *(Appendix 10.15)*.

7.4.3 Points to watch

The benchmark does not demonstrate that the involvement of the public transport operator is a guarantee of high performance (Cologne, Milan, Munich, Vienna). To avoid certain pitfalls, here are some key success factors to consider *(Figure 102)*.

Figure 102: Key success factors for involving the PT operator into PB

Key success factors	Comments
Enhance the value of PT operations	Offer current and future public transport customers an alternative during off-peak hours and at night, during disruptive situations (incidents, roadworks, strikes) or long journeys (walking, waiting, transfers).
Dedicate a budget	The authority defines a dedicated budget for PB, independent of that for PT, to avoid using PB as a negotiating point, at the risk of repeating the PB pitfall within the advertising market.
Treat all modes equally	• PB has direct, one-click access above the waterline on the website and app. • Consider the quality of cycling facilities when planning public spaces.
Take ownership of the specific features of the bicycle.	PB does not just serve public transport (image, line extensions/replacements, pricing structure). Like PT, PB supports Good Move. Together, they help each other and improve the multimodal offer. Without being systematically dependent on PT, the PB service can adapt its needs, audiences, services, maintenance and warehouses (no synergies identified in operations).
Be involved	Given the low weight of PB in relation to the PT network (around 1% of journeys, 1% of human resources and 1% of the annual budget), the risk of disinterest is high. A team devoted 100% to PB has dedicated resources and time, particularly for becoming involved in supervision without blindly trusting the chosen service provider(s). The involvement of the PT operator can be increased by setting contractual indicators to align the efforts of PT and PB operators.
Respect each party's roles	Adding the PT operator as an intermediary generates risks of short-circuiting, loss of information, duplication of meetings and disconnection between the authority and the reality of operations. A RACI (Responsible, Accountable, Consulted, Informed) matrix is then put in place to clarify relations and decision-making between the authority, the PT operator, the PB operator, the media and politicians (since PB are highly exposed to the media).
Weight changes	Total integration, for each level of the marketing mix *(Source 2)*, could generate very high costs (e.g. adjustment of an already complex IT system) compared with the benefits for each player.
Ensure the relevance of involvement	The direct involvement of the PT operator in the operation of the PB service is only relevant if it goes beyond the partnership approaches possible without strong involvement (discount for public transport subscribers, use of public transport ticketing support).

STIB in contact with PB customers is the preferred governance option to move towards one experience which includes bike, bus, tram and metro.

8 Reflections on public procurement

8.1 A contract dedicated to PB

8.1.1 Possible contract title

The public procurement contract would cover only "the provision, installation and B2G2C operation of a public bicycles rental one-way service".

8.1.2 Disconnect PB and advertising space in public areas

Historically, the *Villo !* market has been linked to the contract for advertising space in public areas. For a number of reasons, these two subjects should now be kept completely separate.

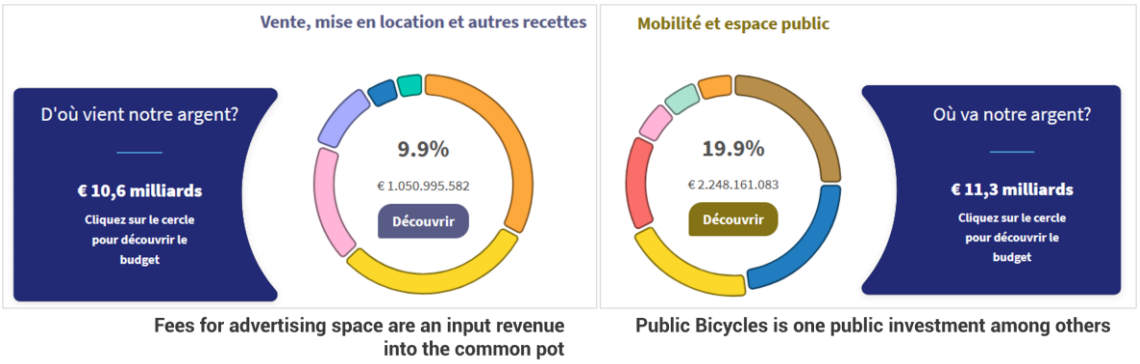
Firstly, it is important to distinguish between the contractual model, the source of financing, advertising support and naming *(Figure 103)*.

Secondly, linking PB and outdoor advertising space has been rare for many years. PB contracts focus mainly on PB only (Antwerp, Budapest, Marseille, Paris). In some cases, PB can be linked to the PT public service delegation (Bordeaux, Lille) or included in a package of bicycle services: PB, LTR, bike centre, parking (Nantes, Rennes).

Figure 103: Four different approach about advertising and bike share

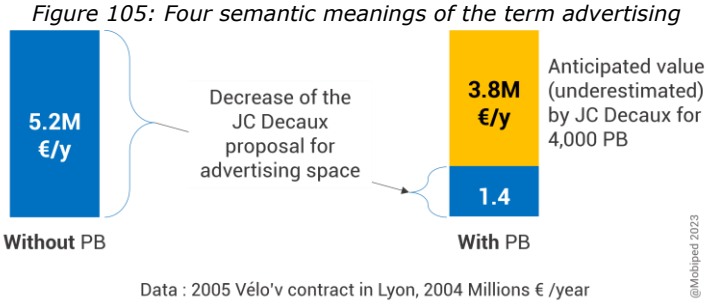
Thirdly, saying that "advertising finances PB" is an abuse of language. While combining the two contracts avoids the need for cash advances to pay for the PB service and the corresponding VAT, directing a revenue towards an expense is not sufficient to say that it finances the service. Including them in the same contract gives the impression of a direct link, whereas in fact they are diluted in the local authority's accounts. The fee for advertising space is to be considered as a revenue paid into the common pot, among many other revenues. And PB is one of many public investments *(Figure 104)*.

Figure 104: Public revenue and expenditure in Brussels in 2022 (Data 75)



Fourthly, to say that "PB is free for the city" is also a misuse of language. In 2004, JC Decaux offered Greater Lyon €5.2 million a year to operate outdoor advertising space. Including PB, the proposal dropped to €1.4 m/year. This €3.8 m/year shortfall, invisible in public accounts, is the price of the service for the public authorities *(Source 7, Figure 105)*.

Figure 105: Four semantic meanings of the term advertising



Fifth, advertising revenues depend on the economic context (e.g. Covid-19), the evolution of digital media and the structure of the local market. A monopoly on all local outdoor advertising increases negotiating power with advertisers, potentially leading to higher fees for the use of public space.

Sixth, experience in Brussels shows that to improve the PB service, prior negotiations on outdoor advertising are often imposed. Moreover, advertising is not one of Brussels Mobility's core competencies.

Seventh, the design of the service is oriented towards the advertising public and not towards the PB user, with a visibility mask *(Figure 106)*.

Figure 106: Orientation of advertising street furniture to catch the eye of motorists and cyclists

8.1.3 Disconnect with shared e-scooters

The rise of players and shared solutions between PB and shared e-scooters opened up the prospect of linking the two contracts. In the end, this is less relevant because:

- Shared e-scooter is potentially a profitable service, with less justification for government intervention.
- there is no political order in Brussels for a public scooter service.
- the battery models are actually different. E-scooters needs a 48 V battery and PBs a 36 V battery, or even 24 V for JC Decaux bikes. To generate economies of scale, some PB are equipped with 48V batteries, generating unnecessary overcapacity and extra weight for the PB.
- mixed operation/regulation, where PB and shared e-scooters are parked and charged at the same stations, becomes very complex (Chicago).

8.1.4 Disconnection from other bike services

In some French cities, PB are included in a more global contract for bicycle services, with rental, parking, training, etc. *(Figure 107)*. But it seems advisable to separate the contracts because:

- very few players have mastered the operation of both services, while there is a great deal of competition in the bike sharing market.
- the prospect of a PT service in Brussels and governance with STIB concerns the one-way PB service bike rental service, not LTR.
- on the scale of services involving several thousand bicycles, economies of scale are reduced.
- the priority is the prospect of a PB, given that the *Villo !* concession is due to expire on 16 September 2026, and the timetable is already tight *(see section 2.1)*.
- PB services with several thousand bikes are complex enough to handle.
- synergies between LTR and other services (Grenoble) seem to be more relevant.

While this study has validated the desirability and interest of a LTR, it is a subject that still needs to mature and be the subject of a more detailed feasibility study. PB has a time constraint with the end of the *Villo !* concession, while there is no urgency for LTR.

Figure 107: Content of five French public procurement contracts for bicycle services

Title	Vélib'	Véligo	Nantes	Rennes	Grenoble
PB	✓		✓	✓	
LTR		✓	✓	✓	✓
Consignment parking			✓		✓
Secure parking					
Event					✓
Bicycle centre		✓		✓	✓
Building management		✓			✓
Loan of equipment to communities					✓
Purchase assistance management					
Abandoned bike management					

8.1.5 Advantages of a dedicated PB contract

A market dedicated to PB makes it possible to:

- focus the energy of the authority and the provider on the quality of the PB service.
- stimulate competition between B2G2C players and historically B2C consortia of charging station suppliers + operators.
- know the real price (Paris) and enable the evaluation of public policy.
- reduce the level of litigation on subjects other than PB.

8.1.6 Why not separate charging stations and bikes into two contracts?

In many public network sectors (gas, electricity, rail, etc.), infrastructure is a public monopoly, while operations are increasingly subject to competition. It would then be conceivable to separate into two contracts: charging stations (1) and bicycle operation (2). But securing and charging the bike depend enormously on the bike (frame or fork) <> lock <> dock, with a very strong impact on operating costs. The absence of a sufficiently mature standard does not, in the current timing of the Brussels PB, suggest that the two contracts should be strictly separated. However, it is advisable to distinguish between the two components in the public procurement contract in order to:

- enable consortia to respond.
- distinguish between investments when applying for European funding.
- maintain the possibility of the local authority retaining ownership of the infrastructure at the end of the contract.

8.2 An 8- to 10-year contract

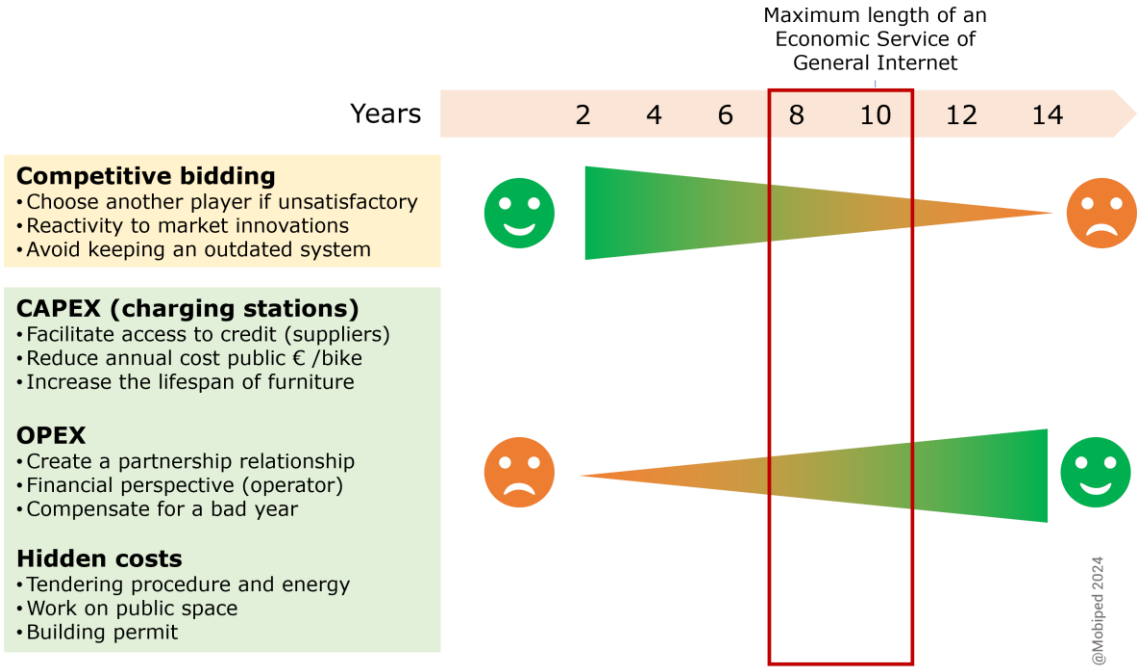
The current *Villo !* contract was signed in 2008, for launch in 2009. Initially for a 15-year term, a three-year amendment extended the contract to 16 September 2026, i.e. 18 years after signature. The duration of PB contracts varies widely in France *(Figure 108)*. Since 2012, the maximum duration for a Service of General Economic Interest (SGEI) has been ten years *(Source 64)*.

Figure 108: Duration of PB contacts in France (2015 data, Source 9)

Type de contrat	Marché public de fourniture et de service		DSP		Régie
	Couplé au mobilier urbain	Indépendant	Intégrée à la DSP transport	Indépendante	
Durée moyenne	13,5 ans	8,5 ans	5,5 ans	9 ans	non définie
Durée minimale	10 ans	2 ans	3 ans	8 ans	non définie
Durée maximale	15 ans	15 ans	7 ans	10 ans	non définie

Contract duration is a trade-off between a number of parameters *(Figure 109)*. Having charging stations involves a significant initial investment to be amortised, as well as indirect costs associated with the work. A contract of eight to ten years would enable the investment in stations and bicycles to be amortised. It is possible to include a firm tranche and an option to extend the service.

Figure 109: Parameters involved in choosing the duration of the PB contract



The diversity of the data collected during the benchmark highlights the need to be very precise when it comes to the semantics of dates and durations, of which the following are some distinctions.

Dates	Contract signature, Official start of contract (after final appeal), Installation of first station, Installation of last station, Delivery of service, Launch, End of contract, Removal of first station, Removal of last station, Clean-up of public space at last station, Removal of reservations, Contract closure
Durations	Contractual duration, Communicated duration, Duration of presence of equipment in public space, Duration of operation, Duration of opening to the public, Duration for public cost calculations, etc.

8.3 Concession or public procurement contract?

Assuming commercial risk guides the choice of contractual relationship.

- Either revenue is kept by the public authorities, in which case the service provider is paid 100% by the public authorities under a lump-sum public procurement contract (Marseille, Paris). This is possible in governance options 1, 2 and 3 as mentioned in the previous section. The 2010 ordinance will have to be amended, as it refers to a public utility concession.
- Or the operator collects and keeps the revenues, then a concession is signed in which it receives a fixed financial contribution that does not cover all costs. It then tries to maximise its user revenues (Antwerp). Concession is possible in options 1 and 2. It seems less likely in option 3, as the PB provider has no influence on prices and communication, which would be the responsibility of STIB. Some PB players do not offer concessions.

8.4 Competitive bidding format

Several competitive bidding formats are possible *(Figure 110)*. Given the complexity of PB, many cities (Madrid, Marseille, Paris, Vienna) have opted for competitive dialogue. This process involves shortlisting candidates, submitting specifications, discussing every aspect of the contract with each of them in confidence, and then adapting the final version of the specifications. This procedure makes it possible to:

- create a space for dialogue, so that each party can express their needs, and compare the ideals of public authorities with the field experience of candidates, in order to anticipate, avoid or reduce many of the technical and financial pitfalls.
- balance the budget and service levels.
- lay the foundations for future authority-supplier-operator relations.
- give the authorities time to appropriate, adapt and deepen their understanding of all technical subjects.
- give suppliers (a little) time to fine-tune their technological solution, without having to completely overhaul their entire R&D process.

This procedure is quite cumbersome in terms of timing and confidentiality, both internally and externally with all the players involved. A priori, competitive dialogue is a procedure that has never yet been implemented in Belgium.

Figure 110: Possible competitive bidding formats (ComoUK)

	Strengths	Weaknesses
Competitive dialogue	Hones the final service and contract. The multiple rounds enable stronger understanding of the authorities' needs, operators' services and increases likelihood of aligning objectives.	Time consuming
Requests for Proposals	Similar to competitive dialogue with less formal structure so simpler and faster to implement	This initial round typically leads to tender or MOU
Traditional tender process	Route most authorities are used to and provides strong contractual framework	Can be too rigid and slow which can mean delays and lost opportunities
Memorandum of Understanding	Fast to implement and allows maximum flexibility	Lacks teeth to enforce any KPIs No binding contract durations of service so operator can leave any time
Concession contract (possible outcome of a concession contract via a competitive dialogue)	Provides a contractual agreement for contracts without funding	Limited scenarios

8.5 Reflections for the specifications

8.5.1 State of mind

Consistency	Make reasonable, coherent and stimulating requests.
Requirements	Think in terms of expected functionalities, rather than asking for technical specifications (e.g. battery watts, bike weight, number of gears) that cannot always be met, since R&D cycles and return on investment extend over several years.
Flexibility	• Foresee options, scenarios, extensions, framework agreements and future addendums to integrate new technologies, adjust the network and install new stations. • Distinguish the launch year and its specific features.
Documentation	Provide precise documentation to enable candidates to better understand the specificities of the local context *(Appendix 10.20)*, and the risks and thus propose the most appropriate technical and financial offers and reduce surprises in the medium term.
Semantics	Define a common dictionary to ensure the same definitions for different uses (accounting, communication, contractual, operations) and guarantee a sound basis for short- and long-term dialogue with all stakeholders concerning: • bikes: bike available and usable, bike available, bike on the ground (attached but not available), bike in service, lost in the park (stolen, damaged bike), bike in maintenance, bike removed, bike on hire, lost bike, bike in station, etc. • stations: post, terminal, totem, stand set, stands, dock, parking slot, virtual, etc. • rental: identification of use, authorisation to release, releasing the bike, rental of more than two minutes, regulation, trip, travel, etc. • turnover rates: rentals (see above), total rentals/theoretical bike/less than three min/regulation, six or 12 months, spread turnover rate, daily turnover rate, peak turnover rate, turnover rate per bike, turnover rate per station, etc. Furthermore, the vocabulary of private operators quickly takes over in discussions, focusing on the industrial vision of the service. A translation of the terms into public logic is proposed to facilitate understanding between the two worlds *(Figure 111)*.

Figure 111: Correspondence between private and public sector vocabulary

Contact vision		Vision of the public authorities
CAPEX	↔	Depreciable public investment
OPEX	↔	Operation of a public service
Conversion rates	↔	Modal shift
Customer acquisition	↔	Change in behaviour/new users
Consumption habits	↔	Travel practices
KPI Key Performance Indicator.	↔	Quality criteria
SLA (Service Level Agreement)	↔	Public service obligation
Technology	↔	PB supplier/system
Slack ratio	↔	Expansion rate
Turnover rate	↔	Rentals/bike/year

8.5.2 In the drafting process

Deadline	• Allow at least one year between the final signature of the contract (after the last legal recourse) and the launch, to enable equipment to be ordered, produced and delivered in a calmer environment. Some Shimano parts, with no equivalent in the market, sometimes have lead times in excess of 24 months. • Consider a gradual increase in service.
Interactions with private players	Create a forum for open dialogue with market players, providing an exchange framework for players and candidates wanting to communicate their solutions. This could be an information meeting (Budapest) on Brussels' intentions, or an invitation to respond to the study on points of disagreement.
Interactions with private players	Design a Beta version of the technical specifications and submit it to public players such as the benchmark partner territories for feedback.
Technical skills	PB is a multidisciplinary subject *(Source 3)*. PB is a good pretext for bringing together skills within BM and/or STIB on a range of technical subjects and thus uniting parties around a cycling topic.

8.5.3 Selection criteria

In view of the broken promises or failures of certain e-PB systems, the reliability of candidates could be assessed by:

- including a clause regarding experience of projects of similar size to guarantee product reliability.
- asking for field evidence of marketing promises and arguments, and providing contacts in referral cities.
- experimenting with bikes on a multi-context, real-life trips.
- acquiring a sample parking furniture and bike to challenge weak points.
- challenging the short-, medium- and long-term risk management strategy.

8.5.4 Financial details

Revenue collection	Enable third-party players to collect revenues to diversify sales channels (e.g. Paris for the Olympics, MaaS application), while anticipating remuneration mechanisms.
Payment schedule	The presence of a charging station requires a very substantial initial investment, which raises questions about the CAPEX financing arrangements and how the risk is to be compensated: partial coverage by the local authority, partial advance payment, long contract duration so that the PB provider can finance its initial investments through borrowing.
Price	• Systematically specify whether prices are € excl. tax, € incl. tax and the VAT rate to avoid confusion, calculate financial ratios and enable international comparisons. • Request unit price lists (bicycles, stands, terminal, station relocation) with a distinction between the remaining years of the contract, which will have an impact on the amortisation period. In accounting terms, a station deployed during the course of a contract is more expensive than one deployed at the beginning. • Clarify market price indexation and forecast its repercussions on the range of tariffs and prices paid.

8.5.5 Content

Bikes	Rather than asking for technical specifications (weight, power, number of gears), request that the bikes be: • easy to handle while seated on the saddle and on foot to push or pull the bike, for an optimised experience for every human being in their diversity (size, weight, bike handling in urban environments) or employees who repeat these gestures. • robust and resistant to several years' exposure to weather conditions, over-use, misuse, wear and tear, vandalism and theft, to reduce maintenance costs and time on the contract, reduce the risk of theft and maintain a high level of service. Standards ISO 4210-2 and EN 15194 including mountain bikes are reassuring proof of the frame's robustness.
Station furniture	• Easy to identify from afar, day or night. • Avoid giving the outgoing competitor the advantage of having an already installed and reusable infrastructure. To this end, it is suggested that a neutral appraiser be called in to estimate the price of the stations (including the concrete slabs) to enable each competitor, including the outgoing one, to buy them back and thus avoid saying that the outgoing operator was favoured.
End of contract	• Negotiate the transition amendment with the incumbent in advance, so that it can be communicated to all candidates, who will have identical knowledge of the transition conditions. • Plan contract closure scenarios with early contract closure (Madrid, Stockholm) or conditions for transferring the furniture and brand.
Provider organisation	• Provide a mechanism for taking over teams from the outgoing operator. • Require the creation of a local company or subsidiary to ensure financial transparency, with publication of annual accounts and an activity report (to be published no later than 31 March of the following year for rapid adjustment), with an operations manager dedicated 100% to the Brussels PB service.
Environmental balance sheet	Challenge candidates on the overall life-cycle analysis of: • production: where spare parts are produced and assembled. • usage: travel distances, car journeys avoided. • operation: control vehicles, energy and electricity types. • end-of-life: processing of batteries, bicycles, dock, furniture, etc.
Information system	• Ask for details of the technological (hard) and IT (soft) architecture that enables communication between the bike, the station, the user and the operator. • Demand a high level of service continuity. • Demand a copy of the data to conduct an in-house analyses (Paris).
User Interface (design)	Specific thought is needed to take into account the diversity of users and potential users, to be organised as much as possible in a universal design approach (colour contrast, simple text, ergonomics, right to make mistakes, etc.).
Identification	Avoid any waiting time with an identification device (nearby) for each bike.
Contractualisation	Include a draft contract to be completed in the call for tenders, to reduce the time needed to sign the contract.
Exposure in public spaces	Furniture, docks, bicycles and electronics are designed to withstand humidity, rain, hail, floods, cold, sun, UV rays, heat waves, shocks, scratches and cleaning products. A protocol for preventing corrosion and blistering is provided.
Activity	Presentations to employer establishments.

8.6 Contractual and quality monitoring procedures

Reporting	Public dissemination of real-time usage data (e.g. Rouen, Barcelona, Brussels, Budapest, Munich, Paris, Montreal)
Follow-up	• Have a monthly/quarterly committee meeting to improve service quality. • Carry out joint station audits/mystery users (as outsourced in Lyon).
Positive incentives	Offer a remuneration package that is higher than the increasing marginal cost of an additional rental, and which therefore evolves according to the number of rentals or the turnover rate, with levels to be defined (e.g. 1, 3, 5 and 7 rentals/bike/day).
Bike availability penalties	Rather than obligations to achieve results in terms of availability rates per station or group of stations (which are often impossible for the operator to achieve, with questionable results, and for which penalties are often provisioned), obligations to provide means and resources could be envisaged. For example, it could be a number of bikes moved per week, to be corroborated on the basis of rotation rates, day/peak hour usage, duration, congestion/night and week/weekend per station/cluster of stations/priority replenishment zone and on territorial equity criteria considered as part of the public service.
Usage and operations data	• Request a real-time duplicate of all operating data, as well as customisable, exportable and usable dashboards. • Require real-time availability of the most recent version of the General Bike Share Feed Specification (GBFS) format managed by MobilityData and the Mobility Data Specification (MDS) format, with no authentication required, exportable in .xsl/.csv and compatible or convertible with other formats used in particular for MaaS, such as NeTex, Siri, OCPI, Datex II, TOMP (Transport Operator MaaS Provider). • A global data management strategy must answer the following questions: What information for what uses? How is it collected, stored, managed, analysed and made available? What is the quality, accuracy, format and frequency (real time, precise moment), duration of availability (history), security and aggregation for statistics? How is the GDPR being respected? What user guides are there? What is the role of each player? Who owns the data? What APIs and standards are needed to communicate between services? How can data veracity (trust, certification) and interpretation be guaranteed?
KPI	• Distinguish between KPIs for public policy objectives, contractual KPIs and PIs used to assess service quality and communicate. • Require the licensee to report any significant deviations within a given timeframe.

A dedicated PB contract for eight to ten years.

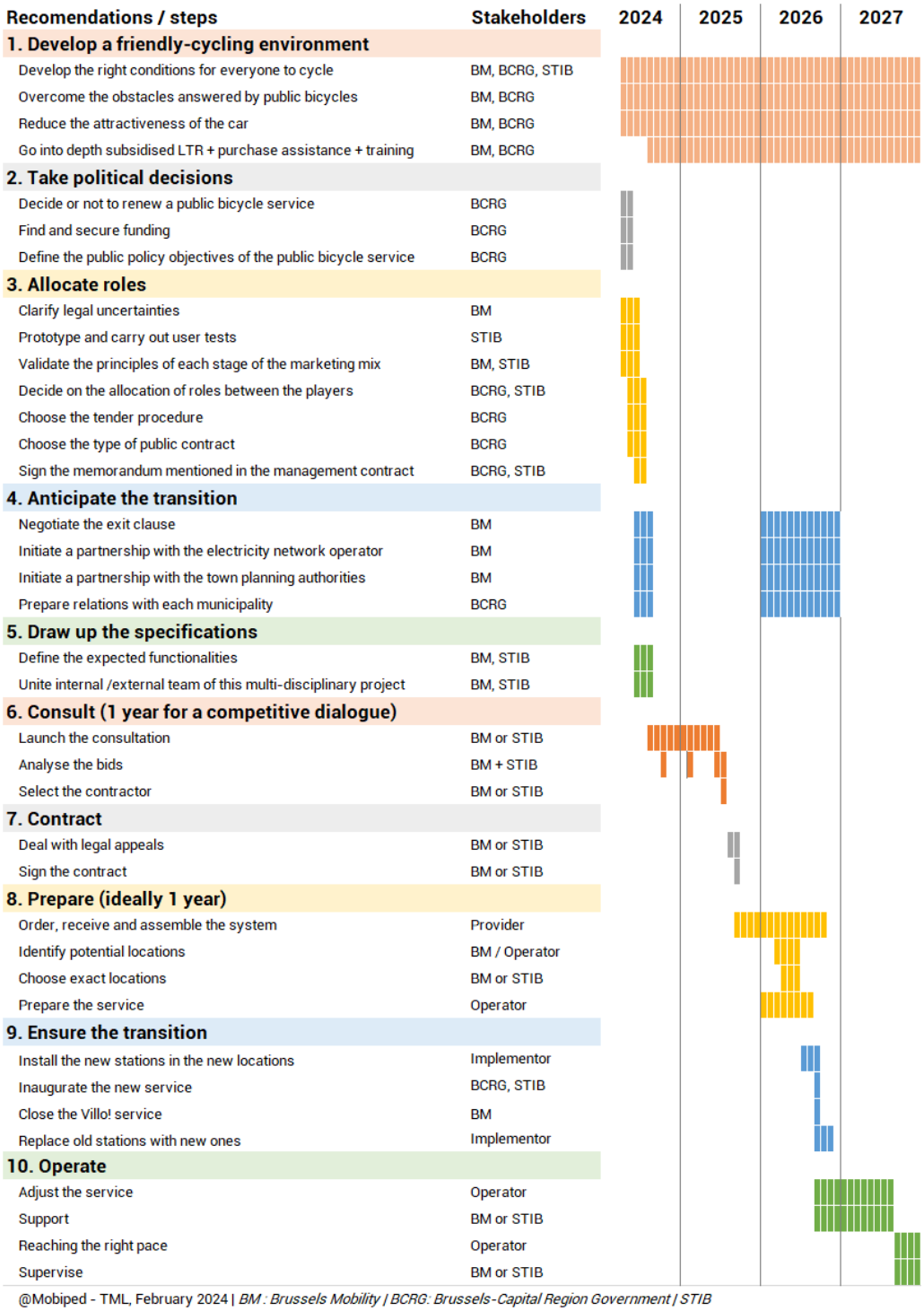
9 A fairly tight schedule

9.1 Global vision

To guarantee continuity of service in 2026 and ensure a smooth transition if the government decides to develop a new PB, several actions need to be launched quickly *(Figure 112)* in view of planning constraints:

- selection of candidates.
- awarding, after possible legal appeals: three months.
- order, production, delivery and installation: one year.
- launch: from September 2026.

Figure 112: Indicative schedule for a possible future PB service following the current concession



9.2 Focus on transition

The transition between two systems is often highly complex, involving industrial, commercial and political risks. A specific action plan is essential to avoid:

- stopping the service for five months (Budapest).
- being impacted by the electoral calendar (Madrid).
- only having 30% of bikes delivered one year after launch (Marseille).
- losing 80% of rentals in one year and waiting six years for service delivery (Paris).

9.2.1 Preparing for the end of the current concession

Brussels Mobility needs to clarify the following elements and schedule with the outgoing holder:

- operation end date and contract closure.
- date of removal of the first and last stations.
- station, slab and power supply specifications.
- negotiation possibilities with the next incumbent. If the outgoing candidate is unsuccessful, it will be required to remove the furniture and normally return the flooring to its original condition. The new service provider will then install the new stations. Ideally, the two parties enter into negotiations to facilitate the coordination of worksites, coordinate schedules and share the same contractors for civil engineering work to avoid having to clean up the public space and then start new excavations.
- the transfer of customer databases, while complying with the GDPR.
- the structure of the operator's PB team and salary conditions.
- how to close the contract.
- terms and conditions for discontinuing advertising and removing the corresponding furniture.

9.2.2 Station electrification

To electrify each station, it may be necessary to dig a trench for the connection and open a new electricity meter. It seems that the need for electrical power is proportional to the number of parking slots and that the batteries used by bike suppliers have different amperages and voltages. The deployment of the stations depends on the schedule of the electricity grid operator. A dedicated protocol is essential, ideally with dedicated human resources on SIBELGA's side to ensure responsiveness in closing/opening meters. The division of technical (RACI Matrix), administrative and legal responsibilities between players (network manager, administration, PB supplier/installer/operator) and intervention times needs to be clarified. To compensate for possible delays in the electrification of stations, and avoid penalising the launch of the service, the applicant may be asked to be able to charge the station with trucks or batteries integrated into the station, or to swap batteries on bicycles.

9.2.3 Building permit

A demolition permit and a building permit are required each time a piece of furniture is removed to install a new one, even in the same location. Since administrative procedures can take six months to a year, a specific protocol is essential to plan and facilitate this process.

9.2.4 Transition date

A service transition on 16 September 2026, in the middle of the September back-to-school period, is questionable given the legal complexity (amendment, negotiations on PB and advertising space, extension of planning permission for advertising space) of shortening the contract to 31 July 2026 or postponing it to 31 December 2026. The presence of private SB services could also temporarily compensate for a service transition with a presumed total shutdown.

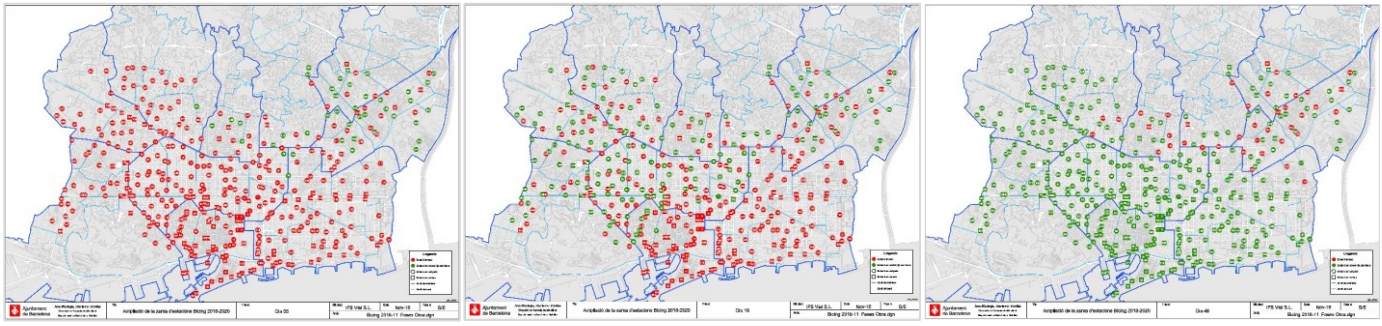
9.2.5 Transition programme

For the transition, one of Brussels' opportunities will be the densification of the network, enabling all new stations to be installed ahead of the closure of the previous service, to ensure continuity of service even if provision remains downgraded *(Figure 113)*. The timetable depends on the technological solution chosen.

Figure 113: Ideas on a transition programme from the old to the new service

	Villo !	**New service**
Two months before		Installation of the stations that will supplement the network and those that have been "moved" from the pavement to a car parking area.
One month before	Gradual closure of half the stations in one district, then in the next district, until the whole area is covered. Then proceed in reverse order *(Figure 114)*.	Replacement of old stations with new ones, for a gradual presence throughout the territory.
D-Day	*Villo !* service stopped.	Launch of the new service.
Two months later	All the old *Villo !* stations have been removed.	All the new stations are now in service.

Figure 114: Snail-like transition in Barcelona with 500 stations for 7,000 bicycles (Source: BSM)



Day 5 *Day 21* *Day 48*

(Red Bicing 1 with Clear Channel stations - Green Bicing 2 with PBSC stations)

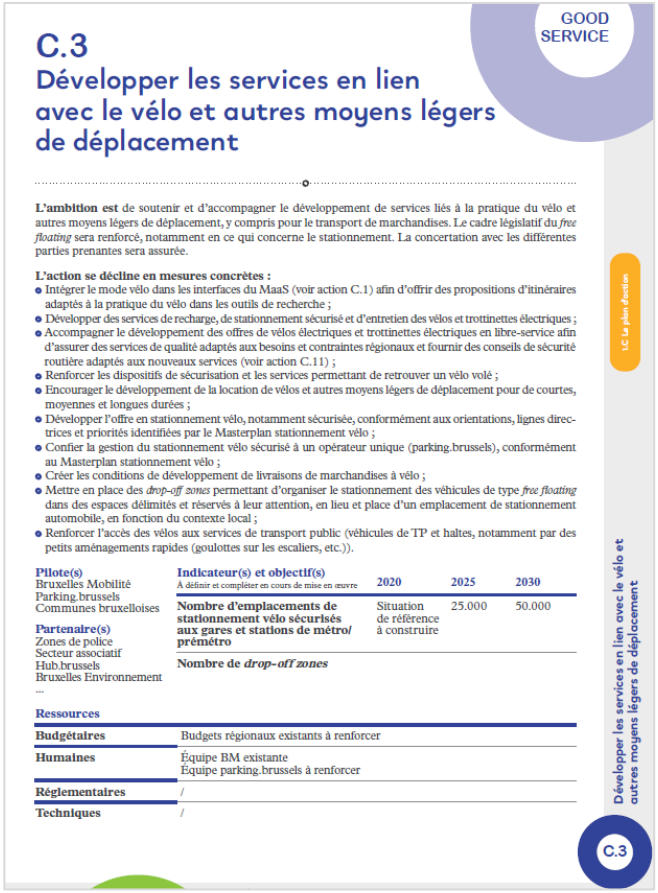
Preparing for a smooth transition starts now, based on political validation.

10 Appendices

10.1 Strengths, Weaknesses, Opportunities, Threats of cycling in Brussels

Strengths	Weaknesses
• A proactive policy, with an ambitious strategy and planning via Good Move (traffic calming zones, motorised traffic-free zones, cyclist visibility). • Increase in modal share from 3.4% in 2010 *(Source 1)* to 8.6 % in 2022, and 9.3% for internal travels (*Source 41*). • Increase in the number of cyclists counted (+43.7% in rush hour between 2021 and 2022) (*Source 37*). • Improved infrastructure. • Reduced car pressure. 	• **"Chaotic" and frightening motorized traffic**. There is still a feeling of insecurity, particularly among the most vulnerable groups (no children on bikes), and habits based on car use are entrenched. • **Bicycles** are under-valued in less affluent population. Bicycles tend to be a middle-class means of transport. • **Conflicts between users**: incitement to a hatred of cyclists with car driver/cyclist opposition. Sometimes fatal tram/bike collisions. • **Gender**: under-representation of women, who account for 40% of the cyclists counted (*Source 36, 37*). • **Governance**: lack of cycling reflex in administrations and bodies (*Source 38*) and insufficient respect for the STOP principle. The associations are calling for active modes to be represented on the Road Work Coordination Committee (*Source 38*). Deployment of on-street bicycle parking spread across a wide range of players. • **Other disincentives**: 19% of cyclists have had at least one bike stolen in the last two years. Bicycle theft and a lack of secure parking are the problems most frequently cited by those who have already cycled (2016, *source 52).* And bicycle ownership rates in Brussels of 48% in 2016 (*source 5)* and 47% in 2022 (*Source 41*). There were around 0.31 bicycles per inhabitant in 2020 *(Source 49).* • Undulating territory.
Opportunities	**Threats**
• 2024, the European Year of Cycling and the Belgian presidency of the EU. • Gradual implementation of Good Move, making car use less attractive and cycling more competitive. • Progressive change in the positive image of cycling. • New BYPAD audit scheduled. • Development of pedelecs and micromobility (objectives, constraints and nearby infrastructures). • Infrastructures that will continue to expand.	• Increasing polarisation of society around mobility, between cyclists and non-cyclists, among others, following Good Move implementation. • Still a lack of secure bike parking. • Public transport heavily subsidised, especially for 18-24 year-olds at €12/year. • Development of personal e-scooters. • Urban sprawl.

10.2 The three Good Move actions that directly concern PB



GOOD SERVICE

C.3
Développer les services en lien avec le vélo et autres moyens légers de déplacement

L'ambition est de soutenir et d'accompagner le développement de services liés à la pratique du vélo et autres moyens légers de déplacement, y compris pour le transport de marchandises. Le cadre législatif du *free floating* sera renforcé, notamment en ce qui concerne le stationnement. La concertation avec les différentes parties prenantes sera assurée.

L'action se décline en mesures concrètes :

- Intégrer le mode vélo dans les interfaces du MaaS (voir action C.1) afin d'offrir des propositions d'itinéraires adaptés à la pratique du vélo dans les outils de recherche ;
- Développer des services de recharge, de stationnement sécurisé et d'entretien des vélos et trottinettes électriques ;
- Accompagner le développement des offres de vélos électriques et trottinettes électriques en libre-service afin d'assurer des services de qualité adaptés aux besoins et contraintes régionaux et fournir des conseils de sécurité routière adaptés aux nouveaux services (voir action C.11) ;
- Renforcer les dispositifs de sécurisation et les services permettant de retrouver un vélo volé ;
- Encourager le développement de la location de vélos et autres moyens légers de déplacement pour de courtes, moyennes et longues durées ;
- Développer l'offre en stationnement vélo, notamment sécurisée, conformément aux orientations, lignes directrices et priorités identifiées par le Masterplan stationnement vélo ;
- Confier la gestion du stationnement vélo sécurisé à un opérateur unique (parking.brussels), conformément au Masterplan stationnement vélo ;
- Créer les conditions de développement de livraisons de marchandises à vélo ;
- Mettre en place des *drop-off zones* permettant d'organiser le stationnement des véhicules de type *free floating* dans des espaces délimités et réservés à leur attention, en lieu et place d'un emplacement de stationnement automobile, en fonction du contexte local ;
- Renforcer l'accès des vélos aux services de transport public (véhicules de TP et haltes, notamment par des petits aménagements rapides (goulottes sur les escaliers, etc.)).

Pilote(s)
Bruxelles Mobilité
Parking.brussels
Communes bruxelloises

Partenaire(s)
Zones de police
Secteur associatif
Hub.brussels
Bruxelles Environnement
...

Indicateur(s) et objectif(s) (À définir et compléter en cours de mise en œuvre)	2020	2025	2030
Nombre d'emplacements de stationnement vélo sécurisés aux gares et stations de métro/ prémétro	Situation de référence à construire	25.000	50.000
Nombre de *drop-off zones*			

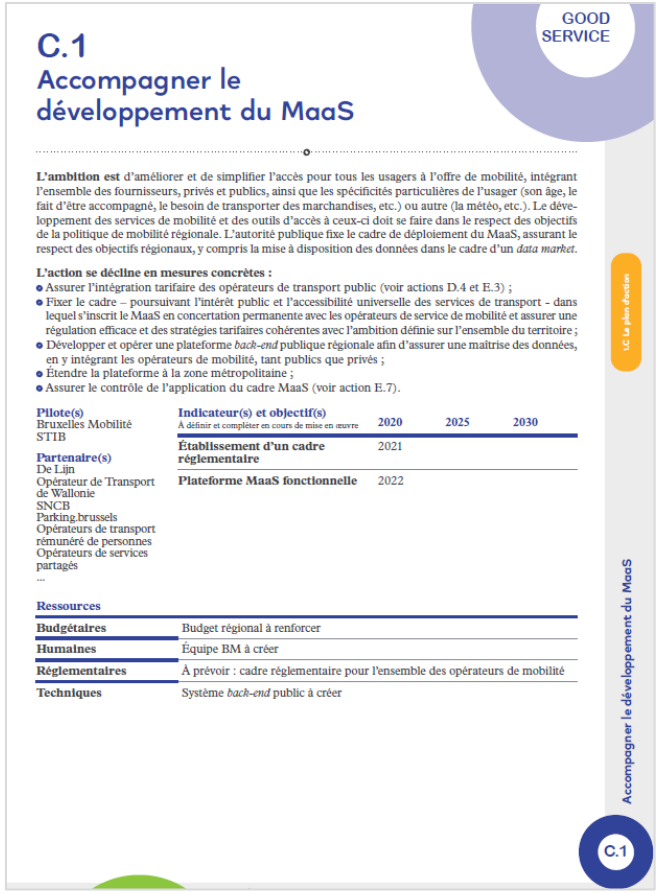
Ressources

Budgétaires	Budgets régionaux existants à renforcer
Humaines	Équipe BM existante Équipe parking.brussels à renforcer
Réglementaires	/
Techniques	/

1.C Le plan d'action

Développer les services en lien avec le vélo et autres moyens légers de déplacement

C.3



GOOD SERVICE

C.1
Accompagner le développement du MaaS

L'ambition est d'améliorer et de simplifier l'accès pour tous les usagers à l'offre de mobilité, intégrant l'ensemble des fournisseurs, privés et publics, ainsi que les spécificités particulières de l'usager (son âge, le fait d'être accompagné, le besoin de transporter des marchandises, etc.) ou autre (la météo, etc.). Le développement des services de mobilité et des outils d'accès à ceux-ci doit se faire dans le respect des objectifs de la politique de mobilité régionale. L'autorité publique fixe le cadre de déploiement du MaaS, assurant le respect des objectifs régionaux, y compris la mise à disposition des données dans le cadre d'un *data market*.

L'action se décline en mesures concrètes :

- Assurer l'intégration tarifaire des opérateurs de transport public (voir actions D.4 et E.3) ;
- Fixer le cadre – poursuivant l'intérêt public et l'accessibilité universelle des services de transport - dans lequel s'inscrit le MaaS en concertation permanente avec les opérateurs de service de mobilité et assurer une régulation efficace et des stratégies tarifaires cohérentes avec l'ambition définie sur l'ensemble du territoire ;
- Développer et opérer une plateforme *back-end* publique régionale afin d'assurer une maîtrise des données, en y intégrant les opérateurs de mobilité, tant publics que privés ;
- Étendre la plateforme à la zone métropolitaine ;
- Assurer le contrôle de l'application du cadre MaaS (voir action E.7).

Pilote(s)
Bruxelles Mobilité
STIB

Partenaire(s)
De Lijn
Opérateur de Transport de Wallonie
SNCB
Parking.brussels
Opérateurs de transport rémunéré de personnes
Opérateurs de services partagés
...

Indicateur(s) et objectif(s) (À définir et compléter en cours de mise en œuvre)	2020	2025	2030
Établissement d'un cadre réglementaire	2021		
Plateforme MaaS fonctionnelle	2022		

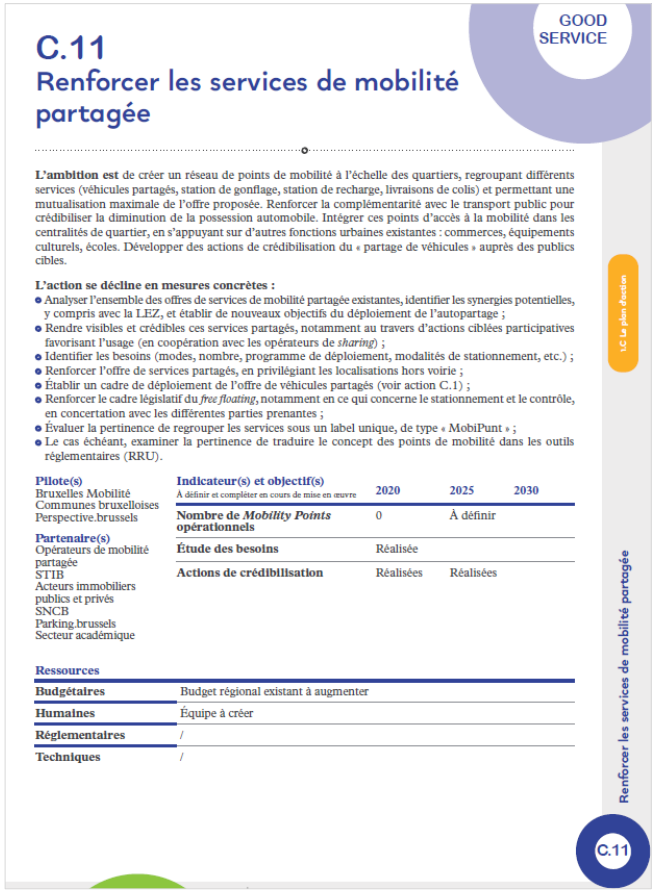
Ressources

Budgétaires	Budget régional à renforcer
Humaines	Équipe BM à créer
Réglementaires	À prévoir : cadre réglementaire pour l'ensemble des opérateurs de mobilité
Techniques	Système *back-end* public à créer

1.C Le plan d'action

Accompagner le développement du MaaS

C.1



GOOD SERVICE

C.11
Renforcer les services de mobilité partagée

L'ambition est de créer un réseau de points de mobilité à l'échelle des quartiers, regroupant différents services (véhicules partagés, station de gonflage, station de recharge, livraisons de colis) et permettant une mutualisation maximale de l'offre proposée. Renforcer la complémentarité avec le transport public pour crédibiliser la diminution de la possession automobile. Intégrer ces points d'accès à la mobilité dans les centralités de quartier, en s'appuyant sur d'autres fonctions urbaines existantes : commerces, équipements culturels, écoles. Développer des actions de crédibilisation du « partage de véhicules » auprès des publics cibles.

L'action se décline en mesures concrètes :

- Analyser l'ensemble des offres de services de mobilité partagée existantes, identifier les synergies potentielles, y compris avec la LEZ, et établir de nouveaux objectifs du déploiement de l'autopartage ;
- Rendre visibles et crédibles ces services partagés, notamment au travers d'actions ciblées participatives favorisant l'usage (en coopération avec les opérateurs de *sharing*) ;
- Identifier les besoins (modes, nombre, programme de déploiement, modalités de stationnement, etc.) ;
- Renforcer l'offre de services partagés, en privilégiant les localisations hors voirie ;
- Établir un cadre de déploiement de l'offre de véhicules partagés (voir action C.1) ;
- Renforcer le cadre législatif du *free floating*, notamment en ce qui concerne le stationnement et le contrôle, en concertation avec les différentes parties prenantes ;
- Évaluer la pertinence de regrouper les services sous un label unique, de type « MobiPunt » ;
- Le cas échéant, examiner la pertinence de traduire le concept des points de mobilité dans les outils réglementaires (RRU).

Pilote(s)
Bruxelles Mobilité
Communes bruxelloises
Perspective.brussels

Partenaire(s)
Opérateurs de mobilité partagée
STIB
Acteurs immobiliers publics et privés
SNCB
Parking.brussels
Secteur académique

Indicateur(s) et objectif(s) (À définir et compléter en cours de mise en œuvre)	2020	2025	2030
Nombre de *Mobility Points* opérationnels	0	À définir	
Étude des besoins	Réalisée		
Actions de crédibilisation	Réalisées	Réalisées	

Ressources

Budgétaires	Budget régional existant à augmenter
Humaines	Équipe à créer
Réglementaires	/
Techniques	/

1.C Le plan d'action

Renforcer les services de mobilité partagée

C.11

Source 47

10.3 List of performance indicators

Theme	Sub-themes
Availability	• Stations and terminals • Bicycles: by zone or by group of stations, rather than by station (e.g. Barcelona), classifying stations by priority level (e.g. Paris) with a time-based concept • Parking slots available (per station or group of stations/hour) • IT back office • IT front office • Customer service
Quality of service	• User journey times (first-time, regular users) with distinction at each stage
Performance	• Number of annual rentals • Annual rentals of more than 2 min/theoretical bike/365 days • Km cycled • Average journey distance • Journey distance avoided by car • Number of subscribers • Number of different users, % of residents who used PB once in the year • Travel reasons • Pick-up, Drop-off, Pick-up/Drop-off by station
User satisfaction	• User satisfaction • Public image • % of Brussels residents who consider cycling an integral part of the STIB offer
Resident coverage rate	• % of population (14-18 years of age) or > 18 • % of women • % of users with secondary school diploma maximum • % of commuters who now use their own bikes
Mobility impact	• Modal shift per journey or per user
Preventive maintenance	• Bicycle | Station | IT
Cleanliness	• Station cleaning • Bike cleaning
Reactivity	• Removal time for a damaged bike
New customers	• Acquisition rate
Road safety	• Minor injuries, serious injuries, deaths at 30 days (Number and per km travelled) • Proportion in relation to private bicycles and all modes of transport • Respecting the traffic rules • Feeling of safety • Average and incremental speed
Accessibility	• Travel purpose • Transport connections, service connections, work connections • Journey time • Mode share • Frequency of use • Access to work and necessities • Location of vehicle for public transport, jobs, other necessities • Carrying/lifting • Average vehicle density

Economy	• Number of local jobs • % of jobs in the bicycle sector • Service turnover, compared with turnover for all bicycle activities in the region
Environment	• Air quality • Impact per kilometre travelled per vehicle: service use, redistribution • Carbon footprint of regulation vehicles • Lifespan of regulation vehicles, bicycles and batteries • Reuse and recycling of bikes and batteries • Data volume • Life cycle analysis: production, import, services, recycling
Public health	• Personal healthcare costs avoided • Health service expenditure avoided
Public finance	• Remaining cost per trip • Remaining cost per km • Remaining cost per car km avoided • User revenue coverage rate
Operation and maintenance	• Mean time to failure • Wear and tear • User complaints - response time • Vehicle condition • User experience of employees
Equity	• User demographics - income bracket, age, gender, capacity • Vehicle distribution • Pricing structure - connection to use • Community involvement (number of events, participation, street team, etc.)
Territorial coverage	• Total area served • Rebalancing needs • Stagnant bikes
GOOD MOVE *(Source 47 page 140)*	
Motorisation rates and behaviour	• Motorisation rate of BCR residents • Percentage of the population (15+) who walk or cycle to get from one place to another for at least 30 minutes on a typical day • Modal share of secondary school students • Modal share of employees
Main traffic and flow measurements	• Average number of cyclists per hour per Bike Observatory counting point • Number of journeys made on the STIB public transport network (metro, tram, bus) over one year
Perception of mobility and road safety	• Level of satisfaction with the mobility offer • Overall level of user satisfaction with STIB public transport (Barometer)
Air quality	• Volume and percentages of CO_2 equivalent emissions within the BCR perimeter • Number of days on which the daily average concentration of PM10 and PM2 is exceeded • Energy consumption of the transport sector within the BCR perimeter

Table 2. New Mobility performance indicators in five policy areas

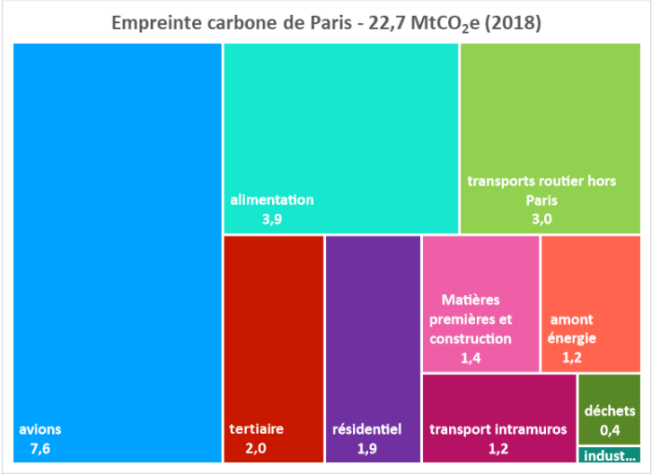
Policy area	Indicator
Sustainability	1.1 Vehicle-kilometres and passenger-kilometres travelled 1.2 Average vehicle lifespan 1.3 Alternative mode replaced and trip generation effects 1.4 Operational CO_2 emissions
Safety	2.1 Injury rate 2.2 Crash rate 2.3 Share of passenger-kilometres travelled on low-stress routes
Utilisation	3.1 Vehicle utilisation rate 3.2 Trip distance (or trip duration for round-trip services) 3.3 Total users
Accessibility	4.1 Access latency 4.2 Number of trips starting or ending near essential services and opportunities 4.3 Vehicles or trips available by area (spatially aggregated) 4.4 Trip purpose
Equity	5.1 Vehicle and trip availability in targeted service areas 5.2 Number of trips starting or ending in targeted service areas 5.3 Vehicle and trip availability for users with physical disabilities

Source 21

10.4 Some PB challenges regarding pedelecs

Installation	Choose between charging station and/or swapping. Avoid novice suppliers who have gone bankrupt (Copenhagen, Stockholm). Dependent on the electricity grid operator.
Operation	↗ acquisition, maintenance and operating costs, with the challenge of finding a skilled workforce, which is generally very male-dominated. ↗ risks: fire, theft. ↗ failures: connectors, oxidation, high temperatures.
Social appropriation	Willingness to pay of certain groups. Some users prefer pedal bikes so they can continue to make a physical effort, have a lower deposit and prices, and a reduced environmental footprint. Contribution to the SUVisation of cycling.

10.5 The City of Paris' carbon footprint in 2018



Source 54

10.6 Reflections based on the regional mobility plan

10.6.1 City Vision extended to PB

City Vision	Application to PB
Green	Life cycle of stations, batteries and bicycles Impact of operating trips Modal shift avoided
Social	Accessible to under-represented groups: low-income earners, women, those with few qualifications Solidarity pricing Consideration of the digital divide
Pleasant	Attractive user experience Respectful sharing of public space Acceptance by non-users
Healthy	Encouraging physical activity Improvement of air quality
Effective	Large number of rentals Set an example for other European cities
Efficient	Public money well invested Setting SMART objectives Long-term service
Safe	Compliance with safety standards Bikes in good condition Road safety

10.6.2 Good Move actions to which PB indirectly contributes

Focus	Application to PB
A. Good neighbourhood	Territorial coverage Living environment with lowered speeds (A1, A2) Integration into renovation projects (A6)
B. Good Network	Hyper-dense network in the hypercentre and continuous outwards Consistency with the cycling network (B1, B4) and PT network (B5) PB network operation (B8, B9)
C. Good Service	Customer-oriented - User-friendly (C5) Quality, scalable (C3, C11) and hierarchical service (C6) Integrated into the public mobility offer (Floya, STIB) (C1, C2)
D. Good Choice	Alternative for current and future motorists (D3, D6, D7) Adapt pricing (D4) Develop multimodal skills, enhance personal cycling
E. Good Partners	Public cooperative initiative (E1, E2, E3) Involvement of STIB (E4) Call for private-sector expertise, with follow-up (E7)
F. Good Knowledge	Transparency in the use of public funds (F1, F6) Data collected, analysed and regularly published (F2, F3)

10.7 Data table for the quantitative assessment of scenarios

N°	2022	1. LTR			2. DZ Private SB		3. DZ public PB		4. Hybrid PB		5. Dock-based PB	
	Villo!	Base	Option	Total								
SERVICE												
Supply												
Stations locations	345	-	-	-	3,000	3,000	3,000	3,000	700	700	700	700
Specific urban furniture	*345*	-	-		-	-	-	-	*350*	*350*	*700*	*700*
Dropzones	-	-	-		*3,000*	*3,000*	*3,000*	*3,000*	*350*	*350*	*0*	*0*
nb of stations/ km²	2.1				18.4	18.4	18.4	18.4	4.3	4.3	4.3	4.3
Bicycles	4,103	4,000	500	4,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500
Pedal	*2,303*	*1,400*	*500*	*1,900*	-	-	-	-	-	-	-	-
Pedelecs	*1,800*	*2,600*		*2,600*	*7,500*	*7,500*	*7,500*	*7,500*	*7,500*	*7,500*	*7,500*	*7,500*
Bikes/ 10.000 inhabitants	33.6	32.4	4.1	36.5	60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.8
Bikes/ station	11.9				2.5	2.5	2.5	2.5	10.7	10.7	10.7	10.7
Mobility practise												
VLS Rentals/bike/day	0.67	-	-	-	1.6	2.0	2.0	3.0	3.0	5.0	3.0	5.0
Rentals or trips/year	997,826	2,190,000	140,250	2,330,250	4,380,000	5,475,000	5,475,000	8,212,500	8,212,500	13,687,500	8,212,500	13,687,500
Rentals or trips/year (Million)	1.0 M	2.2 M	0.1 M	2.3 M	4.4 M	5.5 M	5.5 M	8.2 M	8.2 M	13.7 M	8.2 M	13.7 M
Trips/1,000 inhabitants/day	816	1,776	114	1,890	3,553	4,441	4,441	6,662	6,662	11,103	6,662	11,103
Trips/inhabitant/year	0.82	1.8	0.1	1.9	3.6	4.4	4.4	6.7	6.7	11.1	6.7	11.1
Distance/rental (km)	1.9	3.1	2.0	-	2.5	3.1	2.5	3.1	2.5	3.1	2.5	3.1
Annual km cycled	1,865,935	6,789,000	280,500	7,069,500	10,950,000	16,972,500	13,687,500	25,458,750	20,531,250	42,431,250	20,531,250	42,431,250
Annual km cycled (Millions)	1.9 M	6.8 M	0.3 M	7.1 M	11.0 M	17.0 M	13.7 M	25.5 M	20.5 M	42.4 M	20.5 M	42.4 M
Subscribers												
SB yearly rentals/yearly members	53	-	-	-	50	50	80	80	80	80	80	80
LTR trips/beneficiary/year	-	365	187	-	-	-	-	-	-	-	-	-
LTRbeneficiaries/year/bike		1.5	1.5	2								
Number of annual subscribers	18,861	6,000	750	6,750	87,600	109,500	68,438	102,656	102,656	171,094	102,656	171,094
Subscribers/inhabitants (%)	1.5%	0.5%	0.1%	0.5%	7.1%	8.9%	5.6%	8.3%	8.3%	13.9%	8.3%	13.9%
% of female users	29%	62%	95%	-	30%	34%	30%	34%	35%	40%	35%	40%
Female users	5,470	3,720	713	4,433	26,280	37,230	20,531	34,903	35,930	68,438	35,930	68,438
% maximum secondary education	26%	40%	100%		26%	30%	26%	30%	26%	30%	26%	30%
Users up to secondary degree maximum	4,904	2,400	750	3,150	22,776	32,850	17,794	30,797	26,691	51,328	26,691	51,328

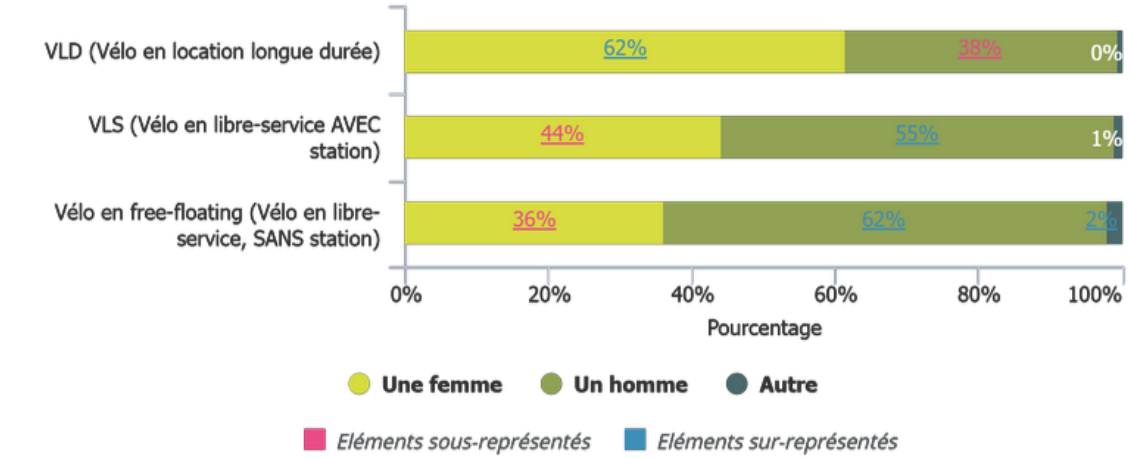
N°	2022	1. LTR			2. DZ Private SB		3. DZ public PB		4. Hybrid PB		5. Dock-based PB	
	Villo!	Base	Option	Total								
Mobility Impacts												
Comparison of volumes												
Bike rentals/Alle trips in BRC (%)	0.10%	0.21%	0.01%	0.22%	0.42%	0.53%	0.53%	0.79%	0.79%	1.31%	0.79%	1.31%
Bike rentals/Cycle trips in BCR (%)	1.04%	1.40%	0.09%	1.49%	2.80%	3.50%	3.50%	5.26%	5.26%	8.76%	5.26%	8.76%
Bike rentals/PT journeys in BCR (%)	0.39%	0.82%	0.05%	0.87%	1.64%	2.05%	2.05%	3.08%	3.08%	5.13%	3.08%	5.13%
Bike rentals/STIB journeys in BCR (%)	0.40%	0.84%	0.05%	0.89%	1.68%	2.09%	2.09%	3.14%	3.14%	5.23%	3.14%	5.23%
Bike rentals/STIB journeys(%)	0.30%	0.48%	0.03%	0.51%	0.95%	1.19%	1.19%	1.79%	1.79%	2.98%	1.79%	2.98%
Car modal shift												
% car journeys avoided	7%	20%	0%	-	7%	10%	7%	10%	7%	12%	7%	12%
Car - journeys avoided /year	0.07 M	0.44 M	0.00 M	0.44 M	0.31 M	0.55 M	0.38 M	0.82 M	0.57 M	1.64 M	0.57 M	1.64 M
Car - % journeys avoided /year	0.03%	0.23%	0.00%	0.23%	0.16%	0.29%	0.20%	0.43%	0.30%	0.86%	0.30%	0.86%
Car - km avoided /year	0.13 M	1.36 M	0.00 M	0.00 M	0.77 M	1.70 M	0.96 M	2.55 M	1.44 M	5.09 M	1.44 M	5.09 M
Car - % of km avoided	0.01%	0.15%	0.00%	0.00%	0.08%	0.19%	0.11%	0.28%	0.16%	0.56%	0.16%	0.56%
Imrpovment of PT travels												
% of PT journeys improved	60%	35%	60%	-	60%	60%	60%	60%	60%	60%	60%	60%
PT - Journeys improved/year	0.60 M	0.77 M	0.08 M	0.85 M	2.63 M	3.29 M	3.29 M	4.93 M	4.93 M	8.21 M	4.93 M	8.21 M
PT - % of journeys improved	0.63%	0.29%	0.03%	0.32%	0.98%	1.23%	1.23%	1.85%	1.85%	3.08%	1.85%	3.08%
PT - % of STIB journeys improved	0.24%	0.29%	0.03%	0.33%	1.01%	1.26%	1.26%	1.88%	1.88%	3.14%	1.88%	3.14%
PT - km improved/year	1.12 M	2.38 M	0.17 M	2.54 M	6.57 M	10.18 M	8.21 M	15.28 M	12.32 M	25.46 M	12.32 M	25.46 M
PT - % of km improved	0.07%	0.15%	0.01%	0.16%	0.42%	0.65%	0.53%	0.98%	0.79%	1.64%	0.79%	1.64%

N°	2022	1. LTR			2. DZ Private SB		3. DZ public PB		4. Hybrid PB		5. Dock-based PB	
	Villo!	Base	Option	Total								
Financial impacts (€ excl. VAT)												
Public expenditure assumptions (€ excl. VAT)												
Ratio of price paid		€640	€888	€668	€0	€0	€3,000	€2,000	€3,200	€2,200	€3,000	€2,000
FTE for supervision	1	1	0.5	1.5	0	0	2	1	5	3	5	3
Public authorities budget (€ excl. VAT)												
Total paid by public authorities	€0.09 M	€2.65 M	€0.49 M	€3.14 M	€0.00 M	€0.00 M	€22.68 M	€15.09 M	€24.45 M	€16.77 M	€22.95 M	€15.27 M
Price invoiced to public authorities	€0.00 M	€2.56 M	€0.44 M	€3.00 M	€0.00 M	€0.00 M	€22.50 M	€15.00 M	€24.00 M	€16.50 M	€22.50 M	€15.00 M
Cost of supervision	€0.09 M	€0.09 M	€0.05 M	€0.14 M	€0.00 M	€0.00 M	€0.18 M	€0.09 M	€0.45 M	€0.27 M	€0.45 M	€0.27 M
User revenue (€ excl. VAT)												
User revenue coverage rate		40%	4%		-	-	35%	50%	35%	50%	35%	50%
User revenue		€1.02 M	€0.02 M	€1.04 M	€0.00 M	€0.00 M	€7.88 M	€7.50 M	€8.40 M	€8.25 M	€7.88 M	€7.50 M
Residual public cost (€ excl. VAT)												
Residual cost: € public / year		€1.63 M	€0.47 M	€2.10 M	€0.00 M	€0.00 M	€14.81 M	€7.59 M	€16.05 M	€8.52 M	€15.08 M	€7.77 M
Residual cost: € public / bike		€407	€942	€466	€0	€0	€1,974	€1,012	€2,140	€1,136	€2,010	€1,036
Residual cost: € public / trip by bike		€0.74	€3.36	€0.90	€0.00	€0.00	€2.70	€0.92	€1.95	€0.62	€1.84	€0.57
Residual cost: € public / km by bike		€0.24	€1.68	€1.92	€0.00	€0.00	€1.08	€0.30	€0.78	€0.20	€0.73	€0.18
Residual cost: € public / car km avoided		€1.20		€1.20	€0.00	€0.00	€15.45	€2.98	€11.17	€1.67	€10.49	€1.53
Residual cost: € public / Tonne avoided		€7,327	€75,676	€9,192	€0	€0	-€244,937	€709,832	-€177,023	€55,103	-€166,270	€50,252
Other impacts												
Carbon footprint (CO^2 tons avoided)												
Emitted/year (life cycle)	127	204	8	212	744	1,152	929	1,729	1,394	2,881	1,394	2,881
Avoided/year (Modal shift from car and PT)	118	426	15	440	695	1,160	869	1,739	1,303	3,036	1,303	3,036
Carbon footprint (CO^2 tons avoided)	-8	222	6	228	-48	7	-60	11	-91	155	-91	155
External impact (€ excl. VAT)												
Benefits from car kilometres avoided/replaced	€0.25 M	€2.03 M	€0.00 M	€2.03 M	€0.98 M	€2.17 M	€1.22 M	€3.25 M	€1.83 M	€6.50 M	€1.83 M	€6.50 M
Benefits from PT kilometres avoided/replaced	€0.21 M	€3.56 M	€0.25 M	€3.81 M	€6.39 M	€9.91 M	€7.99 M	€14.87 M	€11.99 M	€24.78 M	€11.99 M	€24.78 M
Benefits of external impacts	€0.46 M	€5.59 M	€0.25 M	€5.84 M	€7.37 M	€12.08 M	€9.21 M	€18.11 M	€13.82 M	€31.27 M	€13.82 M	€31.27 M
Societal balance (€ excl. VAT)												
External benefits - € users - € public		€2.94 M	-€0.24 M	€2.70 M	€7.37 M	€12.08 M	-€13.47 M	€3.02 M	-€10.63 M	€14.50 M	-€9.13 M	€16.00 M
Social benefits / cycle trip		€1.34	-€1.69	-€0.35	€1.68	€2.21	-€2.46	€0.37	-€1.29	€1.06	-€1.11	€1.17
Social benefits / km cycled		€0.43	-€0.85	-€0.41	€0.67	€0.71	-€0.98	€0.12	-€0.52	€0.34	-€0.44	€0.38
Social benefits / km of car avoided		€2.16		€2.16	€9.62	€7.12	-€14.05	€1.19	-€7.39	€2.85	-€6.35	€3.14

10.8 French study data on bike share and long-term rental

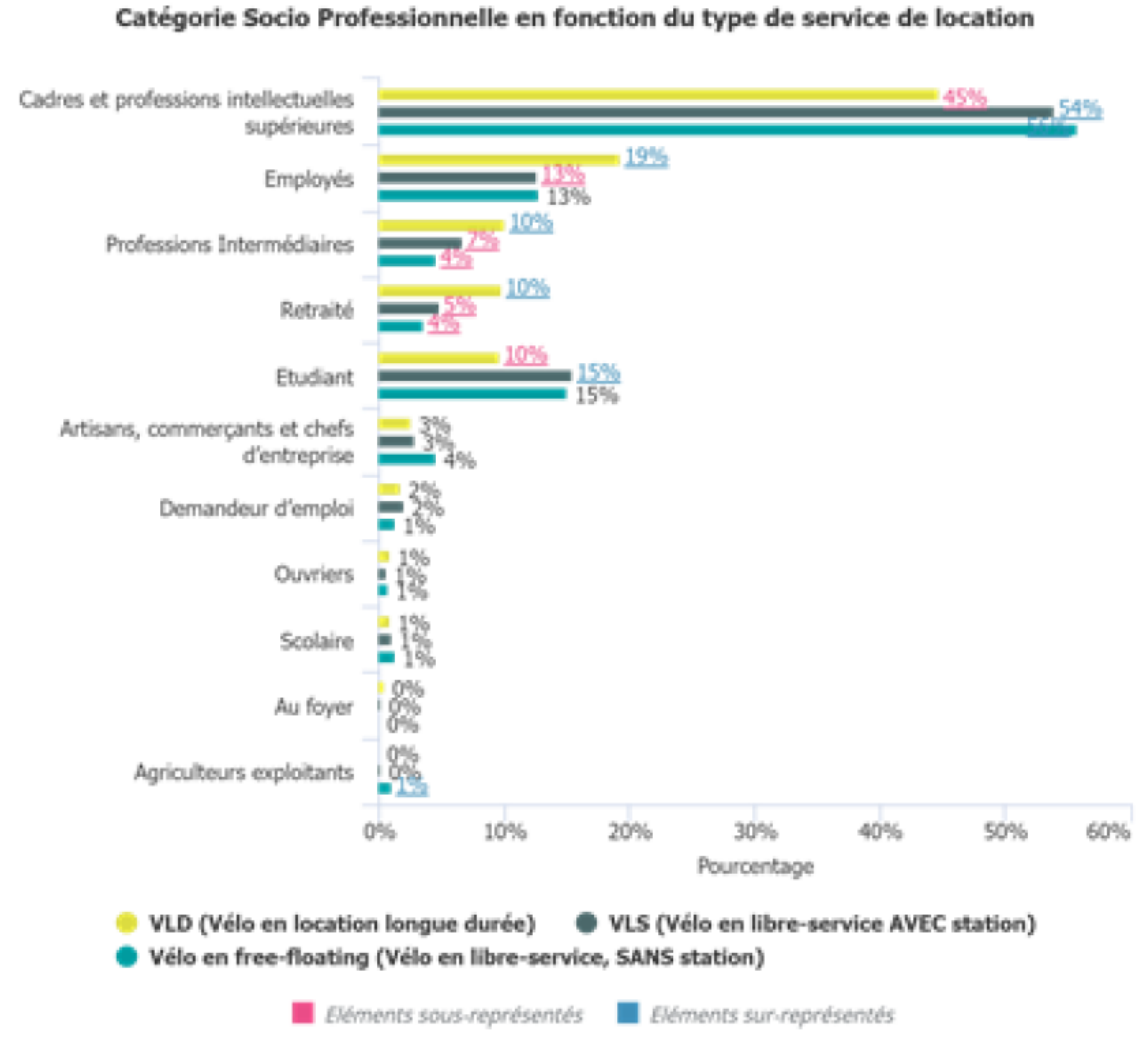
10.8.1 The respondents

Gender of respondents by type of service



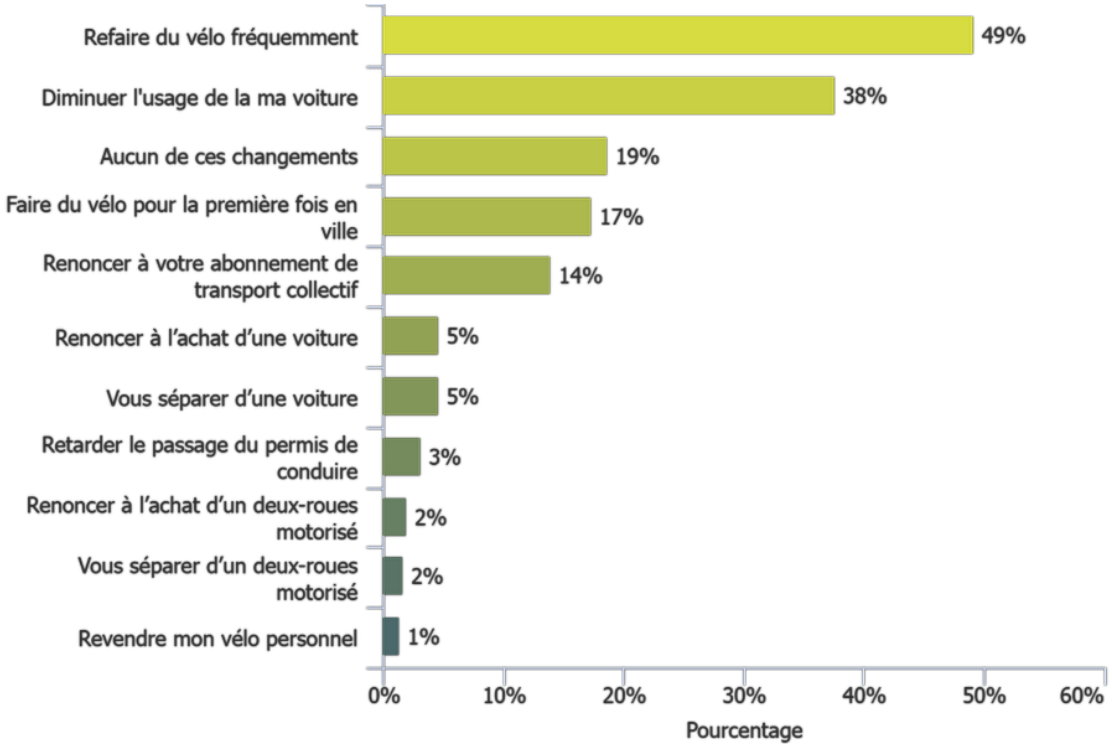
La relation est très significative. p-value = < 0,01 ; Khi2 = 148,8 ; ddl = 4.

Socio-professional category by type of rental service

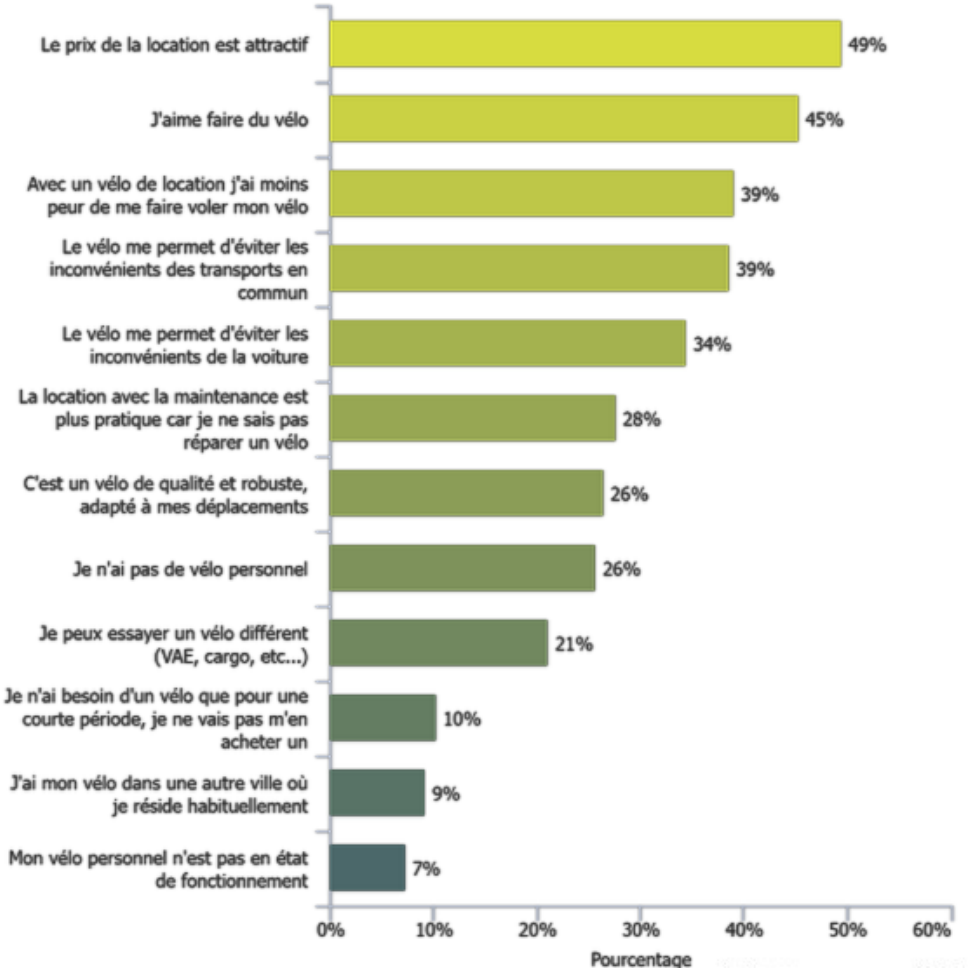


La relation est très significative. p-value = < 0,01 ; Khi2 = 152,7 ; ddl = 20.

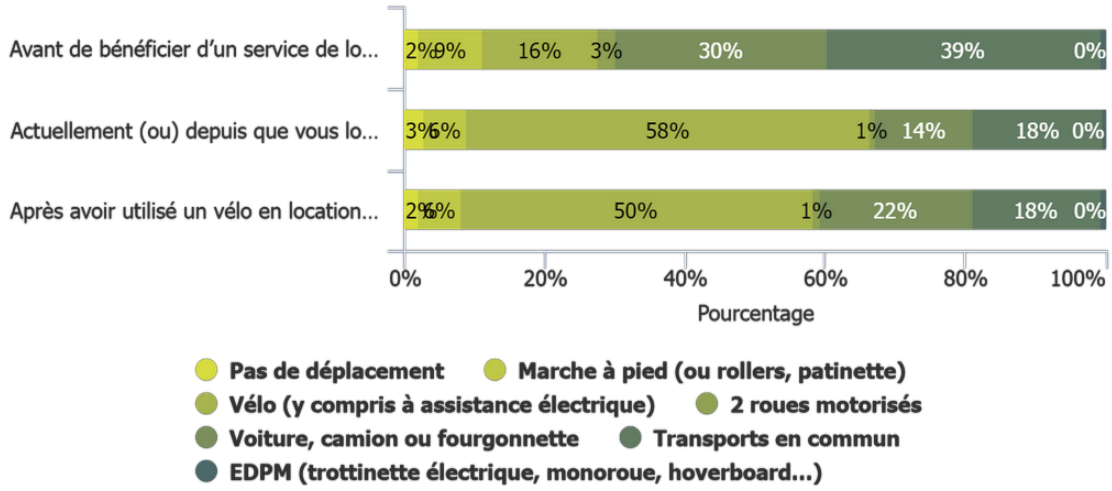
10.8.2 Would you say that renting has led you to …



10.8.3 Why do you prefer to rent a public bicycle?

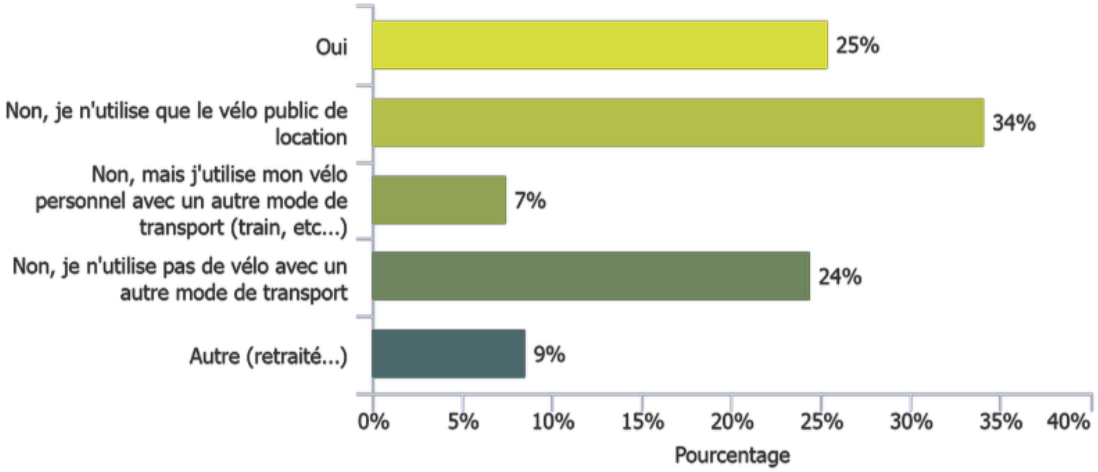


10.8.4 Modal share trends before, during and after public bike rental

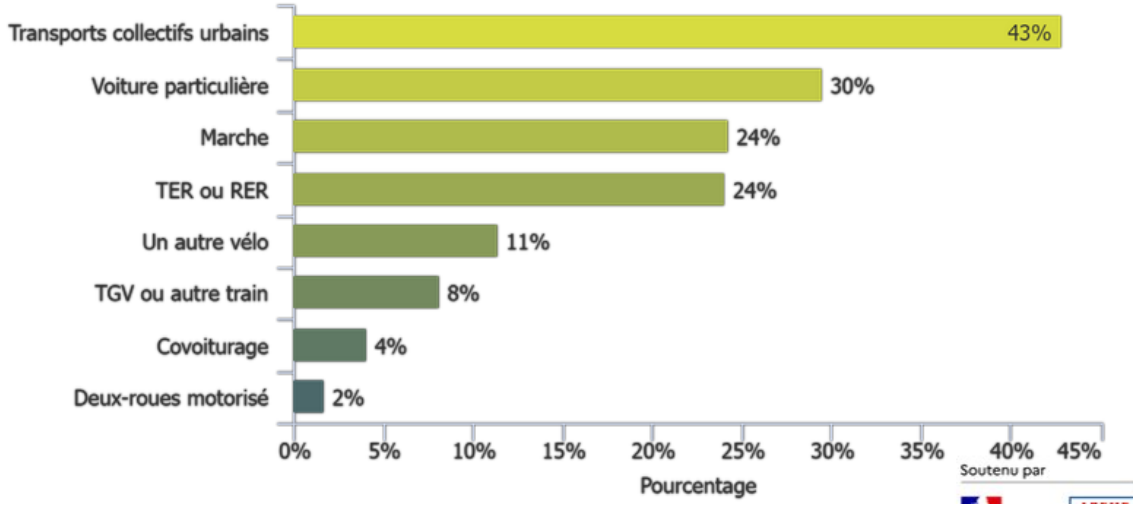


10.8.5 Intermodality

For your commute to work, do you combine your rental bike with other modes of transport?



If so, with which other means of transport?



10.9 Social LTR - Focus on two inspiring Belgian experiences

10.9.1 Vélo Solidaire in Brussels

Vélo Solidaire is a project initiated by Brussels Mobility and implemented by three associations: Pro Velo, Cyclo and Les ateliers de la rue Voot. The following data is based on exchanges with Cyclo in November 2023.

Vélo Solidaire targets people with no initial cycling skills or who are not comfortable getting around in traffic. The service, which is based on close collaboration with local associations, consists of:

- **training to learn to ride a bike**. Training generally lasts 30 hours, but varies according to the learner's basic level. The cost of 30 hours' training is estimated at €400/person, paid for by the public authorities. Conventional bikes are rarely the right size for the target audience, with a need for smaller bikes.
- **provision of a test bike for 12 months at the end of the training course**. The bike on offer is a second-hand bike reconditioned in the Cyclo et Ateliers de la rue Voot workshops by people enrolled on a professional integration pathway. The cost of a bicycle to the public authorities is estimated at €1,500, including:
    - €650 for the "organisation of the professional integration pathway" of the people working on the bike, including their supervision
    - €450 for the "bike" part, which includes new parts for the bike, logistical coordination for the provision of bikes, and overheads.
- **Subsidised purchase option price of €25 for the beneficiary**. 60-70% of people who complete the training course buy the bike at the end of the process. In this way, 300 bikes are purchased by people who have completed the training course.

The total cost to the public authorities of the whole project is around €1,500 per person who buys a bike. Above and beyond this figure, the pleasure and autonomy gained by beneficiaries are priceless.

Figure 115: Vélo Solidaire (Photo: Cyclo)

10.9.2 Fietsschool in Leuven

Fietsschool was launched in 2011 in Leuven and has since expanded its activities in Flanders. It is a bicycle training, testing and purchasing service provided by Mobiel21. This data is based on exchanges with Mobiel21 in November 2023.

Participants:

- learn to ride a bike in 30 sessions in groups of 20, for €20 only.
- test a bike for three months.
- benefit from a €75 bike purchase option.

Every year, around 200 people benefit from this service and 125 people buy a bike. There is always a waiting list. 90 to 95% of beneficiaries are women. Only 20% of participants have at most a secondary school diploma.

The vast majority of participants do not have a car at their disposal. While this service does not reduce car use, it does profoundly change the lives of the beneficiaries who have learned to ride a bike, as the following testimonials illustrate:

- "I feel better, my health is better."
- "My life has changed."
- "I've gained confidence in myself and I know I'm still capable of learning something."
- "I no longer need to complicate my life by taking the bus with a buggy and my child."
- "I've found a new freedom."
- "I save time on my travels, as I can now clean in four places instead of two" *(source 69).*

The total cost to the public authorities, per person trained and who then bought a bike, is €525 (€325 for training and bike test divided by the proportion of people who then buy the bike, 62%). The service is therefore very similar to the *Vélo Solidaire* in Brussels, with lower costs.

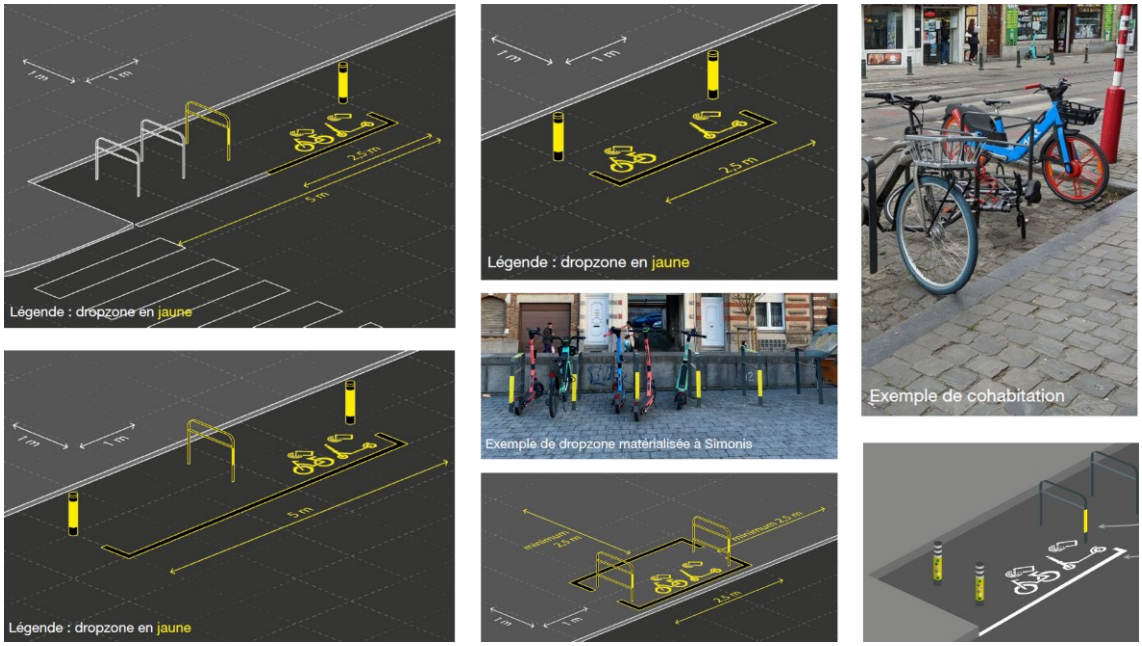
Figure 116: Fietsschool Leuven (photo Mobiel 21)

10.10 Abandoned scenario: each bicycle rack is a virtual station

"Each bicycle rack is a virtual station. As with private bicycles, any shared bikes should be attached to bicycle racks"; this scenario was created by:

- observing the mix and confusion of parking uses between private bikes, PB in stations, private SB and shared e-scooters.
- realising that private SB in Brussels are accepted in existing bike racks on a temporary basis until dropzones are fully deployed (*Source 46*).
- hoping to bring order to public space by forcibly attaching SB and shared e-scooters to bicycle racks.
- considering the common battery model for SB and e-soocters.
- believing that battery swapping was cheaper than stations, even on long-term.
- investing huge public money once in parking racks (infrastructure useful to all cyclists and depreciable by the public authorities over several decades) rather than investing in PB stations (dedicated, proprietary parking supply, depreciable over ten years, to change).
- making dropzones accessible to all cyclists without dedicating them to private SB operators, who enjoy a competitive advantage over PB thanks to a finer territory coverage.
- considering public infrastructure such as removable battery charging hubs, accessible only to operators. These would be shelters in public spaces with charging cabinets, reducing journey times and hence swapping costs.

Figure 117: Extracts from the Brussels' dropzone guide (Source 55)



The idea was to install the 8,800 bike racks already provided for in the parking plan and add 20,000 new bike racks in place of the current dropzones and *Villo !* station locations. At €150 per stainless steel rack, including installation, this represents a one-shot investment of €3 million. On-street parking would then increase from 41,000 bicycle spaces at the end of 2022 to 100,000 at the end of 2026 *(Figure 118 and Figure 119)*. This would narrow the gap with the 265,000 on-street car parking spaces (1,325 million linear km) and the 295,000 car parking spaces in buildings and homes recorded in 2014 *(Source 50)*.

Figure 118: Repair of available land for on-street bicycle parking in Brussels

Figure 119: Estimated potential for bicycle racks and parking places

	Parking category			
	Dropzones	**Villo ! Stations**	**Bicycles racks battery**	**Total**
Parking areas	3,000	345	7,300	**10,645**
Bicycle spaces			40,800	
Easement	3,75 *	1 mètre par bornette,	2 places par arceau	
Bicycle spaces per easement		2 places vélo par mètre		
Bicycle racks projects			8,800	
Additional bicycle spaces			17,600	
Cumulative length	11,250	8,500	29,200	**48,950**
Potential bike places end 2026	22,500	17,000	58,400	**97,900**

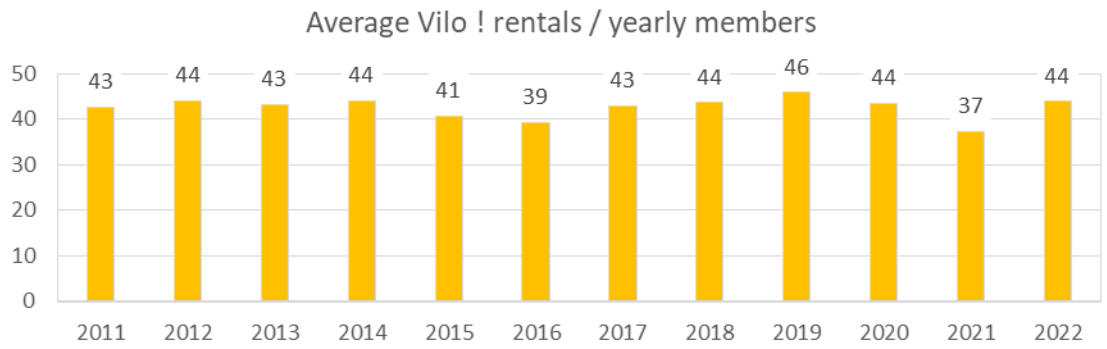
** Average. Dropzones measure 2.5 to 5 m | assumption of a similar number*

In the end, however, this prospect was not adopted for the following reasons:

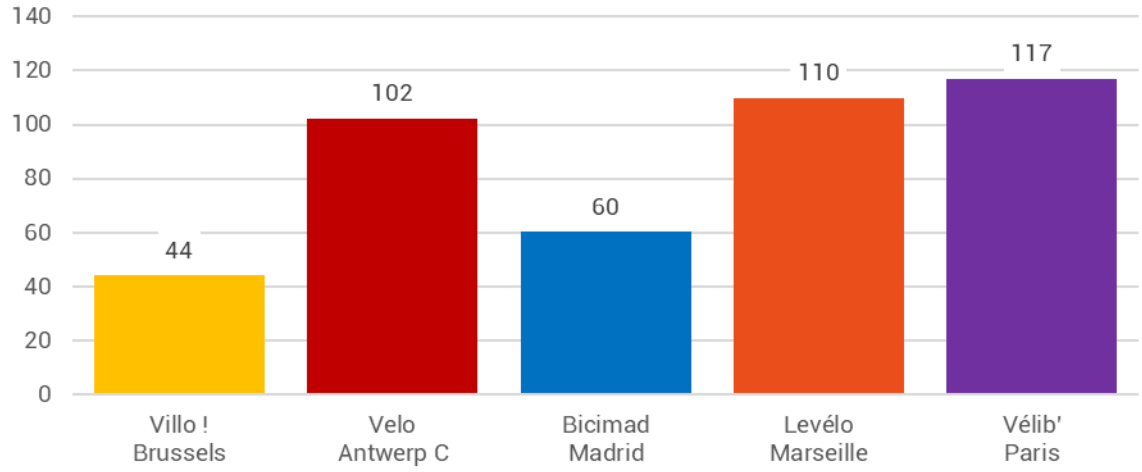
- no robust mechanism to check that the padlock is wrapped around an urban furniture.
- a variety of racks and rack heights in Brussels.
- a lack of suitable parking racks on the market to stabilise both bicycles (parallel parking) and e-scooters (front parking).
- no battery standard or a e-scooter standard that unnecessarily burdens the bicycles.
- administrative and governance complexity in Brussels for the installation of bike racks.
- space between two racks.
    - If it is too small, it makes it difficult to insert or remove a vehicle, especially with the increasing size of PB, private cargo bikes, bikes with baskets, child seats or panniers. Collisions between vehicles can damage them, leading to legal complications for the operator and dissatisfaction among users.
    - If it is too wide, users run the risk of placing the shared bike or e-scooter between two racks, de facto blocking an available space and resulting in user dissatisfaction.
- operational complexity for the operator, where the multiplication of bicycle drop-off/collection points increases costs and accelerates deterioration.
- The history of the Brussels PB calls for calming decision rather than bike share revolution risk.

10.11 Ratios of rentals per PB subscriber

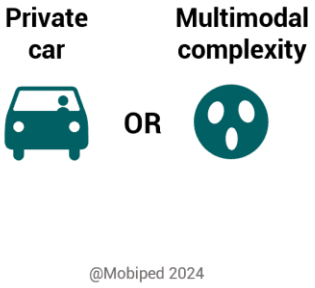
10.11.1.1 Brussels ratio of annual rentals per subscriber (~43)



10.11.1.2 Ratio of rentals per subscriber in the benchmark (~80)

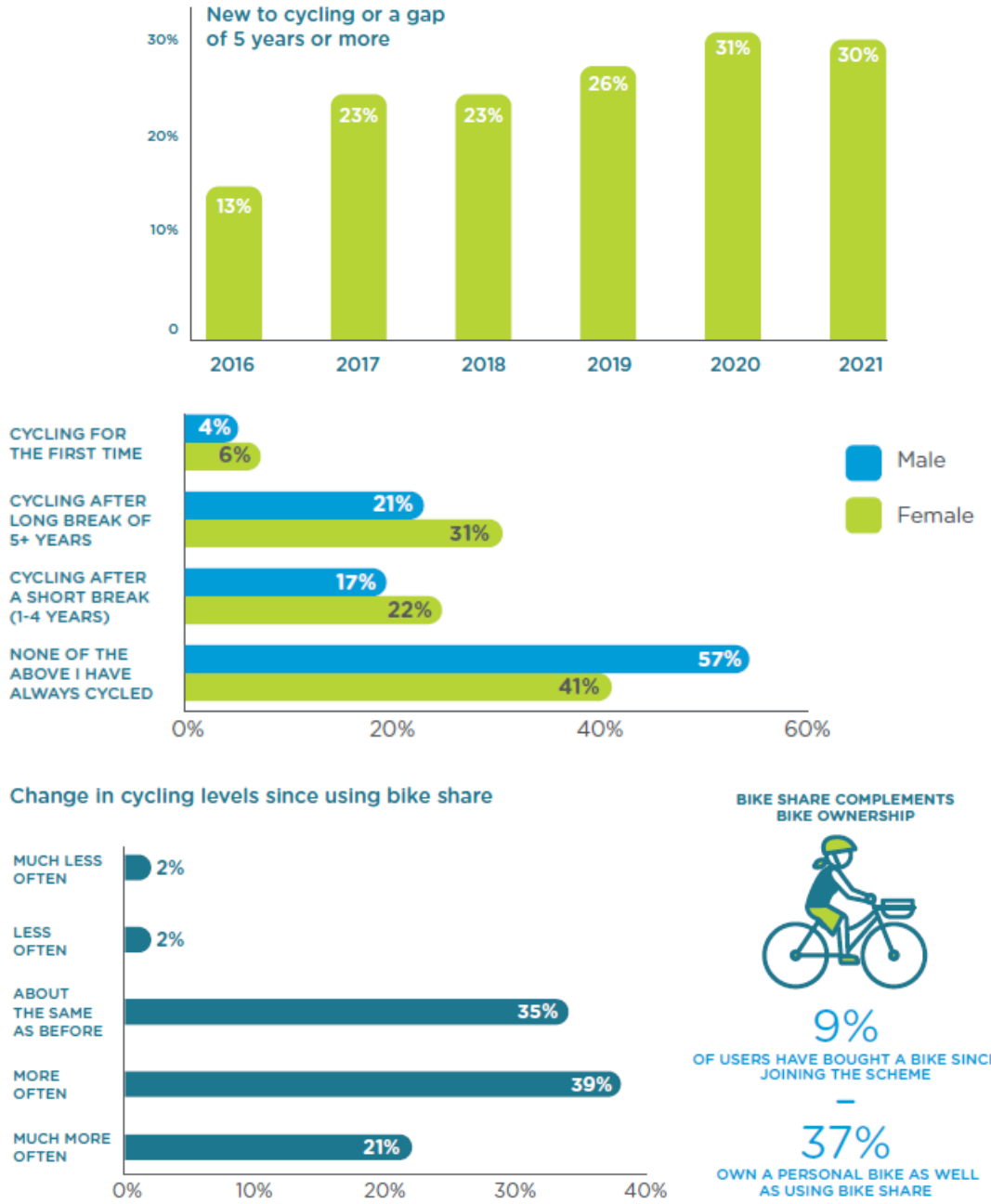


10.12 Private car versus 35 mobility offers



Mass transit	4	Urban: STIB | Inter-regional: De Lijn, TEC, waterbus | Train: SNCB, Thalys, Eurostar | Coach: FlixBus, Ouibus
Car parking	3	MyFlexiPark, BePark, Commuty
One-way shared bikes	6	Villo !, Dott, Tier, Pony, Bolt, Voi
Bike rentals	4	Blue bikes, Swapfiets, Pro Velo, Cambio, Monkey, etc.
Carsharing	8	Cambio, Getaround, Poppy, Cozywheels, Wibee, Dégage, Green Mobility, MILES Mobility
Scooters	7	Dott, Lime, Poppy, Pony, Voi, Bolt, Tier
Mopeds	1	Felyx
Carpooling	4	Blablacar, Commuty, Kowo, Carpool
Taxi	6	Collecto, Taxis verts, Taxis bleus, Taxi.eu, Victor Cab, Handycab

10.13 Impact of bike sharing on cycling in the UK



Source 12

10.14 Monthly rental prices for pedal, pedelecs and cargo bikes in LTR in 2023

		Solidarity	Student	Normal	Website
Pedal bikes	FietsAmbassade (Ghent)		€7/month		https://fietsambassade.gent.be/en
	Vélocité (Liège)			3 months: €30 (€10/month) 6 months: €50 (€8/month) 12 months: €80 (€6.70/month)	https://www.liege.be/fr/vivre-a-liege/mobilite/velocite
	Swapfiets (Brussels)			€22/month	https://swapfiets.be/
	Pro Velo (Brussels)			€172/month	https://www.Pro Velo.org/en/services/bicycle-hire-in-brussels/
	M Vélo+ (Grenoble)	€7/month	€4.90/month	€27/month	https://www.veloplus-m.fr/
Pedelecs	Véligo Location (Paris)	€20/month	€20/month	€40/month	https://www.veligo-location.fr/what-is-veligo-location/
	M Vélo+ (Grenoble)	€14/month		€54/month	
	Vélocité (Liège)			3 months: €180 (€60/month) 6 months: €300 (€50/month) 12 months: €480 (€40/month)	
	Swapfiets (Brussels)			€65/month	
	FietsAmbassade (Ghent)			€140/month	
	Pro Velo (Brussels)			€336/month	
Cargo bikes	Véligo Location (Paris)	€40/month		€80/month	
	M Vélo+ (Grenoble)	€14/month		€54/month	
	FietsAmbassade (Ghent)			€275/month	
	Pro Velo (Brussels)			€423/month	

10.15 Legal context of bike sharing in Brussels

The following details are provided for information purposes only. While they are partly the result of the interpretation and popularisation of exchanges with the legal departments of Brussels Mobility and STIB, any decision must be subject to legal analysis in accordance with the rules.

10.15.1 Some key documents

Jurisdiction	Text
Brussels-Capital Region | Convention *Villo !*	• 5 December 2008: concession to operate an automated bicycle rental system in the Brussels-Capital Region. • 9 June 2011: amendment n°1 (content and duration of phase 2). • 24 April 2014: amendment n°2 (control over the waiver of fees related to the occupation of the regional public domain). • 19 July 2018: amendment n°3 (introduction of *e-Villo !* with portable battery) • 16 September 2026: end of concession.
Brussels-Capital Region	• 25 October 2010: Ordinance governing the operation of a public service of automated bicycle rental. • 29 November 2018 (amended on 22 March 2022): Ordinance on the use of shared transport modes as an alternative to the car. • 13 July 2023: Decree of the government of the Brussels-Capital Region implementing the ordinance of 29 November 2018 on the use of shared transport modes as an alternative to the car.
European Commission	• Decision 2012/21/EU of the European Commission of 20 December 2011 concerning the application of article 106, paragraph 2, of the Treaty on the Functioning of the European Union Treaty to State aid in the form of public service compensation granted to certain undertakings entrusted with the operation of services of general economic interest (OJ L 7 of 11.1.2012, p. 3). • Decision of 24.6.2019 on the State aid implemented by Belgium for JC Decaux Belgium Publicité.
European directives	• Directive 2010/40/EU on Intelligent Transport Systems (ITS). • Directive 2014/23/EU on the award of concession contracts.
European Regulation	Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public passenger transport services by rail and by road.
Altmark case law	Judgment of the Court of Justice of 26 October 2016, Orange v. Commission, C-211/15 P, ECLI:EU:C:2016:798, paragraph 44.

10.15.2 PB would not be a public passenger transport service

A bike sharing rental scheme does not appear to qualify as "public passenger transport" within the scope of Regulation (EC) 1370/2007. This then calls into question the formula of the 2010 ordinance.

10.15.3 Are public bicycles an SGEI?

In 2019, the European Commission appeared to confirm the existence of an SGEI and State aid for the *Villo !* contract (*Figure 120, Source 10*).

Figure 120: Service of General Economic Interest

Service of general economic interest (SGEI): SGEI are economic activities which deliver outcomes in the overall public good that would not be supplied (or would be supplied under different conditions in terms of quality, safety, affordability, equal treatment or universal access) by the market without public intervention. The PSO is imposed on the provider by way of an entrustment and on the basis of a general interest criterion which ensures that the service is provided under conditions allowing it to fulfil its mission.

But in 2019, operators of private B2C shared bikes initiatives either did not exist or were still in their infancy. Does their development call into question the notion of SGEI? Whether an activity qualifies as an SGEI depends in particular on the existence of a market failure. If an operator only considers its commercial interest, it will not offer a level of service that meets a real need for a

specific public service. This failure would then be an objective reason for considering that public intervention is required to guarantee the provision of this service, with the constraint that it must be provided universally. In view of the elements studied *(see section 4.4.3)*, the SGEI still seems relevant.

10.15.4 Some implications to consider for an SGEI

- Since 2012, the mandate of an SGEI company cannot exceed ten years.
- For an SGEI, the financial compensation (= a financial contribution) of users is required.
- Additional aid is possible above the €15 M/year ceiling, subject to prior notification to the European Commission. The aid must meet stricter criteria, in line with the 2011 SGEI guidelines (existence of a mandate, prior determination of the parameters for calculating compensation, control of any overcompensation and the principle of repayment). The European Commission may impose additional conditions in terms of incentives to improve SGEI efficiency and compliance with public procurement rules where applicable.
- All direct or indirect contractual documents between the BCR and the operator must include the following information:
    - the nature and duration of the public service obligations.
    - the company and the territory concerned.
    - the nature of any exclusive or special rights granted to the company by the aid granting authority.
    - a description of the compensation mechanism and the parameters for calculating, monitoring and revising the compensation.
    - how to recover any overcompensation and how to avoid it.
    - a reference to this decision.

10.15.5 Awarding of an SGEI without competition

The awarding of an economic mission without competitive tendering in accordance with Altmark case law can be qualified as State aid unless the four conditions are met:

- the beneficiary company must have clearly defined its public service obligations.
- the method used to calculate compensation is objective, transparent and pre-established.
- the compensation does not exceed the amount required to cover all or part of the costs incurred in discharging the public service obligations, taking into account the related revenues and a reasonable profit. There can be no overcompensation.
- where the company which is to perform the public service obligations is not chosen following a public procurement procedure, the level of compensation is determined based on an analysis of the costs which a typical company, well run and adequately provided with means of meeting the necessary public service requirements, would have incurred in performing those obligations, taking into account the relevant revenues and a reasonable profit for performing the obligations. This last option could a priori be accepted by the Commission only in exceptional cases. On this last point, costs can be requested from candidates as part of the competitive dialogue.

In addition, discussions are currently underway on regulatory changes to exclude bicycles from State aid.

10.16 Household composition and number of adults in 2022

	Households in 2022	Adults
One-person household	263,886	263,886
Married couples without children	50,787	101,574
Married couples with children	103,298	206,596
Unmarried couples without children	30,557	61,114
Unmarried couples with children	28,507	57,014
Single-parent families	65,482	65,482
Other household types	21,365	21,365
NUMBER OF HOUSEHOLDS	563,882	777,031
ADULTS PER HOUSEHOLD		1.38

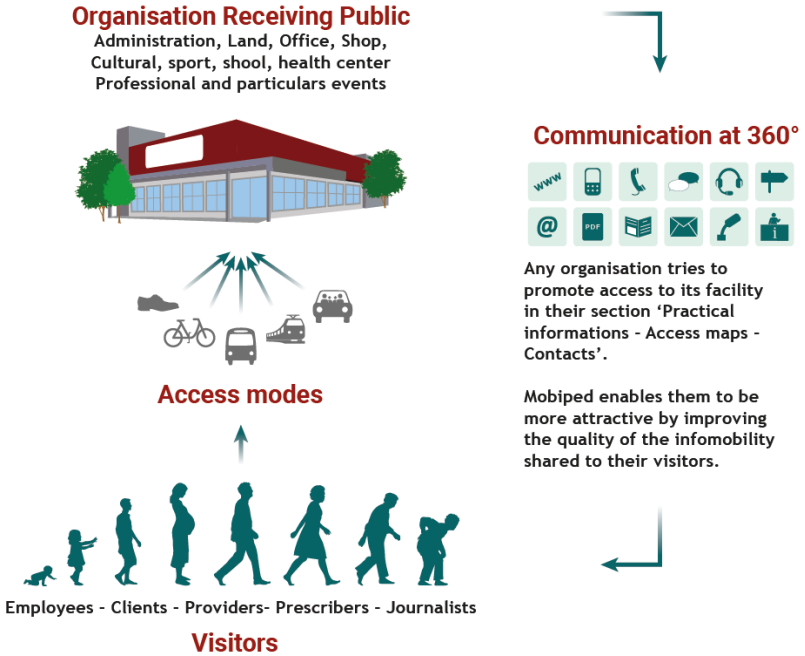
Number of private households on 1 January by household type by region | *Data*: Federal Planning Bureau; FPS Economy - Statbel (source 56).

10.17 Digital skills of Brussels residents

		Belgium (Household income)				
	Brussels	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
Advanced	36%	12%	16%	23%	35%	47%
De base	26%	20%	27%	29%	31%	31%
Low	15%	18%	19%	22%	19%	14%
Very low	7%	17%	17%	12%	8%	4%
Limited	5%	9%	8%	5%	3%	1%
None	4%	6%	3%	4%	2%	1%
Not user of Internet	6%	18%	10%	6%	3%	1%

Source 16

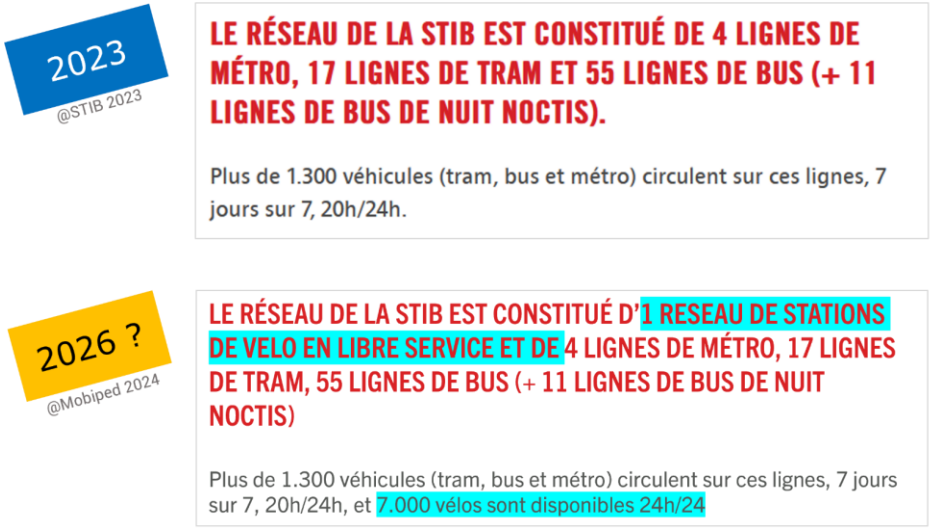
10.18 Multimodal information disseminated by mobility generators receiving various audiences (visitors, employees, suppliers)



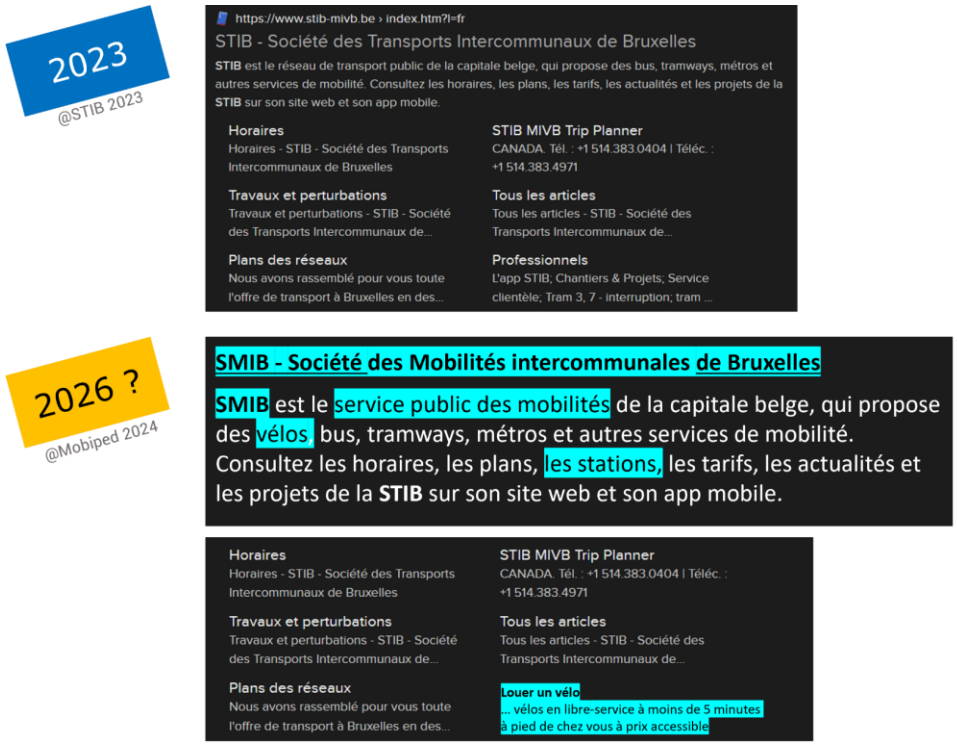
Source 77

10.19 Forward-looking approach to integrating PB into STIB communication media

10.19.1 Network presentation integration PB features



10.19.2 Google search results from PT operator to mobility operator



10.19.3 Change of name from STIB to SMIB with a mobility focus rather than transport

2023

@STIB 2023

SUIVEZ LE GUIDE

La STIB (Société des Transports Intercommunaux de Bruxelles) est le principal opérateur de transports publics à Bruxelles. Notre réseau, composé de lignes de métro, de tram et de bus, vous transporte aux 4 coins de la ville tous les jours.

2026 ?

@Mobiped 2024

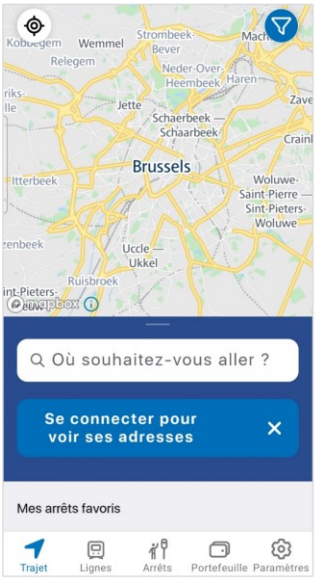
SUIVEZ LE GUIDE

La SMIB (Société des Mobilités Intercommunales de Bruxelles) est le principal opérateur des services publics de mobilité Bruxelles. Notre réseau, composé de lignes de métro, de tram et de bus et de stations de vélo en libre-service, vous permet de vous déplacer aux 4 coins de la ville tous les jours.

10.19.4 Home of the STIB app with direct access to PB station

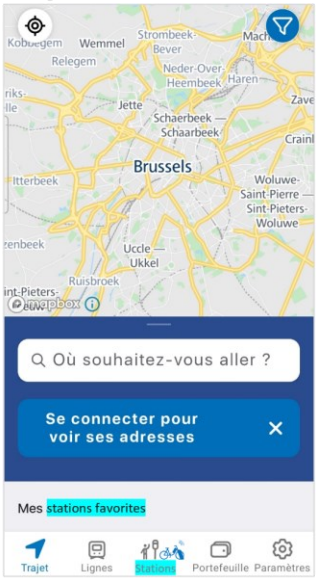
2023

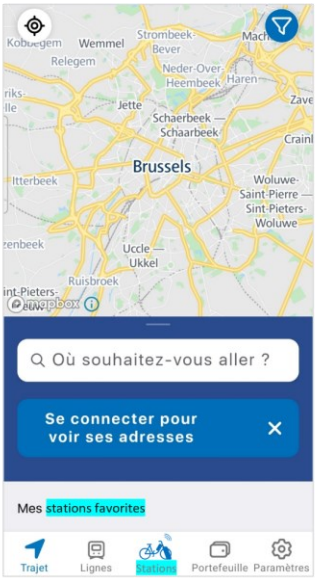
@STIB 2023



2026 ?

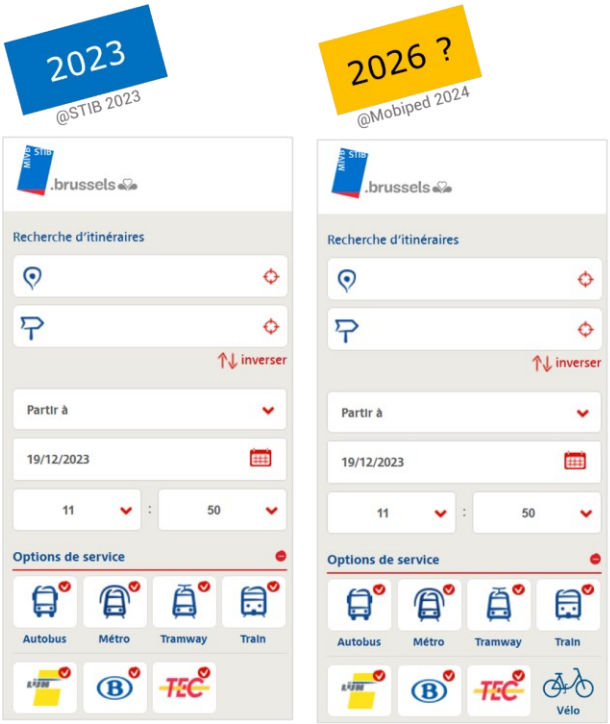
@Mobiped 2024



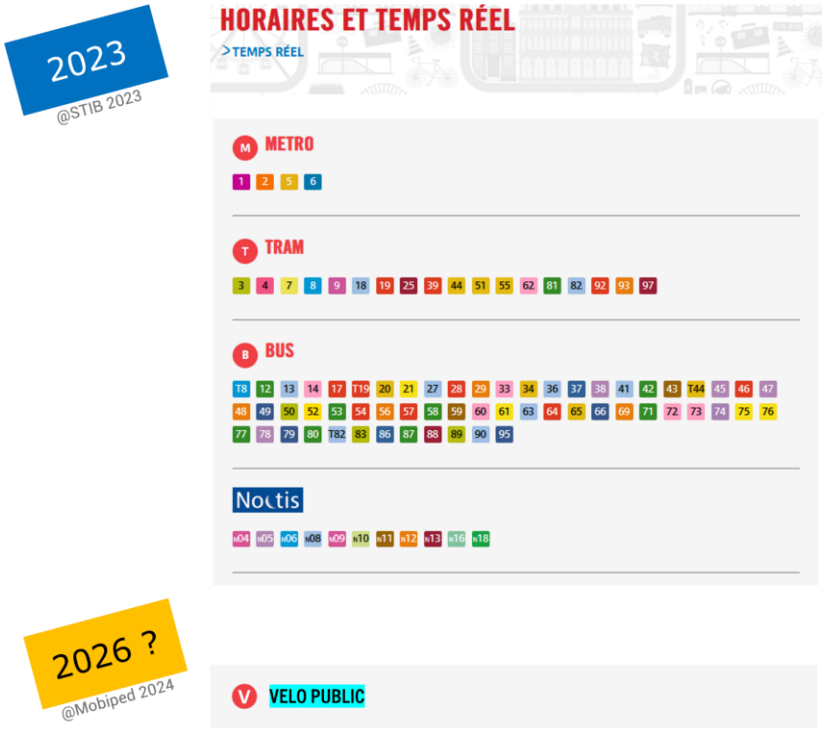


10.19.5 Home of Floya, the Brussels MaaS app, with a priority to public service on shared e-scooters and including the notion of public bicycle service

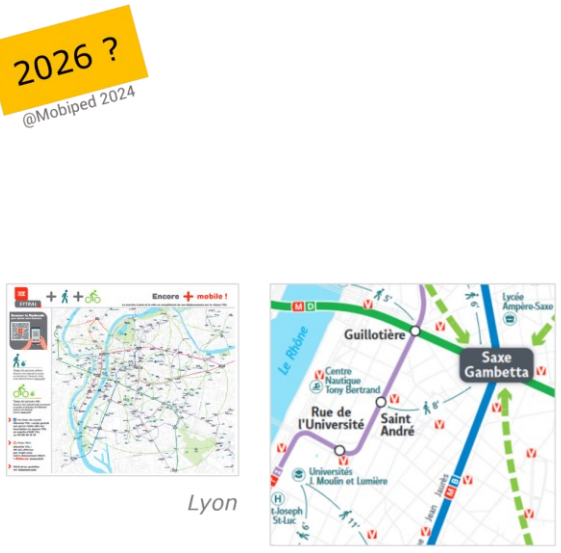
10.19.6 STIB route search engine with bike as a research criteria



10.19.7 Real-time information, including bike availability at each station



10.19.8 Network map with PB stations



Lyon

10.20 Extract of the Innov@talier design sprint

10.21 Some information on the Brussels context

CLIMATE

Temperature and rainfall (Source 76)

Mois	jan.	fév.	mars	avril	mai	juin	jui.	août	sep.	oct.	nov.	déc.	année
Température minimale moyenne (°C)	0,8	0,6	3	4,9	8,9	11,6	13,7	13,4	10,9	7,6	3,7	2	**6,8**
Température moyenne (°C)	3,2	3,6	6,5	9	13,3	15,8	18	18	14,8	11	6,5	4,3	**10,4**
Température maximale moyenne (°C)	5,6	6,5	9,9	13,1	17,7	20	22,3	22,4	18,7	14,4	9,1	6,5	**13,9**
Record de froid (°C)	−21,1	−18,3	−13,6	−5,7	−2,2	0,3	4,4	3,9	0	−6,8	−12,8	−17,7	**−21,1**
Record de chaleur (°C)	15,3	20	24,2	28,7	34,1	38,8	39,7	36,5	34,9	27,8	20,4	16,7	**39,7**
Précipitations (mm)	71,1	52,7	72,9	53,7	69,3	77,5	68,9	63,6	62,3	68,1	79,1	78,8	**817,8**

Source : Meteo Stats[24]

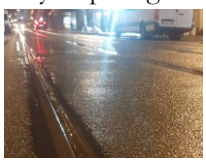
INFRASTRUCTURES

Road covering

Cobblestones => Sturdy frame, tyre grip in the rain, comfortable to use.
https://data.mobility.brussels/mobigis/fr/ > Bicycles > Roads

Tram tracks

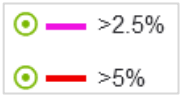
There are 150 km of tram track, with regular sharing of use with other modes. A bicycle pictogram is sometimes affixed in the middle of the two lanes.



TOPOGRAPHY

Slopes

The Brussels area has an impact on people's willingness to make an effort by bike and on battery life:
https://data.mobility.brussels/mobigis/fr/ > Bicycle > Slope.



HISTORY

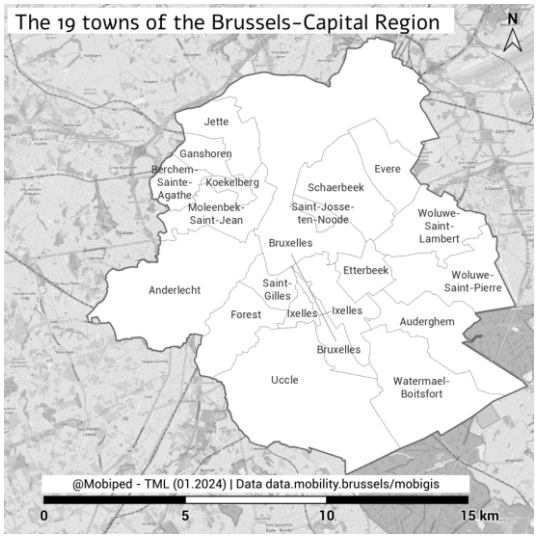
Protected heritage

Some buildings and sectors are classified as UNESCO sites, which may impose specific architectural constraints.

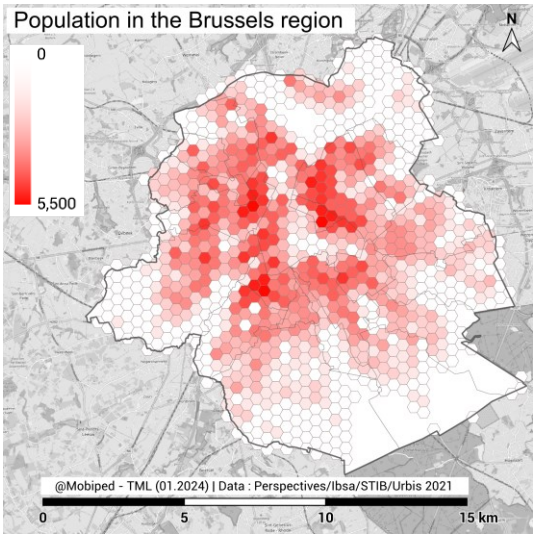
VANDALISM

Vandalism

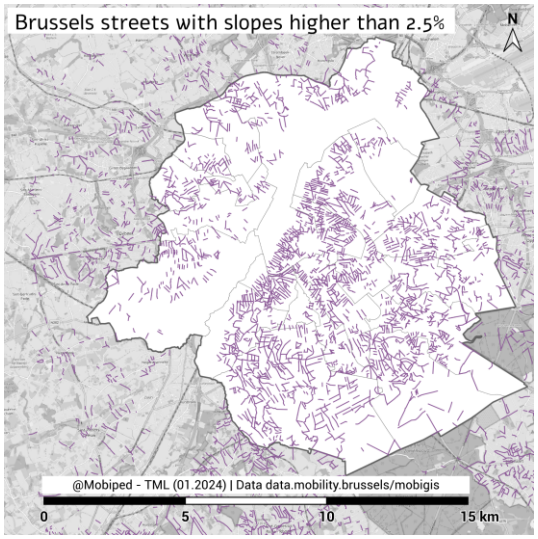
©Max de Radiguès *(Source 71)*.



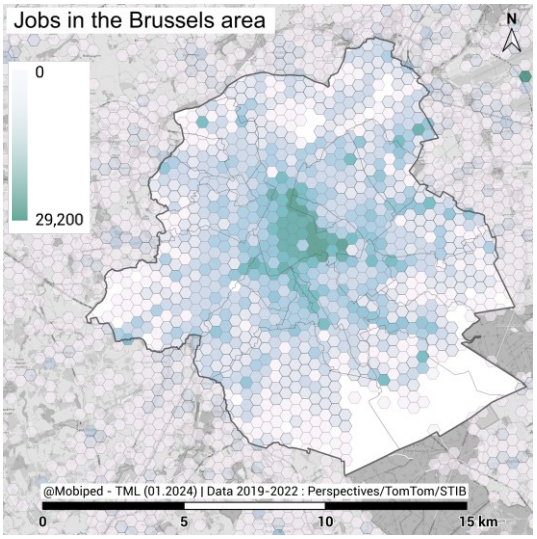
Administrative boundaries of the 19 towns



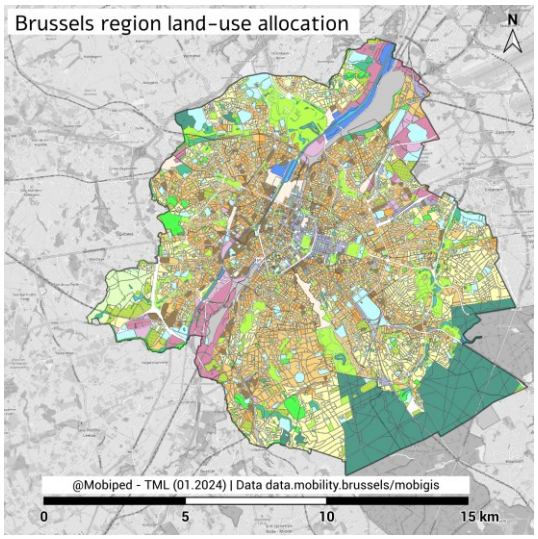
Population



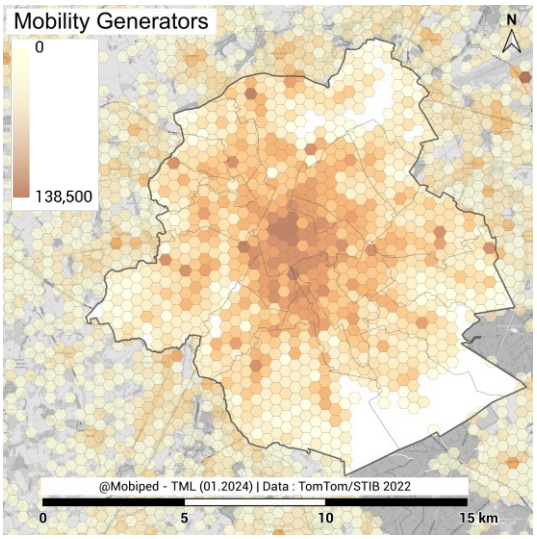
Streets with slopes greater than 2.5%



Jobs



Land use



Mobility generators

11 Table of illustrations

12 Sources

12.1 Publications

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The "Preparatory study for the public bicycles service of the Brussels-Capital Region in 2026: Benchmark and Recommendations" is part of these priorities established by the Brussels Government and at European level, and concerns in particular the Mobility axis and the Acceleration of MaaS deployment component. More specifically, it aims to plan the Brussels-Capital Region's future public bicycle service. In financial terms, the "Preparatory study for the public bicycles service of the Brussels-Capital Region in 2026: Benchmark and Recommendations" is supported to the tune of €197,816.75 incl. VAT.