

A Bike Share Market Trends

April 2024

Benoît Beroud - MOBIPED

Bruno Van Zeebroeck - TML

Emanuela Peduzzi - TML

@STIB

Commissioner



Consultancies




Authors	Benoît Beroud (MOBIPED) Bruno Van Zeebroeck (TML) Emanuela Peduzzi (TML)
Reviewers	Christophe De Voghel (BRUSSELS MOBILITY) Mathieu Nicaise (STIB)
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), Bike Share Market Trends, Preparatory study for the public bicycles service of the Brussels-Capital Region in 2026: Benchmark and Recommendations, [Brussels-Capital Region, Brussels Mobility], April 2024, 78 p.



Sponsor

Brussels-Capital Region | Brussels Mobility Regional Public Service
Organising Authority for Mobility

Place Saint-Lazare 2 | 1035 Brussels 

<https://mobilite-mobiliteit.brussels/en>

Christophe De Voghel: cdevoghel@sprb.brussels



Partner

STIB-MIVB - Brussels public transport company
(Société des Transports Intercommunaux de Bruxelles –
Maatschappij voor het Intercommunale Vervoer te Brussel)

Rue Royale 76 | 1000 Brussels  | www.stib-mivb.be

Mathieu Nicaise: mathieu.nicaise@stib.brussels



Mobility research office

TRANSPORT & MOBILITY LEUVEN


Diestsesteenweg 71, 3010 Leuven  | www.tmleuven.be/en

Bruno Van Zeebroeck: bruno.vanzeebroeck@tmleuven.be



Public bicycles expert

MOBIPED - Mobility of Bipedes

10 bis rue Jangot, 69007 Lyon  | www.mobiped.com/en

Benoît Beroud: benoit.beroud@mobiped.com

Summary

1	ACCESS TO A BICYCLE.....	5
1.1	OWN OR RENT A BIKE	5
1.2	RENT-A-BIKE DIVERSITY	6
1.3	FOCUS ON LONG-TERM (CYCLE) RENTAL, NAMED LTR.....	8
2	BIKE SHARE (BS) CONCEPT	10
2.1	INTRODUCTION	10
2.2	BACKGROUND	11
2.3	THE GENERATIONS	11
2.4	BIKE SHARE, A SELF-SERVICE PUBLIC SPACE SERVICE.....	12
2.5	BIKE SHARE, A COMPLEMENT TO THE MULTIMODAL OFFER	13
3	GOVERNANCE AND BUSINESS MODELS.....	14
3.1	GOVERNANCE MODELS	14
3.2	CITIES REGULATE PRIVATE INITIATIVES	14
3.3	TWO BUSINESS MODELS FOR PRIVATE PLAYERS.....	15
3.4	B2C PLAYERS IN SEARCH OF PUBLIC MONEY.....	15
4	BIKE SHARE SYSTEMS TRENDS	16
4.1	BICYCLE ELECTRIFICATION	16
4.2	DIVERSIFICATION OF BIKES, WITH SEATS OR CARGO BIKES	18
4.3	STATION PARKING AND ELECTRIFICATION	19
5	THE BIKE SHARE INDUSTRY	24
5.1	A MARKET INTEGRATED WITH SHARED MOBILITY	24
5.2	PESTEL ANALYSIS OF THE BIKE SHARE INDUSTRY	25
5.3	POSITIONING OF PLAYERS IN THE VALUE CHAIN	26
5.4	NEWS FROM SOME PLAYERS.....	27
6	THE USER EXPERIENCE	29
6.1	USERS EXPERIENCE SEVERAL SERVICES	29
6.2	DIGITALISATION OF THE CUSTOMER JOURNEY	29
6.3	DIVERSIFICATION OF PRICE RANGES	29
7	PUBLIC BICYCLES AND PUBLIC TRANSPORT INTEGRATION.....	30
7.1	SIMILARITIES AND DIFFERENCES BETWEEN THESE TWO WORLDS.....	30
7.2	TWO PARALLEL NETWORKS WHICH STRENGTHEN EACH OTHER.....	32
7.3	PB, ~ 1% OF THE PT NETWORK, A DOUBLE STANDARD.....	32
7.4	TRAVEL PRACTICES	33
7.5	CHALLENGES OF CREATING A UNIQUE EXPERIENCE	34
7.6	OVERVALUED PT-PB INTEGRATION	35
7.7	INVOLVEMENT OF THE PT OPERATOR IN THE GOVERNANCE	36
7.8	PB AND PT ARE RATHER COMPLEMENTARY THAN COMPETITORS	40
8	CHALLENGES FACING THE BIKE SHARE MARKET	41
9	APPENDICES	42
9.1	KEY FEATURES OF RENTAL SERVICES	42
9.2	DIFFERENT TYPES OF DAMAGE TO BIKE SHARE	44
9.3	PLANNING DIAGRAM	47
9.4	ADVANTAGES AND DISADVANTAGES OF PEDELECS PARKING AND CHARGING SOLUTIONS	48
9.5	THE NORTH AMERICAN MARKET (SOURCE 31)	56
9.6	MICROMOBILITY MARKET TRENDS (SOURCE 19)	57
9.7	BIKE SHARE BUSINESS SKILLS.....	58
9.8	DETAILS OF PB AND PT INTEGRATION ISSUES	59
9.9	COMPILATION OF PRICE LISTS	61
9.10	UNDER-REPRESENTATION OF CERTAIN GROUPS IN NORTH AMERICA (SOURCE 36).....	74
10	TABLE OF FIGURES.....	75
11	BIBLIOGRAPHY	76
11.1	DOCUMENTATION.....	76
11.2	WEBSITE	77

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

Stakeholders

BCR	Brussels-Capital Region
STIB	Brussels Inter-Municipal Transport Company

Other vocabulary

BLE	BlueTooth Low Emission
ET	Excluding Tax
IoT	Internet of Things
MaaS	Mobility-as-a-Service
PSD	Public Service Delegation
PT	Public Transport
UN	Underground Networks

1 Access to a bicycle

1.1 Own or rent a bike

The aim of the Brussels study is to facilitate access to a bicycle and, ultimately, increase cycling. With this in mind, it is important to make a clear distinction between access to a bicycle (ownership, loan, rental) (Figure 1) and the use (in working order, practicality, reassuring and attractive cycling conditions). While many solutions offer access to a bike (Figure 2), this does not mean it will be used, since each type of bike is designed for different types of journeys. The rest of the study focuses on rent-a-bike-services.

Figure 1: Preferences between owning and renting micromobility in Germany, the US and China (Source 19)

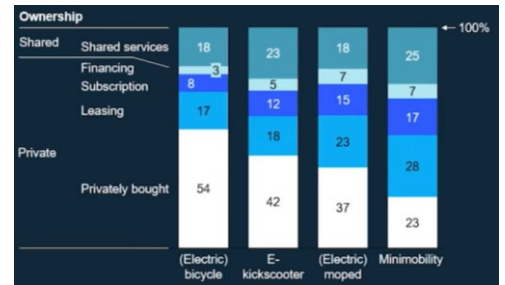
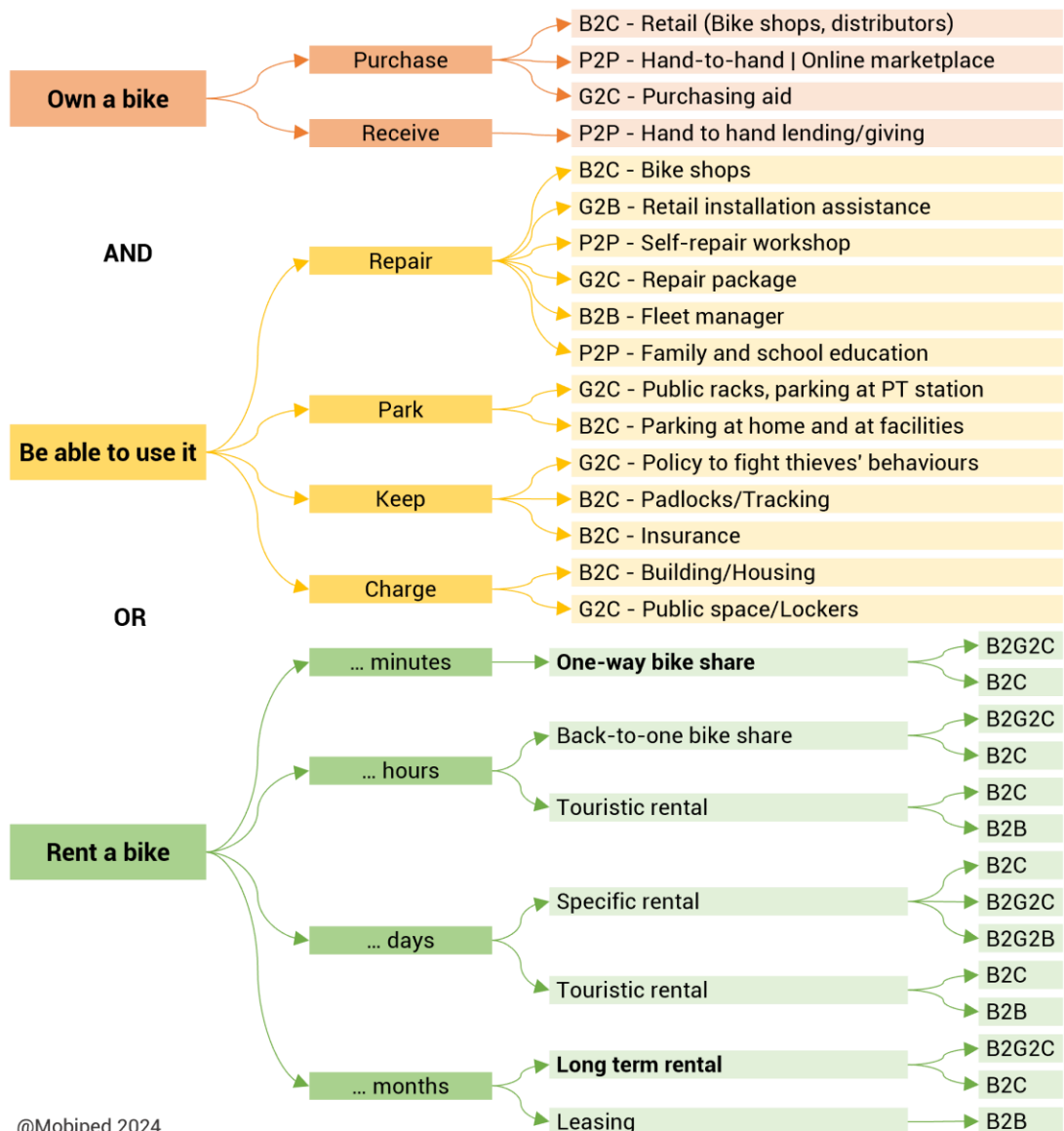


Figure 2: Overview of how to access a bike in good condition



@Mobiped 2024

B2B: Business to Business | B2C: Business to Customer | B2G2B: Business to Government to Business
 B2G2C: Business to Government to Customer | G2B: Government to Business
 G2C: Government to Citizen | P2P: Peer to Peer

1.2 Rent-a-bike diversity

Bike rental services are differentiated according to:

- rental periods of minutes, hours, days or months (Figure 3, Figure 4 and Appendix 9.1). Some players offer hybrid rental periods: Fifteen has a service that combines city PB, train station SB and LTR. Donkey's price range extends from a per-minute offer to several days. Brompton offers rentals from a few hours to a few months.
- target groups and bike types (Figure 5, Figure 6, Figure 7).

The study briefly looks at Long-Term (cycle) Rental (LTR), before going into more detail on Bike Share (BS).

Figure 3: Overview of rent-a-bike diversity

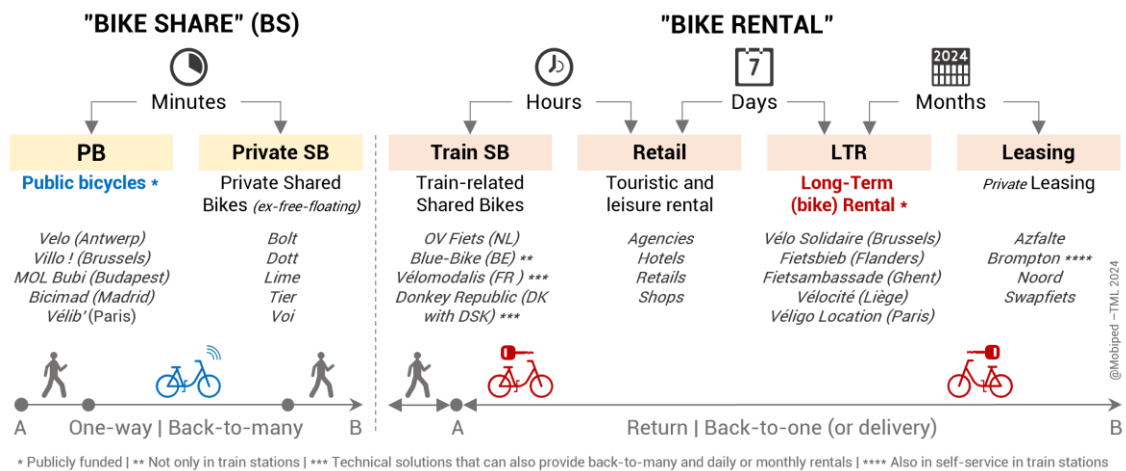


Figure 4: Examples of rent-a-bike services

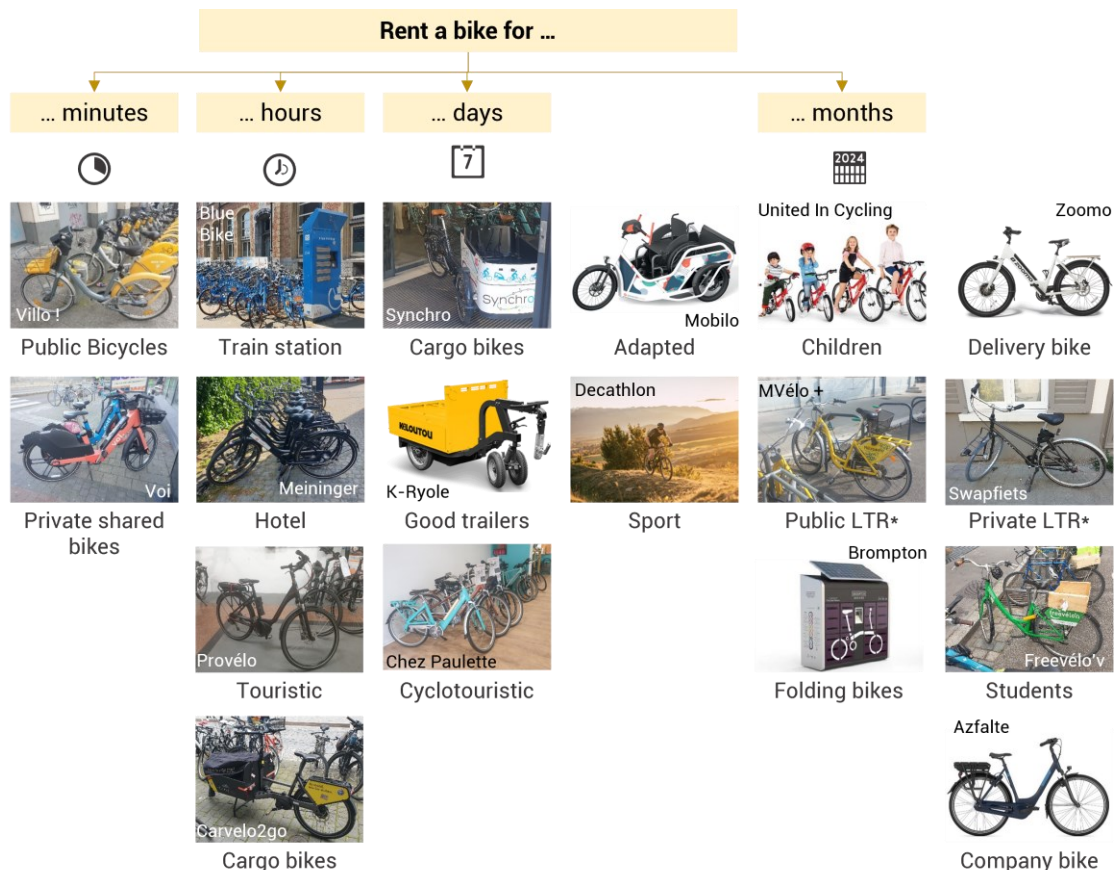


Figure 5: Accessories for a one-way tourism rental (Chez Paulette)




	
<h3>Remorque bagages</h3> <p>Une remorque pour vos longues distances</p> <p>Modèle Topeak - Journey</p> <p>Poids Maximal 32 kg</p> <p>Adaptabilité Tous nos modèles adulte</p> <p>Volume Maximal 66 litres</p> <p>Caractéristique Étanche et équipé d'un système de fermeture "Roll top"</p>	<h3>Remorque Enfant</h3> <p>Une remorque pour vos balades en famille</p> <p>Modèle Arcade - Explorer</p> <p>Poids Maximal 40 kg - 2 enfants</p> <p>Adaptabilité Tous nos modèles adulte</p> <p>Caractéristique Bac Rigide</p> <p>Sécurité Ceintures et bandes réfléchissantes</p>

Figure 6: Long-term rental (LTR) of bicycles for employers (Azfalte)



GAZELLE
PARIS C7 HMB
Idéal en ville. Moteur BOSCH

Couleur

Taille

Batterie

Usage

Prise en charge employeur

Loyer tout inclus [voir le détail](#)

Loyer total brut (LLD 36 mois) 117,58 € TTC/mois
97,98 € HT/mois

Loyer employeur brut 82,30 € TTC/mois
Loyer employeur net* 61,73 € TTC/mois

Loyer collaborateur** 35,28 € TTC/mois
* remise fiscale de 25% déduite
** exonéré de taxes sur avantages en nature

Description

La marque:
Fondée en 1892, la marque de vélo Gazelle est l'une des plus anciennes marques néerlandaises de vélo. Avec ses plus de 100 ans d'expériences dans le domaine de la conception de vélos de villes, Gazelle est reconnue comme étant l'un des leaders sur le marché des cycles aux Pays-Bas.

Figure 7: Overview of adapted bicycles (Praxie Design)



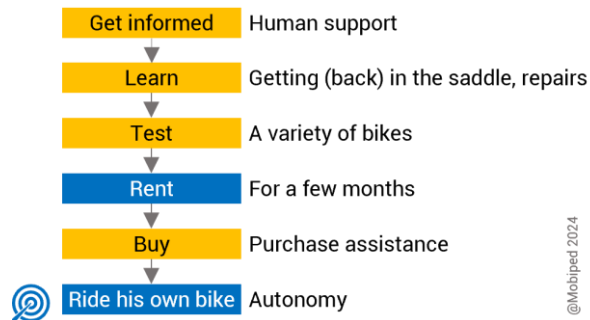
1.3 Focus on Long-Term (cycle) Rental, named LTR

1.3.1 Definition

An LTR service allows users to rent a bike and accessories (luggage rack, child seat) for several months, and benefit from services (training, repairs, insurance against theft). LTR invites people to adopt a cycling lifestyle by accessing a quality bicycle, before considering purchasing a bike. An LTR service such as Véligo Location 2 in the Paris region is part of an overall mobility management approach (Figure 8) to help beneficiaries to become everyday cyclists with their bike.



Figure 8: LTR in the mobility management chain



1.3.2 Public LTR markets in France and Belgium

Unlike bike share services, which have conquered the entire world, the market for publicly funded LTR services is mainly concentrated:

- in France: Véligo Location (Ile-de-France Mobilités), MVélo + (Grenoble), Freevélo'v (Lyon). Many new services are launched every year (Figure 9).
- in Belgium: StudentEnMobilité became Fietsambassade in 2017 (Ghent), Vélocité (Liège), Fietsbieb (Flanders), Vélo Solidaire (Brussels) or in Ottignies, Gembloux, Mons.

The services can be distinguished by the diversity of bikes on offer, the services provided, pricing adapted to different audiences, renewable or non-renewable rental periods, support via (returning to) cycling training and with the option of buying the bike (Figure 10 and sources 17, 21, 22, 23 and 24). Free services are considered to be bicycles provision and not rental services.

Figure 9: Yearly creations of Public Bicycles, Long Term Bicycle rental and purchase aids (Source 9)

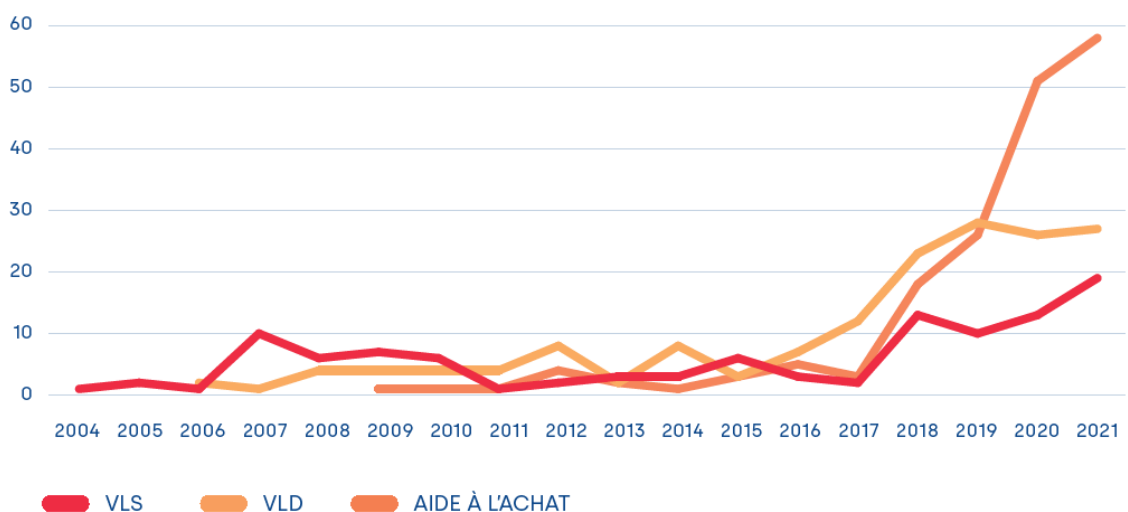


Figure 10: Illustrations of LTR (Photos: Vélo Solidaire - Provelo, others B. Beroud)



Mobility centre where people can rent LTR (Bordeaux)

TARIF FORFAIT ÉTUDIANT NON BOURSIER	
LOCATION PAR ANNÉE SCOLAIRE	
1 ^{ère} année d'abonnement	42 €
2 ^e année d'abonnement	48 €
3 ^e année d'abonnement	56 €
TARIF FORFAIT ÉTUDIANT BOURSIER	
année scolaire 2022/23	10 €

Conditions de l'offre:
 Réservé aux étudiants de moins de 26 ans, le forfait étudiant donne droit à un vélo classique en location pour l'année scolaire en cours. Il est souscrit pour une durée de 10 mois maximum et prend fin au plus tard au 15 juillet 2023.

Forfait étudiant boursier:
 Offre spéciale pour l'année scolaire 2022/2023 réservée aux étudiants boursiers dans le cadre des aides de l'Eurorégion de Strasbourg liées au COVID-19.

Graduated annual rates for students (Strasbourg)



Visibility of LTR in racks in front of the train station (Grenoble)



LTR in different colours (Toulouse)



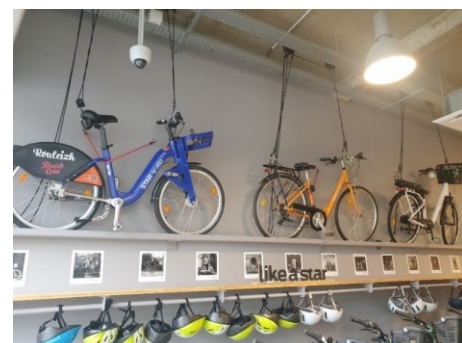
Vélo Solidaire training (Brussels)



Fietsambassade bikes (Ghent)



Freevélo'v parked in bicycle racks (Lyon)



PB and LTR on display at the bicycle centre, accessible on the station forecourt (Rennes)

1.3.3 Some public LTR players

- Cycle suppliers: Arcade cycles, Second Cycle, Fifteen.
- Operators: Cyclo, Cykleo, Inurba, Consortium members of Fluow, Nextbike, Provelo, Swapfiets, Velogik.
- Training: Ateliers de la rue Voot, FietsAmbassade, Mobiel21, Provelo.

2 Bike Share (BS) concept

2.1 Introduction

Bike Share allows people to rent a bike for the duration of their one-way trip. By dropping off the bike close to its final destination, the user discharges responsibility for parking and maintaining the bike. Bike share removes the obstacles to buying a bike, parking at home and at the destination, maintenance and the risk of theft. Several semantics are used in each language. The adjective "Public" is sometimes added to qualify the notion of public funding or service, legally considered as such in Brussels, France and Hungary (Figure 11). A number of publications are available on the topic (Figure 12), and in addition to national conferences, several conferences in Europe deal with the subject (Figure 13). "The Meddin Bike-sharing World Map" also lists bike share worldwide. At the end of 2022, there were over 1,900 bike share services in 1,600 cities (Figure 14, Source 28).

Figure 11: Bike share, public bicycles and other related names

 French	 English	 Dutch	 Spanish
Vélo(s) en libre-service (VLS)	Bike-sharing (BS)	Deelfietsen (DF)	Bicicleta publica
Vélo(s) public(s)	Bike share (BS)	(openbare/ publieke fietsen)	Bicicleta en libre servicio
Vélo(s) partagé(s)	Shared bike (SB)		Servicio de bicicleta compartida (SBC)
Cyclopartage	Public bike/bicycles (PB), City bikes		
Location en trace directe	Back-to-many		
	One-way		

Figure 12: Some must-read documents on shared bicycles

2001 and 2004 DEMAIO ¹¹	2015 RICARDO ³³	2021 DIAMOND ¹²
2005 FIERLING	2015 FISHMAN ¹⁴	2022 CAUPD ⁶
2006 BEROUD ³	2015 HERAN ²⁰	2022 COMOUK ¹⁰
2010 SHAHEEN ³⁵	2016 ADEME ¹⁷	2022 GIZ ¹⁸
2011 ANAYA and CASTRO ¹	2016 ROLLAND BERGER ³⁴	2023 AAVP ²¹
2011 OBIS ³²	2019 CEREMA ⁷	2023 CIE ⁸
2012 ANAYA and BEROUD ⁴	2019 T4AMERICA ³⁶	2023 NABSA ³¹
2013 ITDP ²⁵ , updated 2018 ²⁶	2021 ADEME ^{22, 23, 24}	2024 FLUCTUO ¹⁶

Figure 13: Main international conferences in Europe visited during the study

Cycling Industry Europe	Brussels	9 March 2023
Autonomy	Paris	22 and 23 March 2023
Cargo Bike Sharing Europe	Cologne	24 May 2023
Velo-city	Leipzig	9 to 12 May 2023
Micromobility	Amsterdam	8 and 9 June 2023
Shared mobility rocks	Brussels	6 February 2024

Figure 14: Shared bikes worldwide from the Russell Meddin map



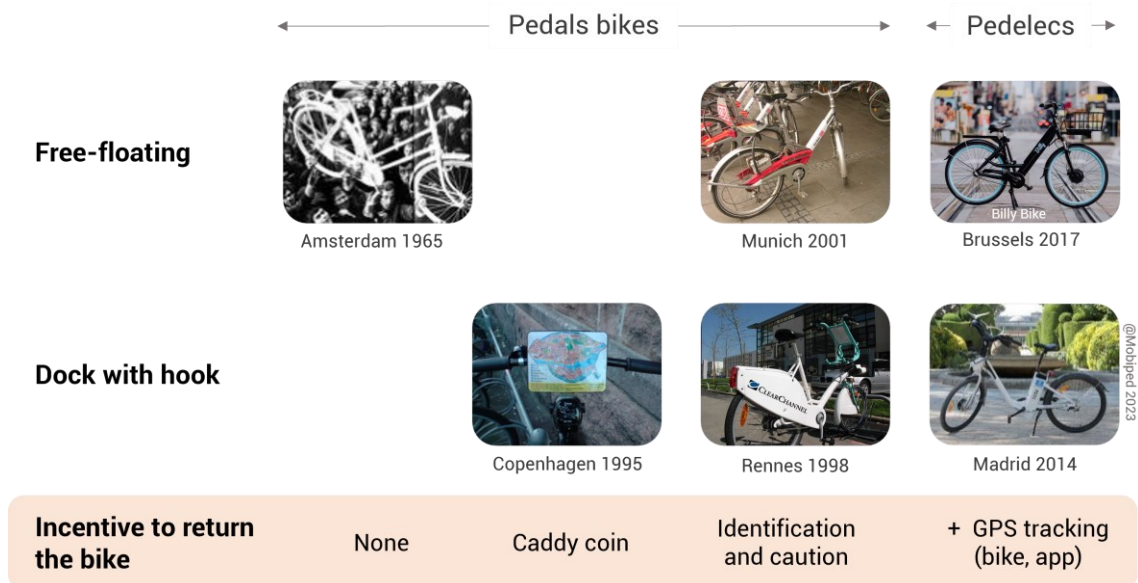
2.2 Background

Figure 15: Milestones in the history of bike share

1965	In Amsterdam, Whites Bikes (Wittefietsenplan) were bicycles that had been salvaged, repainted and placed on the street for free use: full free-floating. Bikes were kept or thrown away.
1995	In Copenhagen, the Caddie system was an initial incentive to bring back and share the bicycles. At the University of Portsmouth, Bike About developed the first automated service.
1998	In Rennes, Clear Channel included in its advertising space offer the first automated bike share service in the public space (with identification of the user, obliging them to return the bike), enabling it to enter JC Decaux's domestic market.
2000	In Munich, Deutsche Bahn proposed dockless bicycles, using GSM technology.
2005	In Lyon, Vélo'v was the first large-scale one-way public bicycles (PB) rental service ³ .
2007	In Paris, Vélib' inspired by Vélo'v accelerated a worldwide trend.
2014	In Madrid, launch of a dock-based PB service with pedelecs.
2015	In Beijing, Ofo offered smartphone-based free-floating shared bikes (SB), which rapidly spread to European cities in the following years.
2017	In Key Biscayne, LimeBike launched free-floating e-SB. In Brussels, Billy bike launched free-floating e-SB. In Paris, Vélib' 2 offered bicycles with on-board electronics. In Santa Monica, Bird launched shared e-scooters.
2019 - 2022	Cities were looking at how to deal with free-floating shared vehicles (scooters, bikes, scooters), and were introducing bans or restrictions on the number of players, regulations, calls for expressions of interest, and more or less virtual parking zones.
2023	In Paris, 100,000 citizens voted in a referendum to stop shared e-scooters, upsetting the industry, which lost its most profitable market.
2024	Tier merged with Dott and Nextbike regained its independence.

2.3 The generations

Figure 16: Bike share main generations



2.4 Bike share, a self-service public space service

To accommodate as many journeys as possible by picking up a bike close to the point of departure and dropping it off close to the final destination, shared bikes are accessible from the public space for reasons of estate economy, human resources and speed. This implies:

- automated services in 99% of cases, with self-service access and no need for a human being to conduct an inventory.
- structural exposure to misuse, neglect, vandalism and weather conditions (*Appendix 9.2*).

Parking at the end of the rental period is either totally free with *free-floating*, or restricted in certain areas with *back-to-many* (*Figure 17 and Figure 18*). For n stations, there are n^n travel options. The more stations there are, the greater the chance of meeting a travel need. And the density of stations and proximity between them are also decisive factors in reducing access times on foot.

Figure 17: Free-floating (2019) and back-to-many (2020) parking locations in Paris (source ?)

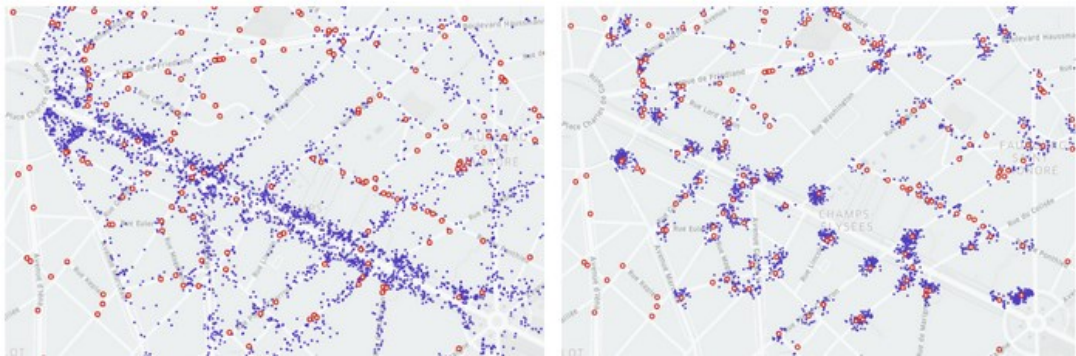
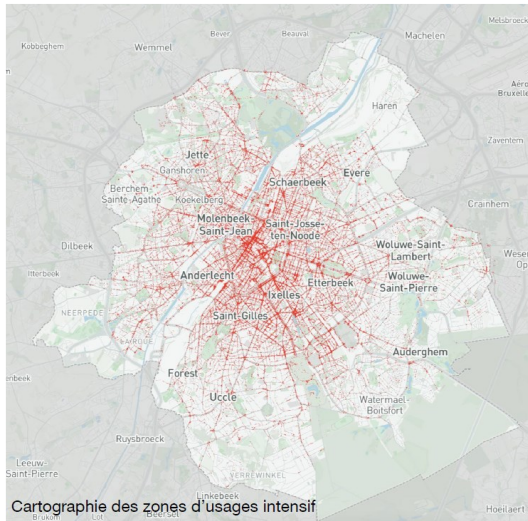


Figure 18: Flow of free-floating micromobility (left) and dropzones locations (right) in Brussels



Intensive use zones, May 2022 | Source: Guide Dropzone en RBC, December 2022 | Author: Vraiment Spa Park

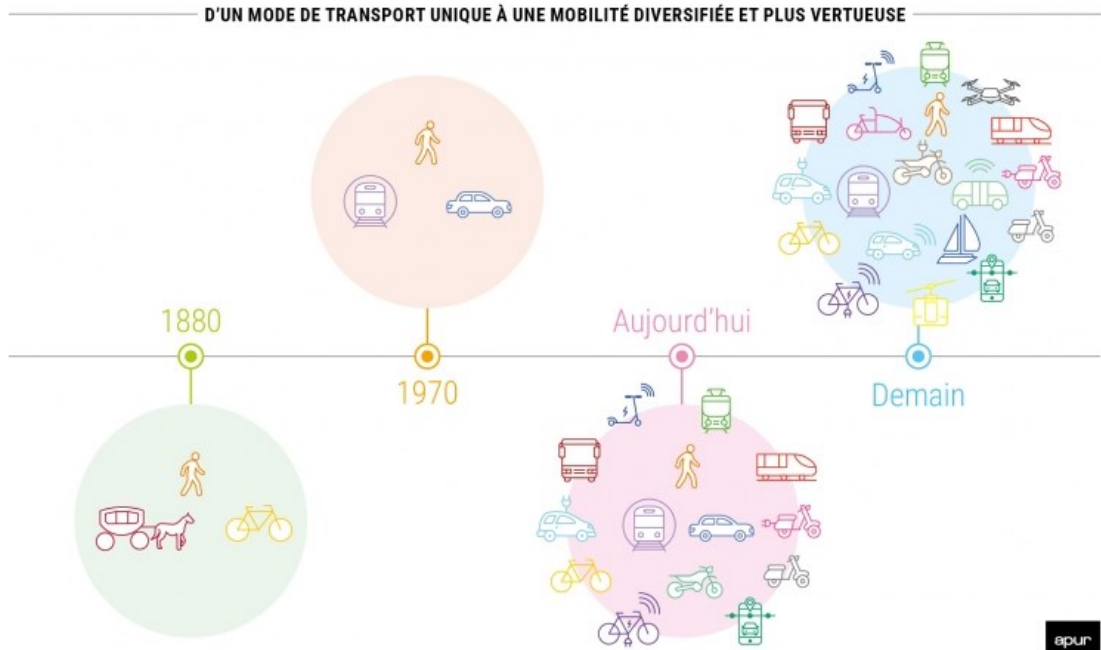


1,600 dropzones deployed or in progress
Data: Brussels Mobility
Author: Mobiped-TML, November 2023

2.5 Bike share, a complement to the multimodal offer

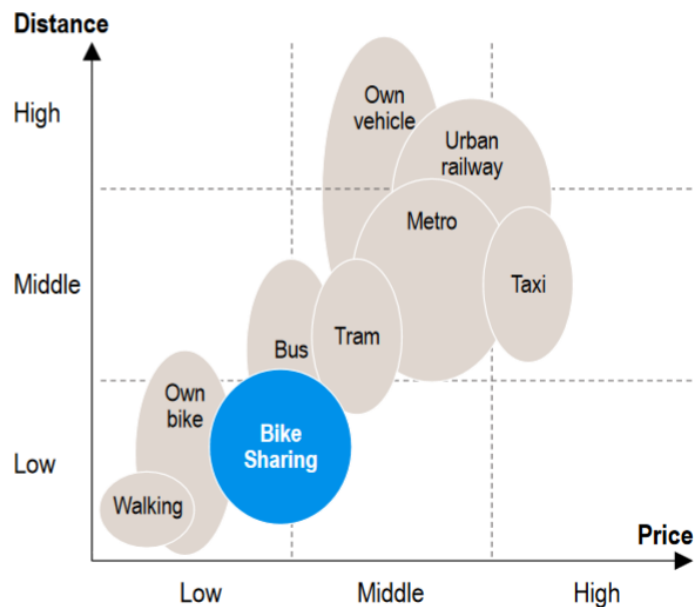
Bike share contributes to the diversity and attractiveness of multimodal alternatives to the private car (Figure 19).

Figure 19: An increasingly diversified mobility offer (Source 2)



Generally speaking, the cost of using shared bikes is higher than that of using a personal bicycle and closer to that of public transport. Compared with personal bicycles, the range of distances covered is shorter (Figure 20).

Figure 20: Simplified representation of bike share in relation to other modes (Source 34)

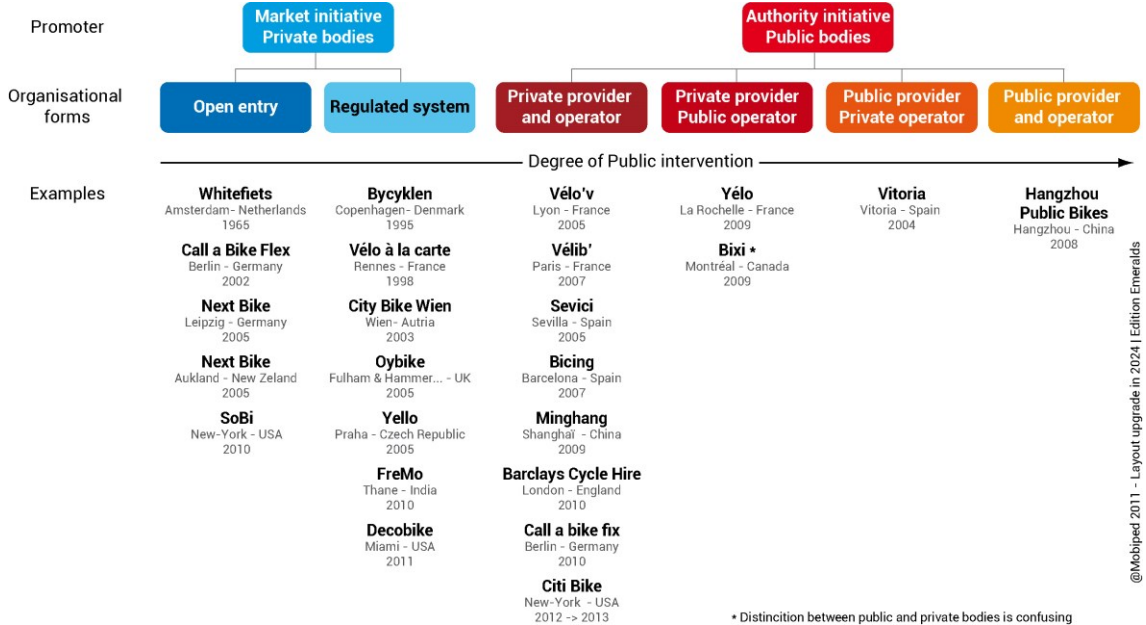


3 Governance and business models

3.1 Governance models

As early as 2011, bike share services were the result of both private or public initiatives, with varying degrees of government involvement (Figure 21). While in-house public management is possible (Hangzhou, La Rochelle, Madrid), supply and operation are generally the responsibility of private players (Appendix 9.3).

Figure 21: Historical view of bike share governance models worldwide in 2011 (source 4)



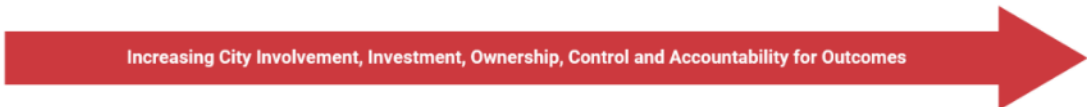
3.2 Cities regulate private initiatives

After the surge of thousands of free-floating shared bikes from the mid-2010s, cities became aware of the hidden costs (order, aesthetics, civic pressure, political image, parking space management). To regulate public space, they intervene to a greater or lesser extent (Figure 22) by:

- imposing dedicated parking zones called *dropzones* or *mobility hubs* (Brussels, Budapest, Grenoble, Paris, etc.) and banning total free-floating.
- launching calls for expressions of interest to grant a limited number of licences, or even requiring payment of a fee (€35/year/bike in Brussels). Grenoble granted a monopoly for shared e-scooters and a monopoly shared e-bicycles (e-SB).
- prohibiting private shared e-scooters (Paris, Barcelona) or private e-SB (Luxembourg, Lyon).

Figure 22: Different models of government intervention (Source: M. Bennett, S. Schwartz)

Open License	Limited License	Limited License Strong Oversight	Multi-Operator Partnership	Single-Operator Partnership	Municipal Program
Any eligible operator can receive a license if they meet the license terms	Any eligible operator can apply for a license, but limited number available (granted either first-come-first-serve or competitive process)	Any eligible operator can apply for a license, but limited number available; City works closely with operators to regulate service	Competitive process used to select operators for multi-year contracts to partner with City in developing and operating a program	Competitive process used to select one operator for multi-year contract to partner with City in developing and operating a program	City develops and operates program with internal resources and owns infrastructure; City may contract out for support services



Source: Mark Bennett, Sam Schwartz

3.3 Two business models for private players

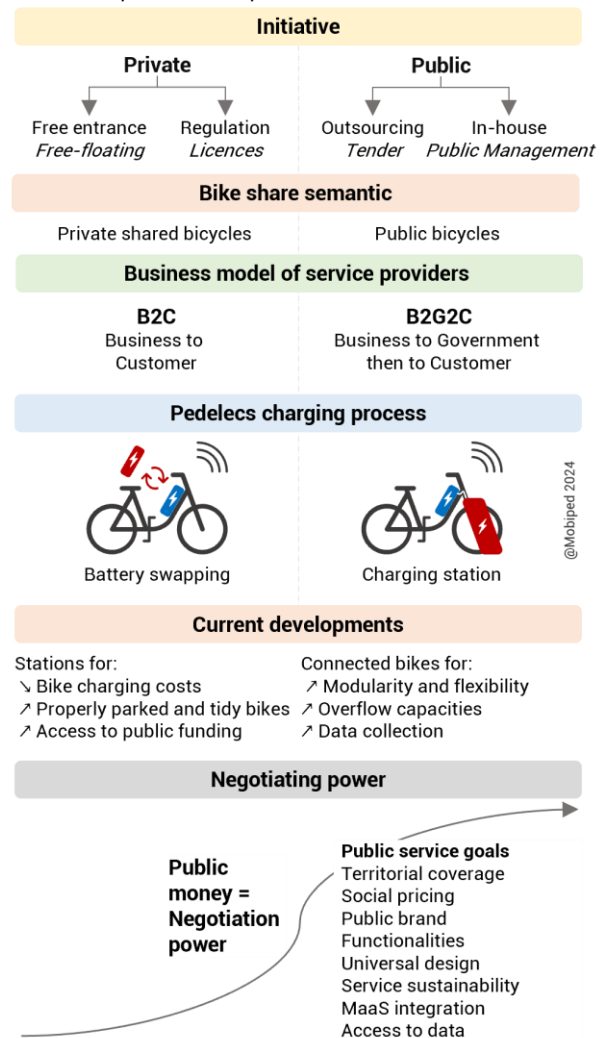
- **Public bicycles B2G2C business model:** their customers are local authorities, for which they contribute to the service delivered to citizens. The main international B2G2C players are suppliers (Fifteen, PBSC), operators (Clear Channel, Inurba, Serco, Serveo, Velogik) or both (JC Decaux, Nextbike). They are regularly main sponsors of Velo-city, the world conference on cycling policies.
- **Private shared bikes B2C (Business to Consumer) business model:** their customers are the end-users. They generally offer free-floating services like Deutsche Bahn in Munich in 2001, Nextbike in Leipzig in 2005, then Mobike, Ofo, Gobeebike around 2015, followed by Bolt, Dott, Lime, Pony, Poppy, RideMovi, Tier, Voi in the late 2010s. The latter usually operate several types of free-floating micromobility vehicles. Some players, like Nextbike, changed their business model and developed stations.

3.4 B2C players in search of public money

The business model of B2C micromobility players is based on the pursuit of hypergrowth at a "loss" to kill off competition, achieve a monopoly and thus raise prices to generate profits (Source 38). But after years of success in the quest for market share, deploying services in numerous cities by raising funds on the stock markets and offering exceptional commercial offers to attract customers, the rise in interest rates put an end to easy money. Investors are urging these services to become profitable. However, micromobility players are struggling to find their business model, as evidenced by the Dott-Tier merger in 2024 and the setbacks experienced by Superpedestrian, Spin, Bird in 2023. Profitability of shared e-scooters is already uncertain. The economic equation is even more perilous for e-SB, as they are less profitable, 50% more expensive to buy, heavier, bulkier and more costly to regulate. B2C players are currently developing station-compatible solutions, while B2G2C players are developing connected bikes (Figure 23).

At the end of 2022, the co-founder of Micromobility Industries explained that companies used to believe that their customers were the end-users, whereas in reality, their real customers were the public authorities (Source 39). The Cycling Industry Europe's B2C and B2G2C bike share expert group delivered the message that "Bike share is not a private service, but a public service to be financed". Some players, such as Donkey Republic, respond to calls to tender in several of the Flemish Region's "vervoer regio's" territories. Dott calls on cities to create the best ecosystem for achieving public goals, rather than having the best Public Bicycles service. This can take the form of micro-subsidies (Molière project in Brussels) or a subsidy of €125 excl. VAT/e-SB/year (Ghent).

Figure 23: Characteristics and current developments of the private and public bike share markets



4 Bike share systems trends

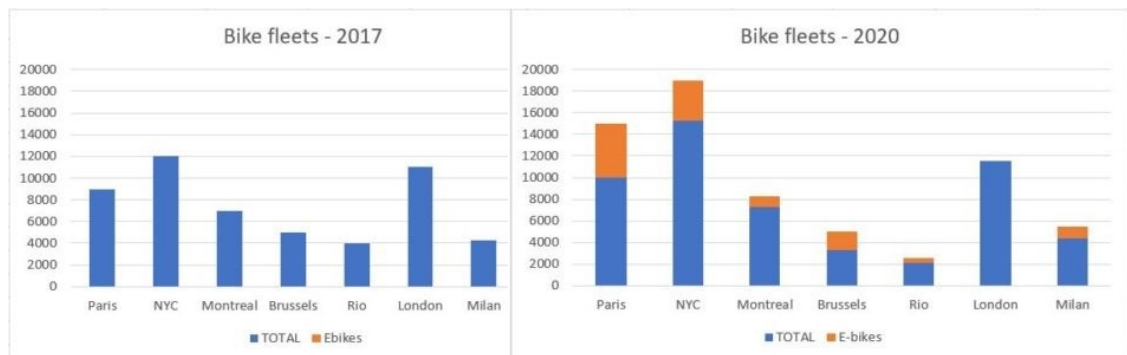
4.1 Bicycle electrification

4.1.1 More and more mixed fleets, for city initiatives public bicycles

In 2014, the first PB service with pedelecs was deployed on a large scale in Madrid. In 2016, 11 cities worldwide had more than 100 pedelecs (Source 5). Between 2017 and 2020, PB fleets gradually integrated pedelecs (Figure 24). The percentage of mixed fleet is the result of a financial arbitrage linked to higher purchase and operating costs (more costly, time-consuming and complex maintenance and electricity costs). Some territories, such as Luxembourg, Madrid and Marseille, have a 100% electric fleet, justified by the slopes, particularly in city centres.

At the beginning of 2023, 41 bike share services worldwide had more than 1,000 pedelecs in their fleet, for a total of 90,000 pedelecs (Source 28)

Figure 24: Electrification of PB fleets between 2017 and 2020 (Source 40)



Pedelecs with integrated batteries present a number of challenges: electrification of stations, battery charging, skilled human resources, risks of motor controller and wiring failures, fire and theft. However, their impact is considerable. They generate more rentals than bikes with portable battery (Bordeaux, Brussels, Lyon), attract new customers (women ↑ 9%, average age ↑ 7 years¹⁸) and increase the distances covered (↑ 1 km in Paris). In mixed fleets, pedelecs are preferred to pedal bikes (Figure 25), increasing wear, costs and the unavailability of loaded bikes. Lastly, they contribute to the growth of rentals in hilly areas (Figure 26).

Figure 25: Overuse of pedelecs in mixed fleets

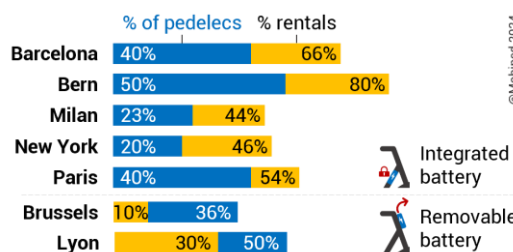
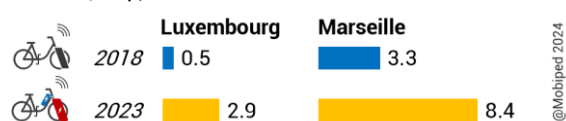


Figure 26: Annual rentals/actually available bikes/day, before and after fleet electrification.



4.1.2 100% electric fleets for private SB

After pedal free-floating SB from Asian companies, free-floating e-SB from European and North American companies appeared in 2017. These services directly offer a 100% electric fleet, with the exception of Donkey Republic, which still offers some pedal bikes. In China, the current trend is towards the development of lightweight electric motorised two-wheelers, also known as e-bikes (Meituan, picture on the right).



4.1.3 Larger and more connected Bikes

With connected locks in particular, technology is increasingly present in the bikes, and less so in the terminal and stands when there are any. The integration of these electronics (IoT, communication with servers, communication with the user's smartphone, GPS, sensors for preventive maintenance, credit card terminal for tapping) will probably be rationalised in terms of benefits/costs:

- The presence of electronics, sensors and wires increases the likelihood of breakdowns and bike stoppages, particularly in the event of intensive use, low and high temperatures.
- Electronics make bikes even more attractive to thieves, so they need to be reinforced.
- The frames and bikes are larger (Figure 27). The bike is heavier with a battery. In the absence of assistance, its manoeuvrability decreases when sitting on the bike, on foot when parking it and when handling it in regulation shuttles (Figure 28).
- GPS as a guidance aid requires a lot of batteries with a continuous signal. But a GPS tracking system makes it possible to identify the bike's location in the event of theft. While this data generates useful operational data, it can also be monetised for commercial purposes independent of bicycle use.
- IoT usage generates recurring and costly subscription fees over the long term.
- Pedelects dock-based system increases the economic risk for start-ups with no significant large-scale experience (Copenhagen, Madrid, Paris, Stockholm).
- Remote control makes it possible to monitor the bike's charge level and remotely lock the electric assistance or connected lock.
- Electrification requires the bike to be permanently connected.
- A bank card reader on the bike enhances the user experience with contactless card payment (Figure 29).

Figure 27: Shared bicycles, a larger overall size



SB versus private bicycles (Paris)

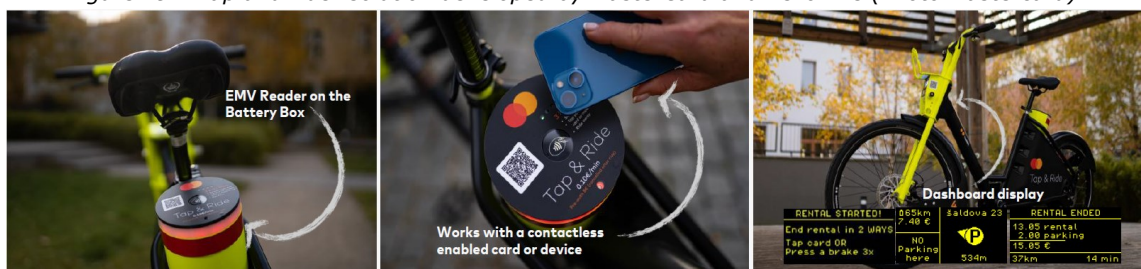
2000's lightweight Clear Channel bike (Antwerp)

SB produced by Segway (Brussels)

Figure 28: A customized shuttle to avoid lifting pedelecs (Barcelona)



Figure 29: "Tap and ride" solution developed by MasterCard and YelloBike (Photo Mastercard)



EMV Reader on the Battery Box

Works with a contactless enabled card or device

Dashboard display

RENTAL STARTED	05:55km	05:40 €	RENTAL ENDED
End rental in 2 ways	Tap card OR	Press a brake 3x	NO Parking here
13.05 rental	2.00 parking	15.05 €	37km
14 min			

4.2 Diversification of bikes, with seats or cargo bikes

4.2.1 Two-seater bikes

Baby seats are often in demand but seem to be more of a communication tool than a service. No usage statistics could be obtained from Vienna and Milan. Parents of young children have logistical constraints that require certainty regarding the availability of the bike. To target parents with children, long-term rental with accessories or cargo bikes purchase assistance would seem more appropriate. On the investment side, the frame is a reinforced specific one. On the operational side, they do not seem to suffer less vandalism and require double regulation to distribute these bikes throughout the network.



Child seat (Milan)



Child seat (Vienna, Photo C. De Voghel)



Pony two-seater bike (Bordeaux)



Tandem (Rosario) (photo Rosario noticias)

4.2.2 Shared cargo bicycles (SCB)

Unlike bike share, SCB are "back to one" (except Baqme). The European Cyclists' Federation monitors cargo bikes, with a particular focus on SCB. In 2022, 70 cities had a SCB service, compared with 21 in 2017 (Source 41). As the market is still in its infancy, SCB are rarely designed for intensive self-service use. Instead, the cargo bikes come from the B2C market. The main SCB operators in Europe are Baqme, Beryl, Call a Bike, Cargoroo, Carvelo2go, Nextbike, Tink and Sigo. If shared cargo bikes are included in a public bicycles tender, there is a risk that the choice will be between the thousands of PBs rather than the quality of the SCBs.

Figure 30: Shared cargo bikes in Europe (Source 41).



SCB mainly target parents with small children, owners with their dogs for leisure journeys, and students or entrepreneurs for transporting small goods. They are mainly used by women and avoid the need for a car. They probably need awareness and training campaigns. Visible in public spaces, SCB are a milestone in the maturing of local cycling culture.



Cargo bikes (Hamburg) (photo StadRad)



KVB (Cologne) (photo F. Strompen)



Baqme (Ghent)



Sigo charging station (photo Sigo)



Cargo Vélo'v, Cargoroo white-label (Lyon)



Carvelo2go (Bern)



Tink (Velocity 2023)



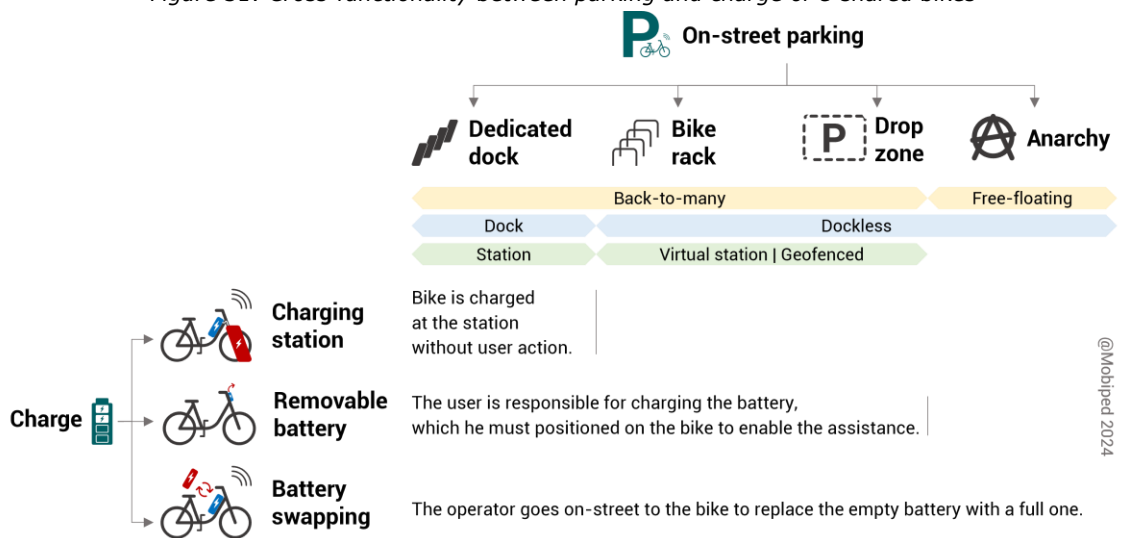
Nextbike (Velocity 2023)

4.3 Station parking and electrification

The success of e-bike share depends on:

- **A secure bicycle parking in public spaces.** This can be done at a dedicated station using the "Bike <> Lock <> Parking furniture" triptych, or via a connected lock to park the bike in a dropzone, or with a cable to be wound into a bike parking rack.
- **The charge of the pedelecs** at a charging station, with a removable battery handled by the user, or by regular battery replacement by the operator (*Figure 31*). Charging stations, swapping and hybrid formats all have their advantages and disadvantages (*Appendix 9.4*).
- **The respect of the parking zone.** Technological solutions are improving. But GPS remains inaccurate. The camera on the bike has a cost and raises questions about data use. The photo taken by the user requires the use of a smartphone. Bluetooth Low Emission signals seem to blur in the presence of many bicycles, generating significant deployment costs. Even with penalties, parking outside dropzones persists, with 5% in Antwerp Region.
- **The bike's stability** over time in the face of wind, misuse and incivility. Fall detectors have been developed, but depend on the operator's responsiveness.

Figure 31: Cross-functionality between parking and charge of e-shared bikes

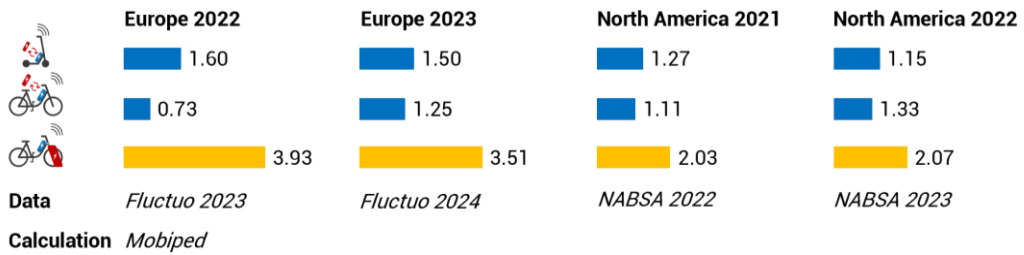


4.3.1 Pedelects charging

(Charging) stations

In Europe and the U.S., public bicycles with stations generate more journeys per vehicle than free-floating shared bikes and shared scooters (Figure 32). Pricing alone cannot explain this difference, since a 20-minutes journey in New York costs around \$10, whether on a Citi Bike or a Lime. Charging stations reduce operating costs compared with swapping, organise public space, reduce the number of thefts and increase the likelihood of recharging.

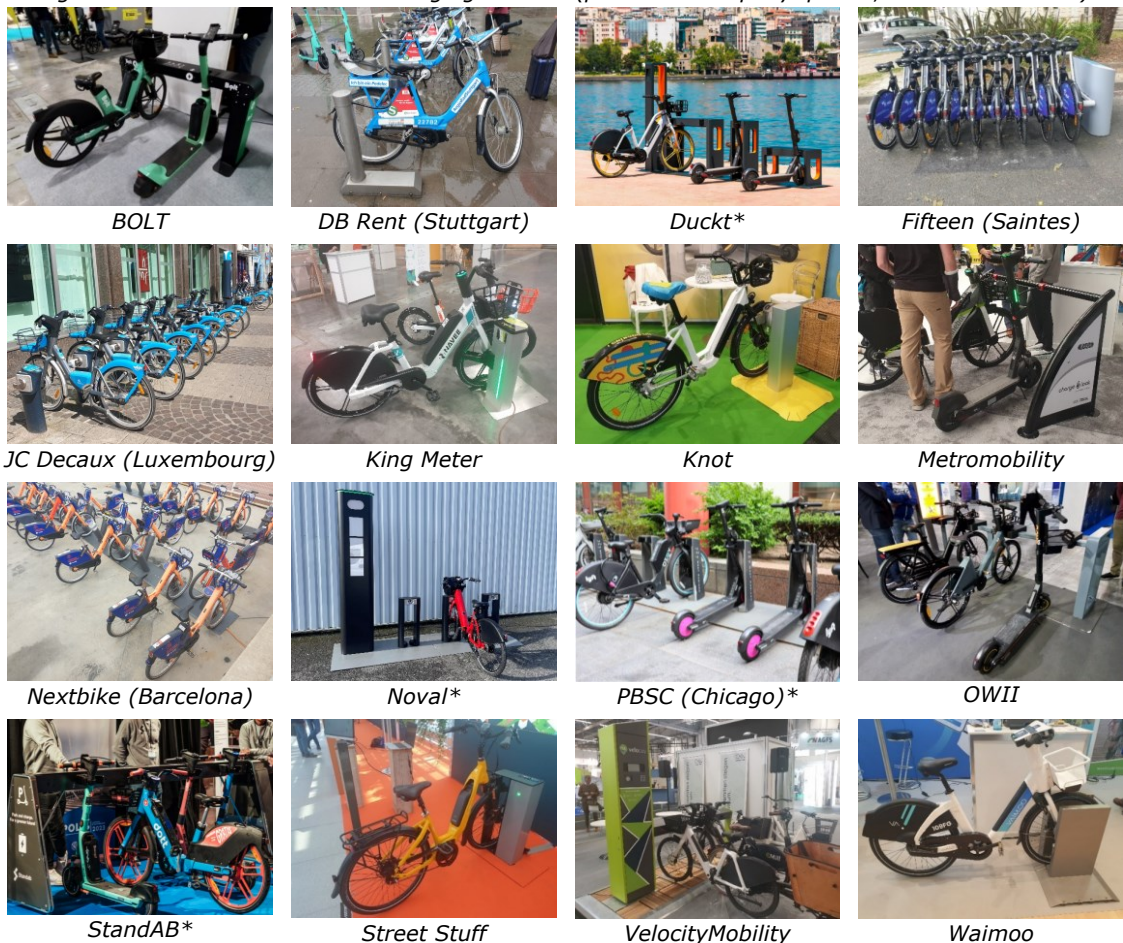
Figure 32: Comparison of rentals/vehicle/day between bike share in station, or not and shared e-scooters^{15, 16, 30, 31}



@Mobiped 2024

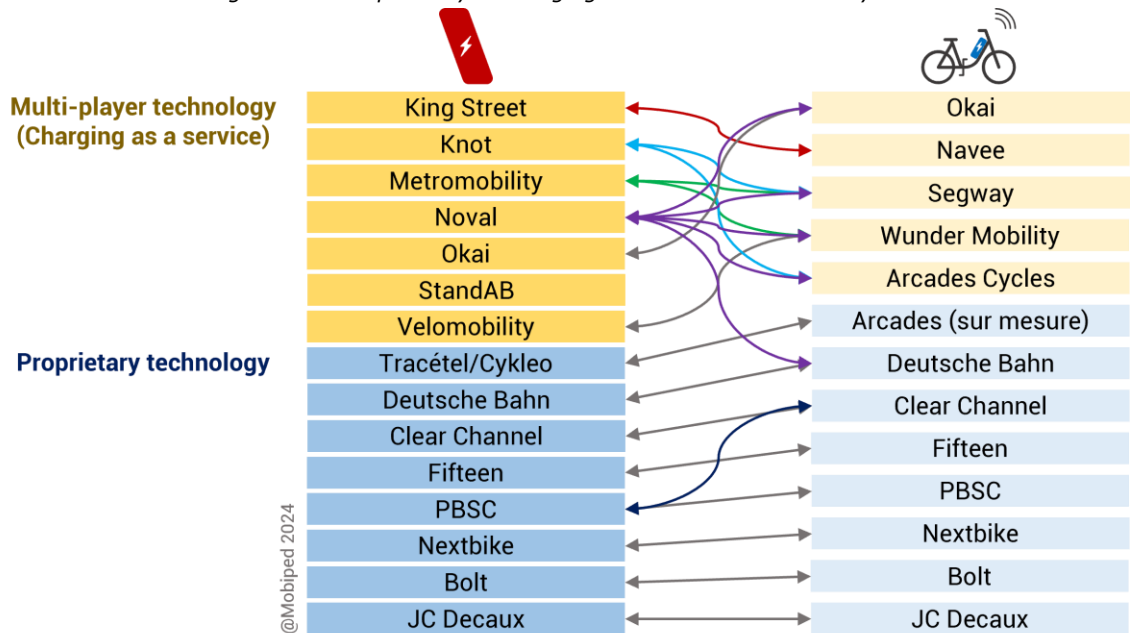
To reduce the human resources costs involved in swapping batteries for B2C operators, free-floating bike manufacturers (Navee, Okai, Segway) are adapting their bikes to be compatible with the new multi-operator stations (Knot, Metromobility, Noval, StandAB), which use a Charging as a Service approach (Figure 33). The challenge is to identify the vehicle, the type of battery and the type of charging. Some stations accommodate both shared e-bikes and shared e-scooters, but dedicated shared e-scooters stations are also being developed.

Figure 33: Photos of bike share charging stations (photos: * company quoted, others: B. Beroud)



Historic station suppliers prefer to develop their own products and bikes. A universal station for all the bikes on the market seems illusory, but some stations are compatible with several bikes (*Figure 34*).

Figure 34: Compatibility of charging stations with shared bicycles



As in Vancouver and Quebec City, electrifying a few stations would reduce swapping costs for mixed fleets. In New York, electrifying 20-30% of stations would reduce battery swapping by 75-80%, according to Caroline Samponora, Head of Lyft's Transport and Micromobility Unit (*Source 42*). From the perspective of a hybrid system with and without stations, the different players put forward very different figures, ranging from 10% to 90% of charging stations for a 100% electric fleet.

A battery can be integrated into the station to assist the launched of the service when there are delays in connection with a building or the grid operator (*Figure 35*).

Figure 35: Different options for delivering electricity to stations (Station Fifteen)



User-removable battery

Removable batteries (JC Decaux and Cykleo types), which are under the user's responsibility, have insufficient energy autonomy. In addition, the JC Decaux battery fire necessitated the recall of all batteries and the shutdown of this functionality. Even during free trial periods in Brussels, this format did not reach a wide audience, unlike pedelecs with integrated batteries, which are more popular than pedal bikes (Figure 32 previous page). The battery boxes developed by Okai, in a similar vein to Gogoro, where the users themselves exchange the battery, seem illusory when the bike is also self-service.



Removable battery
(JC Decaux - Brussels)



Removable battery slot
(Cykleo - Bordeaux)

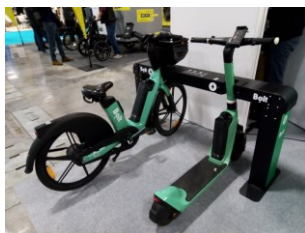


Battery cabinet
(Okai - Photo Okai)

Swapping by the operator

Swapping involves replacing directly on the bike an empty battery with a full one. In general, everything becomes swappable: the batteries on the bike, spare parts (Part-as-a-Service), the bikes (change a bike if it is faulty), the station battery (Fifteen), the station extensions (Fifteen, PBSC). Similar battery for both shared e-bikes and shared e-scooters requires 48 V batteries as the ones for e-scooters. Thus, bikes become heavier than those with 36 V batteries with is sufficient for bikes.

Swapping at non-charging stations allows some pedelecs to be included in the fleet (London, Milan, New York), and facilitates overflow if the pedelecs allows it. The swapping option can also be used to create and open a virtual station, even if the electrical connection is not yet complete.



Identical shared e-bikes and e-scooters
batteries (Bolt 2023)



SB with e-scooter battery (left) and with e-bike battery
(right) (Navee 2024)



Cargo bike full of batteries
(Dott - Brussels)



Cargo bikes
(photo Serco - West Midlands)



Swapping vehicle
(photo Donkey R. - Antwerp)

4.3.2 The many forms of bike share parking



SB parked on a cycle track (Paris)



Dropzone on sidewalk (Berlin)



Virtual station with other bikes on kickstands (Geneva)



Free-floating with bikes on the ground (Frankfurt)



SB and e-scooters in dropzone with ground markings (Antwerp)



Surface paint (Photo Bolt - Nijmegen)



Dropzone with demarcation and purple ground markings (Bern)



PB attached to its dedicated rack (Rouen - @Inurba)



PB racks used for personal bicycles (Rouen - @Inurba)



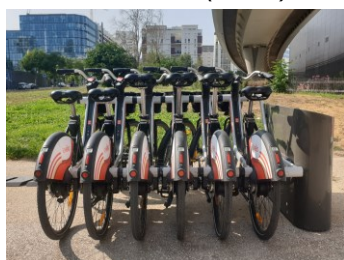
SB, LTR and personal bikes in bike racks (Ghent)



Individual lightweight furniture (Ecovélo - Agen)



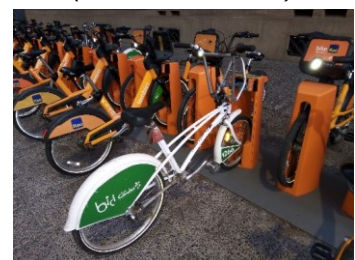
Collective lightweight furniture (Nextbike - Lucerne)



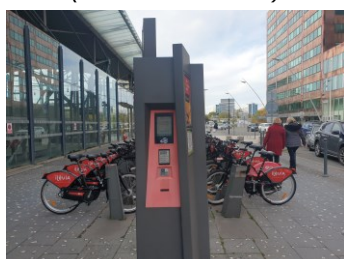
Compact station (Fifteen - Marseille)



Light easement, but used by shared e-scooters (Milan)



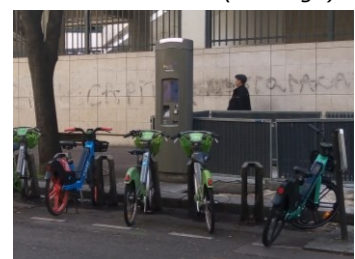
Clear Channel Retrofitted bicycles at a PBSC station (Santiago)



Station with individual stands (Cykleo, Lille)



Young people in contact with the service (Lyon)



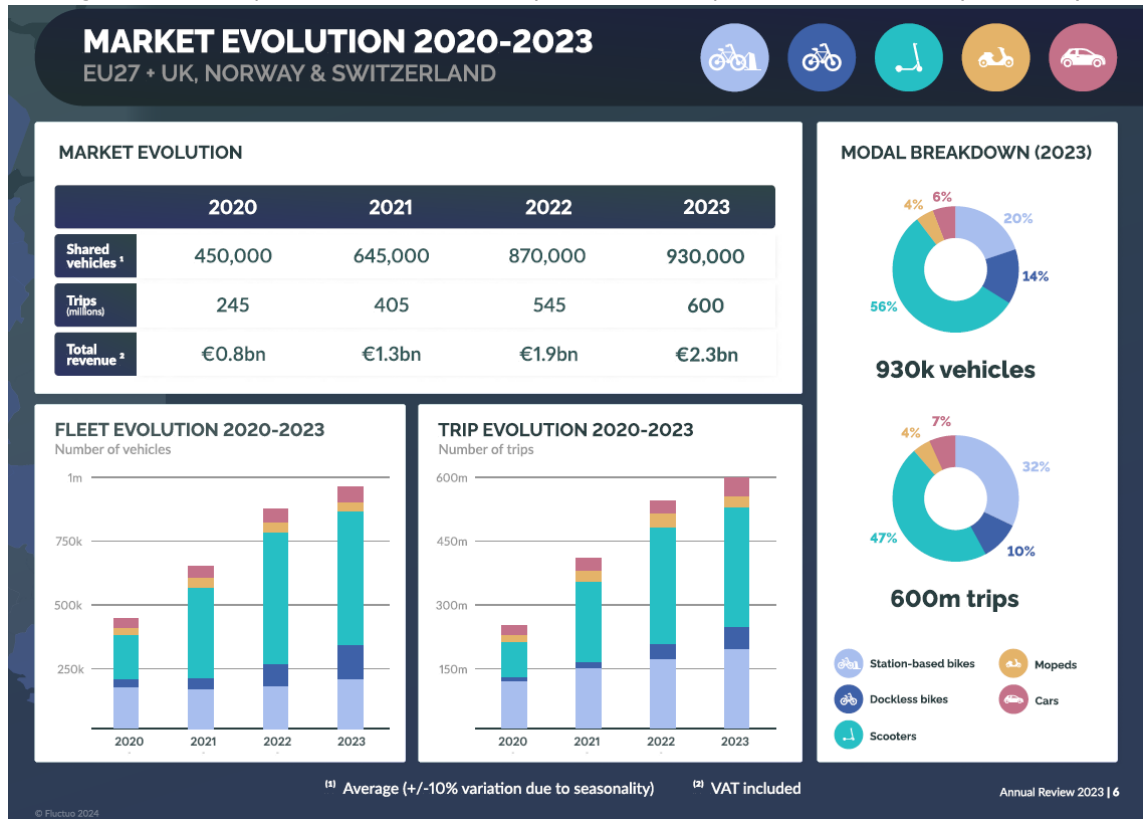
Private SB parked next to a PB slot (Paris)

5 The bike share industry

5.1 A market integrated with shared mobility

The shared bicycles bike market has been turned upside down by connected locks and the use of smartphones. In this way, bicycles can be secured without the need for infrastructure. This development has tipped bike share into the shared micromobility market. The European market is dominated by e-scooters (Figure 36). The North American market is fairly balanced (Appendix 9.59.4). The micromobility market should continue to grow, given that users seem to prefer pedelecs (Appendix 9.6).

Figure 36: Development of the micromobility market in Europe from 2020 to 2023 (Source 16)



In 2022, fleet growth was fairly stable for station-based PB, but more volatile for free-floating shared e-bikes and free-floating shared e-scooters (Figure 37).

Figure 37: Seasonal trends in shared mobility fleets in 2022 (Source 15)

FLEET SIZE & SEASONALITY FLUCTUATIONS

2022



Parking for micromobility is increasingly part of a mobility hub approach, as in Budapest and Vienna (Source 37). What have historically been known as cycle paths are becoming facilities for a variety of users: cyclists, runners, wheelchair users and e-micromobility users.

5.2 PESTEL analysis of the bike share industry

The PESTEL analysis provides an overall view of the sector's current and future context (*Figure 38*).

Figure 38: PESTEL analysis of the bike share industry in 2023

	Risks	Opportunities
Policy	<ul style="list-style-type: none"> • Geopolitical interdependence for supplies of raw materials, frames and spare parts in a climate of international tensions (war in Ukraine, conflicts in the Middle East, Taiwan). 	<ul style="list-style-type: none"> • 2024: Year of Cycling under the Belgian presidency of the European Commission.
Economy	<ul style="list-style-type: none"> • Inflation in raw materials, energy, freight, electronic components and human resources (salaries, more skilled labour on pedelecs) and rising interest rates, which impact investment amounts. • Risk of bankruptcies linked to pedelecs surplus stock post Covid-19. • Bike share is a niche market in the bicycle industry that is not highly valued. • Unattainable profitability for hypergrowth business models. 	<ul style="list-style-type: none"> • Prospect of partial production relocation to Europe (but probably still with Chinese capital). • Bike-as-a-Service. • Consolidation of market players.
Society	<ul style="list-style-type: none"> • Difficulties in finding qualified, stable and occasional labour. 	<ul style="list-style-type: none"> • Climate awareness • Circular economy
Technology	<ul style="list-style-type: none"> • Insecure supply of electronic components (station, bike) and uncertain responsiveness between contract sign and installation dates. • Battery recycling challenge. 	<ul style="list-style-type: none"> • The beginnings of a battery reprocessing and production chain for European batteries. • Electrification of bicycles with different types of charging (<i>Tiler, Clip and bike</i>). • Using AI to optimise routes.
Legal framework	<ul style="list-style-type: none"> • 2026: Prospect of "carbon" duties on EU importation. 	<ul style="list-style-type: none"> • The European Cycling Strategy voted by the European Parliament (2024) mentions bike-sharing three times (<i>Figure 39</i>).
Environment	<ul style="list-style-type: none"> • Negative carbon footprint if usage does not replace individual car journeys. 	<ul style="list-style-type: none"> • Life cycle assessment of suppliers.

Figure 39: Articles on bike sharing in the European Cycling Strategy (Source 13)

Chapter V: Improving road safety and security: 22. Improving security at public bike parking spaces (including bike sharing and multimodal hubs), and increasing efforts to tackle the issue of bike theft.

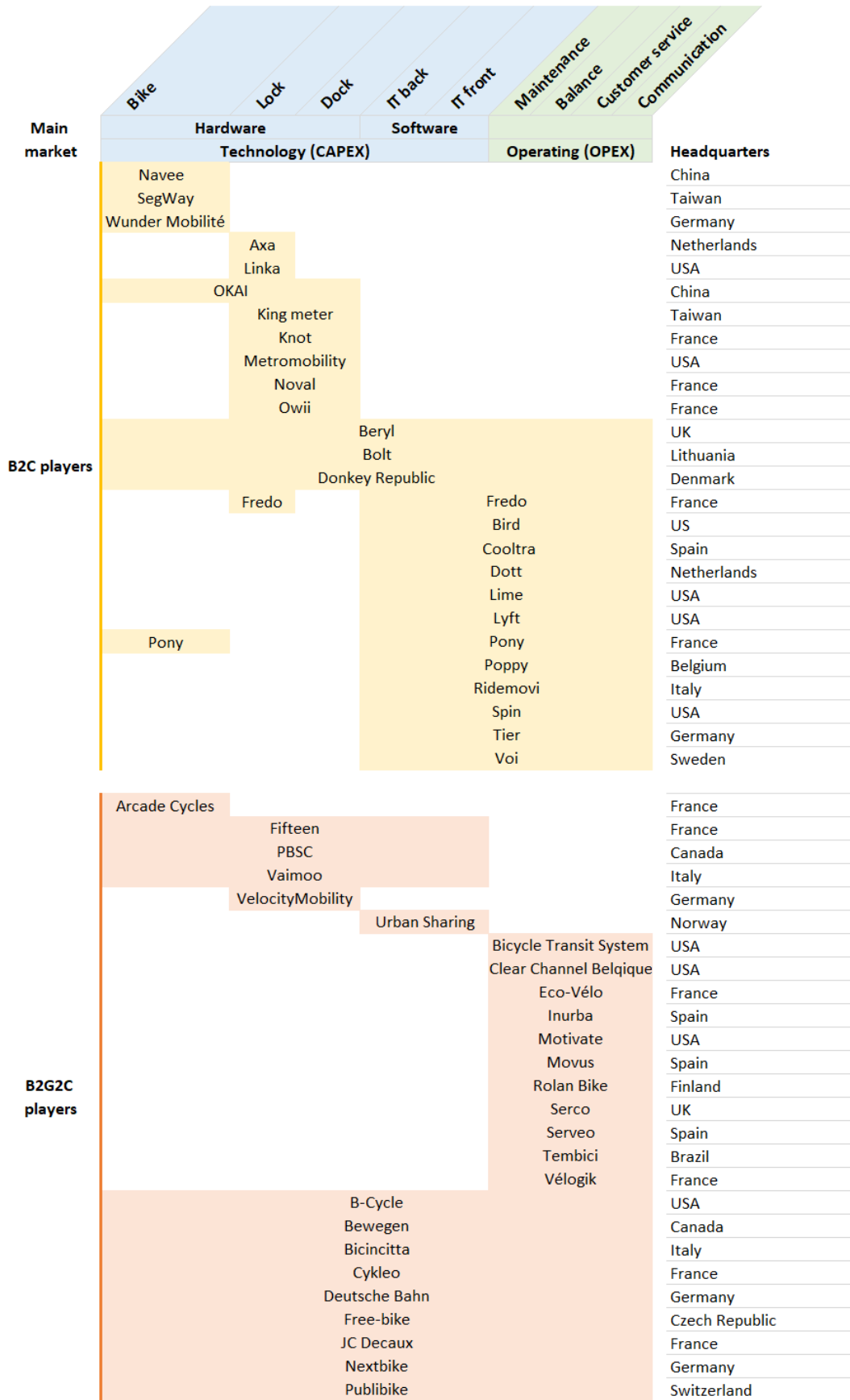
Chapter VI: Supporting quality green jobs and the development of a world-class European cycling industry 29. Supporting cycling service industries, such as bike sharing and cycle logistics, especially in cities, including by strengthening the integration of cycle logistics into the logistics system.

Chapter VII: Supporting multimodality and cycling tourism 31. Supporting bike sharing schemes as a solution to first and last mile access to public transport services.

5.3 Positioning of players in the value chain

Numerous players are positioned throughout the bike share value chain (Figure 40).

Figure 40: Positioning of bike share players in the value chain



@Mobiped 2024

5.4 News from some players

5.4.1 Market positioning

- The traditional players in outdoor advertising (JC Decaux and Clear Channel) have lost a number of contracts. JC Decaux acquired all Clear Channel activities in Italy and Spain in 2023. JC Decaux has won the Toulouse contract, which is now back on the PB market. Clear Channel now only operates the Antwerp service.
- PBSC is the world's leading supplier of PB systems. Fifteen has developed a condensed, stacking parking offer that can be used for PB, PB + Train and LTR.
- Fleet suppliers for B2C players include Okai, Segway, WunderMobility and Navee.
- Inurba chose a solution (PBSC, Fifteen, Waimoo, OEM, Segway) according to the city's needs.
- Velogik, which once specialised in repairs, is now refocusing its business as an operator.

5.4.2 Some changes in the capital structure of companies

- By 2023, several micromobility players went bankrupt: Bewegen, Superpedestrian, Spin and Bird.
- After acquiring Nextbike, Wind and Spin in 2022 and 2023, Tier merged with Dott in early 2024 and spun off its Nextbike business.
- Lyft bought Motivate in 2018 (the New York and San Francisco operator, for \$250 million) and PBSC in April 2022 for US\$163.5 million. In August 2023, Lyft's new president suggested that the micromobility division generates 5% of revenues but 25% of expenses, and was therefore thinking of spinning it off.
- At Fifteen (ViaID Group), the Zoov solution has taken over from the historic Smoove solution.
- In Switzerland, Public Bike and Velospot have merged.
- In China, Mobike has become Meituan Diaping.
- Pony offers resident investors the chance to own a scooter (€1,090) or a bike (€1,790), and to recoup 50% of the earnings generated by "their" electric vehicle on each trip. Pony then takes care of operations (logistics, charging and maintenance).

5.4.3 Other players in the bike share industry

Fluctuo	Data aggregator and provider of white-label user MaaS APIs such as MDMS (Multimodal Digital Mobility Services).
ID now	Identity or helmet verification app.
Indeez	Insurance for operators and customers.
Joyride	White-label platform for micromobility vehicle services.
Nowos	Repair and recycling of bicycle batteries.
Qcit	Software publisher specialising in predictive logistics (from 0 to 24 hours) for the field operations management of micromobility systems.
Urban Sharing	White-label micromobility fleet management and user interface platform.
Vianova	Aggregator of shared mobility data for better management.
Yuwway	App for comparing and booking daily transport offers.

5.4.4 Some challenges for bike share operators

Bike share operators face several challenges.

Economic balance	Success upsets the operator's economic balance. The more bikes are rented, the more fragile they become. Beyond a certain threshold, maintenance costs soar, and the operator seeks to reduce rentals (Paris). Operating cost impact of an additional rent is not specified in the initial contract and is not covered by user revenues, as fares are set by the public authorities. Once a certain level of success has been achieved, it is necessary to accept a deterioration in service.
KPIs requested	Some operators include penalties amount in their initial offer for unreachable KPIs.
Vandalism (see Appendix 9.2)	A self-service activity in the public space is structurally exposed to neglect, misuse, vandalism of opportunity or fashion (Cologne) and theft (Marseille). These costs are funded by the candidates in their initial price or in an envelope whose positive balance is eventually reinvested into the service (Antwerp).
Human Resource management	<ul style="list-style-type: none"> • Operations are first and foremost a matter of human resources management, with the occasional risk of absenteeism in low value-added jobs. • The feminisation of the repair professions has enormous room for improvement. • The social representations of technicians are an obstacle to sharing the operation of several modes. Mechanics who work in heavy transport or cars are unlikely to work on bicycles. Similarly, bicycle mechanics are not interested in scooters. Operating several modes with the same teams requires time and energy to train, support and convince them to change their job slightly, with no guarantee of results.
Commuter flows	<p>Bike share is not immune to commuter flows, requiring a budget to rebalance bikes at stations on the outskirts or in uni-functional neighbourhoods (housing, employment or shopping). Dropzones (racks or demarcated parking areas), overflow (overcapacity of a full station) or pedelecs reduce but do not avoid this need for rebalancing.</p> <p>Artificial intelligence is starting to be used mainly for flow prediction (different from forecasting), and to support logistics, repair and maintenance (Qcit and Urban Sharing). Segway integrates it to detect bad behaviour (parking). However, "The best AI won't be able to do much to fix a poor quality supply" (<i>Source 43</i>).</p>
Process industrialisation	Operations are moving towards a service-based approach, with the industrialisation and digitisation of services, which will be reinforced by the entry of automotive (and even aeronautical) players into the bicycle industry, as they anticipate restrictions on car use.
Electrification	<p>The electrification of fleets is having an impact on operators' business, particularly for mixed fleets, with:</p> <ul style="list-style-type: none"> • Overuse of pedelecs compared with pedal ones, which accelerates wear on spare parts and increases breakdown rates. • More complex, longer repair cycles, more skilled labour. • The complex management of batteries, in terms of both investment and lifespan, but also in terms of the complexity of charge cycle management and safety conditions in the face of fire risks. • Increase acquisition, maintenance and operating costs.

6 The user experience

6.1 Users experience several services

Potential bike share users can use several services in the same city, or the same service in several cities. As each service has its own way of working, users may experience a certain amount of confusion. They must then deconstruct their habits to use another service, such as returning a bike to a station rather than parking it unattached. Meanwhile, they develop adaptive skills.

6.2 Digitalisation of the customer journey

Digital interfaces now play a central role in the customer experience. Sometimes, the experience requires users to download the app even before knowing the conditions of use, the locations or the price range of the service. Identity can sometimes be verified (Bird), or a photo of the parked bike can be requested when the bike is returned via the app (Dott).

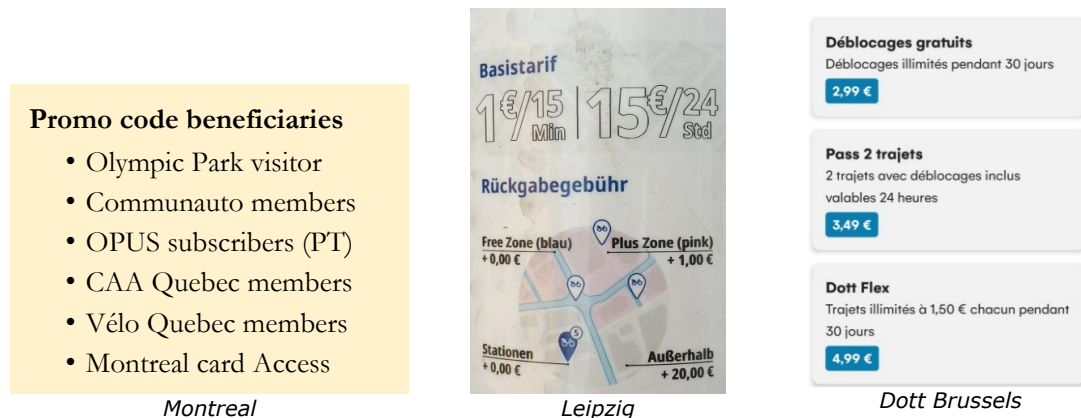
6.3 Diversification of price ranges

While free fares for the first 30 minutes have often been the trend, the range of prices is becoming increasingly varied and complex:

- Unlocking fees (Vélib' in Paris), sometimes unlimited with a special package (Dott).
- Pay-as-you-go per-minute usage fees.
- Stages of 15, 30 or 45 minutes depending on the type of subscription.
- 24h unlimited pass (Pony).
- Pedal bikes and pedelecs.
- The first journey free (Dott).
- The number of bikes that can be rented with a single account, and the corresponding deposit.
- Pricing from several hours to several days (Donkey Republic).
- Prices for public transport users, for customers of the parent company (New York) or for customers of partner organisations (Montreal).
- Different prices for different drop-off locations (Leipzig).
- The creation of a personal wallet (Bolt).
- Insurance against theft (Donkey).

The price ranges of 12 bike share services are compiled in *Appendix 9.9*, with a few extracts (*Figure 41*).

Figure 41: Price range diversity (Montreal, Leipzig, Dott Brussels)



7 Public Bicycles and Public Transport integration

7.1 Similarities and differences between these two worlds

While there are many differences or complementarities between Public Transport (PT) and Public Bicycles (PB) (Figure 42), here are a few points they have in common:

- direct track services, with no return constraint.
- more or less close audiences with low car use.
- constant operational challenges in providing quality service at controlled costs.
- contribution to multimodal services to reduce the impact of individual car use.
- need for government intervention: network industries, unprofitable in low-density areas, insufficient coverage by user revenues.
- service available in public spaces, and therefore subject to vandalism.
- media and political exposure.

Figure 42: Differences and complementarities between PT and PB



SEMANTICS		
Mode	Bus, tram, metro, train	Bike
Category	Mass Transport or Public Transport (PT)	Bike share (BS)
Public service	Public transport (PT), considered as such in European legislation.	Public bicycles (PB), in national or local legislation.
OFFER		
Action	Transport	Travel
Driver	Licensed and salaried driver	Users/customers
Preventing vehicle misuse	Driver training and telematic monitoring of deviant behaviour.	Random care under the user's total responsibility in the absence of a joint inventory, and permanent exposure to vandalism.
Waiting time	A few minutes, with passenger information on timetables or waiting time	Uncertain, random and dependent on the behaviour of other users.
Accessibility	~ 6.00 AM to 12.00 PM	24/7/365
Anonymous use	Possible	Identification linked to the credit card but not to the user.
Payment	Pay-as-you-go, no authentication required for tickets	Identification, deposit, pre-authorisation for post-payment
Intra-mode competition	Monopoly	Personal bikes and private SB
Cover	Metropolis	Mainly limited to the centre
Catchment area	<u>Trains</u> : several kms <u>Metro</u> : 800 m <u>Tram</u> : 600 m <u>Bus</u> : 300-500 m	<u>PB</u> : 150-200 m
Spacing between two stops of the same line	<u>Metro</u> : 590 m <u>Tram</u> : 409 m <u>Bus</u> : 417 m line (STIB)	<u>PB</u> : between 200 and 300 m
Network	Linear	Scatter graph
USES		
Journey volume	Hundreds of millions a year	A few million a year
Transfer	Possible	Direct to destination



Exclusion	Agoraphobic, young children alone, dedicated solution for people with reduced mobility and great difficulties	Children, visually impaired, and wheelchair users
Seasonality	Stable throughout the year, excluding school holidays	More use in summer, less in winter
User revenue coverage rate	20 - 40 %	30 - 50 %
Empty journeys	Possible	No

OPERATION

Core activity	Carrying passengers on a set route at fixed times	Moving ready-to-use bikes to different locations
Regulation	Real-time positioning tracking with information on journey times on a fixed and controlled route	Random, user-specific use. Only the user knows where he will put the bike. The operator only has the information once the bike has been returned to the system. AI enables predictions.
Maintenance	Fairly well mastered, in the PT sector	Seasonal and variable, in the bike sector
Risk management	Variable costs are fairly fixed and well under control	Variable costs depending on usage volumes
Local employer	Thousands of jobs	Dozens to hundreds of jobs
Rolling stock service life	<u>Several decades</u> : Metro (5,400,000 km), Tram (2,500,000 km), Bus (800,000 km)	<u>Several years</u> : PB (~ 12,000 km)

INDICATORS

Number of lines	Number of bicycles
Number of stops	Number of stations
Passenger seat/km	Parking slots per bicycle
Commercial speed	Trip average length
Number of trips	Number of rentals/bike/day

7.2 Two parallel networks which strengthen each other

Unlike SB + Train (back to one with pick-up and drop-off at railway stations only), one-way urban PB are not an extension of urban PT lines. In fact, PB operates on its own network. In this way, a large number of stations cater for a maximum number of potential origins/destinations. Density is particularly necessary in the hypercentre, where travel demand is concentrated.

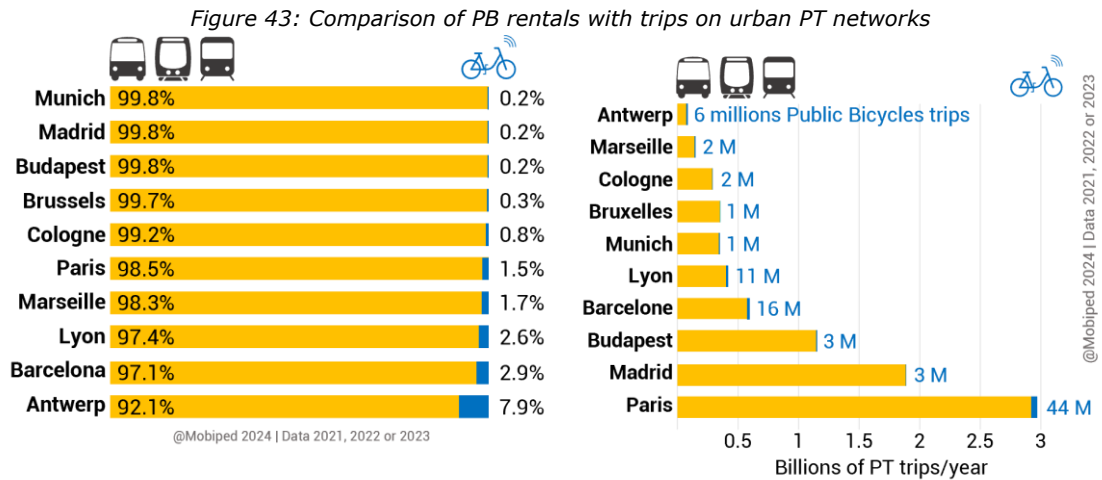
The proximity of PB stations to PT stops enhances the mobility experience for both PT passengers and cyclists, by providing additional flexibility.

Hoping that an PB service will make it possible to reduce the PT with very low ridership (e.g. line ends at staggered times) seems illusory, given that:

- People who use these PT lines are probably not experienced and motivated cyclists.
- Areas concerned are likely to have little or no cycling infrastructure, especially when visibility is poor at night.

7.3 PB, ~ 1% of the PT network, a double standard

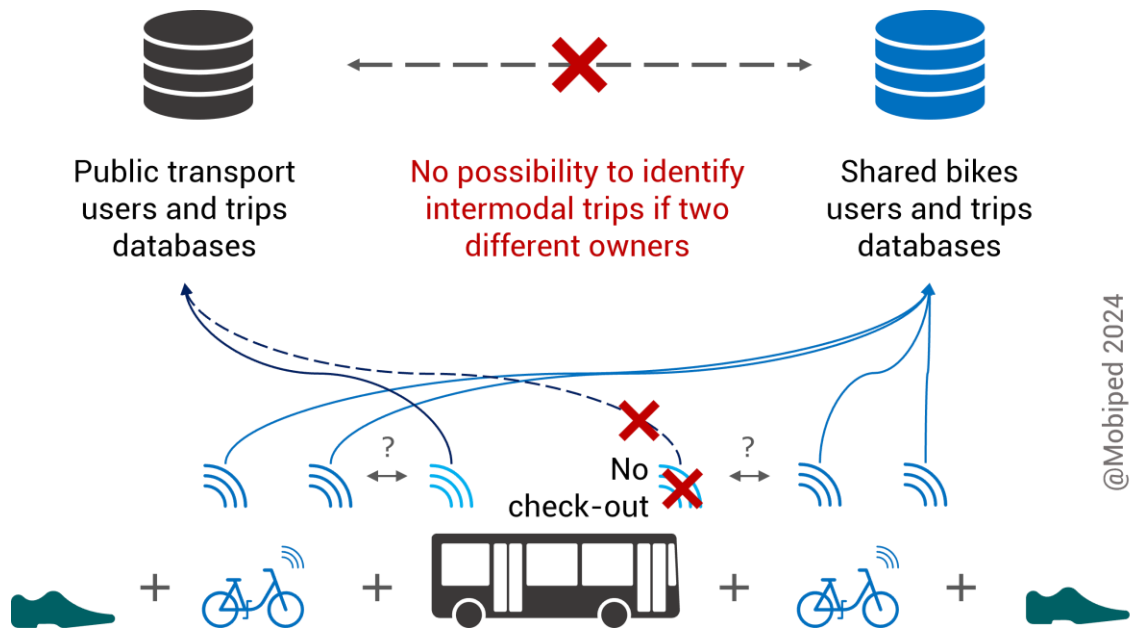
In a highly simplified view, the PB network represents 1% of journeys (Figure 43), 1% of human resources and 1% of the annual budget of urban PT networks.



7.4 Travel practices

As PT and PB user and journey databases are separate, the GDPR does not allow to link journeys and obtain precise data on multimodal and intermodal practices (Figure 44). Data below are therefore taken from user surveys, with percentages of users and not journeys (Figure 45). In addition, the type of PT is rarely specified, whereas the type of mode must be distinguished for a precise analysis. Intermodality seems more plausible on long-distance journeys with heavy PT modes than with urban bus lines. In Munich, the average journey time by PT is 2.06 times longer than by car. When PT and micromobility are combined, this ratio drops to 1.69, making PT more attractive in terms of time access (Source 29).

Figure 44: No communication between PT and PB customers and trips databases



@Mobiped 2024

Figure 45: Data on multimodal and intermodal use of PT and PB

Multimodality			
Budapest	80% of PB users travel mainly by PT (2022).		
France	55% of PB users have an annual PT subscription (2017).		
Mexico City	Between 40% and 45% of users also use the bus and metro.		
Milan	34% of annual PB subscribers also have an annual PT subscription.		
Paris	22% of PB users use it as their main mode of transport.		
Intermodality			
Antwerp	> 25% of PB users combine it with the bus, tram, metro or train.		
Brussels	47% of users are intermodal (30% at start, 17% at end of journey) (2017)		
France	62% of PB users combine their journeys with urban transport (CEREMA, 2017).		
Helsinki	55% of PB users use the metro before or after.		
Taipei	> 70% of PB users connect with PT.		

7.5 Challenges of creating a unique experience

The ideal of a single experience for all PT and PB subscribers faces with certain challenges (*Appendix 9.8*). Certain parameters appear to be structural, linked to service access conditions (*Figure 46*), capabilities (*Figure 47*) and age (*Figure 48*).

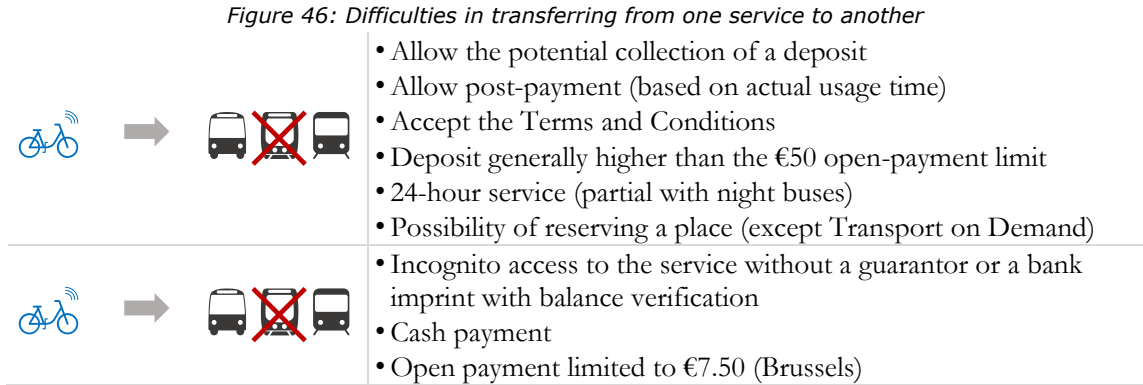


Figure 47: Comparison between bike share, LTR and PT according to capacity

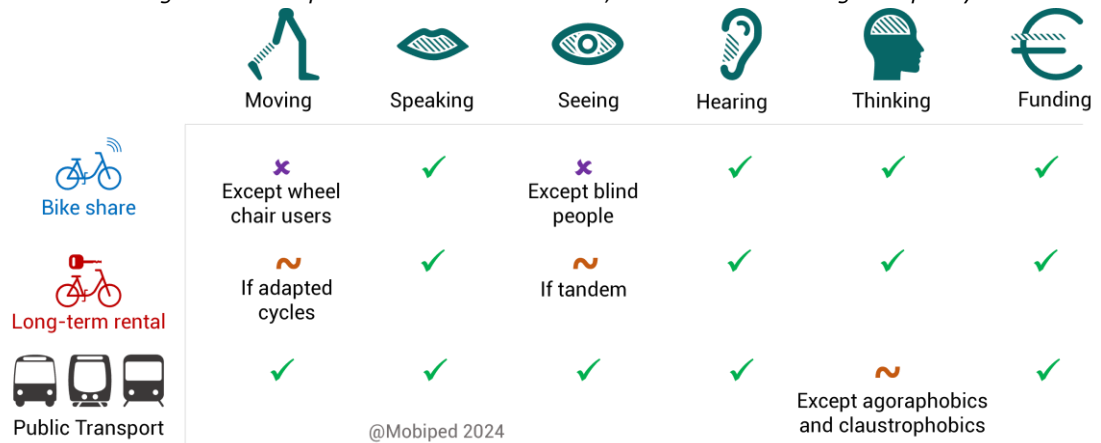
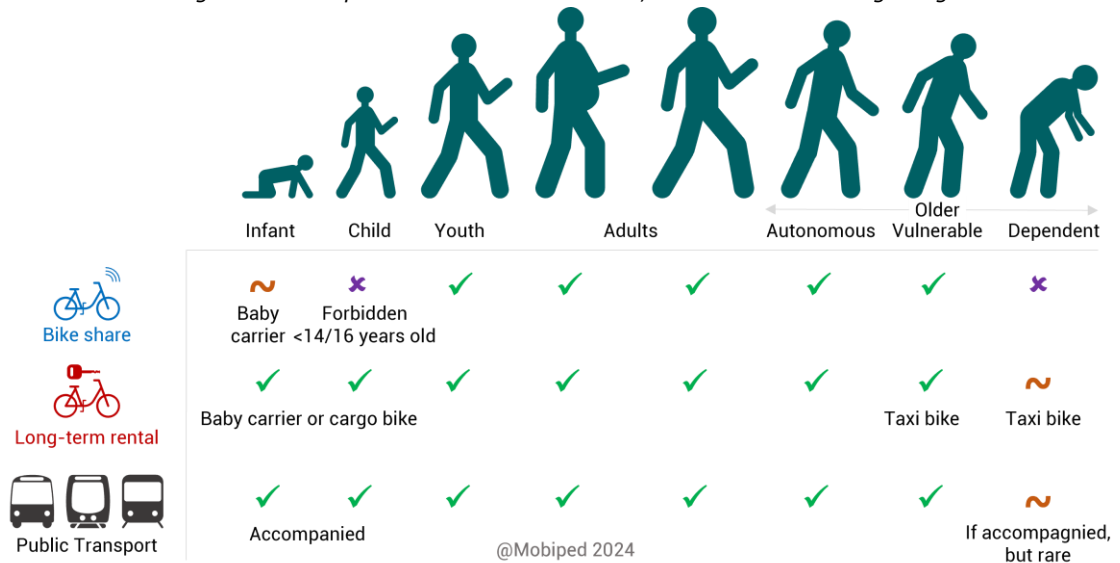


Figure 48: Comparison between bike share, LTR and PT according to age



7.6 Overvalued PT-PB integration

The players discourses value PT-PB integration without mentioning the levels of integration for each parameter (Figure 49). Integration is generally limited to discounts for PT subscribers and use of the PT ticketing system. The ultimate integration would involve a single mobility pass that allows all modes to be used equally (Figure 50).

Figure 49: Three levels of integration for each theme

	Sub-theme	None	Intermediate	Full
People	Customer databases	Two owners	Whitelist	One owner
	Practices	Monomodal	Intermodal	Multimodal
Products/Services	T&C	Two separate T&C		Single T&C
	Action	Rent or travel		Travel
	Transfer	Separate	X	Included
Places	Walking distance	> 50 m	25 m	Side by side
	User flows	Separate	Cohabitation	Sharing
Price	One journey	Separate	Same price	Single ticket
	Subscription	Separate	Discount	Single subscription
Promotion	Brand	Separate	Varied	Single
	Semantics	Specific	Hierarchical	Universal
	Communication	Separate	Hierarchical	Equitable
	Advertising	Separate	Alternating	Integrated
	Sells	Separate	Partnership	Integrated
Process	Website/App	Separate	One, but multiple clicks	Direct access
	Usage	Purchase identified		Anonymous
	Payment	Bank card/Direct debit	Open payment	Cash
	Ticketing (support)	Separate	Shared	Identical
	Itineraries (offers)	Monomodal	Multimodal	Intermodal
	Routes (research)	PT only	PB unchecked per default	PB checked per default
Proof	Customer survey	Separate	Intermodality analysis	Unique barometer
	Data analysis	Separate	Overlaid	Automated

Figure 50: Marketing mix for a total PT and PB integration

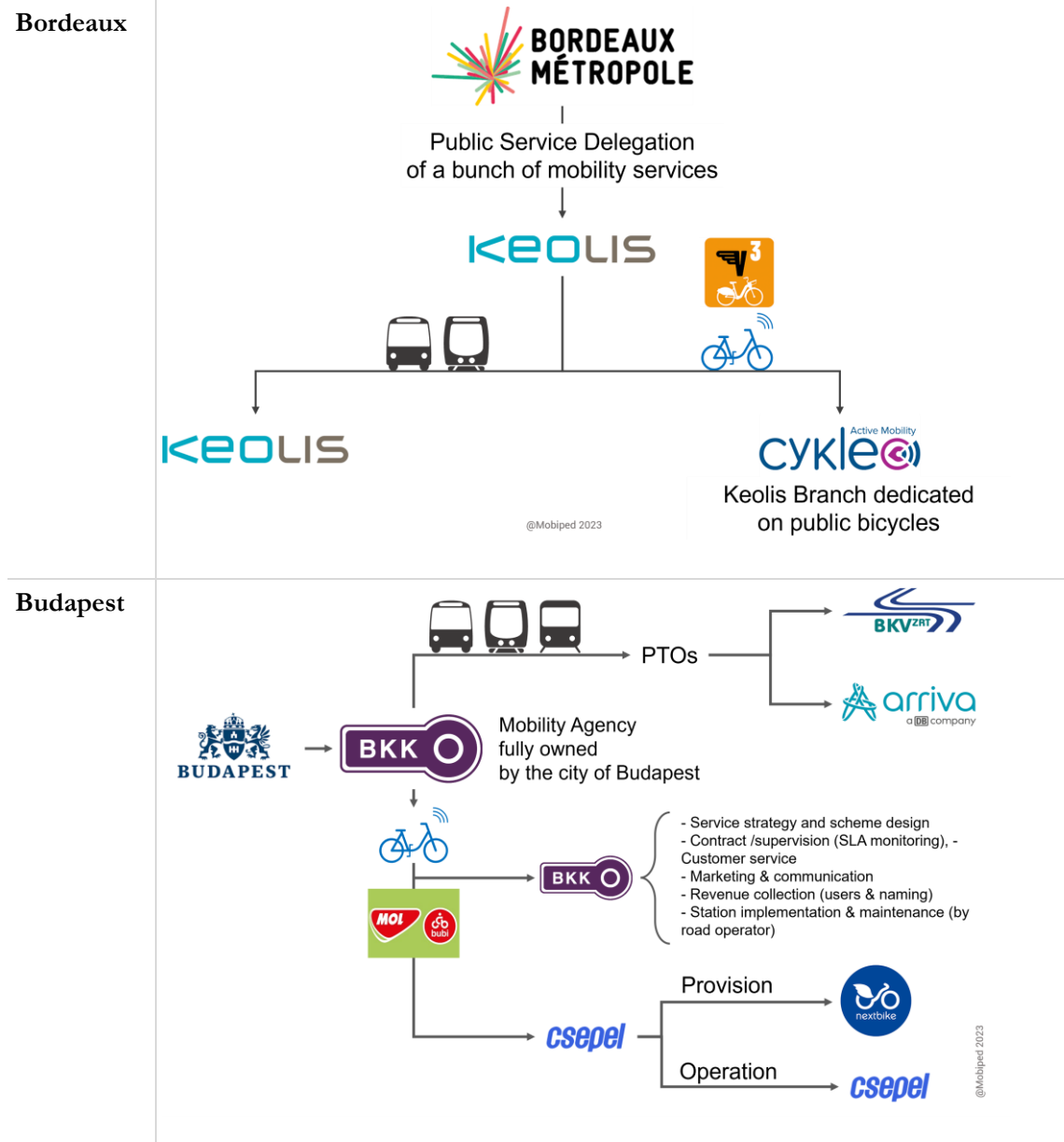


7.7 Involvement of the PT operator in the governance

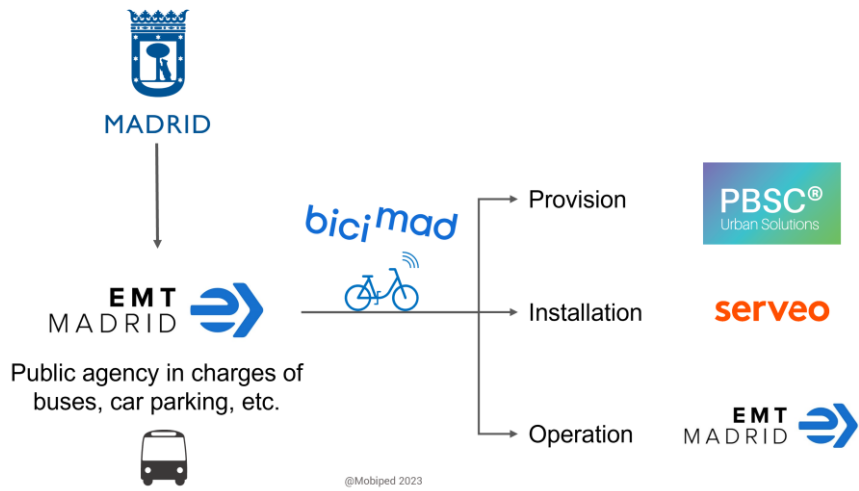
7.7.1 Governance models

Governance diagrams have been produced for the Madrid, Milan, Bordeaux, Budapest and Vienna services. Each diagram illustrates a diversity of approaches and adaptation to the local context (Figure 51).

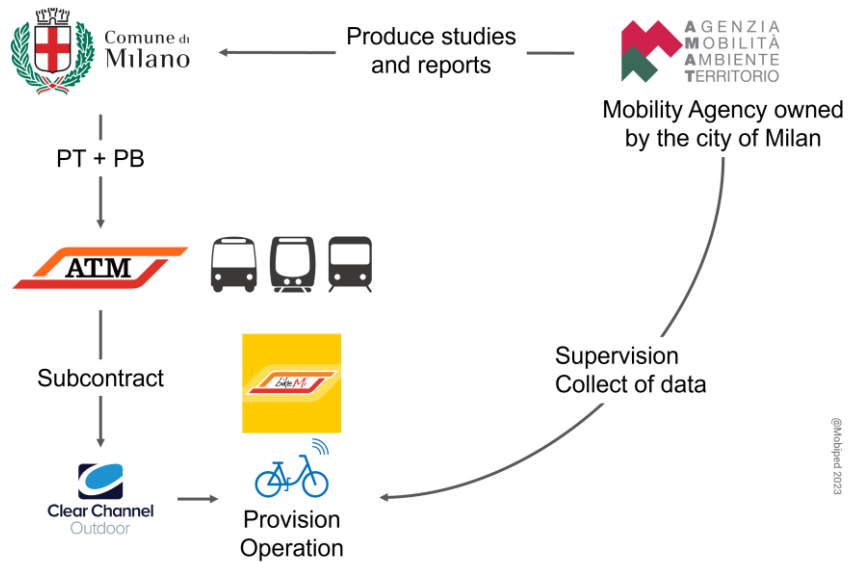
Figure 51: Five governance models in Europe involving the PT operator



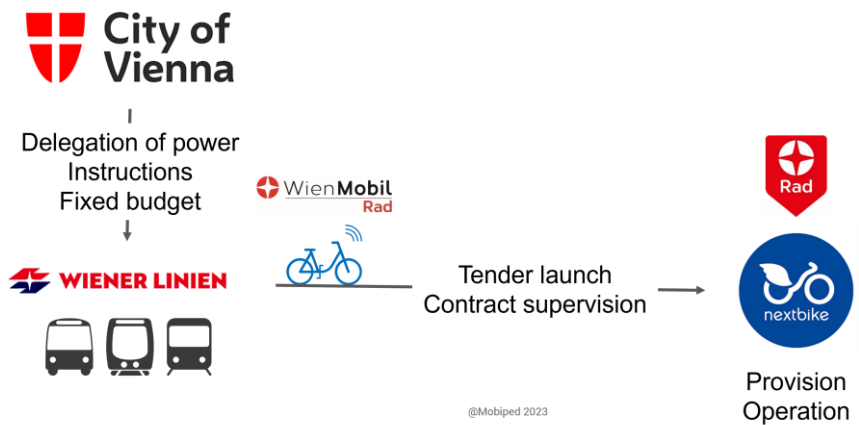
Madrid



Milan



Vienna



7.7.2 Opportunities and Threats



Opportunities

Strategic interest for the PT operator

- Develop revenue by inviting subscriptions to both services (but with possible discounts).
- Enhance the PT brand image and increase its visibility in public spaces (Cologne, Vienna).
- Initiate the cultural shift from PT operator to mobility public service operator (e.g. Budapest, Madrid), which is reflected in the communication approach (Dijon).
- Improve the quality of land coverage.
- Attract audiences reluctant to use PT.

Business skills

- Ability to supervise contracts.
- Agency and distribution networks.
- Land availability for potential mini-warehouse or battery charging.

User experience

- Users in favour of easier intermodal and multimodal experience (Brussels).



Threats

Unequal treatment

- Loss of interest in PB, with a drop in energy and dedicated resources, as PB represents 1% of PT (flows, budget, revenue), with cycling relegated to second place (*Figure 52 and Figure 53*).
- Fear of having journeys "stolen" from them, when the user chooses an offer that better meets their mobility needs.
- Believe that the presence of PB in the PT field will lead to give priority to bicycles rather than PT in urban development projects.
- Absenteeism of human resources and lack of appropriate human resources.
- Few real economies of scale in operations (Bordeaux, Madrid).
- Time-consuming and energy-intensive change management, with no guaranteed results in terms of a cultural bridge between PT and PB mechanic workers, or in considering bicycle services as a way out for staff at the end of their careers.

Governance

- Negotiation and supervision of PB is buried at the end of the meeting in relation to PT and carried out by senior decision-makers without the presence of the PB officers in the discussions (Bordeaux).
- Addition of an intermediary and a lack of direct exchanges between the needs of the authority and the reality on the ground (Milan).
- Belief that delegating supervision to the operator will avoid the need for the authority to supervise the service.
- Legal framework to be defined.

Uncertain results

- Low (Cologne, Milan, Munich, Vienna) or fairly good (Bordeaux, Lille) turnover rates.

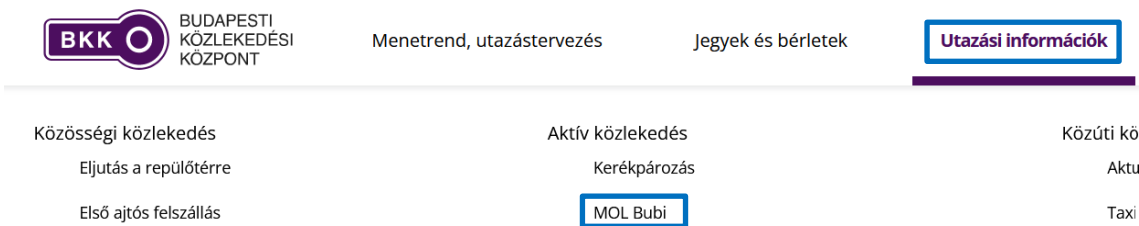
Figure 52: Rare good practice of direct access to the PB page from the home page (Dijon)



Figure 53: Efforts required to access information on PB (Vienna, Bordeaux, Budapest, London)



Vienna Bordeaux



Budapest

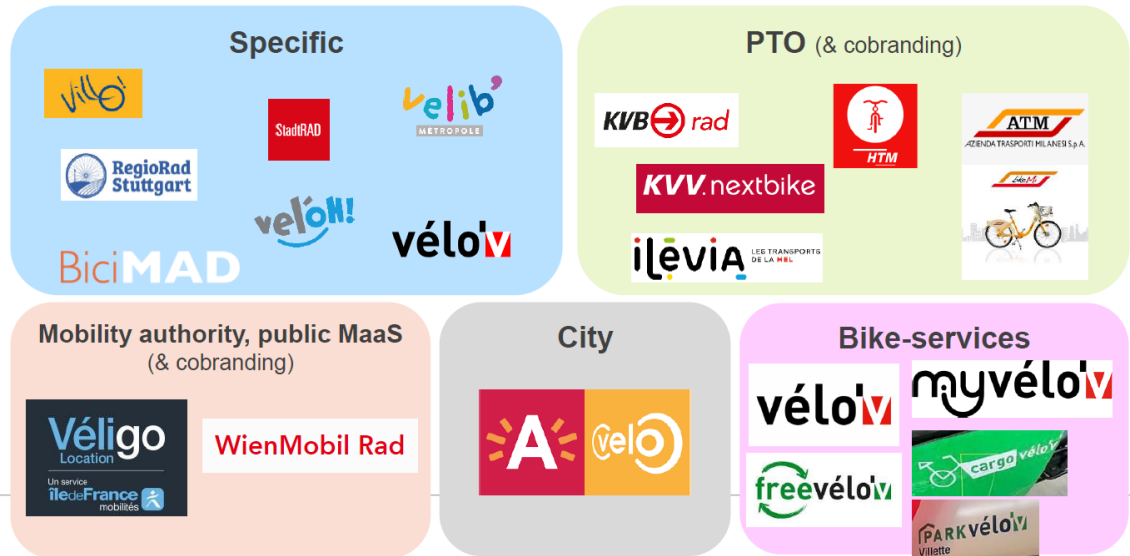


7.7.3 Brand diversity

The brand of the PB service can be:

- specific to the PB service (Brussels, Luxembourg, Paris).
- a range of bicycle services (Lyon).
- institutional in connection with the city (Antwerp).
- linked to the global mobility public services brand (Vienna).
- Derived from PT operators (Cologne, Dijon, Milan).

Figure 54: Brand positioning strategy for PB services (Author: M. Nicaise, STIB)



7.8 PB and PT are rather complementary than competitors

"Rather than being afraid of cycling, the PT operator should put its energy into attracting subscribers to multimodal practices. Cyclists are more likely to be PT passengers than motorists" (Budapest) (Figure 55).

Figure 55: PB and PT, more complementary than competitive

Icons: Bicycle, Bus, Tram

"Stolen" trips Competitors

- "Improved" trips from the user point of view
- Public Transport service improved with intermodal options
- Public Bicycles (PB) trips < 2% Public Transport (PT) trips
- Intermodal and multimodal practises
- Mutual insurance

COMPLEMENTARY

➔ Think on "additional income" rather than on "loss of travels".
A cyclist who does not want to use a car is a potential PT customer.

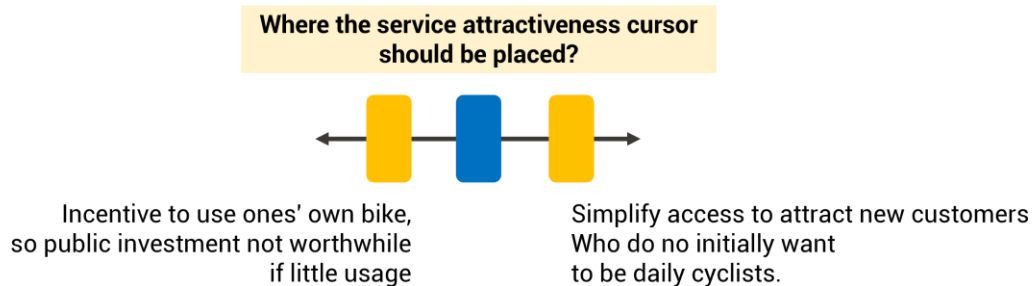
@Mobiped 2024

8 Challenges facing the bike share market

With Lyon's first large-scale PB service soon to celebrate its 20th anniversary, and more than 1,600 cities in the world with bike share services, the market is facing a number of challenges.

Maturity and stability of the sector	The industry is evolving rapidly, with players from a variety of backgrounds (advertising space, PT, IT, bike share specialists). Strategic changes and capital uncertainties, even among the historic players, raise questions about the sector's stability and maturity.
Return on investment	<ul style="list-style-type: none"> • A very high cost compared with the bicycle budget, but ultimately a very low bicycle budget compared with other modes. • Difficulties in defining the use value of a journey for each individual (one-off but extremely useful, regular because it is the only solution, regular but total opportunism) and the reality of intermodal and multimodal practices. • Little data is systematically collected to assess the services economic impacts.
Public vs. private vision	Silo approach to public and private bike share services, even though the service is virtually identical and only the governance model differs.
Complexity	A simple subject at first glance, but one of multidisciplinary complexity.
Policy	Decision makers are reluctant to pay, but each want a station in its municipality.
Alignment of interests	Difficulties in aligning the interests of users, the authority and the service provider. The marginal revenue from a rental is insufficient to cover the marginal cost of a rental, which has an impact on the service's economic equation.
Demand modelling	Prediction tools are appearing, but there is no robust modelling tool for designing a service.
Standardisation	No standard for furniture, bicycles and batteries.
Pricing	Pricing remains complex, with at least a right of access and a payment according to duration of use.
"Popularity"	"Popular" success is in terms of numbers and visibility in the public space. But the most vulnerable are under-represented.
Public service	Some cities (Brussels) and countries (France, Hungary) consider bike share to be a public service operated by the private sector. Other cities (Antwerp) and countries (Switzerland) consider bike share to be a private service supported (or not) by the public authorities.
Modal shift	Little commercial effort to target motorists.
Level of attractiveness	Difficulties in finding the balance between an attractive service to entice users with a simpler, more fluid service than the personal bike, and a service that is not too attractive to prevent cyclists from stopping using their personal bike at the taxpayer's expense (<i>Figure 56</i>).

Figure 56: Striking a balance in the level of service offered



@Mobiped 2024

9 Appendices

9.1 Key features of rental services

Duration (type)	Very short	Short	Medium	Long
Rental period	Minutes	Hours	Days	Months
Name	Bike share	Daily rental Tourist rental	Weekly rental Tourist rental	LTR (Long-term rental bicycle)
Service to customer	Back-to-many	Back-to-one	Back-to-one	Back-to-one
Service access				
Location	Numerous locations in public spaces	Few times in public spaces, often in buildings	Few times in public spaces, often in buildings	One or more buildings Home delivery
Parking in public spaces	Dedicated racks/slots or virtual hubs	Bicycle racks	Bicycle racks	Bicycle racks
Time	24/7	24/7 or opening hours	Opening hours	Opening hours
Examples				
Local authority initiatives	Vélib', Vélo'v, Bicing, Villo !	Auxerre, New Aquitaine Mobility Region	Donkey Republic (Geneva, Lantis in Antwerp)	Véligo Location, Metrobike, Freevélo'v
Initiatives by private or semi-public organisations	Lime, Dott, Tier, Donkey	OV-Fiets (NS-Fiets), Blue Bike (ex SNCB), Smovengo in "Gare de Lyon"	Rental shops, Donkey	Swapfiets, Decathlon, Brompton
Main targets				
Children				✓
Students	✓			✓
Commuters	✓	✓		✓
Tourists	✓		✓	
Professional travel			✓	
Vulnerable groups				✓
Transport of goods				✓
Delivery (meals)				✓
Parents with children				✓
Company bikes				✓
Bike for employees				✓
Access to a bike				
Bike type	Standardised for intensive use and display in public areas, bike or cargo bike	Specific bike adapted to the environment + Accessories	Specific bike adapted to the environment + Accessories	Variety of bikes (City, mountain bike, children's, cargo bikes, etc.) + Accessories (luggage rack, baby carrier)
Bikes in good condition	Random	✓	✓	✓
Bikes for special use	x	✓	✓	✓

Duration (type)	Very short	Short	Medium	Long
Renter/lessee interface				
Joint inventory	x	✓	✓	✓
Service user interaction	Automated	Automated/Human	Human	Human
Liability during rental				
Express parking (theft)	✓	✓	✓	✓
Night parking (theft)	x	✓	✓	✓
Incentive to keep bikes in good condition	x	✓	✓	✓
Maintenance	x	x	x	✓ Partly
Return of bike to its place of origin	x	✓	✓	✓

9.2 Different types of damage to bike share

9.2.1 Causes

Service deterioration is the result of many factors: theft, vandalism, misuse, wear and tear, hacking (*Figure 57 et Figure 58*). Nextbike estimates that 4% of its fleet is stolen or damaged each year.

The absence of a joint inventory at the beginning and end of the rental period does not encourage careful and respectful behaviour and does not allow responsibility to be attributed for damage. Vandalism is not specific to Europe, as it has also occurred in Asia with free-floating bicycles.

Figure 57: The different causes of damage

Theft	<ul style="list-style-type: none"> • Entertaining occupation • Occasional use to get around without paying • Resale (materials): batteries, electronics, spare parts
Vandalism/Damage	<ul style="list-style-type: none"> • Bike dumping game (throwing them into the canal, placing them in unlikely places like trees) TikTok challenge (Cologne) • Urban riots Deliberate damage to a public symbol or a symbol of capitalism • Frustration of other users of the public space who do not use the service • Tagging or breaking screens
Improper use	Rubbish in the basket Support for tags or unauthorised advertising campaigns (e.g. Vélo'v and Vélib') Bike parking in the wrong place thanks to false geolocation False prepaid card account (e.g. Nice).
Misuse	Frustration with poor service Negligence (using a bike even if it is damaged) Unintentional misuse: lack of understanding, lack of cycling infrastructure Deliberate misuse: use of the emergency stop button to leave the bike anywhere in Marseille, the bike seen as a BMX for jumping pavements, two-person riding Users are potentially inexperienced in urban cycling and prefer to switch from road to pavement, forcibly mounting pavements Users are not 100% reliable to be considered as contributors to the service quality.
Excessive wear	Over-use during peak periods or by food deliverers Wear and tear (poor prevention by the operator) Ageing of materials due to climatic conditions (sun, cold, rain) Operator's lack of interest Questionable technical and maintenance choices (noise of crows from Vélib' brakes, noise from Vélo'v rear tyres).
Hacking	Computer viruses (e.g. Copenhagen) Data theft Disclosure of personal data.
Poor design	The manufacturer's belief that the system is tamper-proof despite all the tests carried out upstream, with possible resistance for several months or years before being surprised (Cologne, Marseille).

Figure 58: Some examples of the deterioration of bike share services



Cracking (Geneva)



Vandalism (Montpellier)



Rust (Montpellier)



Frame wear (Paris)



Faded paint (Barcelona)



Baskets as bins (Paris)



Disappearance of signage at four parking slots (Stuttgart)



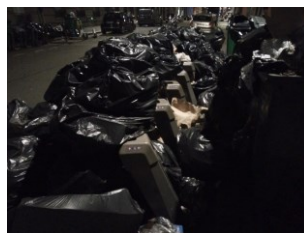
Disrupted water flows (Paris)



Warped rear wheel (Madrid)



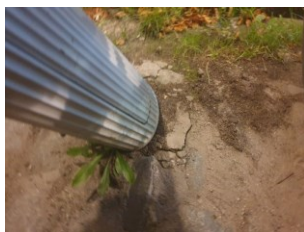
Inconvenient parking (Paris)



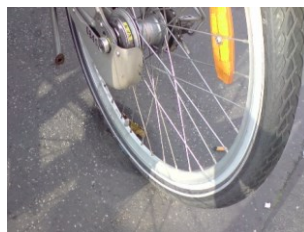
Bin collectors' strike (Paris)



Tag on furniture



Loosening of the slot (Lyon)



Pavement deformation under the tyre (Paris)



Wear and tear of protection (Nice)

9.2.2 The consequences

This damage has many harmful consequences:

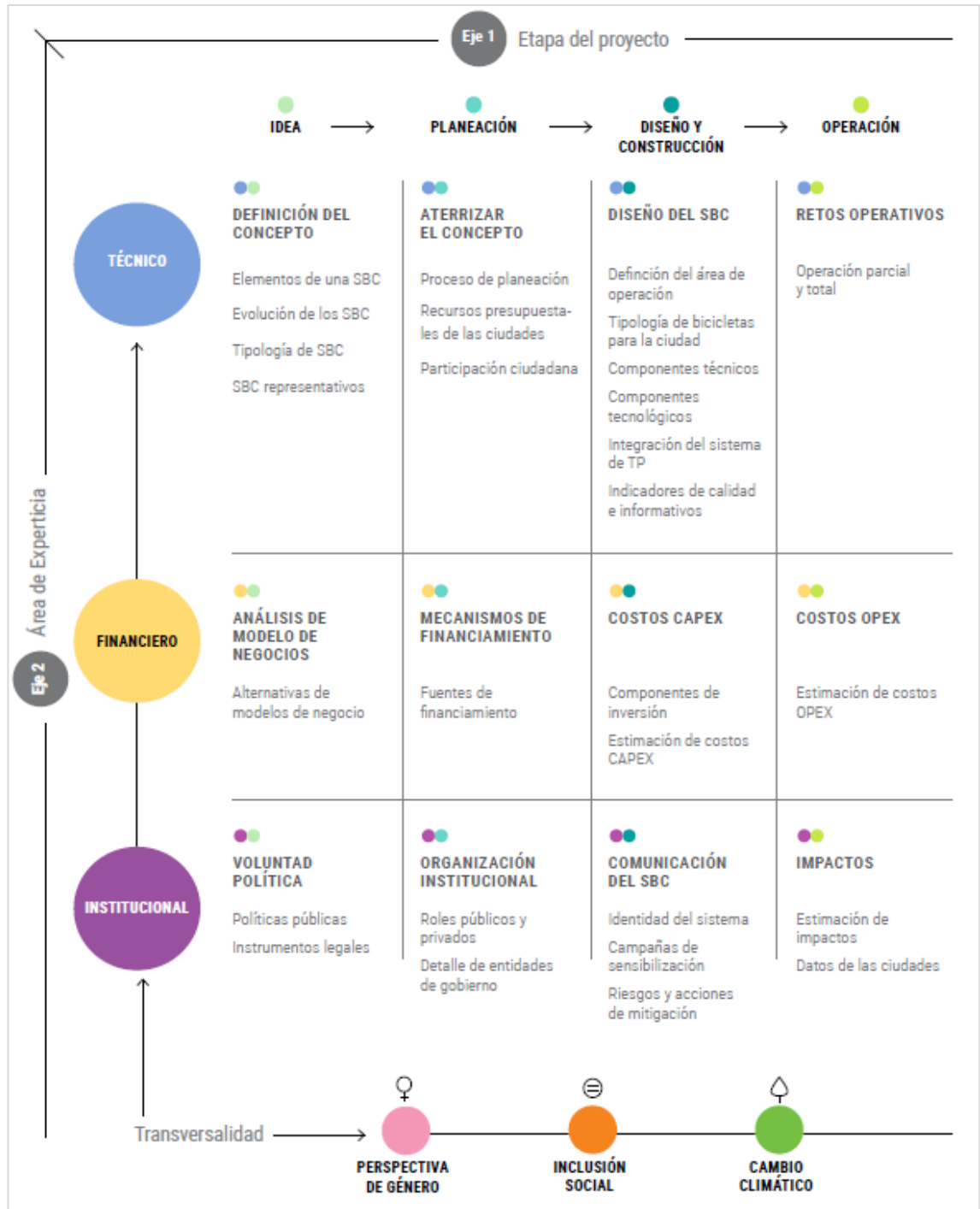
- deterioration of service quality and image.
- disruption of the operator's economic equilibrium, leading to service discontinuation (Lorient).
- water pollution from electronics.
- hidden costs of systematic complaints.
- removal of stations in neighbourhoods if too much vandalism.
- over-prevention disrupts the user experience by focusing on troublemakers rather than focusing on attracting users and increasing the sense of belonging.

9.2.3 Ways to reduce damage

It may seem unlikely to eradicate vandalism from a self-service device in the public space, but there are ways of reducing it.

Infrastructures	Develop a continuous network with as few micro-hazards as possible (pavements, jumps, fewer cobblestones, potholes) that make bicycles weaker.
Design of the bike - rack - stand system	Discourage/frustrate attempts with: <ul style="list-style-type: none"> • a streamlined bike. • special parts and protection. • a device that prevents leverage. • an alarm when there is a theft attempt. • a motor brake to prevent the possibility of using the stolen bike. • an eye tag sticker and stating that the bike is geolocated (several GPS chips in the bike?). • good station lighting. In the specifications: <ul style="list-style-type: none"> • higher strength requirements than those for private bicycles • possible R&D improvements as the contract evolves. • a distinctive, recognisable frame design. • beautiful things are less likely to be vandalised. • buy a bike in the tender to conduct beta tests with ex-convicts, in "Catch me if you can" redemption mode. • specific work on the connectors that cause faults. • durable materials and accessories to avoid warped wheels or flat tyres. • right to error included in the user experience design. • reduced possibilities for two people on a bike (flexible rear skirt or basket, possibility of renting several bikes with a single account, no foot support) or bikes designed to carry a passenger.
Community spirit	<ul style="list-style-type: none"> • Create a sense of community and brand loyalty among users, beneficiaries and their friends and family. • Organise consultations on the location of stations and artistic cocreation to involve residents of disadvantaged neighbourhoods, in partnership with social players.
Financial risk management	10% budget provision for vandalism, reinvested in the quality service if vandalism is lower (Antwerp).
Before the launch	Set up a simplified protocol with law enforcement agencies for filing complaints.
Operation	<ul style="list-style-type: none"> • Have robust spare parts and carry out preventive maintenance to avoid the broken glass phenomenon (close link between environmental conditions and social or anti-social behaviour). • Be able to adapt to heavy repair workloads, and switch to 24-hour operation during periods of very high usage. • Human presence to explain how the service works.
Communication	<ul style="list-style-type: none"> • Always positive communication: sense of belonging, diversity. • Update signage materials.
After the damage	<ul style="list-style-type: none"> • Be extremely reactive to avoid the broken glass phenomenon. • Interact with social networking platforms to avoid viral videos or challenges (Cologne). • Collect stolen bikes directly, with a team available 24 hours a day. • Avoid over-communicating to stifle the phenomenon. • Creation of a task force.

9.3 Planning diagram



9.4 Advantages and disadvantages of pedelecs parking and charging solutions

This work was carried out in the perspective of pedelecs bike share service to explore the advantages (+) and disadvantages (-) of different variants:

- A full dropzones service.
- A full charging stations service.
- A hybrid service combining dropzones and charging stations.

9.4.1 Technological solution

	Dropzones	Hybrid	Charging stations
PEDELECS CHARGING			
Method	Battery swapping	Grid via charging station + Swapping	Grid via charging station
If a lot of rentals	- ↗ swapping costs	+ Swapping in support	+ Constant charging
Battery charge cycle	+ Controlled in warehouse		← - Random/variable parking time
Battery life	- Over-used battery connectors		← + Less handling
Electricity failure	- Dependent on power failure	→	- Dependent on power failure
Strike/absenteeism	- Dependent on human resources		+ Charging will continue

9.4.2 A look at users and non-users

	Dropzones	Hybrid	Charging stations
USER EXPERIENCE			
Walking time/distance before/after rental	+ Very dense network	+ →	- Less dense network
Target audiences (in general)	Young, tech-savvy, male	+ →	← Older, higher education, male
Digital divide	- Experience mainly via an app Impossible to return bike without app	~ →	← + Access to a bicycle without systematically using Internet
No-commitment use	- Impossible to pay without creating an account		← + In-station card payment
Return of the bike	- Potential problem when returning the bike due to inaccurate GPS	- →	← - Problem if bike not attached properly + Return without action
If a station is full	+ Dense network and nearby dropzones	+ →	- Frustration, uncertainty, detour
Understanding the offer	- Evolution of rules over time from free-floating to dropzone, different in each city or country If several services, different prices and condition of use	+ Flexibility according to needs and habits - Potentially confusing with distinct functions	+ Simple: pick-up and return only at the station, with a more reliable user experience. If efficient service, ↗ network effect, ↗ annual subscriptions
Bike availability	- ↗ risk of uncharged bike		← + ↗ probability of having a charged bike
Access time	+ More chance of having a station nearby	+ Drastic reduction in pedestrian distances to/from a station.	- Network dependent on the number of stations and associated costs
Obtain information	- On the bike, or on the app		← + Possible on a stand or sign

	Dropzones	Hybrid	Charging stations
VISIBILITY IN PUBLIC SPACES			
Mass effect and visible urban landmark	- Average (but direct visibility of bikes). Need for a symbolic totem/post. The colourful bicycle is in the spotlight.	→	← + Stable landmark with dock and slots furniture, even when no bike is present. The furniture "stifles" the bike's visibility.
Bike colour	+ Flashy, highly visible frame colour		← - Urban architectural constraints
Parking space	- Ground markings and/or racks	→	← + Slots
MANAGEMENT AND SHARING OF PUBLIC SPACE			
Speed control	+ Can be restricted by geolocation	→	← + Possible, if GPS integrated
Bicycle stability	- Weak (wind, kicking, neglect), with risk of bicycles lying on the ground	→	← + Parked upright
Orderly bikes	- Varied and anarchic directions Risk of parking outside dropzones and racks Unsatisfactory technology: GPS inaccurate, intrusive camera on bike, photo at end of journey restrictive, beacon very expensive	→	← + User obliged to park the bike properly to end rental period Positioned in station, in the same direction (except for overflow and temporary off-station parking)
Pedestrian/cyclist cohabitation	- Risk of cluttered pedestrian walkways, problematic for people in wheelchairs, visually impaired or blind people, those with pushchairs or suitcases	→	← - If positioned on the pavement, the cyclist believes they are entitled to ride on the pavement
Road safety	- Danger if the bike protrudes onto the road	→	← + No parking risks
INCIVILITIES			
Theft	- Higher exposure to theft to put in a truck.	- Increased theft risk with dropzone + Fewer removal attempts in station	More secure lock to furniture, especially if double lock (rear wheels and station attachment).
Vandalism	- Higher if private service		← + Lower if public service

9.4.3 Financial aspects: investment, operation and revenue

	Dropzones	Hybrid	Charging stations
INVESTMENT (CAPEX)			
CAPEX costs	+ "Less high"	←	- "Higher"
Stations	+ None, unless beacons are used to manage parking and compensate for GPS inaccuracies	CAPEX optimisation to meet needs	High, with IoT in the terminal
Bikes	- High stresses to withstand exposure to theft, the risk of shock in the event of a fall, and to protect IoT and embedded technologies (GPS, camera).	- • Bike with both charging functions (swappable and in-station charging), • Lock system to the parking furniture • Robustness and IoT onboarding requirements	- Integration of the lock into the bike frame or fork
Batteries	- Two batteries per bike: on the bike and charging Handling shortens service life	Duplicate batteries, but fewer of them	+ One battery per bike Longer service life
IoT placement	- On the bike	On the bike and in the slot stand	+ In the terminal and limited in the bike
Swapping vehicle	+ Numerous	Some	- None
Collection vehicle	Identical	→ ←	Identical
Regulation vehicle	+ Few (because no SLA)	In between, less need for regulation	+ High (according to SLA)
User application	+ Shared with other cities, generally a proprietary brand	←	+ White labelling and adaptation to the needs of local authorities
Information system and software	+ Shared with other cities - Black box	←	+ Solution developed for other cities, + Access for public authorities, with specifications
Financing and cash requirements	+ "Low", with user revenues collected quickly, but insufficient over the long term	←	- Very significant investment at the outset and payment dependent on public authorities

	Dropzones	Hybrid	Charging stations
OPERATION (OPEX)			
Operating costs	- "Very high"	- "High" with more complex operation	+ "Low"
Swapping	- A lot of human resources, makes it possible to carry out a visual check of the bikes' condition	- Depending on station/dropzone percentage and incentives to return bikes to charging station	+ None
Repair of stands and terminals	+ None	- Lower ←	- Repair and cleaning
Collection of bicycles for repair	- Many locations	- More complex (number of collection points, new profession), complicated and costly	+ Control the limited number of locations, thus regulating flows and workloads
Regulation	+ More alternatives with dropzones nearby for the customer	+ Challenge to return bikes to charging stations	- More frequent full/empty stations, with additional effort on the part of the user
Badly parked bikes	- Cost of removal or relocation	- → But lower	Almost none
Risk of theft	- High	- → Lower	+ Lower
Penalties	+ None		← - Potentially high and provisioned
If use rate is high	-- Marginal cost of swapping increases with use, without considering cost of repairs and accelerated wear.	Possible reduction in regulation requirements due to availability of bikes in more locations	- Marginal cost increases with repairs and accelerated wear, with the need for regulations
USER REVENUES			
Type of user	+ More "tickets"	→	← + Long-term, recurring subscriptions
Territorial scope	- Drop in revenue per bike as land coverage expands	→	← + Drop in revenue per bike as land coverage expands
Network density	+ Expectation of higher revenues with more attractive service	→	- Small distances between stations, making service less attractive
Profitability	- Need for public funding due to insufficient revenues	→	← - Need for public funding due to insufficient revenues

	Dropzones	Hybrid	Charging stations
HIDDEN COSTS FOR PUBLIC AUTHORITIES			
Selection of candidates	+ Short, involving few players		← - Long, involving several players
Deployment supervision	- Monitoring of dropzone implementation + implementation costs	→	← - Participation in all meetings with the selected provider and stakeholders
Service supervision	+ Low		← - Regular meetings, field audit, quality analysis, legal/accounting monitoring
Pound	- Removal of obtrusive bicycles	→	
Water services	- Collection from canals and waterpoints	→	← - Collection from canals and waterpoints
Police complaints	- Damage and theft of bicycles	→	← - Damage and theft of bicycles

9.4.4 Public space integration

	Dropzones	Hybrid	Charging stations
PARKING			
Mutualisation with shared e-scooters	- Possible without racks (↘ capacity) No parking racks to stabilise bikes and scooters	→	← - Possible depending on proprietary technology solutions
For 5*2 m ² (10 m ²)	+ 10-12 bikes, 10 if bike racks	Depending on public spaces availability	- 6 bicycles
Minimum length	+ 2.5 to 5 metres	Depending on public spaces availability	- 10-15 meters (except stacking)
Replace car space	+ Space-by-space negotiation	→	- Negotiation of several spaces
Durability	- Location without furniture, except racks	→	← + Multi-year guarantee
Easement - Near public transit stop	+ Multiplication of small dropzones at each station/metro entrance/exit and near bus stops	→	← - Limited availability of continuous linear space nearby
Territorial coverage	+ Hyper-dense and hyper-extensive	→	- Density and limited coverage
Choice of locations	+ Potentially underserved neighbourhoods	Political arbitration on stations	- Numerous political and road trade-offs
Beyond the territory	+ Easy to deploy	→	- Complex to deploy
Physical or visual barrier	+ Possible to cross or bypass		- Not possible if the lock is connected at height

	Dropzones	Hybrid	Charging stations
IMPLEMENTATION			
Flexibility/agility	+ Flexibility to test locations Possible in several phases	+ Tactical urban planning possible before creating charging stations Dropzones can be discontinued if there is too much uncivilised behaviour, and the operation is too expensive.	- Very low and costly flexibility to resize/relocate/expand in response to changing demand. No room for error. Platform or modular stations are a little more flexible.
Works duration	+ A few hours	→ ←	- Several weeks (with connection)
Service delivery	+ A few months	+ Possible to start with dropzones and swapping to identify areas for intervention	- Allow a minimum of one year after signing, after final legal recourse.
Civil engineering and (roads ground networks)	+ None or limited to one post	→ ←	- Location constrained by roads and ground networks and the distance to the power grid Compliance with safety standards Analysis, excavation, risk of asbestos, +/- long trench Restoration to initial condition
Administrative procedures	+ Simplified approach	→ ←	- Dependent on administrative layers (local government authorisations, building permits, RN management, power grid management, etc.).
Landscape integration	+ No constraints		← - Architectural constraints

9.4.5 Impact

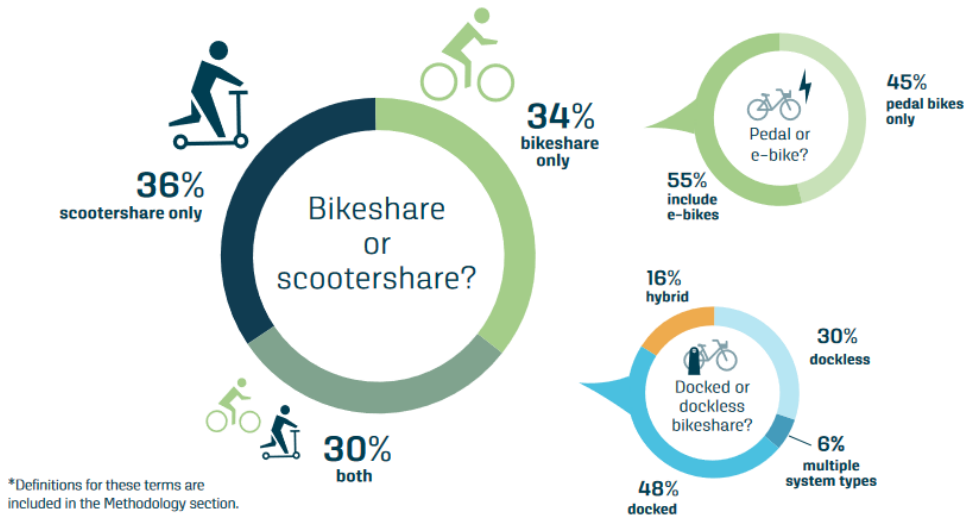
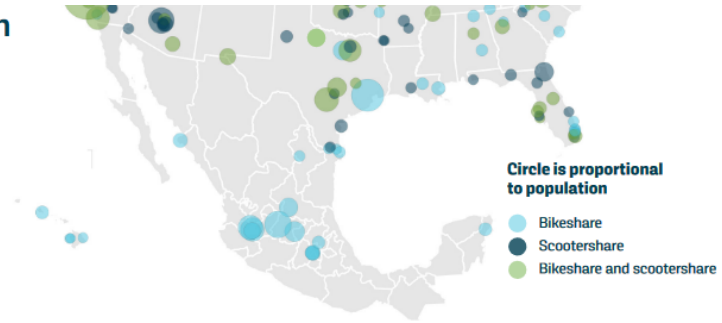
	Dropzones	Hybrid	Charging stations
ENVIRONMENTAL IMPACTS			
Manufacturing and recycling	- Bikes, batteries		← - Bikes, batteries and street furniture
Importation and logistics	- Bikes, batteries		← - Bikes, batteries and street furniture
Operation (depending on vehicles used)	- Journeys for swapping	Reducing both	- Journeys for regulation

9.4.6 Governance, competition and market players

	Dropzones	Hybrid	Charging stations
NUMBER OF PLAYERS			
Local competitive bidding structure	Historically, free competition. Then local oligopolies regulated by the licensing system, or even a monopoly (Grenoble) or bans (Lyon).	Local monopoly for charging stations highly likely due to current lack of universal stations	Local monopoly due to the stations, which imposes a minimum local monopoly on the docking stations
Economies of scale	- If oligopoly, double expenses and sub-optimisation of swapping and maintenance rounds	←	+ Yes, due to the local monopoly
Subscription	- ↘ probability of being a long-term subscriber	←	+ ↗ network effect, probability of subscribing
Economic balance	- Unstable (B2C model), stabilised if subsidised (B2C and B2G2C mix)	←	+ Stable (model B2G2C)
Discussions with public authorities	- Around the table with competitors	←	+ Face to face, a single point of contact for public authorities
Innovation	+ Autonomous and fast	←	+ Within a constrained contractual framework
MARKET STAKEHOLDERS Detailed but probably non-exhaustive list			
Stakeholders	See section 5.3	- Solutions are being deployed by B2C and B2G2C players, but suppliers and operators have little or no experience of a large-scale hybrid system. The market does not yet seem ripe for large-scale deployment.	See section 5.3

9.5 The North American market (Source 31)

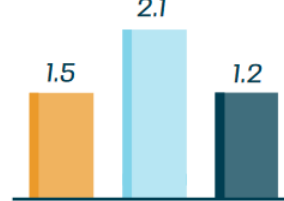
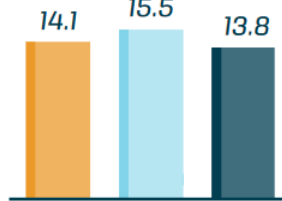
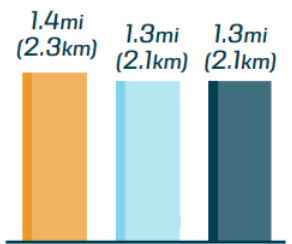
At least **401** cities in North America had a **scootershare** or **bikeshare** system in 2022.



1.4 miles (2.3 km) per trip
Average trip distance

14.1 minutes per trip
Average trip duration

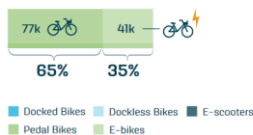
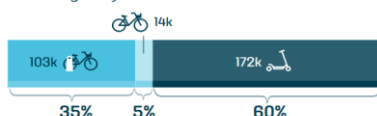
1.5 trips/vehicle/day
Average utilization per deployed service day



Legend: All Vehicles, Bikes, E-scooters

289 Thousand Vehicles

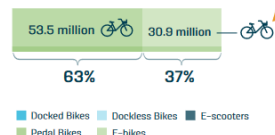
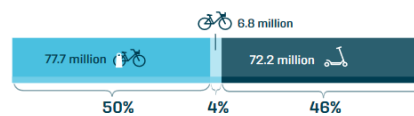
Deployed Across North America on an average day in 2022



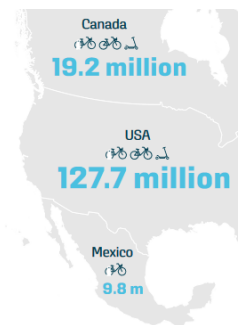
Legend: Docked Bikes, Dockless Bikes, E-scooters, Pedal Bikes, E-bikes

157 Million Trips

Across North America in 2022



Legend: Docked Bikes, Dockless Bikes, E-scooters, Pedal Bikes, E-bikes



9.6 Micromobility market trends (Source 19)

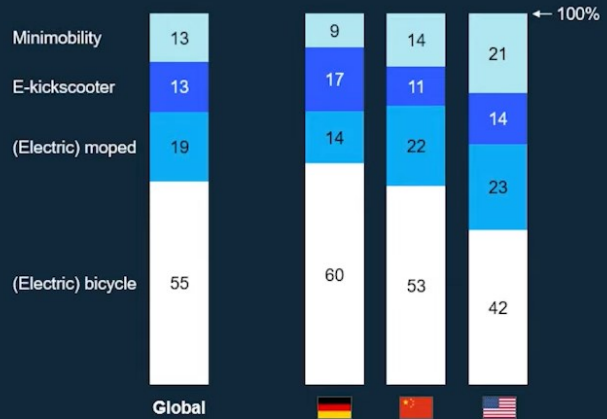
Our 7 key insights on the micro- and minimobility markets

- 1 Global micromobility market expected to reach ~ USD 355 billion by 2030**
Global value pools might increase from ~174 to ~355 bn USD across private and shared manual and electric bicycles, e-kickscooters and (e-)mopeds
- 2 Electric bicycle already accounts for half of today's bicycle value pools in key regions**
Today's electric bicycle market in Europe, Greater China and US with ~ USD 44 billion in value pools, expected to reach ~ USD 114 billion by 2030
- 3 Global minimobility total addressable market estimated at ~ USD 500 billion today**
Global SAM estimated at ~ USD 300 billion in revenue pools, based on a 50% consumer adoption
- 4 70% of urban population globally lives in regulated shared e-kickscooter environments**
Thereof, the majority lives in cities within Greater China
- 5 Bicycle is the preferred mode for consumers globally**
Minimobility vehicles almost equally favored as e-kickscooters on a global level, with particularly high preference in the US
- 6 Approximately 50% of minimobility consumers would use it as a private car extension**
38% of survey respondents would use minimobility as a replacement for their car
- 7 Majority prefers private ownership models for their micromobility vehicle**
This is mainly due to reluctance of sharing with strangers and a higher flexibility than in a shared service

Consumer insights: (e-)bicycle as preferred mode across all regions – minimobility and e-kickscooters equally favored

Preferred micromobility vehicle per country
 Share of respondents, percent rounded

Question: You indicated that you use micromobility services as part of your mobility mix. Which micromobility vehicle do you most prefer to use? Select up to three.



5

9.7 Bike share business skills

CONTRACT SUPERVISION

Contractual and legal monitoring
Field audits and mystery customers
Updating of indicators
Weekly meeting
Mirror software (Paris)
Data analysis and customer survey management
Assessments
Accounting: invoicing, penalties, bonuses

STATION LOCATIONS

Station pre-location study
Integration study for each station
Construction sites (permits, security, follow-up)
System settings
Signage

SUPPLY, LOGISTICS AND ASSEMBLY (CAPEX)

Stations	Back-office IT solution
Bikes	Front-office IT solution
Insurance	Spare parts supply
International logistics	After-sales service

SERVICE OPERATION (OPEX)

FINANCE

- Banking
- Revenue collection
- Revenue allocation

OPERATING COSTS

- Telecommunications
- Electricity
- IT maintenance
- Back office

HUMAN RESOURCES

- Hiring and management
- Key skills: electromechanics
- Wages
- Absenteeism management

COMMUNICATION

- Campaign design
- Dissemination
- Creation of a community spirit

USER RELATIONSHIP

- After-sales service and call centre
- Reception centre

BATTERY CHARGING

- Location
- Cabinet
- Security protocol

STORAGE

- Spare parts and consumables
- Inventory
- Replenishment (CAPEX)

BIKE AND STATIONS REPAIR

- On-street process
- Mobile workshop vehicle
- Warehouse process
- Quality control

BUILDING

- Warehouse
- Supplier reception
- Maintenance department

SWAPPING

- Battery swapping vehicle
- Charging structure and safety
- Battery repair and life cycle

REGULATION

- Regulation shuttle
- Operating software

EXTENSION

- New bikes
- New stations

INSURANCE

- Theft
- Vandalism/Damage
- Accident/Incident

IT

- Computer system
- IT security
- Banking transactions

9.8 Details of PB and PT integration issues

	PB - PT integration challenges	Feasibility	Comments
PEOPLE	Intermodal and multimodal users	✓	Already using one of the two modes
	Access by age	~	Different age categories
	Access by capacity	✗	Blind, severely visually impaired and wheelchair users cannot ride bicycles
PRODUCTS	Use the same ticket for PT and PB	✗	1. Need to identify the PB user and have a bank imprint (otherwise, risk of bike theft) 2. Need to harmonise usage times (30 min for PB, 60 min + transfer for PT)
	Use PT and bicycles with the same subscription	~	Request additional information for PB (deposit, post-payment authorisation, T&C)
	24-hour service	✗	Budget and maintenance constraints for PT
PLACES	PB positioned near PT stops	~	Visibility and access time, but competition for public space between modes
	Ensure the cohabitation of pedestrians, cyclists and buses	~	Enforce the Brussels' STOP principle
	Guarantee commercial speed	~	Balance with the STOP principle?
	Improve territorial coverage	✓	PB station in the interstices of the PT network on radial routes
PRICE	Attractive combined pricing	✓	Voucher with customer number
	Special offer	✓	First trip for free
	Same PB - PT pricing, without distinction	~	To be defined, with overall price increase, but many PT products
PROMOTION	Single brand	✓	Harmonise brands
	Common or specific advertising	✓	A little advertising for the combination, a lot for each service
	Face-to-face sales	✓	Advertising for the combination, as for each service
	Partner and prescriber approach	✓	Need for the resources
	Create a sense of community	✓	

	PB - PT integration challenges	Feasibility	Comments
PROCESS			
Register	Incognito for a ticket	✘	Possible for PT, not for PB
	Subscription information	~	Different information required
	Register only once	✓	One account for all modes
Obtain information	PB stops and stations	~	Limited space available on PB stations
	Website	✓	Avoid two clicks to reach the PB info
	App	✓	One common app
	With humans: agency, bus	~	Training customer-facing staff
	Real-time information	✓	GTFS and GBFS
Book	Route planner	✓	Displays intermodal routes.
	PT and PB network map	✓	Several map versions
	Line thermometer	✓	
	Directional signage	✓	PB indicated in metro stations
	Positioning signage	✓	Hub signage
	Website	✘	Not possible for PT, booking rare
	Mobile app	✘	Not possible for PT, possible for PB
Pay	In agency	✓	Interface adaptation
	PT vending machines and PB stations	✓	Interface adaptation
	To a third-party organisation	✘	Buy a ticket on the Eurostar?
Access	Cash	✘	Difficult for PB
	Deposit	✘	Signature required, check amount available + direct debit authorisation
	Pre-payment - Bank imprint/transaction €0	~	Not necessary for PT
	Travel credit	~	
	Post-payment	✘	PB (after journey), PT (end of day or end of month)
	Smartphone	✓	Bluetooth technology, NFC, QR code
	Season ticket	✓	Same RFID technology
PROOF	Bank card/open payment	✘	Incompatible deposit amount
	Client testimonials	✓	To be found once implemented
	Actual practice data	~	Avoid the GDPR with a single common customer database and make assumptions due to lack of check out in PT
	Loyalty programme	✓	Common program, with authorisation in the same data base to track the intermodal journey

9.9 Compilation of price lists

9.9.1 Public Bicycles

Barcelona - Ambici

<https://www.ambici.cat/en/>

The screenshot displays the TMB website's transport network interface. At the top, there are navigation links for 'Transport network', 'T-mobilitat', 'Tickets and fares', and 'Visit Barcelona'. The main heading is 'Transport network'. Below this is a 'Journey planner' section with options for 'Search nearby', 'iBus', and 'iMetro'. The journey planner includes 'From' and 'To' fields with location selection icons and a 'Search' button. Below the journey planner are four icons representing different transport modes: Metro lines (M), Bus routes (B), Bus on demand (B), and AMBici (bi).

Below the transport mode icons, there are three promotional cards for travel passes:

- AMBici annual pass**: I want this fare! [↗](#)
- AMBici + Bicing metropolitan pass flat rate**: I want this fare! [↗](#)
- AMBici + Bicing metropolitan per use pass**: I want this fare! [↗](#)

At the bottom, there are three detailed cards for travel passes under the heading '2023 PRICES':

AMBici travel passes	METROPOLIN TRAVEL PASS	METROPOLIN TRAVEL PASS
€25 a year	AMBici + Bicing flat rate €65 a year	AMBici + Bicing pay per use price €53 a year
The first 30 minutes of each rental period are included (€0.15 as of 2024). After the first 30 minutes, you will pay €0.50 for each additional 30-minute period, up to a maximum of 2 hours. Using the application has a cost of €0. The AMBici card has an additional fee of €6. Starting in 2024, the AMBici subscription will cost €40/year.	The first 30 minutes of each rental period in the AMBici service are included (€0.15 as of 2024). After the first 30 minutes, you will pay €0.50 for each additional 30-minute period, up to a maximum of 2 hours. Check the prices for the Bicing service (flat rate travel card) at the website . Using the app costs €0. The AMBici card has an additional fee of €6.	The first 30 minutes of each rental period in the AMBici service are included (€0.15 as of 2024). After the first 30 minutes, you will pay €0.50 for each additional 30-minute period, up to a maximum of 2 hours. Check the pay per use prices for the Bicing service (pay per use pass), at the website . Using the app costs €0. The AMBici card has an additional fee of €6.
I want to buy this travel pass.	I want to buy this travel pass.	I want to buy this travel pass.

Barcelona - Bicing

<https://www.bicing.barcelona/es/tarifas>

	Tarifa Plana		Tarifa por uso		Abono metropolitano (Bicing + AMBici) Tarifa Plana		Abono metropolitano (Bicing + AMBici) Tarifa por uso	
	50 €/año		35 €/año		65 €/año		53 €/año	
	BICICLETA MECÁNICA	BICICLETA ELÉCTRICA	BICICLETA MECÁNICA	BICICLETA ELÉCTRICA	BICICLETA MECÁNICA	BICICLETA ELÉCTRICA	BICICLETA MECÁNICA	BICICLETA ELÉCTRICA
Primeros 30 minutos	Gratis	0,35 €	0,35 €	0,55 €	Gratis	0,35 €	0,35 €	0,55 €
30 min - 2 horas (Fracción de 30')	+0,70 €	+0,90 €	+0,70 €	+0,90 €	+0,70 €	+0,90 €	+0,70 €	+0,90 €
A partir de 2 horas	+5€/hora	+5€/hora	+5€/hora	+5€/hora	+5€/hora	+5€/hora	+5€/hora	+5€/hora

Chicago - Divvy Bikes

<https://divvybikes.com/>

	Single Ride	Day Pass	Divvy	Lyft Pink
	\$1 + \$0.17/min	\$16.50/day	\$130.90/year	\$199/year
	Get the app →	Get a day pass →	Join →	Join →
Classic bike prices	\$1 unlock + \$0.17/min	3 hours free, then \$0.17/min	45 min free, then \$0.17/min	45 min free, then \$0.17/min
Scooter prices	\$1 unlock + \$0.42/min	Free unlocks + \$0.42/min	Free unlocks + \$0.27/min	Free unlocks + \$0.27/min
Ebike prices	\$1 unlock + \$0.42/min	Free unlocks + \$0.42/min	Free unlocks + \$0.17/min	Free unlocks + \$0.17/min
Bike Angels			●	●
Rideshare benefits				●

Madrid - Bicimad

<https://www.bicimad.com/en/bicimad>

Tarifa del contrato básico

Primera fracción de hasta 30 minutos: 0,50 €.

Segunda fracción de hasta 30 minutos: 0,50 €.

Siguientes fracciones de hasta 30 minutos: 3 €.

Tarifa plana 30 días

Cuota de 10 € mensuales:

- Viajes gratis ilimitados de hasta 30 minutos.
- Segunda fracción de hasta 30 minutos: 0,50 €.
- Sigüientes fracciones de hasta 30 minutos: 3 €.

Cologne - KVB

<https://nextbike-live.pluspol-networks.de>

Standardtarife		Vorteilstarife
<p>FÜR GELEGENHEITSAHNER*INNEN</p> <h3>Basistarif</h3> <p>1 €/15 min</p> <p>Du fährst im Basistarif, wenn du keinen anderen Tarif gebucht hast und zahlst max. 15 €/24 h pro Ausleihe.</p>	<p>FÜR VIELFAHNER*INNEN</p> <h3>Monatstarif</h3> <p>10 €/Monat</p> <p>Die ersten 30 Minuten pro Ausleihe sind inklusive. Für jede weitere halbe Stunde zahlst du 1 € (max. 15 €/24 h).</p>	<p>FÜR DAUERNUTZER*INNEN</p> <h3>Jahrestarif</h3> <p>60 €/Jahr</p> <p>Die ersten 30 Minuten pro Ausleihe sind inklusive. Für jede weitere halbe Stunde zahlst du 1 € (max. 15 €/24 h).</p>

Standardtarife	Vorteilstarife
<p>FÜR ALLE MIT VRS-CHIPKARTE & FÜR STUDIERENDE</p> <h3>VRS-Basistarif</h3> <p>0 €/30 min</p> <p>Die ersten 30 Minuten pro Ausleihe sind inklusive. Für jede weitere halbe Stunde zahlst du 1 € (max. 9 €/24 h).</p> <p>Alle mit VRS-Chipkarte genießen Vergünstigungen in Köln und weiteren Städten und Gemeinden im VRS. Studierende kooperierender Hochschulen genießen ebenfalls Vergünstigungen. Mehr Infos zur Vergünstigung gibt es unter Partner und CAMPUSbike.</p>	

Dijon - Divia VéloDi

<https://www.divia.fr/en/bicycle/diviavelodi/see-rates>

À LA STATION DIVIAVÉLODI

Droits d'accès DiviaVéloDi 1h 1,00 €

Actif instantanément

DÉPÔT DE GARANTIE ET PAIEMENT PAR CB À LA BORNE

Première heure gratuite
Puis par heure entamée : 1€



Droits d'accès DiviaVéloDi 24h 1,50 €

Actif instantanément

DÉPÔT DE GARANTIE ET PAIEMENT PAR CB À LA BORNE

Première 1/2 heure gratuite
Puis par 1/2 heure entamée : 1 €



Droits d'accès DiviaVéloDi 7 jours 7,00 €

Actif instantanément

DÉPÔT DE GARANTIE ET PAIEMENT PAR CB À LA BORNE

Première 1/2 heure gratuite
Puis par 1/2 heure entamée : 1 €



SUR VOTRE CARTE DIVIAMOBILITÉS

POUR LES ABONNÉS DIVIA BUS&TRAM

Droits d'accès DiviaVéloDi mensuel 5,00 €

Actif le lendemain de la souscription

CARTE NOMINATIVE DIVIAMOBILITÉS + RIB / UN CHÈQUE DE 200€ OU UN MANDAT SEPA À TITRE DE DÉPÔT DE GARANTIE

Première 1/2 heure gratuite
Puis par 1/2 heure entamée : 1 €

Je m'abonne >



Droits d'accès DiviaVéloDi annuel 22,00 €

Actif le lendemain de la souscription

CARTE NOMINATIVE DIVIAMOBILITÉS + RIB / UN CHÈQUE DE 200€ OU UN MANDAT SEPA À TITRE DE DÉPÔT DE GARANTIE

Première 1/2 heure gratuite
Puis par 1/2 heure entamée : 1 €

Je m'abonne >



POUR LES NON-ABONNÉS DIVIA BUS&TRAM

Droits d'accès DiviaVéloDi mensuel 10,00 €

Actif le lendemain de la souscription

CARTE NOMINATIVE DIVIAMOBILITÉS + RIB / UN CHÈQUE DE 200€ OU UN MANDAT SEPA À TITRE DE DÉPÔT DE GARANTIE

Première 1/2 heure gratuite
Puis par 1/2 heure entamée : 1 €

Je m'abonne >



Droits d'accès DiviaVéloDi annuel 30,00 €

Actif le lendemain de la souscription

CARTE NOMINATIVE DIVIAMOBILITÉS + RIB / UN CHÈQUE DE 200€ OU UN MANDAT SEPA À TITRE DE DÉPÔT DE GARANTIE

Première 1/2 heure gratuite
Puis par 1/2 heure entamée : 1 €

Je m'abonne >



London - Santander Cycles

<https://tfl.gov.uk/modes/cycling/santander-cycles/what-you-pay?intcmp=2315>

Pay as you ride - £1.65 for up to 30 minutes

- £1.65 for each additional 30 minutes

Monthly membership - £20 a month

- Unlimited rides up to 60 minutes for 30 days
- Rides longer than 60 minutes pay £1.65 for each additional 60 minutes

Annual membership - £120 a year

- Unlimited rides up to 60 minutes for 365 days
- Rides longer than 60 minutes pay £1.65 for each additional 60 minutes

E-bikes (users must be registered)

- £3.30 for single rides up to 30 minutes - £3.30 for each additional period up to 30 minutes
- Monthly: add a surcharge of £1 (on top of the £20 monthly membership fee) for rides up to 60 minutes - £3.30 for each additional period up to 60 minutes
- Annual: add a surcharge of £1 (on top of the £120 annual membership fee) for rides up to 60 minutes - £3.30 for each additional period up to 60 minutes
- Hire only available through the app or a membership key

Luxembourg - Vel'oh

<https://myveloh.lu/en/offers/groups>

<p>VEL'OH AU QUOTIDIEN</p> <p>Choisissez la simplicité avec l'abonnement 1 an. Avec votre carte personnelle, louez un vélo rapidement et effectuez de multiples opérations.</p> <p>EN SAVOIR +</p>	<p>VEL'OH À L'OCCASION</p> <p>Des formules sans engagement, pour découvrir le service ou explorer la ville, pour une journée ou trois jours à partir de 2,00 € seulement.</p> <p>EN SAVOIR +</p>	<p>VEL'OH BUSINESS</p> <p>Des formules pour faciliter aux entreprises l'accès aux abonnements pour leurs employés</p> <p>EN SAVOIR +</p>
<p>ABONNEMENT LONGUE DURÉE</p> <p>Abonnez-vous et accédez immédiatement au service avec un nombre de trajets illimité pendant 1 an. Première demi-heure gratuite, puis au-delà de la période de gratuité : toute heure d'utilisation supplémentaire sera facturée 1,00€ jusqu'à un maximum de 5,00€ pour 24h ; au-delà de 24 heures d'utilisation la garantie est prélevée.</p>	<p>18 €</p> <p>CHOISIR CETTE FORMULE</p>	
<p>TICKET 1 JOUR</p> <p>Envie d'une sortie vélo occasionnelle ? La formule courte durée 1 jour est faite pour vous. Les 30 premières minutes de chaque trajet sont offertes. Au-delà de la période de gratuité : toute heure d'utilisation supplémentaire sera facturée 1,00€ jusqu'à un maximum de 5,00€ pour 24h ; au-delà de 24 heures d'utilisation la garantie est prélevée.</p>	<p>2 €</p> <p>CHOISIR CETTE FORMULE</p>	
<p>TICKET 3 JOURS</p> <p>Avec cette formule, vous bénéficiez d'un nombre de trajets illimité pendant 72 heures à compter de l'activation de votre ticket. Les 30 premières minutes de chaque trajet sont offertes. Au-delà de la période de gratuité : toute heure d'utilisation supplémentaire sera facturée 1,00€ jusqu'à un maximum de 5,00€ pour 24h ; au-delà de 24 heures d'utilisation la garantie est prélevée.</p>	<p>5 €</p> <p>CHOISIR CETTE FORMULE</p>	
<p>OFFRE BUSINESS VEL'OH!</p> <p>Offre uniquement accessible grâce à un code entreprise. La formule Semi-Business prévoit que l'employeur et l'employé se partagent les frais : l'abonnement annuel de l'employé est payé par l'entreprise tandis que les frais supplémentaires* et la caution resteront à charge de l'employé.</p>	<p>18 €</p> <p>CHOISIR CETTE FORMULE</p>	
<p>OFFRE BUSINESS INSTITUTIONS EUROPÉENNES</p> <p>Offre accessible grâce à un code entreprise fourni par les Institutions Européennes. La formule Semi-Business prévoit que l'employeur et l'employé se partagent les frais : l'abonnement annuel de l'employé est payé par l'entreprise tandis que les frais supplémentaires* et la caution resteront à charge de l'employé.</p>	<p>18 €</p> <p>CHOISIR CETTE FORMULE</p>	

Marseille - Levélo

<https://levelo.ampmetropole.fr/fr/about>

Paiement à l'usage

Idéal pour effectuer des trajets ponctuels

- Coût d'accès gratuit
- 1€ les 30 premières minutes puis 0,05€/min au-delà

ACHERER

Conditions

Caution vélo : 300€

Pass 24h

Accès au service levélo à la journée

- Coût d'accès 3€
- 30 minutes gratuites par trajet + 0,05 € / min au-delà

ACHERER

Conditions

Caution vélo : 300€

levélo Permanent Tout Public

Profitez du vélo en illimité toute l'année

- Coût d'accès 6€/mois
- 30 minutes gratuites par trajet + 0,05 € / min au-delà

ACHERER

Conditions

Par prélèvement automatique. Engagement sur douze mois avec tacite reconduction.

Caution vélo : 300€

levélo Permanent réduit -26ans

Profitez du vélo en illimité toute l'année

- Coût d'accès 3€/mois
- 30 minutes gratuites par trajet + 0,05 € / min au-delà

ACHERER

Conditions

Abonnement mensuel disponible pour tous les -26ans. Par prélèvement automatique. Engagement sur douze mois avec tacite reconduction.

Caution vélo : 300€

Combiné transport

Abonnement mensuel pour les titulaires d'un abonnement de transport*

- Coût d'accès gratuit
- 30 minutes gratuites par trajet + 0,05 € / min au-delà


ACHERER

Conditions

*Titulaire d'un pass Intégral, pass Métropole ou d'un Pass XL. Voir conditions en détails pour découvrir la liste des abonnements compatibles.

New York - Citybike

<https://citibikenyc.com/pricing>

	Course unique	Laissez-passer d'un jour	Citi Bike	Lyft Pink
	4,49 \$ pour 30 minutes	19 \$/jour	205 \$/année	199 \$/an
	Téléchargez l'appli →	Obtenez un laissez-passe... →	Joignez-vous à nous →	Joignez-vous à nous →
Vélo déverrouillé	4,49 \$	gratuit	gratuit	gratuit
Prix des vélos électriques	0,26 \$/min	0,26 \$/min	0,17 \$/min	0,17 \$/min
Temps de course 30 min		30 min	45 min	45 min
Bike Angels				

Paris - Vélib' Métropole

<https://www.velib-metropole.fr/en>

Offre courte durée

1 ou 3 jours

Parcourez la ville à Vélib' pendant un trajet ou quelques jours

[Je choisis mon forfait](#)

Abonnement sur 12 mois



Trouvez l'abonnement Vélib' qui vous convient



[Je choisis mon abonnement](#)



LES FORFAITS TEMPORAIRES



Parcourez la ville à Vélib' pendant un trajet ou quelques jours



<h3>TICKET-V</h3> <p>3 €</p> <ul style="list-style-type: none">✓ Un trajet en Vélib' mécanique ou électrique (au choix)✓ Inclus 45 minutes <p>En savoir plus</p>	<h3>PASS 24H CLASSIQUE</h3> <p>5 €</p> <ul style="list-style-type: none">✓ 24 heures à Vélib' (électrique en supplément)✓ Inclus 30 minutes en Vélib' mécanique✓ Location jusqu'à 5 vélos simultanément <p>En savoir plus</p>
<h3>PASS 24H ELECTRIQUE</h3> <p>10 €</p> <ul style="list-style-type: none">✓ 24 heures à Vélib' (électrique inclus)✓ Inclus 60 minutes en Vélib' mécanique✓ Inclus 45 minutes en Vélib' électrique✓ Location jusqu'à 5 vélos simultanément <p>En savoir plus</p>	<h3>PASS 3 JOURS</h3> <p>20 €</p> <ul style="list-style-type: none">✓ 72 heures à Vélib' (électrique inclus)✓ Inclus 60 minutes en Vélib' mécanique✓ Inclus 45 minutes en Vélib' électrique✓ Location jusqu'à 5 vélos simultanément <p>En savoir plus</p>

	0-45 min	Au-delà 1 € / 30min
	1 trajet au choix (mécanique ou électrique)	Au-delà 2 € / 30min
3 €		Souscrire

PASS 24H CLASSIQUE <small>24 heures à Vélib' (électrique en supplément)</small>		0-30 min gratuit	Au-delà 1 € / 30min
		0-45 min 2 €	Au-delà 2 € / 30min
Nombre de Vélib' : - 1 +		5 €	Souscrire

TICKET-V <small>Un trajet en Vélib' mécanique ou électrique (au choix)</small>		0-45 min	Au-delà 1 € / 30min
		1 trajet au choix (mécanique ou électrique)	Au-delà 2 € / 30min
		3 €	Souscrire



PASS 24H ELECTRIQUE <small>24 heures à Vélib' (électrique inclus)</small>		0-60 min gratuit	Au-delà 1 € / 30min
		0-45 min 5 trajets gratuits* <small>*Puis 2€ / trajet à partir du 6e trajet</small>	Au-delà 2 € / 30min
Nombre de Vélib' : - 1 +		10 €	Souscrire



PASS 3 JOURS <small>72 heures à Vélib' (électrique inclus)</small>		0-60 min gratuit	Au-delà 1 € / 30min
		0-45 min 5 trajets gratuits* <small>*Puis 2€ / trajet à partir du 6e trajet</small>	Au-delà 2 € / 30min
Nombre de Vélib' : - 1 +		20 €	Souscrire



LES ABONNEMENTS

Avec engagement 12 mois

V-LIBRE 0 € / mois	V-PLUS 3,10 € / mois	V-MAX 9,30 € / mois
<ul style="list-style-type: none"> ✓ Pour les utilisateurs occasionnels ✓ Sans abonnement ✓ Paiement dès la 1ère minute ✓ Minutes Bonus : Activé 	<ul style="list-style-type: none"> ✓ Pour les utilisateurs réguliers (plus de 4 trajets par mois) ✓ Inclus 30 minutes en Vélib' mécanique ✓ Engagement 12 mois ✓ Minutes Bonus : Activé 	<ul style="list-style-type: none"> ✓ Le tout inclus de Vélib' (mécanique et électrique) ✓ Inclus 60 minutes en Vélib' mécanique ✓ Inclus 45 minutes en Vélib' électrique ✓ Engagement 12 mois ✓ Minutes Bonus : Activé

V-PLUS Pour les utilisateurs réguliers (plus de 4 trajets par mois)	 	<p>0-30 min gratuit</p> <p>Au-delà 1 € / 30min</p> <p>0-45 min 2 €</p> <p>Au-delà 2 € / 30min</p>	
Choisissez votre abonnement : V-Plus		3,10 € / mois pendant 12 mois	Souscrire <small>ou réglez votre abonnement en une fois pour 37,20 €</small>





V-MAX Le tout inclus de Vélib' (mécanique et électrique)	 	<p>0-60 min gratuit</p> <p>Au-delà 1 € / 30min</p> <p>0-45 min 2 trajets gratuits / jour*</p> <p><small>*Puis 2€ / trajet à partir du 3e trajet</small></p> <p>Au-delà 2 € / 30min</p>	
Choisissez votre abonnement : V-Max		9,30 € / mois pendant 12 mois	Souscrire <small>ou réglez votre abonnement en une fois pour 111,60 €</small>

V-LIBRE Pour les utilisateurs occasionnels	 	<p>0-30 min 1 €</p> <p>Au-delà 1 € / 30min</p> <p>0-45 min 3 €</p> <p>Au-delà 2 € / 30min</p>	
		0 € / mois pendant 12 mois	Souscrire

Vienna - Wien Mobil Rad

<https://www.wienerlinien.at/web/wl-en>

Preise & Tarifs

 € 0,60 / 30 min	 € 0,30 / 30 min Für Stammkund*innen	 € 49 / Jahr	 € 25 / Jahr Für Stammkund*innen
Standardtarif Maximal EUR 14,90 pro 24 Stunden und Ausleihe! Jetzt registrieren	WienMobil Mix Tarif Wiener Linien Stammkund*innen fahren mit 50% Rabatt! Jetzt registrieren	Standard Jahresabo Bei jeder Fahrt: die ersten 30 Minuten kostenlos! Jetzt registrieren	WienMobil Mix Jahresabo Für Stammkund*innen: 50% Rabatt aufs Jahresabo! Jetzt registrieren

9.9.2 Private Shared Bicycles

Various prices on the MaaS Jelbi app (Berlin)

The screenshot displays three bicycle sharing options in the MaaS Jelbi app:

- Voi e-scooter No. JU2X:** 28% battery, 4.9 km range. Price: €0.49 + €0.22/min. Includes an "Unlock now" button and navigation icons (Discover, Tickets, Account).
- Bolt Bike XX-899:** 50% battery, 27 km range. Price: Free + €0.26/min. Includes an "Unlock now" button and "Help" / "How it works" links.
- TIER Bike No. 60:** 82% battery, 23 km range. Price: €1 + €0.23/min. Includes an "Unlock now" button and "Help" / "How it works" links.

Basic Pricing for Bolt Bike:
 Basic rate - Free + €0.26/min
 On parking mode - €0.09/min

Basic Pricing for TIER Bike:
 Basic rate - €1 + €0.23/min
 On parking mode - €0.23/min

Fees for TIER Bike:
 Parking outside station - €1
 Parking outside zone - €20

Donkey Republic



The screenshot shows the app interface with rental deals and a bike selection screen:

- Rental Deals:**
 - 24 Hour Deal: 12 € (Économisez jusqu'à 25%*)
 - 48 Hour Deal: 17 € (Économisez jusqu'à 39%*)
 - 72 Hour Deal: 20 € (Économisez jusqu'à 50%*)
 - Week Deal: 29 € (Économisez jusqu'à 61%*)
- Bike Selection Screen:**
 - 1 Vélo Électrique
 - Code de réduction
 - Assurance vol
 - Ajouter assurance vol (2 CHF vélo électrique/jour)*
 - Police d'assurance
 - Portefeuille (19 CHF)
 - Ajouter des fonds

Carvélo2go

The screenshot shows the Carvélo2go app interface for a cargo bike rental:

- Location:** Bern
- Time:** 19:30 to 21:30 on 05.05.2023
- Distance:** 1,4km
- Bike Model:** Riese & Müller | Packster 60 2020
- Price:** Réserver pour CHF 12,00

Dott

← Découvrez les pass Dott

Pass 2 trajets
2 trajets avec débloquages inclus
valables 24 heures
3,49 € 3,99 €

Débloquages gratuits
Débloquages illimités pendant 30 jours
3,99 €

Dott Flex
Trajets illimités à 2,00 € chacun
pendant 30 jours
2,99 €

Dott Pro
Trajets illimités à 1,00 € chacun pendant
30 jours
12,99 €

Pony

Abonnements

Explorez la ville
Pass 24h
Illimité pour 24h
24 heures
6.99€

Le plus populaire
Abonnement Mensuel
2 trajets par jour
Mensuel (renouvellement auto)
39.99€

Acheter

Abonnements

Déverrouillage Illimité
Déverrouillage gratuit sur tous vos trajets
Mensuel (renouvellement auto)
2.99€

Pour le quotidien
Pass Aller-Retour
2 trajets gratuits dans les prochaines 24h
24 heures
3.49€

Acheter

Déverrouillage Illimité

Déverrouillage gratuit sur tous vos trajets
Mensuel (renouvellement auto)
Déblocage : 0.00€
Prix par min : standard
Trottinettes
20 trajets par jour (max)
120 minutes par jour (max)
40 minutes par trajet (max)
2.99€

Tier

Configuration du paiement

Ajoute du crédit à ton compte avant de circuler afin de bénéficier de promo ou paie après ton trajet.
1 € pour démarrer, puis 0,25 €/minute commencée.
Une caution de 5 € peut vous être facturée au départ du trajet.
La caution sera appliquée au prix total du trajet. Si celui-ci est inférieur à la caution, nous vous rembourserons la différence.

POURSUIVRE

Ajouter du crédit

Ajoute du crédit à ton compte
Sélectionne le montant

10,00 €

20,00 €

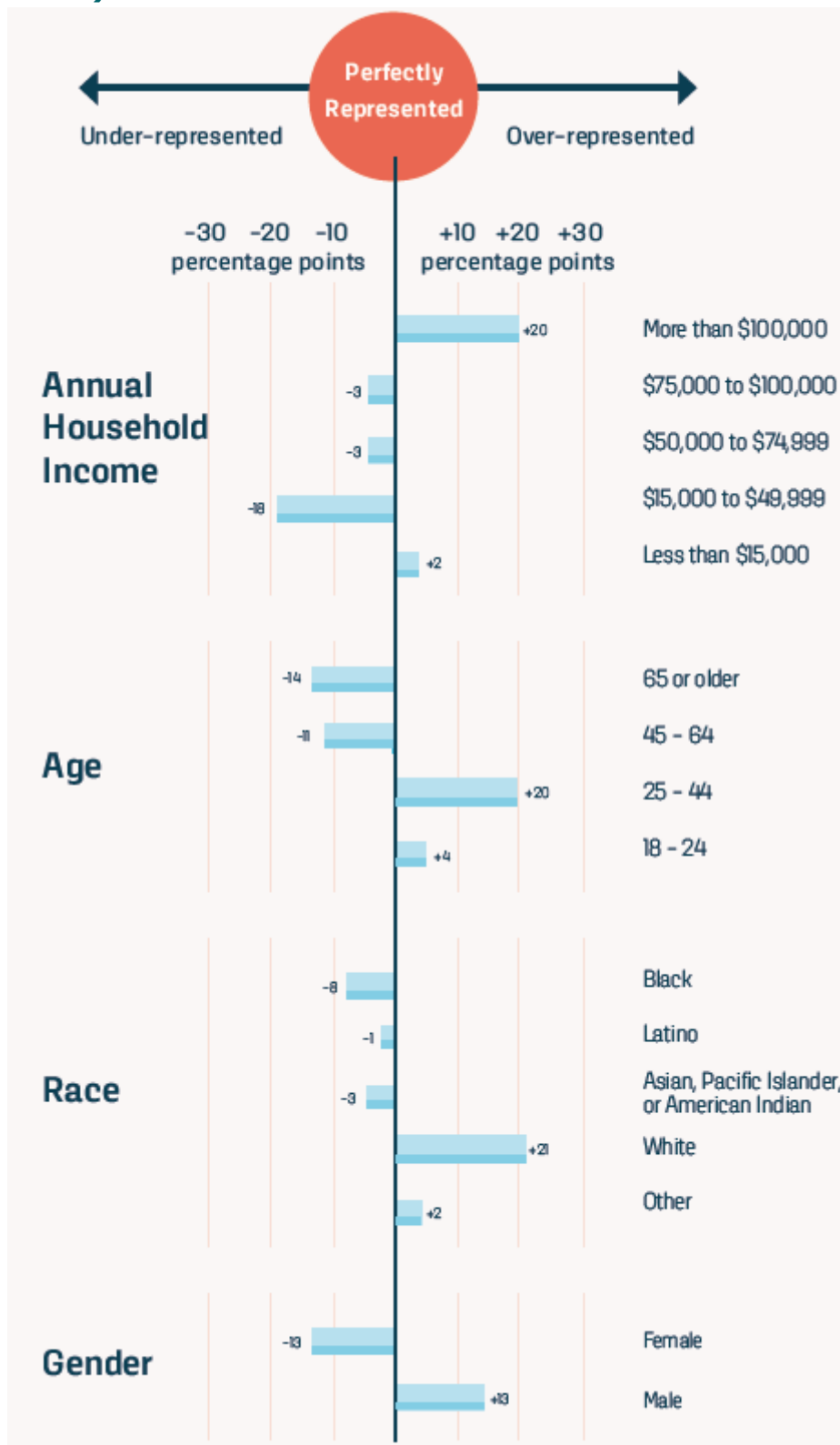
30,00 €

Payer après le trajet

Les conditions de paiement de Bird s'appliquent.

POURSUIVRE

9.10 Under-representation of certain groups in North America (Source 36)



10 Table of figures

FIGURE 1: PREFERENCES BETWEEN OWNING AND RENTING MICROMOBILITY IN GERMANY, THE US AND CHINA (SOURCE 19)	5
FIGURE 2: OVERVIEW OF HOW TO ACCESS A BIKE IN GOOD CONDITION	5
FIGURE 3: OVERVIEW OF RENT-A-BIKE DIVERSITY	6
FIGURE 4: EXAMPLES OF RENT-A-BIKE SERVICES	6
FIGURE 5: ACCESSORIES FOR A ONE-WAY TOURISM RENTAL (CHEZ PAULETTE)	7
FIGURE 6: LONG-TERM RENTAL (LTR) OF BICYCLES FOR EMPLOYERS (AZFALTE)	7
FIGURE 7: OVERVIEW OF ADAPTED BICYCLES (PRAXIE DESIGN)	7
FIGURE 8: LTR IN MOBILITY MANAGEMENT	8
FIGURE 9: YEARLY CREATIONS OF PUBLIC BICYCLES, LONG TERM BICYCLE RENTAL AND PURCHASE AIDS (SOURCE 9)	8
FIGURE 10: ILLUSTRATIONS OF LTR (PHOTOS: VÉLO SOLIDAIRE - PROVELO, OTHERS B. BEROU)	9
FIGURE 11: BIKE SHARE, PUBLIC BICYCLES AND OTHER RELATED NAMES	10
FIGURE 12: SOME MUST-READ DOCUMENTS ON SHARED BICYCLES	10
FIGURE 13: MAIN INTERNATIONAL CONFERENCES IN EUROPE VISITED DURING THE STUDY	10
FIGURE 14: SHARED BIKES WORLDWIDE FROM THE RUSSELL MEDDIN MAP	10
FIGURE 15: MILESTONES IN THE HISTORY OF BIKE SHARE	11
FIGURE 16: BIKE SHARE MAIN GENERATIONS	11
FIGURE 17: FREE-FLOATING (2019) AND BACK-TO-MANY (2020) PARKING LOCATIONS IN PARIS (SOURCE?)	12
FIGURE 18: FLOW OF FREE-FLOATING MICROMOBILITY (LEFT) AND DROPZONES LOCATIONS (RIGHT) IN BRUSSELS	12
FIGURE 19: AN INCREASINGLY DIVERSIFIED MOBILITY OFFER (SOURCE 2)	13
FIGURE 20: SIMPLIFIED REPRESENTATION OF BIKE SHARE IN RELATION TO OTHER MODES (SOURCE 34)	13
FIGURE 21: HISTORICAL VIEW OF BIKE SHARE GOVERNANCE MODELS WORLDWIDE IN 2011 (SOURCE 4)	14
FIGURE 22: DIFFERENT MODELS OF GOVERNMENT INTERVENTION (SOURCE: M. BENETT, S. SCHWARTZ)	14
FIGURE 23: CHARACTERISTICS AND CURRENT DEVELOPMENT OF THE PRIVATE AND PUBLIC BIKE SHARE MARKETS	15
FIGURE 24: ELECTRIFICATION OF PB FLEETS BETWEEN 2017 AND 2020 (SOURCE 40)	16
FIGURE 25: OVERUSE OF PEDELECS IN MIXED FLEETS	16
FIGURE 26: ANNUAL RENTALS/ACTUALLY AVAILABLE BIKES/DAY, BEFORE AND AFTER FLEET ELECTRIFICATION	16
FIGURE 27: SHARED BICYCLES, A LARGER OVERALL SIZE	17
FIGURE 28: A CUSTOMIZED SHUTTLE TO AVOID LIFTING PEDELECS (BARCELONA)	17
FIGURE 29: "TAP AND RIDE" SOLUTION DEVELOPED BY MASTERCARD AND YELLOBIKE (PHOTO MASTERCARD)	17
FIGURE 30: SHARED CARGO BIKES IN EUROPE (SOURCE 41)	18
FIGURE 31: CROSS-FUNCTIONALITY BETWEEN PARKING AND CHARGE OF E-SHARED BIKES	19
FIGURE 32: COMPARISON OF RENTALS/VEHICLE/DAY BETWEEN BIKE SHARE IN STATION, OR NOT AND SHARED E-SCOOTERS	20
FIGURE 33: PHOTOS OF BIKE SHARE CHARGING STATIONS (PHOTOS: * COMPANY QUOTED, OTHERS: B. BEROU)	20
FIGURE 34: COMPATIBILITY OF CHARGING STATIONS WITH SHARED BICYCLES	21
FIGURE 35: DIFFERENT OPTIONS FOR DELIVERING ELECTRICITY TO STATIONS (STATION FIFTEEN)	21
FIGURE 36: DEVELOPMENT OF THE MICROMOBILITY MARKET IN EUROPE FROM 2020 TO 2023 (SOURCE 16)	24
FIGURE 37: SEASONAL TRENDS IN SHARED MOBILITY FLEETS IN 2022 (SOURCE 15)	24
FIGURE 38: PESTEL ANALYSIS OF THE BIKE SHARE INDUSTRY IN 2023	25
FIGURE 39: ARTICLES ON BIKE SHARING IN THE EUROPEAN CYCLING STRATEGY (SOURCE 13)	25
FIGURE 40: POSITIONING OF BIKE SHARE PLAYERS IN THE VALUE CHAIN	26
FIGURE 41: PRICE RANGE DIVERSITY (MONTREAL, LEIPZIG, DOTT BRUSSELS)	29
FIGURE 42: DIFFERENCES AND COMPLEMENTARITIES BETWEEN PT AND PB	30
FIGURE 43: COMPARISON OF PB RENTALS WITH TRIPS ON URBAN PT NETWORKS	32
FIGURE 44: NO COMMUNICATION BETWEEN PT AND PB CUSTOMERS AND TRIPS DATABASES	33
FIGURE 45: DATA ON MULTIMODAL AND INTERMODAL USE OF PT AND PB	33
FIGURE 46: DIFFICULTIES IN TRANSFERRING FROM ONE SERVICE TO ANOTHER	34
FIGURE 47: COMPARISON BETWEEN BIKE SHARE, LTR AND PT ACCORDING TO CAPACITY	34
FIGURE 48: COMPARISON BETWEEN BIKE SHARE, LTR AND PT ACCORDING TO AGE	34
FIGURE 49: THREE LEVELS OF INTEGRATION FOR EACH THEME	35
FIGURE 50: MARKETING MIX FOR A TOTAL PT AND PB INTEGRATION	35
FIGURE 51: FIVE GOVERNANCE MODELS IN EUROPE INVOLVING THE PT OPERATOR	36
FIGURE 52: RARE GOOD PRACTICE OF DIRECT ACCESS TO THE PB PAGE FROM THE HOME PAGE (DIJON)	39
FIGURE 53: EFFORTS REQUIRED TO ACCESS INFORMATION ON PB (VIENNA, BORDEAUX, BUDAPEST, LONDON)	39
FIGURE 54: BRAND POSITIONING STRATEGY FOR PB SERVICES (AUTHOR: M. NICAISE, STIB)	40
FIGURE 55: PB AND PT, MORE COMPLEMENTARY THAN COMPETITIVE	40
FIGURE 56: STRIKING A BALANCE IN THE LEVEL OF SERVICE OFFERED	41
FIGURE 57: THE DIFFERENT CAUSES OF DAMAGE	44
FIGURE 58: SOME EXAMPLES OF THE DETERIORATION OF BIKE SHARE SERVICES	45

11 Bibliography

11.1 Documentation

1. ANAYA E., CASTRO A., (2011), Balance General de la Bicicleta Pública en España, 155 p.
2. APUR, (2021), Évolution des mobilités dans le Grand Paris, Tendances historiques, évolutions en cours et émergentes, June 2021, 92 p.
3. BEROUD B., (2007), Vélo'v : un service de mobilité de personnes à transférer ? Analyse des performances et des usages de 7 systèmes distincts de vélos publics - vélos en libre-service (VLS), vélos partagés dans 10 villes européennes et analyse économique du marché des vélos publics, Master Recherche Transports, Espaces, Réseaux, Université Lumière Lyon II, Laboratoire d'Économie des Transports [Supervisor: BAUMSTARK L.], March 2007, 118 p.
4. BEROUD B., ANAYA E., (2012), Chapter 11 Private Interventions in a Public Service: An Analysis of Public Bicycle Schemes, John PARKIN, in (ed.) Cycling and Sustainability (Transport and Sustainability, Volume 1), Emerald Group Publishing Limited, pp. 269 - 301.
5. BEROUD B., VAN ZEEBROECK B., (2018), Benchmark international e-VLS [Sponsor: Brussels-Capital Region], 146 p.
6. CAUPD, (2022), Annual report on sharing bikes sharing electric bikes riding in major Chinese Cities, 51 p.
7. CEREMA, (2019), Vélos en libre-service avec station: de l'étude de faisabilité du service à sa mise en œuvre, 116 p.
8. CIE, (2023), Shared Ambition - The potential of bike sharing in Europe: Benchmarking 148 cities, Cycling industry Europe, 25 p.
9. CLUB DES VILLES ET TERRITOIRES CYCLABLES ET MARCHABLES, VELO & TERRITOIRES, (2023), Enquête nationale sur les politiques modes actifs : vélo et marche, de la commune à la région, March 2023, 190 p.
10. COMOUK, (2022), Bike share guidance for local authorities, November 2022, 24 p.
11. DEMAIO P., GIFFORD J., (2004), Will Smart Bikes Succeed as Public Transportation in the United States? 15 p.
12. DIAMOND, (2021), Unveiling Women's Needs and Expectations as Users of Bike Sharing Services: The H2020 DIAMOND Project, 29 p.
13. EUROPEAN COMMISSION, (2023), European Declaration on Cycling, 9 p.
14. FISHMAN E., (2015), Bikeshare: A review of Recent Literature, 20 p.
15. FLUCTUO, (2023), 2022 European Shared Mobility Index, 38 p.
16. FLUCTUO, (2024), European Shared Mobility - Annual review 2023, 33 p.
17. GIORIA C., (2016), Etude d'évaluation sur les services vélos - Enquête sur la location de vélos classiques et de vélos à assistance électrique [ADEME - INDDIGO], 56 p.
18. GIZ, (2022), Guía de Sistema de Bicicletas Compartidas, Planeación, implementación y operación de Sistemas de Bicicleta de uso público en Colombia y la Región, 117 p.
19. HEINEKE K., (2023), 7 Key Insights on the Micromobility and Minimobility Markets, <https://www.youtube.com/watch?v=8YVlnjN6vcg>, visited September 6, 2023, Micromobility conference, June 8th Amsterdam.
20. HERAN, (2016), Vélos en libre-service, un succès en trompe-l'œil? Vélocité, February 2016), 5 p.
21. INDDIGO-AAVP, (2023), Rapport du Vélo Public - 1ère édition, [Association des Acteurs du Vélo Public], September 2023, 35 p.
22. INDDIGO-ADEME, (2021), Actualisation de l'étude d'évaluation des services vélos - Rapport de diagnostic, 46 p.
23. INDDIGO-ADEME, (2021), Cahier technique sur la location de vélos en libre-service, 64 p.
24. INDDIGO-ADEME, (2021), Cahier technique sur la location de vélos de longue durée, 72 p.
25. ITDP, (2013), The Bike Share Planning Guide - 2018 Edition, 152 p.
26. ITDP, (2018), The Bike Share Planning Guide – 2018 Edition, 110 p.
27. ITDP, (2021), Maximizing Micromobility, Unlocking opportunities to integrate micromobility and public transportation, 32 p.
28. MEDDIN BIKE SHARING WORLD MAP, (2022), The Meddin Bike Sharing World Map 2022 Report, December 2022, 16 p.
29. MOBILITY INSTITUTE BERLIN, (2023), Grundsatzuntersuchung geteilte Mikromobilität, Endbericht, 19.06.2023 [MVV, Landeshauptstadt München Mobilitätsreferat], 39 p.
30. NABSA, (2022), Shared Mobility, 2021 State of the industry report, 23 p.

31. NABSA, (2023), Shared Mobility, 2022 State of the industry report, 23 p.
32. OBIS, (2011), Optimizing Bike Sharing Handbook, EU project, 90 p.
33. RICARDO, (2015), Public Bike Sharing, Finale Guidance Note [European Cyclist Federation], 16 p.
34. ROLLAND BERGER, (2016), Bike Sharing 4.0, Hamburg, June 2016 34 p.
35. SHAHEEN S., GUZMAN S., ZHANG H., (2010), Bikesharing in Europe, the Americas and Asia: Past, present and future, 19 p.
36. TRANSPORTATION FOR AMERICA, (2019), Shared Micromobility Playbook, <https://playbook.t4america.org>.
37. UITP, (2023), Mobility Hubs: Steering the shift towards integrated sustainable mobility, Policy brief, April 2023, 16 p.

11.2 Website

38. <https://15marches.fr/business/hypercroissance>, visited on 2 April 2023.
39. <https://techcrunch.com/2022/12/29/e-bike-subsidies-consolidation-and-ipos-our-2023-micromobility-predictions>, visited on 2 April 2023.
40. <https://shared-micromobility.com/the-massive-electrification-of-public-bike-share/> | Visited on 29 March 2023.
41. <https://ecf.com/tracker-cargo-bike-friendly-cities-sharing-0>, Accessed on 2 June 2023.
42. <https://www.lyft.com/blog/posts/electrifying-just-20-of-bike-share-stations-could-dramatically-reduce>, visited on 19 May 2023
43. <https://15marches.substack.com/p/a-quoi-sert-lintelligence-artificielle>, 18 April 2023.



**Funded by
the European Union**
NextGenerationEU

Financing

NextGenerationEU is a temporary recovery instrument of over €800 billion to help repair the immediate economic and social damage caused by the coronavirus pandemic. Post-COVID-19 Europe will be greener, more digital, more resilient, and better adapted to current and future challenges.

The Recovery and Resilience Facility, the centrepiece of NextGenerationEU, is endowed with €723.8 billion in the form of loans and grants to support reforms and investments undertaken by EU countries. The aim is to mitigate the economic and social consequences of the COVID-19 pandemic and to make European economies and societies more sustainable, more resilient, and better prepared for the challenges and opportunities posed by the ecological and digital transitions.

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 particularly concerns the Mobility axis and the Acceleration of MaaS deployment component. More specifically, it aims to prepare the future public bicycle service in the Brussels-Capital Region. In financial terms, "Preparatory study for the public bicycles service of the Brussels-Capital Region in 2026: Benchmark and Recommendations" will receive €197,816.75 including tax.