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*Public bicycles represent an answer to the constraints which impede the development of the daily cycling practice in the city. Indeed, the cyclist hasn't the imposition of entering or taking out the bike from home and of picking up his bike where he left it. Numerous services companies propose to local authorities self-service systems. These systems partially tackle the problems of parking, hire, and security against theft. This system of bicycle rental makes wide use of NTIC. Most often, self-service bicycle hire is proposed to cities by urban service providers, notably advertising companies. However, one can imagine a different organisation, such as in Orléans, Montpellier and Barcelona, in which the bicycle are part of the responsibilities of a public authority organisation of urban mobility.*

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# Experiences of public bicycles services in Europe

The bicycle is an advantageous mean of transport in terms of autonomy, speed and cost over short distance journeys (5 km or less). For the community, it contributes to an economic use of public space, to a preservation of the environment (air quality, noise pollution, saving fossil fuels) and to the improvement of public health. However, its use is confronted by numerous impediments: climatic and topographic constraints, physical effort involved, risk of accident

linked to traffic, parking problems at place of residence and/or at the final destination, fear of theft and/or mechanical maintenance. Faced with these obstacles, the establishment of a **street based rent a bike service on the public space** can be acknowledged as an unexpected success, as attested by the 4 550 000 annual rentals of *Vélo'v* in Lyon, and within its first year!

## Public bicycles: new perspectives thank to new technologies of information and communication (NTIC)

Made available by a public or a private entity, public bicycles can be borrowed and returned at different public locations. The first generation of public bicycles, simply returned to the public realm, appeared in Amsterdam in 1968. Based on an utopian ideal of total public-spiritedness, the experiment failed as the bicycles were rapidly deteriorated, stolen and repainted or thrown in the canals. The *yellow bicycles* provided in 1974 by La Rochelle were also appropriated by users and it was necessary to modify the project. The second generation appeared in Copenhagen in 1995, integrating a financial dimension. The objective of the caddie system was to encourage clients to bring the bicycle back to a station for recuperating their deposit and allowing the best sharing of the bicycle fleet. Actually, the anonymous users kept the bicycles, as the incentives to return were insufficient. Thanks to the use of NTIC such as GSM,

GPRS, even UMTS or fibre optics, the bicycle is released only if the borrower signs into the system: it is the third generation. Having their individual, personal (banking) information known is a strong incentive for returning the bicycle promptly, under threat of extra payment and/or of loss of deposit. Paradoxically, the first attempt, led in Amsterdam in 1995, *Depo Bike*, did not work because, among other flaws, of strength of the security system. *Vélo à la Carte*, the first operational system, was implemented in Rennes in 1998 by the Clear Channel company. Today, the concept has been developed under different declensions in Berlin, London, Oslo and Lyon, to name the most representative. *Vélo'v*, this service has been put in place and exploited by the company J.C.-Decaux in Lyon since 19 May 2005, is the public bicycle system setting the standard today.

## The third generation: diversity of services

**Call a Bike Flex (Berlin):** call from a mobile for starting and ending the rental without spatial constraints

*Call a Bike Flex* is a service which was established in 2002 in Berlin on their own initiative BD Rent. To hire a bicycle, the client calls the telephone number written on the bicycle. Once registered within the system, a four-digit code is given over the phone. This code is entered on the case found on the rear wheel of the bicycle for releasing the padlock. Users are charged by the minute starting from the first minute. To end the rental, the same action is carried out whilst indicating the bicycle deposit location. The telephone call can be made from anywhere. This service offers in particular the ability to return the bicycle closest to the final des-

However, the client is charged an extra fee if the bicycle is left outside the city of Berlin.



**Call a Bike Flex in Berlin**  
(Photo : Benoît Beroud)

The frequency of usage is low given that only 3% of subscribers use the service almost every day and 10% of subscribers at least once per week (source DB Rent). The lack of specified parking places lowers the chances of finding a public bicycle and the client pays, by location, for two phone calls and furthermore the cost of use.

**Next Bike (Leipzig):** This system, managed by Next Bike, is very close to *Call a Bike Flex* in the differences near the cost of usage is free the first hour and that the client must pay the cost of regulation between the place of return and the place of hire. The principal activity of the business is not the hire of bicycles but the sale of advertising space.

It is from elsewhere why the bicycles were conceived for the display of advertising when the bicycle is immobile.



Next Bike in Leipzig (photo: Benoît Beroud)

### Characteristics on the main public bicycles systems in Europe in 2007

Name of programme	Call a bike Fix	Oybike	Oslo Byssykel	Vélo'v
<b>Locations</b>				
Cities	Berlin	London	Oslo	Lyon
Countries	Germany	England	Norway	France
Date established	1 Jul 2002	12 Jul 2004	1 Jul 2002	19 May 2005
<b>Participants</b>				
Operator	Deutsch Bahn Rent	Oybike	Clear Channel	JC Decaux
Origin	Deutsch Bahn Rent	Oybike	City of Oslo	The Grand Lyon
Relationship with advertising market	None	None	Used in the sale of advertising space	Used in the sale of advertising space
<b>Principal Characteristics</b>				
Stations	Virtual	On bicycle parking arches	5 locking points (for 12 parking)	13 locking points (for 12 parking)
Means of identification	Mobile telephone	Mobile telephone	Smart card	Contactless Smart card
Technology for information transfer	GSM	GSM	GPRS	GPRS
Number of public bicycles	1750	45	650 (1200)	2227 (4000)
Number of stations	40	28	65 (100)	210 (350)
Rate of availability	Undetermined	1.87	1.2	1.73
On the spot hire	Yes (by telephone)	Yes (by telephone)	No	Yes (reading bank card)
<b>Hire Rates</b>				
Cost of subscription	A telephone call	An internet connection	60 Norwegian crowns (~ 8 €)	5 € (issue of new card)
Cost of identification	A telephone call **	A telephone call **	None	None
Change over time	Constant	Progressive	Constant	Progressive
<b>Usage</b>				
Number of users	33 000 (Jul 2002-May 2006)	Not provided	20 000 (Aug 2006)	65 000 (Aug 2006)
Number of rentals	170 000 (Mar-Dec 2005)	Not provided	430 000 (Mar-Dec 2005)	4 550 000 (Sept 2005-Sept 2006)

\* Number of places available/number of bicycles available

\*\* the subscriber must sign in to take and return the bicycle

Source : Vélo'v: A service of mobility for people to transfer? Comparison of Automated systems of Bicycle Hire in Public Locations in Europe  
Benoît Beroud, March 2007. Data dates from September 2006

**Oybike (London):** Similar to the system *Call a Bike*, but with stations.

Oybike is a service which results from the private initiative of a business by the same name. The procedure of identification via mobile telephone in order to hire and return the bicycle is similar to that of *Call a Bike*. However, the code must be entered on a housing, fixed to a bike parking arch, and to which the bicycle is locked. The client has the option to return the bicycle at any one of the 28 stations which can be found throughout the borough of Fulham & Hammersmith. The parking capacity of one station is limited to 3 places.

Before the establishment of the free first half hour of use offer, it seemed that rentals were concentrated on the weekends, most likely for leisure purposes. As for *Call a Bike*, the cost of identification via two telephone calls makes onerous frequent usage of the service.



*Oybike in London (photo: Oybike)*

**Call a Bike Fix (Stuttgart):** Responding to the demands of Stuttgart, based on the success in Lyon, DB Rent established a system with fixed stations in spring 2007. This service is similar to that of *Oybike*: the cost of identification per hire is composed of two telephone calls, the first half hour is free and one must take and return the bicycle from a fixed station. However, the stations have a greater parking capacity and the code must always be entered on the bicycle.



*Call a Bike Fix in Stuttgart (photo: Benoît Beroud)*

**Oslo Bysykkel (Oslo):** no charge for identification per hire.

Integrated with the sale of advertising space in the city of Oslo taken by Clear Channel,

*Oslo Bysykkel* was inaugurated in 2002. This service is an improved version of the system, *Vélo à la carte*, in Rennes. The bicycles are available in the stations, whose installation necessitates public realm work. The subscriber can rent a bicycle for a length of 3 hours free by inserting a card in the totem found at the end of the station. Once returned at one of 65 stations, the bicycle is detected and the user recognised automatically. The fixed stations have a great number of bicycles, which create a visual effect informing the residents of the availability of another mode of transport. Contrary to the two preceding systems, there is a subscription process (slightly onerous) but there are no costs of identification and usage.

In the same time period and with fewer bicycles, the service in Oslo has generated 2.5 times more rentals than *Call a Bike* in Berlin. And the usage is more frequent: 42% of subscribers have used the service more than 5 times within the week before the inquiry and 35% between 2 and 4 times (source: Clear Channel).



*Bysykkel in Oslo (photo: Clear Channel)*

**Vélo'v (Lyon):** a large scale service

The same as in Oslo, this service has appeared on a public initiative of The Greater Lyon also including the sale of advertising space taken by the company J.C.-Decaux. The client logs into the system with a contactless Smart card, then enters a four-digit code. To end the rental, the bicycle must be correctly locked at one of the parking stations. The system which detects the bicycle automatically recognises the user. Those who also subscribe to public transport services benefit from preferential subscription and can use their public transport Smart cards with the system. The first half hour is free, then the rates are progressive. In one year, more than 4.5 million journeys have been made and 85% of the journeys provided by *Vélo'v* each morning are home-work or home-university journeys (study of 2406 users conducted by the Grand Lyon from 30 November to 6 December 2006).

Like Oslo, the cost of subscription each year remains low (5 €), the cost of identification is null and usage for the first half hour is free. The pro-

*The identification choice impeges on the attractiveness of the system. The Oslo system recorded 2.5 times more rentals than Berlin with fewer bicycles.*

establishment of the service have given the population exposure to the service. One difference to the Norwegian system, the possibility to pay by credit card (Visa) offers the opportunity to try the service on an impulse.

Thanks to a dense network, the 250 stations offer 62500 possibilities of rentals likely to correspond with journeys of certain individuals. Finding a bicycle in good working order in proximity to one's point of departure and finding an available place close to one's point of arrival are the main limitations of the service. Auto-regulation is facilitated by a rate of availability of 1.72, superior to that of Oslo. An elevated relationship between the number of places available and the bicycles available increase the possibilities of parking in the reserved locations. After all, pendular flow translates to missed bicycles or available parking places. A regulatory service with trucks balances the fleet in order to reduce this type of situation, which discourages use of the service.



*Yello in Prague (photo: Benoît Bérourd)*

**Vélo + (Orleans).** Established and managed by Effia, an affiliate of SNCF, this service was inaugurated 25 June 2007. The system is very close to the service in Lyon with stations of an average capacity of 18 places and a similar process of identification. The first half hour is also free, subscription costs 5 € annually for subscribers of public transport or 15 € for others. An on the spot rental for a short trip will cost 3 € to purchase. The innovation of this market resides in its elaboration. If Barcelona was the first European city to separate the sale of advertising space from public bicycles, the city of Orleans is the first in France to have launched a tender carrying advertising only on the flaps of the public bicycle.



*Vélo'v in Lyon (photo: Grand Lyon)*

**Yello (Prague).** En route since 2005 with 23 bicycles for 12 stations in the district of Karling by the company Homeport, this service is a derivative of *Oybike*. The case for identifying oneself and attaching the bicycles is similar, it is posed on its own parking arch more easily identifiable. Owing to the presence of a station and the use of a contactless Smart card for signing in, the service is close to *Vélo'v*.



*Vélo+ in Orléans (photo: Effia)*

*In Lyon, the 250 stations offer at least 62 500 feasible trips, if we consider one trip per rental.*

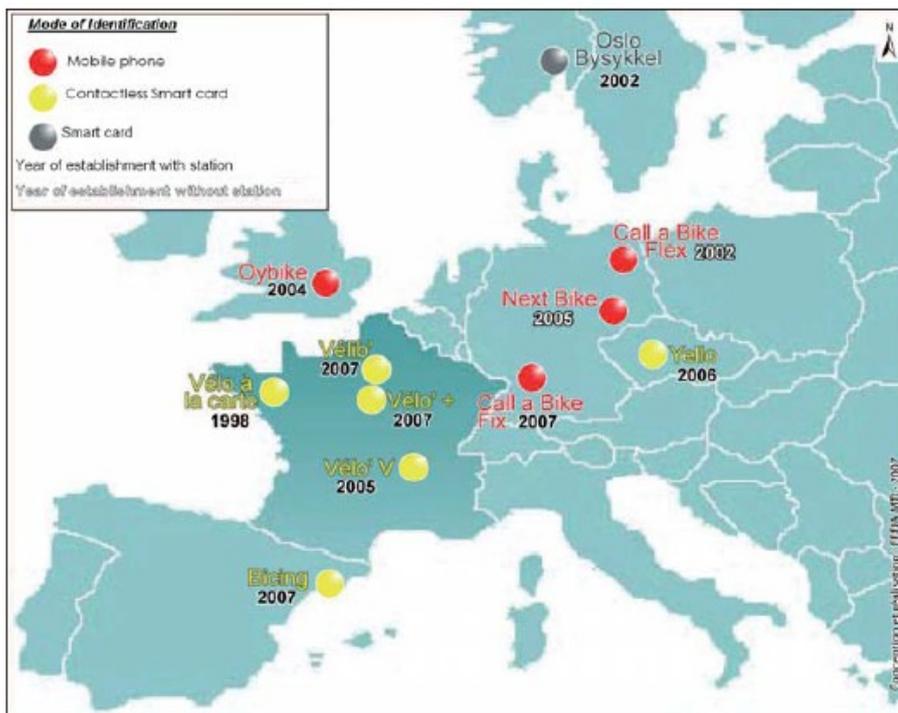
*Public bike systems with stations are marks in the urban landscape. Hence, bicycle remains in the mind of all city-zens as a potential mean of transport*

## First lessons from the European experience

### *Three key factors: stations, choice of identification and hire procedures*

If the services without stations permit more flexibility in the choice of the destination, **a station is a marker in the urban scene** more or less visible according to its capacity for welcome and the number of public bicycles that are parked there. This allows easy location of potential places for withdraw and deposit.

**The choice of a mode of identification** is a strategic choice for the operator. Fully private services, with the exception of Yello, use the borrower for transmitting the information via the GSM network. In making two telephone calls, the clients pay for identification. On the other hand, services providers from public initiatives have recourse to the GPRS technology. The transfer of information created by the identification of a subscriber in the system is paid by the operator, and generally subsidised by the local council.



**Source:** EFFIA MTI, Location and main characteristics of street based rent a bike services on the public space in Europe.

The customer is not charged any cost for identification at each location. The cost of the card is integrated into the subscription but this remains derivative. However, the cost of identification for clients with mobile phones can be null with the use of NFC (Near Field Communication) technology. The operator must invest in GSM or GPRS transmitter/ receptors on each bicycle or each barrier for hiring the bicycles and centralise information.

Except Next Bike, private services have (or had) a hire rate payable from the start of the rental. Public services, benefiting from subsidies, have allowed an initial time period without paying. After this, the rental rate can be progressive in order to encourage the client to return the bicycle so the latter can be shared. **This gratuity facilitates considerably more frequent usage of the service.**

## Towards recognition of the bicycle as a mean of transport?

Considered a niche market two years ago, the concept is now widespread in several French and European cities. The establishment of the service *Vélib'* in Paris on 15 July 2007 with more than 20 000 bicycles at end of the quarter, is a voluntary symbol of the hold of the bicycle in public politics. The strength of this system will be an anchor point for a policy favouring eco-mobility, in proposing a non-motorised service of mobility visible in the urban scene, reducing, in the same limited proportions, the number of parking places for cars and contributing to the best equilibrium between the different users of the public domain.

Despite all the advantages of this service, its establishment is not a bicycle policy panacea.

*Will the local authorities still consider public bikes as a simple by-product derived from the sale of advertising space or will they assume a role of non-motorised transport mobility planner as the cities of Barcelona and Orleans?*

## Key factors to success: short term rental on the public realm

The success of this new type of rental rests on two elements. Firstly, **the client does not bear any of the constraints of the owner of the bicycle: fear of theft, maintenance and parking at home.** It is therefore not surprising that 96% of *Vélo'v* users are new cyclists. Secondly, **the client can hire a bicycle uniquely for the duration of a one way trip at an reasonable price.** For that, the client must have the option of returning the public bicycle at a location other than the place of hire. To correspond better to the travel needs of the potential clients, the number of possible places of origin and destination must be elevated. Individuals whose origin and destination are not within the client zone of a station (4 minutes by foot at 4 km/h, being less than 300 m), are unlikely to travel further for borrowing this service, hence the importance of a dense network.

**From this perspective, it would not be reasonable, economically, that the bicycles are kept in private locations due to land costs and salaries. This service is therefore possible only if the bicycles are accessible in public: hence our preference for the name public bicycles rather than self-service bicycles.** The use of computerisation has allowed the automation of the systems. The public bicycles, available 24 hours a day, 7 days a week, are a new alternative for journeys during the night.

Other actions taking into account the behaviour and the needs of non-motorised modes of transport must be conducted in parallel (cycle paths, cycle lanes, 30km/h zones, arches for parking and other services...).

As the origin of the services results more and more from public power, the stakes of the coming years for the local authorities will be to organise the competition in a view of efficiency and of transparency of use of public funds. Will the local authorities still consider this service as a simple by-product derived from the sale of advertising space or will they assume a role of non-motorised transport mobility planner as the cities of Barcelona and Orleans?