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## **Bicing Barcelona, Clear Channel Public Bicycle System**

*“Take the Bicing. Your new public transport in Barcelona”*

[www.bicing.com](http://www.bicing.com)





### Facility:

'Bicing' Smart Bike Sharing/ Public Transport System.

### Provider:

Clear Channel Outdoor (system provider) and management is in collaboration with BS:M, the public transport management company, on behalf of the Ayuntamiento (City Council) of Barcelona.

Bicing customer service contact - Servei d'atenció a l'usuari:  
Tel. 902 31 55 31, Pl. Carles Pi i Sunyer, 8-10, Barcelona  
[www.bicing.com](http://www.bicing.com)

### Supplier / Manufacturer of System Equipment:

Clear Channel Outdoor.

### Designer/ Architect:

Clear Channel, International Street Furniture Division  
[www.smartbike.com](http://www.smartbike.com).

The Smart Bikes system technology was developed in collaboration with Creacom. [www.creacom.be/Smartbike](http://www.creacom.be/Smartbike)

### Cost of Provision:

The initial 1500 bikes were installed as part of a scheme to last 10 years, on a budget of €2.23 million euros per year, awarded to Clear Channel by the City Council of Barcelona. The updated cost for the now-expanded scheme is not known. The City Council put the company 'Barcelona de Servicios Municipales' (B:SM) in charge of the management of this service. The launch of the Bicing system in Barcelona was financed with the income obtained by the system of 'green area' car parking introduced in 2005 (also managed by B:SM). The other part of the finance for the provision of the Bicing scheme comes from user subscriptions.

### General Description:

Bicing is billed as a new form of public transport by bicycle in Barcelona. It is based around the 'Smart Bike' system, developed and managed by Clear Channel Outdoor, one of the earliest iterations of which was installed in Oslo. To date 13 cities internationally have installed schemes using the Clear Channel system, including Rennes, France, and recently Zaragoza, Spain and Washington DC, USA (see end of document for fuller list). The Barcelona Bicing scheme represents one of the recent success stories of a city which has introduced this service.

Installation started in March 2007 and the original plan was to install a total of 100 parking stations with 1,500 bicycles available, by July 2007. However, effective promotion and a city culture and

infrastructure ripe for bike-sharing, prompted 30,000 users to sign up in the first two months, which is near what was forecast for the first year.

From the outset the scheme has been designed primarily for short journeys around the city, not for leisure cycling. Although initially it was possible for visitors to the city to use the scheme, this option was soon removed to control expansion and the service is now limited to those who work/live in the city.



There are now (summer 2008) over 150,000 users subscribed to Bicing, which has been expanded to 6,000 bicycles. Each bike is used on average almost 8 times per day, which equates to over 325,000 journeys per week.

### Location of Facility:

Barcelona-wide.



(map: Bicing stations, July 2008)



The majority of Bicing stations are near the entrances to the underground and overground train stations and public car parks. In each station there are bicycles which can be borrowed and free spaces to which to return them (see map), though at peak times there may be no bikes or no spaces available.

Bicing parking stations are located according to these criteria:

- Proximity to underground, train and FGC (Ferrocarrils de la Generalitat de Catalunya- the Catalan government-run rail service) railway stations (every Bicing parking point is within 300m of a station)
- Proximity to public car parks

## Scale (capacity):

6000 bikes and 400 parking-retrieval stations. Each Bicing station can take up to 20 bicycles. Some locations are double-installed, to hold up to 40 bikes.

The original scheme had only planned a 1500-bike and 100-station system in the centre of the city, but the success and popularity became apparent so quickly that the City Council decided to expand the system to 6,000 bikes, to cover the ten inner districts of the city.



Bicing Card

There are now plans to expand further by introducing a similar Clear Channel Smart Bike system to seventeen more districts in the Greater Metropolitan area of Barcelona. This will be offer 440 collection-parking points and 3,520 bicycles, supported by 375 km of cycle network.

## Length of use:

The scheme is promoted as a point-to-point public transport system and as such the operators of Bicing encourage users to make only short journeys of less than half an hour (bike usage is free up to 30 mins) and stipulate a 2 hour limit before cost penalties are incurred. Bicing report that only 6.6% of users borrow the bikes for more than 30 minutes.

Being an on-street scheme, it is accessible seven days a week, 365 days a year and operates at the following times:

Sunday-Thursday: 19 hour pick-up/ 24 hour drop off. The service operates all day except from midnight to 5am, during which time bicycles can only be returned and not borrowed.

Fridays and Saturdays, the full service operates 24 hours a day.

## Charges (cost to user):

The annual subscription to the service is €24 which includes an RFID swipe card to unlock the bikes. When the scheme was first introduced an introductory offer was promoted whereby within the first four months, people could sign up for the first year for €6 – this helped attract about 90,000 new users within the first six months.

The first 30 minutes are free and to take the bike longer the cost is €0.30 for each half an hour. The maximum time you can keep a bike is





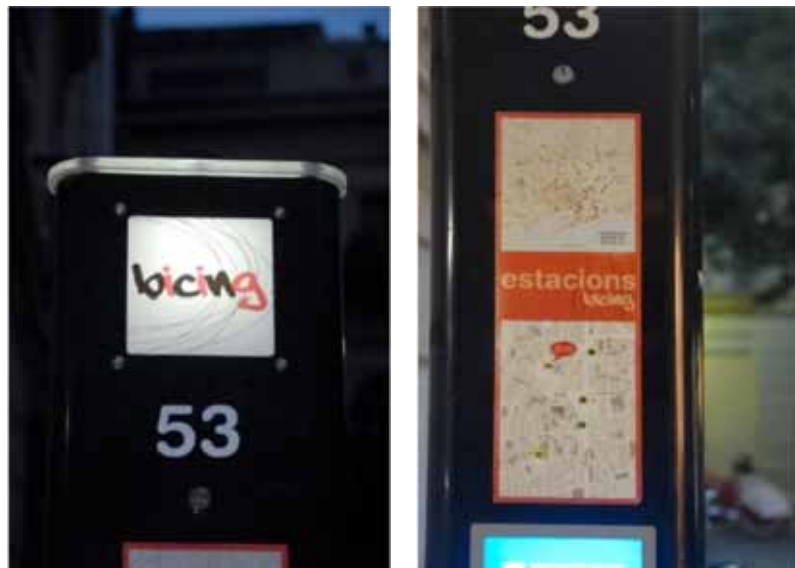
2 hours, after which there is an increasing penalty fine. After 24 hours a further €150 euro fee is incurred if the bike is not returned. Users have to provide identity details and credit card details when they sign up, and any costs are charged straight to the registered card.

## Access:

All Bicing stations are on-street, located in public areas. Access in most cases is very straightforward. In a few cases, where the parking stations have been installed on roadscape of narrow streets, users are left with limited manoeuvring space between themselves and moving traffic when taking out or returning cycles.

## Signage:

The distinctive red and white of the bicycles themselves acts as an effective signage that highlights the location of the Bicing stations, since they can be seen easily from long distances. There is no off-site signage directing to Bicing points, but each station has a pillar of approximately 2m in height with the system interface and the Bicing logo, which is lit at night. These pillars also each have a map indicating the nearest alternative stations in the area.



## System Interface:

The Smart Bikes parking and release system is connected to a central server and management facility. This allows the operators to keep tabs on which bikes are parked, where and who is using them etc.

From a user perspective the system allows users to remotely see which stations have bikes and which are empty, via [www.bicing.info](http://www.bicing.info), for example.

The user interaction with the system is via the Bicing 'smart card'. Each user's card has an RFID chip, a unique ID and number, linked to their registration information. To release a bike the card is placed in close proximity to the touch-point on the pillar at any of the stations.

The display on the pillar then shows a large number, indicating which parking point (of 20 or 40) to take a bike from.



If no bikes are available at one station, the display will list other stations nearby that do have bikes available. If, upon the return of a bike, a station is full, the user can touch the card on the pillar of that station and an extra 10 minutes will be credited, to give time to go to the next available parking point.

Owing to the popularity of Bicing, in practice, at peak times, some users report having to make frustrating trips between numerous stations to either find a bike or to be able to park one.

To locate the bike, the two posts at the bottom of the bicycle's handlebar/ basket structure, slot into any of the parking points on the racks at each station. Users must wait for the green or flashing red/green light to go solid green to know the bike has been parked securely. There have been reports of some users not realising the bike

is not fully locked or, of the system not completely locking and the light continuing to flash, which means the bike will not register as returned by that user. To combat this there are plans for late 2008, to increase the size of the LED light so that it is more noticeable and also to introduce an audible indication to help confirm correct parking.



### Furniture/ Parking equipment:

Bikes are parked in racks, in rows of 20 or 40. There are two types of parking location for the Bicing bicycles: those which are on the pavement and occupy pedestrian space and those which occupy the space of motor vehicles. Both types are shown in the following photographs.



Parking for Bicing bicycles on the pavement



Parking for Bicing on the road

Generally the stations are located where space is available. The majority occupy pedestrian space, such as the pavement or squares (Hospital Clínic, Plaça Catalunya, etc) However, there are also Bicing stations to be found on the road which occupy space previously used for parking motor vehicles (C/ Rosselló, Pg de Colom).

The mechanism to attach the bicycles to the rack is integrated as part of the structure at the front of the handlebar. Unofficially the bicycles can be parked from the pavement side as well as from the road-side, since the lock is symmetrical and does not distinguish from which side it is attached, though the maintenance team encourage users to use just one side of each station.



As mentioned above, the lock is symmetrical and may be placed on the rack from either side (which means it can occupy space belonging either to pedestrians or to motor vehicles).



### Bicycles used with this system:

Clear Channel use virtually the same design in all the cities in which this services exists. The bicycles are also designed to be as hardwearing as possible due to their 24 hour a day outdoor exposure. The estimated value of each bicycle is approximately € 450.



Image source: Flickr; Faxlet.

The bicycles are red with white mudguards. The frame is made of steel and aluminium with a weight of 16.8 kg. The back wheel is of a similar size to a mountain bike and the front wheel is smaller, of a similar size to a foldable bike wheel. Both wheels have wide tyres. They have a red light at the back and a white light in front, which both automatically switch on when it gets dark. The lights are charged up at the parking station. The bicycles also have a Shimano Nexus gear hub, with three gears, with an internal brake incorporated. The front brake is a standard brake of the V-Brake variety. The handlebars have a special shape which includes a bag carrier; and a gear lever of the Grift Shift variety plus a bell (compulsory in Barcelona). It also has a flick stand in order to keep it upright.

Each bicycle has a number and is identified by the computer system each time it is returned to a station. In this way journey time and maintenance are controlled. The original idea was for all bicycles to have a GPS fitted in order to be immediately located at all times, but this was not put into practice due to the high cost.



## Security, Guardianship and Lighting:

### Bicycles:

The bicycles have been designed differently to those which are commercially available, to avoid theft and chances of resale on the black market. Of the latest iterations of the bikes, very few components are interchangeable with other bikes and use 'security screws' all-round, which helps limit parts theft.

### Locking Mechanism:

The structure on the cycles that forms the locks, when connected to the station parking points, are made from high grade hardened 15mm stainless steel bar - solid enough to ensure the bicycles are not stolen from the racks in most cases. In some cases the lock has been cut while the bicycle was parked on the rack. There are no statistics available for this type of bicycle theft. There are other reports of the locking ports being filled with gum or otherwise tampered with so that customers do not realise their bike has not locked properly when they return it, though these cases have not been corroborated.

In addition to the physical locking mechanism, the structure has a small passive RFID chip mounted to it, which is located on the rail between the locking posts and communicates with the system when the bikes are removed and parked, to confirm the unique ID of the bike etc.



There have been unconfirmed anecdotes of these chips being removed, to destroy the bike's electronic identity.

Other reports suggest cases at long Bicing stations of two thieves in operation, one of whom looks at the number of the bicycle, which has been taken and shouts out the number, while the other thief steals it, because he or she reaches it faster than the user. This is one disadvantage of the long rows of racks.

Occasionally 'mis-parked' bikes can be seen, held off the ground, or upside down, supported only by their handlebar lock, though these are few and far between.



Image: Flickr; Ogomogo



Image: Flickr; Cien de Cine

**Thefts and forcibly removed components:**

Bicing management B:SM and Clear Channel have so far reported about 180 thefts of Bicing cycles, but they insist that overall there has been "very little vandalism and theft". In relation to nearly 6,000 bikes that are in circulation, thefts are reported to have been about 3% (nearly 200 bikes) in the year 2007-8, which is considerably less than the 10% per year, advisory figure often communicated to city councils setting up bike

sharing schemes.

Wikipedia states that in the first two and a half months there were 10 bicycles stolen. Users of the scheme have stated on the Internet that they have often found bicycles with punctures in the stations. There have also been cases of slit bicycle seats, loose chains, broken gears and lights which do not work on the earliest models (this is now against city regulations, which state that it is compulsory to use lights on the bicycle at night). The more recent models of the Bicing bikes are fitted with automatic LED lights, front and rear, which are more reliable.

Infrequently Bicing bikes can be seen circulating in the city, which have been stripped of a number of their accessories, mudguards, etc, which make them look different, and some cases without the front locking structure. Presumably some of these have been changed linked to theft, or to hide their identity. One web forum writes of silver Bicing bikes being seen, stripped of all paint, and another, of Bicing bikes being spotted as far as Bilbao and other cities, where fewer people will recognise them.



Occasionally Bicing parking points can be found, either taped over 'out of service' by the operators, or clearly attacked. The one in this photo looks as if it has been prised open to release the bike.





Sometimes discarded components from a Bicing bike can be found around the streets of Barcelona, though in most cases, it is suspected this is due to wear and tear more than malicious damage.

### Maintenance and Servicing:

The management of this scheme is a collaboration between B:SM, commissioned by Barcelona City Council and Clear Channel outdoor. All the service and maintenance is conducted by the Bicing team (B:SM/ Clear Channel Outdoor), which comprises 162 people, working in the different areas connected to servicing and managing the system (customer service, maintenance, distribution etc).

There are currently 21 vehicles dedicated to the distribution of the bikes and there are five parking station maintenance teams, plus three rapid intervention motorbikes for small repairs.



### Service Period (how long facility meant to last):

Target duration of this system is 10 years. First stations operational since March 2007.

### Strengths:

- Barcelona has an increasing network of cycle lanes, which provided a good basic level of relatively safe cycle infrastructure, upon which Bicing could be introduced, including hundreds of km of cycle lanes and many controlled low traffic or traffic free zones.
- The service is very simple to use and continues to iterate improvements as the management learn about issues arising.
- Reports indicate that the number of daily cyclists in Barcelona has increased by nearly 50% since the introduction of the service.
- The Barcelona version of the Clear Channel Smart Bike has proved popular: ergonomic and comfortable for many ages and both sexes. It is reported to be the lightest public bike on the market, at just over 16kg, which makes manoeuvrability simpler in city traffic and needs less energy to get around.
- The latest iteration is proving mostly resistant to thefts and vandalism.
- With the expanded Bicing system, the service now has many stations covering a great portion of the city's working/ resident population.

- The price of annual subscription €24 is considered fair by 68% of users, according to a survey commissioned by the City Council.
- Positive feelings towards council evidenced by comments and enthusiasm of city inhabitants who use the system.

### Weaknesses:

- Massive popularity has required the system to expand four-fold beyond the originally anticipated scale in a short time (15 months), and the operators have consequently had difficulties to iron out problems as fast as they emerge. The Bicing management have announced that users should not have especially high expectations of the service while it is still being rolled out.
- Some Bicing station locations are extremely popular and experience excess demand for either bike retrieval or parking at peak times of day, and the distribution service for the bikes struggles to keep up. Some users report waiting 40 minutes to park or for a bike to become available at their chosen station.
- The demand for more bikes and new stations in all areas of the city has been great and as the system has tried to expand fast to cope. There have been numerous reported technology failures, where whole stations will not allow bikes to be released or at other times, will not allow bikes to be parked.
- The 2008 City Council-commissioned survey indicated that some users were not happy with the typical level of maintenance of the bikes (scoring 6.5 out of 10). Also that others are not satisfied with the level of customer service offered (5.5 out of 10). Mainly complaints have been about the premium rate telephone service and “hard-to-speak-to” personnel, though more staff are due to be employed in 2008 and a new free-phone number has now been introduced.
- The system is no longer available on a day or week-basis and not available to visitors or tourists.



### User Responses:

Short interviews conducted Summer 2007.

Questions for users:

- 1) What do you think of the cost of the service? Would you like it to be changed?
- 2) What do you think of the locations? Are they too far for you? Would you change anything, and if so, how?
- 3) How could the service be changed or improved, overall?



Jane 29 years of age, female, uses Bicing every day, except to go to work, because she works in Hospitalet which is just outside the city of Barcelona.

- 1) The price is low, I use it for short distances of under half an hour. I subscribed for €6, but €24 also seems a low price to me.
- 2) If I want to go to the beach, I can only go to Barceloneta. I would like the service to cover the other beaches too.
- 3) It is already difficult to find a bike which is not faulty. I



always find some kind of fault-the brakes or the seat...



**Ferran 36 years of age**, male, uses Bicing to go to the FGC station [Ferrocarrils de la Generalitat de Catalunya- the Catalan government-run rail service] (he mainly uses it for work as a connection with the FGC trains). He works in Sant Cugat.

1) "I think the cost is fine. €6 was fantastic but €24 is also good for all the service."

2) "Well, there is a station close to where I live, near Plaça Tetuán. I would like it if there were bike stations in Sants, Diagonal and Universitat. I am lucky because I go to work at seven and return at seven, so I always find a bike. What I don't like is that in Plaça Catalunya the service is often out-of-order and I have to go to another station to return the bike. That has happened a lot: they must have a serious problem in Plaça Catalunya."

3) "I would like more stations to be fitted. I would also like to see reflectors on the wheels and on the bike. The default lights don't work. A bike with lights which work is an exception."



**Jennifer, 24 years of age**, female, uses Bicing to go to work.

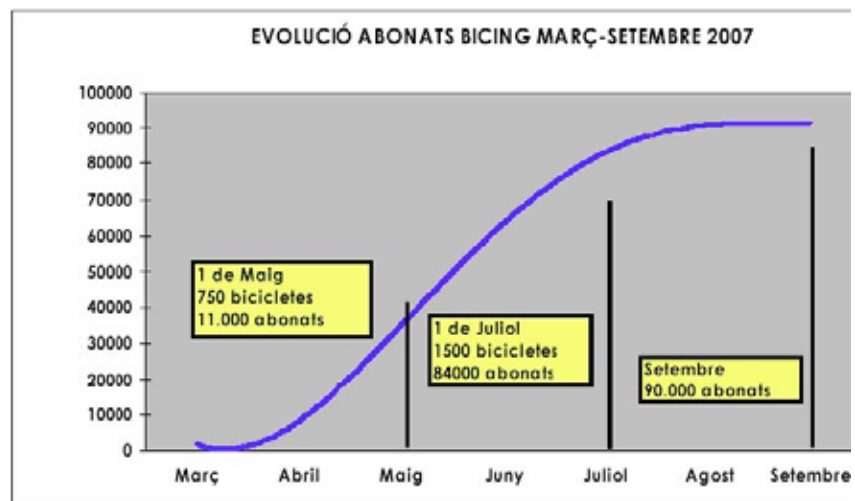
1) "The price is not excessive, but I would prefer it if there was a symbolic price – for €6 or even better, for free, like the system in Gijón [a city in Asturias, in the north of Spain]."

2) "It's close but not quite close enough. I would like to see the service spread to Sant Martí and the Forum area and the

whole of Passeig Maritim (it now has reached those areas).”

3) “The bikes are not good and are easily damaged. I don’t like the fact that the bicycles are parked in a long row of racks. It forms a barrier and sometimes it is difficult to get the bike out or put it back in. I would prefer it if I could choose the bike myself so that I always have a good one and I would also like to extend the operating hours of Bicing (in operation 24 hours every day).”

### Further Statistics on the Bicing Scheme:



Graph showing the evolution in Bicing subscriptions (‘abonats’) May-September 2007

The system has been very well received by citizens since its launch. In the first few months, in which there was a special offer of €6 for the membership fee (instead of €24 , after the offer) there was an average of 3,000 daily subscriptions to the service. At present there is an average of 100 subscriptions per day. Six months after the launch in mid-September there was a total of 90,000 members.

#### User profile:

According to the statistics obtained about members of Bicing, the average user of this transport service is a male or female students, aged between 25 and 35. They are typically resident of the Eixample neighbourhood and uses Bicing to go to work without combining it with any other means of transport. 51% of users are male, and a similar proportion between 25 and 35 years of age. The statistics regarding sectors of occupation of members are as follows (percentages rounded):

- Students 13%
- Administrative workers 10%
- Engineers 7%

- Civil service employees 6%
- Self-employed workers 5%
- Artists 4%
- Primary school teachers 3%
- Architects 3%
- Managers/ Managing directors 2.5%
- Medical sector 2%

### **Mobility habits of Bicing users:**

By autumn 2007 the Bicing system registered 100,000 journeys a week on weekdays and 30,000 journeys on weekends and public holidays. This is an average of 9.2 journeys per week per user registered. Each Bicing user makes an average of 1.4 journeys a day. Nearly 30% of all Bicing journeys are combined with some other means of transport.

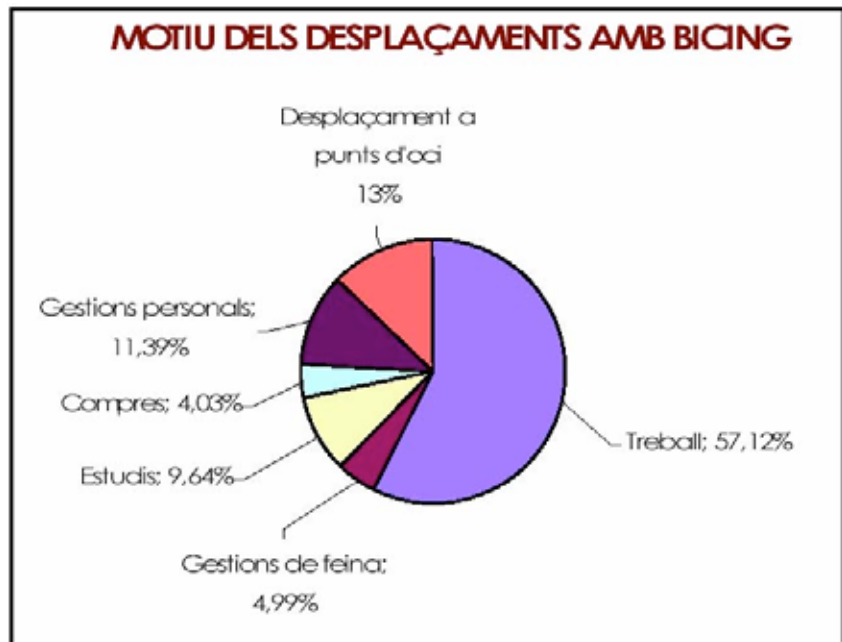
Of the total 100,000 weekly journeys using Bicing on weekdays

72% use Bicing as the only means of transport

28% combine the Bicing service with another means of transport

Percentage of means of transport combined with Bicing:

- Underground 34%
- Train 22%
- FGC trains 13.5%
- Municipal bus 9.5%
- Walking 8%
- Tram 4.5%
- Intercity bus 4%
- Car (driver) 3%
- Car (passenger) 1%
- Motorcycle 0.5%
- Own bicycle 0.25%



Pie-chart showing motives of Bicing journeys (round percentages):

- Work 57%
- Leisure trips 13%
- Personal matters 11.5%
- Studies 10%
- Shopping 4%
- Work matters 5%

### The future of Bicing:

Bicing started on March 22, 2007 with approximately 200 bicycles in 14 stations and it was gradually extended in several phases until by May 2007 there were 750 bicycles in 50 stations. In July 2007, on completion of the first phase, there were 1,500 bicycles and 100 stations.

In this first phase, the Bicing stations were mainly located in the neighbourhoods of the Old City and the Eixample, although a few stations were opened in the neighbourhoods of Sant Martí and Sants-Montjuïc.

The second 2007 phase of the project, doubled the initial availability and brought the fleet of bicycles to 3,000 and the total number of stations to 200.

Although the system cannot continue growing indefinitely, it is still increasing. By spring 2008 nearly 6,000 bicycles and nearly 400 stations were available, again doubling the availability of the public transport bicycle system.



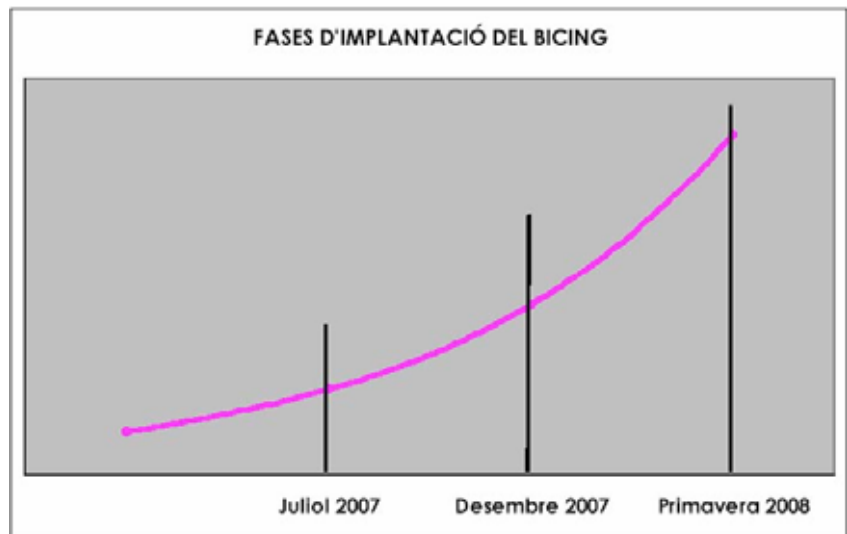


Figure 12: Bicing implementation phases



Bicing Barcelona

Marcus Willcocks and Eva Sterbova July 2008

### Useful References:

Bicing <http://www.bicing.com>

Clear Channel Smart Bike System: <http://www.smartbike.com>

Smart Bike technology by Creacom <http://www.creacom.be/Smartbike>

Schemes using the Clear Channel/ Smart Bike system:

#### France

Caen: <http://www.veol.caen.fr/>

Dijon: <http://www.velodi.net/>

Perpignan: <http://www.bip-perpignan.fr/>

Rennes:

<http://www.smartbike.com/www.clearchannel.fr/veloalacarte>

#### Italy

Milan (soon)

#### Norway

Drammen:

[http://www.adshel.no/English\\_WEB2003/indexhtml\\_english.html](http://www.adshel.no/English_WEB2003/indexhtml_english.html)

Oslo:

[http://www.adshel.no/English\\_WEB2003/indexhtml\\_english.html](http://www.adshel.no/English_WEB2003/indexhtml_english.html)

Trondheim:

[http://www.adshel.no/English\\_WEB2003/indexhtml\\_english.html](http://www.adshel.no/English_WEB2003/indexhtml_english.html)

#### Spain

Barcelona <http://www.bicing.com/>

Zaragoza <http://www.bizizaragoza.com/>

#### Sweden

Gothenburg <http://www.goteborgcitybikes.se/>

Stockholm <http://www.stockholmcitybikes.se/sv/>

#### USA

Washington, D.C. <http://www.smartbikedc.com/>

#### Other Bicing links:

Bicing for the Metropolitan area of Barcelona

[http://w3.bcn.es/V01/Serveis/Noticies/V01NoticiesLlistatNoticiesCtl/0.2138,1653\\_1800\\_1\\_535205335,00.html?accio=detall&home=](http://w3.bcn.es/V01/Serveis/Noticies/V01NoticiesLlistatNoticiesCtl/0.2138,1653_1800_1_535205335,00.html?accio=detall&home=)

Bicing Forum <http://www.forumbicing.com>

Treehugger interview with Barcelona council about Bicing:

[http://www.treehugger.com/files/2008/01/the\\_th\\_intervie\\_28.php](http://www.treehugger.com/files/2008/01/the_th_intervie_28.php)

Treehugger interview with Bicing users:

[http://www.treehugger.com/files/2008/01/bicing\\_interview2.php](http://www.treehugger.com/files/2008/01/bicing_interview2.php)

Treehugger interview with Bicing creators:

[http://www.treehugger.com/files/2008/01/bicing\\_interview\\_3.php](http://www.treehugger.com/files/2008/01/bicing_interview_3.php)