

COST- BENEFIT EVALUATION OF BICING

Workshop 6: The renaissance of cycling

Authors:

Anaya, Esther
Bea, Miguel

ECOMM Conference 2009
San Sebastián/Donostia, Spain
14TH May 2009

I. Introduction

What's BICING?



- It's a Public Bike System (PBS) launched in March 2007 in Barcelona
 - Provider: Clear Channel (contract signed for 10 years) 
 - Management: BS:M, the public transport management company 
 - Administration: Barcelona Town Council (Security and Mobility Department)
- Financed by on-street car parking revenues and users subscriptions
 - Fee: annual subscription. Bike usage is free up to 30 minutes, the following fractions of 30 minutes are charged 0'50 €, with a limit of 2 hours.
- Schedule
 - Fridays – Saturdays: 24 hours a day
 - Sunday – Thursday: collecting a bike from 5am to midnight, though a bike can be returned whenever.

■ Profile of the user/trip*

- 70% of trips were exclusive whereas 30% were combined with other alternatives of transportation
- Commuting and studying are the main reasons for displacement (70%)
- 60% of subscribers are over 30 years old (50% men / 50% women)
- Average length trip: 3km (14' working day; 18' holiday)

Type of trip replaced	Public Transportation (Bus/Underground)	Car or motorbike	Private bicycle	Foot or previously non-existing trip
	55%	10%	6%	29%

* Based on "Estudi d'habits de mobilitat dels usuaris del Bicing". Instituto de Investigaciones Market Aad (September 2007) and "Bicing... el nuevo transporte público individual de Barcelona" Ángel López Rodríguez. Barcelona Town Council. Director of Mobility Management. March 2009

II. Main Costs and Benefits

Some assumptions:

- Calculations for 2009
- 6.000 bicycles, 400 racks and 180.000 subscribers
- Each station has an average capacity for 21 bikes (about 42 m²)
- Average bicycle rotation: 8 trips/day (working day)
- 24 redistribution and maintenance vans. 17.000 monthly visits to the stations
- Evaluation of externalities transportation: "Study of the Social and Environmental Costs of Transportation" by Department of Territorial Policy and Public Works of Catalonia in 2004.

A. COSTS

A1. Provision

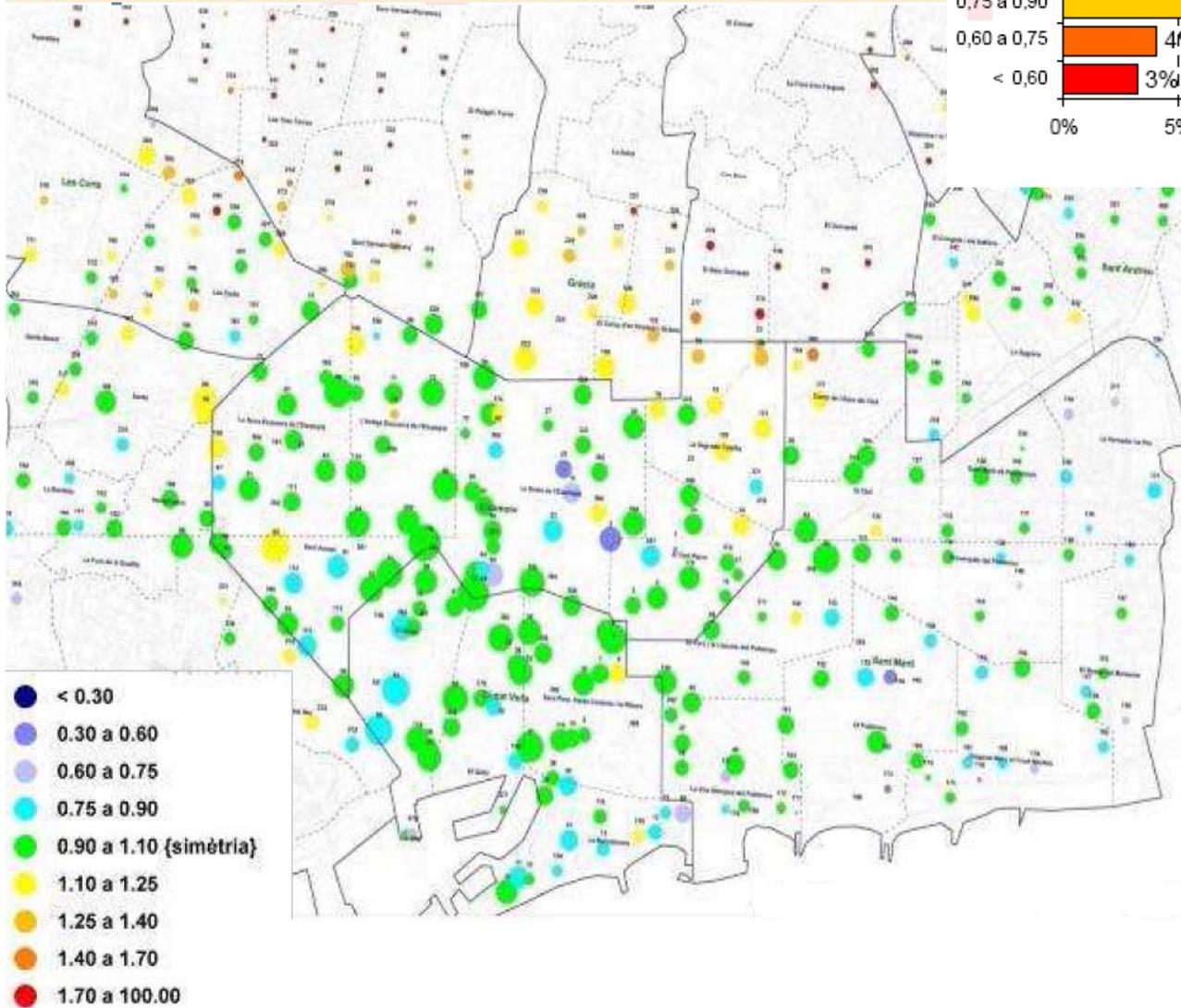
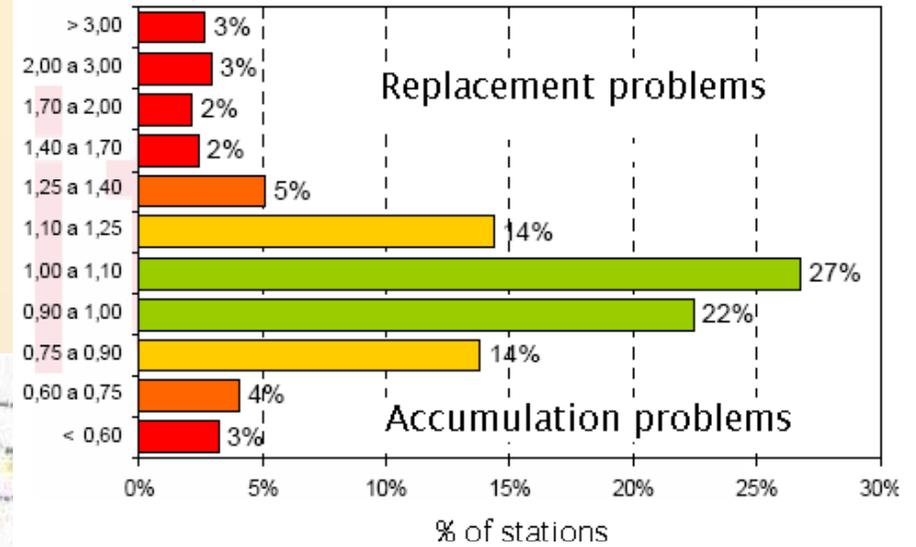
- Basically: bicycles, stuff, capital cost, redistribution and maintenance works, software and customer service.
 - Between 10'5 and 18 millions Euros (1.750 - 3.000 € by bicycle)
 - High initial costs of investment

A2. Negative externalities associated with redistribution and maintenance trips (noise, pollution, congestion, accidents,...)

- Daily redeployments (lack of bikes and maintenance works).
 - Reasons: the directionality of the movement of trips and the orography.
 - Estimated impact of 2'1 millions Euros

S represents the ratio between the generated (G) and attracted (A) trips

$$S = G / A$$

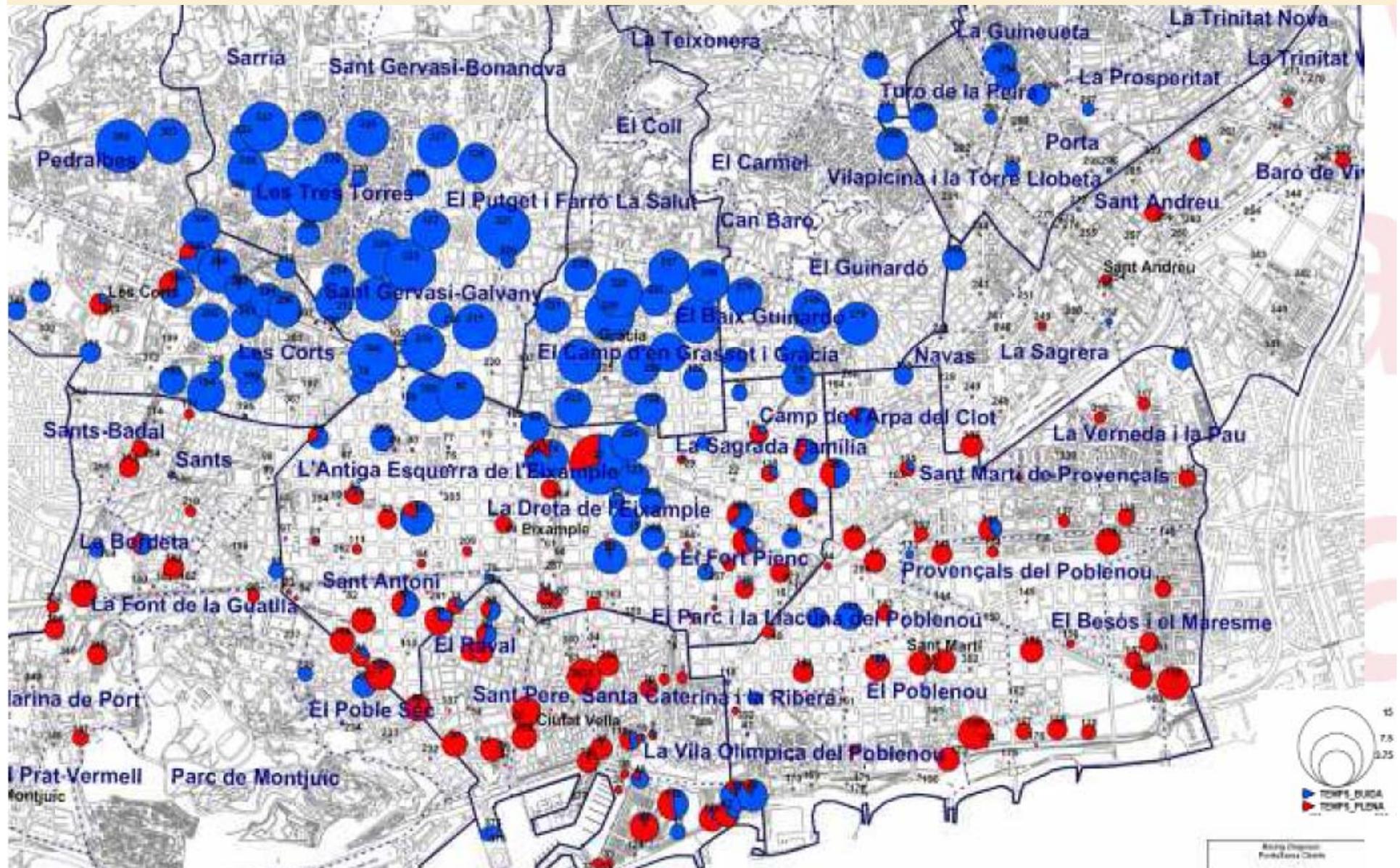


The diameter of each circle indicates the volume of trips generated.

Meanwhile the different colors refer to the value of S, so:

- $S < 1$ tendency to be full
- $S > 1$ tendency to be empty

Blue circles represent empty stations and red circles are filled stations during the day. Its diameters reflect the number of daily hours that they have been in this situation.



A3. Opportunity cost of urban space (parking)

- Urban land is scarce and expensive.
- Political or administrative pricing: parking fees.
 - The collection is estimated between 2 and 4 millions Euros

A4. Accident costs

- Has increased the **absolute** number of bicycles accidents (124 in 2008).
 - Estimated cost in < 1 million Euros
 - There has also been a reduction in the number of injuries in other means, so *the net result could be negative (benefit)*

A5. Design and operation faults (non-monetarised)

- Crash system, time losses associated with not finding a bike or a free parking slot, conflicts in the public space between pedestrians and drivers, vandalism,...

B. BENEFITS

B1. Improving health (decrease sick leaves and absenteeism)

- Cycling has a positive effect on the health that is reflected in a lower risk of disease and a reduction of absenteeism.
- Some of the WHO studies allow provide instruments to estimate the economic benefits of increased physical activity.
 - About 5 million Euros

B2. Avoided negative externalities from motorized transport and saved fuel

- Similar procedure as used in section A2.
 - It could rise up to 6 million Euros

B3. Non-monetarised

- Catch-effect
 - There has been a raise of the number of citizens using their private bike in response to an increased presence of cyclists on the streets.
- Increasing inter-modality options
 - The supply of public transport is now more comprehensive and allows a greater number of combinations to public or private alternatives.
- Positive externalities
 - Positive image for the city and better quality of life



III. Conclusions and Recommendations

1. Layout

- Orography of some district areas of the city is not appropriate because of heavy slope.
- We further recommend that Bicing stations must be installed at points of mix of uses to avoid breakdown or saturation of bicycles.

2. Financial scheme and quality service

- Subscriptions hardly cover 30% of the total costs of the system. Fees are too low and it seems to offer a "low cost" service to the user, who doesn't worth it.
- Most expensive fees in the high areas and on the other hand cheaper fees in the low areas would encourage would solve partially the redistribution problem.

3. Synergies (complementary policies)

- To launch a public bike system requires a series of measures to guarantee the success of the project (i.e., city regulation for cycling, cycle paths, traffic calming). To sum up, make the city more **CYCLABLE**.

4. High reversibility costs and expanding constraints

- **Limited compatibility:** As each provider has a unique model of public bike system, it's quite difficult to reconcile two of them. This fact limits the available options, particularly when we talk about extending the system among nearby municipalities or even in the same city.
- **High reversibility costs of the project:** once the grant or subsidies are over the facilities of the system can not be used by another company apart from Clear Channel (systems are not compatible).
- **Outdoor advertising companies** (it's not the case of Bicing)
 - Substantially increasing the number of billboards ("advertising pollution")
 - Suitable only for large cities

5. To change the paradigm

- Public transport is traditionally associated with mass transport.

Thank you so much for
your attention!

Contact:

estheranaya@gmail.com

miguelbeaalonso@hotmail.com