

**CASE STUDY:** Buga – the free riding bicycle of Aveiro

**SECTOR:** Transport  
**COUNTRY:** Portugal

### **STATEMENT ON SUSTAINABILITY**

One of the most usual problems in nowadays cities is the increase of motorized vehicles, which causes several disturbances to people and the environment. The purpose of this project was to reintroduce the use of the bicycle in Aveiro (where, in the 1950s, it was a very common means of transport) and evaluate the sustainability of this action, using the methodology described below.

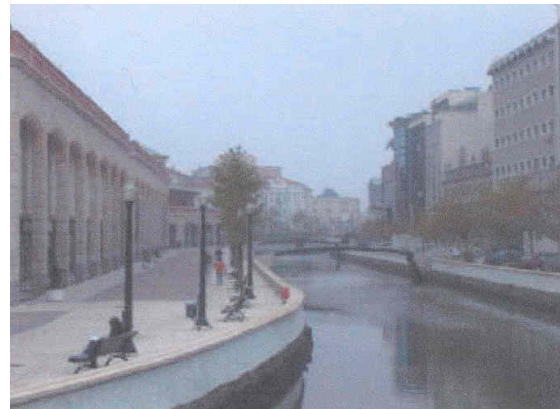
### **BACKGROUND**

In the hilly cities and towns of Northern and Central Portugal, bicycles were never popular. The town of Aveiro was clearly an exception. This town is located nearby a coastal lagoon, some 60km southwards from Oporto. At present, Aveiro has a population close to 50 000 inhabitants. Up to the 1950s, the flat lands of the town and surrounding countryside made two wheels a rather popular means of local transport. At that time, Aveiro District was the heartland of the Portuguese bicycle and motorbike industries. However, with the rapid increase of car ownership, the decline of these industries was sudden and sharp. By the early 80s, only a few industries were still in operation, mainly for the external market. In only two decades, the use of the bicycle vanished from the town and the countryside.



Against this background, the BUGA project (Bicicleta de Utilização Gratuita de Aveiro), sponsored and managed by the municipality, aims at reintroducing the bicycle in the current day-to-day life

of the town. With a stock of 200 bicycles, spread over 39 parks, it offers the possibility of a free ride to any citizen, as well as a specially designed network of bicycle routes covering the whole town.



This initiative involved;

- i) the design and assembly of a new bicycle with a different look, easily identifiable to deter eventual thefts, user friendly, sufficiently safe and reliable for intensive public use;
- ii) the set up of the necessary project logistics, covering maintenance, collection and surveillance services, as well as a BUGA shop for gadgets and accessories and an emergency line for urgent repairs;
- iii) the design of urban furniture responsive to the particular demands of the BUGA project;
- iv) the introduction of a new and dedicated network of bicycle routes,

particularly needed in the busy streets of the town centre.

### INDICATORS

- air pollution - reduction of airborne car emissions
- noise pollution - reduction of car noise levels
- modal split in transport - induced use of bicycles
- urban planning - provision of bicycle routes face
- traffic congestion - reduction of car traffic flows
- safety - road accidents rate

### EVALUATION

After an experimental period of six months, the project was launched on the 1st of April 2000. The project was directly responsible for the creation of four full time jobs. Five months later, more than 50 000 people had already used the BUGAs. At present the average number of users per day varies with the day of the week, from 1500 to 3000. It is not yet clear if the success of the BUGA project is associated with the attractiveness of the scheme to car drivers, to pedestrians, or to people on public transport. The overall impact of the project will vary significantly depending upon the average profile of the BUGA user, the average length of the journey and the demonstration effect of the scheme, encouraging the generalised use of bicycles in the town. To date, students of the local university are surely one of the groups that most benefit from this scheme.

#### The users of Buga are from:

Aveiro	47.22%
Out of town	50%
Tourists	2.78%

#### Riding a Buga instead of:

Means of transport	%
Motorized vehicles	27.78%
Public transport	16.66%

Walking	55.56%
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#### Means of transport people use when not riding a BUGA:

Means of transport	%
Car	25%
Bus	22.22%
Walking	52.78%

### BENCHMARK DATA

There are no benchmark data agreed upon for the daily number of users and induced modal split, in particular from private car to public bicycle.



### DRIVERS

The BUGA project is essentially a Local Authority initiative inspired in the Local Agenda 21. It accounted with the technical support of the University of Aveiro and the local industry that produces the BUGAs.

### LESSONS LEARNT

The pilot period was particularly useful to adjust the maintenance and surveillance services. In that period some BUGAs were vandalised or stolen. More effective surveillance procedures were introduced. At present, this problem seems finally under control. The initial period was also useful to adjust the location of the BUGA parks. In most cases locations end up privileging proximity to large traffic generators in the town centre, such as schools, transport terminals, shopping

molls or public services. Residential areas were almost totally excluded.

### Judgement of Buga's users

Good idea	25%
Few hours schedule	5.56%
Few number of bugas	16.67%
Bugas in bad conservation state	2.78%
Lack of civics	8.33%
Don't answer	41.66%

As a result BUGAs have not been successful deviating people from cars in the most frequent local journeys home / work, home / shopping or home / schools.

### Reasons why people don't use Bugas

hurry	4.21%
Need to go beyond buga points	5.26%
Take children to school	2.01%
Few buga points	10.53%
Not from aveiro	37.89%
Prefer the car	14.74%
Commodity	4.21%
Like walking	1.05%
Own bicycle	2.01%
Other reasons	18.09%

### APPLICATION

There are a number of cities in Europe and the US, such as Amsterdam, Copenhagen or Portland, to name just a few, with free bicycle schemes with similarities to the Aveiro BUGA. In Portugal this was the first serious attempt to run a permanent free bicycle scheme. At present, other cities are planning to introduce similar schemes, taking advantage of some of the investment programmes under way, namely those geared towards the improvement of urban environmental quality or city centre revitalisation.

### TRANSFERABILITY

This project can be easily adaptable to other small towns and cities, provided due attention is paid to the profile of potential users, to the design, safety and comfort conditions of the bicycle routes,

and to the overall quality and efficiency of supporting services.

### SUSTAINABILITY IMPACT

**Environmental:** In the case of Aveiro, there is no evidence that the total number of daily trips on bicycle will necessarily mean a significant reduction of car flows and, therefore, of air pollutants and noise levels. The BUGAs have been far more effective deviating people from local public transport or from walking long distances in the town centre. As a result, the overall environmental impact of the project, although positive, has to be considered, so far, relatively modest. Nevertheless, the amount of CO2 that will not be produced, per year, due to the use of Bugas, can be estimated as 2958 ton/year. This may seem very low but the fact that Aveiro is a town with only 50,000 inhabitants should not be forgotten,

**Social:** The indirect impact attached to the demonstration effect of the project is surely far more important from both an environmental and social point of view. There has been a gradual increase of bicycle users in town taking advantage of the network of bicycle routes introduced UGA project. This network offers a new and far more social and friendly way of using and experiencing the town centre, despite some conflicts arising here and there with pedestrians.

**Economic:** The direct economic impact of the project is negligible. Apart from the design and production of an entirely new bicycle, the project generated four new jobs for the Local Authority.

**Institutional:** The institutional impact of the project has been far more visible. The media coverage of the project has been quite extensive. The Local Authority has been able to capitalise on the positive image of the project, particularly among the local community.

**PROJECT CONTACT**









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Ana Claudia Cardoso (2002) *Bicicleta de utilizacao gratuita de Aveiro – BUGA*, trabalho de Mestrado em Engenharia do Ambiente, sob a coordenação do Professor Paulo Pinho.

**REFERENCE**

CMAveiro (2001) BUGA, a bicicleta de utilização colectiva de Aveiro, notas de apresentação do projecto, DPGOM-CMAveiro.

**SUMMARY OF IMPACT ON SUSTAINABILITY**

<b>Ecology</b>		<b>Economy</b>		<b>Social aspects</b>	
Emissions?		Cost effective?		Participation?	
Use of natural resources?	-	Willing to pay?	-	Transparency?	
Biodiversity?	-	Effective organisation?		Safety?	
Total		Total		Total	