Measure title: **Extension of the infrastructure for cycling and walking**

City: **Donostia–San Sebastián** *Project:* **ARCHIMEDES** *Measure number:* **24**

Executive Summary

This measure addresses a number of pre-requisites for cycling and walking to play an important role in urban mobility in DSS. The main action is that road space dedicated to these modes have been increased. In fact, the city has extended the pedestrian zone by 4 kilometres. Also the cycle network has been completed with 22 kilometres of additional cycling lanes since the ARCHIMEDES start, summing more than 50km in total and making relevant connections between the former network and the new extensions. An interesting action has been the reuse of two obsolete rail tunnels as long cycle lanes connecting San Sebastian and its metropolitan area, important neighbourhoods or the Anoeta Stadium, avoiding hilly itineraries and bridging highways. Three new axes have been built. The new itineraries allow a direct and quick cycle direct connection between the University, diverse neighbourhoods, other cities of the metropolitan area of Donostia and the city centre.

In addition, 60 new bicycle parking facilities (providing parking space for 600 bicycles) have been installed. Furthermore, underground bicycle parking facilities are being installed in the city centre in order to stimulate the use of the bicycle. In particular, indoor bicycle parking inside underground car parking lots in the city centre is being offered to cyclists, providing financial incentives to the residents of these areas to use the service.

This measure is part of a package of measures aiming to increase the use of non-motorized modes as well as reducing the number of private cars entering the city and circulating within its neighbourhoods. The extension of the pedestrian and cycling network has prompted a steady increase in the use of the bicycle, meaning a 33% increase during the CIVITAS project (2008-2011). In 2011 the increase in cycling levels was 26% compared with the previous year.

In terms of modal shift in favour of sustainable modes of transport, results are moderate in the short term, achieving an overall reduction in car use of 0,1% as compared with the situation before the CIVITAS project started. It should be highlighted that this achievement is made in a context of a steady increase in car travel, thus it can be considered a positive result. On the other hand, walking levels seems to be follow a slightly decreasing trend, which is not a desirable result (0,3% reduction in modal share as compared to the situation before the project started). Attention should be placed to this issue in the coming years.

Regarding energy consumption and efficiency, even though an increase in energy consumption of the overall system has been experienced (2,3% increase between 2008 an 2011), the energy efficiency of the system has increased as a consequence of the CIVITAS project. It is estimated that in 2011 energy saving accounted for nearly 15 PET as compared with the BaU scenario. Consequently, there is an overall increase in emission levels as compared with the situation before the CIVITAS project, due to the increased mobility levels experienced in the city. Nevertheless, both in terms of GHG and pollutant emission levels, significant reduction have been achieved by the CIVITAS project as compared to the BaU scenario (e.g. 2,5% reduction in Particulate Matter emission levels in 2011).

As for public perception, most of the population regards the cycling and pedestrian networks as positive (98% in 2010 and 91% in 2011). A slight increase in the number of negative ratings has been accounted, most probably linked to some friction between pedestrians and cyclist at certain locations, and punctual lack of bicycle parking space, caused by the increased level of cycling in the city. Nevertheless, it should be highlighted that the share of population rating the cycling and pedestrian network as “very good” has significantly increased (9% and 12% respectively).

The benefit to cost ratio (BCR) is 5,87 which means that benefits are nearly six times larger than costs. This result reveals that the implementation of non-motorized infrastructure is a very cost-effective measure.

A. Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To reduce the level of private cars, thereby reducing congestion and pollution.

(B) Strategic level:

- To increase priority and incentives for using public transport, walking and cycling through a more equitable sharing of space.

(C) Measure level:

a. To increase the number of cyclists among the residents of the CIVITAS zone with the target on 30%
b. To maintain the high level of pedestrian mobility at 47%

A1.2 Target groups

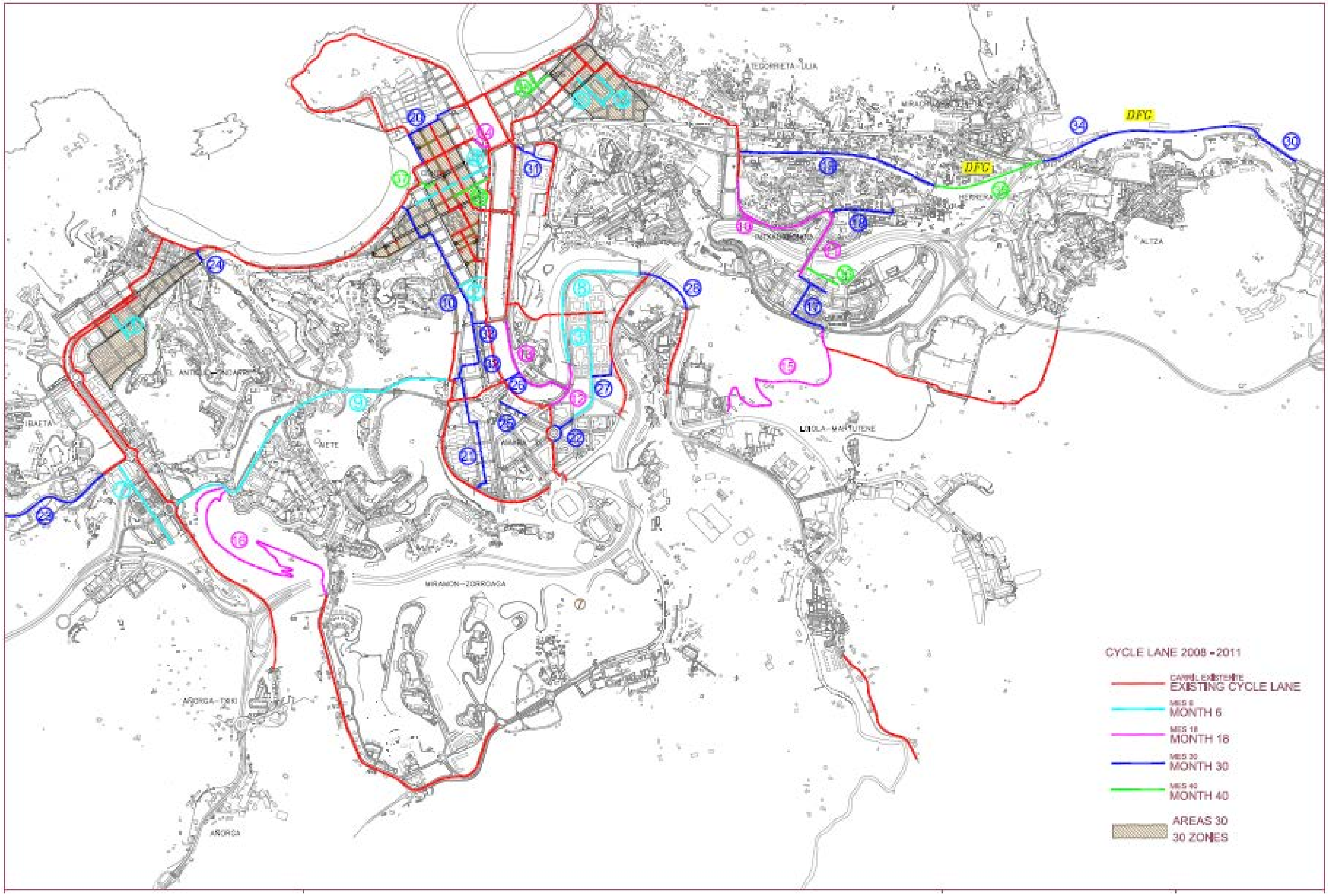
Citizens in general and residents of the Donostia metropolitan area (Donostialdea).

A2 Description

This measure addresses a number of pre-requisites for cycling and walking to play an important role in urban transport. The main action is that road space dedicated to these modes has been increased. In particular the city has extended the pedestrian zone by 4 kilometres. Also the municipality has implemented 22 kilometres of new cycling lanes as it can be seen in the map (Figure 1). In addition to several cycling connections, three important cycle lanes arteries have been opened during Civitas Project:

i. Anoeta Stadium – Concha beach (City center)
ii. Amara – Antiguo (Tunnel of Morlans)
iii. San Sebastian – Pasaia (tunnel and bridge Txaparrene).

These cycle bypasses are important new connexions completing the existing network, two of them reusing obsolete rail tunnels. One is a 1 km long recovery as a cycle lane to avoid a hilly route and to link the university with several neighbourhoods. There is another cycle lane opened in August 2011 with a tunnel and a bridge over the highway that avoids a hilly route and links big and important neighbourhoods with the city centre.



Picture 1.- Cycle network before (red) and after (Pink, green and blue) Civitas

In three areas of the city, 30-km-zones have been created as part of the cycling strategy. Symbol of cyclists has been marked on the road to make people use the road in these areas sharing the space with the bicycle (Figure 1).

Some walk and cycle shared lanes have been implemented in parks and riverside green areas, summing 4 km.

In addition, 60 new bicycle parking facilities (providing parking space for 600 bicycles) have been installed. Furthermore, underground bicycle parking facilities are being installed in the city centre in order to stimulate the use of the bicycle. In particular, indoor bicycle parking inside underground car parking in the city centre is being offered to cyclists, providing financial incentives to the residents of these areas to use the service. The parking facilities are planned to be exclusive for residents to ease their use of the bicycle and reduce robberies. The parking operator is responsible for providing data collection on the number of users.

Finally, an extensive parking facility for 144 bicycles has been implemented by the Basque Government (by means of its rail transport operator Euskotrenbideak) in the centric Euskotren's train station of Plaza Easo. The use of this bicycle parking facility is limited to commuter train users, who are required to use their train ticket to access to the service.

Picture 2.- Euskotren's bicycle parking facility

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New physical infrastructure solutions** (at international level). Two of the infrastructure projects make use of obsolete railway tunnels, which are useful infrastructures to avoid hilly itineraries.
- **New policy instrument** (at national level). Promotion of indoor spaces in public car parking for bicycles is innovative in Spain
- **New organisational arrangements or relationships** (at national level)**.** New relationships with transport operators (bus and rail companies)

B2 Research and Technology Development

Not relevant.

B3 Situation before CIVITAS

Before the ARCHIMEDES project started, there was a total of 98,000 m^2 of pedestrian areas and 28.2 km of cycling lanes. Although these are significant figures, and non-motorized modes have a significant share in Donostia-San Sebastian mobility, the network did not reach every neighbourhood and there was still need for its completion and extension.

Currently, most apartment buildings in Donostia-San Sebastian do not have an indoor designated space for the parking of bicycles, especially in the city centre, and there is no space in the buildings to include an bicycle parking. Cyclists therefore either have to leave their vehicles outside or bring the bicycles inside the apartments.

B4 Actual implementation of the measure

BACKGROUND

San Sebastian is a city with a long network of cycle lanes in the flat areas, including the CIVITAS corridors. Before the start of the project it was 28,2 km long.

The use of the bicycle in the city has steadily increased year by year. From 2007 to 2010 the overall increase is of 20,95%, with 2008 and 2010 as the highlight years, with an increase of 15,01% and 9,77% respectively, as compared with the corresponding previous year.

IMPLEMENTATION OF THE MEASURE

After the implementation of this measure there are 22 km of new bicycle lanes, summing more than 50 km of cycle lanes and 600 (60 elements) new bicycle parking spaces what means a big improvement in the overall non-motorised transport system. Also the 30-km-zones have been implemented and design to promote bicycle mobility, with 6 new km of this kind of streets.

During the CIVITAS project three very important cycle lanes arteries has been opened:

- Amara – Antiguo cycle lane (Tunnel of Morlans) 1,95 km

  A very important connection, exclusive for cyclists, was built connecting the two CIVITAS corridors. This connection makes possible to reduce the distance to go from one neighbourhood to the other from 4 km to 2 km. The users of this cycle lane are mainly students from public university and workers from the industrial areas in those neighbourhoods.

Picture 3.- Large tunnel and short tunnel of Morlans.

Picture 4.- Entrance to the tunnel of Morlans. Before and After.

- Anoeta Stadium –Concha beach (City centre) 2,10 km

  An important connection has been opened between the Paseo de la Concha and the stadium of Anoeta, going through one of the CIVITAS corridors (Amara). To build this cycle lane a car lane and car parking spaces for cars has been removed.

Picture 5.- Cycle lane in car lane and parking space in Easo Street.

- San Sebastian – Pasaia cycle lane (tunnel and bridge Txaparrene). 1,80 Km

  This cycle lane includes a tunnel and a bridge over a highway that avoids a hilly route and links important neighbourhoods from the outskirts of the city with the city centre.

Picture 6.- Entrance to the tunnel of Txaparrene. Before and after.

Picture 7.- Tunnel and bridge over the highway in Herrera

In addition to these main cycling corridors, other important connections that provide continuity to the existing network have been implemented.

The construction of the cycle lanes started in the end of 2008 and early 2009 and most of them were finished by 2011.

Picture 8.- Boulevard-C/Hernani Cycle lane. Before and after.

Picture 9.- Boulevard-C/Hernani Cycle lane. Before and after.

Picture 10.- Paseo de Mons Cycle lane. Before and after.

Picture 11.- Paseo de Otxoki cycle lane. Before and after.

Picture 12.- Plaza Irun cycle lane. Before and after.

Picture 13.- Plaza Teresa de Calcuta cycle lane. Before and after.

Picture 14.- Plaza Teresa de Calcuta cycle lane. Before and after.

Also important pedestrian improvements have been developed within the CIVITAS project.

- The construction of the pedestrian areas of Intxaurrondo and Riberas de Loiola finished in 2011.

Picture 15.- Ametzagaina Park with 2 km of walking paths

Picture 16.- Viewpoint of the city on the Ametzagaina Park

Picture 17.- Coexistence pedestrian-bicycles path in Ametzagaina park

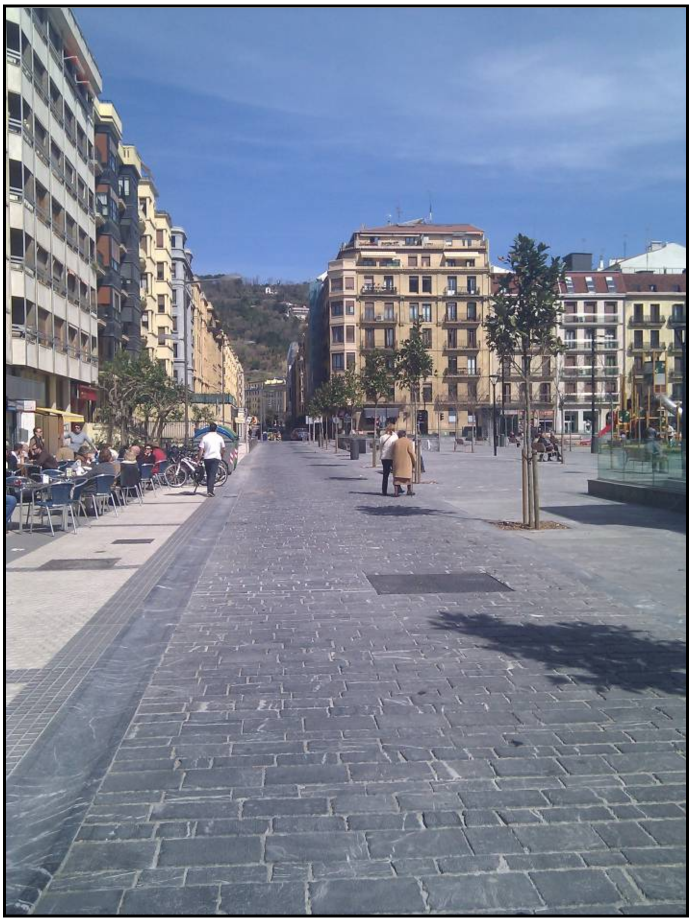
Picture 18.- Pedestrian Area in Riberas de Loiola. Beside the river. 1,650 m.

Picture 19.- Pedestrian Area in Riberas de Loiola.

Picture 20.- Pedestrian Area in Riberas de Loiola.

- Two more pedestrian areas were finished by month 40 in the city centre.

Picture 21.- Pedestrian Area in Calle Arrasate.



Picture 22.- Pedestrian Area in Calle Zabaleta

Following is a summary of the different stages in which the measure has been implemented:

- **Extension of the cycling infrastructure**

Phase 1: 5,0 additional kilometres (Month 6)

NAME	MONTH	FROM	TO	TYPE	LENGTH	START	FINISH
1.- Avd Tolosa Simona Lajust	6	Avd Tolosa	Simona Lajust	Cycle lane	200	October 2008	January 2009
2.- Pedro Egaña	6	C/Urbieta	C/Autonomia	Cycle lane	140	Nobember 2008	February 2009
3.- Riberas de Loiola	6	Avd Barcelona (Gregorio Ordoñez)	Avd Barcelona (Nemesio Etxaniz)	Cycle lane	707	January 2009	April 2009
4.- San Marcial	6	Easo	Fueros	Cycle lane	487	January 2009	February 2009
5.- Segundo Izpizua	6			Coexistence with vehicules	310	October 2008	April 2009
6.- Berminghan	6			Coexistence with vehicules	255	October 2008	April 2009
7.- Xabier Lizardi (Errotaburu)	6	Iglesia	Cancha de Baloncesto	Cycle lane	450	September 2008	November 2008
8.- Riberas de Loiola	6	Puente Egia	Humbolt	Cycle lane	740	April 2009	August 2009
9.- Morlans	6	Autonomia	Lugaritz	Cycle lane	1650	November 2009	August 2009
				TOTAL	**4939,00 metres**		

Phase 2: 6,3 additional kilometres (Month 18)

NAME	MONTH	FROM	TO	TYPE	LENGTH	START	FINISH
10.- Paseo de Mons	18	Paseo de Mons 7	Plaza Pablo Sorozabal	Cycle lane	810	May 2009	September 2009
11.- Zarategi	18	Pablo Sorozabal	Calle Sagastieder	Cycle lane	415	January 2010	April 2010
12.- Riberas de Loiola	18	Humbolt	Eustasio Amilibia	Cycle lane	530	August 2009	August 2010
13.- Urbanización Aldunaene	18	Puente Mundaiz	Puente de hierro	Cycle lane	670	January 2009	December 2010
14.- Plaza SantaCatalina	18	Calle Oquendo	República Argentina	Cycle lane	100	October 2009	April 2010
15.- Parque Ametzagaina	18	Paseo Otxoki	Camino de Uva	Coexistence with pedestrians	1860	May 2010	June 2010
16.- Urbanización Pagola	18	Paseo Oriamendi	Rotonda de Sesiotegi	Cycle lane	1940	January 2009	July 2010
				TOTAL	**6325,00 metres**		

Phase 3: 9,6 additional kilometres (Month 30)

NAME	MONTH	FROM	TO	TYPE	LENGTH	START	FINISH
17.- Sagatieder - Parque Otxoki	30	Plaza Baratzategi	Paseo Otxoki	Cycle lane	590	June 2010	September 2010
18.- Pablo Sorozabal - Paseo de Mons	30	Pablo Sorozabal	Polideportivo Mons	Cycle lane	410	July 2010	September 2010
19.- Paseo Txaparrene	30	Estación Ategorrieta	Tunel en paseo Txaparrene	Coexistence with pedestrians	1150	December 2010	January 2011
20.- Boulevard - Calle Hernani	30	Calle Aldamar	Calle Andia	Cycle lane	480	June 2010	August 2011
21.- Jose Maria Salaberria	30	Pedro Manuel Collado	Paseo Errondo	Coexistence with pedestrians	600	August 2010	November 2010
22.- Plaza Irún	30	Plaza Irún	Gregorio Ordoñez	Cycle lane	280	July 2010	September 2010
23.- Poligono Industrial Igara	30	Plaza Lautximinieta	Rotonda Illara	Cycle lane + coexi vehi	1185	September 2010	October 2010
24.- Avenida Satrústegi	30	Avd zumalakarregi	Calle Matia	Cycle lane	60	September 2010	September 2010
25.- Calle Felipe IV	30	Calle Avd de Madrid	Calle Eustasio Amilibia	Coexistence with pedestrians	170	March 2009	November 2010
26.- Puente Lehendakari Aguirre	30	Paseo Federico Garcia L	Paseo Bizkaia	Cycle lane	120	July 2010	December 2010
27.- Riberas de Loiola	30	Avd Barcelona	Paseo Zorroaga	Cycle lane	65	May 2011	June 2011
28.- Loiola	30	Puente Egia	Plaza Atarieder	Cycle lane	430	November 2009	June 2010
29.- Zubieta	30	Puente Hipica	Pueblo Zubieta	Cycle lane	660	May 2009	December 2009
30.- Donostia - Pasaia	30	Buenavista	Calle Eskalantegi	Cycle lane	265	June 2010	January 2011
31.- Plaza Euskadi	30	Plaza Euskadi	Teresa de Calcuta	Cycle lane + coexis pedestri	365	May 2010	February 2011
32.- Calle Easo - Sancho el Sabio	30	Paseo de la Concha	Calle Pedro Manuel Collado	Cycle lane + coexis pedestri	1480	November 2010	March 2011
33.- Calle Parque	30	Paseo Bizkaia	Calle Sancho el Sabio	Cycle lane	85	November 2010	March 2011
34.- Donostia - Pasaia	30	Herrera	Buenavista	Cycle lane	1225	June 2010	January 2011
				TOTAL	**9620,00 metres**		

Phase 4: 1,4 additional kilometres (Month 40)

NAME	MONTH	FROM	TO	TYPE	LENGTH	START	FINISH
35.- Paseo Txaparrene	40	Paseo Txaparrene	Herrera	Cycle lane	675	September 2011	September 2011
36.- Centro Civico Intxaurrondo	40	Paseo Zarategi	Centro Civico	Cycle lane	200	April 2011	May 2011
37.- Avenida de la Libertad	40	Calle Urbieta	Calle Loiola	Cycle lane	95	July 2011	July2011
38.- Calle Ramón y Cajal	40	Paseo Colon	Avenida de la Zurriola	Cycle lane + coexis pedestri	250	September 2011	October 2011
39.- Calle Arrasate	40	Calle Etxaide	Calle Fuenterrabia	Cycle lane + coexis pedestri	150	August 2011	December 2011
				TOTAL	**1370,00 metres**		

Table 1: Detail of cycle lane extensions within ARCHIMEDES project

Additionaly, 30-km-zones have been implemented in three areas of the city as an extension of the cycling network developed in Donostia-San Sebastián (see measure 46-47 for details)

- **Extension of pedestrian areas**

Phase 1: 3,65 additional de kilometres (Month 30)

NAME	MONTH	FROM	TO	TYPE	LENGTH	START	FINISH
1.- Riberas de Loiola	30	Puente de Egia	Calle Eustasio Amilibia	Pedestrian	1250	Jjanuary 2009	August 2010
2.- Parque Ametzagaina	30	Paseo de Otxoki	Salida parque Ametzagaina	Pedestrian. Park	2000	January 2009	June 2010
3.- Loiola	30	Puente de Egia	Plaza Atari Eder	Pedestrian	400	November 2009	June 2010
				TOTAL	**3650,00 metres**		

Phase 2: 0,35 additional de kilometres(Month 40)

NAME	MONTH	FROM	TO	TYPE	LENGTH	START	FINISH
4.- Plaza Cataluña	40	Calle zabaleta	Calle Ramon y Cajal	Pedestrian	200	September 2011	October 2011
5.- Calle Arasate	40	Calle Fuenterrabia	Calle Bergara	Pedestrian	150	August 2011	December 2011
				TOTAL	**350,00 metres**		

Table 2: Detail of pedestrian paths extensions within ARCHIMEDES project

- **Covered parking spaces in public car parking:**

  The measure was planned to include financial incentives to condominiums to construct indoor bicycle parking. There have been big difficulties to find spaces in the apartment buildings and to manage the economical aids for condominiums.

  Therefore, bicycle parking facilities in the public car parking network in the city centre are being installed, with financial incentives to the residents of these areas to promote its use.

B5 Inter-relationships with other measures

The measure is related to others not just in the field of non-motorised transport but in the fields of public transport, road safety and parking policy, because they explain the context of the mode of transport personal election:

- Measures on non motorized transport: i.e. Vertical Transport (M57) and City Bike Scheme (M58)
- Measures on public transport: i.e. High Quality Bus Corridors (M16) and Bus Traveller Information (M73)
- Measures on parking policy: i.e. Changing Parking Behaviour (M23)
- Measures on road safety: i.e. Safe Districts and 30 kilometre zones (M46)

Also, there are a number of similar measures in other CIVITAS cities:

- Measure 51: Cycle Motorway in Aalborg
- Measure 55: Cyclist Priority in Brighton & Hove
- Measure 59: City Cycle Routes in Iasi
- Measure 60: Cycle Transport Improvements in Ústí nad Labem
- Measure 62: Cycle Transport Improvement in Monza

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

Being part of an overall strategy to reduce the number of private cars entering the city and circulating within its neighbourhoods, this measure is part of a package of measures directed to increase the use of non-motorized modes (Measures nº 24, 57 and 58).

In particular, this measure is aimed at providing a more equitable share of Donostia-San Sebastian public space by increasing the number of exclusive and shared infrastructures for pedestrian and cyclist mobility. Therefore, it is expected that the use of these modes on daily trips will increase; resulting in reduced transport related emissions and safer mobility patterns (fewer accidents). Moreover, it is expected that the promotion of these active modes of transport will improve health values of the population, by favouring physical activity on a regular basis.

Modal shift to non-motorized modes will relief traffic congestion on Donostia-San Sebastián streets, favouring time saving for motorized modes, and improving public transport reliability, which, in addition to improved access to bus stops, may contribute to increase the public perception of this mode, and therefore its use.

This measure will also impact on the intermodal integration of the transportation system, by improving non-motorized access to some of the main transport terminals in the city.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	ECONOMY					
2a		**Costs**	Costs	Capital costs	Capital cost per system or unit	Euros, quantitative
2b				Maintenance Costs	Maintenance cost per system or unit	Euros, quantitative
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Attitude survey of current acceptance of the measure	Index (%), qualitative, collected, survey
14			Acceptance	Acceptance level	Attitude survey of current acceptance of the measure	Index (%), qualitative, collected, survey
			Bicycle theft	Bicycle theft level	Number of stolen private bikes.	No., quantitative, collected.
	ENERGY					
3		**Energy Consumption**	Fuel Consumption	Vehicle fuel efficiency	Fuel consumed per vkm	PET/1.000 v-km, quantitative, derived or measurement
	ENVIRONMENT					
8		**Pollution and Nuisance**	Emissions	CO2 emissions	CO2 per vkm by type	G/vkm, quantitative, derived
9				CO emissions	CO per vkm by type	G/vkm, quantitative, derived
10				NOx emissions	NOx per vkm by type	G/vkm, quantitative, derived
11				Particulate emissions	PM10 and/or PM2.5 per vkm by type	G/vkm, quantitative, derived
	TRANSPORT					
20		**Safety**	Transport Safety	Injuries and deaths caused by transport accidents	Number of accidents, fatalities and casualties caused by transport accidents (all nodes of transport are considered).	No, Quantitative, measurement
29		**Transport System**	Modal split	Average modal split-trips	Percentage of trips for each mode	%, quantitative, derived
			Bike use	Number of cyclist	Number of trips per day.	No., quantitative, collected.

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
2a	Capital costs		Data collected from financial records	When implementation takes place
2b	Maintenance Costs		Annual maintenance costs	Annual
13, 14	Acceptance level		Data have been collected through a specific survey over a representative sample of citizens living in neighbourhoods affected by this measure. The target audience is citizens of all ages and gender living in the neighbourhoods where new pedestrian areas and/or cycle lanes are implemented. The survey method will be based on on-street personal interviews .The questionnaire included questions regarding awareness and acceptance levels. A sample size of 400 interviews is defined (95% confidence level)	2 times after implementation of the measure
	Bicycle theft level		Police records on the number of stolen private bikes	Annual
3	Vehicle fuel efficiency		Model based on the mobility survey and traffic flows data	One in 2012
8, 9, 10, 11	CO_2, CO, NOx, PM emissions		Model based on the mobility survey and traffic flows data	One in 2012
20	Injuries and deaths caused by transport accidents		Police records on transport accidents (all modes) have been analysed before and after the implementation of the measure	Annual
29	Modal split	Maintain the share of pedestrian mobility on modal split	Update of the Regional Mobility Survey (Basque Govern) based on a field work campaign (mobility survey) conducted in the framework of the studies for the implementation of the metro network in Donostialdea	One in 2012
	Number of cyclists	30% of increase in bicycle use	Manual gauging of cyclist using bicycle lanes.	Annually (April to October)

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Specific attitude survey to reveal the attitude towards the extension of cycling and walking infrastructure.	13, 14	Months 24/36	Ayuntamiento de Donostia-San Sebastián Fermín Echarte
Police records on the number of stolen private bikes	-	Months 15/27/39	Ayuntamiento de Donostia-San Sebastián Fermín Echarte
Model based in the Regional Mobility Survey and data of traffic flows	3, 8, 9, 10, 11, -	Month 42[1]	Ayuntamiento de Donostia-San Sebastián Fermin Echarte
Police records on accidents will be analysed before and after the implementation of the measure	20	Months 15/27/39	Ayuntamiento de Donostia-San Sebastián Fermín Echarte
Update of the Regional Mobility Survey (Basque Govern)	29	Month 42[1]	Ayuntamiento de Donostia-San Sebastián Fermín Echarte
Manual gauging of cyclist using bicycle lanes	-	Months 12/24/36/48	Ayuntamiento de Donostia-San Sebastián Fermín Echarte

C1.2 Establishing a baseline

EVALUATION PROCESS

The main scope of the evaluation process is to assess how pedestrian and specially cycling levels are evolving as a result of the actions undertaken by the municipality in this regard. But also environmental, cost and acceptance issues are considered in the evaluation plan, since they play an important role in the success of the non-motorized strategy deployed by Mobility Department within the CIVITAS project.

The data collection method for the evaluation of the measure is as follows:

1.- Data collected from other departments

Construction costs of specific cycle lanes have been collected from the Mobility Department. Capital costs of cycle lanes included in bigger developments have been calculated with data facilitated by "Proyectos y Obras" Department (Public Works Department). The maintenance costs have been collected by "Vías Públicas" Department (Public Roads Department).

2.- Survey

The perception of citizens about the construction of the infrastructure in the areas was analysed. Surveys were done in the areas where the works have been made. As perceptions are a personal feeling, it has been considered that this is the best way to measure these results.

3.- Model

A classic four step model has been designed to assess modal shift, traffic performance and emissions. Car traffic, public transport and non-motorized modes have been considered within the demand model.

In order to replicate trips generation (including origin and destination), modal share and traffic assignment to the road network, the following input has been used:

- Urban zoning according to Regional Mobility Survey traffic zones and census division
- Road network characteristics (nº lanes, speed management, traffic regulations, etc.)
- Non-motorized transport network characteristics (walking and cycling exclusive connections)
- Public transport service provision characteristics (frequency, capacity, etc.)
- Socioeconomic variables (population projections, income, etc.)
- Urban development plans
- Baseline modal share: actualization of the Regional Mobility Survey (Basque Govern) based on a field work campaign (mobility survey) conducted in the framework of the studies for the implementation of the metro network in Donostialdea
- Traffic counts from automatic traffic gauging devices in the main corridors entering the city
- Cycling levels from Bicycle Observatory statistical database

CUBE (Citilabs) modelling software has been used for calibration and future projections. CIVITAS and BaU scenarios have been projected. The modelling software includes an emissions module used to determine emission volumes in both scenarios.

4.- Counting of cyclists

The number of cyclists making use of the network has been counted. Data has been collected one day per month in each of the designated counting points (5 points has been defined to compare the data and 1 more for the use of the newly adapted Morlans tunnel). The data have been collected during the months from April to October 2011 in every point.

BASE DATE, AREA INCLUDED

Bicycle usage data has been collected regularly since 2003 and this data has been included in the analysis as it can be seen on the graphic in point C2. Nevertheless, the reference year to compare the evolution of most indicators is 2008 as it was the start of the project. An exception is made for capital cost and the maintenance cost in which the comparison year is 2007, because there were infrastructures included in the project that were finished in 2008.

The area considered in this measure includes all the flat neighbourhoods in the city, which mostly correspond to the CIVITAS corridor.

C1.3 Method for Business as usual scenario

If this measure would not be implemented, the non-motorized transport network will follow the same evolution pattern as previous years, and car use would continue growing.

For evaluation purposes, the BaU scenario has been estimated as follows:

Capital cost

Capital cost has been calculated according to the data collected from different Departments of the Council in those cases that has been possible. In the cycling lanes included in bigger developments, estimations have been done.

For the BaU, data from 2005 to 2007 has been taken into account in order to calculate the average number of cycling paths implemented during those years and an average cost factor per length unit of cycling network (€/m). This cost factor has been used to estimate the evolution of the cycling network in the future years under the BaU scenario, as well as the corresponding investment costs.

YEAR	TOTAL LENGTH OF CYCLE LANES (m)	AVERAGE LENGTH (m/year)	TOTAL INVESTMENT (€)	COST PER LENGTH UNIT (€/m)	AVERAGE COST PER LENGTH UNIT (€/m)	CAPITAL COSTS BaU (€)
2005	950 m	2.687 m	243.500 €	256,32 €/m	243,89 €/m	655.404,41 €
2006	4.072 m		1.223.000 €	300,34 €/m		
2007	3.040 m		532.000 €	175,00 €/m		

Table 3 Average cost of cycling paths built in Donostia-San Sebastian 2005-2007

Maintenance cost

Maintenance cost has been calculated with data collected from different Departments of the council. A similar approach to Capital Costs has been used. Cost factor corresponding to each concept according to the references given by maintenance council departments, have been applied to the estimated evolution of the non-motorized network in the BaU scenario (as described above):

- Pavement maintenance: 0,5 €/ year per metre
- Horizontal signing: 0,05 €/ year per metre
- Lighting: 100,00 €/lightning post
- Cleaning: 0,5 €/ year per metre

For the lighting it has been considered that there is a light every 25 metres and that the 10 % of the lighting costs applies to the cycle lane. Each point of light costs 100 € so the maintenance cost for 1 metre of cycle lane would be = 100 €/light * length (metres)/25 metres * 10/100

In order to apply this cost factors, it is estimated that an average of 2.687 metres of cycle lanes are constructed each year under the BaU scenario (see above calculation):

Cycling network length	**Before CIVITAS**			**BaU**			
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
	20.640 m	24.712 m	27.752 m	30.439 m	33.127 m	35.814 m	38.501 m

Table 4 BaU Cycling network evolution

Maintenance Costs (€)	**Before CIVITASBaU**			**BaU**			
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Pavement maintenance	10.320,00	12.356,00	6.938,00	15.219,67	16.563,33	17.907,00	19.250,67
Horizontal signing	1.032,00	1.235,60	1.387,60	1.521,97	1.656,33	1.790,70	1.925,07
Lightning	8.256,00	9.884,80	11.100,80	12.175,73	13.250,67	14.325,60	15.400,53
Cleaning	10.320,00	12.356,00	13.876,00	15.219,67	16.563,33	17.907,00	19.250,67
Total	**29.928,00**	**35.832,40**	**33.302,40**	**44.137,03**	**48.033,67**	**51.930,30**	**55.826,93**

Table 5 Maintenance costs - BaU calculation

Number of cyclists

For the estimation of the BaU scenario, it has been estimated that the evolution in the number of bicycle users would follow the same pattern as the number of passenger-km for bicycle users as predicted by the demand model. In particular, the same difference in yearly growth levels has been applied to estimate the BaU scenario according to the actual number of cyclists counted on the cycling network during the CIVITAS years.

	BEFORE CIVITAS						**AFTER CIVITAS**		
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
P-km CIVITAS scenario (modeled)	-	-	-	133667	137167	140667	144167	147667	151167
Yearly increase (p-km CIVITAS)					2,6%	2,6%	2,5%	2,4%	2,4%
P-km BaU scenario (modeled)	-	-	-	126682	129719	132756	135793	138830	141867
Yearly increase (p-km BaU)					2,4%	2,3%	2,3%	2,2%	2,2%
Bicycle users (real)	**7540**	**8401**	**10163**	**9646**	**10113**	**11631**	**11185**	**12278**	**15424**
Yearly increase (bicycle users real)	-	11,4%	21,0%	-5,1%	4,8%	15,0%	-3,8%	9,8%	25,6%
Yearly increase (BaU)							-4,0%	9,6%	25,4%
Bicycle users (BaU)							**11162**	**12257**	**15402**

Table 6 Evolution number of cyclists 2003-2011

This is coherent with the observed reality in many Spanish cities where non-motorized demand increases faster during the beginning stages of sustainable mobility strategies, while during the consolidation phase bicycle use grows slower.

Average modal split- trips
The BaU scenario is calculated by the demand model calibrated within this measure according to the evolution in traffic levels without the implementation of the CIVITAS measure.

Vehicle fuel efficiency
The BaU scenario is calculated by the demand model calibrated within this measure according to the evolution in traffic levels without the implementation of the CIVITAS measure.

Emissions
The BaU scenario is calculated by the demand model calibrated within this measure according to the evolution in traffic levels without the implementation of the CIVITAS measure.

Bicycle theft level
It has been considered that the increase in the number of stolen bicycles is directly related with the number of cyclist circulating on the city streets (see calculations above). The (stolen bicycles / number of users) yearly ratio has been calculated for the situation before CIVITAS, and its average has been used for the BaU scenario.

To calculation of the number of bicycle users in the BaU scenario is based on the average yearly increase in the number of cyclists between 2003 and 2008.

	BEFORE CIVITAS						AFTER CIVITAS		
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bicycle users (Real)	**7540**	**8401**	**10163**	**9646**	**10113**	**11631**	**11185**	**12278**	**15424**
Yearly increase	-	11,42%	20,97%	-5,09%	4,84%	15,01%	-3,83%	9,77%	25,62%
Stolen bikes (Real)	-	-	657	875	711	675	883	849	947
Stolen bikes / Bicycle users	-	-	6,46%	9,07%	7,03%	5,80%	7,89%	6,91%	6,14%
Average ratio	7,09%						6,98%		
Average ratio for BaU estimation	7,09%								
Bicycle users (BaU estimation)							**11162**	**12257**	**15402**
Stolen bikes (BaU estimation)							**792**	**869**	**1092**

Table 7 Evolution number of stolen bikes 2003-2011

Deaths caused by transport accidents
The average number of deaths caused by transport accidents between 2002 and 2008 has been analysed in order to identify an evolution pattern useful to estimate the BaU scenario. But the historic data didn’t revealed any evolution trend (see table below, where a clear fluctuation of increasing and decreasing number of deaths caused by transport accidents can be seen), therefore, the average number (2002-2008) has been considered constant in the future years.

		Deaths caused by transport accidents		
		Nº	**Growth rate**	**Average nº**
BEFORE CIVITAS	**2002**	8	-	6
	2003	11	37,50%	
	2004	7	-36,36%	
	2005	2	-71,43%	
	2006	5	150,00%	
	2007	7	40,00%	
	2008	2	-71,43%	
AFTER CIVITAS	**2009**	6	200,00%	5
	2010	4	-33,33%	
	2011	5	25,00%	
BaU Estimation		*Average nº*		
		6		
2009		**6**		
2010		**6**		
2011		**6**		

Table 8 Deaths caused by traffic accidents 2002-2011

Knock down people

Contrary to the situation regarding the number of deaths caused by transport accidents, in this case the analysis of the historic data revealed a clear decreasing tendency in the number of knock down people (see table below). Therefore, the BaU has been calculated applying the average growth rate of the 2002-2008 period (before CIVITAS), to the figure corresponding to the last year before CIVITAS started (2008).

		Knock down people		
		Nº	**Growth rate**	**Average growth rate**
BEFORE CIVITAS	**2002**	145	-	-5,73%
	2003	162	11,72%	
	2004	149	-8,02%	
	2005	120	-19,46%	
	2006	115	-4,17%	
	2007	107	-6,96%	
	2008	99	-7,48%	
AFTER CIVITAS	**2009**	99	0,00%	3,63%
	2010	107	8,08%	
	2011	110	2,80%	
BaU Estimation	*Average growth rate*			
	-5,73%			
2009	**93**			
2010	**88**			
2011	**83**			

Table 9: Knock down people 2002-2011

Accidents with injured people

Like in the case of the number of deaths caused by transport accidents, the average number of accidents with injured people between 2002 and 2008 has been analysed in order to identify an evolution pattern. But the historic data didn't revealed any evolution trend (see table below), therefore, the average number (2002-2008) has been considered constant in the future years. Also, it can be seen haw some undetermined coyuntural circumstances provided an unbalanced value to 2005, therefore this figure has been omitted.

		Accidents with injuried people		
		Nº	**Growth rate**	**Average nº**
BEFORE CIVITAS	**2002**	735	-	737
	2003	747	1,63%	
	2004	748	0,13%	
	2005	1202	60,70%	
	2006	701	-41,68%	
	2007	760	8,42%	
	2008	730	-3,95%	
AFTER CIVITAS	**2009**	675	-7,53%	656
	2010	666	-1,33%	
	2011	627	-5,86%	
BaU Estimation		*Average nº*		
		737		
2009		**737**		
2010		**737**		
2011		**737**		

Table 10. Accidents with injured people 2002-2011

Accidents with no injured people

In this case the analysis of the historic data revealed a clear decreasing tendency in the number of accidents with no injured people (see table below). Therefore, the BaU has been calculated applying the average growth rate of the 2002-2008 period (before CIVITAS), to the figure corresponding to the last year before CIVITAS started (2008).

		Accidents with no injured people		
		Nº	Growth rate	Average growth rate
BEFORE CIVITAS	2002	2040	-	-9,25%
	2003	2042	0,10%	
	2004	1952	-4,41%	
	2005	1513	-22,49%	
	2006	1752	15,80%	
	2007	1500	-14,38%	
	2008	1048	-30,13%	
AFTER CIVITAS	2009	955	-8,87%	-5,23%
	2010	880	-7,85%	
	2011	889	1,02%	
BaU Estimation		*Average growth rate*		
		-9,25%		
2009		**951**		
2010		**863**		
2011		**783**		

Table 11. Accidents with no injured people 2002-2011

Society

Before the CIVITAS project there was not a regular survey program regarding awareness and acceptance, lacking of reference data. Therefore is not possible to estimate a BaU scenario in this regard.

C2 Measure results

What follows is an analysis of the indicators used for the evaluation of the extension of the infrastructure for walking and cycling:

C2.1 Economy

Capital cost corresponding to cycling infrastructure has been calculated according to the data collected from different Departments of the Council in those cases that has been possible. In the cycling lanes included in bigger developments estimations have been done.

In the maintenance cost we have included the cost of lighting the cycle lanes and the cleaning cost even if this costs are included in bigger contracts that makes very difficult to define the exact maintenance cost. In 2008 it has been included the re-asphalt cost of a cycle lane surface. That is why the maintenance cost in 2008 is much higher as compared to 2007.

In most of the cycle lanes the lighting is general for pedestrians, vehicles and bicycles, so we consider that the 10 % of the lightning costs applies to the cycle lane.

Table C2.1.1: Costs (bicycle infrastructure)

Indicator	Before (2007)	After (2008)	After (2009)	After (2010)	After (2011)
2a. Capital costs	532.000,00 €	442.870,76 €	3.440.000,36 €	2.141.454,79 €	3.066.544,63 €
2b. Maintenance costs	33.302,40 €	48.320,00 €	51.507,30 €	84.613,42 €	87.003,80 €

Indicator	Before (2007)	BAU (2008)	BAU (2009)	BAU (2010)	BAU (2011)
2a. Capital costs	532.000,00 €	655.404,41 €	655.404,41 €	655.404,41 €	655.404,41 €
2b. Maintenance costs	33.302,40 €	44.137,03€	48.033,67 €	51.930,30 €	55.826,93 €

Indicator	Difference: 2008 -2007	Difference: 2009 –2007	Difference: 2010 –2007	Difference: 2011 – 2007
2a. Capital costs	-89.129,24 €	2.908.000,36 €	1.609454,79 €	2.534.544,63 €
2b. Maintenance costs	15.017,60 €	18.204,90 €	51.311,02 €	53.731,40 €

Indicator	Difference: 2008 -BaU	Difference: 2009 –BaU	Difference: 2010 – BaU	Difference: 2011 – BaU
2a. Capital costs	-212.533,65€	2.784.595,95 €	1.486.050,38 €	2.411.140,22 €
2b. Maintenance costs	4.182,97 €	3.473,63 €	32.683,12 €	31.176,87 €

The tables above reveal the big increase in the investment in cycling lanes between 2008 and 2011 due to the big infrastructures that were built in that period: reuse of 2 tunnels, 1 bridge and important connections with the city centre neighbourhoods from the outside.

As for maintenance costs, it can be seen how these costs have increased accordingly to the network extension.

Regarding pedestrian infrastructure, only capital costs for the construction of the new pedestrian areas in the city have been accounted.

It is impossible to estimate a BaU for this measure because these kind of infrastructure are mostly included as part of bigger developments.

Table C2.1.2: Costs (pedestrian infrastructure)

Indicator	2008	2009	2010	2011	Lenth (m)	
2a. Capital costs						
Riberas de Loiola	1.369.580 €			1.250 m	1.250 m	Pedestrian
Puente Egia – Ararieder			530.373 €		400 m	Pedestrian
Ametzagaina			6.299.347 €		2000 m	Pedestrian. Park
Calle Arrasate				600.000 €	150 m	Pedestrian.
Plaza Cataluña				1.200.000 €	200 m	Pedestrian.

C2.2 Society

Society indicators results have been gathered through two on-street surveys in neighbourhoods affected by the measure. The criteria to establish the quantity of questionnaires needed to have a representative universe with a 95% confidence, has been as follows:

DISTRICTS TO SURVEY	AMARA	ANTIGUO	CENTRO	GROS	INTXAURRONDO	TOTAL
Population	26.004	17.411	14.200	20.396	17.155	95.165
% Population	27,33%	18.30%	14.92%	21,43%	18,03%	100%
Nº Survey	**105**	**70**	**57**	**82**	**69**	**383**

Table 12 Society surveys by districts

The two main indicators measured within society category, have been the following ones:

- Awareness level
- Acceptance level

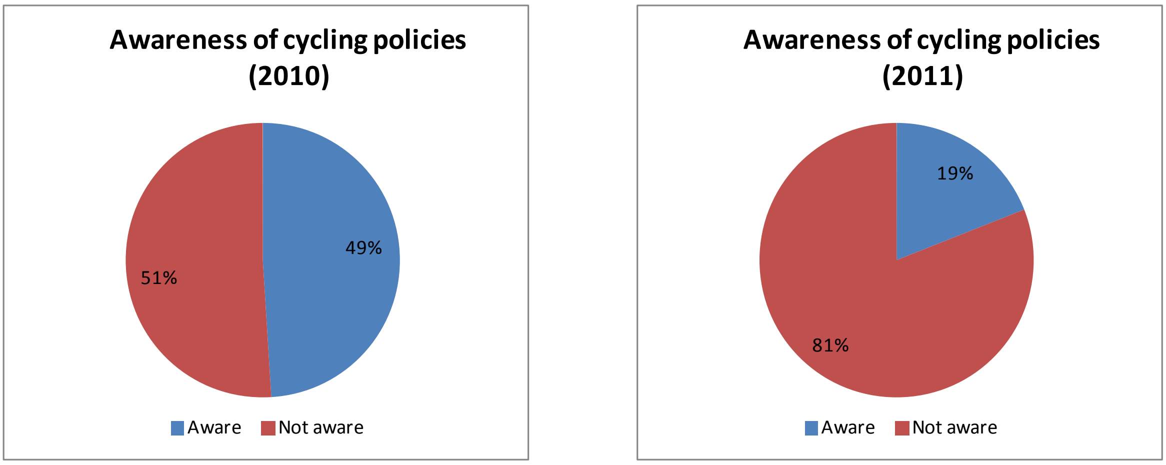
Below there is a summary of the survey results, followed by a detailed assessment of these results:

Table C2.2.1: Acceptance (awareness and acceptance level)

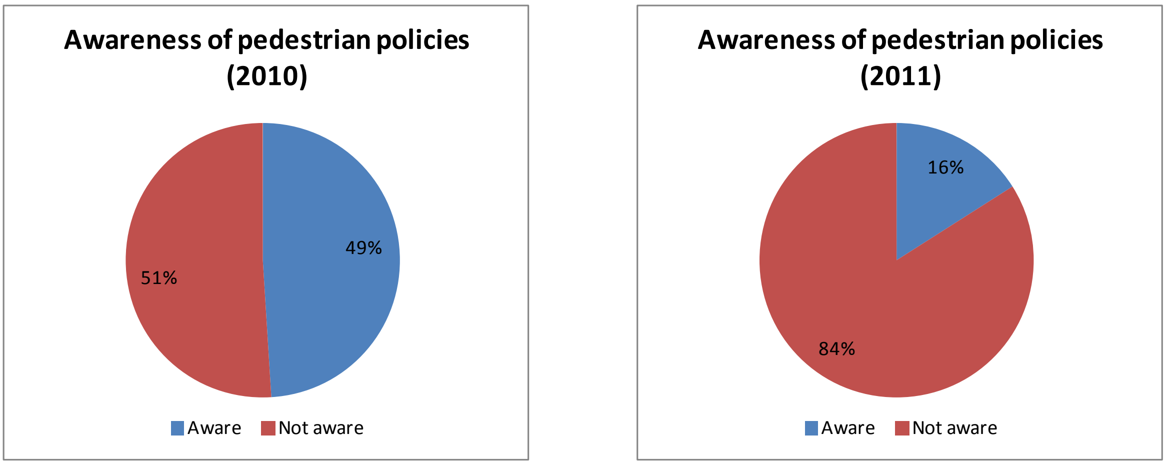
Indicator	Before	BaU	After (2010)	After (2011)	Difference: 2011 –2010
13. Awareness level	**N/A**	**N/A**	**74,88 %**	**77,46 %**	**2,58 %**
14. Acceptance level	**N/A**	**N/A**	**98,27 %**	**90,70 %**	**-7,57 %**

Regarding "*Awareness level*" indicator, when requested to assess the measures implemented by the municipality to improve cycle/pedestrian mobility, a significant share of the population declared that they wasn't aware of them.

Surprisingly the lack of knowledge is even larger over time, after cycling and pedestrian developments are fully implemented. A possible explanation for this might be that citizens may believe that they were asked about additional future plans instead of the strategy currently under development.

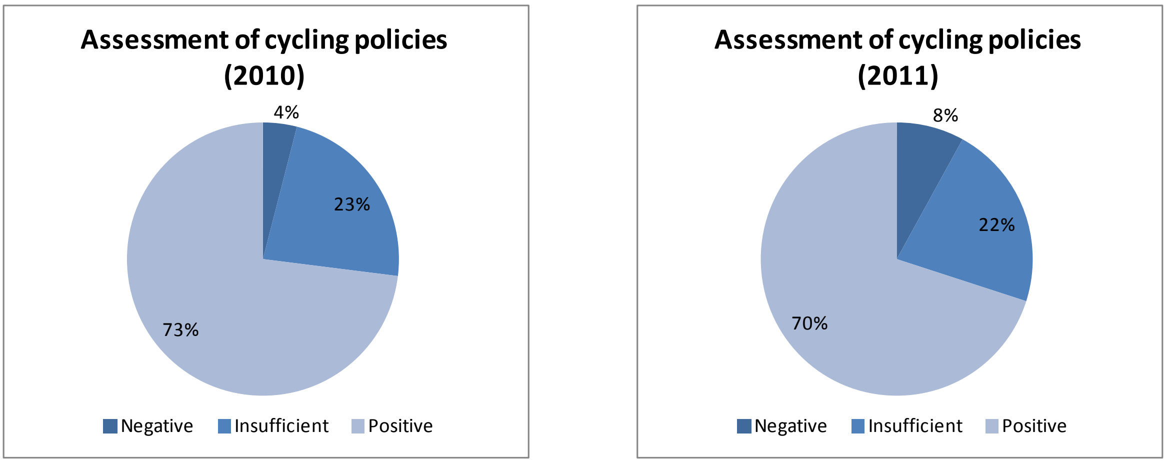


Graphic 1.- Awareness of cycling policies.

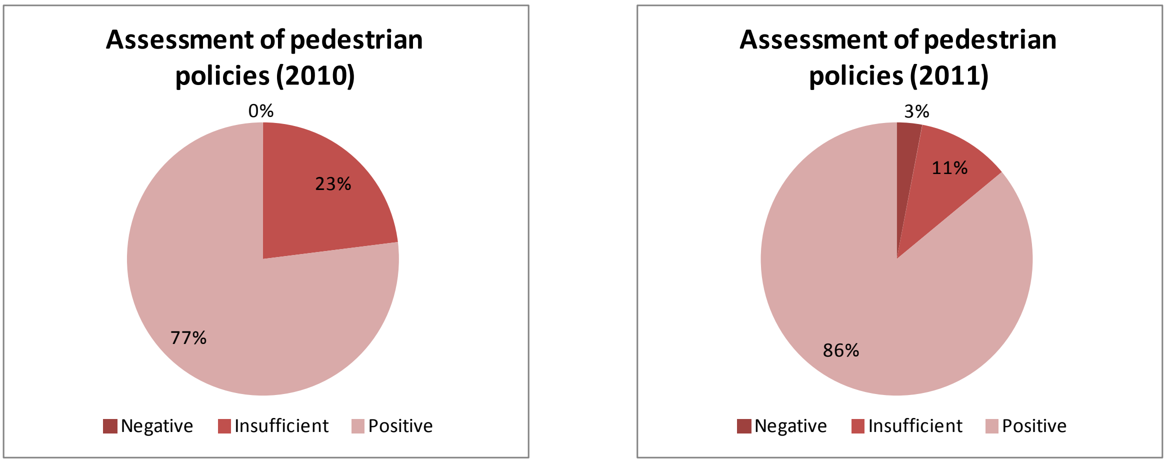


Graphic 2.- Awareness of pedestrian policies.

On the positive side, the survey clearly revealed that, among those who were aware of the measures, their assessment is mostly positive:

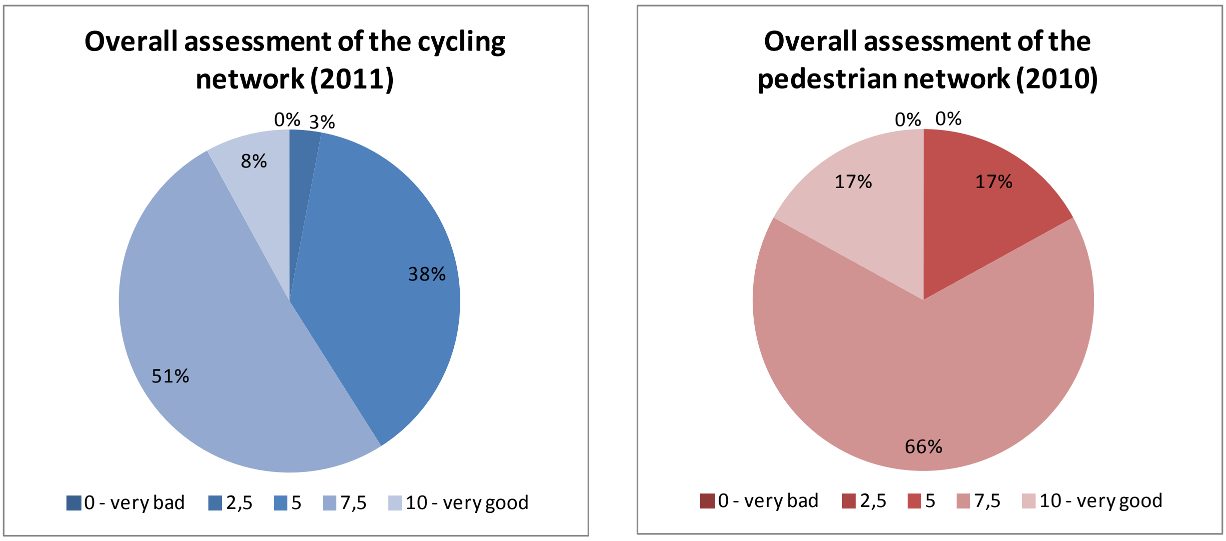


Graphic 3.- Assessment of cycling policies.

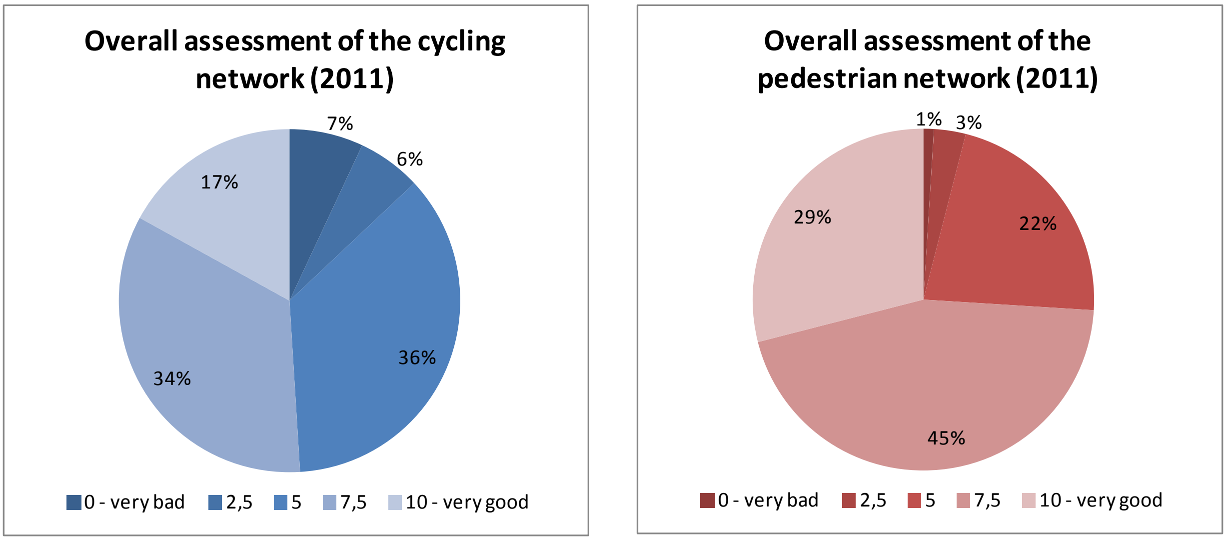


Graphic 4.- Assessment of pedestrian policies.

Deepening in the "*Acceptance level*" indicator, citizens were requested to assess the overall situation regarding cycle lanes/pedestrian zones, rating them from "very bad" to "very good".



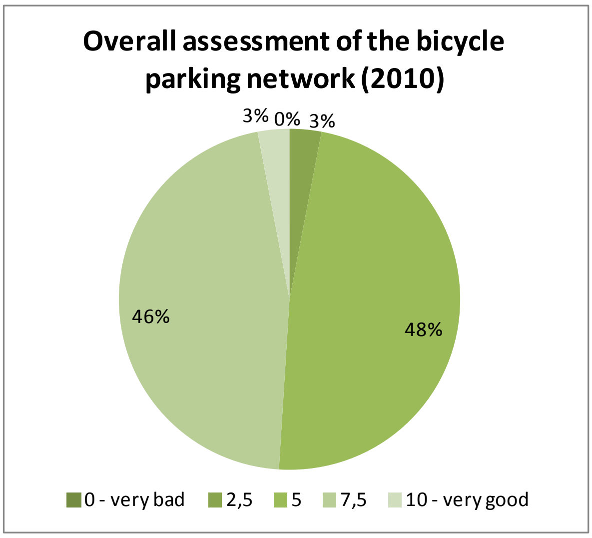
Graphic 5.- First survey results.



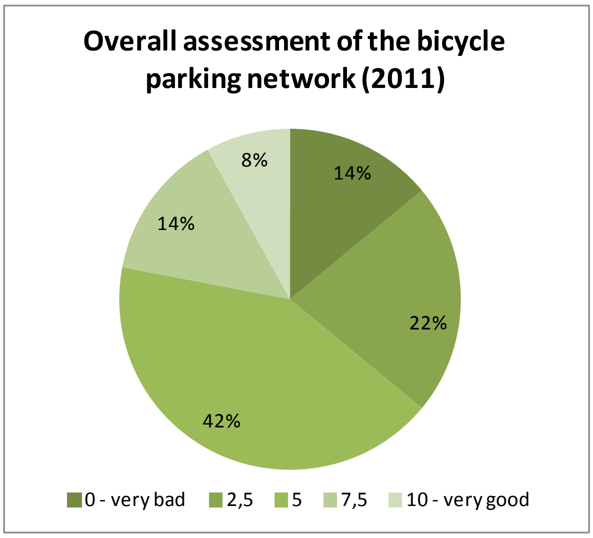
Graphic 6.- Second survey results.

Although there is a slight increase in the number of negative ratings, still most of the population regards the cycling and pedestrian networks as positive (98% in 2010 and 91% in 2011). It should be highlighted that the share of population rating the cycling and pedestrian network as “very good” has significantly increased (9% and 12% respectively). The following value (“good”) has suffered a decline in their assessment, so we may assume that a percentage of them have come to appreciate better each area.

They were also requested to assess the bicycle parking network, also rating it form “very bad” to “very good”.



Graphic 7.- First surveys results.



Graphic 8.- Second surveys results.

It should be noted that the share of population who rates the parking network as “very good” has raised 3% to 8 % between the first and second survey what may indicate that increasing the parking spaces for bicycles has been a good measure positively accepted by the users.

But at the same time there has been an increase from 1% to 14% in the share of population whose opinion of “very bad” and from 2% to 22 % whose opinion is “bad” which means that users are also perceiving problems related to bicycle parking.

The fast extension of the cycling network and the opening of new routes to the city centre during the last four years have increased the use of the bicycle in the city. This big increase in bicycle users has lead to high occupancy rates of parking facilities, making it difficult to park sometimes. This may be the reason why negative opinion against bicycle parking facilities in the city have increased compared to the previous year.

The bicycle parking network is being analysed and spaces for residents in some car public parking are being implemented. The municipality will continue working in the parking network extension to solve the problem.

In addition to the acceptance, bicycle theft level has also been assessed. As it can be seen in the table below the number of stolen private bicycle has increased between the years 2008 and 2009. In 2010 a slight decrease in bicycle thief levels was accounted, at the same time that the number of recovered bicycles has increased. But in 2011 the number of stolen bicycles increased again.

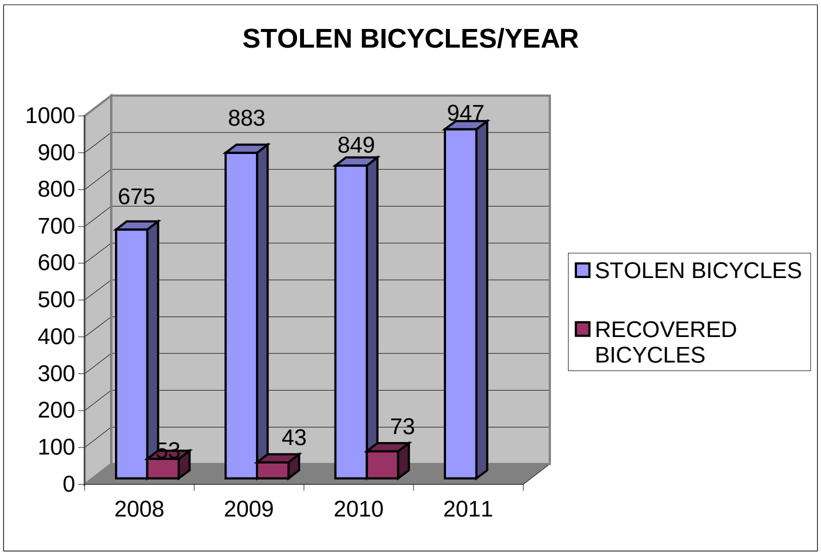
Table C2.2.2: Acceptance (bicycle theft level)

Indicator	Before (2008)	After (2009)	After (2010)	After (2011)
Bicycle theft level	675	883	849	947

Indicator	Before (2008)	BaU (2009)	BaU (2010)	BaU (2011)
Bicycle theft level	675	792	869	1092

Indicator	2009 - 2008	2010-2008	2011 - 2008
Bicycle theft level	208	174	272

Indicator	2009 - BaU	2010- BaU	2011 - BaU
Bicycle theft level	91	-20	-145



Graphic 8.- Stolen bicycles per year

Taking into account that the number of users is increasing, it looks like the bicycle theft level is decreasing, which is a very positive result for the promotion of bicycle use. In order to assess this, a coefficient that shows the relation between the number of bicycle users and the stolen bicycles has been calculated. It can be seen that this number is decreasing since 2009.

	2005	2006	2007	2008	2009	2010	2011
BICYCLE USERS	10163	9646	10113	11631	11185	12278	15424
STOLEN BICYCLES	657	875	711	675	883	849	947
RECOVERED BICYCLES	32	18	46	53	43	73	
COEF (STOLEN/USERS)X100	**6,46**	**9,07**	**7,03**	**5,80**	**7,89**	**6,91**	**6,14**

Table 13 Number of stolen and recovered bicycles 2005-2011

C2.3 Energy

Table C2.3.1: Energy Consumption

Indicator	Before (2008)	After (2009)	After (2010)	After (2011)
Vehicle fuel efficiency	4,16 PET/1.000 v-km	4,11 PET/1.000 v-km	4,08 PET/1.000 v-km	4,05 PET/1.000 v-km

Indicator	Before (2008)	BaU (2009)	BaU (2010)	BaU (2011)
Vehicle fuel efficiency	4,16 PET/1.000 v-km	4,12 PET/1.000 v-km	4,09 PET/1.000 v-km	4,06 PET/1.000 v-km

Indicator	2009 - 2008	2010-2008	2011 - 2008
Vehicle fuel efficiency	-0,04 PET/1.000 v-km	-0,07 PET/1.000 v-km	-0,11 PET/1.000 v-km

Indicator	2009 - BaU	2010- BaU	2011 - BaU
Vehicle fuel efficiency	-0,01 PET/1.000 v-km	-0,01 PET/1.000 v-km	-0,01 PET/1.000 v-km

Although an increase in energy consumption of the overall system has been experienced (2,3% increase between 2008 an 2011), as it can be seen in the tables above, energy efficiency of the system has increased as a consequence of the CIVITAS project.

An improvement is also experienced in the BaU scenario, due to the increased patronage of public transport and cycling levels experienced in the city during the last years, which would have also improved the energy efficiency of the system even in the absence of the CIVITAS project, although to smaller degree. Moreover, it is estimated that in 2011 energy saving accounted for nearly 15.00 PET as compared with the BaU scenario.

C2.4 Environment

Table C2.4.1: Pollution and Nuisance

Indicator	Before (2008)	After (2009)	After (2010)	After (2011)
8. CO_2 emissions	249.777,00 Ton/year	253.562,72 Ton/year	257.753,23 Ton/year	261.943,75 Ton/year
9. CO emissions	21.854,80 Ton/year	22.190,44 Ton/year	22.556,88 Ton/year	22.923,32 Ton/year
10. NOx emissions	1.562,00 Ton/year	1.583,82 Ton/year	1.610,05 Ton/year	1.636,27 Ton/year
11. Particulate emissions	11.301,40 Ton/year	11.828,27 Ton/year	11.945,94 Ton/year	12.063,61 Ton/year

Indicator	Before (2008)	BaU (2009)	BaU (2010)	BaU (2011)
8. CO_2 emissions	249.777,00 Ton/year	253.981,29 Ton/year	258.185,58 Ton/year	262.389,86 Ton/year
9. CO emissions	21.854,80 Ton/year	22.222,73 Ton/year	22.590,66 Ton/year	22.958,58 Ton/year
10. NOx emissions	1.562,00 Ton/year	1.588,22 Ton/year	1.614,45 Ton/year	1.640,67 Ton/year
11. Particulate emissions	11.301,40 Ton/year	11.456,46 Ton/year	11.611,51 Ton/year	11.766,57 Ton/year

Indicator	2009 - 2008	2010-2008	2011 - 2008
8. CO_2 emissions	3.785,72 Ton/year	7.976,23 Ton/year	12.166,75 Ton/year
9. CO emissions	335,64 Ton/year	702,08 Ton/year	1.068,52 Ton/year
10. NOx emissions	21,82 Ton/year	48,05 Ton/year	74,27 Ton/year
11. Particulate emissions	526,87 Ton/year	644,54 Ton/year	762,21 Ton/year

Indicator	2009 - BaU	2010- BaU	2011 - BaU
8. CO_2 emissions	-418,57 Ton/year	-432,34 Ton/year	-446,12 Ton/year
9. CO emissions	-32,29 Ton/year	-33,78 Ton/year	-35,27 Ton/year
10. NOx emissions	-4,40 Ton/year	-4,40 Ton/year	-4,40 Ton/year
11. Particulate emissions	371,81 Ton/year	334,43 Ton/year	297,04 Ton/year

As in the case of energy consumption, there is an overall increase in emission levels as compared with the situation before the CIVITAS project, due to the increased mobility levels experienced in the city.

Nevertheless, both in terms of GHG and pollutant emission levels, significant reduction have been achieved by the CIVITAS project as compared to the BaU scenario (ranging from nearly 450 tonnes per year of CO_2 to 4,5 tonnes per year of NOx). The most significant reductions has been achieved in the case of Particulate Matter, reaching a 2,5% reduction in 2011.

C2.5 Transport

Table C2.5.1: Safety

Indicator	Before (2008)	After (2009)	After (2010)	After (2011)
20. Deaths caused by transport accidents.	2	6	4	5
20. Accidents with injured people	730	675	666	627
20. Accidents with no injured people	1048	955	880	889
20.- Knock down people	99	99	107	110

Indicator	Before (2008)	BaU (2009)	BaU (2010)	BaU (2011)
20. Deaths caused by transport accidents.	2	6	6	6
20. Accidents with injured people	730	737	737	737
20. Accidents with no injured people	1048	951	863	783
20.- Knock down people	99	93	88	83

Indicator	2009 –2008	2010 - 2008	2011 - 2008
20. Deaths caused by transport accidents.	4	2	3
20. Accidents with injured people	-55	-64	-103

20.-Accidents with no injured people	-93	-168	-159
20.- Knock down people	0	8	11

Indicator	2009 –BaU	2010 - BaU	2011 - BaU
20. Deaths caused by transport accidents.	0	-2	-1
20. Accidents with injured people	-62	-85	-139
20.-Accidents with no injured people	4	17	106
20.- Knock down people	6	19	27

As it can be seen in the comparison of before and after data there has been an increase in the number of death people. Nevertheless it should be noted that 2008 (the reference year) was a very positive year in this regard.

Both accidents with injured people and accidents with no injured people have decrease compared with the reference year. If compared to the BaU estimation, it can be seen how the number of accidents with no injured people has grown as a consequence of increased mobility patterns, including a higher number of bicycle users, which results in a higher accident risk level. Nevertheless, the number of severe accidents, with injured people, has significantly decreased as compared to the BaU scenario.

Also a consequence of the higher exposure to accident risk, the data of knock down people has increase compared both with the reference data and with the BaU.

As a conclusion, it could be inferred that the promotion of sustainable modes, usually followed by a significant increase in demand of non-motorised modes, can have implications in terms of an increased number of accidents due to a higher risk exposure. This should not lead to the consideration that bicycle use is dangerous, but should be taken into account in order to further improve traffic safety for non motorised users. Also it should be noted that the kind of accidents that have increased are accidents with no injured people, while those with injured people involved have decreased.

Table C2.5.2: Transport System (modal split)

Indicator		Before (2008)	After (2009)	After (2010)	After (2011)
Average modal split- trips	**Car**	48,9%	48,7%	48,8%	48,8%
	Public Transport	15,3%	15,4%	15,3%	15,3%
	Cycle	4,5%	4,8%	4,8%	4,8%
	Walk	31,3%	31,2%	31,1%	31,0%

Indicator		Before (2008)	BaU (2009)	BaU (2010)	BaU (2011)
Average modal split- trips	**Car**	48,9%	49,0%	49,1%	49,2%
	Public Transport	15,3%	15,3%	15,3%	15,2%
	Cycle	4,5%	4,5%	4,5%	4,5%
	Walk	31,3%	31,2%	31,1%	31,1%

Indicator		Difference: 2009 –2008	Difference: 2010 –2008	Difference: 2011 –2008
Average modal split- trips	Car	-0,2%	-0,1%	-0,1%
	Public Transport	0,1%	0,0%	0,0%
	Cycle	0,3%	0,3%	0,3%
	Walk	-0,1%	-0,2%	-0,3%

Indicator		Difference: 2009 – BaU	Difference: 2010 – BaU	Difference: 2011 – BaU
Average modal split- trips	Car	-0,3%	-0,3%	-0,4%
	Public Transport	0,1%	0,0%	0,1%
	Cycle	0,3%	0,3%	0,3%
	Walk	0,0%	0,0%	-0,1%

The tables above reveals that modal shift in favour of sustainable modes of transport is moderate in the short term, achieving a reduction in car use of 0,1% as compared with the situation before the CIVITAS project started. It should be highlighted that this achievement is made in a context of a steady increase in car travel, thus it can be considered a positive result.

If compared to the BaU situation, the modal shift away from car achieves a 0,4% in 2011, while cycling increases by a 0,3%. On the contrary, walking levels seems to be slowly going down, which is not a desirable result. Attention should be placed to this issue in the coming years.

Table C2.5.3: Transport System (number of cyclists)

Indicator	Before (2008)	After (2009)	After (2010)	After (2011)
Number of cyclist	11.631	11.185	12.278	15.424

Indicator	Before (2008)	BaU (2009)	BaU (2010)	BaU (2011)
Number of cyclist	11.631	11.162	12.257	15.402

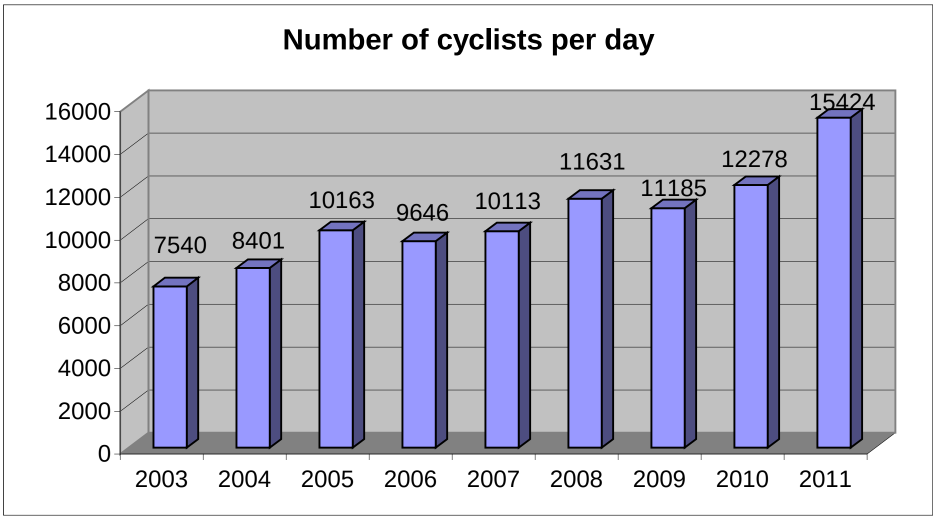
Indicator	Difference: 2009 –2008	Difference: 2010 –2008	Difference: 2011 –2008
Number of cyclist	-446	647	3.793

Indicator	Difference: 2009 – BaU	Difference: 2010 – BaU	Difference: 2011 – BaU
Number of cyclist	23	21	22

As we can see in the table above, there has been and steady increase in the use of the bicycle. The biggest increase in the number of cyclist has been accounted in 2011 with a 25,62% growth rate as compared with the previous year. In 2008 and 2010 there has been a yearly increase of 15,01% and 9,77%, respectively, as compared with the corresponding previous year.

One of the objectives in this measure was to increase the use of the bicycle users 30 % by the end of the project. As it can be inferred from the figures above the increase between 2011 and 2008 is of 32,61 %, fulfilling the measure objective.

It should be said that this data has been taken along the CIVITAS corridor, where the cycle network extension started before the project. But other routes connecting with the hilly areas of the city and neighbourhoods in the outskirts have been also opened, placing new opportunities for citizens willing to use the bike in their displacements.

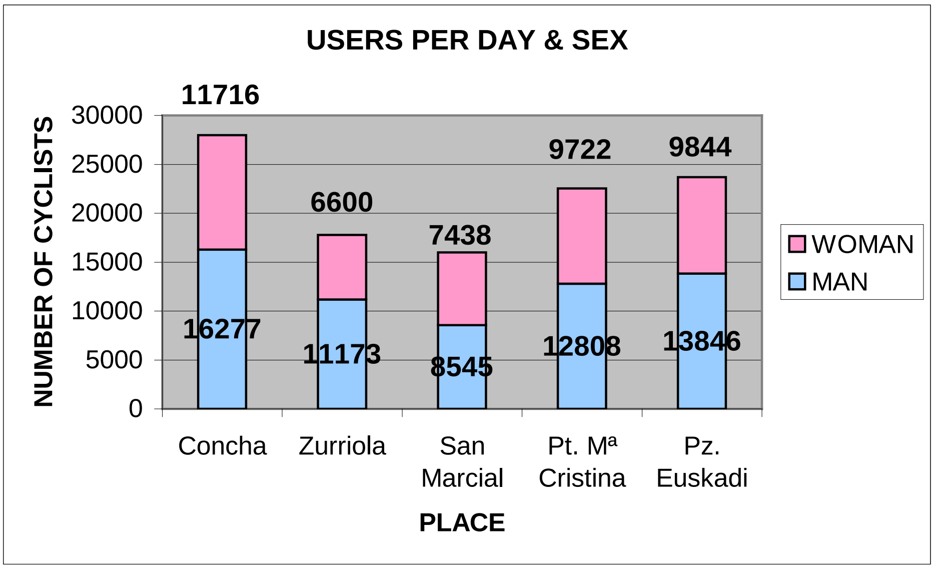


Graphic 8.- Number of cyclists per day

The analysis of bicycle usage by gender reveals that cycling levels are slightly higher among men, although female cycling level is considerably high, as compared with other Spanish cities.

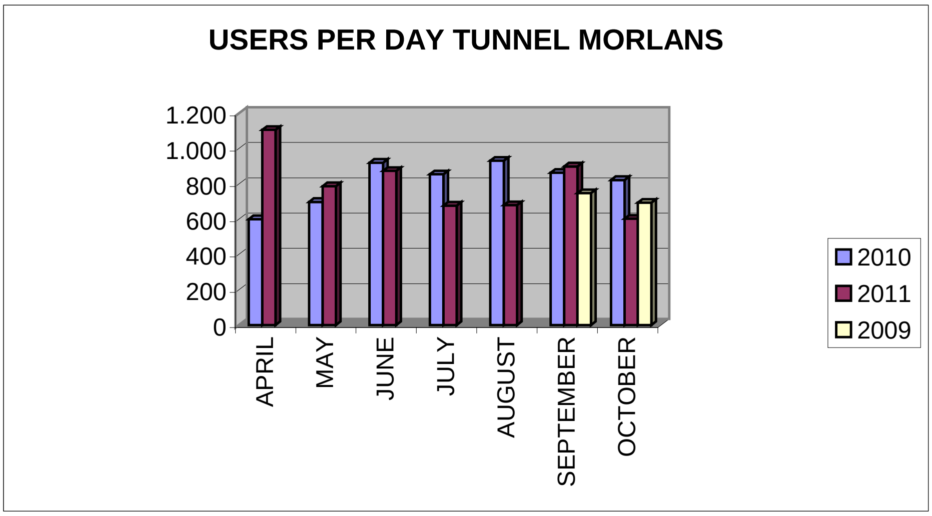
	Concha	Zurriola	San Marcial	Pt. Mª Cristin	Pz. Euskadi	Total
MAN	16277	11173	8545	12808	13846	**62649**
WOMAN	11716	6600	7438	9722	9844	**45320**
TOTAL	27993	17773	15983	22530	23690	**107969**
MAN	58,15%	62,87%	53,46%	56,85%	58,45%	**57,95%**
WOMAN	41,85%	37,13%	46,54%	43,15%	41,55%	**42,05%**

Table 14: Cycle use by gender



Graphic 9. Cycle use by gender

Complementing this information, data on the use of the Morlans Tunnel is provided.



Graphic 10: Use of Morlans tunnel cycle axis 2010-2011

As it can be seen in the graphic above the use of the tunnel is higher during the work and study months, while in July and August there a reduction in the number of users is experienced. This reveals that the main users of the infrastructure are workers and students for their daily trips.

C2.6 Other

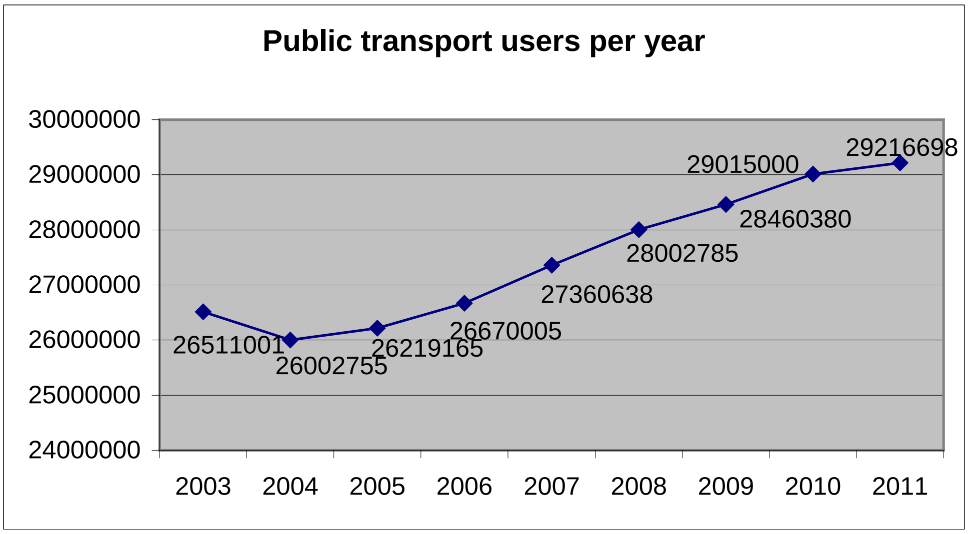
In addition to the indicators assessed above, the following variables not included in the MLEP have also been evaluated:

<u>1.- Number of public transport users</u>

The analysis of this variable has been included in table below in order to see the relation between the soft modes of transport in the city and the use of public transport and private cars. During the last years a significant increase in the use of public transport has been accounted. It should also be noticed, as shown above that the number of cyclist has also increased. From these results it can be inferred that car traffic levels in the city have decreased.

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Public transport users	26511001	26002755	26219165	26670005	27360638	28002785	28460380	29015000	29216698
Percentage of increase		-1,92%	0,83%	1,72%	2,59%	2,35%	1,63%	1,95%	0,70%

Table 15: Number of public transport users/year 2003-2011



Graphic 11: Number of users of public transport

<u>2.- Number of private vehicles in the city</u>

As it has been shown above, the use of the bicycle and the public transport has increased in Donostia-San Sebastián. Although this had a reflection on private car traffic levels, regarding car ownership, the number of vehicles registered in the financial department has remained constant during the last years.

	1996	2001	2006	2007	2008	2009	2010	2011
Number of vehicles	77255	95771	102369	104953	107883	109157	109351	109748
Percentage of increase		23,97%	6,89%	2,52%	2,79%	1,18%	0,18%	0,36%

Table 16: Number of vehicles registered 1996-2011

<u>3.- Number of accidents in the cycling network</u>

As it can be seen in the table below the number of injured people has increased compared to 2009 and 2010 levels. But if we have a look in the coefficient accidents / users, we can say that the injured people related with the number of user have decreased. If we have a look to the different typology of accident, it can be seen that the most important increase is cyclist itself and cyclists with car.

KIND OF ACCIDENT	2009	2010	2011
Cyclist itself	18	24	33
Cyclist with pedestrian	11	8	10
Cyclist with cyclist	2	3	4
Cyclist with motorbike	12	7	9
Cyclist with car	25	28	26
Cyclist with bus	1	2	1
Cyclist with van/lorry	0	1	3
Cyclist with more than 1 vehicle	1	0	1
TOTAL	**70**	**73**	**87**
USERS	11.185	12.278	15.424
COEF(ACCIDENTS/USER) X 1000	6,26	5,95	5,64

Table 17 Number and accident types 2009-2011

The first one it is caused by lack of concentration of the cyclists on cycle lanes: using mobile phone, headphones or other elements. Now a day we are working in a campaign with the police to reduce the accidents.

In the case of cyclists with a car, as we can see in table most of them happened while crossing at Zebra Crossing and by the road. The use of the road for cycling is increasing so that could explain the rise in the number of accidents with car,

We have detected that the speed of the cyclists when they arrive to the Zebra Crossings, makes impossible sometimes for the drivers to stop. In the next cycling net map a explanation will be included on the way to change people behaviour.

UBICATION OF THE CYCLISTS WHEN THE ACCIDENT HAPPENED

	2009	2010	2011
Riding by the road	16	22	33
Riding by bus lane	1	0	0
Riding by cycling lane	11	12	21
Changing road to sidewalk	2	3	1
Changing sidewalk to road	0	2	1
Cycling by pedestrian area	1	2	1
Cycling by sidewalk	14	8	10
Crossing the road (places not alowed)	4	1	3
Crossing a Zebra Crossing	18	25	20
Cycling by the mountain	3	0	0
Others	2	1	1
TOTAL	**72**	**76**	**91**

Here there are included cyclist not injured.

Table 18 Number and location of accidents 2009-2011

As it can be seen on the table below, most of the injuries are slight injuries. This kind of injuries has decreased. The number of seriously injured people has increased and most of them has been in Zebra Crossings and riding by the road.

There has not been any death cyclist in the city during the last years.

VICTIMS AND SERIOUSNESS OF WOUNDS

Victims and severity of injuries	2009			2010			2011		
	Death	Seriously injured	Slight injury	Death	Seriously injured	Slight injury	Death	Seriously injured	Slight injury
Pedestrian	0	0	11	0	0	8	0	0	9
Cyclists	0	2	60	0	8	58	0	5	76
Motorbike drivers	0	1	7	0	0	4	0	0	4
Bus passengers	0	0	0	0	0	1	0	0	1
TOTAL	**0**	**3**	**78**	**0**	**8**	**71**	**0**	**5**	**90**

Table 19 Victims and severity of the injuries 2009-2011

It is significant the number of pedestrian injured by cyclists. It can be seen how the number of pedestrian injured by cyclists is very low.

This data show how important is to build new cycle lanes and creating 30-km-zones to increase the security of cyclists and pedestrians. In the other hand it is important to analyse the existing crossing on the network in order to identify dangerous points.

C2.7 Cost benefit analysis

The CBA of this measure will focus on the effect of the extension of the infrastructure for walking and cycling. This would include new pedestrian areas, new cycle lanes and new on-street bicycle parking facilities. Due to the time planning of the measure, CBA will not consider new parking spaces at public car parking facilities, whose implementation is being approached by the end of the CIVITAS project.

C2.7.1 Evaluation period for CBA

In order to facilitate eventual comparisons, the project life estimated for this measure corresponds to the usual project life used to evaluate road infrastructure projects, that is: 25 years.

A reference case is required for comparison with the CIVITAS measure. The BaU scenario is used for that purpose. If this measure would not be implemented, the non-motorized transport network will follow the same evolution pattern as previous years, and car use would continue growing.

Following EU recommendations a discount rate of 3.5% is used for the analysis.

C2.7.2 Method and values for monetisation

As a first step in the monetisation of the expected impacts of the measure, the main parties affected by the measure are identified. It is expected that the implementation of this measure will affect the following stakeholders:

Agent	Implications
City Administration	Responsible for the implementation of pedestrian and bicycle infrastructure, as well as its maintenance.
Non-Motorized Users	Regarding current no-motorized users, this measure may lead to time savings for certain connection, especially for cyclists. This measure will result in an increase in the number of pedestrians and bicycle users. They will benefit from a better health and fitness. Both new and current users will benefit from enhanced quality and increased safety.
Motorized Users	Due to the expected modal shift from private car and/or public transport to non-motorized modes, traffic congestion is expected to decrease. Therefore, car and public transport users would benefit for reduced travel times. Nevertheless this effect is not likely to happen since it is widely accepted that exceeding road capacity induce more traffic, both from new users and from actual drivers who change their routes to avoid congestion, especially in a context of increased motorized mobility patterns.
Society	Donostia-San Sebastian citizens will benefit from an improvement on air quality and less noise due to the reduced emissions (air pollutants and noise) derived from an increased public transport usage and the corresponding decrease in private car use, as well as from a better traffic performance (less congestion).

Prior to its monetization, the main impacts of the measure are synthesized in the following table in the form of cost and benefits affecting the above referred parties:

Agent	Cost	Benefit
City Administration	– Capital costs (infrastructure) – Operating and maintenance costs	
Non-motorized users		– Time savings(1) – Quality benefits(2) – Increased safety(3) – Better health(2)
Society		– Better air quality – Less carbon emissions

(1) Only time savings from former pedestrians will be considered since time savings from former bicycle users are limited to small stretches of the network and its volume is very difficult to assess

(2) Difficult to assess in monetary terms: omitted

(3) It is not clear how the isolated impact of the extension of the non-motorized network on traffic safety can be assessed, since this is a combination of factors affecting also car traffic volumes and speed. Therefore it will be omitted.

Following is a brief description on how the impacts have been assessed and monetised, including the reference values used for its conversion to money values where applicable:

- Capital costs: Capital cost has been calculated according to the data collected from different Departments of the Council in those cases that has been possible. In the cycling lanes included in bigger developments estimations have been done.

  For the reference case, data from 2005 to 2007 has been taken into account in order to calculate the average number of cycling paths implemented during those years and an average cost factor per length unit of cycling network (€/m). This cost factor has been used to estimate the evolution of the cycling network, as well as the corresponding investment costs, in the BaU scenario.

  It has been considered that after the CIVITAS project either there would not be major investments in non-motorized infrastructure or this investment will be equal in the CIVITAS and BaU scenarios (thus not affecting CBA calculations).

- Maintenance costs: Maintenance cost has been calculated with data collected from different Departments of the council. A similar approach to Capital Costs has been used. Cost factor corresponding to each concept according to the references given by maintenance council departments, have been applied to the estimated evolution of the non-motorized network in the BaU scenario

For the lighting it has been considered that there is a light every 25 metres and that the 10 % of the lightning costs applies to the cycle lane. Each point of light costs 100 € so the maintenance cost for 1 metre of cycle lane would be = 100 €/light * length (metres)/25 metres * 10/100

- Modal split and time savings: these indicators have resulted from the transport demand model used to assess future modal shift and emission in the city due to the CIVITAS measures. A CIVITAS scenario in which the project developments in terms of no-motorized transport infrastructure has been defined for that purpose (see section C.1.2. for further details on this). It should be noted that other CIVITAS project developments have not been included in this CIVITAS scenario attempting to isolate the effect of the extension of walking and cycling infrastructure on modal share and traffic performance (which otherwise would be affected by public transport improvements, parking restrictions, etc.).

  A BaU scenario assuming that CIVITAS' developments in terms of non-motorized transport would have not occurred has been also modelled.

- Time savings: an average value of time of 15€/h has been used in the calibration of the transport demand model. This same figure has been considered within the CBA for the monetisation of time savings.

- CO_2 and pollutant emissions: these indicators have also resulted from the transport demand model used to assess future modal shift and emission in the city due to the CIVITAS measures. A BaU scenario assuming that no changes in public transport services would be implemented has been also modelled.

  The following sources have been used for the monetisation of these impacts:

Pollutant	Cost factor	Value year	Source
CO_2	25 €/tonne (2010) 40 €/tonne (2020)	-	IMPACT 2008 (Central value)
HC	400 €/tonne	€ 2000	IMPACT 2008 (CAFÉ)
NOx	2600 €/tonne	€ 2000	IMPACT 2008 (CAFÉ)
PM10	119900 €/tonne	€ 2000	IMPACT 2008 (HEATCO Metropolitan / Urban)
PM2,5	299600 €/tonne	€ 2000	IMPACT 2008 (HEATCO Metropolitan / Urban)

Table 20: Sources for impact monetisation

C2.7.3 Life time cost and benefit

<u>Capital costs:</u>

– CIVITAS scenario: During the CIVITAS period, capital costs have been accounted according to municipal records in those cases that it has been possible. In the cycling lanes included in bigger developments estimations have been done.

– Reference case: Data from 2005 to 2007 has been taken into account in order to calculate the average number of cycling paths implemented during those years and an average cost factor per length unit of cycling network (€/m). This cost factor has been used to estimate the evolution of the cycling network, as well as the corresponding investment costs. See section C.1.3. for further details on calculation.

In both cases, for the future years, it has been considered that after the CIVITAS project either there would not be major investments in non-motorized infrastructure or this investment will be equal in the CIVITAS and BaU scenarios (thus not affecting CBA calculations).

Table C2.7.1 Capital cost in the evaluation period (not discounted)

	Cases for comparison	Cost (e.g. €200,000)
Year 1	CIVITAS measure	442.870,76
	Reference case (or BAU)	655.404,41
Year 2	CIVITAS measure	3.440.000,36
	Reference case (or BAU)	655.404,41
Year 3	CIVITAS measure	2.141.454,79
	Reference case (or BAU)	655.404,41
Year 4	CIVITAS measure	3.066.544,63
	Reference case (or BAU)	655.404,41
Year 5	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 6	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 7	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 8	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 9	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 10	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 11	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 12	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 13	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 14	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 15	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 16	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 17	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 18	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 19	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 20	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 21	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 22	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 23	CIVITAS measure	0,00

	Reference case (or BAU)	0,00
Year 24	CIVITAS measure	0,00
	Reference case (or BAU)	0,00
Year 25	CIVITAS measure	0,00
	Reference case (or BAU)	0,00

Maintenance costs:

- CIVITAS scenario: During the CIVITAS period, maintenance costs have been accounted according to municipal records.
- Reference case: A similar approach to Capital Costs has been used. Cost factor corresponding to each concept according to the references given by maintenance council departments, have been applied to the estimated evolution of the non-motorized network in the BaU scenario. See section C.1.3. for further details on calculation.

Table C2.7.2 Maintenance costs in the evaluation period (not discounted)

	Cases for comparison	Cost (e.g. €200,000)
Year 1	CIVITAS measure	48.320,00
	Reference case (or BAU)	44.137,03
Year 2	CIVITAS measure	51.507,30
	Reference case (or BAU)	48.033,67
Year 3	CIVITAS measure	84.613,42
	Reference case (or BAU)	51.930,30
Year 4	CIVITAS measure	87.003,80
	Reference case (or BAU)	55.826,93
Year 5	CIVITAS measure	88.743,88
	Reference case (or BAU)	56.943,47
Year 6	CIVITAS measure	90.518,75
	Reference case (or BAU)	58.082,34
Year 7	CIVITAS measure	92.329,13
	Reference case (or BAU)	59.243,98
Year 8	CIVITAS measure	94.175,71
	Reference case (or BAU)	60.428,86
Year 9	CIVITAS measure	96.059,23
	Reference case (or BAU)	61.637,44
Year 10	CIVITAS measure	97.980,41
	Reference case (or BAU)	62.870,19
Year 11	CIVITAS measure	99.940,02
	Reference case (or BAU)	64.127,59
Year 12	CIVITAS measure	101.938,82
	Reference case (or BAU)	65.410,15
Year 13	CIVITAS measure	103.977,59
	Reference case (or BAU)	66.718,35
Year 14	CIVITAS measure	106.057,15
	Reference case (or BAU)	68.052,72
Year 15	CIVITAS measure	108.178,29
	Reference case (or BAU)	69.413,77
Year 16	CIVITAS measure	110.341,86
	Reference case (or BAU)	70.802,05
Year 17	CIVITAS measure	112.548,69
	Reference case (or BAU)	72.218,09
Year 18	CIVITAS measure	114.799,67

	Reference case (or BAU)	73.662,45
Year 19	CIVITAS measure	117.095,66
	Reference case (or BAU)	75.135,70
Year 20	CIVITAS measure	119.437,57
	Reference case (or BAU)	76.638,41
Year 21	CIVITAS measure	121.826,32
	Reference case (or BAU)	78.171,18
Year 22	CIVITAS measure	124.262,85
	Reference case (or BAU)	79.734,60
Year 23	CIVITAS measure	126.748,11
	Reference case (or BAU)	81.329,30
Year 24	CIVITAS measure	129.283,07
	Reference case (or BAU)	82.955,88
Year 25	CIVITAS measure	131.868,73
	Reference case (or BAU)	84.615,00

Journey times:

Average speed (km/h) and mileage (passenger-km) for each mode of transport in the CIVITAS and Reference scenarios have been used to estimate the time spent travelling by users of the different modes throughout the year.

Differences in modal split between CIVITAS and Reference scenarios have been used to estimate time savings, considering that:

- Former users of car and public transport that shift towards the use of bicycle loose time
- Former pedestrians that shift towards the use of bicycle gain time

An average value of time of 15€/h has been used in the calibration of the transport demand model. This same figure has been considered within the CBA for the monetisation of time savings.

Table C2.7.3 Costs from journey times (not discounted)

	Cases for comparison	Cost (e.g. €200,000)
Year 1	CIVITAS measure	2.994.015,91
	Reference case (or BAU)	2.998.902,06
Year 2	CIVITAS measure	3.296.545,36
	Reference case (or BAU)	3.199.146,33
Year 3	CIVITAS measure	3.585.268,82
	Reference case (or BAU)	3.384.122,06
Year 4	CIVITAS measure	3.939.608,16
	Reference case (or BAU)	3.628.404,09
Year 5	CIVITAS measure	4.291.698,04
	Reference case (or BAU)	3.867.151,00
Year 6	CIVITAS measure	4.655.928,16
	Reference case (or BAU)	4.113.850,01
Year 7	CIVITAS measure	5.032.636,67
	Reference case (or BAU)	4.368.722,88
Year 8	CIVITAS measure	5.422.170,30
	Reference case (or BAU)	4.631.997,07
Year 9	CIVITAS measure	5.824.884,51
	Reference case (or BAU)	4.903.905,91
Year 10	CIVITAS measure	6.241.143,75
	Reference case (or BAU)	5.184.688,77

Year 11	CIVITAS measure	6.671.321,62
	Reference case (or BAU)	5.474.591,13
Year 12	CIVITAS measure	7.115.801,14
	Reference case (or BAU)	5.773.864,82
Year 13	CIVITAS measure	7.574.974,95
	Reference case (or BAU)	6.082.768,12
Year 14	CIVITAS measure	8.049.245,53
	Reference case (or BAU)	6.401.565,96
Year 15	CIVITAS measure	8.539.025,45
	Reference case (or BAU)	6.730.530,05
Year 16	CIVITAS measure	9.044.737,63
	Reference case (or BAU)	7.069.939,06
Year 17	CIVITAS measure	9.566.815,52
	Reference case (or BAU)	7.420.078,80
Year 18	CIVITAS measure	10.105.703,43
	Reference case (or BAU)	7.781.242,39
Year 19	CIVITAS measure	10.661.856,73
	Reference case (or BAU)	8.153.730,46
Year 20	CIVITAS measure	11.235.742,15
	Reference case (or BAU)	8.537.851,30
Year 21	CIVITAS measure	11.827.838,00
	Reference case (or BAU)	8.933.921,07
Year 22	CIVITAS measure	12.438.634,51
	Reference case (or BAU)	9.342.264,00
Year 23	CIVITAS measure	13.068.634,07
	Reference case (or BAU)	9.763.212,59
Year 24	CIVITAS measure	13.718.351,51
	Reference case (or BAU)	10.197.107,79
Year 25	CIVITAS measure	14.388.314,44
	Reference case (or BAU)	10.644.299,25

<u>Emissions:</u>

Emission volumes for the CIVITAS and Reference scenario are calculated within the emissions module of the transport demand model used to assess future modal shift and traffic performance in the city. A BaU scenario assuming that CIVITAS' developments in terms of non-motorized transport would have not occurred has been also modelled.

The following cost factors have been used for the monetisation of these impacts:

Pollutant	Cost factor
CO_2	25 €/tonne (2010) 40 €/tonne (2020)
HC	400 €/tonne
NOx	2600 €/tonne
PM10	119900 €/tonne
PM2,5	299600 €/tonne

Table 21: Cost factors for emissions

Table C2.7.4 Costs from environmental emissions (not discounted)

	Cases for comparison	Cost (e.g. €200,000)
Year 1	CIVITAS measure	2.870.413.356,42
	Reference case (or BAU)	2.872.541.285,72
Year 2	CIVITAS measure	2.922.075.862,92
	Reference case (or BAU)	2.924.326.174,93
Year 3	CIVITAS measure	2.994.359.191,58
	Reference case (or BAU)	2.996.747.757,42
Year 4	CIVITAS measure	3.062.530.884,90
	Reference case (or BAU)	3.065.056.537,26
Year 5	CIVITAS measure	3.127.947.110,67
	Reference case (or BAU)	3.130.609.262,80
Year 6	CIVITAS measure	3.194.365.515,27
	Reference case (or BAU)	3.197.166.412,84
Year 7	CIVITAS measure	3.261.811.797,01
	Reference case (or BAU)	3.264.753.748,98
Year 8	CIVITAS measure	3.330.312.286,74
	Reference case (or BAU)	3.333.397.666,97
Year 9	CIVITAS measure	3.399.893.962,87
	Reference case (or BAU)	3.403.125.211,81
Year 10	CIVITAS measure	3.470.584.466,71
	Reference case (or BAU)	3.473.964.093,15
Year 11	CIVITAS measure	3.542.412.118,26
	Reference case (or BAU)	3.545.942.701,07
Year 12	CIVITAS measure	3.615.405.932,22
	Reference case (or BAU)	3.619.090.122,20
Year 13	CIVITAS measure	3.689.595.634,51
	Reference case (or BAU)	3.693.436.156,22
Year 14	CIVITAS measure	3.764.861.770,58
	Reference case (or BAU)	3.768.861.309,94
Year 15	CIVITAS measure	3.841.380.889,68
	Reference case (or BAU)	3.845.542.313,17
Year 16	CIVITAS measure	3.919.184.953,95
	Reference case (or BAU)	3.923.511.207,67
Year 17	CIVITAS measure	3.998.306.706,48
	Reference case (or BAU)	4.002.800.818,18
Year 18	CIVITAS measure	4.078.779.689,74
	Reference case (or BAU)	4.083.444.770,96
Year 19	CIVITAS measure	4.160.638.264,47
	Reference case (or BAU)	4.165.477.512,66
Year 20	CIVITAS measure	4.243.917.629,01
	Reference case (or BAU)	4.248.934.329,73
Year 21	CIVITAS measure	4.328.653.839,04
	Reference case (or BAU)	4.333.851.368,22
Year 22	CIVITAS measure	4.414.883.827,77
	Reference case (or BAU)	4.420.265.654,04
Year 23	CIVITAS measure	4.502.645.426,70
	Reference case (or BAU)	4.508.215.113,72
Year 24	CIVITAS measure	4.591.977.386,68
	Reference case (or BAU)	4.597.738.595,59
Year 25	CIVITAS measure	4.682.919.399,64
	Reference case (or BAU)	4.688.875.891,52

Accident savings

Considering that road traffic accidents data come from the police records (not a modelling result), it is not clear how the isolated impact of the extension of the non-motorized network on traffic safety can be assessed, since this is a combination of factors affecting also car traffic volumes and speed. Therefore it will be omitted.

C2.7.4 Compare the lifetime costs and benefits

Table C2.7.5 Lifetime cost/benefit of CIVITAS measure (discounted)

	Capital cost	Maintenance costs	Costs from journey times	Costs from environmental emissions	Total cost	Total Benefit	Cumulated cost
Year 1	442.870,76	48.320,00	2.994.015,91	2.870.413.356,42	2.873.898.563,09	0,00	2.873.898.563,09
Year 2	3.323.671,85	49.765,51	3.185.067,98	2.823.261.703,30	2.829.820.208,63	0,00	2.829.820.208,63
Year 3	1.999.070,96	78.987,53	3.346.886,81	2.795.266.346,08	2.800.691.291,38	0,00	2.800.691.291,38
Year 4	2.765.847,56	78.472,44	3.553.300,84	2.762.227.392,52	2.768.625.013,36	0,00	2.768.625.013,36
Year 5	0,00	77.335,16	3.739.966,90	2.725.825.198,25	2.729.642.500,31	0,00	2.729.642.500,31
Year 6	0,00	76.214,36	3.920.166,57	2.689.570.049,00	2.693.566.429,93	0,00	2.693.566.429,93
Year 7	0,00	75.109,81	4.094.053,17	2.653.485.998,48	2.657.655.161,46	0,00	2.657.655.161,46
Year 8	0,00	74.021,26	4.261.776,84	2.617.595.353,63	2.621.931.151,73	0,00	2.621.931.151,73
Year 9	0,00	72.948,49	4.423.484,61	2.581.918.765,31	2.586.415.198,41	0,00	2.586.415.198,41
Year 10	0,00	71.891,26	4.579.320,47	2.546.475.314,83	2.551.126.526,56	0,00	2.551.126.526,56
Year 11	0,00	70.849,36	4.729.425,41	2.511.282.596,55	2.516.082.871,31	0,00	2.516.082.871,31
Year 12	0,00	69.822,56	4.873.937,49	2.476.356.796,66	2.481.300.556,71	0,00	2.481.300.556,71
Year 13	0,00	68.810,64	5.012.991,90	2.441.712.768,36	2.446.794.570,90	0,00	2.446.794.570,90
Year 14	0,00	67.813,38	5.146.721,02	2.407.268.251,34	2.412.482.785,74	0,00	2.412.482.785,74
Year 15	0,00	66.830,58	5.275.254,43	2.373.135.163,16	2.378.477.248,17	0,00	2.378.477.248,17
Year 16	0,00	65.862,02	5.398.719,04	2.339.324.731,67	2.344.789.312,72	0,00	2.344.789.312,72
Year 17	0,00	64.907,50	5.517.239,07	2.305.847.114,48	2.311.429.261,04	0,00	2.311.429.261,04
Year 18	0,00	63.966,81	5.630.936,15	2.272.711.458,60	2.278.406.361,56	0,00	2.278.406.361,56
Year 19	0,00	63.039,75	5.739.929,34	2.239.925.957,32	2.245.728.926,41	0,00	2.245.728.926,41
Year 20	0,00	62.126,13	5.844.335,21	2.207.497.904,26	2.213.404.365,61	0,00	2.213.404.365,61
Year 21	0,00	61.225,75	5.944.267,87	2.175.433.745,01	2.181.439.238,63	0,00	2.181.439.238,63
Year 22	0,00	60.338,42	6.039.838,99	2.143.739.126,15	2.149.839.303,57	0,00	2.149.839.303,57
Year 23	0,00	59.463,95	6.131.157,92	2.112.418.942,01	2.118.609.563,88	0,00	2.118.609.563,88
Year 24	0,00	58.602,16	6.218.331,66	2.081.477.379,11	2.087.754.312,93	0,00	2.087.754.312,93
Year 25	0,00	57.752,85	6.301.464,95	2.050.917.958,52	2.057.277.176,33	0,00	2.057.277.176,33
Total	8.531.461,13	1.664.477,68	121.902.590,56	61.205.089.371,02	61.337.187.900,39	0,00	61.337.187.900,39

Table C2.7.6 Lifetime cost/benefit of the reference measure/case (discounted)

	Capital cost	Maintenance costs	Costs from journey times	Costs from environmental emissions	Total cost	Total Benefit	Cumulated cost
Year 1	655.404,41	44.137,03	2.998.902,06	2.872.541.285,72	2.876.239.729,22	0,00	2.876.239.729,22
Year 2	633.240,98	46.409,34	3.090.962,63	2.825.435.917,80	2.829.206.530,76	0,00	2.829.206.530,76
Year 3	611.827,03	48.477,49	3.159.114,15	2.797.496.097,85	2.801.315.516,53	0,00	2.801.315.516,53
Year 4	591.137,23	50.352,69	3.272.612,60	2.764.505.386,24	2.768.419.488,76	0,00	2.768.419.488,76
Year 5	0,00	49.622,94	3.369.998,68	2.728.145.110,03	2.731.564.731,65	0,00	2.731.564.731,65
Year 6	0,00	48.903,77	3.463.751,32	2.691.928.329,60	2.695.440.984,69	0,00	2.695.440.984,69
Year 7	0,00	48.195,02	3.553.958,88	2.655.879.278,30	2.659.481.432,20	0,00	2.659.481.432,20
Year 8	0,00	47.496,54	3.640.707,82	2.620.020.434,60	2.623.708.638,97	0,00	2.623.708.638,97
Year 9	0,00	46.808,19	3.724.082,82	2.584.372.613,10	2.588.143.504,10	0,00	2.588.143.504,10
Year 10	0,00	46.129,81	3.804.166,73	2.548.955.051,42	2.552.805.347,95	0,00	2.552.805.347,95
Year 11	0,00	45.461,26	3.881.040,65	2.513.785.493,13	2.517.711.995,03	0,00	2.517.711.995,03
Year 12	0,00	44.802,40	3.954.783,96	2.478.880.266,80	2.482.879.853,16	0,00	2.482.879.853,16
Year 13	0,00	44.153,09	4.025.474,35	2.444.254.361,49	2.448.323.988,93	0,00	2.448.323.988,93
Year 14	0,00	43.513,19	4.093.187,86	2.409.825.573,42	2.413.962.274,47	0,00	2.413.962.274,47
Year 15	0,00	42.882,56	4.157.998,90	2.375.706.014,81	2.379.906.896,28	0,00	2.379.906.896,28
Year 16	0,00	42.261,08	4.219.980,30	2.341.907.031,93	2.346.169.273,30	0,00	2.346.169.273,30
Year 17	0,00	41.648,60	4.279.203,31	2.308.438.895,26	2.312.759.747,17	0,00	2.312.759.747,17
Year 18	0,00	41.044,99	4.335.737,67	2.275.310.859,49	2.279.687.642,16	0,00	2.279.687.642,16
Year 19	0,00	40.450,14	4.389.651,62	2.242.531.220,49	2.246.961.322,25	0,00	2.246.961.322,25
Year 20	0,00	39.863,91	4.441.011,94	2.210.107.369,69	2.214.588.245,53	0,00	2.214.588.245,53
Year 21	0,00	39.286,17	4.489.883,94	2.178.045.845,87	2.182.575.015,98	0,00	2.182.575.015,98
Year 22	0,00	38.716,80	4.536.331,56	2.146.352.384,39	2.150.927.432,76	0,00	2.150.927.432,76
Year 23	0,00	38.155,69	4.580.417,34	2.115.031.964,19	2.119.650.537,22	0,00	2.119.650.537,22
Year 24	0,00	37.602,71	4.622.202,46	2.084.088.852,34	2.088.748.657,51	0,00	2.088.748.657,51
Year 25	0,00	37.057,74	4.661.746,79	2.053.526.646,64	2.058.225.451,17	0,00	2.058.225.451,17
Total	2.491.609,64	1.093.433,15	98.746.910,37	61.267.072.284,59	61.369.404.237,75	0,00	61.369.404.237,75

C2.7.5 Summary of CBA results

For the summary of CBA results the changes in benefits and costs between the two scenarios are assessed. Both journey time and emission savings are a benefit resulting from the implementation of the CIVITAS measure, therefore accounted as such in this summary.

The corresponding Net and Cumulative Cash Flow is also considered in the following summary.

Table C2.7.7 Lifetime changes in costs and benefit (discounted)

	Changes in Costs	Changes in benefits	Net cash flow	Cumulative cash flow
Year 1	-208.350,68	2.132.815,45	2.341.166,13	2.341.166,13
Year 2	2.693.787,03	2.080.109,16	-613.677,87	-613.677,87
Year 3	1.417.753,97	2.041.979,12	624.225,15	624.225,15
Year 4	2.202.830,08	1.997.305,48	-205.524,60	-205.524,60
Year 5	27.712,22	1.949.943,56	1.922.231,34	1.922.231,34
Year 6	27.310,59	1.901.865,35	1.874.554,76	1.874.554,76
Year 7	26.914,79	1.853.185,52	1.826.270,74	1.826.270,74
Year 8	26.524,72	1.804.011,95	1.777.487,23	1.777.487,23
Year 9	26.140,30	1.754.445,99	1.728.305,69	1.728.305,69
Year 10	25.761,46	1.704.582,85	1.678.821,39	1.678.821,39
Year 11	25.388,10	1.654.511,82	1.629.123,72	1.629.123,72
Year 12	25.020,16	1.604.316,61	1.579.296,45	1.579.296,45
Year 13	24.657,55	1.554.075,57	1.529.418,03	1.529.418,03
Year 14	24.300,19	1.503.788,93	1.479.488,73	1.479.488,73
Year 15	23.948,01	1.453.596,13	1.429.648,11	1.429.648,11
Year 16	23.600,94	1.403.561,52	1.379.960,58	1.379.960,58
Year 17	23.258,90	1.353.745,03	1.330.486,13	1.330.486,13
Year 18	22.921,81	1.304.202,41	1.281.280,60	1.281.280,60
Year 19	22.589,61	1.254.985,45	1.232.395,84	1.232.395,84
Year 20	22.262,23	1.206.142,15	1.183.879,92	1.183.879,92
Year 21	21.939,59	1.157.716,93	1.135.777,34	1.135.777,34
Year 22	21.621,62	1.109.750,81	1.088.129,19	1.088.129,19
Year 23	21.308,26	1.062.281,60	1.040.973,34	1.040.973,34
Year 24	20.999,45	1.015.344,04	994.344,59	994.344,59
Year 25	20.695,11	968.969,95	948.274,84	948.274,84
Total	6.610.896,01	38.827.233,38		

The change of Net Present Value of the extension of the infrastructure for cycling and walking is 32,22 m€, which means that the NPV of this measure is higher than the one associated to BaU scenario.

The benefit to cost ratio (BCR) is 5,87 which means that benefits are nearly six times larger than costs. This result reveals that the implementation of non-motorized infrastructure is a very cost-effective measure.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	15 km of new infrastructure for cycling by the end of the project	***
2	2 km of new infrastructure for walking by the end of the project	***
3	Maintain the 47% of pedestrian mobility on modal split	*
4	Increase the number of cyclists with 30%	***
5		
NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%) ★★ = Achieved in full ★★★ = Exceeded		

C4 Upscaling of results

Up-scaling this measure would be made by identifying additional key corridors where comfort and safe non-motorised infrastructure is lacking, and implementing pedestrian and bicycle lanes on them. The number of pedestrians and cyclist in these areas will increase according to modal share and bicycle traffic flows registered in the areas where this measure is implemented.

C5 Appraisal of evaluation approach

These are the main difficulties encountered during the evaluation process:

Firstly, due to their different nature, it has been decided to separately evaluate cycling lanes and pedestrian areas.

The capital cost of the cycle lanes and pedestrian areas included in urban developments has been difficult to calculate because there are integrated in a new development that includes other important infrastructures such as bridges or installations that are in the same development but have not relation with the pedestrian area.

The maintenance cost has been difficult to calculate, because the department that maintains the city has not specific data for each type of use.

Although a city-wide scale could have been followed since non-motorized mobility affects the whole city, it was decided to undertake survey regarding the "social" indicators in the areas where the infrastructures has been built, which concentrate in the CIVITAS corridor.

C6 Summary of evaluation results

This measure is part of a package of measures aiming to increase the use of non-motorized modes as well as reducing the number of private cars entering the city and circulating within its neighbourhoods, by increasing the number of exclusive infrastructures for pedestrian and cyclist mobility and improving its overall quality.

The extension of the pedestrian and cycling network in Donostia-San Sebastian (4 and 22 kilometres, respectively) has prompted a steady increase in the use of the bicycle, meaning a 33% increase during the CIVITAS project (2008-2011. In 2011 the increase in cycling levels was 26% compared with the previous year.

In terms of modal shift in favour of sustainable modes of transport, results are moderate in the short term, achieving an overall reduction in car use of 0,1% as compared with the situation before the CIVITAS project started. It should be highlighted that this achievement is made in a context of a steady increase in car travel, thus it can be considered a positive result. On the other hand, walking levels seems to be follow a slightly decreasing trend, which is not a desirable result (0,3% reduction in modal share as compared to the situation before the project started). Attention should be placed to this issue in the coming years.

Regarding energy consumption and efficiency, even though an increase in energy consumption of the overall system has been experienced (2,3% increase between 2008 an 2011), the energy efficiency of the system has increased as a consequence of the CIVITAS project. It is estimated that in 2011 energy saving accounted for nearly 15 PET as compared with the BaU scenario. Consequently, there is an overall increase in emission levels as compared with the situation before the CIVITAS project, due to the increased mobility levels experienced in the city. Nevertheless, both in terms of GHG and pollutant emission levels, significant reduction have been achieved by the CIVITAS project as compared to the BaU scenario (e.g. 2,5% reduction in Particulate Matter emission levels in 2011).

As for public perception, most of the population regard the cycling and pedestrian networks as positive (98% in 2010 and 91% in 2011). A slight increase in the number of negative ratings has been accounted, most probably linked to some friction between pedestrians and cyclist at certain locations, and punctual lack of bicycle parking space, caused by the increased level of cycling in the city. Nevertheless, it should be highlighted that the share of population rating the cycling and pedestrian network as “very good” has significantly increased (9% and 12% respectively).

C7 Future activities relating to the measure

Other new cycle lanes are being studied. It is being analysed a connection between Loiola and Martutene. A new connection will be built in the city centre in Avda de Navarra next months..

We are studying the possibility to include parking for bicycles in public car parking in the city centre. The first year a financial incentive will be given to the users on the way to promote the use of the bicycle.

D Process Evaluation Findings

D0 Focused measure

	0	No focussed measure
2	1	Most important reason
1	2	Second most important reason
3	3	Third most important reason

D1 Deviations from the original plan

The deviations from the original plan comprised:

- **Unavailability of Regional Government mobility survey:** there was a delay in the delivery of the Regional Government mobility survey which has make it impossible to use this data source for evaluation purposes. A model based on the previous mobility survey and traffic flows data have been used instead. Due to the differences in the tools and data sources used, modal share results are not directly comparable. Therefore, the target objective of maintaining a 47% share of pedestrian mobility in modal share has been adapted to the actual situation regarding data sources.
- **Increase on the km of cycle lanes:** the number of km constructed within the project period has been of 22 km instead the 15 km envisaged.
- **Increase on the km of pedestrian lanes:** the number of km constructed within the project period has been of 4 km instead the 2 km envisaged.
- **Increase on the parking for bicycles:** the number of parking facilities implemented in 2010 has been 60 units.
- **Delay in the construction of the covered parking space:** The construction of the new bus station is being delayed and it is not clear when it will start. Even if the covered parking space for bicycles is planned in the project of the new bus station of Atocha, it won’t be finished by the end of the project.
- **New parking facility at Euskotren’s train station:** Although not part of the CIVITAS project itself, the implementation of an extensive parking facility for commuter train users in Euskotren’s train station of Plaza Easo comprises a significant development in terms of cycling policy in the city.
- **Difficulties to manage the incentives to condominiums:** The measure was planned to include financial incentives to condominiums to construct indoor bicycle parkings. There are big difficulties to manage the economical aid for condominiums. A solution or alternative is being studied.
- **Underground bicycle parking at public parking facilities:** In order to overcome the above referred difficulties, underground bicycle parking facilities are being installed in the city centre in order to stimulate the use of the bicycle. In particular, indoor bicycle parking inside underground car parking in the city centre is being offered to cyclists, providing financial incentives to the residents of these areas to use the service.

D2 Barriers and drivers

D2.1 Barriers

The main barriers encountered for the development of measure 24 are:

Preparation phase

- **Cultural:** Although cultural changes are emerging, a part of the population doesn't even consider the possibility to abandon the car for every displacement. In many cases, cycling and walking is still seen as unsafe modes of transport. Also, there are people who don't agree with the construction of the cycle lanes.
- **Involvement/Communication:** Lack of information regarding the strategic objectives and measure goals. Measures implementation has not always been accompanied by the required explanation about its integration in a city wide strategy and the specific goals of each measure. Therefore these are not always very well accepted by the citizens.

Implementation phase

- **Financial:** The capital cost for the construction of cycle lanes and pedestrian areas is a very important issue.
- **Spatial:** The topography of Donostia-San Sebastián, with many urban areas in hilly territories, makes it more difficult to implement efficient non-motorized transport corridors in some neighbourhoods. Synergies with other measures, such as vertical transport, are required.

Operation phase

- **Cultural:** The shared use of urban space between cyclists and pedestrians is a cause of conflicts, insecurity perception for vulnerable people and sometimes lacks of specific regulations.
- **Positional:** Although cycling and walking are increasing over the years, traffic management remains focused on car traffic, sometimes penalizing non-motorized users, thus making these modes less attractive.
- **Political/Strategic:** Although significant improvements regarding non-motorized modes are taking place over the last years, encouraging its use, recent decisions regarding the parking policy in the city, with mass storage parking infrastructure being built in the city centre, may counteract with the objective of fostering its use, making more attractive to drive towards the city centre

D2.2 Drivers

As for the drivers, the main ones affecting the measure are:

Preparation phase

- **Political/Strategic:** There is a clear commitment at the city level to support the development of non motorized modes of transport, allocating increased technical resources and fund for that purpose.

- **Cultural:** Over the last years cycling in Donostia-San Sebastian has notably increased. Currently there is a critical mass of cyclists which is accelerating the change towards a new mobility culture by raising awareness about this mode of transport and its associated benefits.

Implementation phase

- **Financial:** The provision of cycling and pedestrian infrastructures requires a significant investment. The availability of European funds has meant a great opportunity to develop this measure.
- **Positional:** Over the last years, new developments are frequently planned including cycle lanes. This makes it possible to extend the cycle lane network and encourage future residents to use the bicycle.

Operation phase

- **Positional:** The implementation of the public bike sharing service has helped raising awareness on the potential of bicycle mobility in the city, thus fostering its use. It has also eased intermodality options for commuters.
- **Positional:** The construction of vertical transport systems has made possible to extend the network of cycling and pedestrian itineraries to the hilly neighbourhoods of the city, where half of the population lives.

D2.3 Activities

In order to handle the above referred barriers and/or to make use of the drivers, the following activities were taken during the implementation of the measure:

Preparation phase

- **Cultural:** Ongoing promotional and awareness raising activities, including children and scholars

Operation phase

- **Positional:** Coordinate cycling promotion measures with car traffic restriction initiatives such us on-street parking policy (enlargement of the paid parking management scheme) and P&R facilities.
- **Involvement/Communication:** Information campaign regarding 30-km-zones where its implications towards non motorized mobility are explained to the population

D3 Description of organisations and risks

D.3.1 Measure partners

Following there is a brief description of all project partners and its level of involvement with the measure:

- **DSS Municipality Mobility Department –** Responsible for the planning and implementation of the measure. Leading role.
- **DSS Municipality Public Works Department –** Construction of new infrastructural developments. Principal participant.

D.3.2 Stakeholders

The main stakeholders involved in the measure are:

- **Mobility Advisory Council -** Advising for the proper implementation of the measure of the measure
- **Cycling Observatory –** Monitoring of cycling development in the city.
- **Kalapie (Cyclists association)** – Participation in the definition of measures
- **Pedestrians associations** - Participation in the definition of measures
- **Environmental NGOs** - Participation in the definition of measures

D4 Recommendations

The implementation of this measure has been very helpful in the promotion of non-motorized modes of transport instead of the car, making it possible to achieve a behavioural change of the citizens.

The main recommendations derived from it are:

D.4.1 Recommendations: measure replication

- **Design of the cycle network:** It is very important to do a previous analysis of the existing cycling lane network and the selection of the cycling lanes that will be constructed. A proper design of the cycling lanes is very important in order to make safe and easy cycle lanes.
- **Quality of infrastructures:** The construction of safe and well designed infrastructure is very important to have success in the implementation of the measure. Space requirements for high quality infrastructure design and all available options for it acquisition have to be studied.
- **Intermodality and activity centres:** It is important that the cycle network provides a good connection with the train stations, bus station, university campus, and commercial areas in order to better promote the use of the bicycle.
- **Parking facilities:** The implementation of a well dimensioned bicycle parking network to accompany the extension of the cycling infrastructure is essential to foster its use.

D.4.2 Recommendations: process

- **Political involvement and consensus:** Is needed to agree on the required investment to build these infrastructures in different areas of the city.
- **Complementary actions:** In order to increase the effectiveness of the measure, infrastructural developments should be accompanied to incentives and promotion activities, as well as actions to restrict car use in the city.
- **Citizen's awareness.** It is very important that the citizens are involved in the strategies to change mobility behaviour.
- **Formation and information:** It is important to make cyclists aware of the rules to circulate in the cycle lanes and other areas of the city. This campaign makes possible a better coexistence between different modes of transport, avoiding potential frictions, especially with pedestrians.

E Summary time schedule

		YEAR 1												YEAR 2												YEAR 3												YEAR 4											
Task No.	**Task name**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
3.5	Extension cycling-walking infraestructure						X						E1																		E2						X						E3						
Evaluation tasks																																																	
Learning History Workshop																			X												X												X						
Process evaluation report																				X													X											X					
Deliverables																																																	
M12.1 Draft MLEP													X																																				
D12.1 Final MLEP																											X																						
D12.2 Baseline and first results Temp																																	X																
D12.3 Draft results Temp																																													X			
D12.4 Final result temp																																																	X