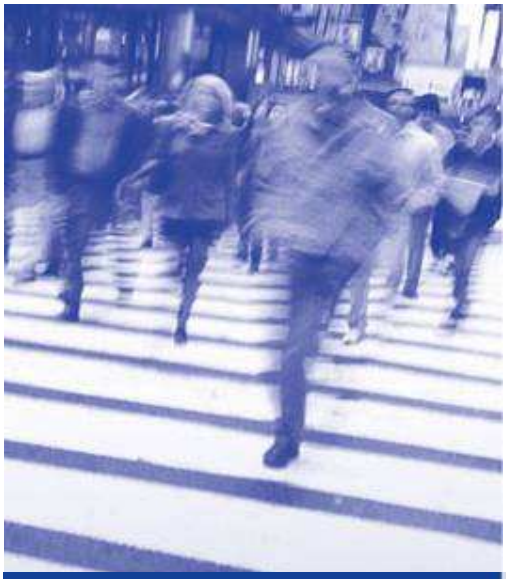

CiViTAS
Cleaner and better transport in cities

ARCHIMEDES
AALBORG • BRIGHTON & HOVE • DONOSTIA - SAN SEBASTIÁN • IAŞI • MONZA • ÚSTÍ NAD LABEM

Donostia – San Sebastian

T16.1 – High Quality Public Transport Corridors in Donostia-San Sebastian

Donostia – San Sebastian

April 2010

THE CIVITAS INITIATIVE
IS CO-FINANCED BY THE
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Contents

1. Introduction

1.1 Background CIVITAS

CIVITAS - cleaner and better transport in cities - stands for CIty-VITAlity-Sustainability. With the CIVITAS Initiative, the EC aims to generate a decisive breakthrough by supporting and evaluating the implementation of ambitious integrated sustainable urban transport strategies that should make a real difference for the welfare of the European citizen.

CIVITAS I started in early 2002 (within the 5th Framework Research Programme);
CIVITAS II started in early 2005 (within the 6th Framework Research Programme) and
CIVITAS PLUS started in late 2008 (within the 7th Framework Research Programme).

The objective of CIVITAS-Plus is to test and increase the understanding of the frameworks, processes and packaging required to successfully introduce bold, integrated and innovative strategies for clean and sustainable urban transport that address concerns related to energy-efficiency, transport policy and road safety, alternative fuels and the environment.

Within CIVITAS I (2002-2006) there are 19 cities clustered in 4 demonstration projects, within CIVITAS II (2005-2009) 17 cities in 4 demonstration projects, whilst within CIVITAS PLUS (2008-2012) 25 cities in 5 demonstration projects are taking part. These demonstration cities all over Europe will be funded by the European Commission.

Objectives:

- to promote and implement sustainable, clean and (energy) efficient urban transport measures
- to implement integrated packages of technology and policy measures in the field of energy and transport in 8 categories of measures
- to build up critical mass and markets for innovation

Horizontal projects support the CIVITAS demonstration projects & cities by :

- Cross-site evaluation and Europe wide dissemination in co-operation with the demonstration projects
- The organisation of the annual meeting of CIVITAS Forum members
- Providing the Secretariat for the Political Advisory Committee (PAC)
- Development of policy recommendations for a long-term multiplier effect of CIVITAS

Key elements of CIVITAS

- CIVITAS is co-ordinated by cities: it is a programme “of cities for cities”
- Cities are in the heart of local public private partnerships
- Political commitment is a basic requirement
- Cities are living ‘Laboratories' for learning and evaluating

1.2 Background ARCHIMEDES

ARCHIMEDES is an integrating project, bringing together 6 European cities to address problems and opportunities for creating environmentally sustainable, safe and energy efficient transport systems in medium sized urban areas.

The objective of ARCHIMEDES is to introduce innovative, integrated and ambitious strategies for clean, energy-efficient, sustainable urban transport to achieve significant impacts in the policy fields of energy, transport, and environmental sustainability. An ambitious blend of policy tools and measures will increase energy-efficiency in transport, provide safer and more convenient travel for all, using a higher share of clean engine technology and fuels, resulting in an enhanced urban environment (including reduced noise and air pollution). Visible and measurable impacts will result from significantly sized measures in specific innovation areas. Demonstrations of innovative transport technologies, policy measures and partnership working, combined with targeted research, will verify the best frameworks, processes and packaging required to successfully transfer the strategies to other cities.

1.3 Participant Cities

The ARCHIMEDES project focuses on activities in specific innovation areas of each city, known as the CIVITAS corridor or zone (depending on shape and geography). These innovation areas extend to the peri-urban fringe and the administrative boundaries of regional authorities and neighbouring administrations.

The two Learning cities, to which experience and best-practice will be transferred are Monza (Italy) and Ustí nad Labem (Czech Republic). The strategy for the project is to ensure that the tools and measures developed have the widest application throughout Europe, tested via the Learning Cities' activities and interaction with the Lead City partners.

1.3.1 Leading City Innovation Areas

The four Leading cities proposed in the ARCHIMEDES project are:

- Aalborg (Denmark);
- Brighton & Hove (UK);
- Donostia-San Sebastian (Spain); and
- Iasi (Romania).

Together the Lead Cities in ARCHIMEDES cover different geographic parts of Europe. They have the full support of the relevant political representatives for the project, and are well able to implement the innovative range of demonstration activities proposed.

The Lead Cities are joined in their local projects by a small number of key partners that show a high level of commitment to the project objectives of energy-efficient urban transportation. In all cases the public transport company features as a partner in the proposed project.

2. Donostia – San Sebastian

The city of Donostia -San Sebastian overlooks the sea and, with a bit more than 180,000 inhabitants, keeps a human scale. Some people consider the balanced combination of

small mountains, manor buildings, and sea as the setting for one of the most beautiful cities in the world. We have a tradition in favouring pedestrians, cyclists and public transport.

For about twenty years, the city has been enforcing a strong integrated policy in favour of pedestrians, bicycles and public transport. Considering walking and cycling as modes of transport, has led to the building of a non-motorised transport network for promoting this type of mobility around the city.

Likewise, the city has extended its network of bus lanes. The city holds one of the higher bus-riding rates, with around 150 trips per person per year.

2.1 Objectives in CIVITAS

The CIVITAS project is a perfect opportunity to expand our Sustainable Urban Transport Strategy. With the package of CIVITAS measures Donostia-San Sebastian wants to:

- Increase the number of public transport users
- Decrease the number of cars entering in the city centre
- Increase the use of the bicycle as a normal mode of transport
- Maintain the high modal share of walking
- Reduce the number of fatal accidents and accidents with heavy injuries
- Reduce the use of fossil fuels in public transport.

3. Background to the Deliverable

The present deliverable refers to Measure number 16, High Quality Bus Corridors in Donostia-San Sebastian

As part of this measure CTSS has been working on the Task 2.10 High Quality Public Transport Corridors

3.1 Summary Description of the Task

Within measure 16, task 2.10 concerns the implementation and promotion of two high quality transport corridors. The corridors will combine dedicated platforms for bus lines with all dimensions of quality.

ADS will realize the necessary changes in the infrastructure for the dedicated platform and will reprogram UTC (traffic lights) to ensure public transport priority along the two corridors.

CTSS-DBUS will introduce bus services along the two high quality corridors according to the UNE-EN 13816 quality standard The services will be fully operational from month 18 (Milestone 2.10).

4. High Quality Public Transport Corridors in Donostia-San Sebastian

4.1 Summary of the activities undertaken

CTSS-DBUS has implemented the UNE-EN 13816 quality standards in the two high quality corridors.

The bus service of line “28-Amara-Ospitaleak” operates in the south corridor and the bus service of line “5-Benta Berri” operates in the west corridor. Both corridors have been defined as CIVITAS high quality public transport corridors.
On February 2010 both DBUS lines 28 & 5 have achieved the UNE-EN 13816 certification by AENOR, the only Spanish organization able to issue this kind of certification.

In order to achieve this challenging quality standard UNE-EN 13816, ADS has implemented several changes in the infrastructure: new bus lanes on both corridors, several road changes and UTC (traffic lights) new programming to ensure public transport priority in some crossroads. This interventions have been essential to achieve the challenging punctuality index levels in the bus services.

ADS has started to implement the bus priority on traffic lights in the crossroads, and the aim is to have finished the priority in 31 crossroads by the end of 2010. Most of these crossroads are included in the CIVITAS high quality public transport corridors.

CTSS-DBUS has also carried out customer satisfaction surveys of the service provided through the high quality public transport corridors.

In relation with this ARCHIMEDES project measure 16, CTSS-DBUS has already finished the last step to have its own BRT (Bus Rapid Transit) system, that includes most of the characteristics shown in the deliverable R16.1 Technical Development of High Quality Public Transport Corridors and that will be explained in the next section.

CTSS-DBUS BTR system includes characteristics described in the CIVITAS measures number 4, 16, 17, 73 and 74.

4.1.1 UNE-EN 13816 Quality Standard

The UNE-EN 13816 standard was devised in 2003 from the evolution of the ISO 9000 for its application in the public transport sector. The main aim of UNE-EN 13816 is to encourage the link between Quality to Public Transport Managing, taking special interest in the customers’ expectations and needs. UNE-EN 13816 is more stringent than ISO 9000, because there are a lot of specific commitments with the travellers that the public transport company has to achieve to get the certification. In Spain, AENOR is the only organization that can issue the certification according to the UNE-EN 13816 quality standards.

The UNE-EN 13816 consists of eight criteria:

1. Offered service
2. Accessibility

3. Information
4. Punctuality and Reliability
5. Customer attention
6. Comfort and Cleanliness
7. Security
8. Environmental impact

In each criterion there are obligatory commitments that must be achieved to get the certification. The most important ones are the following:

1. Offered service
    a. Bus occupation must be less than 3 persons per square meter for the 80% of the travellers (not more than 110 travellers in a 18 meter articulated bus).
    b. It is unacceptable to have 2 consecutive full buses at the same bus stop

2. Accessibility
    a. 100% of the bus services must be accessible to disabled people.

3. Information
    a. 95% of the bus stops must have the complete, clear and updated information of the line service: schematic representation of the line, time of first and last services from terminal stops, frequency in time slots, fares and prices, maximum notes accepted, service or stop changes notices, lines map, etc.
    b. Website must have all the up to date line service information, clear and complete.
    c. The travellers must have real time information at bus stops, onboard the buses and at website.

4. Punctuality and Reliability
    a. Early departures from terminal stops: maximum 1 minute for 85% of the travellers.
    b. Late departures from terminal stops: maximum 5 minutes for 85% of the travellers.
    c. Waiting time for travellers: not exceed 25% of the bus service frequency for 80% of the travellers (7,5 minutes for line 28, 10 minutes for line 5).
    d. Waiting time unacceptable: double of the bus service frequency for 80% of the travellers (12 minutes for line 28, 16 minutes for line 5).

5. Customer attention
    a. 100% of the customers´ complaints, documents and suggestions must be answered within 20 days.
    b. The lost property found in the buses must be handed over the Local Police within 48 hours, so that customers can claim it.
    c. The Customer Attention and Actuation Plan indicates the correct way to serve the customers, and must be guaranteed by 90% against a specified customer service protocol

6. Comfort and Cleanliness
    a. The Cleanliness Protocol must include buses, company facilities and bus stops, and must be guaranteed by 95% against a specified cleanliness protocol.

7. Security
    a. The Accident Prevention Plan must include the necessary indicators to guarantee an adequate accident index, trying to avoid travellers falls.
    b. 100% of the buses must be safe according to a continuous improvement protocol.

8. Environmental impact
    a. 100% of the buses must have a reduced environmental impact according to a continuous improvement protocol
    b. Clean vehicles, biofuels use, noise and vibration reduction

4.2 Description of the Work Done

CTSS-DBUS has implemented this quality standard in all the bus lines and has already obtained the UNE-EN 13816 certification in the two most important lines that cover the public transport service in the two CIVITAS corridors (high quality public transport corridors).

UNE-EN 13816 Certificate for Line 28 (south corridor)

AENOR

CERTIFICADO AENOR DE SERVICIO Nº A37/ 00042

TRANSPORTE PÚBLICO DE PASAJEROS

PUBLIC PASSENGER TRANSPORT

AUTOBÚS URBANO

28 AMARA – HOSPITALES / 28 AMARA - OSPITALEAK

prestado por performed by

COMPAÑIA DEL TRANVIA DE SAN SEBASTIAN / DONOSTIA BUS

con domicilio social en whose registered office is at

CL FERNANDO SASIAIN, 7 20015 SAN SEBASTIAN (Donostia - ESPAÑA)

en in

CL FERNANDO SASIAIN, 7
20015 SAN SEBASTIAN (Donostia - ESPAÑA)

se conforma con complies with

UNE-EN 13816:2003

2008-11-26 2011-11-26

El Director General de AENOR

UNE-EN 13816 Certificate for Line 5 (west corridor)

Certificado AENOR de Servicio
Transporte público de pasajeros

AENOR

A37/000207

COMPAÑIA DEL TRANVIA DE SAN SEBASTIAN

con domicilio social en: CL FERNANDO SASIAIN, 7 20015 SAN SEBASTIAN (Donostia - ESPAÑA)

presta el servicio de: Transporte Público de Pasajeros

Tipo transporte / Concesión o Línea: Autobús Urbano / Línea 5 Berria Berri

conforme con: UNE-EN 13816:2003

Sistema de certificación: Este certificado se ha concedido de acuerdo con lo establecido en el Reglamento Particular de Certificación de AENOR RP A37/01

Fecha de emisión: 2010-01-11
Fecha de expiración: 2013-01-11

AENOR

El Director General de AENOR

AENOR

The UNE-EN 13816 quality standard is really difficult to achieve in bus services, because the punctuality and reliability commitments depend on the traffic of the city. This

problem doesn't appear in tram or train services, that have their own lane for all their routes. CTSS-DBUS was the third Spanish company to obtain the UNE-EN 13816 certification, and now is a model and a reference in Spain for other companies in quality terms (nowadays around 10 Spanish bus companies have obtained this certifications). Currently, almost the 30% of DBUS travellers use lines 5 & 28 according to UNE-EN 13816 quality standards.

The future plans are to obtain the UNE-EN 13816 certification in line 13, so that CTSS-DBUS will cover the 40% of the travellers receiving the service according to these quality standards and certified by AENOR.

4.2.1 CTSS-DBUS Results

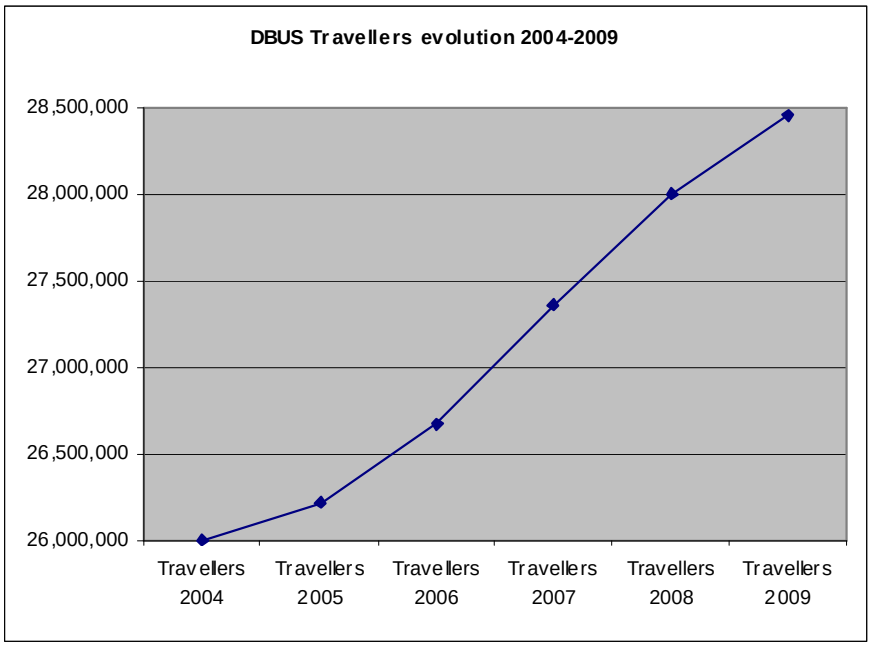
Besides the implementation of the quality standards in lines 5 and 28, CTSS-DBUS has implemented other actions to achieve a Bus Rapid Transit system for San Sebastian covering the two main corridors (CIVITAS high quality public transport corridors):

- Security cameras in buses (3 of them viewing inside the bus and one with the driver's front view).
- Fleet management system (GPS fleet location, operation managing and planning).
- Traveller information system (at bus stops by electronic boards, by SMS, by website and inside the bus).
- Traffic light priority system for buses in crossroads along the main corridors.
- Bus lanes (reserved platform) in most of the important points of the routes.
- Efficient and comfortable payment ways for bus access (contactless card payment).
- Clean vehicles using biofuels.
- High capacity, articulated buses of (18 metres) are used in lines 5 & 28, that have service frequency of 6 minutes in week days in all the stops of their routes.
- 100% accessibility in buses for disable people.
- Intermodality with the rest of the bus network, deterrent parkings (Park & Ride), inter-city buses and train services.
- New CTSS-DBUS service image (new blue and green corporate colours, and new logo of the Igeldo southern little frog), gives an environmental commitment image of CTSS-DBUS to all San Sebastian citizens.
- Main connections of the CIVITAS corridors with lines 5 and 28: University (Ibaeta), business and industrial areas (Miramon, Igara and Zuatzu), Hospital, Park & Ride deterrent parkings (Ibaeta, Anoeta, University and Ondarreta-UPV).

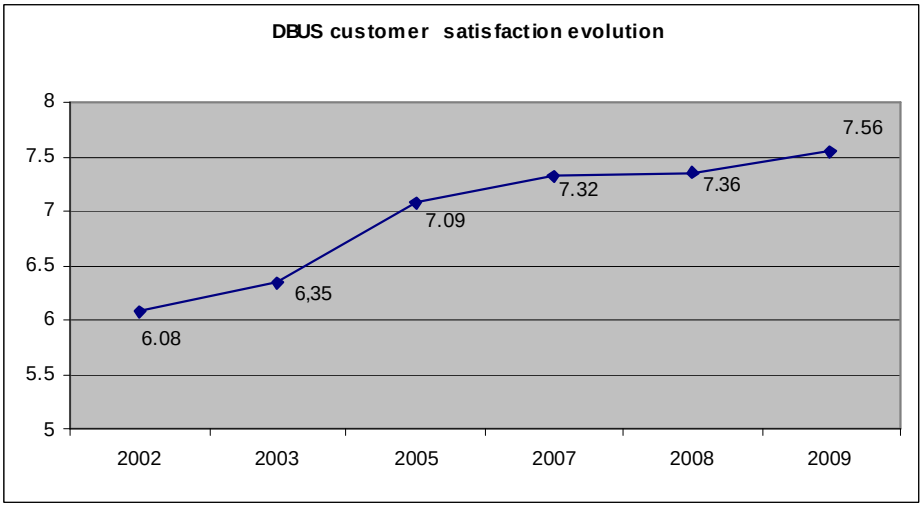
Most of these actions are included in the CIVITAS - ARCHIMEDES project, measures 4, 17, 73 and 74.

The results of the implementation of all these actions are amazing. In a few years CTSS-DBUS has increased public transport use and customer satisfaction by a significant amount .

From a steady base up to and including 2004, CTSS-DBUS has steadily increased the number of passengers carried each year, even though San Sebastian has maintained its population at around 183,000 inhabitants over this period. In 2009 CTSS carried 28,460,380 travellers an increase of almost 2.5 million extra passengers per year over the previous steady performance.



From year 2002, CTSS-DBUS has increased the customer satisfaction surveys results by 1.48 points so that last year the average rating was 7.56.



4.2.2. Line 28-Amara-Ospitaleak (South Corridor)

The main data of line 28 are showed below, and its comparison with the data before the implementation of the quality standards and BRT system.

<u>Line 28 data:</u>

- Route total distance: **11,6 km**
- Number of stops: **28**
- Average distance between stops: **414 m**
- Stops with electronic boards: **11 (39%)**
- Bus lanes in route: **4,5 km (39%)**
- Weekday service frequency: **6 minutes**
- Route Planned Travel Time: **54 minutes**
- Interesting connections with City Centre:
  - Amara (most populated district)
  - Donostia Hospital and Policlinica
  - Miramon business area
  - Anoeta sport area
  - Pío XII Bus station
  - Euskotren Easo station
  - Anoeta and Ilunbe Park & Ride deterrent parkings
- Weekday passengers: **15.000 (17% of total weekday CTSS-DBUS passengers)**

Line 28 Indicators	2006 – Before actions	2009 – BRT system
Traveller average per Weekday	14.683	15.145
Travellers per year	4.731.537	4.833.325
Commercial Speed average	14 km/h	16,4 km/h
Journey Time average (peak hour)	54 minutes	43 minutes
Punctuality (accuracy of timekeeping)	92,4 %	95,2 %
% Travellers waiting less than 7,5min. (weekdays)	79,0%	82,0%
Customer satisfaction Quality Index	6,71 (year 2002)	7,57

4.2.3 Line 5-Benta Berri (West Corridor)

The main data of lines 5 are showed below, and its comparison with the data before the implementation of the quality standards and BRT system

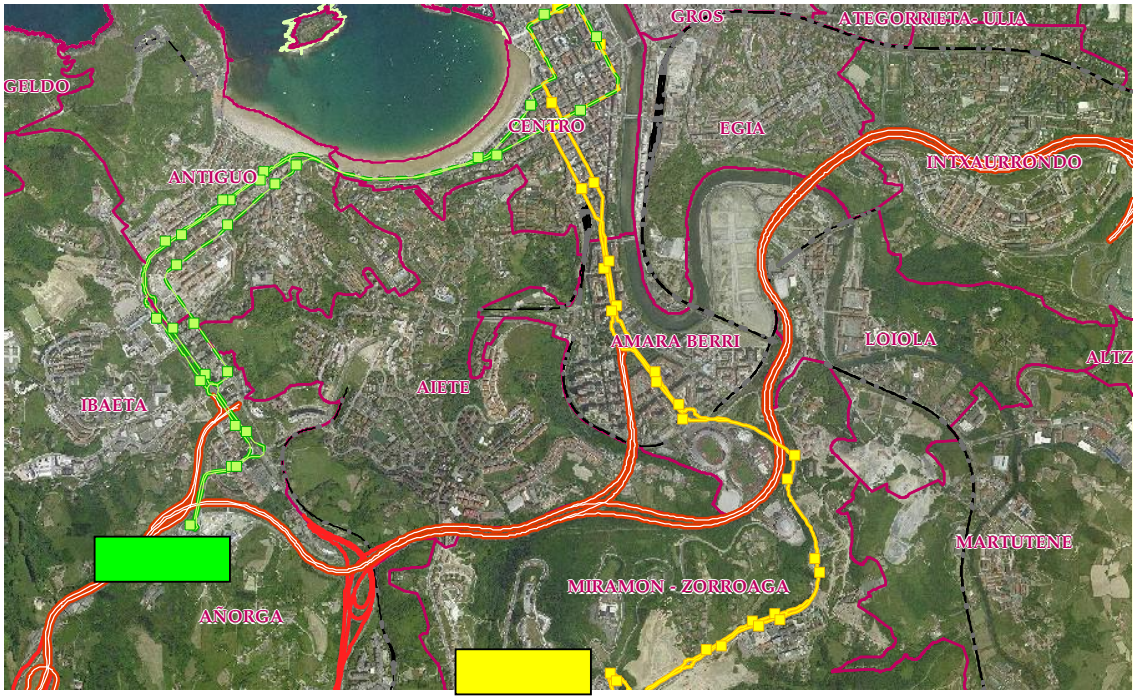
Line 5 data:

- Route total distance: **9,3 km**
- Number of stops: **27**
- Average distance between stops: **403 m**
- Stops with electronic boards: **11 (41%)**
- Bus lanes in route: **2,5 km (38%)**
- Weekday service frequency: **6-8 minutes**
- Route Planned Travel Time: **48 minutes**
- Interesting connections with City Centre:
  - Antiguo (very populated district)
  - University (Ibaeta Campus)
  - Zuatzu and Igara business area
  - Ibaeta and Ondarreta-UPV Park & Ride deterrent parking
- Weekday passengers: **10.000 (11% of total weekday CTSS-DBUS passengers)**

Line 5 Indicators	2006 – Before actions	2009 – BRT system
Traveller average per Weekday	7.754	9.885
Travellers per year	2.450.231	2.559.145
Commercial Speed average	12,6 km/h	15,2 km/h
Journey Time average (peak hour)	48 minutes	40 minutes
Punctuality (accuracy of timekeeping)	91,4 %	96,0 %
% Travellers waiting less than 10min. (weekdays)	84,0%	88,8%
Customer satisfaction Quality Index	6,54 (year 2002)	7,54

4.2.4. Bus Rapid Transit System In Donostia-San Sebastian

CTSS-DBUS has implemented for Donostia-San Sebastian its own public transport high quality system, consisting of a Bus Rapid Transit system along the two main corridors (CIVITAS high quality public transport corridors, south and west) to attend the most populated districts, University, Hospital, Sport center area, business areas and deterrent parkings (Park & Ride) with a high quality bus service (around 6 minutes frequency on weekdays) and a very good intermodality to the rest of the urban bus network, inter-city station and train stations.



The main characteristics of the BRT system of DBUS for Donostia-San Sebastian:

- Bus Lanes
- Traffic Light priority for buses
- Quality standards UNE-EN 13816
- Security cameras system
- Payment system (contact less cards)
- GPS location system
- Traveller information system (stops, onboard, website, SMS)
- Accessibility
- High capacity buses (18 metres articulated buses)
- Interesting connections (University, Hospital, business areas)
- Clean and ecological buses (biofuels, noise reduction)
- Intermodality (inter-city bus, train and parking areas)
- New corporative image

4.3 Improvements Achieved

The main improvements obtained thanks to the implementation of high quality bus system in Donostia-San Sebastian public transport main corridors are:

- Commercial Bus Speed
- Quality
- Economic
- Environmental

Commercial Bus Speed:

To attract users of the private transport to the public transport it is very important the commercial speed characteristic is closely related to the service reliability.

By prioritising traffic lights, implementation of reserved lanes for the bus, improving the payment ways to access into the bus and improving the accessibility, the service reliability can be ensured, besides the amount of external agents that affect to conventional bus systems

With this amount of improvements the travel times have been reduced, the commercial speed of the service has been increased and the service image for the travellers has been improved, providing confidence and peace to use the service regularly as the user knows accurately what time the bus leaves and arrives at its destination.

The implementation of a greater number of bus lanes (both segregated and not segregated) also impacts in the reliability and increased speed of the service, because with these reserved lanes, the problem of the congestion and traffic jams in the city in the rush hours is avoided.

These actions have contributed to the reliability of the service, causing an increase in the number of travellers and an improvement in the image of the company.

Quality:

The high quality bus service, according to the UNE-EN 13816 quality standards, provides a response to the current needs and will not become obsolete in the medium-long term.

The accessibility is being improved both in terms of the access to the stops and the access to the bus. This measure means that all kind of people could use this public urban service whether they are people with limited mobility, with baby carriages or with wheelchairs (disabled).

The regularity and the punctuality of the service has been increased and also the travellers are informed onboard, at the stops, by SMS and by website of the journey times, frequencies, schedules and waiting times.

It is also a comfortable system in all respects. The bus service operates in close proximity to all residences and, in addition, the vehicle internally offers the passengers wide space and comfort.

The service is intended not only to transport the passengers to their destination, but also to do it in a fast and comfortable way, and definitely without discriminating anybody with physical problems or residents of high areas districts or with narrow streets.

Economic:

The economic benefits are derived from improving the commercial speed and quality in the service, which leads to an increase in the number of travellers and a reduction of in number of buses and drivers to offer the same service. This system means that previously unprofitable lines become profitable with the BRT system.

Therefore, it is a sustainable public transport as it does not lose money, it serves the whole population of San Sebastian and it is friendly with the environmental.

Environmental:

In an analysis of the type of fuels used important reductions in the pollutant emissions are observed.

This reduction is important, but the major achievement is the one that arises from the correct management of three previous points as they manage to eliminate the polluting emissions belonging to the new travellers which would have come from their private vehicle. And that is really the major achievement in the reduction of pollutant emissions.

Besides, the reduction in the number of the private vehicle users clears the traffic in the city, which results in an increase in citizens' welfare: less air and noise pollution, reduced anger and nervousness, and a greater possibility of creating more leisure and recreation areas.

CTSS-DBUS service data with BRT system:

- Lines Route total distance: **492 km**
- Route total network: **181 km**
- Number of stops: **500**
- Number of total lines stops: **1.117**
- Average distance between stops: **408 m**
- Stops with electronic boards: **82 (16,4% of the total)**
- Bus lanes network: **9,6 km (5,3% of the total)**
- Bus lanes in lines route: **61 km (12,4% of the total)**
- Weekday service frequency in main corridors: **6-8 minutes**

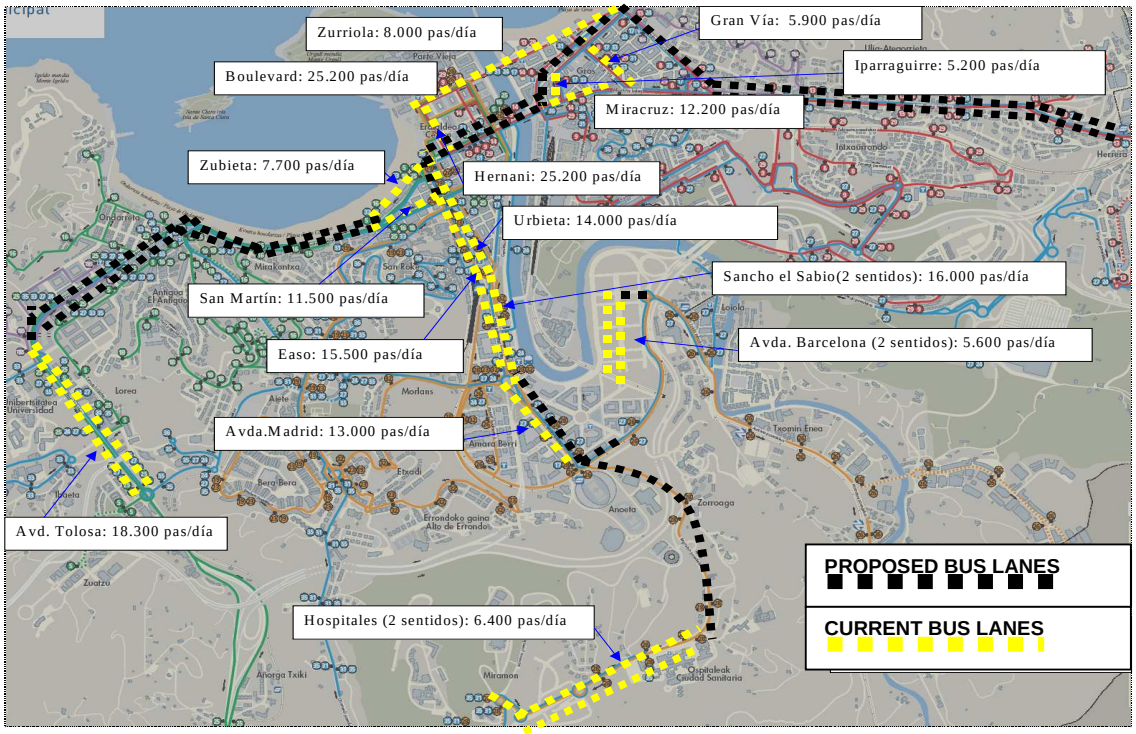
▪ Weekday passengers: **90.307**
In the following table there is a comparison of several indicators before and after the implementation of the BRT system.

CTSS-DBUS Indicators	2006 – Before actions	2009 – BRT system
Traveller average per Weekday	85.355	90.307
Travellers per year	26.670.005	28.460.380
Commercial Speed average	14 km/h	16,8 km/h
Punctuality (accuracy of timekeeping)	91,9 %	95,3 %
Customer satisfaction Quality Index	6,09 (year 2002)	7,56

4.4 BRT System Characteristics

4.4.1 Bus Lanes

The following map shows the current bus lanes implemented in the CTSS-DBUS network (in yellow) and also the proposed bus lanes for the future (in black).



The solution chosen for Donostia-San Sebastian is a mixed solution formed by:

- **Segregated bus-lane** in avenues or streets with 20-40m width. The central reservations are plastic pivots accompanied by painted road markings and identical traffic signs.
- **Bus lane** in avenues or streets with less than 20m width when it is impossible the bus lane due to problems of space. The separation from the rest of the urban traffic will be based on sonorous bands, road markings (ONLY BUS) and vertical signs.

- **Mixed road** when none of the previous options is possible, in streets less than 15m width

Some examples of the current protected bus lanes of the BRT system in the high quality public transport corridors.

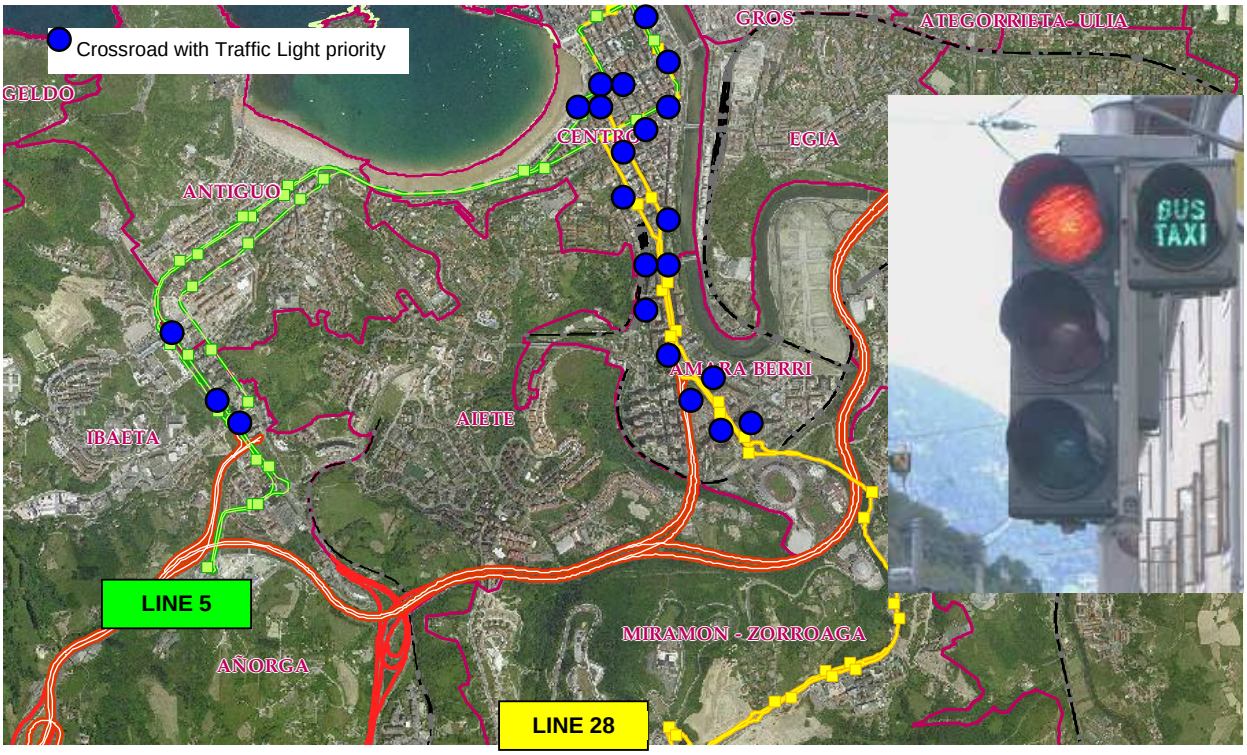
To select the reserved platforms or bus lanes it has taken into account:

- The number of urban and inter-city buses and therefore of affected users.
- Those itineraries where there is recurring traffic congestion which leads to significant delays in the bus lines.

Currently, in CTSS-DBUS network there are 9,6 km of bus lanes, of which 1,9 km are segregated. In 2010 the bus lane network is expected to increase to **12 km**.

4.4.2 Traffic Light Priority for Buses

Donostia-San Sebastian is going to implement Traffic Light priority at 31 crossroads in the city, 22 of which are included in the high quality public transport corridors:

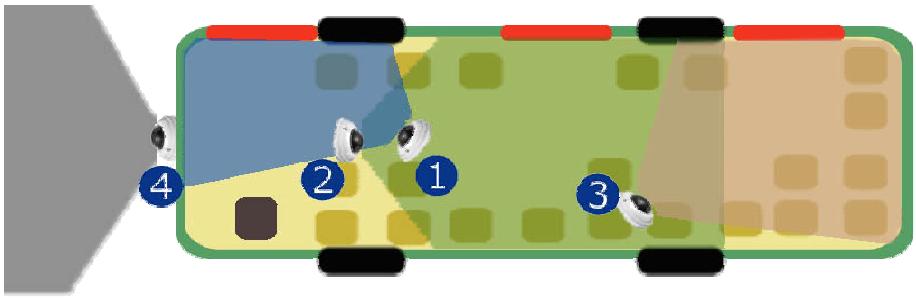


These points do not involve consequences for the rest of the traffic but provide great advantages in the time that the bus is stopped in its route.

The first crossroad where Traffic Light priority has been implemented, has led to a reduction of the line 28 travel time between Hospital and City Centre from 21 minutes to 17 minutes (19% saving time).

4.4.3 Security Cameras System

The security camera system onboard the buses consist on 4 cameras located in different strategic points: 3 of them to cover and view all the space inside the bus and one located on the front of the bus to have a frontal view of the road.



Camera nr.1: view of front door (bus passengers access) and payment systems
Camera nr.2: view of central door and part of the bus (descent of passengers and access of wheel chairs and children prams)
Camera nr.3: view of the back part of the bus and the back door (descent of passengers)
Camera nr.4: frontal view of the road (what the driver views)

The 4 cameras are connected to an advanced onboard computer that administrates and manages and records all the (video) images of the 4 cameras. The images are digitized and zipped in this computer, which has a capacity to record videos for 30 days (due to legal limits) and is integrated with the GPS system.

There are two possibilities to download recorded videos:

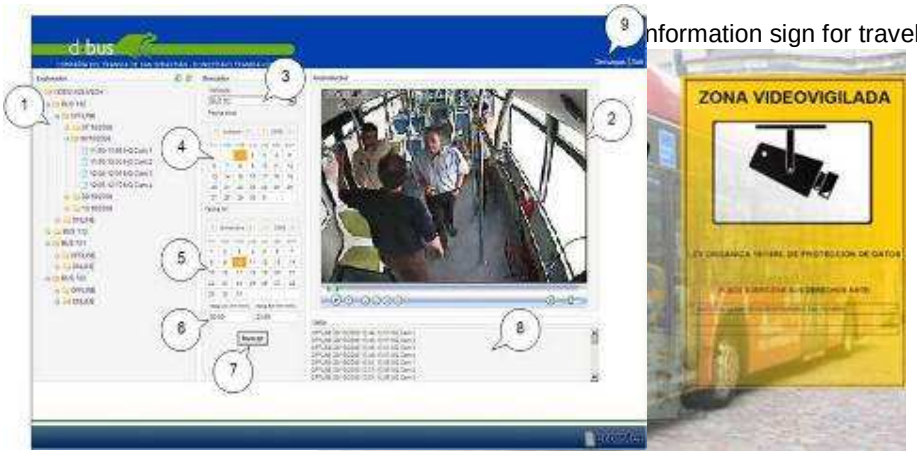
- Wire-less (WIFI), when buses return to deposit and are parked in its place.
- By wire, connecting directly to a portable computer when in the depot

It is also possible to have an on-line visualization of what is going on in a specific bus. Those videos are transferred from the bus to the control centre by HSDPA-3G communications, and can either be activated by the driver or by the control centre operator.

On-line images visualization of the bus in the control center

Also for driver security, there is an emergency key that can only be activated by the driver. While pressing the emergency key, videos are recorded in a bigger resolution, an alarm sounds in the control center and also the bus microphones are activated, so that video and sound can be recorded and downloaded in the control center.

In the control centre there is specific software that administrates and manages all the security camera system, and follows the legal requirements of data protection. In the bus, travellers are informed of the presence of cameras by an information sign.



nformation sign for travellers

With the security camera system, CTSS-DBUS has improved the security and the physical integrity of the drivers, travellers and material equipments of the public transport.

The main innovation compared to other cities that have similar systems is the video recorded by the front view camera. It is expected that this evidence will be used by the Local Police to fine vehicles that slow down the operation of the public transport, parking at bus stops or driving along bus lanes.

With this activity, CTSS-DBUS adapts the new technologies to improve the bus service quality and promotes and strengthens the use of the public transport.

The security camera system has been a solution to reduce vandalism problems. In the first year of operation, CTSS-DBUS has detected that the vandalism has been reduced significantly in the buses with the security camera system, several people have had charges pressed against then and several accidents have been solved.

4.4.4 Payment System (Contactless Cards)

All the buses have two machines where smart cards can be validated. Smart cards used in CTSS-DBUS services are:

1. Contact smart card ISO 14443 type B dual double interface (bank cards for both contact and contact less use)
2. Contact cards (bank cards only for contact use)
3. Contactless smart cards ISO 14443 type A Mifare 1KB
4. Contactless smart cards ISO 14443 type A Mifare ultralight 125Bytes

Currently, around 70.000 smart cards used in urban buses are contactless cards, and around 100.000 smart cards are chip contact smart cards.

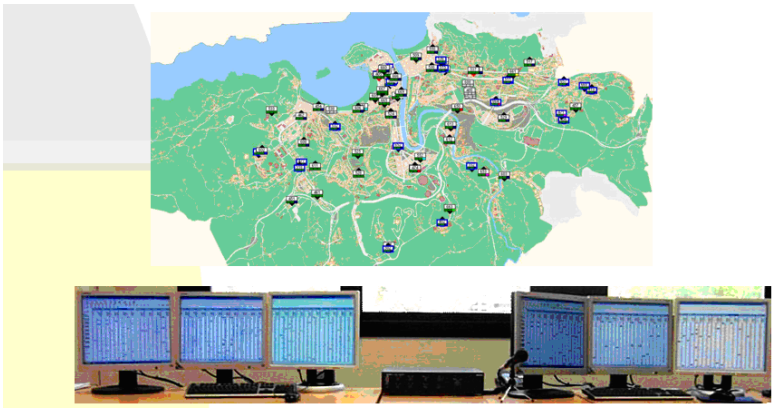
In the period of time of approximately four years all the users should change from the chip contact card to the contact less card.

In addition, to stimulate the use of the contactless card, CTSS-DBUS has discounts and bonuses. To discourage payment in cash, there are higher tariffs without discount possibility. Currently 16% of the payments are in cash and although it is a relatively low number, but it must be reduced.

There is also an agreement with Lurraldebus (inter-city bus company) to develop a single ticket and to help the bus public transport users. It is also proposed to make a study to integrate railway transport in the single ticket structure, and to encourage the use of the public transport in general.

4.4.5 GPS Location System

CTSS-DBUS has opted for the use new technologies and has implemented an intelligent system of public transportation.



Planning diagram of the Integrated Management System that exists in CTSS-DBUS

GENERAL PLANNING
Service offer:

- Lines
- Itineraries - Routes
- Stops
- Schedule
- Buses

DAILY PLANNING
Vehicles Assignment:

- Maintenance
- Garages
- Incidences
- Breakdowns
- Assignment of Drivers

MONITORING SERVICE

- SAE by events
- GPRS technology

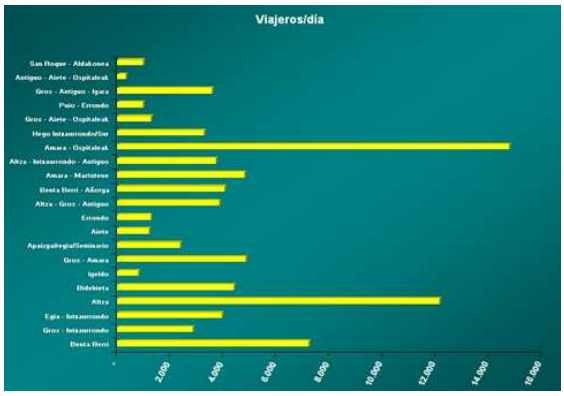
REAL TIME INFORMATION FOR TRAVELLERS

- Electronic Boards at stops
- Monitors in buses
- Website
- SMS to mobile phones

ANALYSIS OF INFORMATION

Reports:

- Travellers
- Incomes
- Rates
- Kilometres
- Drivers hours



The system consists on different technologies and computer applications between which can be highlight some:

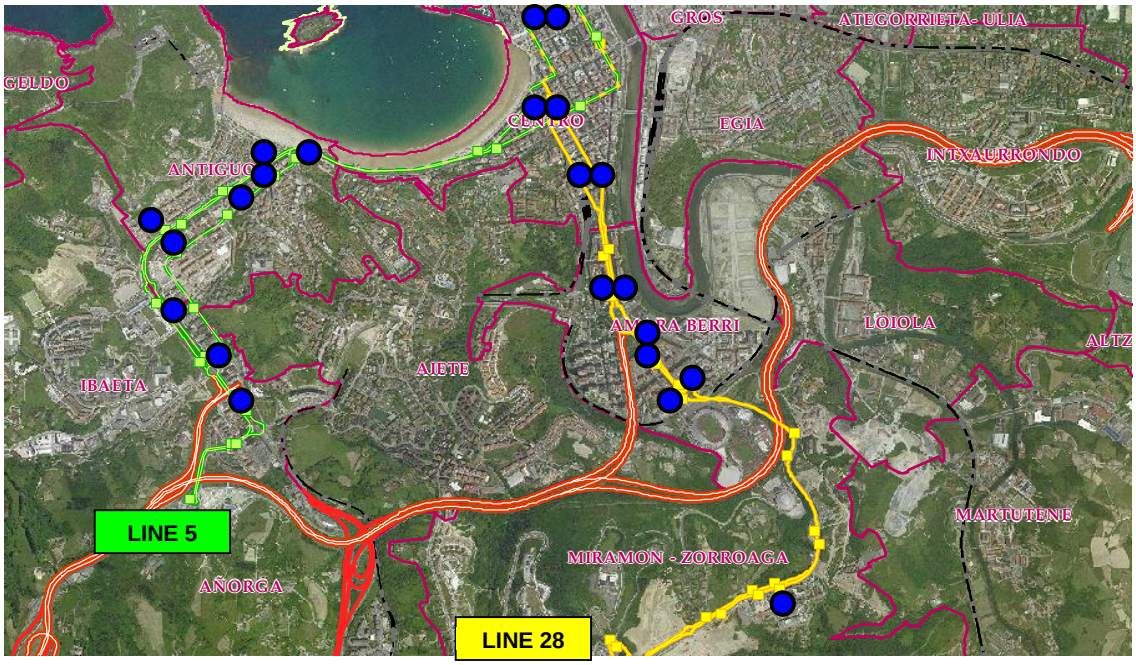
- SAE
- GPS
- Passengers counting and payment system (ticketing system)
- GPRS
- WIFI

4.4.6 Traveller Information System (stops, onboard, website, SMS)

Bus arrival time at bus stops electronic boards

CTSS-DBUS has installed 82 electronic boards in the main bus stops with real time information of the bus arrival time to the bus stop. In these electronic boards, CTSS-DBUS provides information of the line number, the destination and the waiting time for the bus arrival.

During the year 2010, the number of stops with the electronic board will go up to 90 (of the total of 500 bus stops = 18%). In the CIVITAS high quality public transport corridors 22 electronic boards have been installed, which are indicated in the map below with a blue circle.



Electronic information board in the bus stop
(dynamic information)

Bus stop design
(static/dynamic information)

Information in the bus stops
(static information)

Information in the bus
(dynamic information)

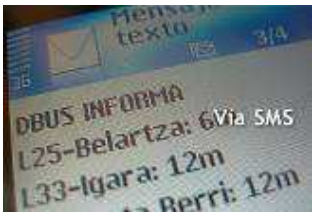
Onboard bus traveller information

CTSS-DBUS has implemented an onboard real time information system that provides travellers the next stop announcement. This system is completely integrated with the DV-BUS information and entertainment channel, which also provides travellers with local, national and international news, health advice, cultural agenda, sports, environmental news, games, etc.

The next stop announcement provides the travellers the next stop location in a map and also the following stop to the next stop. If a traveller requests the bus driver to active the audio system, the next stop is also announced by sound. All the visually impaired people that travel on CTSS-DBUS buses make this request to the bus drivers.

Bus arrival time at bus stops by SMS

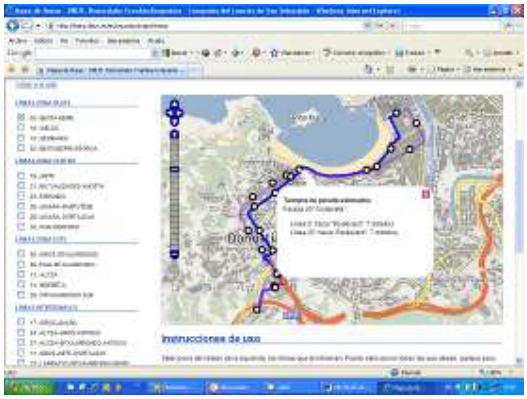
For the rest of the 500 CTSS-DBUS bus stops that don't have the electronic boards, the travellers can know the bus arrival time by SMS to a mobile phone. All they have to do is to send a SMS to the number 7377 with the message "DBUS_bus_stop_code" and in a few seconds an SMS answer will give the information of the waiting time all the buses arriving to that bus stop. The information of the bus stop code is in each bus stop and also available in CTSS-DBUS web site



Website

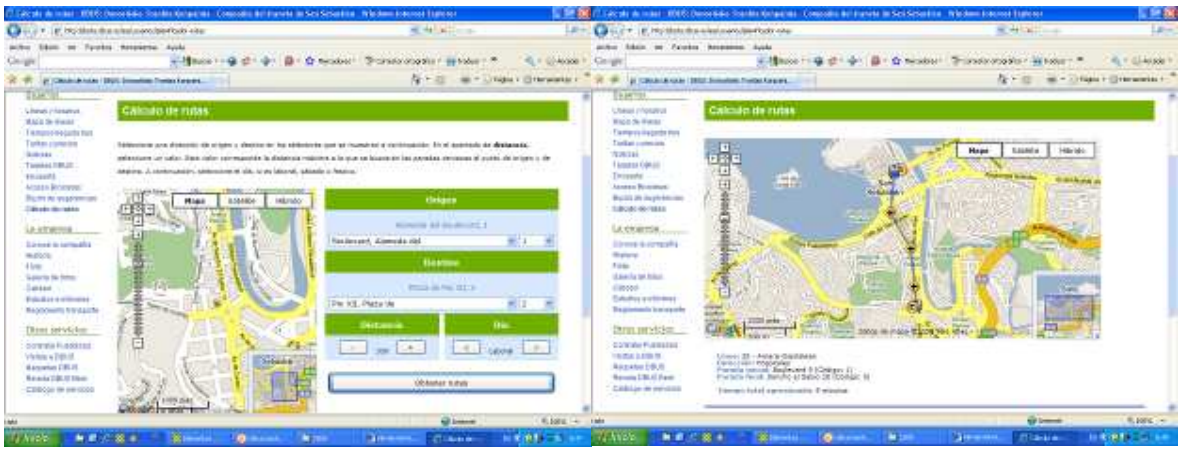
CTSS-DBUS has developed a new web site with the following innovative points:

- Bus arrival information available via website, at each stop of all the lines, and adapted to visually impaired people as a constituent part of the design process.
- Graphic routes and stops information in maps (based on Google Maps)



To achieve the information of the bus arrival time to a bus stop, the traveller must click on the bus stop of any bus line, and immediately the information is provided.

- New route planner for Donostia-San Sebastian using bus public transport (also available for mobile phones with 3G communications that use Java Script navigators). The website provides information about how to go from one point (origin) to other point (destination), calculating the optimum route using bus public transport and providing the approximate travel time.



- Technical studies are published in the website, including the two studies performed as part of the ARCHIMEDES project:
  - Study of the high quality public transport corridors in Donostia-San Sebastian.
  - Biofuels and new technologies for DBUS

4.4.7 Accessibility

With the BRT system there is 100% accessibility for the users. CTSS-DBUS has 100% of the bus fleet with low platform.

To allow accessibility to people in wheelchairs or with limited mobility each bus has an access ramp for traveller access via the central door in the 12 metre vehicles and via the second of the front part of the articulated ones. Though other BRT systems have special ramps with smaller dimensions, in case of the BRT for Donostia the ramp is the same that the one used in the rest of the fleet. The reason is the need for coexistence of BRT infrastructure with other lines, especially the height of the stops.

To obtain an accessibility of 100 % of the travellers to the stops, the Department of Mobility of Donostia-San Sebastian is improving the existing accesses of several bus stops to reach them.

Ramp for the disabled access (wheel chairs)

CTSS-DBUS urban buses network covers the whole municipal residential area to within a radius of 500 metres from at least one stop and 98,5% of the population has an urban bus stop less than 300 metres from home. Therefore it is possible to say that the accessibility to the network of the public urban transport in bus is suitable.

4.4.8 High Capacity Buses (18 Metre Articulated Buses)

The BRT system of Donostia-San Sebastian is performed by 18 metre buses with three doors. The dimension of the doors are of 1,10 metres and the opening towards outside. According to the UNE-EN 13816 quality standards, the maximum number of passengers in these buses is 110 (3 persons per square metre)

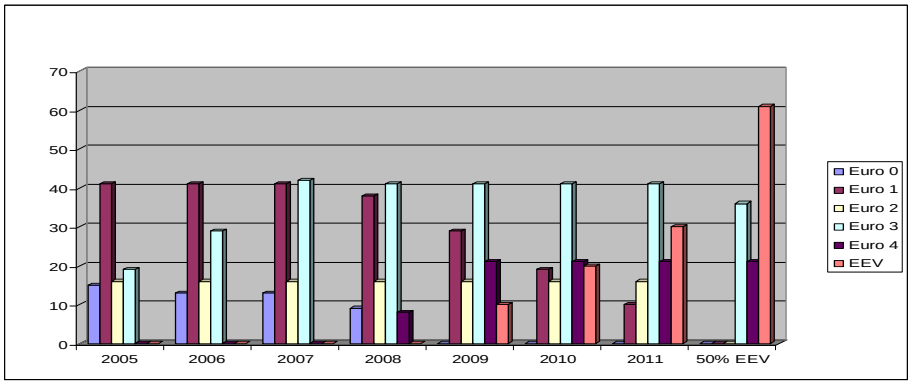
In comparison with the same criteria, a 12 metre bus can transport 75 passengers.

4.4.9 Clean and Ecological Buses (biofuels, noise reduction)

The BRT systems is currently performing using biofuels at the 20%, and is testing hybrid buses for the future. In the coming years it is hoped to increase the biofuel percentage up to 100% (if it is technically viable).

The choice of the fuel and the technology adapted for CTSS-DBUS has been studied in another ARCHIMEDES research project (measure 4). Urban transport fleets have to adapt to current and future European regulations.

In the graph below it is shown the evolution in the distribution of the fleet according to the EURO standards.



Within the range of possibilities the following conditions must be taken into account:

- Phase of technology development
- Social acceptance
- Availability (next resources, suppliers, logistics…)
- Implementation costs (facilities, formation, technology...)
- Functional extra charges (maintenance, over consumptions)
- Reduction of emissions

The current BRT system buses have EEV technology and also big improvements related to noise reduction.

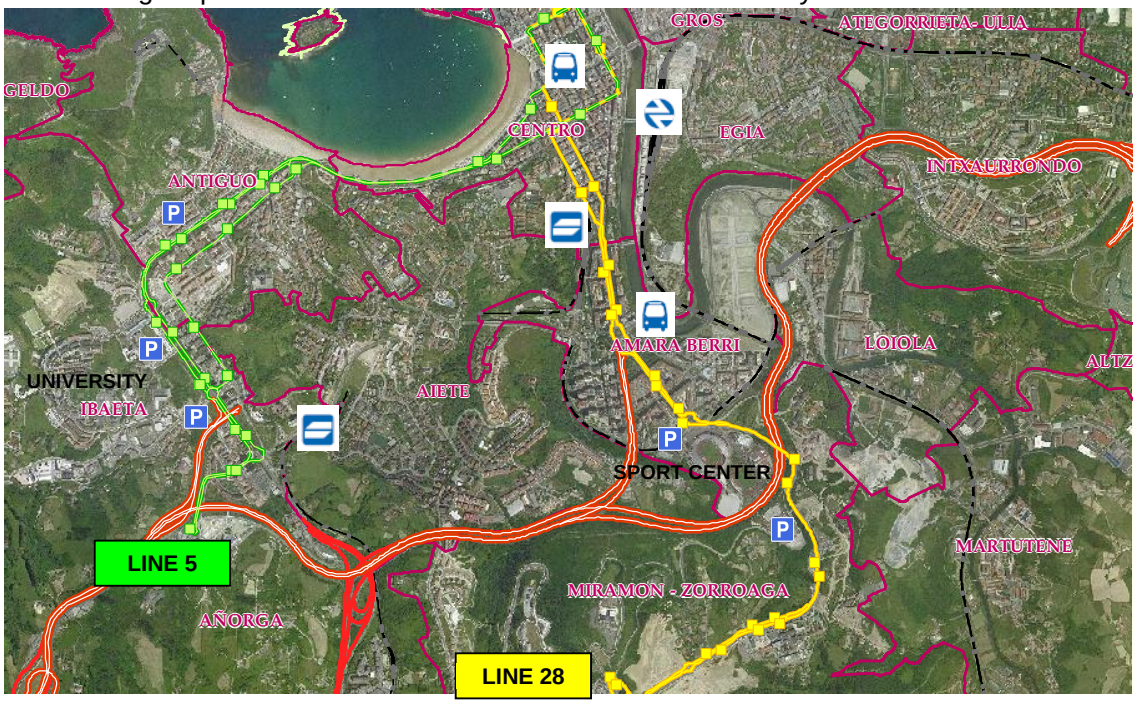
CTSS-DBUS is making a strong environmental stand, introducing greater percentages of biofuels in its fleet of buses and acquiring vehicles that exceed European standards. Thanks to this combination the decrease in the local emissions can be quantified.

4.4.10 Intermodality

The intermodality (to facilitate the change of transport modes) is a necessary policy to improve the global quality of the public transport service. The main types of intermodality are:

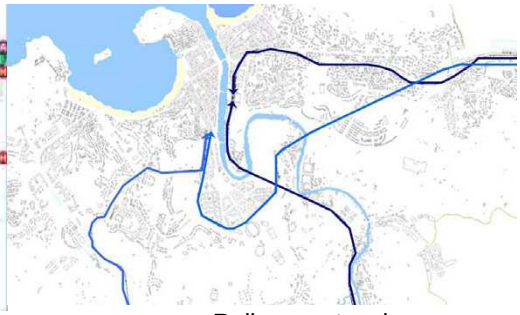
1. Intermodality car -urban public transport by bus (deterrent parkings, Park & Ride).
2. Intermodality inter-city public transport - public bus urban transport.
3. Intermodality train services - public bus urban tran rt. RENFE EUSKOTREN

The following map shows the intermodal connections to the BRT system network.



Also, from the Sustainable Mobility Urban Plan of Donostia-San Sebastian it is proposed the tariff integration as a new users catchment strategy towards the public transport with the reduction of the weight of the car in the modal distribution, and the constitution of the Transport Unique Authority with aptitude to establish tariff policies of improvement and coordination of services, besides improving the image of the public transport.

Network of inter-city buses



Railway network

A good parking policy is important to promote the use of public transport. It is a flexible policy which aims to provide a different solution to different users, such as residents, tourists and workers according to their different needs:.

Nowadays in Donostia-San Sebastian there are six Park & Ride deterrent parkings (Ibaeta, University, Ondarreta-UPV, Anoeta, Ilunbe and Riberas Loiola), with approximately 1.500 parking places, five of them connected to the BRT system network. The existing ones must be promoted being free or very discounted for those that use the public transport. New parking areas must be created where a need that is not covered in some areas of the city is observed, but especially in the East of the city.

4.4.11 New corporate image: Image of the vehicle, reserved bus lanes and bus stops

The aesthetics of the vehicles that are inside the BRT system in Donostia-San Sebastian are as follows:

- Attractive
- Modern
- Accessible
- With a lot of space
- Well lit

The BRT system network follows the image of blue and green fleet with the image of the Igeldo little frog.

The public urban transport stops are the point of usual contact between the service and the transport user, and therefore they have a great importance for the user perception of the public urban transport in terms of comfort, accessibility, cleanliness, information, weather protection and suitable design.

4.5 Problems Identified

No problems have been detected.

4.6 Risks and Mitigating Activities

Because of the relatively high density of car traffic on the corridors there could have been a non-acceptance from citizens of taking away roadspace from the private car. Efficient communication and promotion actions have been taken to lower this risk, and the results have been satisfactory. The last bus lanes implemented have been well accepted by the citizens.

4.7 Dissemination Activities

ADS and CTSS-DBUS have done a Press release for the dissemination of the UNE-EN 13816 certification in lines 28-Amara-Ospitaleak and 5-Benta Berri.
This news has also appeared at Donostia–San Sebastian Local TV, and it is also available at CTSS-DBUS and ADS websites.
The specialized Spanish magazines have also published this news because CTSS-DBUS is one of the ten firsts bus companies in Spain that achieve this quality standards.

4.8 Future Plans

In the following months CTSS-DBUS will implement a promotion campaign stressing the advantages of the new service, the innovative BRT system for Donostia-San Sebastian.

ADS will continue implementing new bus lanes to achieve 12km of reserved platforms in the city and will continue with the public transport priority at UTC (traffic lights) project, during year 2010.