



**CiViTAS**  
Cleaner and better transport in cities

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

## **Donostia – San Sebastian**

### R16.1 – Study of High Quality Public Transport Corridors in Donostia-San Sebastian

Donostia – San Sebastian

October 2009



THE CIVITAS INITIATIVE  
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<b>Author</b>	Javier Vallejo
<b>Quality Control</b>	Elisabeth Jorge
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# 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 11.2.1 Technical Development of High Quality Public Transport Corridors

### 3.1 Summary Description of the Task

A detailed design and planning phase will be undertaken by CTSS for the technical development of the high quality public transport corridor demonstration that will be implemented. Main topics to be addressed are the exact route, design of necessary changes in infrastructure and development of priority measures.

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

### 4.1 Description of the Work Done

The study consists of the design of a high quality public transport system with suitable capacity for the two main corridors in Donostia-San Sebastian.

The aim of this study is the analysis and improvement of the present public transport service in the urban area promoting the use of the public transport instead of the private car. As part of the study the following issues have been analysed:

- The urban mobility (inside Donostia-San Sebastian) in order:
  - To know the mobility inside the city.
  - To analyse the public offer of the current transport
  - To improve the transit times of the lines
  - To analyse the capacity of transport adapted to the current and future needs.
  - To improve the accessibility
  - To improve the intermodality.
  - To improve the quality in the service
  - To improve the image
  - To increase the flexibility in the lines
  - To promote the maximum respect to the environment
- The inter-city mobility with origin - destination Donostia-San Sebastian, that is, from the regions and nearby municipalities. The purpose of this part of the study is to quantify the traffic impact linked to regional trips so that in the future this study could be extrapolated to these zones.

### 4.2 Summary of the Study

This summary of the study presents the characteristics of the BRT (Bus Rapid Transit) system that proposed to be introduced in Donostia-San Sebastian:

1. Infrastructure (lane types, stops, guidance systems & intermodality)
2. Operation ways (payment methods & tariff integration)
3. Technology (vehicle, control centre & traffic light priority)
4. Image & excellent customer service (vehicles, reserved bus lanes & stops)
5. Network description
6. Conclusions

#### **4.2.1 INFRASTRUCTURE**

##### **Types of Lane Chosen and Central Reservations**

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

- Segregated bus-lanes in all those avenues or streets for which the width (20-40m) and characteristics make it possible. The central reservations that they

propose in these lanes are plastic pivots, accompanied by painted road markings and matching traffic signs. In addition it is also proposed to paint the asphalt a blue colour as a way of differentiation.



Segregated bus lane in Donostia-San Sebastian

- When the above solution is impossible due to problems of space (road width less than 20m), the separation from the rest of the urban traffic will be based on road marks (sonorous bands), marks on the road (written ONLY BUS) and traffic signs (ONLY BUS). The rest of characteristics will be similar to those of the segregated lane.
- Mixed road when neither of the previous solutions is allowed (road width less than 15m)

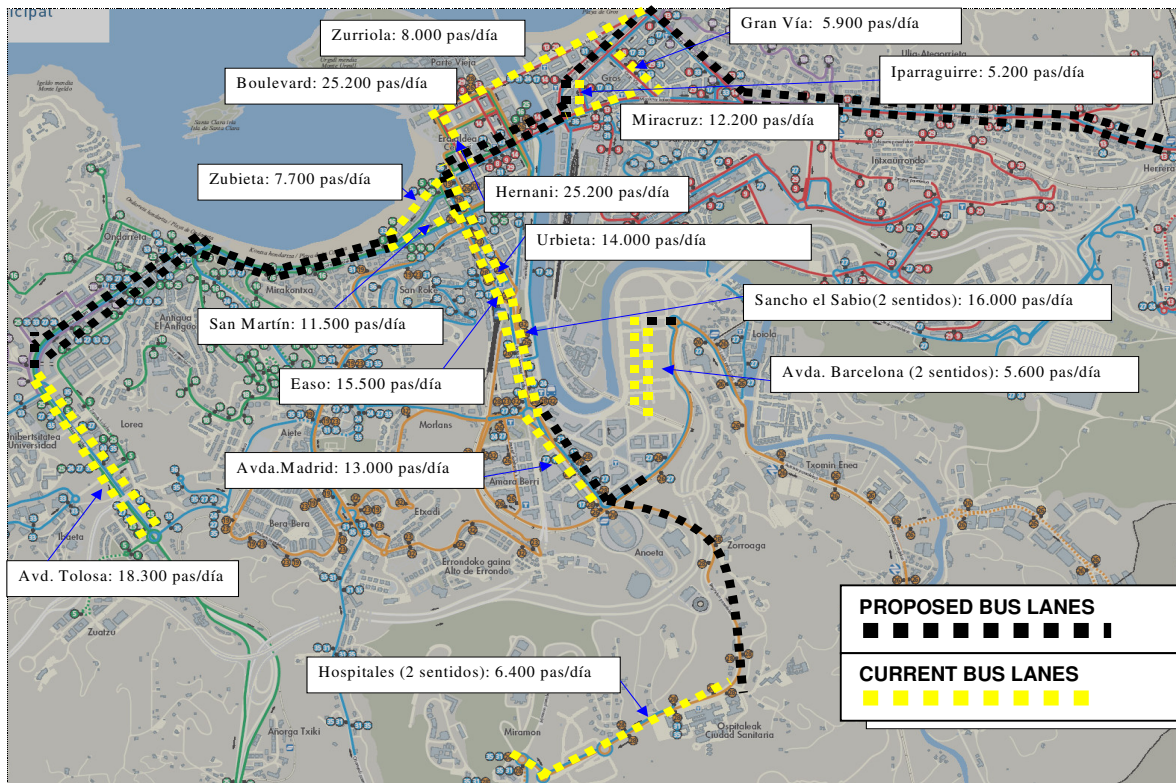
To select the reserved lanes or bus lanes it has taken into account:

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

After the analysis of the current transport network, it is thought that the existing segregated bus lanes must be kept so as not to worsen the service and more segregated bus lanes must be introduced.



The reserved lanes that are proposed are the following ones:



### Types of Stops

The type of stop that is proposed for Donostia-San Sebastian is based on an open system, where there is no barrier to accessing the bus stop. (This is in contrast to a closed system where passengers need to buy a ticket and pass through a control barrier in order to gain access the bus stop.) The choice of the open system is primarily due to the fact that currently there are 470 stops and, besides being complicated and very costly, it would be impossible to implement closed systems at the majority of them, mainly because of the lack of space on of Donostia-San Sebastian’s urban road system.

### Accessibility

With the BRT system, it is essential to provide accessibility for all users.

It is proposed to allow access through all the doors, which leads us to provide a good accessibility from the pavement to the bus lane.

Donostia-San Sebastian already has 98% of the bus fleet with low floor access, so this approach is proposed as standard for the future.

To allow accessibility to people in wheelchairs or with limited mobility each bus has an access ramp for traveller access at the central door for 12 metre vehicles and at the second door of the front section in articulated vehicles. Though in other BRT systems it is proposed to have special ramps with smaller dimensions, in case of the BRT for Donostia the proposed ramp has to be the same as 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 accessibility of the bus from the platform, the Department of Mobility of Donostia-San Sebastian should study the design of each and every one of the stops.

### **Accessibility of passengers to stops**

To obtain an accessibility of 100 % of the travellers to the stops a study by the Department of Mobility of Donostia-San Sebastian is proposed to improve the existing accesses to reach them.

### **Proposals to combat potential fraud in the future**

To avoid the possible originated fraud it is proposed:

- **The installation of security cameras** inside the bus to dissuade the offenders and to avoid the vandalism inside the bus. The security cameras can reduce the fraud and control people who are not paying their tickets
- **Random inspection of passengers** by a ticket inspector dressed in plain clothes to check that the ticket has been paid. If someone had not paid it when it is being inspected, in addition of paying it at the moment, an economic sanction (fine) would be imposed.
- Greater involvement of the police and judicial estates to punish the defrauders would also be very advisable.

### **Influence of the accessibility through all the doors in the commercial speed.**

The commercial speed average nowadays in DBUS lines is 15-16km/h and with this system it is expected to increase to 18 km/h, thanks to the improvements in the accessibility through all the doors, traffic light priority and reserved platforms (bus lane & segregated bus lane).

### **Design**

The option proposed is to allow access through all the doors in the BRT lines in the first phase. In the future it is expected access through all the doors will be expanded to the whole bus network, after the transformation of all the current lines to a BRT system.

It is proposed that the access of people with wheelchairs or children's prams should be through the door where the ramp is placed, since the place reserved for these people is in front of this door.



Ramp for mobility impaired access

## Inter-stop Distance

The current DBUS urban buses network covers practically the whole municipal residential area, to within a radius of 500 m from a stop, though there exist radiuses of 250 m. or even less. Therefore it is possible to say that the accessibility to the network of the public urban transport in bus is already appropriate. For the DBUS Express system (a direct and very fast service to the hospitals and to the University – Zuatzu with a frequency of 6 minutes) what is proposed is to support the current distances between bus stops and to add new ones if necessary.

BUS SERVICES	KM TRAVELLED	Nº OF STOPS	DISTANCE BETWEEN STOPS(METERS)
DBUS-Express Universidad-Zuatzu	9,3	22	421
DBUS-Express Amara-Hospitales	11,9	27	442

## Guided Systems

The guided systems are very interesting in relation to the approximation in the stops but these systems are rejected for Donostia-San Sebastian due to the confluence of the DBUS and DBUS Express systems. The equivalent functionality to that of a guided system in case of the DBUS Express can be reached by a suitable design of the bus stop.

## Intermodality

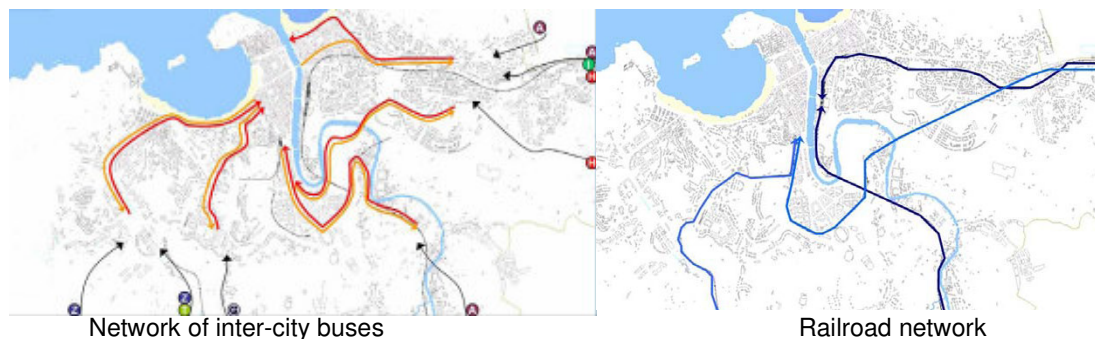
Intermodality (to facilitate the change of transport modes) is a necessary policy to improve the overall quality of the public transport service. In this project two types of intermodality have been studied:

1. Intermodality car -urban public transport by bus.
2. Intermodality inter-city public transport - public urban transport by bus.

Atotxa Station is proposed as the urban - inter-city intermodal centre, in which a good communication with the public urban transport by bus is going to be established. Atotxa Station would allow the transfer between the inter-city buses with the railroad and the public urban transport.

At the same time small interchangers are proposed at Amara (Pio XII), Herrera and Riberas de Loiola, which have proved very useful in the promotion of urban - inter-city intermodality.

From the Sustainable Mobility Urban Plan of Donostia-San Sebastian tariff integration is proposed as catchment strategy for new public transport users to reduce the percentage of car use in the modal distribution



On the other hand it is also proposed to move the inter-city bus stations placed in the Avenida Libertad, Plaza Gipuzkoa and Okendo street to Atotxa Station to improve the intermodality with the rest of inter-city transport systems.

The advantages of this proposal would be an improvement of the commercial speed of the inter-city buses and at the same time an improvement in the commercial speed of the urban buses as it would reduce the number of inter-city bus stops in the city centre. Another advantage is the improvement of intermodality, which encourages the use of the public inter-city transport rather than private cars.

Nowadays in Donostia-San Sebastian there are four alternative parking areas outside the city centre (Riberas Loiola, Ondarreta, Ibaeta and Plaza Elhuyar), with approximately 1.000 parking places that are designed to deter people from entering the city by car. These existing sites must be promoted by being free or very discounted for those that use the public transport. There is also a need to create new parking areas where a need is observed that is not covered, especially in the East of the city. Hence, new deterrent parking areas (alternative parking areas out of the city centre) are proposed located in:

- Martutene
- Marrutxipi

Besides, those parking areas will be complemented each other with those other that will be proposed to give service to the railway stations of EuskoTren and RENFE.

#### **4.2.2. OPERATIONAL ISSUES**

##### **Payment Methods**

It is proposed to carry out the payment inside the bus and with contact-less smartcards. It is proposed to allow the access through all the doors to the people who pay with cards and the people who pay in cash must enter through the front door.



It is proposed that over a period of approximately four years all the users should change from the chip contact card to the contactless card.

In addition, the aim will be to stimulate the use of the contactless card with discounts and bonuses and to discourage the payment in cash with higher tariffs and without discount possibility. It is necessary to say that currently 16% of the payments are in cash and it is a relatively low number, but it must be reduced.

**Tariff Integration**

There are proposed agreements with Lurraldebus (the intercity bus that covers the cities and villages around San Sebastian) to reach a common ticket (the ticket card of Lurraldebus can be used in the San Sebastian buses) and to help the bus public transport users. It is also proposed to make a study to integrate in the unique ticket method the railway transport, and to promote the use of the public transport in general.

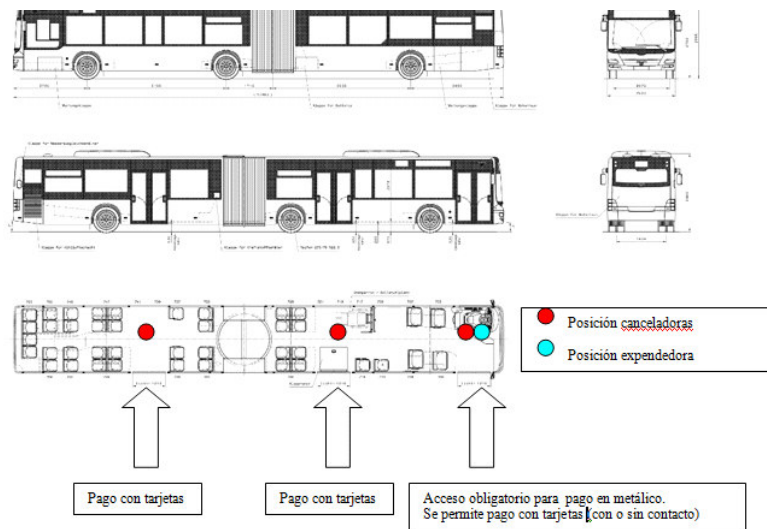
**4.2.3. TECHNOLOGY**

**Vehicle**

For the BRT system of Donostia-San Sebastian it is proposed to use vehicles of 18 metres in length, with three doors. The dimension of the doors will be 1.1 metres and always opening outwards.

It is necessary to note that vehicles of 18.75 meters with three doors also exist, that allow a slight increase in the number of passengers carried. In the present situation they do appear to be especially interesting, but in the future they could be.

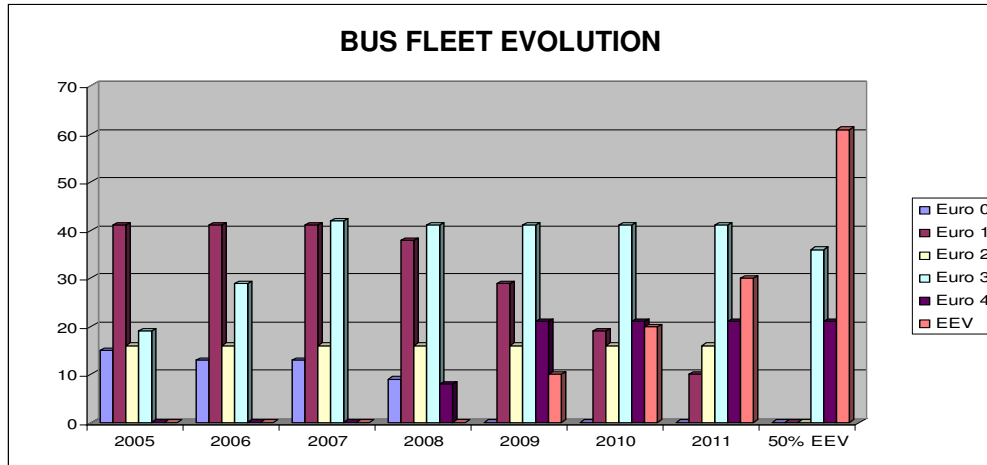
**Design of buses of 18 meters (3 doors):**



**Environmental Consideration: Determining the Type of Fuel**

The choice of the fuel and the technology adapted for DBUS's needs is an object of a specific study for another research project. At European level, the fleets of urban transport have to adapt to current and future laws.

In the graph below the evolution of the distribution of the fleet (past and predicted) according to the EURO standards is shown.



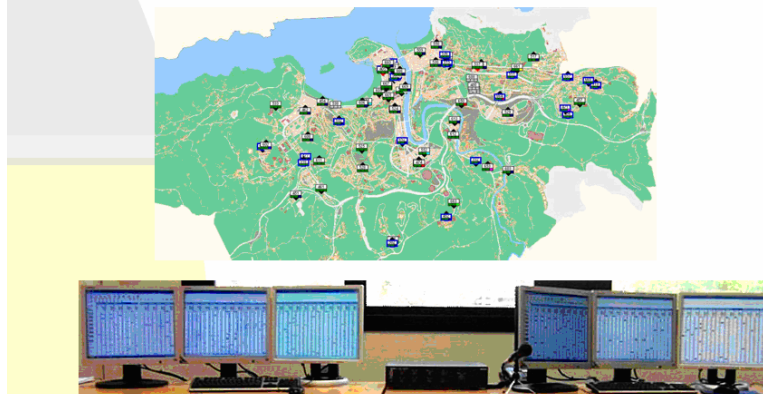
Within the range of possibilities the following conditions must be taken into account:

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

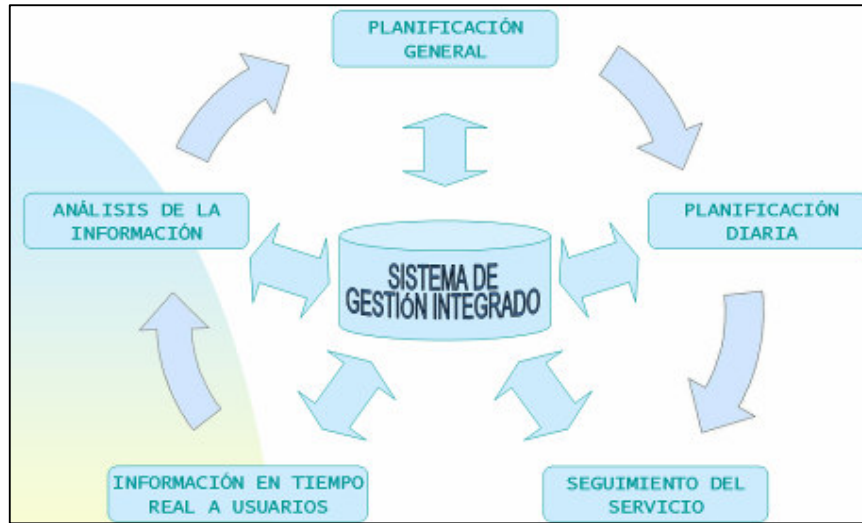
CTSS is making a strong environmental commitment, introducing greater percentages of biofuels in its fleet of buses and acquiring vehicles that surpass the European emission standards.

### Control Centre (Automatic Vehicle Location Systems) & Intelligent Transport Systems (ITS)

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 PLAN**

Service offer:

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

**DAILY PLAN**

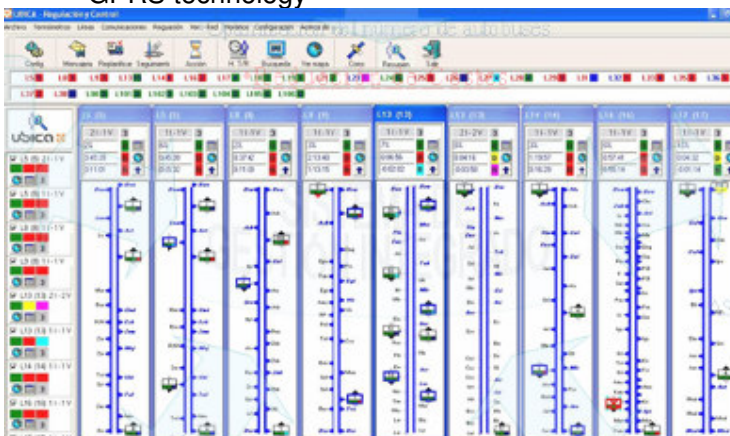
Vehicles Assignment:

- Maintenance
- Garages
- Incidences
- Breakdowns

Drivers Assignment

**MONITORING SERVICE**

- SAE by events
- GPRS technology



REAL TIME INFORMATION TO USERS

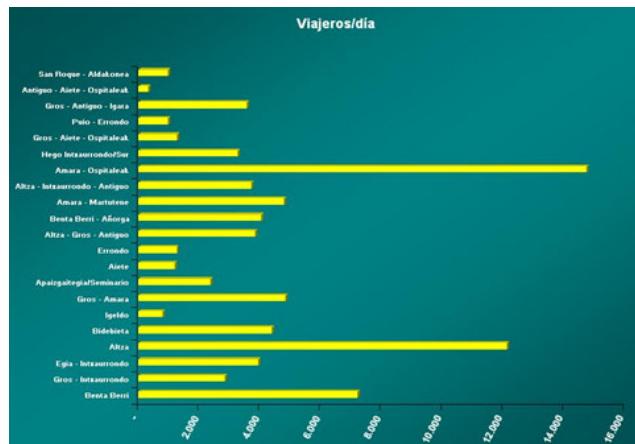
- Electronic Boards at stops
- Monitors in buses
- Website
- SMS to mobile phones



ANALYSIS OF INFORMATION

Reports:

- Travellers
- Incomes
- Rates
- Kilometres
- Drivers hours



The system combines different technologies and computer applications from which the following are highlighted as significant:

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

It is proposed that management of the surveillance cameras installed in the buses should be carried out via this control centre. In this way it is expected to improve the safety of the travellers and of the bus driver, to avoid the vandalism and thefts and especially to prevent fraud.

In addition, there is a possibility to record infractions committed by the users of private vehicles, either by blocking bus lanes or by parking at bus stops from inside the bus. The intention is to raise the awareness of the users of private vehicle of the importance of respecting the public transport operation.

These images will be used as evidence for the imposition of fines to the offenders by the police. As well as the cameras placed inside the bus, additional cameras can also be placed in strategic points along the bus lanes as happens in other cities.





### Traffic Light Priority

For Donostia-San Sebastian it is proposed initially to implement traffic light priority in secondary points:

- Intersection of c/ Urbieta with Larramendi or with c/San Marcial
- C/ Miramar
- C/Andia
- C/Miracruz
- C/José Elósegi
- Paseo de Herrera
- Paseo Doctor Begiristain
- Ondarreta, center direction, before Antiguu tunnel
- La Perla, Antiguu direction
- Buen Pastor.

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

As an example, in the city of Bremerhaven (Germany) the principal lines (100 vehicles) and almost all the traffic lights at the crossroads (approximately 120) were equipped in this way. Savings of 10% in the number of vehicles needed to provide the service in rush hour were observed and these savings allowed the investment in the priority system to pay for itself in less than three years.

The traffic light priority needs to be analysed in a dedicated study to evaluate with precision the consequences to the rest of the traffic of every decision taken in this point.

#### **4.2.4. IMAGE AND EXCELLENT CUSTOMER SERVICE**

##### **Image of the Vehicle, Reserved Bus Lanes and Bus Stops**

The aesthetics that Donostia-San Sebastian is going to be ask for the vehicles that form part of the BRT system are as follows:

- Attractive
- Moderns
- Accessible
- With a lot of space
- Luminous

This new network of buses must follow the current image of the blue and green fleet with the image of the frog, though they will be differentiated from the rest with the name DBUS Express and with the length of the vehicle (at the beginning, only the high quality lines would be those that will have vehicles of 18 metres length).



Image of the bus and the segregated bus lane for Donostia-San Sebastian



Image of the bus and bus - lane for Donostia-San Sebastian

As it is shown in the previous picture, it is proposed to paint the bus lanes in blue.

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.

For DBUS Express network, the placement of electronic boards with real time information showing the bus arrival time at the bus stop is proposed for the main stops .



Electronic information board in the bus stop (dynamic information)



Bus stop design (static information)



Information in the bus stops (static information)



Information in the bus (dynamic information)

### 4.2.5 NETWORK DESCRIPTION

#### “AMARA-HOSPITALES” DBUS EXPRESS LINE

This line serves the corridor located in the Hospital and business area. Because of this, in certain hours there is a very large increase of the demand.

#### Travellers

The estimated number of travellers on a week day in the year 2024 will be about 13,076. Due to the expected demand it is considered necessary to implement a high quality and high capacity system, which will be called DBUS Express Amara-Hospitales.

**Itinerary and proposal of reserved platforms**

It is tried to obtain a line itinerary with a 90% of reserved platform



The chosen proposal is the following one:

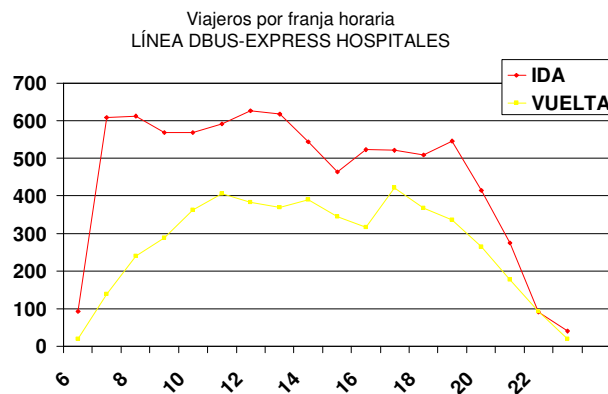
Travel time:	38min
Frequency:	7-8min
Nr. of vehicles:	5
Type of vehicles:	18 m.
Average occupation Miramon direction (go)	51%
Average occupation Boulevard direction (return)	31%

Nr. of places/day offered: 29,920 places  
 % Maximum occupation in rush hour Miramón direction: 69 %  
 % Maximum occupation in rush hour Boulevard direction: 48 %

The travel time would become to 38 minutes with BRT compared to the current 54 minutes.

The number of vehicles would change from being 9 buses currently to 5 buses with BRT.

Nr. of travellers for each time period in the following graph:



**Commercial speed**

The improvements in both the route and in the accessibility are translated in an increase of the commercial speed.

Current speed: 15.1 km/h

Speed with DBUS Express implementation: **18.8 km/h**

**“UNIVERSIDAD-ZUATZU” DBUS EXPRESS LINE**

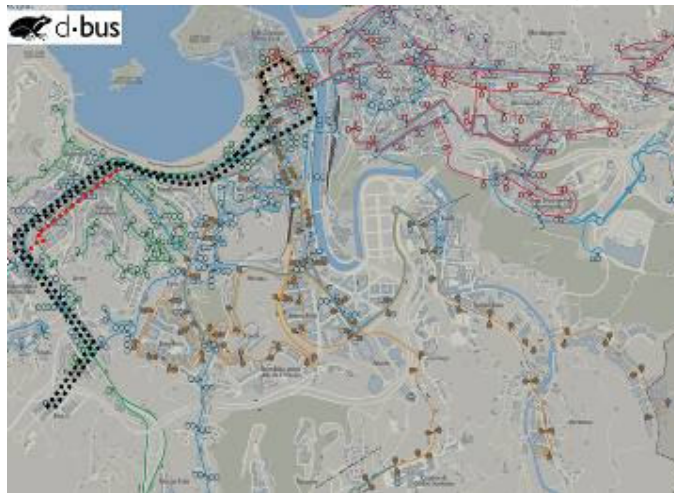
This line serves the corridor located in the University and business area. Because of this, at certain times there is a very large increase in demand.

**Travellers**

The estimated number of travellers on a week day in the year 2024 will be about 8,785. Due to the expected demand it is considered necessary to implement a high quality and high capacity system, which will be called DBUS Express Universidad-Zuatzu.

**Itinerary and proposal of reserved platforms**

It is tried to obtain a line itinerary with a 90% of reserved platform



The chosen proposal is the following:

Travel time:	35min
Frequency:	7min
Nr. of vehicles:	5
Type of vehicle:	18m.
Average occupation Zuatzu direction (go)	27%
Average occupation Boulevard direction (return)	33%

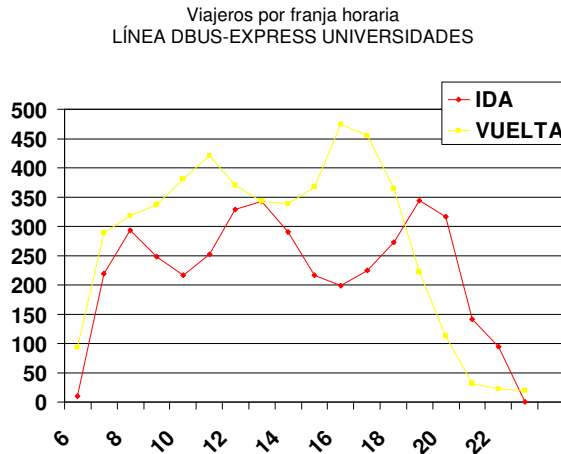
Nr. of places/day offered: 29,920

% Maximum occupation in rush hour Zuatzu direction: 39 %

% Maximum occupation in rush hour Boulevard direction: 54 %

The travel time would pass from the current 48 minutes to 35 minutes with BRT.  
The number of vehicles would be 5 of 18 metres with BRT instead of the current 7.

Nr. of travellers for each time period in the following graph:



### **Commercial speed**

The improvements both in the road area and in the accessibility are translated in an increase of the commercial speed.

Current speed: 13.5 km/h

Speed with the DBUS Express Universidad-Zuatzu implemented: **16.1 km/h**

### **4.2.6 CONCLUSIONS**

The conclusions and principal improvements that are obtained thanks to the implementation of high quality bus system in Donostia-San Sebastian public transport main corridors are those that are briefly listed below.

#### **SPEED**

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

In a beginning the people will not use their private vehicle without knowing at what time they will arrive to their destination, but how can the service reliability be ensured with the amount of external agents that affect conventional bus systems? Through traffic light priority systems, implementation of reserved lanes for the bus, allowing the access through all the doors and improving the accessibility it is expected that this can be achieved.

With this amount of improvements the travel times are reduced, the speed of the service is increased and the image is improved, providing potential users with confidence to use

the service regularly, as the user knows what time he leaves and arrives to his destination.

The access through all the doors and the improvement of the accessibility in the access and descent of the travellers avoids passenger loading times during the journey that are unpredictable and excessive as in the conventional system, and could be controlled and estimated in a much more reliable way. (With the conventional system the bus could be parked at the stop for about 2.5 or 3 minutes to load 20-25 passengers.) With this high quality system, the time could be reduced to approximately 20 seconds.

The implementation of a greater number of segregated bus lanes and not segregated ones also impacts in the reliability and speed increase of the service because with these reserved lanes the problem of the congestion and traffic jams that appear in the city in the rush hours of the day are avoided.

These actions, besides the speed to the system, contribute reliability of the service causing an increase in travellers and an improvement in the image of the company.

### **QUALITY**

With the improvements included in this study, the high quality bus service responds to current user needs and will not become obsolete in the medium to long term.

The accessibility is going to be improved both in the access to the stops and in the access to the bus. This measure means that all people could use this urban public transport service whether they are people with limited mobility, with baby carriages or with wheelchairs.

The regularity and the punctuality of the service will be increased and also the travellers will be informed both in the vehicle and in the stops of the journey times, frequencies, schedules and waiting times.

On the other hand, it will be a comfortable system in all respects. The bus service will be within a very small distance of any house and, in addition, the vehicle internally will offer the passengers wide space and comfort.

With these improvements in the quality it is intended that the service not only transports the passengers to their destination, but also it does it in a fast and comfortable way, and definitely without discriminating against anybody with physical problems or residents of hilly districts or with narrow streets.

### **ECONOMIC IMPROVEMENTS**

The economic benefits are derived from improving the speed and quality in the service that increases the number of travellers and reduces the number of buses and drivers to offer the same service. This BRT system will mean that previously unprofitable lines, can be profitable.

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 to the environment.

## **ENVIRONMENTAL IMPROVEMENTS**

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 who change to the bus from the private car. And that is a really 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 citizen welfare (less air and noise pollution, reduced anger and nervousness, and a greater possibility of creating more leisure and recreation areas).

### **4.3 Problems Identified**

No problems have been detected.

### **4.4 Risks and Mitigating Activities**

Because of the relatively high density of car traffic on the corridors there could be a non-acceptance from citizens of taking away roadspace from the private car. Efficient communication and promotion actions will be taken to lower this risk.

### **4.5 Dissemination Activities**

The complete study has been placed on the CTSS website ([www.DBUS.es](http://www.DBUS.es)), which is summarised in this deliverable.

### **4.6 Future Plans**

Introduce and promote 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's to ensure PT priority along the two corridors.

CTSS 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. (ARCHIMEDES Milestone 2.10)

Around this date a promotion campaign stressing the advantages of the new service will be implemented.