



CiViTAS
Cleaner and better transport in cities

ARCHIMEDES

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

Donostia – San Sebastian

T73.1 Bus Traveller Information in Donostia – San Sebastian

Donostia – San Sebastian

October 2009



THE CIVITAS INITIATIVE
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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 Sebastián (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 Sebastián 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 73, Bus Traveller Information in Donostia – San Sebastian.

As part of this measure CTSS-DBUS has been working on the Task 8.8: Bus Traveller Information.

Within this task, CTSS-DBUS has to develop a new system for the counting of passengers and a bus traveller information system that includes:

- Onboard information (next stop announcement)
- Bus arrival time information at bus stops (electronic information boards)
- Bus arrival time information at web site
- Bus arrival time information by SMS

3.1 Summary Description of the Task

CTSS will prepare, purchase, install, implement, test, demonstrate and monitor a new travel information system. Real time information will be provided in the vehicles, via SMS messages and on a website that will contain real time information for the bus stops along the CIVITAS corridor. In September 2009 CTSS will purchase a system for the counting of passengers and the system for the provision of real time information

4. Bus Traveller Information

4.1 Description of the Work Done

CTSS-DBUS has completed the implementation and testing phases as follows:

CTSS-DBUS has developed a new website that is currently operating to provide real time information on bus stop level and a new route planner for the trips inside Donostia – San Sebastian using the public transport www.dbus.es.

CTSS-DBUS has developed and implemented a new system for the counting of passengers in the bus lines of the high quality public transport corridors. This system is based on the development of:

- new software for passenger counting relating the ticketing machines (travellers' access)
- improvements to the onboard contactless card readers (new antenna, new modulator box and new logic plate) to count all kind of travellers using all kind of smart contactless cards
- a new portable inspection assistant to check smart card validations and counts,
- and a huge field work counting travellers' descent at the different bus stops by time slots and by day types (weekdays, Saturdays, Sundays and holidays).

The reason of the fieldwork to achieve data of the passengers' descents is to have an accurate data of the bus occupation in real time.

CTSS-DBUS has implemented a real time information system on-board (next stop announcement), provision of bus arrival times by SMS, by web and by electronic information devices at bus stops. The bus onboard and web information is adapted to visually impaired people.

CTSS-DBUS has also implemented a large amount of traveller reports related to passenger counting (by line, stop, route, hour, trip, etc.) to have all the data necessary to take the best decisions and actions in the future concerning the bus service offer.

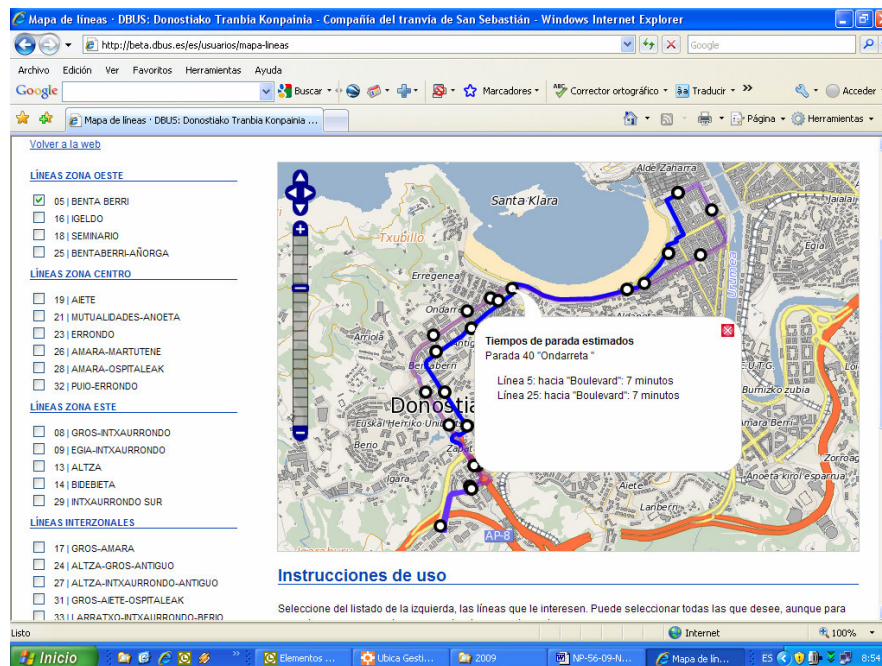
4.2 Summary of Activities Undertaken

NEW WEB SITE



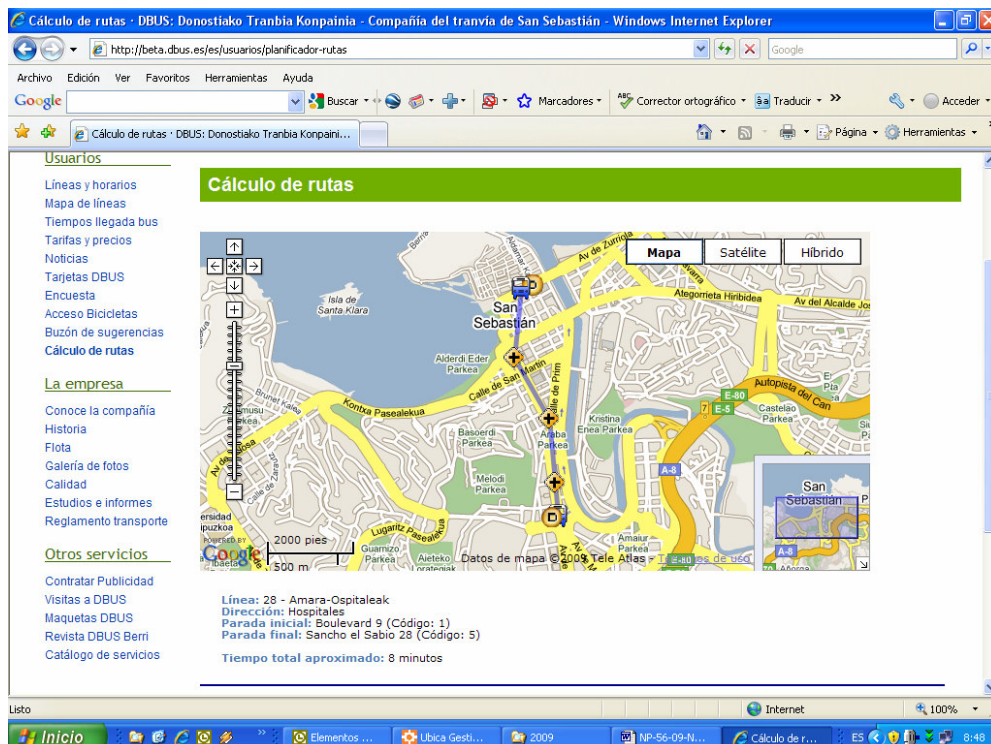
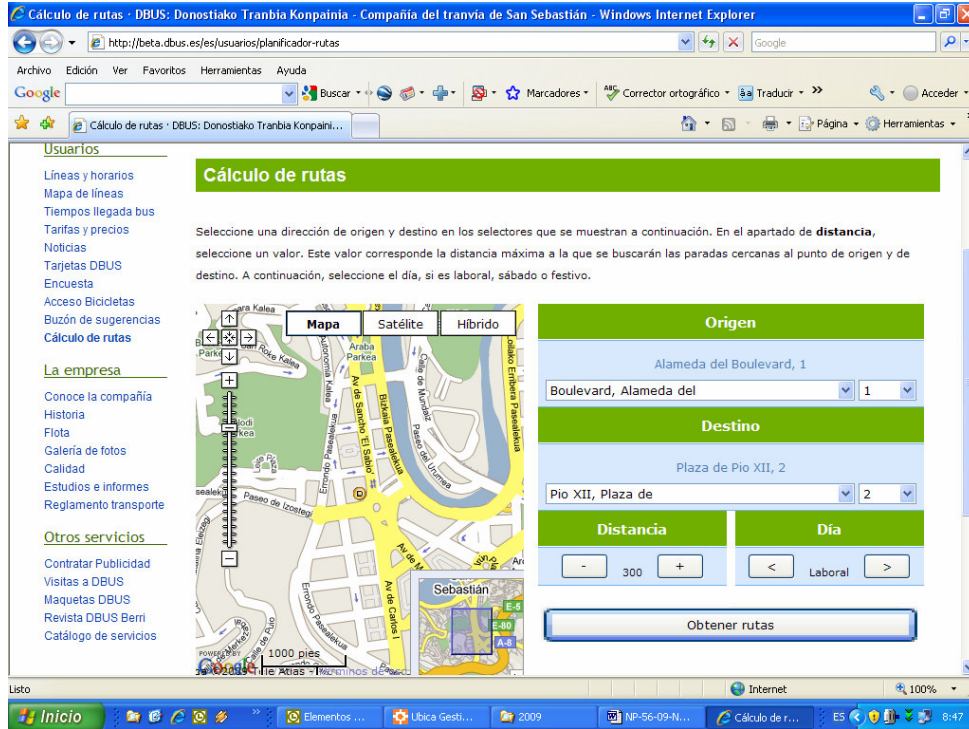
CTSS-DBUS has employed a specialist company to develop a new website with the following innovative points:

- Bus arrival information at website, in each stop of all the lines, and adapted to visually impaired people.
- Graphic information of routes and stops of each bus line 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 web site 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 on the website, including the two studies that form part of the ARCHIMEDES project:
 - Study of the high quality public transport corridors in Donostia-San Sebastian.
 - Biofuels and new technologies for DBUS



ONBOARD BUS TRAVELLER INFORMATION

CTSS-DBUS has implemented a real time information onboard 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 advices, culture agenda, sports, environmental news, games, etc.

The next stop announcement provides the travellers with the next stop location in a map and also the stop after the next stop. If the traveller requests the bus driver to activate 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 according to the information we have from the association of visually impaired people (ONCE).



BUS ARRIVAL TIME AT BUS STOP ELECTRONIC DISPLAYS

CTSS-DBUS has implemented a real time information system providing travellers with the bus arrival time at 83 bus stops through electronic displays. Currently CTSS-DBUS has 495 bus stops, so 17% of the bus stops now have this information system. The displays have been installed in the bus stops used by most passengers.

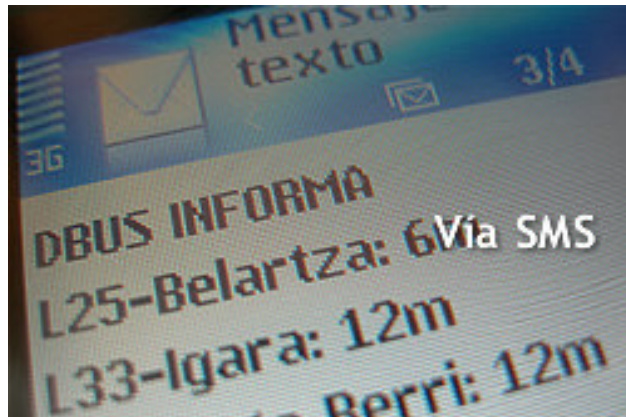
On these electronic displays, CTSS-DBUS provides information of the line number, the destination and the waiting time for the bus arrival.



BUS ARRIVAL TIME AT BUS STOPS BY SMS

An sms system is available for all bus stops. Therefore, for the rest of the 495 CTSS-DBUS bus stops that don't have the electronic displays, 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.

Each bus stop's code number is shown at the bus stop and is also available from the CTSS-DBUS web site.



NEW SYSTEM FOR THE COUNTING OF PASSENGERS

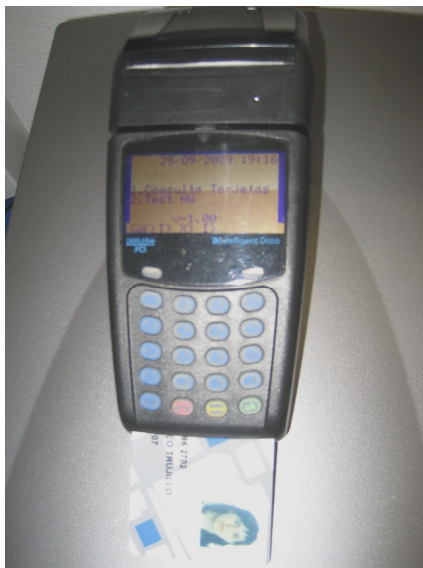
CTSS-DBUS has developed and implemented a new system for counting passengers using the bus lines of the high quality public transport corridors.

This system is based on:

- The development of new software for passenger counting relating the ticketing machines (travellers' access) with the data achieved of the travellers' descent (data obtained through the field work)
- Improvements made in the onboard contactless card readers to count all kind of travellers using all kind of smart contactless cards:
 - new antenna
 - new modulator box
 - new logic plate



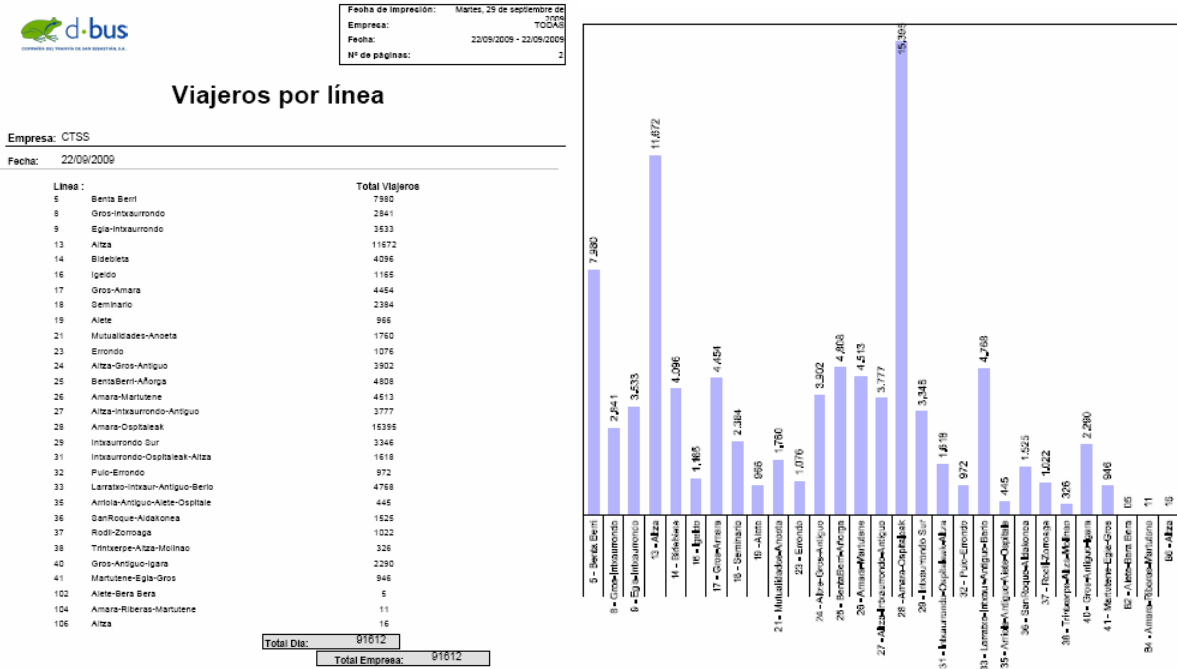
- A new portable inspection assistant to check the reliability of the ticketing machines, by ticketing and smart cards inspection.



- A huge fieldwork exercise counting travellers' descent at the different bus stops by time slots and by day types (weekdays, Saturdays, Sundays and holidays). To do this work, the security cameras have been used to count passengers' descent. The reason for the fieldwork was to have accurate data of the bus occupation in real time.

CTSS-DBUS has also implemented a large amount of reports related to passenger counting (by line, stop, route, hour, trip, etc.) to have all the data necessary to take the best decisions and actions in the future with the bus service offer. Examples of these reports are as follows:

- Daily Passengers per bus line



- Daily average Passengers per bus stop per time slot and per line

Viajeros por línea, parada y franja horaria

Línea: 28 - Amara-Ospitaleak Mes mostrado: Septiembre 2009

D. Sent	Paradas	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total	
L	[1] Boulevard 9 (L28)	9						29	165	205	206	205	195	219	236	202	166	172	231	228	293	265	178	92	46	3.345	
	[2] Urdieta 12 (L21,28)	2						8	73	104	88	110	131	137	190	133	103	96	97	104	124	120	60	24	4	1.708	
	[3] Urdieta 59 (L21,26,26,36)	2						4	59	69	64	56	53	52	44	46	35	44	45	34	31	32	18	8	1	697	
	[4] Antiso Jakituna 12/S. el 5, 12							0	23	19	11	9	9	7	7	4	8	7	4	4	4	2	2	0	0	125	
	[5] S. E. Sabio 29 (L4,23,28,28,33,33)							0	51	72	49	45	35	22	21	28	22	19	16	11	7	4	4	1	0	407	
	[6] Madrid 14 (L26,28)							2	85	80	46	42	39	26	21	34	25	25	22	17	9	5	8	1	0	487	
	[199] Anoeta							6	103	103	81	63	53	42	36	48	45	46	42	27	18	8	11	1	1	734	
	[260] Begiristain I							1	0	1	1	0	1	0	1	1	0	0	0	0	6	0	0			14	
	[262] Lorearte								0	0	0					0	1	0				0				1	
	[264] Donostako Ospitalea I							1	2	0	1	1	1	1	1	3	1	1	1	0	0	0	0	0	0	13	
	[266] Ospitalea/Hospital I							0	1	5	8	17	23	13	14	8	6	6	3	4	3	2	0			113	
	[268] Begiristain 220							0	1	2	6	4	4	3	4	3	11	2	2	1	1	0	0			44	
	[427] Poliklinika I								0	0	0	1	1	2	0	1	2	1	2	1	2	1	0	0			11
	[426] Poliklinika II							0	4	16	20	36	37	43	39	39	40	40	42	28	18	10	5	0		456	
	[270] Uri Gain							0	0	0	0	1	1	1	1	2	6	1	0	1	2	8	1	0			29
	[267] Ospitalea/Hospital II							0	1	5	18	28	33	29	33	29	16	11	13	14	13	14	6	2		265	
	[265] Hospital Donostia (28,31,35)									0	5	19	2	2	1	0	4	1	3	2	3	5	1	0		48	
	[166] Ategorrieta 41							2	2	0																4	
	[165] Ategorrieta 65							1	1																	2	
	[34] Boulevard 17 (L5,16,25)														0	0			0							0	
	[76] Colón (L6,8,14,17,24,31,33,40)							3	2	0																5	
	[75] Gran Via 21 (L6,14,29,31)							1	2	0																3	
	[7] Madrid 28									8															0	8	
	[283] Mamaritxi-Cocheras							6	6				0													12	
	[425] Mikeletegi 12							1	4	5	5	5	6	8	11	14	15	9	20	18	11	5	2	3		142	
	[271] Miramón							0	0	2	3	3	2	4	12	13	9	7	15	24	10	4	1	0	0	109	
	[32] Okendo 11								1	0																1	
	[28] S. E. Sabio 35 (L21,26,28,32)											0														0	
	Total Ida	13	0	0	0	0	0	64	584	693	606	641	620	623	672	617	502	500	561	541	559	434	304	137	52	6.783	

- Daily Passengers per bus stop and per line



Matriz de Paradas

COD. Parada :	L28
1 Boulevard 9 (L28)	3698
2 Urbieta 12 (L21,28)	1646
3 Urbieta 58 (L21,26,28,36)	791
4 Antso Jakituna 12/S. el S. 12	160
5 S.E.Sabio28 (21,23,26,28,32,37)	453
6 Madrid 14 (L26,28)	519
199 Anoeta	804
260 Beginistain I	2
262 Lorearte	4
264 Donostiako Ospitalea I	11
266 Ospitalea/Hospital I	126
268 Beginistain 220	35
427 Poliklinika I	3
428 Poliklinika II	437
270 Uri Gain	16
267 Ospitalea/Hospital II	303
265 Hospital Donostia (28,31,35)	144
425 Mikeletegi 12	130
271 Miramón	95
75 Gran Vía 21 (L8,14,29,31)	3
166 Ategorrieta 41	3
76 Colón 17(L8,14,17,24,31,33,40)	2
165 Ategorrieta 65	2
263 Marrutxipi-Cocheras	1
265 Hospital Donostia (28,31,35)	2704
263 Txiskuene	100
261 Beginistain II	95
26 Madrid 19 (L21,28)	788
27 Madrid 5 (L21,L26,L28)	889
28 S.E.Sabio 35 (L21,26,28,32)	848
29 Antso Jakituna 11/S. el S.11	72
30 Easo Plaza (L21,26,28,32,37)	178
31 San Martín 25	142
32 Okendo 11	140
1 Boulevard 9 (L28)	50

- Average occupation per line per day type and per time period



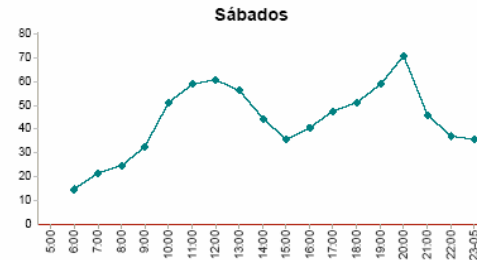
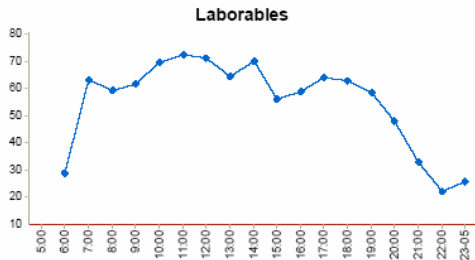
Ocupación por franja horaria

Fecha de impresión: 29 de septiembre de 2009

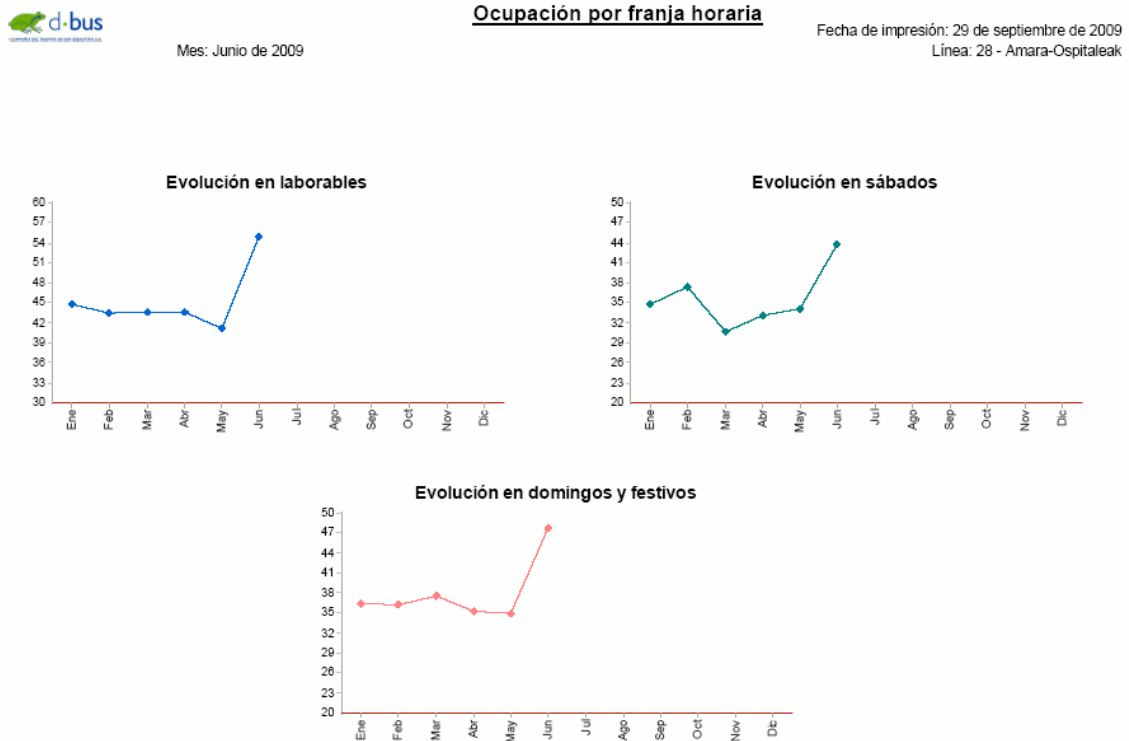
Mes: Junio de 2009

Línea: 28 - Amara-Ospitaleak

Lineas	Día	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23-5	MED
		28 - Amara-Ospitaleak	L		28,83	53,34	59	51,52	69,56	72,24	71,13	54,52	59,99	55,87	58,91	54,1	62,69	59,49	47,97	32,86	21,95
	S		14,95	21,45	24,75	32,57	51,23	59,18	60,74	56,42	44,22	35,85	40,52	47,45	51,37	58,93	71,04	49,93	36,99	36,46	43,83
	F		27,88	40,3	30,26	60,14	56,59	64,44	56,65	49,14	36	52,22	50,48	57,17	54,24	54,14	48,61	27,95	33,48	47,83	



- Evolution of the average occupation per line per day type and per time period



- On-line real occupation per bus

UBICA - Regulación y Control

Archivo Termómetros Líneas Comunicaciones Regulación Ver Red Horarios Configuración Acerca de ...

Config Mensajería Replanificar Seguimiento Acción H.T/R Búsqueda Ver mapa Coms Resumen Salir

L5 6 L8 L9 L13 L14 L16 L17 L18 3 L19 L21 L23 L24 L25 3 L26 L27 L28 L29 L31

L37 L38 L39 L40 L41 L42 L90 L101 L102 L103 L104 L105 L106 L107 L108 L109 L110

L5 (5) 41-1V

L5 (5) 21-1V

L5 (5) 11-1V

L8 (8) 11-1V

L9 (9) 11-1V

L13 (13) 21-2V

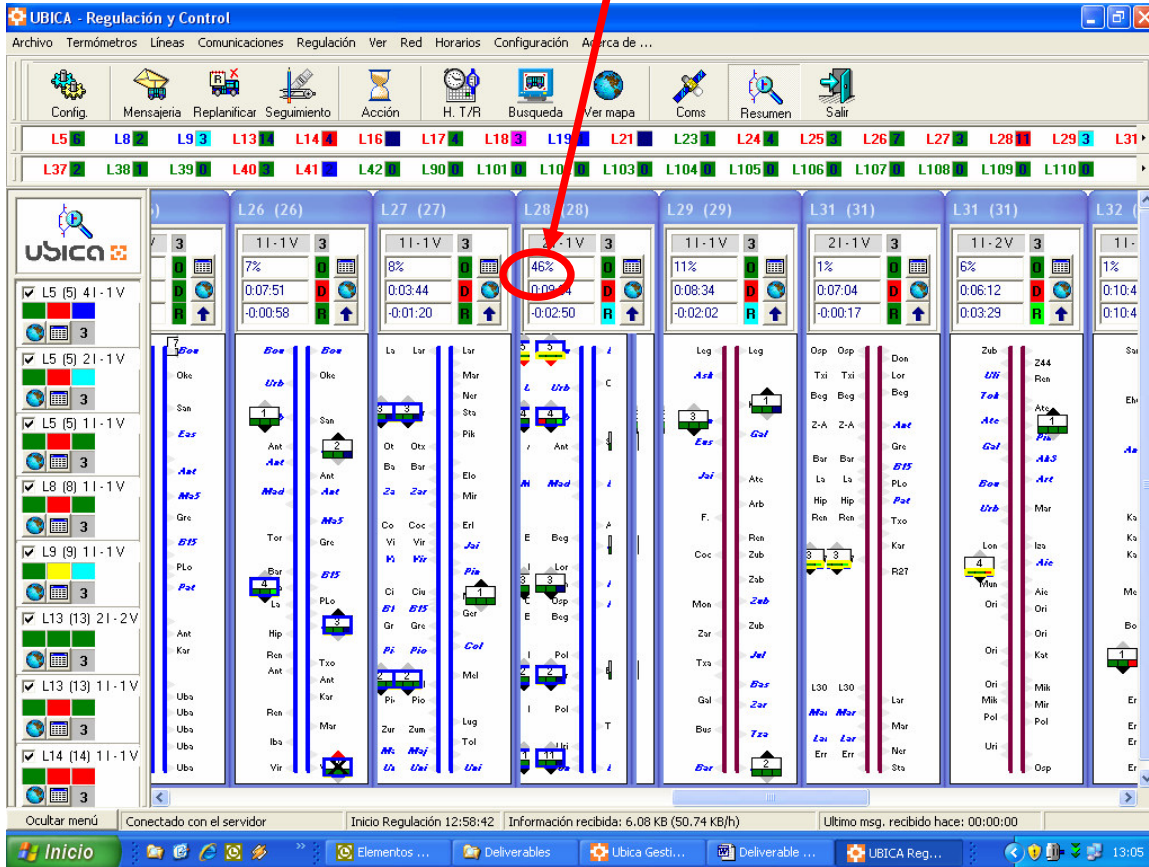
L13 (13) 11-1V

L14 (14) 11-1V

Código bus: 459
Tipo bus: Articulado 18m
Estado: En viaje (PosX: 53098 - PosY: 4795357)
Conductor: Juan M. Paul Tomás (334)
Línea 28 Itinerario 1 - V - 11 - 7
Letrero especial: No
Horario salida: 12:51 # Hora llegada prevista: 13:15
Retraso tiempo (nivel): -004:10 [A] (-4)
Ocupación: 67% **Viajeros: 74**
Frecuencia paso: 0:00:07
Posición real (13:01)

Inicio Regulación 12:58:42 Información recibida: 2.99 KB (47.87 KB/h) Último msg. recibido hace: 00:00:00

- On line average occupation per line



4.3 Problems Identified

CTSS-DBUS has analysed the market and has realised that the systems for the counting of passengers based on onboard devices are very expensive and don't assure 100% effectiveness. Therefore, CTSS-DBUS has decided to implement a new system to cover the passengers counting:

- New software relating data from ticketing machines and data from passengers descent collected by fieldwork
- Improvements on card readers (ticketing machines) based on new contactless antennae, new modulator boxes and new logic plates to provide better counting of the travellers that access to the buses.
- New portable inspection assistant to check the reliability of the ticketing machines, by ticketing and smart cards inspection.

4.4 Risks and Mitigating Activities

There were technological risks due to insufficient HSDPA-3G coverage at certain points of the public transport network. Lack of coverage would lead to incorrect real time information for travellers (onboard, at bus stop, by SMS or by website) and CTSS-DBUS regarding information for each line affected. Hence, an important task was carried out 9 months ago with the communication supplier EUSKALTEL, which improved their coverage in Donostia-San Sebastian to prepare for the ARCHIMEDES project. The CTSS-DBUS information system is now performing in a satisfactory way in respect of the HSDPA-3G communications

4.5 Dissemination Activities

Various press releases have been issued with information about the CTSS-DBUS traveller information system, including bus onboard information, bus arrival time information at bus stops, via the website and by SMS.

The bus onboard information channel (DV-BUS channel) provides passenger information of the web site, the next stop announcement and the bus arrival time information by SMS.

4.6 Future Plans

Extend the website services including a participation section for travellers, as a discussion forum related to bus services themes of Donostia – San Sebastian.

Extend the new system for the counting of passengers to the rest of the bus lines. For this action a great field work has to be done to get information of the travellers' descent at the bus stops of the different lines for all the day types at all time slots.

A new computer server with full capacity and availability is necessary for the data base and communications for the passengers counting system

Evaluation of the new systems will continue through the next 2 years and will be reported as part of the ARCHIMEDES evaluation process.