Environmental Sustainability

OPERATIONAL BUSINESS CENTRE ZONA FRANCA

Manel Barriga

Transports Metropolitans **de Barcelona**

What is TMB?

Transports Metropolitans **de Barcelona**

13th UITP Sustainable Development Commission Meeting

13-14 October 2011, San Sebastián

✓ The main public transport operator in Barcelona and Catalonia, with 2 million passengers per day, and 571 million ticket validations per year

✓ The company that manages the funicular railway of Montjüic, seven metro lines and 106 regular buses covering Barcelona and ten townships in its hinterland, on behalf of Area Metropolitana

✓ The entity responsible for emblematic leisure transport such as Barcelona Bus Turístic, the Blue Tram (Tramvia Blau) and Montjuïc Cable Car

TMB Transports Metropolitans de Barcelona

EUSKO JAURLARITZA GOBIERNO VASCO

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Basic data and indicators

Nº of lines	**106**
Length of network (half total for one-way & return journeys)	**932,37 km**
Number of stops	**2,610**
Fleet of vehicles	**1,090**
Buses with air conditioning	**1,083**
Buses fuelled with natural gas	**341**
Buses fuelled with biodiesel	**122**
Average age of the fleet	**6.14 years**
Staff	**4,279 employees**
Length of bus lanes (km)	**125,97**

Places-km (millions)	**3,503.76**
Vehicles-km in operations (thousands)	**42,394.49**
Passengers/vehicles-km in operation	**4.47**
Passengers-km (places-km/1000)	**156.80**
Average distance per trip (km)	**2.90**

Source: TMB December 2010

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Zona Franca

Basic data and indicators ZONA FRANCA CON

Nº of lines	29
Fleet of vehicles	362
Buses with air conditioning	362
Buses fuelled with natural gas	362
Average age of the fleet	4.60 years
Staff	1,097 employees

Total km useful	8.318.524
Service hours	805.089
Working commercial speed	11,99
Regular client vision	84,62%
Weighted segmented punctuality	79,79%
Validations	39.594.079
km total / total breakdown attributable	2.983
Accidents per million km	100

Source: TMB August 2011

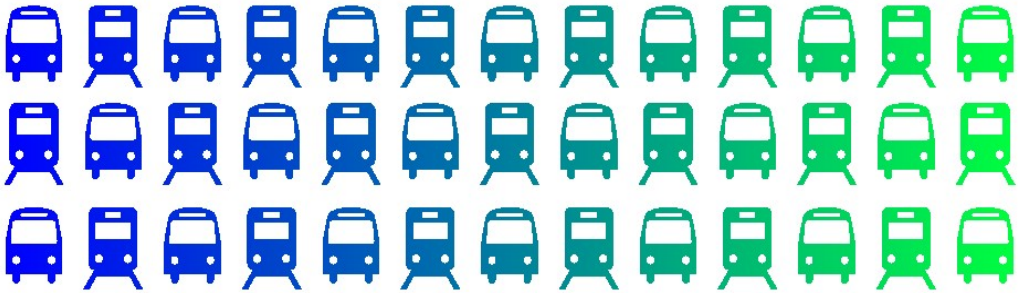
- **Gas Station Refuelling fast Load (3 min./bus)**
- **High Power compression for refuelling until 220 bar**
- **Flow Compressors 2.500 m^3/h**
- **Load natural Gas from pipeline of 70 bar.**
- **Ventage no allowed to atmosphere**
- **Devices for download gas to pipeline in empty bottles**

STATION OF REGULATION AND MEASURE

Here the pressure of gas is stabilized and consumption is mesured

- **Installations :**
  Gas Natural Detection and hidrógen.
  Smoke detectors
- **Antideflagration Electric Installations.**
- **Automatic Opening of doors.**
- **Automatic Extinction by pressure water.**
- **Proceeding in Bus:**
  Changes of oil engine, filters, .
  Started Revisions, racords and pressión regulators.
- **Operations and set up. leakproofness tests.**
- **Security works in bus roof.**
- **Training and practice.**

TMB Environmental Sustainability Master Plan



The Strategic Framework

Environmental sustainability within TMB is based on the following criteria:

- Ensuring environmental protection by setting out milestones and specific behavioural guidelines in each of the company's areas of activity.
- Reducing environmental impact resulting from emissions into the atmosphere, water collection and discharge and waste production.
- Regularly revising the level of environmental protection with the aim of identifying weak points and subsequently implementing the actions required to improve the situation.
- Continually improving and working to prevent pollution to attain more sustainable development through limiting energy and water use and ensuring the environmentally responsible management of products used.
- Providing extensive information for and training employees on all environmental aspects linked to their work. Motivational training for employees to ensure that their behaviour in the workplace reflects the environmental concerns of the company as a whole.
- Requiring environmental awareness from suppliers and subcontracted companies that is in line with TMB's approach.
- Providing information for interested members of the public on the environmental efforts and actions carried out with the aim of improving environmental protection.

The Strategic Framework

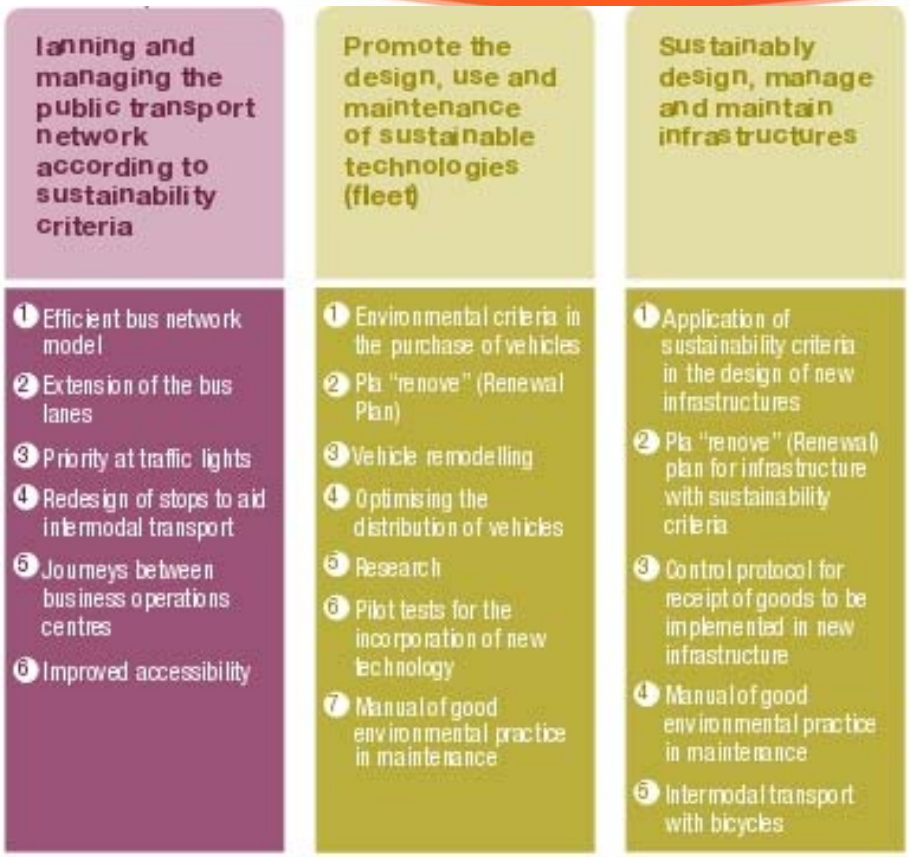
In order to put these principles into practice, TMB undertakes to:

- Implement the Environmental Sustainability Master Plan
- Work towards implementing an environmental management system in line with ISO 14001:2004 and European EMAS Regulation 761/2001.

Firm in its conviction that it is only through respect for the environment that we can be more useful to society, the Executive of TMB takes responsibility for the implementation and monitoring of this environmental policy.

The Management Framework

Strategic objectives



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The Management Framework

Strategic objectives

IP - Internal perspective (processes, people, resources)

Include sustainability criteria in product and service procurement	Internally promote a culture of sustainability	Design and implement an environmental management system (EMAS)
1. Revision, approval and promotion of an environmentally and socially responsible procurement policy	1. Internal environmental communication plan	1. TMB environmental policy and implementation of the EMAS
2. Drawing up and approval of an internal procurement manual	2. Internal environmental training plan	2. Environmental requirements identification system
3. Implementation	3. Internal environmental participation plan	3. Pla d'adequació a la normativa ambiental
4. Assessment, classification and official approval of products and services	4. Awareness of staff environmental habits and values	4. Plan for adaptation to environmental regulations
5. Monitoring and improvement of material consumption	5. Environmental criteria in communication, training and participation activities and media	5. Environmental management scorecard and monitoring indicators
6. Extensió de la sostenibilitat a la cadena d'aprovisionament	6. Mobility plans for centres with over 200 employees	6. Optimisation, monitoring and control of costs and investments linked to sustainability

The Management Framework

Strategic objectives

EP - External perspective (citizens)

Promote a culture of sustainable mobility among citizens	Strengthen public transport through dialogue with interest groups
1. Production of a guide to environmental topics	1. Design and implementation of the framework for relations with interest groups on the subject of sustainability
2. Comprehensive external communication plan	2. Benchmarking in sustainability
3. Development of client information systems to encourage sustainable mobility and the use of public transport	3. Plan to promote the use of public transport by specific groups
4. Implementation of environmental criteria in communication	4. System for collecting information on the evolution of environmental habits and values of the population as a whole and of clients
5. Inclusion of environmental sustainability criteria in heritage projects	

The Management Framework

Main projects

OP - Operational perspective

The Management Framework

Main projects

Punts Verds

STRATEGIC OBJECTIVE

Avoid and reduce waste production.

DESCRIPTION / DEFINITION

Selective collection in workshops and offices, construction of Punts Verds (green recycling points) and implementation of the new waste logistics model..

CURRENT SITUATION (2010)

- Total waste production for 2010: 5,000 tonnes
- Identification and selective management of 56 different types of waste.
- Implementation of procedures to monitor and control waste management within TMB from its production, including transportation, until its arrival at the end treatment
- Implementation of procedures to improve internal management in terms of segregation, handling an storage of waste.
- Punts Verds (green recycling points): Sagrera, Horta, Santa Eulàlia, Triangle TB, Triangle M, Vilapicina, Can Zam and Roquetes.

The Management Framework

Main projects

Greening the fleet

STRATEGIC OBJECTIVE

Promote the design, use and maintenance of sustainable technologies for the fleet..

OP-6

DESCRIPTION / DEFINITION

Renewal of the bus fleet with the introduction of new technologies and new more efficient and less pollutant fuels

2009

FUEL	NO. VEHICLES
Diesel (E1/2/3)	498
Biodiesel (E1/2/3)	122
AdBlue diesel	76
EGR diesel	89
CNG	295
TOTAL	1,080

TECNOLOGY	NO. VEHICLES
Euro I	15
Euro II	260
Euro III	345
Euro IV	155
Euro V	10
EEV	295
TOTAL	1,080

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The Management Framework

Main projects

Greening the fleet

Execution period: 2010 - 2014
Investment: € 89,570,660
Financing: TMB, Gas Natural, etc.

FUTURE ACTIONS (2010-2014)

Forecast for the renewal or greening of the fleet:

YEAR	QUANT.	FUEL / TECHNOLOGY
2010	4	Standard hybrids
2010	5	Minibuses using Euro IV diesel technology
2010-2011	522	Installation of particulate and NOx filters in Euro II and Euro III diesel vehicles (Euro I and some Euro II vehicles will be withdrawn)
2010-2011	100	Conversion of diesel vehicles into hybrids
2011	80	Introduction of CNG vehicles: 52 standard and 28 articulated
2012	30	Introduction of standard hybrid vehicles
2012	30	Introduction of CNG vehicles: 20 standard and 10 articulated
2012	7	Minibuses using advanced technology with hydrogen, diesel, as hybrids or with CNG
2014	62	Introduction of standard and articulated hybrids

hybrid = 20% reduction in fuel consumption

ROLES AND RESPONSIBILITIES DASCI

Department responsible:
TB (Bus Network Technical Department) central engineering works and workshops

Approved by:
Bus Network Executive

Support:
Bus Network Technical Department

Consultation:
Environment

Information:
Environment

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The Management Framework

Main projects

Design, construction and maintenance of infrastructure using environmental sustainability criteria

STRATEGIC OBJECTIVE

Design and manage infrastructures sustainably.

DESCRIPTION / DEFINITION

Implementation of sustainability criteria in the design, construction and maintenance of TMB infrastructures:

- Environmental selection of air conditioning systems: provision of replacement air at a lower temperature than ambient temperature, underfloor heating, solar control of the facade using centrally controlled blinds, centralised control of air-conditioned areas, etc.
- Efficient facilities: high-efficiency lighting that switches on by sector; motion sensors in little-used areas, low-energy lifts; low water consumption taps and WCs, etc.
- Natural, efficient insulation systems for external and internal closures, reducing loss of energy.
- FSC-certified woods (from sustainable forests).
- Water-based environmentally sound paints.
- Internal and external noise control: external structure in noise-reducing glass, insulation of printing areas, etc.
- Thermal solar panels and photovoltaic power plant: thermal solar panels to support the production of domestic hot water and photovoltaic solar panels for the production of electricity and its sale to the grid.
- Waste prevention and reduction criteria.

The Management Framework

Main projects

Design, construction and maintenance of infrastructures using environmental sustainability criteria

Execution period: 2010 - 2014
Financing: TMB
Investment: No en cal

CURRENT SITUATION (2009)

- 147 m2 of photovoltaic panels and 148 m2 of solar panels
- Treatment and reuse of water from M and TB vehicle washing plants.
- Use of treated water from vehicle washing plants in WC cisterns in specific centres.
- Phreatic water: to be used in vehicle washing plants, for watering plants or to be returned to the environment.

FUTURE ACTIONS (2010-2014)

- Implementation of sustainability criteria in the design, construction and maintenance of TMB infrastructures.

ROLES AND RESPONSIBILITIES DASCI

Department responsible:
M/TB infrastructures and maintenance

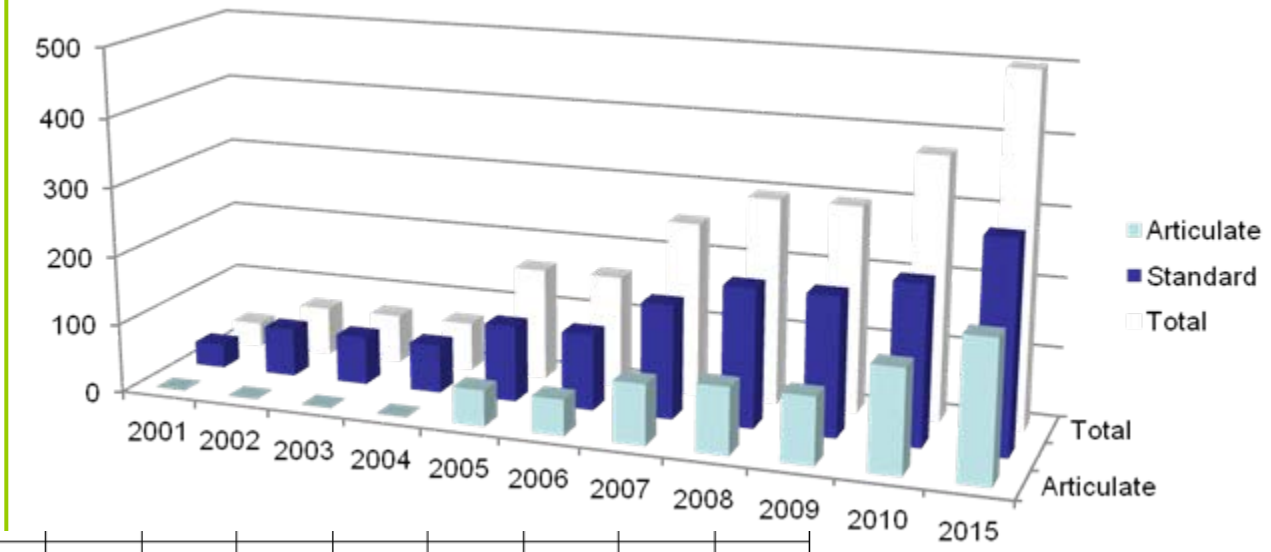
Approved by:
M/TB Executive

Support:
Procurement / Environment

Consulta:
Procurement / Environment

Information:
Environment

CNG Bus Fleet in Barcelona



Articulat	0	0	0	0	52	52	87	96	96	148	200
Estàndard	35	70	70	70	110	110	164	200	200	228	300
Total	35	70	70	70	162	162	251	296	296	376	500

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CSR

Three recent examples

Transports Metropolitans de Barcelona

CON Ponent Calendars

Transports Metropolitans de Barcelona

GET MOVING AGAINST CANCER

13th UITP Sustainable Development Commission Meeting

13-14 October 2011, San Sebastián

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Promoting culture and transport

TMB Transports Metropolitans de Barcelona

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