

INTEGRATED PUBLIC TRANSPORT SYSTEM IN BARCELONA

1. The Metropolitan Transport Authority

1.0 Background and constitution of the ATM

The objective of coordinating the different Administrations to boost the public transport system required, in the case of Barcelona, the creation of a metropolitan public transport coordinating agency.

It would not be until the Framework Agreement of 1996 when the State, the Autonomous Government of Catalonia and the local Administrations (Barcelona City Council and the EMT) recognised the need for a consortium-based local collaboration Agency for the organisation of the public transport system in the area of Barcelona.

In October 1996, the Executive Committee for the creation of the ATM presented the protocol of bases and criteria for the creation of this agency to the Administrations and, finally on March 19, 1997 the Agreement of the Constitution of the ATM was signed in the Palace of the Autonomous Government of Catalonia.

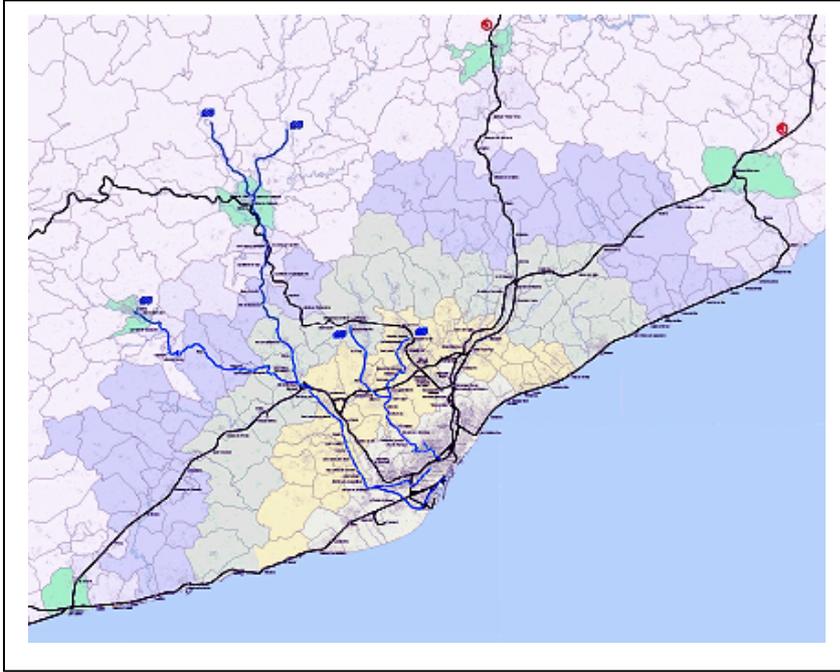
1.1 Administrations in the consortium

The ATM is a voluntary inter-administrative Consortium open to all the administrations that run public transport services in the metropolitan region of Barcelona.

At the moment, the administrations in the Consortium are the Autonomous Government of Catalonia (51%) and the local administrations with public transport service in this region (49%), comprising the Barcelona City Council, the Metropolitan Transport Agency (EMT) and the Association of Municipalities which run Urban Transport services in the metropolitan region of Barcelona (AMTU). Mention must be made of the presence of representatives from the General Administration of the State on the governing organs of the ATM, as observers.

1.2 Sphere of action

At the moment, the area of influence of the metropolis of Barcelona spans 7 counties and 164 municipalities with a surface area of 3,200 km² and with a population of above 4.3 million inhabitants. The sphere of the fare integration extends to the limits of the local trains, or in other words 3,900 km², 200 municipalities and 4.5 million inhabitants.



Metropolitan Railway Network

1.3 Operating Structure

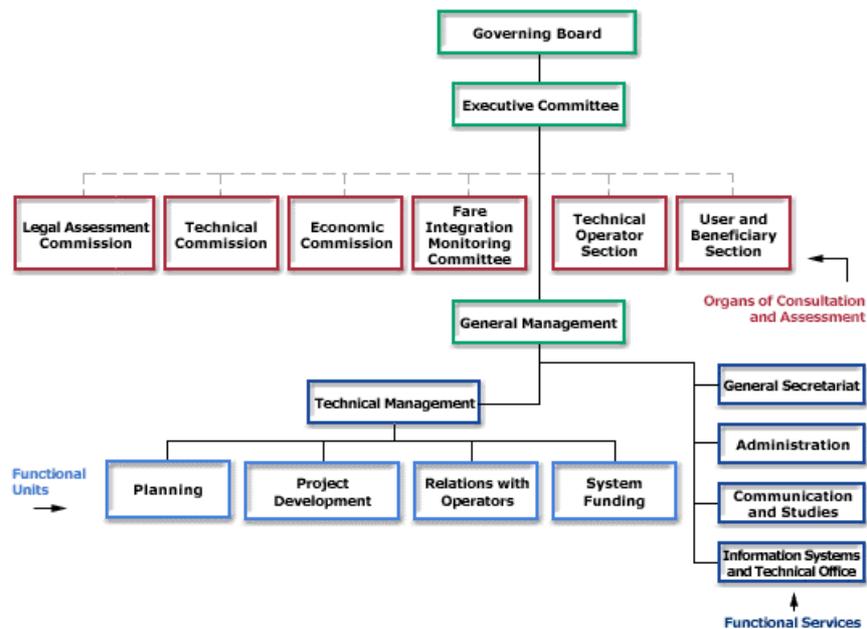
The Governing Board is the governing organ of the ATM. It comprises 18 fully-fledged members - 9 representing the Autonomous Government of Catalonia, 7 representing the constituent local Administrations (Barcelona City Council and the EMT) and 2 representing the AMTU-, and 2 representing the State Administration, as observers.

The second decision-making organ is the Executive Committee of the Governing Board, which comprises six members, three representing the Autonomous Government of Catalonia, two representing the constituent local Administrations and one representing the AMTU, with one observer from the General State Administration and a secretary.

The Executive Committee has the general function of examining and bringing proposals on planning instruments of the Metropolitan Public Transport System, funding agreements and contracts for services with administrations and operators, fare system and annual budgets, amongst others, too the Governing Board.

A fundamental element in guaranteeing the proper running of the ATM is the decision-making mechanism. According to the Statutes of the Consortium, all important agreements (revision of fares, approval of Plans, etc.) must be taken by a two-thirds majority. In practice this means that decisions are taken unanimously after the necessary preparatory sessions to address the subjects. This affords great firmness to the agreements of the Governing Board.

This system means that suitable discussion channels are needed, with the participation of the administrations and the operators. The attached diagram shows the six advisory Commissions which, in Economical and Technical matters and in Follow-up of Fare integration, meet monthly.



The internal operating structure of the ATM is also shown in this organisational chart. The Consortium has a workforce of 36 (June 2003), 60% of whom possess higher and medium level qualifications, and its budget for 2003 is 551.6 M €.

1.4 Functions

The functions performed by the ATM, defined in its statutes, stem from its basic function as the coordinator of metropolitan public transport, and are:

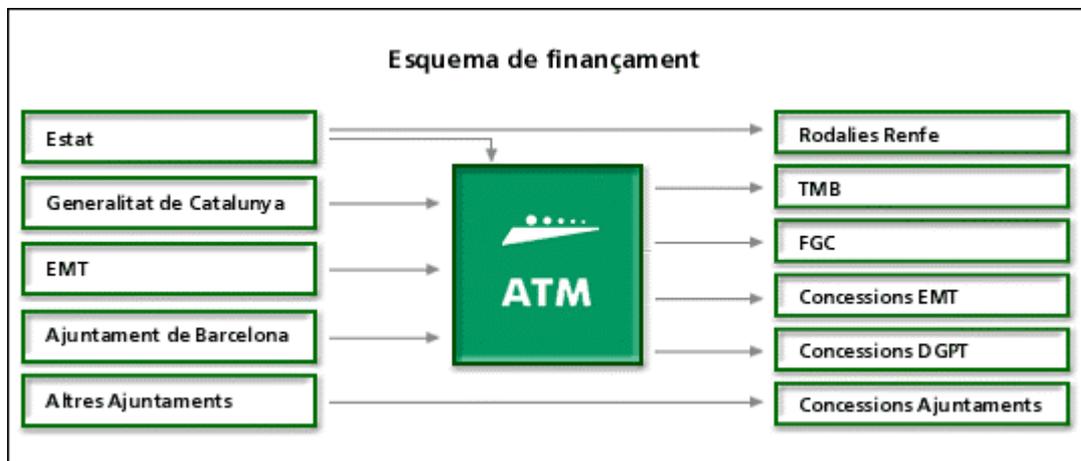
- a) Medium-term TPC (Collective Public Transport) infrastructure planning, addressed by the drafting and approval of the Infrastructure Master Plan 2001-2010. At the moment, more than 50% of the actions included in this Plan have been committed for implementation.
- b) Boost and coordinate the transport services offered by the public and private operators, by means of the 2005 Services Plan, which is currently in the initial approval phase.
- c) Coordination of the funding of the system by the Administrations via, on the one hand, funding agreements with the General State Administration and the Administrations that are part of the Consortium, and on the other, via contract-programmes with the TMB and FGC public operators, and tripartite compensation agreements (including the corresponding Administration in charge) with the private operators.
- d) Fare policy: Definition of the range of tickets and annual revision of prices.

- e) Development of projects commissioned by other Administrations: Diagonal-Baix Llobregat tram, Sant Martí–Besòs tram, Central Interchange Point, the tendering process of the trains for the underground lines L5 and L9.
- f) Definition and promotion of the corporate image of the Metropolitan Public Transport System.

1.5 Funding System

1.5.1 Funding Operations

The public transport systems of virtually all European metropolitan areas are operate at a structural loss, since income from fares, limited by a social level of fares, does not cover the operating costs of the system. In the case of Barcelona, the ATM acts as a central financial compensating agent of the system, according to the following diagram:



Funding scheme

The funding instruments of this deficit are the Contract-programme between the State and the ATM, and the funding agreements between the ATM and the administrations of the Consortium that cover the needs of the operators for four-year periods. The instruments for interacting with the operators that reflect these needs are the Contract programmes between the ATM and the TMB and FGC public operators, the contract programme between the State and Renfe, and the interested management contacts and risk venture franchises between the Autonomous Government of Catalonia and the EMT and the different private bus operators.



The Contract programmes between the ATM and the public operators establish objectives related to the volume of offer, the quality of the service, the increase in demand, the financial rationalisation of the operator and accomplishment of the coverage coefficient.

The volume of the contributions of the Administrations in the Contract programmes 1998-2001 and the needs forecast for the period 2002-2005 are shown in the table bellow.

	Contribution 1998-2001	
	Total	Annual mean
	M€	M€
Autonomous Government of Catalonia	391.43	97.86
General State Administration (AGE)	383.90	95.98
Barcelona City Council	177.97	44.49
Metropolitan Transport Agency	75.46	18.87
Total	1,028.76	257.19

	Needs for the period 2002-2005	
	Total	Annual mean
	M€	M€
Autonomous Government of Catalonia	519.05	129.76
General State Administration (AGE)	631.29	157.82
Barcelona City Council	226.10	56.52
Metropolitan Transport Agency	170.77	42.69
Total	1,547.21	386.80

Distribution of the contributions or needs by the different administrations 2002-2005 and 1998-2001

1.5.2 Funding of the CPT infrastructures

The funding of the metropolitan public transport infrastructures is carried out through Funding agreements between the State and the Autonomous Government of Catalonia. These Agreements, with a term of 3-4 years, establish the contributions of the two administrations, at a rate of 2/3 by Autonomous Government of Catalonia and 1/3 from the General State Administration to fund a given investment programme for the Underground networks, the Barcelona Metropolitan Transport buses (TMB) and the Railways of the Autonomous Government of Catalonia (FGC). The list of the actions to be funded is decided by the Governing Board of the ATM.

The Infrastructure Funding agreements have entailed investments for the value of 265.5 M € in the period 1998-2001. The proposal, yet to be signed, provides for investments to the value of 633.23 M € per the period 2003-2005. Moreover, and outside these Agreements, the Ministry of Development funds all investments in infrastructure of the state railway network.

There are two metropolitan railway infrastructures being implemented at the moment, and which do not adhere to the aforementioned funding model. The new Underground Line L9, 41.4 km long and with a scheduled investment of 2,248 M €, will be funded initially by the Autonomous Government of Catalonia via the German model. Independently, the ATM has entered into an agreement with the BEI for a loan of 650 million euros, to be paid back in 30 years, and which may be used by the Autonomous Government of Catalonia to finance Line 9. An application has also been submitted to the State for a contribution from the European Cohesion Fund for the Airport-Sarrià section, for a value of 565 million euros.

The Catalan Government approved the Law for the creation of the agency for the management of railway infrastructures of Catalonia, which would take on ownership of the rail infrastructure and will have income from royalties for the use of these infrastructures. In this way, this agency will have resources to fund the construction of new rail infrastructures in Catalonia.

Moreover, calls for tenders were issued by the ATM for the two trams under construction (Diagonal-Baix Llobregat and Sant Martí-Besòs) using the BOT system (Build, Operate and Transfer) with the joint participation of the public sector and private companies, both for building and operation. The Autonomous Government of Catalonia takes care of the investment in infrastructure, installations, systems and development, initially funded by the successful bidder, with the Autonomous Government of Catalonia putting pp, in deferred fashion over 13 years, the Diagonal-Baix Llobregat tram, and the Sant Martí-Besòs tram over 18 years, whereas the operation deficit plus depots and rolling stock is compensated monthly via the so-called technical rate, with the franchiser assuming part of the risk of deviations from real demand with regard to the offered demand.

2. Mobility and public transport in the Barcelona Metropolitan Region (RMB)

2.1 Territory and mobility

2.1.1 Description of the territory

At the moment, the area of influence of the metropolis of Barcelona covers a surface area of 3.237 km², with a population of more than 4.3 million inhabitants. It spans seven counties (Barcelonès, Baix Llobregat, Maresme, Vallès Oriental, Vallès Occidental, Alt Penedès and Garraf) and 164 municipalities; its territorial structure includes a main nucleus of 30 municipalities and 3 million inhabitants, and an outside crown segmented into radial corridors, polarised around mature industrial centres, with populations between 50,000 and the 200.000 inhabitants (Sabadell, Terrassa, Mataró, Granollers, etc.). The metropolitan region of Barcelona is therefore a polynuclear structure, with a decided central polarity, albeit with a second crown with relatively autonomous local job markets.

Total surface area metropolitan region :	3,237 km ²
Developed surface area in the metropolitan region:	703 km ²
Surface area of the municipality of Barcelona :	100 km ²
Population : 4.3 million in the Metropolitan region overall, 1.5 million corresponding to the municipality of Barcelona	

2.1.2 Everyday Mobility Survey (EMQ '01)

The Everyday Mobility Survey 2001 (EMQ '01) aims to ascertain the characteristics of mobility in the metropolitan region of Barcelona extended to the limits of the local services, to be able to model its basic patterns and forecast the behaviour of the demand for travel in the face of the evolution of the ways of life and pace of life which go hand in hand with the changes in the urban and socio-economic environment.

Basic characterisation of mobility

The total number of weekly journeys made by the inhabitants aged 4 years or above, in the Metropolitan region of Barcelona extended to the limits of the local services, is 49,958,189.

In the period studied, the population aged 4 years or above living in this territory is 4,345,435. There is a weekly average of 11.5 journeys a week per inhabitant.

8.5% of the population is characterised by not making any journey during the week. Excluding this sector of the population from the analysis gives an average of 12.57 weekly journeys per inhabitant.

Average journeys/week. Total population and population with mobility

	Individual	Journeys	Average journeys
Total population	4.345.435	49.958.189	11,50
Population with mobility	3.974.863	49.958.189	12,57

Types of mobility: forced and non-forced

28% of the journeys made during the week are for forced mobility. Forced mobility journeys have the following distribution depending on the reason:

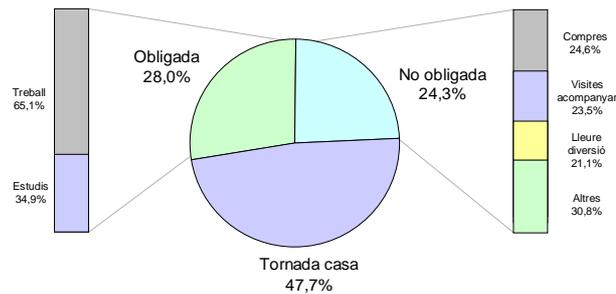
- 65.1% are journeys to work.
- 34.9% are journeys for study purposes.

24.3% of the journeys made during the week are for non-forced mobility, with the breakdown as follows:

- 24.6% are shopping trips or journeys.
- 23.5% are journeys to accompany people.
- 21.1% are journeys for recreation or diversion.
- 30.8% are journeys for other reasons.

The rest, 47.7%, are journeys made during the week to go home.

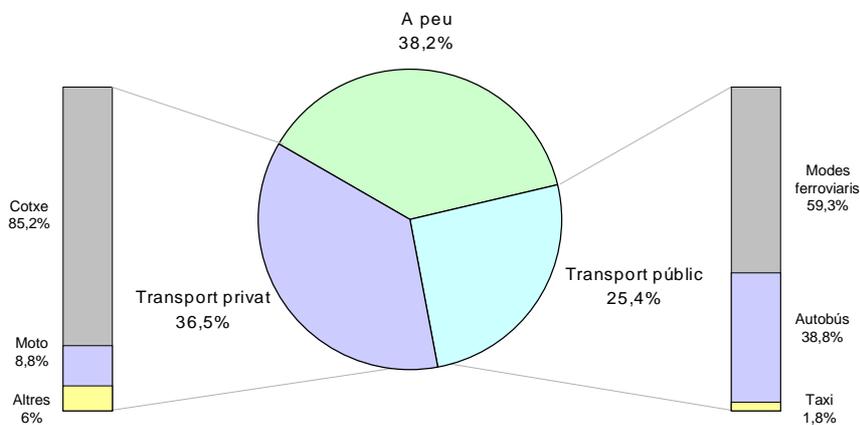
Distribution of mobility according to the reason for the journey



Market share by modes

Journeys on foot (38.2%) is the mode used mode of transport, followed by private vehicle (36.5%) and journeys on public transport (25.4%).

Distribution of mobility according to the main mode of transport

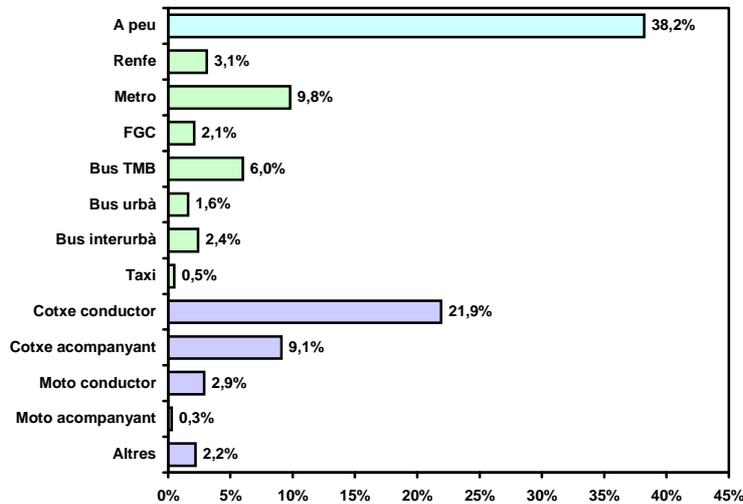


85.2% of journeys in private vehicle are made by car, 8.8% by motorbike and the remaining 6% by other modes of private transport (lorry, van, etc).

Railway modes (59.3%) account for most journeys by public transport, followed by bus (38.8%) and taxi (1.8%).

In rail modes, the most used mode is the underground. On the other hand, in buses the most used mode is the TMB (Barcelona Metropolitan Transport) bus.

Modal distribution and market shares



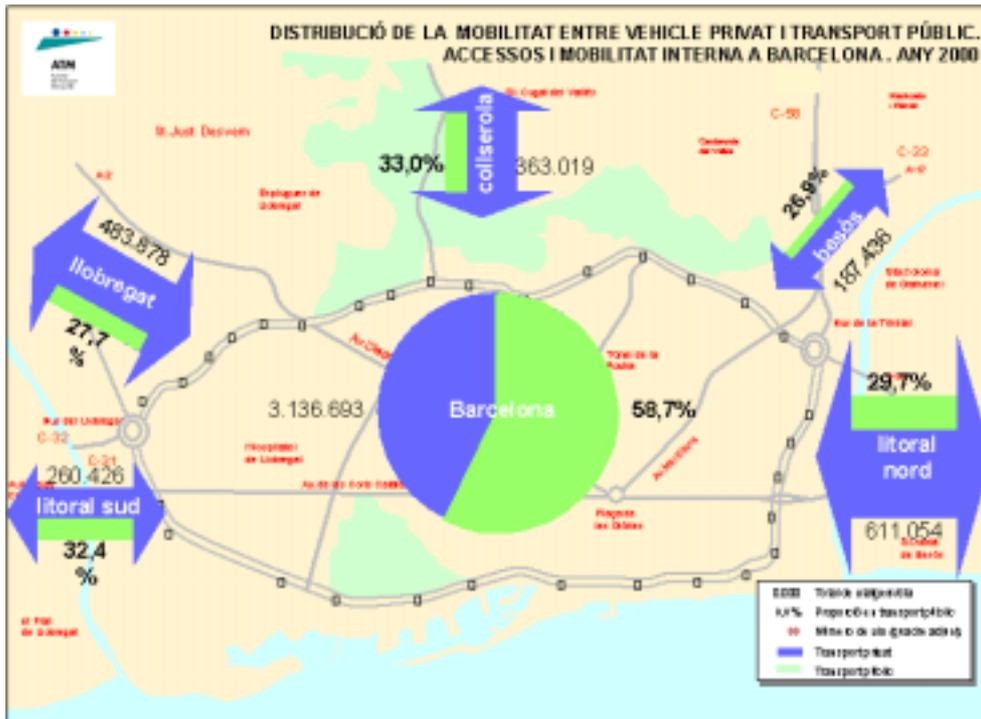
Multi-modality

92.2% of the journeys made in the RMB extended to the limits of the local services are single-mode, and the remaining 7.8% are multi-modal.

66.8% of the multi-modal journeys involve the use of two modes of transport, 29.2% involve the use of three modes of transport and the remaining 4% four modes of transport. 50 million journeys become 55.3 million stages of a journey.

2.1.3 Public transport-private transport study

This study analyses the modal distribution between public transport and private transport in the main corridor axes of the metropolitan region of Barcelona; in the accesses to the main built-up area, in the accesses to Barcelona, as well as internal mobility in Barcelona and perimetral mobility in the RMB.



Distribution of mobility between the private vehicle and public transport. Accesses and internal mobility of Barcelona. Year 2000



Distribution of mobility between the private vehicle and public transport. Accesses to the main built-up area, mobility per corridor axes and perimetral mobility. Year 2000

The share of public transport is substantial, and is even majority (58.7%) in the area inside the ring roads, and falls progressively moving away from the central area (and residential density and activity also fall).

2.2 Public transport operators

The citizen of the RMB has a range of modes of public transport: Underground, urban railway and the Local Lines (FGC and Renfe), and urban and interurban buses, with a total of 42 operators. The public operators are TMB (Underground and Buses of Barcelona), The railways of the Autonomous Government of Catalonia (FGC) and Renfe (Local Railway Lines). The private bus operators cover the lines pertaining to the Metropolitan Transport Agency (EMT, 18 municipalities of the conurbation of Barcelona) mostly on the basis of a system of interested management, and those of the rest of the metropolitan operate franchises from the Autonomous Government of Catalonia on a risk and venture basis; moreover, there are 25 municipalities outside the EMT which have urban transport line operators.

Basic data for 2002

	Lines	Length of network (km)	Vehicles-km (million)	Journeys (million) 2002	Δ 02 / 01 (%)
FMB (underground)	5	84	61.0	322.0	5.3%
FGC (1 st Crown)	2	24	11.6	40.1	8.9%
Renfe Local Lines (1 st Crown)	4	94	n.a.	n.a.	-
TB (buses)	103	879	40.0	189.8	1.4%
EMT Buses	67	848	19.2	52.6	10.1%
Total 1st Crown STI		1,929	-	-	-
Buses Autonomous Government of Catalonia	196	4910	24.4	24.1	8.8%
FGC (Rest STI)	2	120	16.2	29.9	13.6%
Renfe Local Lines (Rest STI)	4	332	61.8 ⁽¹⁾	110.9 ⁽¹⁾	7.0%
Other urban buses	72	521	9.5	30.6	3.5%
Total Rest STI		5,883	-	-	-
TOTAL STI		7,813	243.8	800.05	5.80%

(1) Total data operator
n.a. Not available.

3. Actions of the ATM in integration

One of the objectives of the ATM according to its statutes is the integration of transport networks to achieve a greater share in the use of public transport and more efficient operation in the metropolitan region of Barcelona. To accomplish this goal the ATM works in the fields of the integrated infrastructure and services planning, in the framework of the Integrated Fare System, now fully consolidated, and in the implementation of an Integrated user information system.

The integrated planning of the ensemble of actions in transport infrastructures and services in the Metropolitan region, boosting the network effect and intermodality, is addressed in the PDI 2001-2010, which has already been approved, and with more than 50% of the actions included in it already committed to implementation. The PDI includes a specific action programme for new or existing changeover points and the construction of new park and ride facilities.

The 2005 Services Plan, already drafted and into the phase prior to approval, is the instrument which will improve timetable coordination between the different services, increased frequency, the establishment of new services...

The implementation of the Integrated Fare System in January 2001 made it possible to remove changeover charges. The transport tickets meet the requirements of demand, and guarantee the financial equilibrium of the system.

The single and integrated user information system makes the user feel that he or she is in an integrated public transport system where the service rendered by the different operators is organised and coordinated by a single Authority.

4. Integrated Fare System

4.1 Background and objectives

Up until December 31, 2000, the 41 operators (3 rail, 38 surface) of the RMB had different fare structures and price-fixing levels:

More specifically there were 5 fare models:

- 1.- Flat rate in the central area.
- 2.- By kilometre fare on the FGC.
- 3.- By kilometre fare on the interurban buses of the DGPT.
- 4.- By kilometre fare on the EMT.
- 5.- Crown system on Renfe Local Lines.

There were also 4 different administrations setting price levels:

- 1.- DGPT

- 2.- EMT
- 3.- ATM
- 4.- AGE (Renfe Local Lines)

This situation meant that price setting criteria were heterogeneous, with different prices per journey/Km for the same route with different operator-specific prices.

The project for Fare integration in the RMB was approved by the Governing Board meeting of the ATM held on November 15, 2000, its objectives being:

- To create an easy-to-understand fare system based on principles accepted by the users.
- For the Metropolitan public transport system to be perceived as an integrated network.
- To contribute to positioning public transport as a more attractive system for users.

4.2 Principles defining the Integrated Fare System :

The Integrated Fare System of the Metropolitan Region of Barcelona is based on the following principles which establish the development framework. They are grouped into:

General principles:

- All transport tickets are part of the system, and the ATM has fare-setting power.
- Transport tickets valid for all modes and all operators in their geographic area of validation.
- Permeability of the system: bringing the start and end of the use of the public transport closer.
- Price according to level of use, distance and the discretization of the journey.
- System of validation that removes changeover charges.
- Ideal level of financial coverage of the system (proportion between income from rates and public subsidies).

Specific fare-setting principles:

- Transport tickets valid for all modes and all operators in their geographic area of validation.
- Price according to distance, discretization of journey by establishing the fare zones.

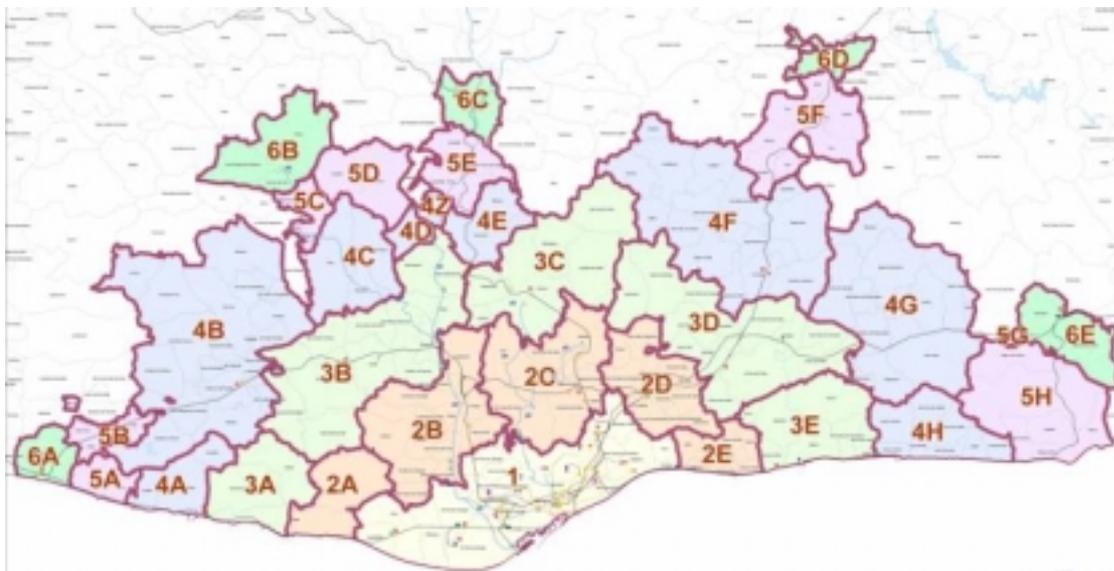
Technological Principles:

- System which makes it possible to travel with different companies and modes using a single ticket and paying only once per journey: the validation and sale systems of the different companies must be compatible.
- System which makes it possible to have a wide range of tickets.
- Open and evolution-based system which makes a by-phase integration possible, the incorporation of new tickets and the adjustment of supply to the needs of the user.
- Follow-up bit: makes it possible to collect sufficient information to distribute income reliably, and to monitor modal chains.
- System which makes the coexistence of integrated tickets with single-mode tickets possible.

4.3 Description of the Integrated Fare System :

The organisational principles of the system are:

Zoning: division of the territory into 6 sectorial geographic crowns, with the **fare area** being the area in the intersection between crowns and sectors. The integration area spans a total of 200 municipalities, more than 4.5 million inhabitants.



Zoning of the Integrated Fare System

- **Range of integrated tickets:** creation of Transport tickets with different features, aimed at different targets:
 - **T-10:** 10 integrated journeys in all the transport modes depending on the zones to cross (from 1 to 6 zones). Multipersonal and multi-timetable ticket.
 - **T-50/30:** 50 integrated journeys in all the transport modes depending on the zones to cross (from 1 to 6 zones). Valid for: 30 consecutive days as of the first use. Single-personal and timetable ticket.
 - **T-Familiar:** 70 integrated journeys in all the transport modes depending on the zones to cross (from 1 to 6 zones). Valid for: 30 consecutive days as of the first use. Multipersonal and multi-timetable ticket.
 - **T-Mes:** unlimited journeys in all the transport modes depending on the zones to cross (from 1 to 6 zones). Valid for: 30 consecutive days as of the first use. Ticket personalised by ID card or special operator cards.
 - **T-Trimestre:** unlimited journeys in all the transport modes depending on the zones to cross (from 1 to 6 zones). Valid for: 90 consecutive days as of the first use. Ticket personalised by ID card or special operator cards.
 - **T-Jove:** unlimited journeys in all the transport modes depending on the zones to cross (from 1 to 6 zones). Valid for: 90 consecutive days as of the first use. Ticket personalised by ID card or special operator cards, for under 21s.
 - **T-Dia:** unlimited journeys in all the transport modes depending on the zones to cross (from 1 to 6 zones). Valid for: 1 day as of the first use until the service stops. Unipersonal ticket.



The period of time in which changeover is free is 1 hour and 15 minutes for tickets for 1 zone, and increases 15 minutes per additional zone.

- The **prices in force in 2003** were:

Preus 2003 (euros)						
	1 Zona	2 Zones	3 Zones	4 Zones	5 Zones	6 Zones
Bitllet Senzill	1,05	1,55	2,20	2,90	3,65	4,30
T-10	5,80	11,70	16,10	20,65	23,65	25,30
T-50/30	24,30	40,65	57,00	71,05	84,20	93,40
T- FAMILIAR	35,60	50,30	68,90	85,10	97,40	104,60
T-MES	37,65	54,20	73,30	87,30	100,50	106,70
T-TRIMESTRE	103,60	149,20	201,80	240,60	274,30	284,00
T-JOVE	88,00	126,80	171,50	204,50	233,20	241,50
T-DIA	4,40	6,90	8,80	10,00	11,30	12,50

4.4 Fare integration management system

The tickets sold by the different companies and/or operators can be used on any public transport operator of the Metropolitan region of Barcelona and the fact that furthermore a journey can be made using a modal change, involves the need to have a series of data available, and which can be managed. In order to provide coverage for the fare integration a Fare integration Management System (SGIT) was created to manage the following aspects:

- Distribution of the income from the sale of integrated tickets among the different transport operators.
- Availability of a series of basic queries and statistics, used for studies on demand, calculation of fares increase and other purposes.
- Definition and parameterisation of new integrated tickets and fares.
- Support to the ATM's audit functions.

The main subsystems of the SGIT are:

- Communications
- Converter
- Distribution
- Queries
- Maintenance
- To guarantee the proper operation of the Chamber there is a Fare Integration Monitoring Committee, comprised of Administrations and Operators.

One of the main outputs of the Management System is the distribution of income, made on the basis of a distribution rule that takes into account the average fare collected and the modal chain of each journey obtained from the intermodality index.

4.5 Integrated Operators

The implementation calendar of this project for the different operators was:

- January 1, 2001: The T-Mes and T-Dia tickets came into operation in the first crown for the following operators: buses (Authosa, Mohn, Oliveras, Rosanbus, Soler and Sauret, TMB, Transports Lydia and Tusgsal), Underground, Railways of the Autonomous Government of Catalonia and Renfe Local Lines (except the stations of St. Feliu de Llobregat, Gavà, Viladecans, Castelldefels and the Airport).
- January 15, 2001: The T-10 and T-50/30 tickets came into operation in the first crown for the following operators: Buses (TMB and Transports Lydia), Underground and Railways of the Autonomous Government of Catalonia. All the services of the Railways of the Autonomous Government of Catalonia from outside the first crown were integrated in the fare system, as was Sarbús, La Vallesana, A. Font and E. Plana, franchisees of the Autonomous Government of Catalonia, with the T-10 and T-50/30 tickets.
- April 1, 2001: The T-10 and T-50/30 tickets came into operation in the first crown for the following operators: Buses (Authosa, Mohn, Oliveras, Rosanbus, Soler and Sauret and Tusgsal) and Renfe Local Lines (except the stations of St. Feliu de Llobregat, Gavà, Viladecans, Castelldefels and the Airport). The T-10, T-50/30, 1-zone T-Mes and T-Dia tickets came into operation, the services offered in the integration system by the franchisees of the Autonomous Government of Catalonia: Autocorb, Empresa Casas, Autos Castellbisbal, Mohn, Transports Públics, Soler and Sauret and Transports Generals d'Olesa. As of this date the 1-zone T-Mes and T-Dia cards on suburban and local services of the Railways of the Autonomous Government of Catalonia, Sarbús, La Vallesana, Autocars Font and Empresa Plana also came into operation.
- June 1, 2001: The T-Mes, T-Dia, T-10 and T-50/30 tickets came into operation in the stations of Renfe Local Lines: St. Feliu de Llobregat, Gavà, Viladecans and Castelldefels; and T-Mes to the Airport.

- June 30, 2001: The services offered in the integration system by the franchisees of the Autonomous Government of Catalonia: Asser, Cingles Bus, Fytza, E. Sagalés, Hispano Igualadina came into operation, as did the urban services of Sabadell with the Transports Urbans de Sabadell company and the urban service of Sant Cugat with the Marti and Renom company.

On this date the urban transport services of Sabadell and Sant Cugat del Vallès were also added to the system.

- August 1, 2001: The Valldoreix (Saiz Tour) urban service joins the fare integration system.
- August 15, 2001: The services offered in the integration system by the franchisee of the Autonomous Government of Catalonia, Cintoï Bus, came into operation.
- September 1, 2001: All the tickets of the Martí Colomer company, the franchisee of the Autonomous Government of Catalonia, are integrated.
- January 1, 2002: On this date all the services of Renfe Local Lines and the urban services of Mataró (Mataró Bus) and Castellbisbal were integrated.
- February 1, 2002: Integration of the interurban services of Bus Castellví.
- March 1, 2002: Integration of the interurban services of Marès-Trans.
- April 1, 2002: Integration of the interurban services of Empresa Pous.
- October 1, 2002: The urban service of Rubí and the Port bus service (TCC) integrated.
- October 14, 2002: The Capellades shuttle bus is integrated (Montferri Hnos)
- January 1, 2003: Scheduled date for the integration of Hispano Llacunense and of the urban services of Terrassa, Granollers and El Papiol.
- January 1, 2003: The Hispano Llacunense and the urban services of Terrassa are integrated.
- January 15, 2003: The urban services of Granollers are integrated.
- March 3, 2003: the urban transport of Mollet del Vallès is integrated.
- April 24, 2003: the urban transport of Molins de Rei is integrated.
- May 2, 2003: the urban transport of Cerdanyola del Vallès is integrated.
- May 5, 2003: the urban transport of Vilassar and Cabrera is integrated.
- May 7, 2003: Masats Transports Generals S.A. and the urban transport of Igualada are integrated.

4.6 Communication to users

Successive communication campaigns have been conducted to explain to the citizen how the Integrated Fare System operates and the changed fares.

4.7 Evaluation of the Integrated Fare System

In 2002, 244.49 million € (without VAT) were earned from the sale of ATM integrated tickets. This entails a growth of almost 20% with regard to the sales of integrated tickets at the end of 2001, which were 203.92 million € (without VAT).

551,995 million validations made with ATM integrated tickets during 2002, whereas the figure for 2001 was 461,614 million integrated journeys. This increase is 19.58% with regard to 2001.

In 2002, total validations of the Metropolitan Public Transport System are estimated at 799.5 million. This figure is an increase of 5.73% versus 2001. The accumulated increase since the introduction of fare integration is 12.7%.

One of the outstanding results is the increase in intermodality in journeys on public transport: this index stands at 20.94% for the whole Metropolitan Public Transport System, whereas before the implementation of Fare integration (as is shown in the attached table) the value was 8.3%. If we analyse these data taking only integrated tickets into account, the values obtained are around 30%, i.e., three of every ten journeys with integrated tickets are made on more than one transport mode.

4.8 Citizen's appraisal of the Integrated Fare System

Recent surveys conducted reveal an 8 out of 10 rating of the Integrated Fare System and a degree of awareness of more than 70% in citizens of the Metropolitan region.

4.9 Costs of implementing the Integrated Fare System

The costs of implementing the Integrated Fare System are comprised mainly by those incurred in the installation of the Validation and Sale System, officially approved by the ATM, in operators who did not have this system. The different public operators had already implemented Validation and Sale systems that were compatible with each other with a view to future fare integration. Therefore, the main cost of implementation is due to the integrated private bus operators and the establishment of a communication system with the ATM and of specific information treatment systems in the ATM and operations management programmes.

Scope and costs of the Fare integration

Scope of the Fare integration project
Sale and Validation System (SVV) for 28 operators (650 buses)
Fare integration Management System (SGIT) in the ATM

The global cost of the project amounts to 7.21 M €, broken down as follows:

Subsides for the SVV of bus operators	6.73 M€
Machines and programming of the SGIT in the ATM	0.48 M€

5. Network integration: global planning

5.1 Infrastructure Master Plan 2001-2010

The PDI 2001-2010 is the consensus-driven response by the Administrations in charge of public transport infrastructure needs in the short- and medium term in the metropolitan region of Barcelona. Structured in four action Programmes (Extension of the network, Modernisation and improvement of the existing network, Changeover Points and Actions on the state railway network) (see map), the PDI provides for a total investment of 7,295.7 million €, according to the attached financing chart.

5.1.1 Methodology

The process of preparation designed defines four main sequential phases:

- a) Collection and preparation of information which, along with the background and the basic information from administrations and operators, will give a first overview of the state of the metropolitan TPC System.
- b) Drafting of the *System Diagnosis and Guidelines for the PDI*, a document which is put to the Administrations and operators, and then approved.
- c) Preparation of the proposals for action in infrastructures and priority setting thereof by means of the *Methodology of evaluation of investments in public transport*, also examined and approved.

- d) Preparation of the PDI proposal including the revised Diagnosis and Guidelines, the Action programmes and the relevant economic-financial study.

Once the status of the public transport system had been analysed in the PDI, and its shortcomings diagnosed vis-à-vis the mobility scenarios for 2010, the main and strategic objectives were defined, as well as the guidelines for preparing the Plan.

5.1.2 Action programmes

The actions contained in the document definitively approved on June 25, (shown in the attached plans and charts) have been grouped into the following chapters:

- Network extension programme: it includes the extension actions being carried out on the current Underground and FGC rail network, as well as the new Underground line 9, the new L12 Sarrià-Castelldefels railway line and the introduction of the tram as a new mode of transport. These actions have been addressed to provide coverage with a high-capacity mode to areas of high density mobility (generation and attraction of journeys) which do not at the moment have a fast and efficient service for making metropolitan journeys or trips.
- Changeover programme. This programme will boost interconnections between the different lines of public transport, to increase the network effect and reduce the deterrent effect of changeovers. Mention must be made of the action to be carried out on the Central changeover at Plaça Catalunya, which will become a powerful nexus of public transport, as well as the changeovers at Sants and Sagrera, Sarrià, Arc de Triomf, from Torrasa to l'Hospitalet, Cornellà, Martorell or Barberà del Vallès.
- Modernisation and improvement programme. The actions included in this programme can be divided into three groups: infrastructure actions related to the territory, improved comfort and quality of the service offered to the public transport client and finally action on the existing network to facilitate operation. In this section, mention should be made of the purchase of rolling stock, station improvements and specially the adaptation of the latter for people with reduced mobility.
- Actions on the state rail network. Here, some actions target extending the network, the remodelling of existing lines, partial track splitting and improved service. The main actions included in this programme are linked to the deployment of the TGV in the metropolitan area of Barcelona.

5.1.3 Funding of the PDI

The aforementioned ensemble of actions will be **funded** differently, depending on how they are characterised. Thus, the sources of funding have been defined as follows:

- Funding agreements for infrastructure (a 2/3 contribution from the Autonomous Government of Catalonia and 1/3 from the General State Administration) for network extensions and infrastructure improvement.

- Contract-Programmes with the participation of all Administrations for investments in modernisation and the improvement of the existing network in terms of improving the way the service is operated.
- Specific funding for the tram, with a deferred capital input from the Autonomous Government of Catalonia and compensation to the private franchisee – by a technical rate – for the operating deficit, plus an investment royalty.
- Own funding for the Underground line 9, to be defined by the Autonomous Government of Catalonia. A similar system may be used to fund the Sarrià-Castelldefels line 12.

PDI 2001-2010. Plan of actions