

A new transport infrastructure policy

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1. The transport infrastructure crisis

It is highly likely that summer 2007 will be remembered as the one in which a serious infrastructure crisis was announced in Catalonia. This is at least the generic idea without reservations which, on the basis of being repeated by some sections of the media, appears to have made an impression on public opinion. Let's look at what happened that summer. In the mass holiday departure of the first weekend of August there were 70 km traffic jams on the AP-7 towards Tarragona to such an extent that the Ministry of the Interior obliged ACESA to raise the toll barriers. For some, this was a clear indication of the serious crisis being experienced by Catalonia due to an insufficient provision of dual carriageways and motorways.

But on the following day the press indicated that the same had occurred in France but on no less than 800 km on practically the entire French motorway network – almost half of which are toll roads – without our neighbouring country unleashing virulent campaigns demanding the extension of the road network or the abolition of tolls, which is what occurred in Catalonia with the support of the people travelling by car and, surprisingly, also of part of the Catalan government. The departure operations have always generated traffic jams, in Barcelona and in any other city of the world. And the way to solve them is not by expanding motorways which generate increasingly big standstills, as demonstrated in the United States, but through a decisive commitment to public transport, in particular the railway, which is the one which has an enormous capacity to move people quickly while occupying little space.

What has really happened for forty years is that in Catalonia we have had a transport system which relies on the mass use of the private vehicle with an inadequate public transport network which in recent years has only received the attention of the authorities in relation to the high-speed train and the Barcelona underground railway, the two types of infrastructure which have received all the public money. For example, just the Madrid-Barcelona-French border high-speed train line will receive 9 billion euros and line 9 of the Barcelona underground – announced amid great hype as the longest in Europe – 6 billion euros according to the latest estimation by the Department of Town and Country Planning and Public Works. Apart from these investments, the rest of the public transport network has generally received very little attention, possibly with the exception of the FGC (Generalitat of Catalonia Railway).

Thus, the model of investments in transport infrastructures that Catalonia has been applying since the 1970s could be characterized as follows: underground railway for Barcelona and roads and dual carriageways for the rest of the country. The car has been the “natural” solution to solve the citizens’ mobility problems. Public planning in favour of roads has encouraged a detrimental model, which appears to have taken root

in the collective imagination, and in which it appeared that everything could be solved with the car.

The real crisis in Catalonia is not the infrastructures but rather a mobility model that has given way due to the sum of four factors: diffuse urban development, the deeply-rooted culture of inequality with Madrid, the intrinsic inefficiency of the private vehicle and too fast an enrichment of Catalan society which has not yet been digested.

1.1. Diffuse urban development

In thirty years of democracy, the surface area occupied by Catalans has doubled in relation to that occupied in the previous two thousand years. In other words, from the Roman Scipios to Tarradellas, Catalonia conquered as many hectares of nature as during Jordi Pujol's twenty-three year mandate to install its housing, economic and transport infrastructures. While between 1977 and 2003 the Catalan population increased by 18%, the occupied surface area rose by 100%. This growth was not concentrated in neighbourhoods with high or medium density but in estates with low densities of some 30 dwellings per hectare, and in a fabulous quantity of m² occupied by roads and dual carriageways, 97% of the new space dedicated to infrastructures.

It appears that the model advocated by President Macià of the house and garden – our version of the Anglo-Saxon model – was well-established in the heads of many citizens who requested this kind of housing, in the face of the passivity of the town planning authorities, because it was the one that apparently allowed them to be happy.

The consequence of all this has been that many people have developed an intense dependence on the private vehicle, because in areas of low density it is really ingenuous to think that the public transport networks can operate efficiently. This is why, in many homes of Catalonia, there are as many cars as driving licences in the family.

1.2. The culture of inequality with Madrid

The nationalist parties play a central role in Catalonia. Since the return of democracy there have always been parties in the Catalan government which declare themselves expressly nationalist, either alone or in a coalition. Inequality, in particular compared with Madrid, can be found among the driving forces of nationalism. It just so happens that, since the right wing conquered the community of Madrid, in the 90s, one of its identifying marks has been infrastructures and strong dynamism in the construction sector. In this respect, it is not surprising that there is a majority of Spanish companies among the world's leading construction companies.

Catalan nationalism, instead of looking toward Europe to see how the countries to the north of the Pyrenees solve their congestion problems, increasingly applying management rather than merely infrastructure policies, has preferred to compare itself with the capital of Spain, to copy what they are doing and, if possible, making the infrastructures even bigger. In Catalonia, the main driving force of demand for infrastructures is a mistaken and provincial conception of territorial inequality with the city of Madrid.

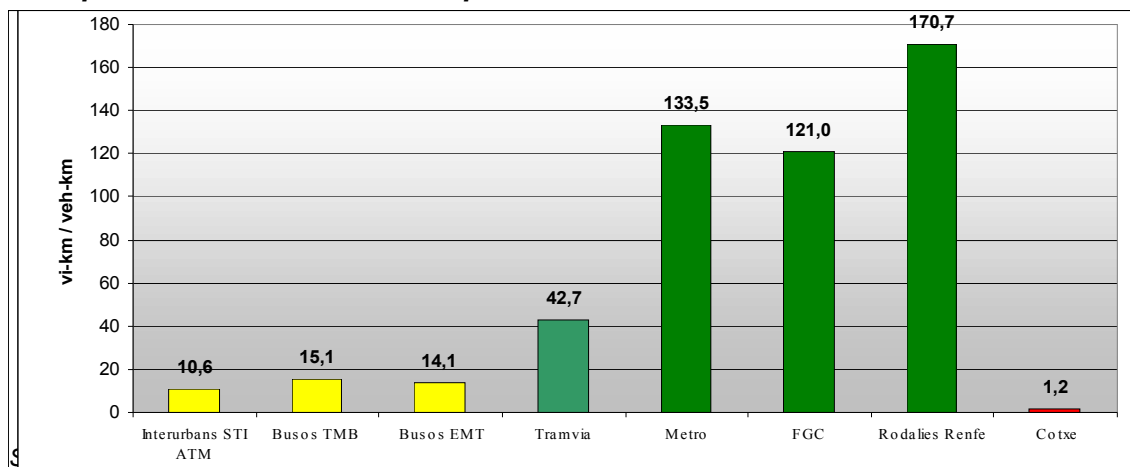
1.3. The intrinsic inefficiency of the private vehicle

The private vehicle is doubly inefficient, due to its low occupation and its low energy efficiency. As regards occupation, let's look at the figures: 80% of vehicles circulating in Catalonia transport only one person, 18% transport two and only 2% transport three or more passengers. On average, the occupation of a car is 1.2 people. On the other hand, as seen in figure 1, public transport has very high levels of passenger occupation.

To travel at a standard speed of 80 km/h a car needs a vital safety space equivalent to a surface area of 100 m². This information results simply from applying the safety distances, in front and behind, multiplied by the dynamic traffic model. As most cars which travel around the congested metropolitan region only have one person in them, in terms of occupation, it is as if each citizen leaving home each morning to go to work by car placed around his body some rigid cardboard of 100 m² and, with it, went driving on the road network. The 400,000 vehicles on the move simultaneously in the rush hour of a working day in the first and second ring of Barcelona need a space of at least 40 km² to travel freely. It is materially impossible for this to occur in areas of high urban density such as the area around Barcelona. Figure 1 shows the passenger occupation level of each transport system in Barcelona Metropolitan Region.

Figure 1

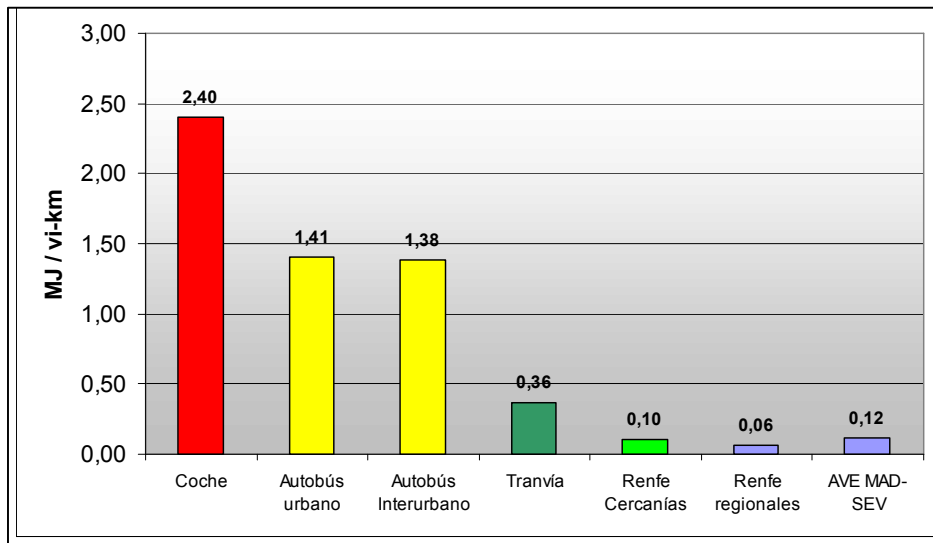
Occupation of the different transport vehicles in Catalonia. 2005.



Starting from the occupation and fuel consumption level of each vehicle, it is easy to deduce the specific consumption of each transport system per passenger transported. This information appears in figure 2.

The high efficiency of the railway system is based on the modern electric traction motors, with the addition of energy recovery systems and the low wheel-rail friction, two times lower than that of tyre-asphalt, offering, overall, an energy efficiency of up to 70%, between 3 and 5 times greater than that of a conventional car. There is moreover a high occupation of passengers. The sum of both factors determines that its unit consumption per passenger-km transported is up to 20 times lower than that of the car.

Figure 2
Energy consumption by type of transport in Catalonia. 2005.



Source: Own preparation from Renfe and ATM data

From the chart it can clearly be deduced that the transport systems, as regards energy efficiency, can be classified in two blocks: those with combustion engines and those with electric motors. We should note that if a car has, for example, three occupants instead of an average of 1.2 people, its energy efficiency per passenger transported would be the same as that of a bus.

1.4. Too fast an enrichment of Spanish society which has not yet been digested.

In 40 years Spain has gone from being one of the poorest countries of Europe to exceeding the EU average of per capita disposable income. This undeniable fact clearly demonstrates that the Spanish have increased their wealth faster than the rest of the European citizens. History demonstrates that when someone leaves poverty and becomes rich, they think that they can buy anything with money. In Catalonia we wanted to buy the solution to the problems of congestion with the money provided by the new situation of economic prosperity. And we took a liking to high-calibre public works.

This is why we became determined to build line 9 of the metro, which will be the longest in Europe, although in size Barcelona is a small European city. This is why we built the Forum of the Cultures Square and at the time it was explained to us that it was the second biggest square in the world, after Tiananmen. This is why we meekly accepted the construction of the high-speed train line between Barcelona and Madrid, which was to be the fastest in the world, at 350 km/h, although it was built at the expense of the resources necessary to maintain the suburban trains that we take each day. And this is why the Catalan government now wants to build 2,800 km of new “toll-free” dual carriageways when almost no-one is building new ones in western Europe, or a new high-speed train which would cost 7 billion euros between Girona and Lleida, passing inland, although the new population served would not even reach 200,000 inhabitants.

This list of infrastructure projects is a clear indication that the idea that we need many infrastructures and, if possible, major projects which are paid for by Madrid, has a considerable level of acceptance in Catalonia.

2. Transport infrastructure provisions in Catalonia

As can be seen in figure 3, the provision of motorways per inhabitant in Catalonia is of 0.19 km/1,000 inhab., one of the highest in Europe, and 60% higher than the average European provision. The Spanish provision is even higher and positions Spain as the leading European country in this subject among the big countries. On the contrary, the railway provision per inhabitant in Catalonia is one of the lowest of Europe, 0.25 km/1,000 inhab. This imbalance will not be corrected with the Madrid-Barcelona-French border high-speed line, as the almost 400 km that will be added to the inventory, corresponding to the section that will pass entirely in Catalonia, will only make the Principality rise two places in the classification.

Figure 3

Transport infrastructure provision in Catalonia compared with other European countries. 2006.

	km motorway per mill. inhabitants	Ranking
CY	357.7	1
LU	323.1	2
ES	239.2	3
SI	238.8	4
AT	203.5	5
PT	190.1	6
DK	189.8	7
Catalonia	185.8	8
CH	182.1	9
SE	176.6	10
FR	171.4	11
BE	165.5	12
NL	155.8	13
DE	146.0	14
EU15	141.0	15
FI	124.7	16
EU25	124.7	17
HR	124.7	18
LT	121.7	19
IT	111.0	20
UK	60.1	21
SK	58.1	22
HU	53.7	23
CZ	50.7	24
NO	46.2	25
IE	42.8	26
BG	42.3	27
TR	26.3	28
PL	10.6	29

Source : Eurostat, IDESCAT and PTP

	km railway per mill. inhabitants	Ranking
SE	1224.8	1
FI	1117.3	2
LV	984.2	3
CZ	939.5	4
NO	884.4	5
HU	787.3	6
EE	712.0	7
AT	705.2	8
SK	679.1	9
SI	615.2	10
HR	613.5	11
LU	604.4	12
BG	556.4	13
PL	521.3	14
LT	517.9	15
RO	505.1	16
FR	483.3	17
IE	467.0	18
DE	437.0	19
CH	435.4	20
EU25	433.3	21
DK	420.0	22
EU15	393.8	23
BE	337.1	24
ES	334.3	25
UK	284.0	26
IT	278.6	27
PT	267.6	28
Catalonia	240.6	29
EL	218.0	30
NL	172.4	31
TR	121.4	32

Source : Eurostat, IDESCAT and PTP

Catalonia already has one of the best per inhabitant provisions of high-speed railway, not just in Europe, but in the world. The problem is that the conventional network is

completely undercapitalized, because it has suffered from many years without investment. And this has been going on for a long time, as successive socialist, conservative, and now again socialist governments have denied that there is any problem because they were only interested in building the high-speed train. If its huge investment had been shared among the whole railway system, as occurs throughout Europe, Catalonia would now have a rail network with great capacity, without congestion and without as many breakdowns, with a quality comparable to that of countries such as France, Germany or Switzerland. The provincial all-out commitment to the high-speed train has caused great problems for the millions of people who regularly use the conventional railway.

Moreover, if the governments had been committed to improving the railways and the public transport which connects Barcelona to the areas of Tarragona and Girona, using regional trains with eight coaches and a frequency of every 20/30', instead of being 100% committed to a high-speed train whose main aim is to travel to Madrid quickly, we would not have any problem during the holiday departure operations, except for the logical congestion suffered by Barcelona, as occurs with all European cities. The rash decision to make the high-speed train enter the city through Sants made things even worse, highlighting the deterioration of the day-to-day rail network, the one used each year by almost 140 million people, the one which could really solve the daily mobility problems.

Outside the urban continuum of Barcelona, we find the main points of congestion in the Vallès, in the airport and very intensely in two or three departure operations a year in the areas of Tarragona and Girona.

Catalonia has a more than sufficient provision of dual carriageways, high-speed trains, airports and ports to confront the challenges of the coming years. However, it does not have a sufficient provision of conventional trains, which are the ones which transport the people, or of public transport network, which is only powerful in the urban continuum of Barcelona.

3. Catalonia plans public transport while it builds roads

Catalonia must be one of the countries of Europe which has planned its public transport the most intensely. Once each term of office, the government of the day approves at least one passenger plan and one public transport infrastructure plan, which is reviewed again every four years. But as the statistics and the advertisements published by GISA show, the real Catalan speciality for years has been that of building roads. Only Spain exceeds us in this skill. Catalonia has never been characterized by having political leaders interested in changing a certain sectorial policy. The tradition of the ministry of public works is that of executing the works requested by the territory, not those requested by the general interest with a strategic vision.

And if the mayors who visit the ministry request roads to solve the congestion suffered by their territory, the ministry takes notice because this brings in votes. What could we expect from the point of view of mayors who have travelled exclusively in their private vehicle from the age of twenty? The duty of true statesmen is to exercise the mastery which allows a higher institution, such as a ministry, to explain to all the representatives of the territory that the true solution to the problems of congestion is not to expand roads indefinitely so that cars with just one driver which cause eternal problems can drive on them, but rather to back a transport system which solves these problems,

public transport. This may not bring in many votes, but it would provide lasting solutions.

4. The solutions offered by rail

The question of how to tackle the problems of congestion with an infrastructure provision which does not burden our health, our long-term competitiveness, our financial standing and our international environmental commitments, has a dual answer. First, by building infrastructures for efficient transport – suburban trains and trams – and, second, by applying management policies, basically transferring passengers and goods from means of transport which waste energy and space and pollute – that is, cars and lorries – to public transport – trains, tram-trains and buses – and goods trains, seeking to develop the great potential of sea transport at the same time. Also, we should not forget the great possibilities offered by a policy in favour of a more rational use of the car, above all if clear incentives are offered for tolls, car parks and facilities on accessing Barcelona.

We should therefore welcome initiatives such as those that the Association for the Promotion of Public Transport, the PTP, has just presented, consisting of a railway plan baptised with the name Train Plan 2014. The plan proposes developing a new railway framework for Catalonia, at present clearly insufficient to meet the citizens' needs, reducing congestion and pollution, and fighting against climate change. In the five months which have passed since its presentation, the Train Plan 2014 has achieved a very considerable level of political (CiU, ERC and ICV), and social support, in addition to that of the experts in railway and public transport planning. It is beginning to be considered that the Train Plan 2014 is probably the best rail plan ever created in Catalonia.

The foundations for this plan can be found in the Train Plan 2000 (*Bahn 2000*) for Switzerland, a country with a similar surface area and demographic volume to that of Catalonia, where they have succeeded in greatly improving their rail network on the basis of a series of actions carried out in the last decade of the 20th century, with a relatively modest investment, 6 billion euros in today's terms. The Swiss railway has been modernized from a triple consideration: small and medium-sized actions on the infrastructure to gain capacity and speed, without considering, for example, new high-performance lines, such as the Spanish high-speed train; a considerable improvement in the rolling stock provision; and a new "hub" timetable structure. In just five years passenger rail transport in Switzerland, measured in passenger-km, increased by 25% and it is still growing.

The maps in figures 4, 5 and 6 show the rail network and services that could be achieved if the forecasts of the Train Plan 2014 are implemented.

Figure 5
Basic Catalunya Express service network. Train Plan 2014

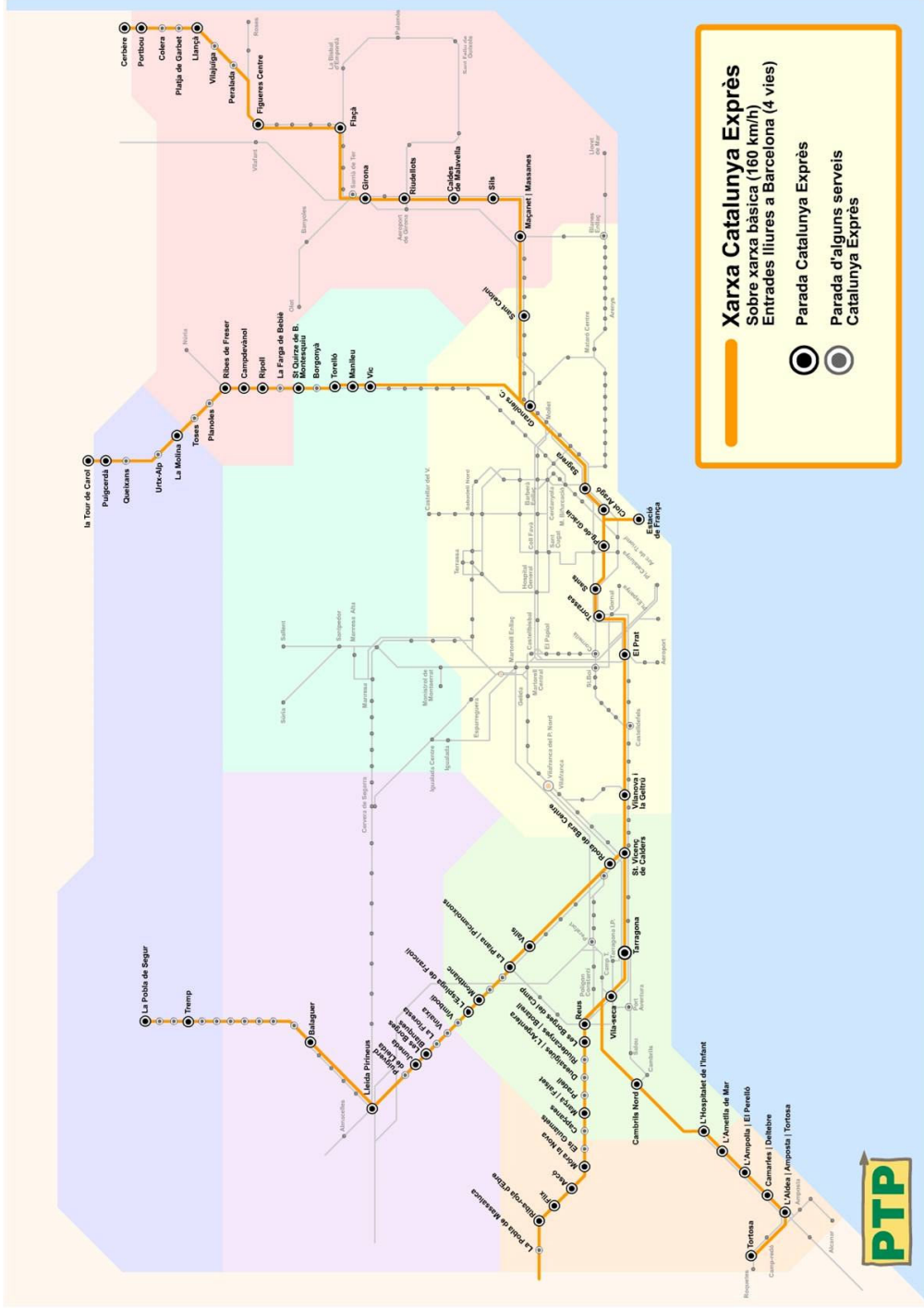
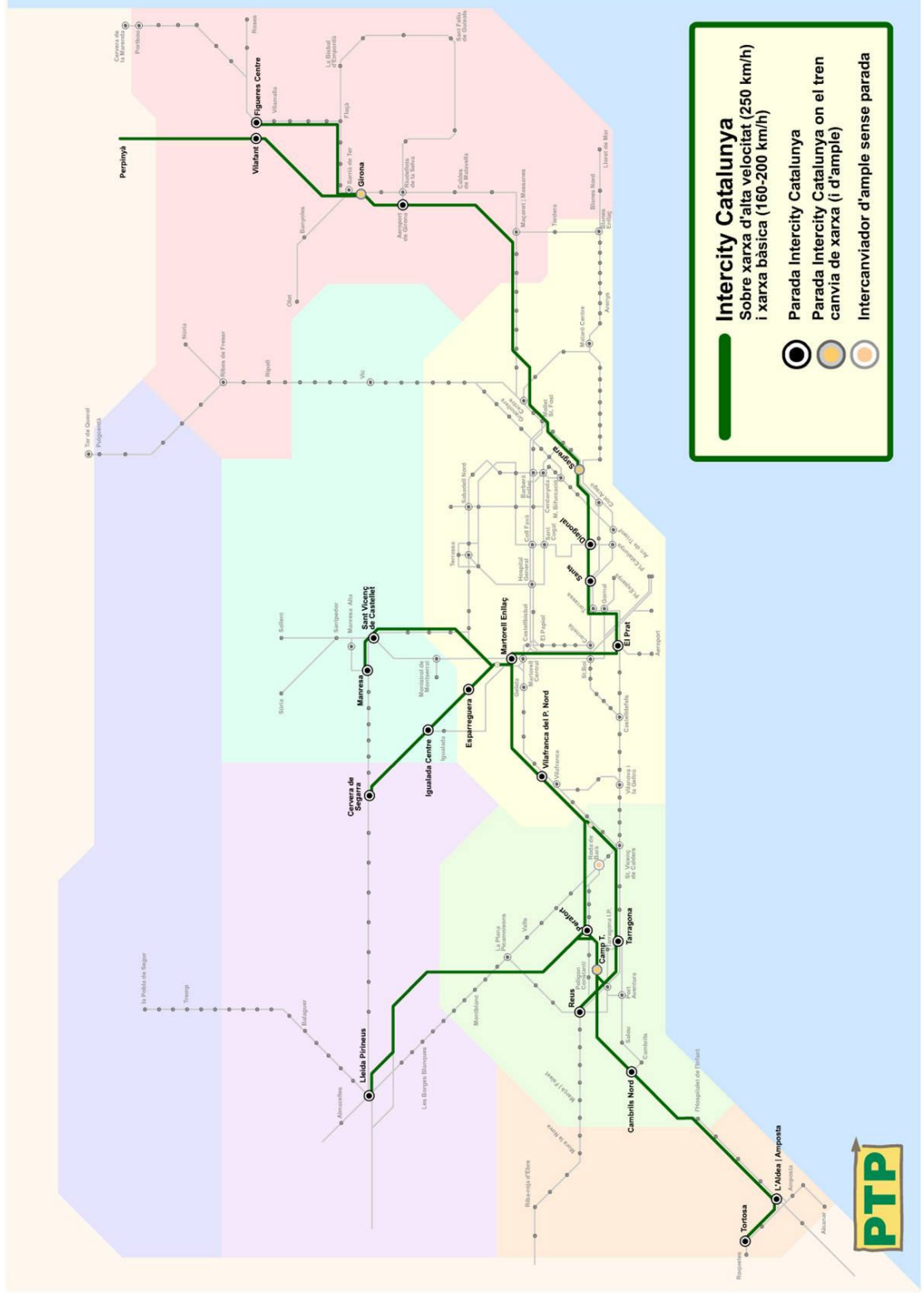


Figure 6
Basic Intercity IC service network. Train Plan 2014



The Train Plan 2014 contributes significant new developments in relation to current planning:

There is a clear commitment to daily (Regional and Suburban) trains which are, by a long way, the ones most used by Catalans, correcting the current trend of the railway system which is aimed at a two-speed Catalonia: on the one hand, very-high-speed trains which pass far from the real Catalonia, with a commercial speed of 200 km/h, and, on the other hand, Suburban trains, which will be increasingly slow, and which will find it very difficult to exceed a commercial speed of 40 km/h, because they have to stop at an increasing number of stations.

To solve this conflict between speed and accessibility of the territory, the Train Plan 2014 proposes three lines of work:

- Remodel and extend the basic rail network (currently Iberian gauge).
- Use as much as possible trains with change of gauge so that they can use the new high-performance line as if it were a rail motorway, at the same time maintaining the accessibility of the stations to the traditional rail network (Tarragona, Reus, Figueres, Tortosa...).
- Reinforce the intermodality: more interchange stations on more direct lines.

All major European metropolitan regions have semi-direct services which are not high-speed but which connect the most important towns quickly. None of the major European urban areas, such as Paris, London, Berlin or Madrid, base their rail network on a dual concept: a very-high-speed train and an increasingly slow suburban service. In Barcelona, on the other hand, it now takes longer to travel from Sabadell or from Blanes to Barcelona than 20 years ago.

At the same time, the Train Plan 2014 foresees an increase in the number of trains that stop at all the stations without this damaging the other services.

Just like the Swiss Train Plan 2000, its Catalan namesake proposes mitigating the current problems of congestion and low speed, at the same time extending the rail network throughout Catalonia with the aim of 94% of the population having a nearby station, all the regions with more than 50,000 inhabitants having at least one station in the most populated municipality, and all the municipalities of 30,000 inhabitants having at least a railway station or tram service.

With the aim of combining frequency, accessibility and commercial speed, the Train Plan 2014 organizes four different levels of service:

a) Regional Metros and Tram-trains, as independent operations connected to the general network at more than one point and with different lines. In some cases the tram networks share tracks with suburban lines, like the new lines C12 and C17, and this is done with the construction of a third track which allows the circulation of trams with international gauge. The tram networks proposed, in addition to those operating in Barcelona, are: Camp de Tarragona, Girona-Costa Brava, Terres de l'Ebre and Vallès Occidental.

b) Suburban Catalonia, which replaces the idea of Suburban Barcelona, and which overall represents 16 lines distributed in the regions of Barcelona, Camp de Tarragona, Comarques Gironines, Ponent and Comarques Centrals. All the lines are connected beyond each district when they exceed its limits. In some cases semi-direct Suburban services are created to offset the great length of the lines, for example the C2; or in other cases the semi-direct services are taken on by different suburban lines: Catalunya Exprés or Intercity Catalunya. Their commercial speeds will be between 40 and 60 km/h.

c) Catalunya Exprés, as a system of semi-direct services which connect the most important Suburban stations to each other and stop at all the stations when they are close to the end of the route (Tortosa, La Pobla de Massaluca, Lleida Pirineus, la Tor de Querol and Cervera de Marenda), similar to the current service with the same name. New stops are added to increase the network effect and link up with all the Suburban lines. A new link to Vic, Ripoll, Puigcerdà and La Tor de Querol is also created. Their commercial speeds will be 90 km/h.

d) Intercity Catalunya, as a system of trains which partially use the high-performance network. They have automatic change of gauge and a maximum speed of 250 km/h (this is the Àlvia or the recent Avant types of train). Their mission is to connect the biggest and most distant towns of Catalonia without intermediate stops, using the high-performance line as a rail motorway and the basic network to guarantee the accessibility to the urban centres of Barcelona, Tarragona, Reus, Tortosa, Figueres, Lleida, Cervera and Manresa. Their commercial speeds will be 160 km/h.

The Train Plan 2014 has a series of realistic actions to be carried out in three stages, which will succeed in turning around the current rail service throughout Catalonia with an overall budget, prepared using realistic criteria and copying the Swiss principles of austerity, of some 7.095 billion euros. This amount is equivalent to the cost of building the Rail Transverse Axis, a 30-year project which in the Train Plan 2014 has short-term and much cheaper transitional alternatives, which at the same time generate numerous savings which are applied in the territory as a whole.

To offer this service, the new railway plan proposes actions on 400 km of track, new or through the laying of double tracks. They appear in figure 7 and are as follows:

a) Quadruplication of tracks on the sections Platja de Castelldefels – Torrassa, Sagrera – Granollers Centre and Castellbisbal/El Papiol – Mollet Sant Fost.

b) Doubling of tracks on the sections Montcada – Vic – Torelló; Arenys de Mar – Maçanet Massanes, El Prat – Airport.

c) New rail axes: Turó de Montcada tunnel, Granollers Centre – Mataró, Granollers Nord – Les Franqueses, Vilanova – Vilafranca, Martorell – Olesa / Viladecavalls, Blanes – Lloret de Mar, Martorell – Igualada – Cervera, Flaçà – Palamós, Sant Feliu de Guíxols – Riudellots, Castelldefels – Sant Boi – Cornellà, Reus – Roda.

d) New tram-trains: Cambrils Nord – Tarragona (conversion and reform of the current line) - Port Aventura – Vila-seca – Reus, Montcada – Cerdanyola – Sant Cugat - Barberà, Barberà – Sabadell – Terrassa, Súria / Sallent – Manresa Riu (conversion and reform of the current goods line), Palamós – St. F. Guíxols, Sarrià de Ter - Banyoles – Olot, Roquetes – Tortosa – Amposta – Alcanar (on current platform and partially on the land of the former Val de Zafán railway line).

e) Rectification of route (tempering of curves): Vic – Puigcerdà, Olesa – Vacarisses – Manresa, l'Arboç – Tarragona, Celrà – Figueres.

f) New gauge changers: l'Arboç and Girona Sud.

g) A wide range of new interchanges (stations).

If all the forecasts from this plan are carried out, with actions which could at least have begun by 2014 and have completely ended by 2020, Catalonia would have a rail network with a power comparable to the one that Switzerland has today. And all for just 7 billion euros, which, for example, is what the rail transverse axis would cost according to the budget that its authors have presented.

Barcelona, May 2008