Certu

This leaflet inaugurates a series devoted to the analysis of mobility

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Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

MINISTÈRE DE L'ÉCOLOGIE, DU DÉVELOPPEMENT ET DE L'AMÉNAGEMENT DURABLES

Mobility: facts and figures

Leaflet n°1

July 2007

Guided public transport systems in France Data for 2005 in the provences

In 1998, Certu undertook a review designed to compare agglomerations in France that are operating or have planned right of way transport systems. Updated in 2001, this is the analysis based on data for 2005. Data sources included:

- the Certu-DGMT-Gart-UTP database on urban public transport (TCU) gathered in 2006 by the Cete agencies relative to urban transport perimeters (PTU)
- and a telephone survey carried out by the Cete of Lyon questioning operators

Given that "right of way" is a very broad term which can lead to confusion, it was decided to refer to guided public transport systems (TPG, Transports Publics Guidés) distinguishing between three different types of systems :

- metro systems run exclusively on reserved sites (no intersection, no access to platforms for other vehicles) and are generally underground systems. They may be automatic, such as Line D in Lyon, or light automatic vehicle (VAL, Véhicule Automatique Léger) systems, such as in Lille
- tramway systems refer to rail vehicles (metal wheel on rail) that mainly run on the urban road network and are driver operated
- tyred guided systems run on rubber tyres and are guided by means of a central rail, cameras or magnetic systems. A distinction is usually made between "guided buses" that abide by the highway code (TEOR, TVR and Phileas) and "tramway on tires" which are completely guided systems and may measure more than 24.5 m in length (Translohr).

For the purposes of analysis, a colour code was defined to identify the agglomerations involved more easily:

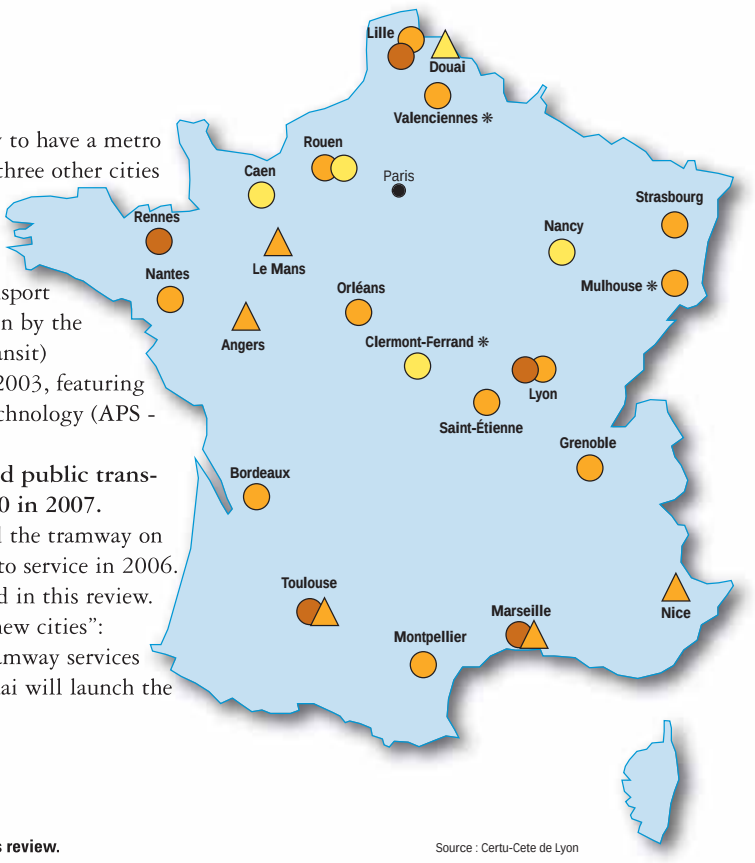
cities with a metro system as the main system
cities with a tramway system as the main system
cities with a tyred guided system as the main system

New cities and innovation

While Rennes became the fifth French city to have a metro system in 2002, between 2002 and 2005, three other cities joined the club of cities with guided public transport systems:

- Nancy and Caen both opted for a new system in 2002 : Bombardier TVR (Transport sur Voie Réservée) technology, also known by the English acronym GLT (Guided Light Transit)
- Bordeaux's tramway network opened in 2003, featuring innovative ground-level power supply technology (APS - Alimentation Par le Sol)

In 2005, 15 cities in France had a guided public transport system. This number will rise to 20 in 2007. Mulhouse's and Valenciennes' tramway and the tramway on tires in Clermont-Ferrand were brought into service in 2006. However, they are too recent to be included in this review. Work has begun on construction in four "new cities": Nice and Le Mans are due to open their tramway services in 2007, followed by Angers in 2009. Douai will launch the first magnetically guided bus in 2008.



◯ Guided public transport in service on 31-12-2006

△ Guided public transport works underway in 2007

✻ Opened in 2006, these systems are not analysed in this review.

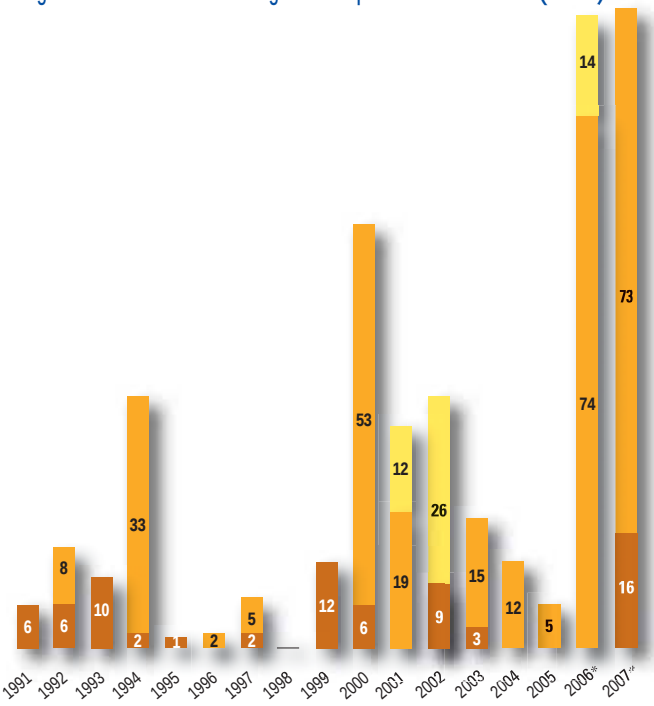
Source : Certu-Cete de Lyon

Guided public transport systems

More new systems opened, to coincide with election dates

The influence of local municipal elections (1995, 2001 and 2008) on the periods during which guided public transport systems are opened is becoming increasingly manifest. Public transport services have become a major issue on which local elections are fought.
While 71 km of guided transport track opened in the period 1998-2000, over 170 km are due to open between 2005 and 2007 - a record!
The pace is unlikely to slacken between now and the 2014 elections, in light of the schemes planned by several cities (Toulouse, Reims, Le Havre, Brest and Tours, etc.) while older networks will continue to expand.
At the same time, as is the case in Douai, other smaller agglomerations may well opt for guided or unguided Bus with High Level of Service (BHLS, French BRT). BHLS are cheaper than tramways and are perhaps better suited to potential passenger use and available resources in such areas.

Length of infrastructure brought into operation since 1991 (in km)



Source : database on urban public transport, Certu-DGMT-Gart-UTP

* estimate Certu

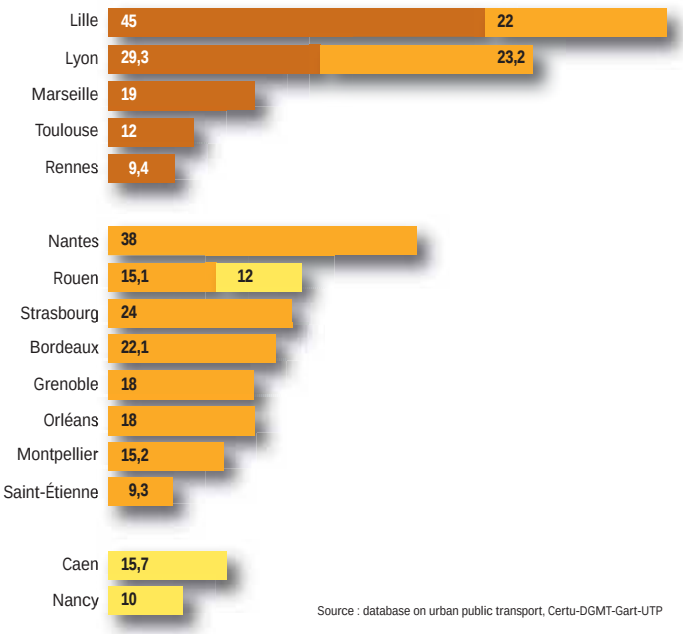
More structured networks

In 2005, three networks were noticeably better developed than others: Lyon, Nantes and Lille.
By 2007, Bordeaux, Strasbourg, Lyon, Grenoble and Montpellier will also boast light rail networks covering over 30 km.

Structural development of the more expensive VAL systems takes much longer: fourteen years after its first line came into service, Toulouse will be opening a second line in 2007, while Rennes plans to open its second line in 2018.

In 2005, there were:
- 115 km of metro track, including 66 km of VAL track
- 205 km of tramway track
- 38 km of tyred guided systems

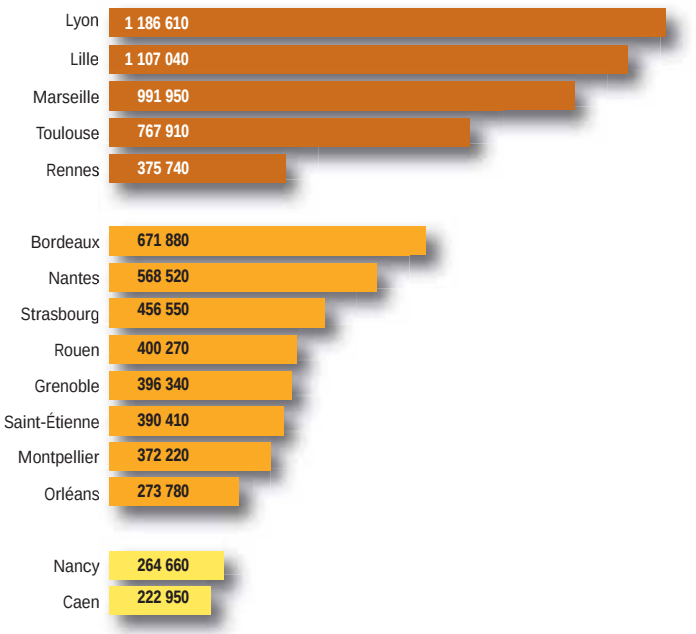
Infrastructure length (in km)



Source : database on urban public transport, Certu-DGMT-Gart-UTP

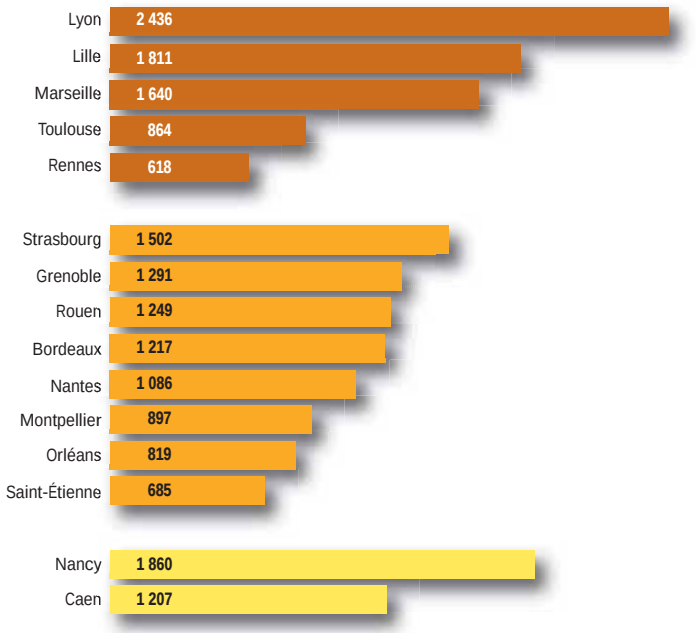
Context data

PTU population (last national census in 1999)



Source : database on urban public transport, Certu-DGMT-Gart-UTP

PTU density (inhabitants per square km)



Source : database on urban public transport, Certu-DGMT-Gart-UTP

The choice of system : a threshold effect ?

The urban transport perimeter, or PTU (périmètre de transports urbains) defines the limits of the area for which the urban public transport authority is responsible. This may vary widely from one agglomeration to the next.

France's bigest cities began developing their guided transport networks more than twenty years ago.

Apart from a few extensions, they currently have no plans to build new metro lines. Instead, they are focusing on developing ground-level networks: tramway systems or BHLS.

With over 800,000 inhabitants, Toulouse opted for a VAL system, in 1993, and will be opening its second line in 2007.

Rennes seems a more atypical case. While other agglomerations with larger populations have deliberately chosen to develop tramway systems (Bordeaux, Nantes and Strasbourg), Rennes has opted for a VAL system.

Apart from Aix-en-Provence, Lens and Toulon, all the agglomerations with over 300,000 inhabitants have a tramway or metro already running or under construction.

For cities of between 200,000 and 300,000 inhabitants, the choice of system, between tramway and BHLS, is not so obvious.

PTUs are significantly less dense and where it is more difficult to provide public transport services

PTU density is often higher than 1,100 inhabitants per square km. Rennes, Saint-Étienne, Orléans, Toulouse and Montpellier have less dense PTUs, between 600 and 900 inhabitants per square km.

Following inter-commune cooperation encouraged by the Chevènement Act of 1999, fifty percent of PTUs saw their surface area increase and density decrease. Providing services to cover new areas is often problematic and more costly.

The following points should be noted :

- in Saint-Étienne and especially in Toulouse, the low density can be explained by the fact that the PTU has been extended to cover widely-spread periurban areas
- in Orléans, the PTU is small but not very dense
- in Lyon and Nancy, the PTUs are smaller than the agglomerations, hence density is very high

Guided public transport services

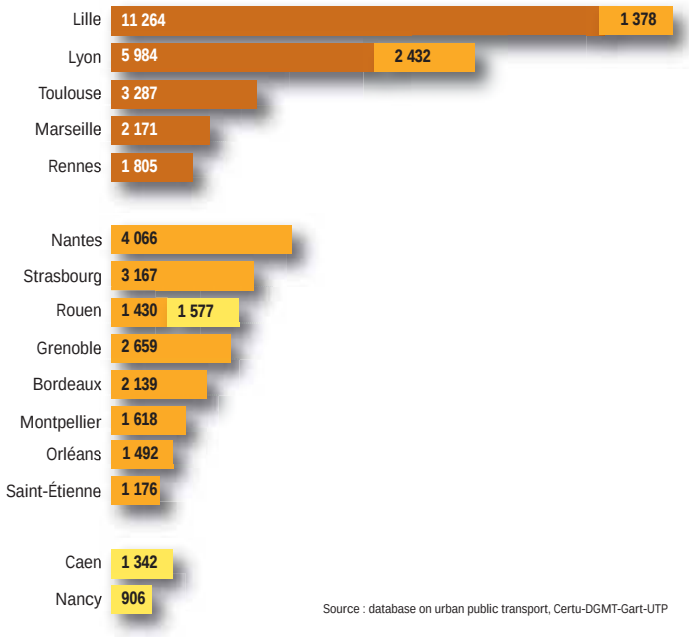
An extremely heterogeneous offer

The figures for Lille and Lyon are significantly higher than for other agglomerations due to a dense offer throughout the day and at night.

The tramway in Nantes, Strasbourg and Grenoble provide a better service than the metro networks in Marseille and Rennes.
The smallest networks tend to be the most heterogeneous. With an infrastructure only half its length, Saint-Étienne's tramway provides a service similar to that of Rouen's tramway.

It should be noted that in 2005, Marseille's network was disrupted by strikes, while light rail services in Saint-Étienne suffered as a result of extension work on the network.
In Rouen, optically-guided bus (TEOR) are gradually being brought into operation. In 2005, 12 km of reserved lanes had been laid. The three TEOR lines cover 26 km, including a 4-km common section.

Annual vehicle-kilometers covered according to type of guided transport system (in thousands of km)



Source : database on urban public transport, Certu-DGMT-Gart-UTP

A two-speed system ?

Définition :

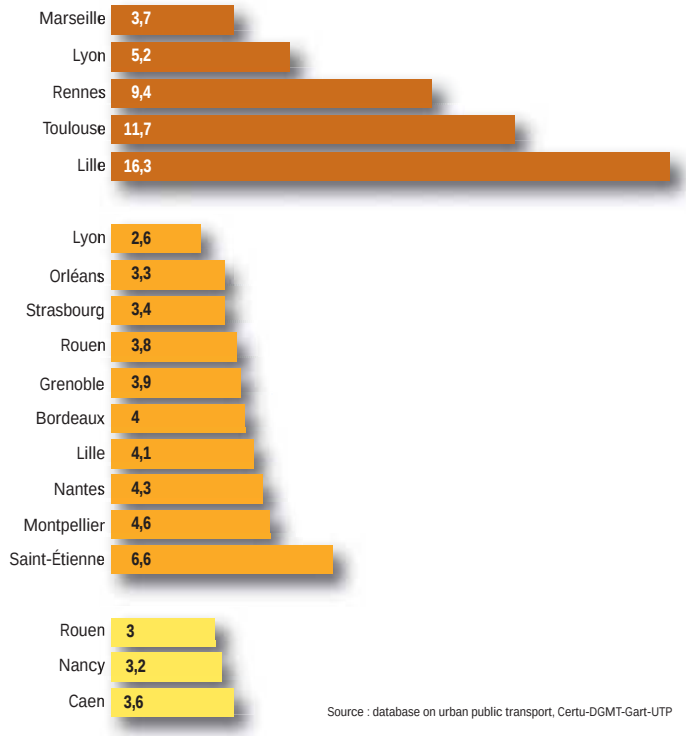
Theoretical frequency is calculated for 24/24 operation, 365 days a year. For more precise details regarding this calculation, see the complete review, which can be downloaded from the Certu website : www.certu.fr

Example of how to interpret the graph

In Lyon, for 1 bus, 2.6 trams and 5.2 metro trains pass.

The tramway and metro lines have naturally a higher frequency than the bus lines. Nonetheless, these differences vary greatly from one city to another.
They are particularly marked, and consistently more so since 2001, in Lille and Toulouse. VAL technology serves to achieve very high frequency. We may speak of a two-tiered system.
Figures for guided buses are often similar to those for tramway. Their theoretical frequency are three or four times higher than those of conventional bus.

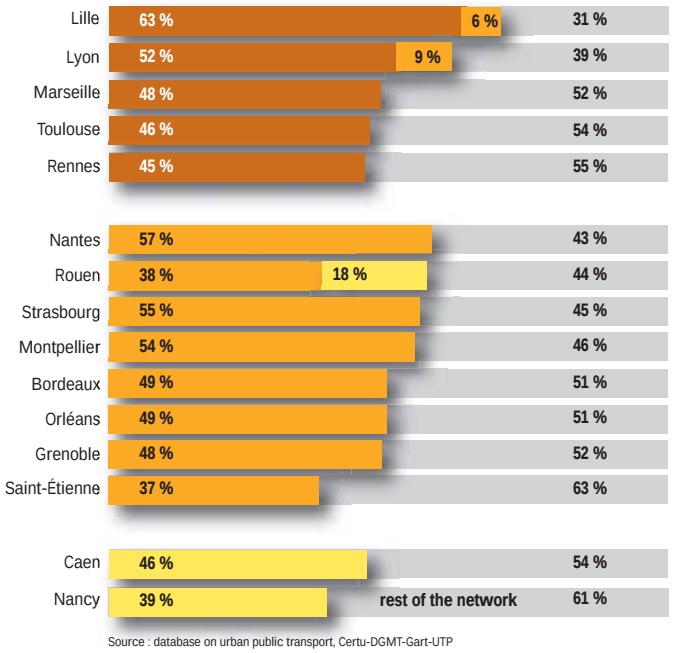
Ratio Theoretical frequency for guided transport systems / conventional bus services



Source : database on urban public transport, Certu-DGMT-Gart-UTP

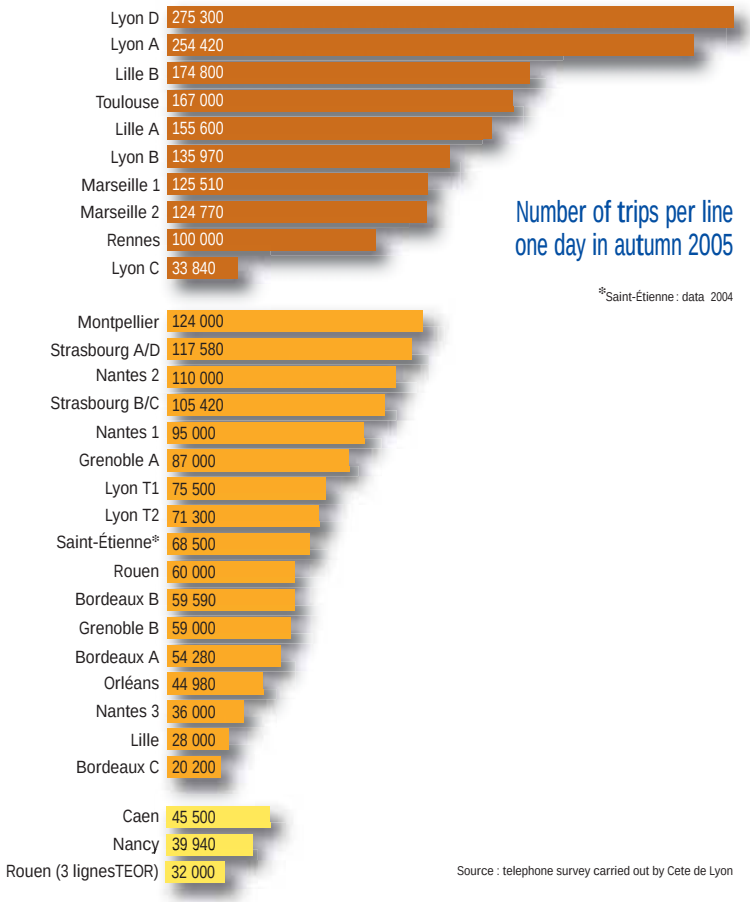
Use of guided public transport services

Part of guided transport use on each network



Source : database on urban public transport, Certu-DGMT-Gart-UTP

Number of trips per line one day in autumn 2005



*Saint-Étienne : data 2004

Source : telephone survey carried out by Cete de Lyon

The part of guided systems on public transport use is growing

Even though guided transport systems generally account for less than 20 % of the public transport network offer in terms of kilometres covered, they account for approximately 50 % of trips and this applies as of the opening of the first line :

• the first tramway line opened in Montpellier accounted for 53 % of trips on the public transport network in 2005

• the only metro line in Rennes accounts for 45 % of trips

In the 1990s, this figure was closer to 40 %.

Network restructuring thus tends to encourage growth in the use of feeder services.

On networks that include several lines, the percentage of guided transport system use is very high. In addition to the “feeder service effect”, there is also the effect of extensive coverage of the agglomeration by the metro/tramway network, as can be seen in Lyon and Nantes.

Apart from a drop in Saint-Étienne due to work on the new tramway line and in Rouen, probably due to the effect of the TEOR, use of metro and tramway as a percentage of all trips has risen by an average of 4 % since 2001.

French definitions :

A trip refers to a single transport mode (one boarding)

A journey is made by several trips and refers to a purpose

Use of some tramway lines is as high as that of metro lines

With over 250,000 trips a day each, use of Lines A and D of Lyon metro is significantly higher than for other lines.

With over 100,000 trips a day, use of the tramway lines in Strasbourg and Montpellier and of Line 2 in Nantes is on a par with the use of Marseille’s metro system and exceeds that of the line in Rennes.

Compared with 2001, use of guided transport lines is growing rapidly. In particular, a significant rise in passenger use can be seen on the tramway lines in Montpellier and Lyon. Bordeaux’s tramway system, opened in December 2003, already has some 135,000 trips a day on the three lines. On the other hand, the tramway system in Orléans and the guided bus services in Caen and Nancy have stagnated at less than 45,000 passengers a day.

Overall use of public transport networks

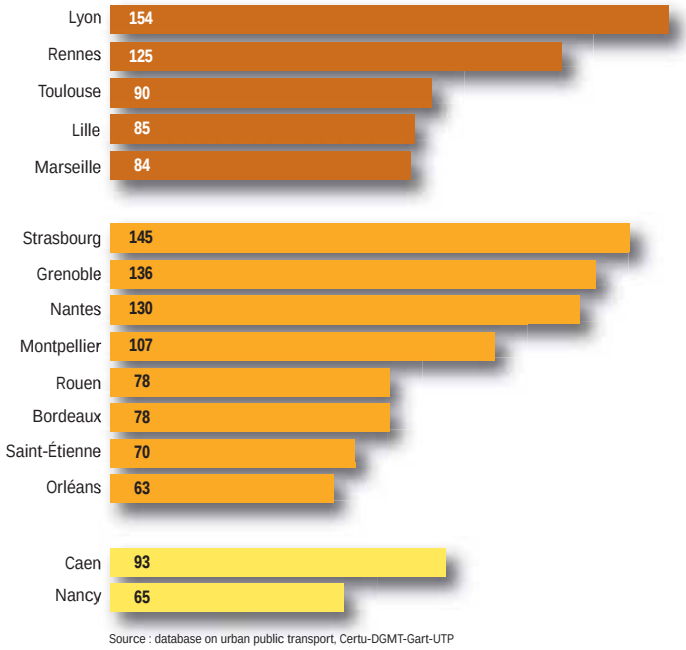
Consistent increases in the number of passengers in half the fifteen agglomerations

In terms of the number of inhabitants within the PTU, the number of journeys using public transport is higher than a hundred journeys/inhabitant/year in six agglomerations :

- in Lyon, where the metro and tramway network is extensive and covers a dense area
- in Grenoble, Nantes and Strasbourg, where network use is better than in most agglomerations with a metro service
- in Rennes, where the "VAL effect" plays a determining role, with passenger use rising from 69 to 125 journeys/inhabitant between 2001 and 2005 (+ 80 %)
- in Montpellier, where it is still too early to confirm the effect of the light rail system

Nancy and Orléans remain slightly down, in spite of significant growth of 25 % between 2001 and 2005.

Number of journeys per inhabitant within the PTU per year across the entire public transport network

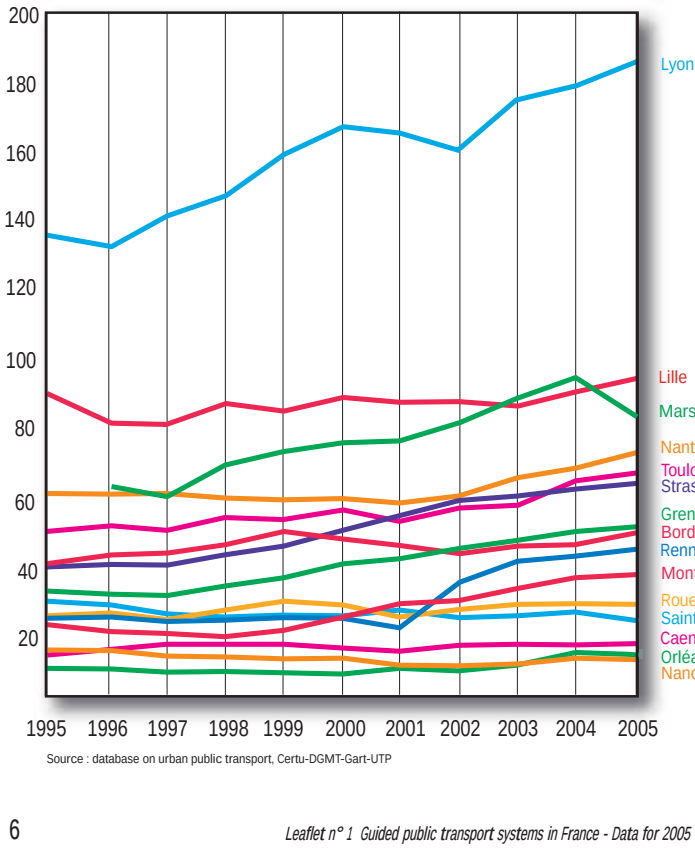


Source : database on urban public transport, Certu-DGMT-Gart-UTP

Effect of right-of-way systems on overall network use

Figures relative to use of public transport systems show an upward tendency since 2001.
Sudden rises in passenger use are generally seen following the opening of a first metro or tramway line. The most obvious example of this is the opening of the VAL system in Rennes.
In Lyon, there has been consistent growth over the last ten years, as in Marseille, which had catch up with Lille before the strikes in 2005.
In spite of having slightly different past experiences, Nantes, Strasbourg, Grenoble and Montpellier have seen consistent increases in passenger use since 2001.
In spite of having similar features to Caen, Orléans – where passenger use has risen since 2003 – has the lowest number of passengers of all the fifteen agglomerations. Lastly, in spite of its TVR system and the high density of inhabitants within its PTU, Nancy has yet to reach the levels of passenger use seen at the end of the 1990s.

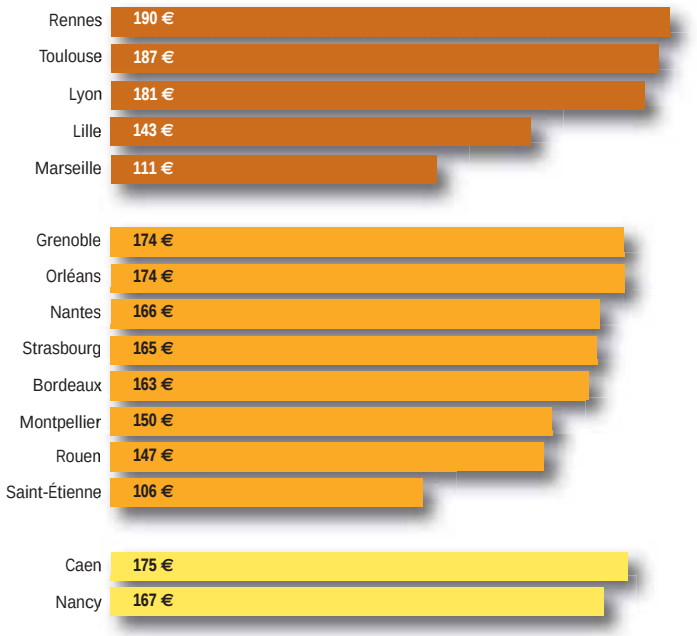
Number of journeys across the entire public transport network



Source : database on urban public transport, Certu-DGMT-Gart-UTP

Financial data

1.8 % yield from the "transport tax" per inhabitant within the PTU



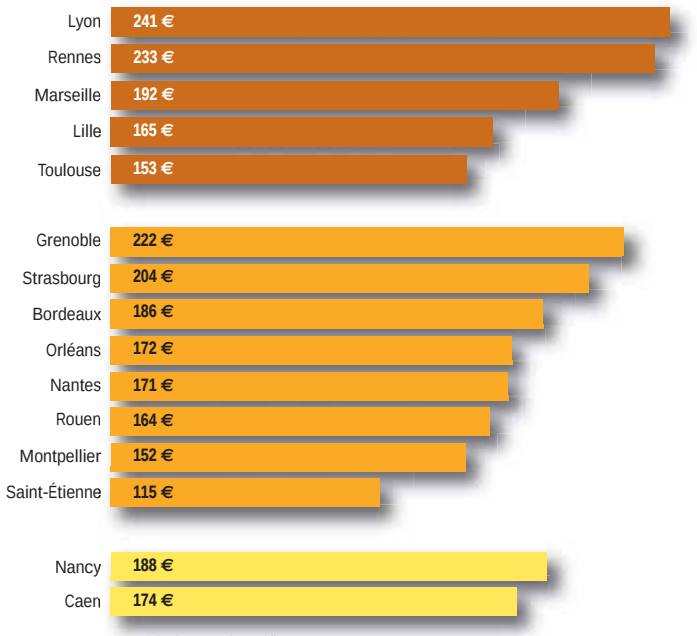
Source : database on urban public transport, Certu-DGMT-Gart-UTP

Financial inequality

The "transport tax" (versement transport) is a tax payable by companies within the PTU that have more than nine employees. It accounts for approximately 50 % of resources available to finance urban public transport services in the provinces. Opening a right of way transport system allows to bring the rate of this tax to 1.75 %, or even 1.80 % for different French administrative districts : greater urban authority (communautés urbaines), urban authority (communautés d'agglomération), inter-communal authority (communautés de communes) and joint management board (syndicats mixtes).
At maximum uniform rate of 1.80 %, the yield from this transport tax can be used to compare the potential resources of the different agglomerations.

Major disparities can be seen :
• considerable potential in Rennes, Toulouse, Lyon, Caen, Grenoble and Orléans
• poorer agglomerations : Saint-Étienne and Marseille, which suffer mainly on account of a less favourable economic structure
Revenue from the transport tax increased since 2001 in all the agglomerations, particularly in Bordeaux, Nantes, Nancy, Lyon and Rennes. However, there is less and less room for manoeuvre insofar as concerns use of this resource.

Operating cost per inhabitant (in euros)



Source : database on urban public transport, Certu-DGMT-Gart-UTP

An efficient network doesn't come cheap

The wealthiest cities, such as Toulouse and Orléans, are not the cities that spend the most on network operating.

Lyon, Rennes, Strasbourg and Grenoble have the highest operating costs per inhabitant, but also boast the best journey/inhabitant ratios, proving that an efficient network doesn't come cheap.

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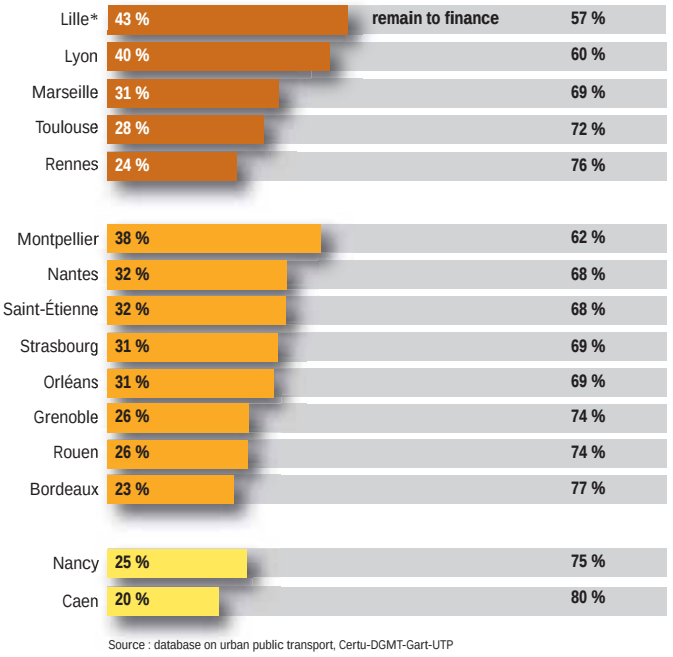
Financial data

A delicate financial balance

Revenue from ticket sales finances between 20 and 43 % of operating costs. This may seem low, but it is similar to levels in other developed countries.
This ratio is particularly low in Caen, Bordeaux, Rennes, Nancy, Grenoble, Rouen and Toulouse (below 30 %).
Between 2001 and 2005, it fell in seven agglomerations. This fall in revenue from ticket sales can partly be explained by the fact that PTUs have been extended (and networks too, therefore) and by social pricing. Nonetheless, the ratio increased in Lyon, Montpellier and Bordeaux after the tramway systems were opened.

**In Lille, the rise in the ratio from 33 % to 43 % between 2001 and 2005 was linked to the fact that, in the survey on urban public transport, the pricing subsidy (compensation tarifaire) was integrated in the traffic incomes. This figure cannot therefore be compared with figures for other networks.*

Share of revenue from ticket sales as part of the operating cost in public transport network



Source : database on urban public transport, Certu-DGMT-Gart-UTP

HIGHLIGHTS OF THE PERIOD 2002 – 2005

- More guided transport systems planned : 79 km between 2002 and 2005 and a further 177 km by the time of the municipal elections in 2008
- Wider differences between guided systems services and conventional bus services
- Growth in overall passenger use on public transport networks that invest and restructure
- Paradoxically, difficulties in financing network development and huge inequalities insofar as concerns resources

THE FUTURE…

- Will a network effect be seen in Strasbourg, Montpellier and Bordeaux ?
- What impact will opting for a VAL system have in Rennes and Toulouse ?
- What can be expected of new systems, such as the Translohr in Clermont-Ferrand or onboard batteries in Nice ?
- How will Bus with a High Level of Service rate in comparison to tramway, notably in agglomerations with less than 300,000 inhabitants?

For more information:

Download the full report from the Certu website : www.certu.fr
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Cete Lyon