

Mobility

THE EUROPEAN COLLECTIVE TRANSPORT MAGAZINE



ISSUE 23 2013 SECOND HALF YEAR

TRAMWAY À LA FRANÇAISE



Reliability, capacity, clean and green, urban regenerator, and vector of economic growth... despite the eulogies bestowed on the modern-day tramway, this mode of collective transport has not always had an easy ride in France.



The tramway of Le Havre

Effectively erased from the country's transport map after the Second World War (idem other many European cities), the original tramways of every French city (with the exception of St Etienne, Lille, and Marseille) fell victim to a combination of circumstances – limited fuel during the war and tram systems that were already feeling their age. As a consequence, the networks were heavily used and so frequently overcrowded, plus they offered less than comfortable interiors (wooden slatted seats and too hot/too cold temperatures hardly enhance the passenger experience!). There is little doubt that priority at the time was getting from A to B.

Post-war, between 1950 and the early 70s, tramways were phased out in favour of the

car, which at the time embodied the *'liberté'* of the French national motto. But beyond this golden age, when the freedom of the car started to feel the squeeze of congestion, when the oil crisis of 1973 hit home, city authorities started eyeing up the tram again. The mode appeared to offer all that was now desirable: reliability, capacity, clean and green, urban regenerator, and vector of economic growth. Plus there was all-important cost factor (cheaper than a metro system), too.

In France in particular, the drive to reintroduce the tram benefitted from the introduction of the *versement transport* (VT) tax in the early 1970s. Levied (on the employer) on the total gross salaries of all employees of companies with a workforce over nine, it was intended

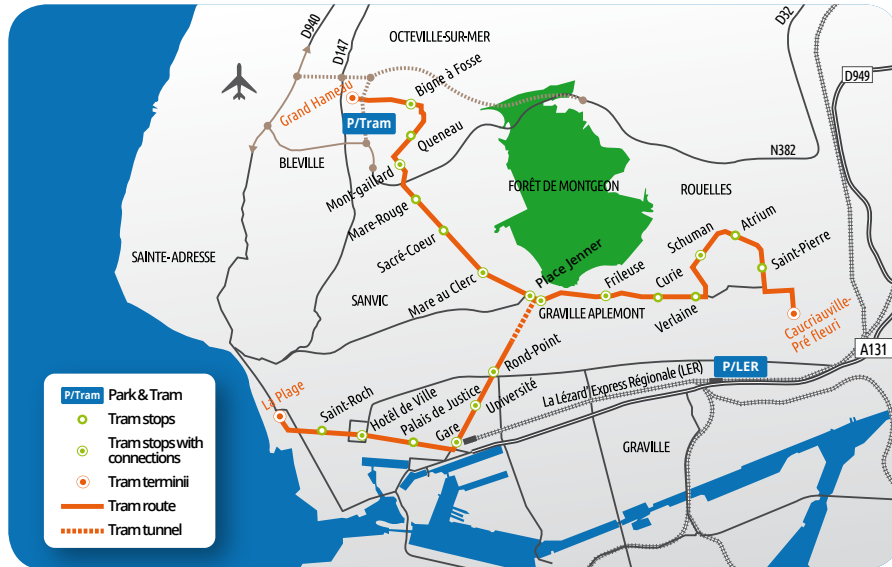
to raise capital for investment in local public transport infrastructure. At the same time, this particular mode of collective transport was championed by Marcel Cavaillé, transport minister from 1974 to 1978 under president Valéry Giscard d'Estaing. His *Concours Cavaillé* competition was designed to stimulate 'concrete' action by inviting constructors to submit proposals for an 'urban, guided mode of transport, powered by electricity and capable of using the existing roads.' It was won by Alstom (known at the time as Alsthom), and gave rise to the *tramway français standard* (TFS) – the first generation of modern-day tram vehicles.

The combination of such economic, political, and environmental factors no doubt induced the rebirth of the tramway in France. And momentum grew over the subsequent years, resulting in its popularity today, "with systems existing or planned in 25 French towns today, the quasi totality of all the country's major agglomerations," points out architect and urban planner François Laisnay.

12.12.12.12

12.12pm – December 12 – 2012 marked a turning point in the transport network of the French port of Le Havre. The mercury was in the negative, but the mood was in the positive as the city braved the winter to inaugurate its new tramway, 60 years after shunning it off the streets.

The number-one container port in the Hexagon, and the country's second in terms of overall tonnage after Marseille, during World War II Le Havre was devastated by the Battle of Normandy, with pretty much 90% of its buildings flattened in the aftermath. In the 1950s, the city was completely rebuilt to plans drawn up by the French architect Auguste Perret – a world leader and specialist in reinforced



➔ Le Havre tram route

concrete construction (in 2005, his postwar reconstruction of the city was declared a World Heritage Site by UNESCO). Key to Perret's vision was a grid plan, with wide avenues designed to facilitate surface transport. And the existing tram network, dating back to 1874, was replaced by the preferred modes of the post-War period, the trolleybus and bus.

Yet six decades after its disappearance, the tram in its modern manifestation is back in town. Running for 13km, northwest-south and northeast-south, the Y-shaped line serves the town centre, the station, university, and a number of key economic and administrative districts. Completed in two and a half years, with the construction work managed by Systra on behalf of transport authority client CODAH (Communauté de l'Agglomération Havraise) – the undertaking forms part of CODAH's global plan established in 2001 to modernise its transport offers.

Doing the same, differently

One of the advantages of reintroducing a tramway is the opportunity to do it differently, taking advantage of advances in technology, techniques, materials, and equipment. The project in Le Havre is a case in point. For example, instead of building the line section by section, as is traditionally the case, eight

teams worked simultaneously on the following different tasks:

- public road works and civil engineering: overhead contact lines, laying the platform, building the tram stops, etc.
 - urban developments: pavements, cycle paths, planting, lighting, urban furniture, etc.
 - laying the ground cladding, planting trees, and other finishing works (signalling, adjusting the traffic lights) were carried out in parallel, in six zones.
- While the wide avenues from the 1950s cer-

tainly made building the track easier, one particularity of Le Havre's tramway is its tunnel. Since the line runs between the lower and upper heights of the town, it was necessary to bore a single-tube, double-track tunnel, 574 metres long, to link the two. Running in parallel to the existing Jenner road tunnel, this piece of civil engineering represented one of the major construction tasks of the whole project.

Other infrastructure features of note include the presence of overhead contact lines, rather than the underground power supply solution often favoured elsewhere in France. This preference, Edouard Philippe, mayor of Le Havre and president of CODAH, told Mobility, "was because of the risk of flooding; the sub-surface solution was simply not a good idea." Furthermore, the visual presence of the lines was not an issue, as it was for other 'historic' French cities such as Reims, Orleans, and Tours, since, ironically, although Le Havre is UNESCO-classified, this rating is based on its contemporary architecture. Indeed, very few buildings, if any, of historic importance were left standing after the devastation of World War II.

Another infrastructure point of interest was the track-laying method employed. Tram rails are typically laid on concrete slabs, which are



➔ Boring the 574-metre long tunnel

then covered with soil and seeded for the turf. The resulting lack of direct contact with the ground explains the need for an automatic watering system. But for Le Havre, since the rails were put down directly on stringers in contact with the ground (apart from one section), the turf can be watered naturally.



Surveillance, rolling stock & service

The network is equipped with a total of 100 surveillance cameras at crossroads, in the tunnel, and two per tram stop (there are a total of 23 along the whole route). In addition, the vehicles themselves – 22 x 30-metre long Citadis 302 (costing a total of €47 million) – have cameras installed in the passenger areas, on the rear-view mirrors, and even on the destination indicators – to film in the case of accidents or incidents with other road users/vehicles, in order to have video footage as evidence.

Each tram can carry up to 250 passengers; the commercial speed is 19km/hr, and the service frequency is between four to eight minutes. The livery of the fleet is remarkable, too, in com-

parison with a number of others in the Hexagon (Montpellier, for instance, or Marseille), for its lack of exuberance or exhibitionism. Instead, the desire was “to give a sense of sobriety,” as Mayor Philippe explained to Mobility, keen to dispel the preconception of Le Havre as synonymous with urban gloom and greyness. “The rose-tinted beige colour was chosen to blend in with the materials predominant in the town. We were seeking sobriety, and yes,” he agrees, “it’s certainly more discreet than some other tramways in France!”

Inspired by the history and architecture specific to postwar Le Havre, the graphic design of the livery aims to “highlight the horizontal lines of the tramway, with the contrasting, darker window surrounds contributing to the dynamism of the vehicle as a whole.” A succession of decorative motifs recalling Perret’s architecture appear progressively along the lateral sides of the tram.

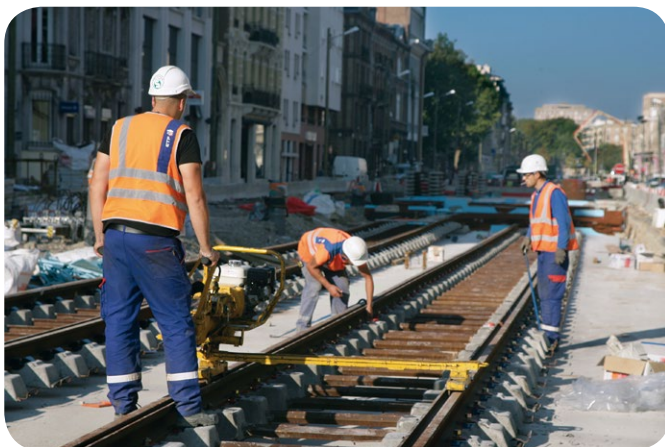
Maintenance centre

The tram maintenance centre (CMT), built on a generous greenfield site at the line terminus, northwest of the city, is a vast complex covering a terrain of some 40,000 square metres. It regroups a wide range of buildings, functions, and even transport modes.

The 1,000 square metre administrative building, spread up over three storeys, includes a number of environmentally friendly features such as a vegetal roof, a Canadian well-type system for climate control, and automatic lighting. The second floor houses the Centralised



Control Post, from where staff monitor and manage the entire public transport network of Le Havre via four control workstations – two for bus operations, two for the tramway. Each of the tram stations is equipped with five screens: three for the traffic management system, one for the city rail service, and one for





©Mobility



Rail set 2 is equipped with underfloor wheel-set lathes, for reprofiling wheel treads

the staff messaging service. During normal operations, one person controls the buses and one the trams.

Activities & equipment

At the tram servicing facility, small tasks such as filling up the sand boxes are performed on a daily basis. The equipment here also includes a wash tunnel and a roofed siding.

Covering a surface area of around 6,000 square metres, the maintenance workshop is equipped with six individual sets of rails, each dedicated to the following specific activities:

- 1: a paint cabin for body repair work
- 2: underfloor wheel-set lathes, for reprofiling wheel treads (see photos above)
- 3: elevator columns for completely raising a tram car
- 4 & 5: built on stilts with foot bridges, for carrying out maintenance tasks under the chassis and on the roof
- 6: major cleaning operations.

The length of the servicing pits, 43 metres, suggests that the 30-metre long Citadis may well be extended to 40 metres in the future. Mobility asked Franck Speck, head of the maintenance hub, if this is indeed the plan. "All the equipment has been dimensioned for Citadis 402 type trams, i.e. 40 metres long, in the case of plans to increase the capacity of the vehicles to meet traffic needs," he confirmed.

Also housed at the CMT is a dedicated service station and washing tunnel for Le Havre's bus network, plus a parking area for up to 60 standard buses. There is also a 130-space Park & Ride, accessible for People with Reduced Mobility (PRM), together with a Park & Bike facility.

Structuring a shift

Le Havre's Y-shaped tram route, described in French as *'une ligne structurante'* has been planned to function in sync with the existing bus network, and so better serve the inhabitants of both the town and its agglomeration. The other collective transport services on offer comprise 41 regular and six night bus lines, one cable car, bike hire, transport on demand for PRM, and special services. In addition the Lézard Express Régionale is a regional train service running to the northern extremities of the agglomeration. Single ticketing for all these modes is designed to make travel easier, too.

Further to structuring the city's transport network, and boosting accessibility to mobility for all, the objective of introducing the tram is to encourage a modal shift from the car. "Ninety thousand inhabitants live within a five-minute walk from a tram stop," says Mayor Philippe. "If just 2% of them take the tram every day this would replace 3,000 daily car movements, which would be fantastic." He admits that during the construction works, the road space given over to the car has been reduced, "but we don't really talk about this too much," he told Mobility. So the strategy is clear: make the public feel they are being given a choice of mode, even though the urban planners, in actual fact, are giving them a push in the tram direction!

Counting the cost

The tram may appeal as a mode of collective transport that compromises between the bus and metro, but it still comes at a high capital

cost. And in France, in particular, this cost has a tendency to spiral. How so? Because in order to sell the tram back to the people, after the negative experiences of the past, it was deemed necessary to use a carrot... in the form of better streets.

New pavements, landscaping, parking facilities, bike and pedestrian paths, designer lighting and street furniture, etc., are all defining elements of the tramway *à la française*. To do one, without the other, is quite simply *pas possible!* Yet, as Sophie Mougard, managing director of the Île-de-France (Paris and its region) transport authority STIF, points out: "Around 50% of tramway costs in France come from the urban development part of the project."

Given the current economic context, whether this French concept of the tramway in its purest form, i.e. with urban redevelopment forming an integral part, can be financially maintained over time, remains to be seen.

Another characteristic of today's French tramway is the tendency to bring on board artists and designers *renommés*, i.e. Christian Lacroix (Montpellier), Daniel Buren (Tours), Hervé Di Rosa (Aubagne). Their participation certainly gives the project, and the city in question, greater appeal and a sense of exclusivity. And this goes a good way towards helping 'sell' a tramway to inhabitants, as well as giving their mayor a trump card when it comes to the next municipal elections. Yet detractors question how much this 'added extra' is costing the taxpayer. And, at the end of the day, whether this aesthetic and celebrity appeal is a necessary ingredient?

On the above points, designer Régine Charvet-Pello, from rcp Design Global, insists on the importance of finding the right balance between all the uses of the public space, and on capturing the specificity of the town or city in question. "It shouldn't be about creating spaces for spaces' sake, but for people to use," she says. "And there must be room for poetry, too," she adds. "The door must be left open for dreaming." Less poetical, Gérard Chausset, vice president of transport



©Mobility



The tramway – the Trojan horse of collective transport?

at the Communauté Urbaine de Bordeaux (the southwestern city has three tram lines, of which the first opened in 2003) sees this particular mode of transport in a more martial light: “the tramway is the Trojan horse of public transport, serving the double function of recapturing and restructuring the public space,” he says.

Bringing permanence to mobility

It is widely recognised that the general public prefers the modern-day tram over the bus, even when the price and journey times are similar. And the reason is largely down to the sense of permanence this mode confers: the fixed track system appeals for a number of reasons, e.g. people can plan their lives around the service with confidence (bus stops can be, and are, relocated), and businesses develop along the route, which leads to further stability and development in the area. “The trolleybus or the bus have the flexibility of the road vehicle, but they are of the same nature, while the tram on rails imposes respect,” says architect Thomas Richez of the Paris agency Richez Associés[1].

At the end of the day, whether we like it or not, people are creatures of habit: we like knowing, and are generally less comfortable

faced with the unknown. “People must maintain their everyday habits, but be encouraged to modify their mobility behaviour,” sums up Mr Chausset.

Size or prestige?

Another question raised by the French school of the tramway is: just how badly do small- and medium-sized towns need one? And would a Bus Rapid Transit (BRT)[2] not be more appropriate? Le Havre, with 270,000 inhabitants in its agglomeration, of which 185,000 live in the town itself, exceeds the ‘recommended’ minimum population level of 200,000 estimated sufficient to maintain a tram system. Yet this figure is falling, with a number of actors saying (often for various reasons of economic or political interest to them, of course) that it no longer applies. Whatever the answer, potential there is for the tram in these smaller municipalities. Take Besançon, for example, which is building a 14.5km line for its population of 120,000. And then there is Aubagne[3], which will open its tiny 9km line in 2014... for just 103,000 Aubagnais. Yet it must be said that this Provençal project stands in category of its own: the long-term plan, it seems, being to use this tram line to link the town by regional train with its big sister Marseille, albeit in a hazy future. Furthermore, it is serving as a (golden) opportunity for Alstom to showcase its Citadis Compact. A 22-metre version of the constructor’s popular 30- and 40-metre Citadis tram, the Compact has been designed with a specific target in mind: to meet the needs of medium-sized towns. And there is more besides. The Aubagne tramway will be free. “We must avoid being biased when proposing a tramway,” comments Emmanuel Bois, business development manager, Alstom.

Another wider issue concerns modal shift: if everyone switches from the car to the tram, are the tramways being built with sufficient capacity in mind? This preoccupation explains why some systems, such as Le Havre’s, have been designed with room for more riders in mind. Idem Besançon, whose 24-metre long trams can be extended to 37 metres by adding intermediary cars, if needs be, without



Line T3, Paris

having to return to the factory. Another question is the underlying conflict of interests at the political level in France: the government is financially bailing out its ailing automobile industry, yet, at the same time, it is supporting the tram as part of its strategy to green the country’s transportation, a strategy that includes... taking cars off the roads....

Paris & the rest of the world

At the 4th edition of the RATP’s annual forum, held in November 2012, the Paris collective transport operator put the spotlight on the tramway. Hardly surprising, given that the French capital, the fiefdom of the RATP Group, has really taken the tram to heart, earning itself the title of tram capital of Europe for the number of lines it has invested in, opened,



©JC de Boisseson

and extended over recent years. In December 2012 alone, the group opened extensions to its existing T1, T2, and T3 lines. And in the near future, the network will total eight lines, the whole covering 105km of route, with 187 stations and an estimated one million riders every day.

"The tram is the preferred collective transport mode in Île-de-France," points out Philippe Martin, deputy director, transport & maintenance operations, RATP. Since the introduction into service of the first tram line in the region in 1992, the services are currently carrying around 390,000 passengers daily. Eric Mauperon, head of the tramway south division, STIF, is keen to emphasise the strengths of the mode. "Higher-capacity than the bus, the tram is really appreciated by riders for its reliability, regularity, service quality, and its aesthetic appeal, too," he adds.

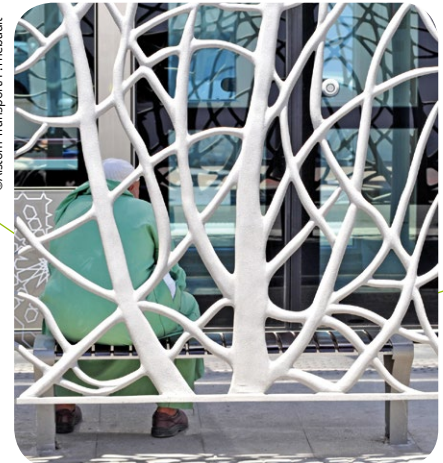
In addition to all the functions described above, the Paris network is being developed to serve as a link between the somewhat isolated suburbs of the capital, helping bring them closer together, and making them more easily accessible. "For Île-de-France, right from the start, the tram strategy has been based on a suburb-to-suburb thinking," explains Pierre Mongin, managing director, RATP. "The benefits being that the lines provide a means of bypassing the increasingly congested centre of Paris, helping save time and reduce stress. They also serve to open up outerlying districts around the capital that were previously cut off and run down, to offer new opportunities for access to employment, education, entertainment, and culture."

Yet despite the glowing picture, the tasks of planning, building, and running tram services are not without their difficulties, as Mr Mongin is at pains to make clear. "It involves endless consultations to get everyone to agree," he says. "Plus, while the systems serve to both open up and embellish cities, their operational complexity is often ignored."

Staying power

To conclude on a positive note, both Mr Mongin from his operator's perspective, and Mr Richez as architect and urban planner, are convinced of the staying power of this second generation of tramways. "It's not a trend, but a tool at the service of the sustainable city," insists RATP's managing director.

"[The tramway] cannot be a mere fashion phenomenon: it's not a small garment that is cast away at the end of a season," says Mr Richez. "Financially, a line and the rolling stock are amortised after 20 or 30 years. We are well



©Alstom Transport/P.Thebault

Rabat-Salé tramway in Morocco

beyond the time scale of a trend. Besides, all the towns/cities that have given themselves the 'gift' of a line have chosen to build a second, even more; so clearly it's a persistent choice among all the municipalities that have sampled it."

With its unique, and seemingly inseparable combination of urban mobility and regeneration now being successfully exported worldwide, e.g. Rabat-Salé in 2011, and Casablanca in 2012, the tramway *à la française* looks well set to play its part in the sustainable cities of the future ●

Lesley Brown

All photos ©Philippe Bréard - unless marked

References

- [1]from his interview in 'Tramways à la française par l'Agence Richez,' by Delphine Désveaux, published by Archibooks, see www.bookstorming.com
- [2]see Bus, p.42
- [3]see Mobility 22, 'Tramway d'Aubagne - marriage of true minds'



©Mobility