

Bus with a high level of service (BHLS)

The european BRT concept



Nantes (France)

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How we see american BRT from Europe ?



Transmilenio in Bogota (Colombia)



Ottawa (Canada)

- A very high capacitive system focused on speed (long trips)
- The demand and the space to build « highways for buses »
- The « system approach » : not only a rolling stock

Which context in Europe for BHLS ?



Metro in Madrid (Spain)

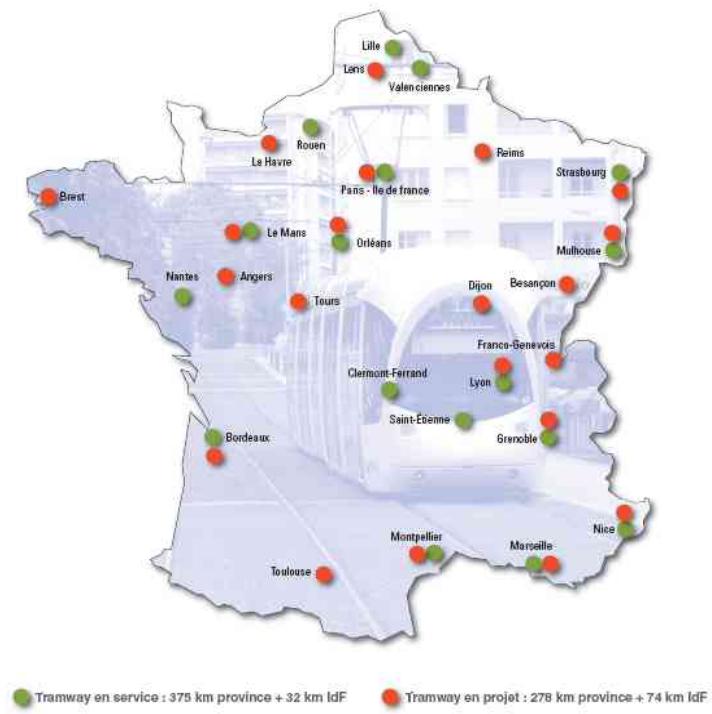


Tramway in Lyon (France)

- Metro and tramway already deliver the mass transit function
- Dense cities with narrow streets
- The « at-grade » urbanism
- The need to fill the gap **between regular bus and tramway**
- Focus on comfort, regularity

The emergence of BHLS in France

- The rebirth of tramways :
 - Between 1985 and 2008 : 250 miles (400 km) tramway
 - Additional 220 miles (350 km) planned by 2013
- But now :
 - Needs less important in small cities and to extend transit networks in large cities (< 2 500 pass./hour/direction)
 - Tramway profitability is questioned :



	Capacity max. (pass./hour/direction)	Investments (\$/km)
Tramway	6 000 or 12 000	20 to 45
BHLS	3 000	5 to 15

1€ = 1,4\$

- BHLS = 24,5 meters (80 ft) max.

The emergence of BHLS in France

- During the 90's, first reflections
 - Trans-Val-de-Marne (TVM) in Paris (1993)
 - The choice of BHLS in Rouen (2001)
(3 BHLS lines instead of 1 tramway line)
- National group of experts managed by Certu :
 - 1st handbook in 2005 to describe the concept of BHLS
 - 1st conference in 2006



TVM in Paris



TEOR in Rouen in 2001 : the system BHLS



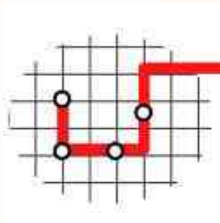
Vehicule : modern, comfortable



Infrastructure : reserved lanes



Stations : accessibility



ITS : ticketing, information

Operating : crossroads priority

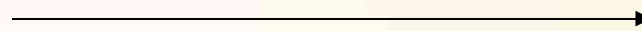
TEOR
m-é-t-r-o-b-u-s

Image, communication :
special name, logo

TEOR in Rouen in 2007 : a way to enhance streets



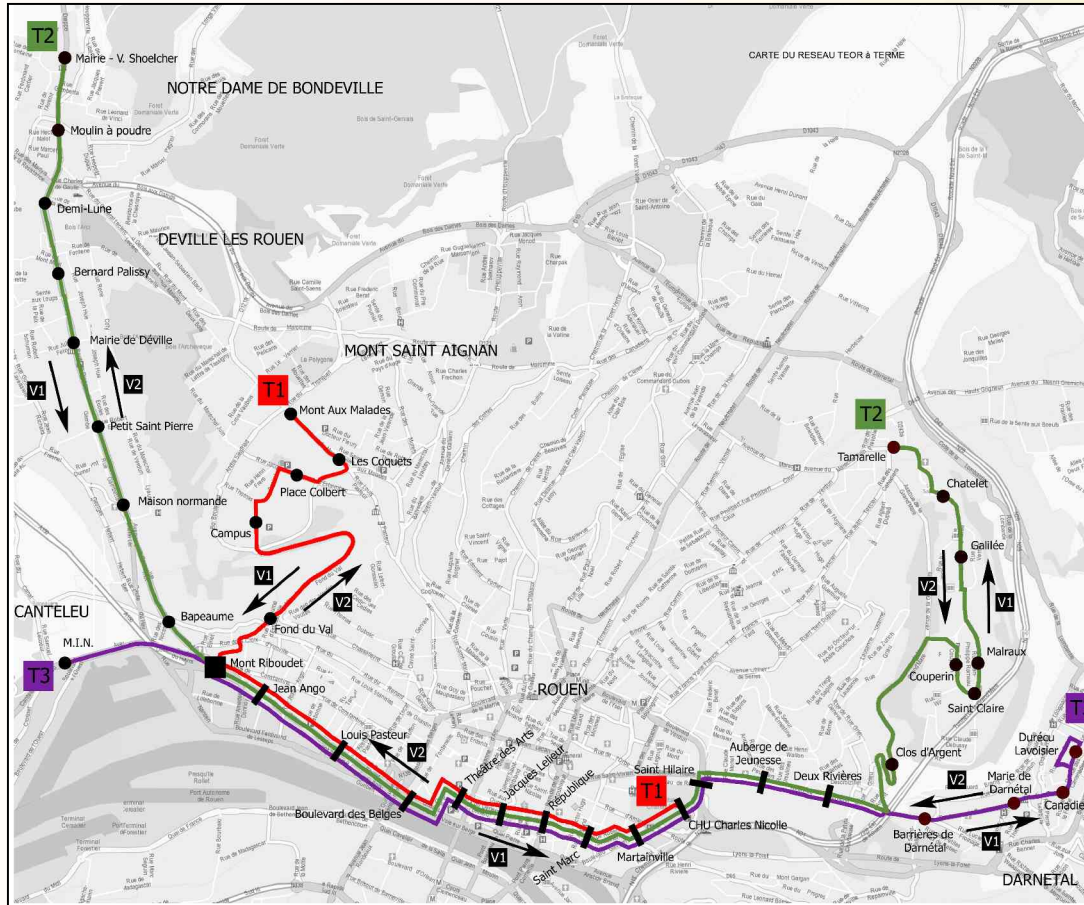
Before



After

In France, tramway is not only a transport tool but it was not obvious with bus before TEOR in Rouen !

TEOR in Rouen : figures



0,4 M inhabitants

3 lines = 19 miles (30 km)

8 miles (13 km) reserved lanes

13,5 M\$/mi of line

Frequency = 6 min./line (PH)

Av. Speed = 10,7 miles/h (17,25 km/h)

45 000 pass./day

The *Busway*® in Nantes in 2006 : « the bus as the tramway »

0,6 M inhabitants

4,5 miles (7 km)

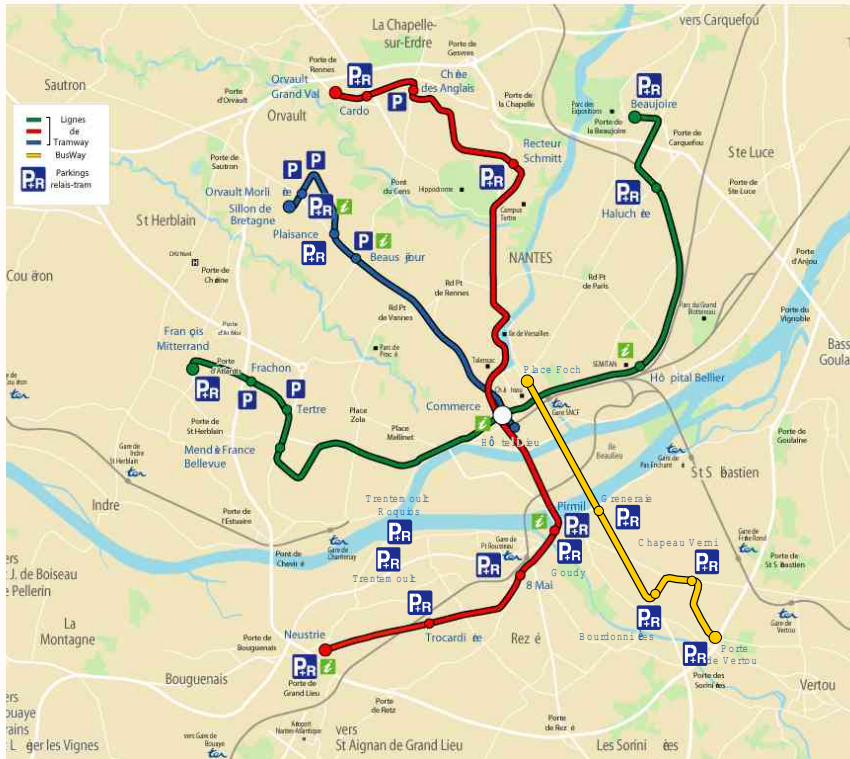
15 stations

19 M\$/mile

Frequency = 3,5 min. (PH)

Av. Speed = 13 miles/h (21 km/h)

23 000 pass./day



The *Busway*® in Nantes in 2006 : « the bus as the tramway »



Schéma de ligne dynamique



Ecrans d'affichage des correspondances



Loge conducteur intégrale fermée



Portes coulissantes type tramway



Rampe courte portes 2 et 3



Éclairage doux et indirect



Sièges confort

Isolation par double vitrage

600 000 \$ / bus (18 meters = 60 ft)

***Triskell* in Lorient in 2007 : the concept BHLs adapted to small cities**



0,15 M inhabitants very scattered

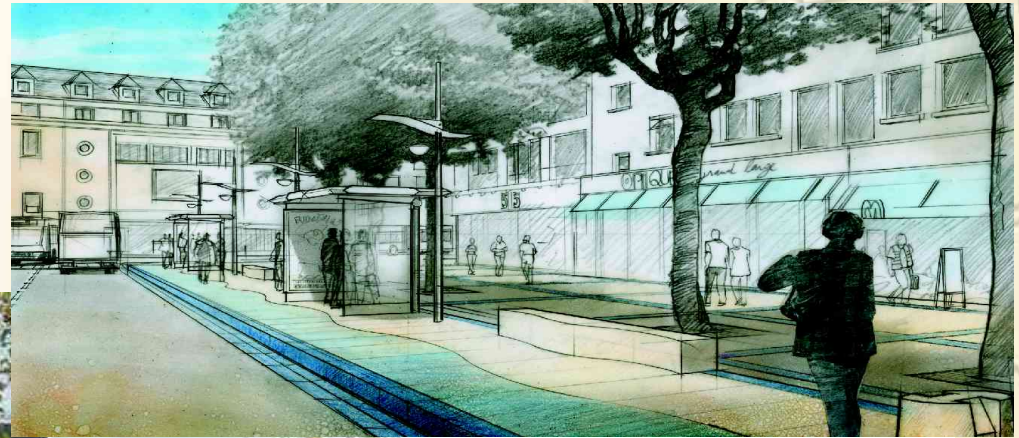
Several attractive area

Trunk network

11 bus lines (750 bus/day)

Bus priority

Triskell in Lorient in 2007 : the concept BHLs adapted to small cities

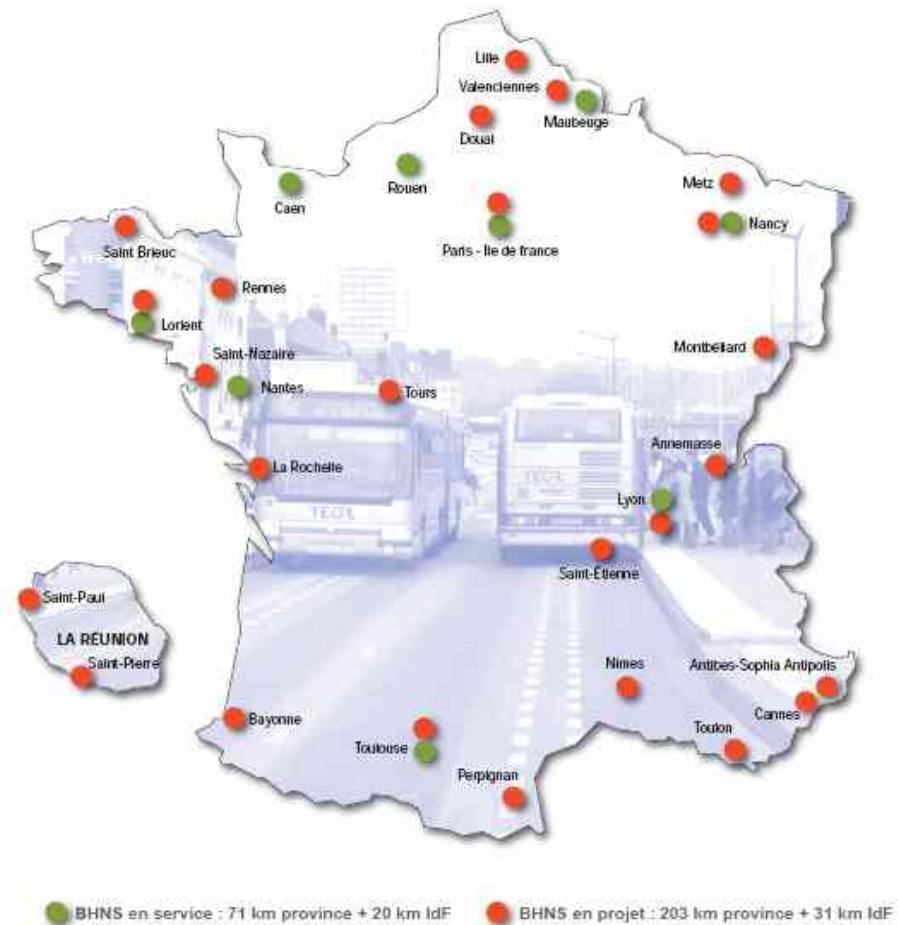


BHLS in France

- 57 miles (91 km) in operation
- 145 new miles (234 km) of urban BHLS by 2014 !
- French government has decided to give 1 G\$ subsidies for metro/tramway/BHLS projects by 2014



Experiment A48 in Grenoble



- BHLS for suburban transport ?

European overview of BHLS

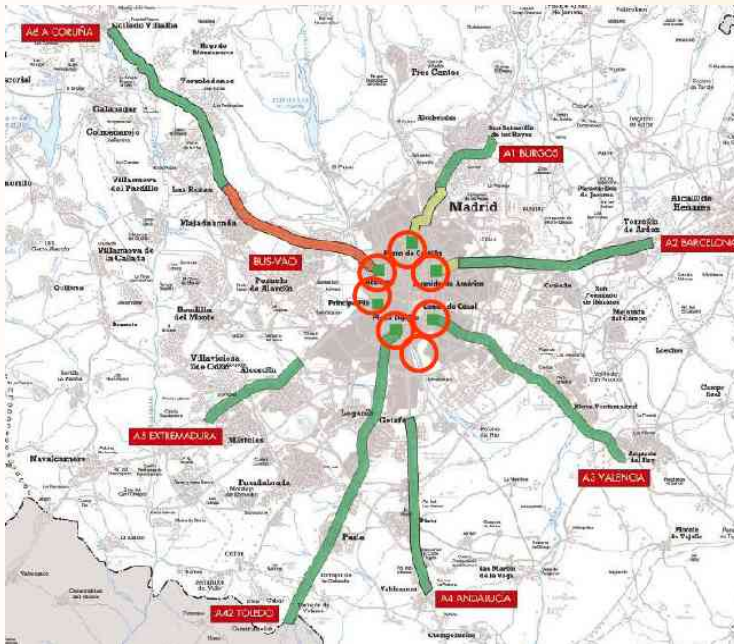
- In 2007 Certu and the city of Nantes launched a European group of experts (Cost BHLS)
 - 14 countries involved during 4 years
 - Sharing experiences
 - Drawing recommendations for decisions-makers
- Some other countries haven't been waiting for the French to develop BHLS !



Spain

■ Madrid HOV lanes

- Madrid region = 6 M Inhabitants
- 7,8 miles (12,5 km) in operation A6
- Program of 125 miles (200 km) in 6 radial highways
- The HOV concept doesn't exist elsewhere in Europe !



Spain

- **Madrid MBus (regional plan for urban area)**
 - First investments based on metro
 - Program of 4 lines – 25 miles (40 km) – 820 M\$
- **Castellon (Valencia Region)**
 - 0,3 M inhabitants
 - The 1st urban BHLS in Spain (2008)
 - 12,5 miles (20 km) when finished
 - Optical guidance system (Civis)



Netherlands

- **12 bus systems may be called « BHLS »**
- **Zuidtangent (2001)**
 - Amsterdam = 1,5 M inhab.
 - 26 miles (42 km) tangential lane (as TVM in Paris)
 - More space for implementation
 - 1,2 miles (1,9 km) between stops – 1,1 miles (1,1 km) tunnel section – 2 grade-separated crossroads
 - 21,5 miles/h (35 km/h)
 - 40 000 pass/day (increase 15%/year)



Netherlands



- **Eindhoven (2005)**
 - 0,4 M inhab.
 - 11 miles (18 km) Phileas system (automatic & magnetic guidance)
 - Bi-modal not reliable
- **Almere (« ville nouvelle »)**
 - 0,2 M inhab.
- **Utrecht (2002)**
 - 0,3 M inhab.
 - Double-articulated bus (24 m = 80 ft)



Sweden

- **4 bus systems may be called « BHLS »**
- **« Blue busses » in Stockholm (1999)**
 - 2 M inhab.
 - 4 lines (25 miles = 40 km) – 150 000 trips/day
 - Pragmatic approach (infra, priority)
 - High identification with new buses
 - + 60 % pass. (1992 – 1999)
- **Trunk network in Gothenburg (2003)**
 - 0,5 M inhab.
 - 3 lines – 2,5 to 5 min. PH
 - Bi-articulated buses on line 16
 - 20 000 trips/day/line



Germany

- **3 bus systems which may be called « BHLS »**
- **« MetroBusse » in Hamburg (2005)**
 - 1,7 M inhab.
 - Bus bi-articulated
 - 9 miles (15 km) – 60 000 trips/day
 - 60% exclusive running ways (former tram)
- **Essen O-bahn (start 1980)**
 - 0,5 M inhab.
 - 2,5 miles (4 km)
 - Kerb guidance system with rollers
 - Has not spread to other cities



Ireland and UK

- **Not the same context as on the continent**
 - No PTA that defines the needs and chose the system
 - More deregulated -> competition between buses, tramway (except London)
 - Difficult to implement Rapid Transit on the surface (tramway, BHLS), to integrate fares and information
 - Road congestion and buses are everywhere !
 - Emergence of Quality Bus Corridor (QBC) concept

- **QBC concept**
 - Reserved lanes used by several bus lines/companies
 - Take space from cars

Ireland and UK



■ QBC in Dublin (start 1997)

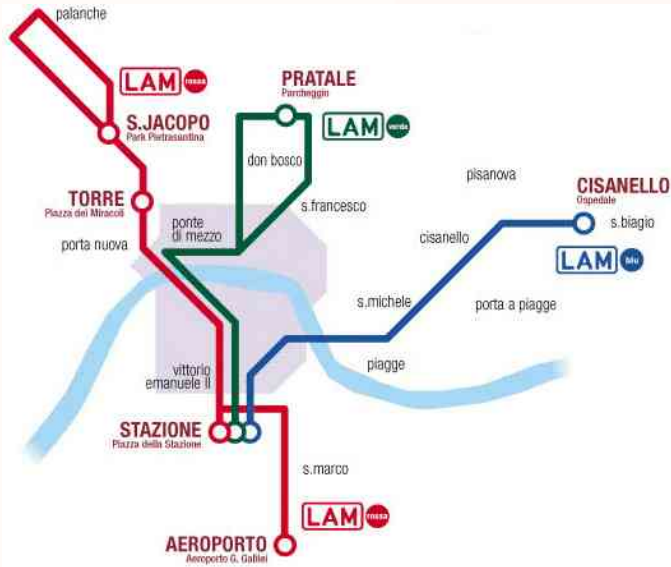
- 1,2 M inhab.
- 150 mi (200 km) -> 250 mi (400 km)
- 40 to 55 M\$/year
- Bus modal split 41% -> 57%



■ QBC in Manchester

- 175 mi (280 km) – 168 M\$
- Focus on bus stop (1st contact)
- 2000 -> 2013
- Reflection on guidance & vehicle

Italy



■ Concept of LAM (Linea Alta Mobilità)

- Prato (0,2 M inh.), Brescia (0,2 M inh.), Pisa (0,09 M inh.)
- Not as thorough as previous presented
- 12 to 50 % reserved lanes
- 4 to 8 min. frequency during PH
- Identification (travel map, colour)



■ Trends

- Insufficient knowledge, operators
- Messina : 4 mi (6 km), Civis or Phileas system
- Bologna : 12,5 mi (20 km), 250 M\$, Civis, mixed with tramway

To go further

- On the French works : www.certu.fr, www.bhns.fr

📖 BHLS – *Concept and recommendations* (2005) – Practical advice

📖 BHLS – *From the choice of the system to the implementation* (to be published in 2009)

📖 Executive summary on the relevance of tramway/BHLS (to be published in 2009)

- On the european COST BHLS : www.bhls.eu

✓ **New !** Leaflet on the Cost BHLS presentation

✓ BHLS concepts and approaches in each country

✓ Descriptions of BHLS

- Intention to present a paper at TRB 2010



Thank you for your attention

