Rubber tyred Tram :

another solution to urban mobility ?

Bombardier TVR
City of Nancy

TransLohr
City of Clermont-Ferrand

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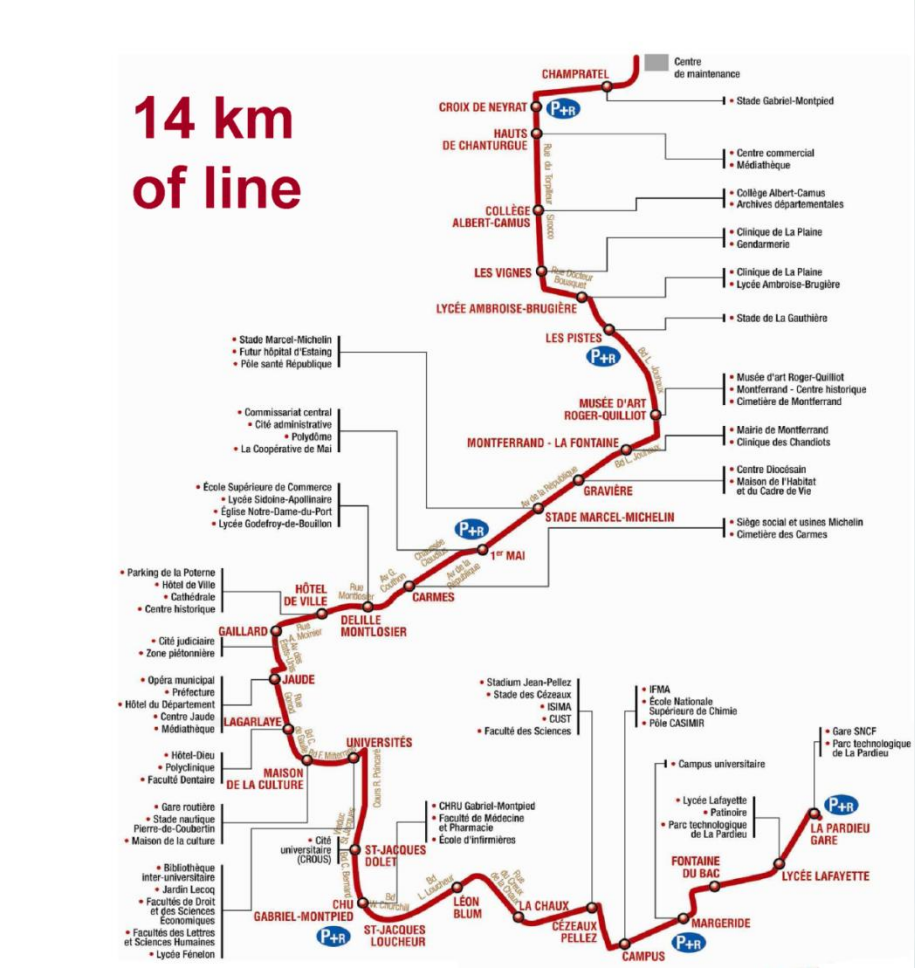
Rubber tyred Tram solution
Clermont-Ferrand case (France)

In 2001 the Union of Public Transport of Clermont-Ferrand (SMTC) appointed SYSTRA to provide assistance to the owner in :

- ✓ drafting tender documents and bid analysis
- ✓ preparing specifications for the selection of project manager
- ✓ the definition, supervision and inspection of contracts, and drawing up applications for authorisation (DUP planning consent, licence application and grant application documents)

SYSTRA also had a general organizational role, providing technical advice, particularly with regard to the implementation of safety procedures.

Rubber tyred Tram solution
Clermont-Ferrand case (France)



- 31 stations
- operates from 5:00 am to 1:00 am
- 45 minutes between terminal stations
- road intersection priority

Bonuses:

- 9 km of additional bicycle lanes
- 6 Park & Ride (P+R)
- Several intermodal exchanges poles

Rubber tyred Tram solution
Clermont-Ferrand case (France)

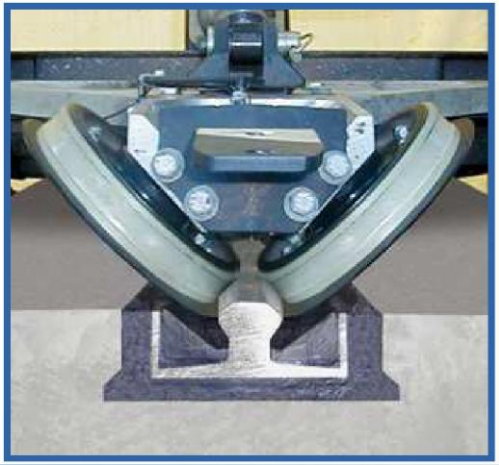
TransLohr vehicles :

- Length : 32 m
- Weight (empty/full): 25t / 32t
- 4-segment vehicle
- 1.08m/s²
- Width : 2,20 m
- Height : 2,95 m
- Bidirectionnal
- Integral low floor : height 25 cm above ToR
- Electric propulsion
- Capacity : 170 p @ 4p/m² ; 225 p @ 6p/m²

Rubber tyred Tram solution
Clermont-Ferrand case (France)

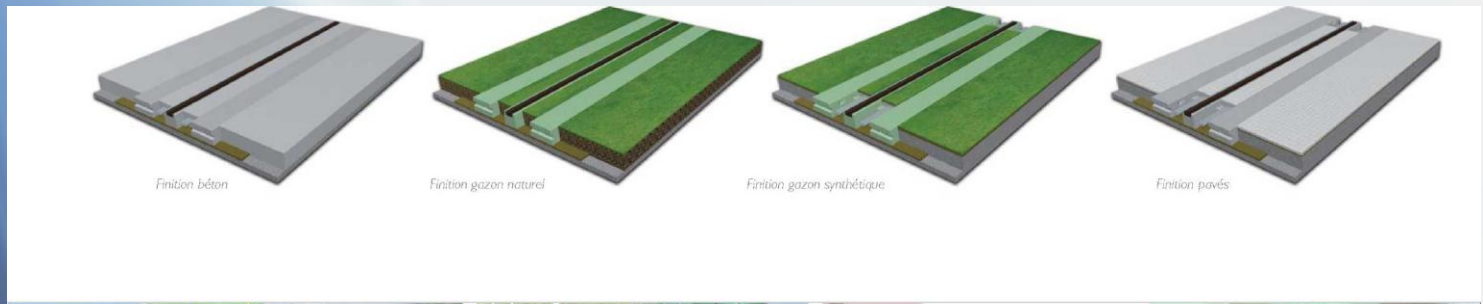
A single rail for guidance

- The rollers grip the rail
- The rail is drowned in resin : reducing vibration and squealing
- The rollers are covered with a composite binding : no contact iron onto iron but significant worn-out rate
- Continuous guidance including in maintenance center



Rubber tyred Tram solution
Clermont-Ferrand case (France)

- Possibility of using prefabricated concrete plinths
- Need for preventing from rutting
- Running surface to be renewed every 10 years
- Possibility of partial grass covering or concrete covering – allowing bus and cars running (not specific to TransLohr)



Rubber tyred Tram solution
Clermont-Ferrand case (France)

The Translohr :

- accepts a very short rail turning radius (10.5m)
- needs less ground surface

  (5,41 m instead of 6,50 m) but very narrow carbody
- can theoritically run on slopes up to 13% (8% tested) while steel wheel tramways can accept up to 9 to 10% slopes
- requires less space for depots than a conventional tram but for narrower vehicles
- requires a hard running surface (rutting effect)

Rubber tyred Tram solution
Clermont-Ferrand case (France)

- This transport system is not compatible with conventional tramways
- Proprietary system
- Cost per passenger is about 12k€ while conventional tramways range from 8k€ to 10k€ / passenger
- Narrow vehicles while the trend in Germany is to widen existing infrastructure to accomodate for wider vehicles
- Comfort
- Safety (sensitivity to derailment)
- Maintenance costs
- Adherence on snow and ice

Rubber tyred Tram solution
Clermont-Ferrand case (France)

Cost and funding of the project

Total cost of the project :
M€ 290 (Euros 2002), being M€ 20.7/km but other sources say M€ 378 , being M€ 27/km.

Funding
Three banking conventions with the European Investment Bank (30 million Euros),
The Bank of the deposits and consignments (32 million Euros)
a banking pool composed by
- Dexia Crédit Local,
- The Crédit Agricole Centre France
- and the Caisse d'Epargne d'Auvergne et du Limousin (140 to 200 million Euros).

Subsidies
20 million Euros from FEDER (Regional European Development Funds).
a financial assistance on work of infrastructures, the studies and the rolling stock
6 + 12 million Euros of the State (instead of the 64 million Euros considered),
15 million Euros for each local authority : The regional Council, the General Council and Clermont Community

Cost of French Tram projects (conditions @ 1/1 2008)

Cost of French Tram projects (conditions @ 1/1 2008) -

Achieved projects

Authority	City size (thousands inhab)	Length (km)	Nbr. of stations	Nbr. of vehicles	Global cost M€ Taxes excluded 2008	Cost/ km M€ Taxes excluded/km
Bordeaux	672	24,6	53	44	913	**37**
Caen	227	15,7	34	24	255	16
Clermont-Ferrand	285	14	31	20	378	27
Grenoble	400	18			472	26
		13,2	23	35	482	**36**
Lyon	1209	21,5	23	18	361	17
Montpellier	372	20,3	36	26	637	31
Mulhouse	236	12	23	16	278	23
Nancy		11			108	10
Nantes	576	27,2			521	19
		13,3			461	**35**
Orléans	274	18			453	25
Rouen		18,3			538	29
Strasbourg	457	13,5	22	39	539	**40**
Valenciennes	347	9,5	19	17	326	**34**
Total		**250**			**6 724**	**27**

Source: GART - Données au 18.12.2006 + Enquêtes 2001 à 2003

Cost of French Tram projects (conditions @ 1/1 2008)

Authority	City size (thousand inhab)	Length (km)	Global cost (M€ Tax excluded)	Projected finish date	Cost/km (M€ Taxes excluded/km)
Angers	269	12	238	2009	20
Brest	222	12	260	2012	22
Le Mans		15,4	290	2007	19
Marseille	992	11,1	387	2007	**35**
		0,8	17	2011	21
Nice		8,5	350	2007	**41**
Reims	219	10	200	2011	20
Toulon	404	19,7	515	2011	26
Toulouse	806	10,9	203	2009	19
Tours	291	14,8	369		25
Fort de France	381	13,8	245,8	2011	18
Total		**129**	**3 075**		**24**

Source: GART - Données au 18.12.2006

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THANK YOU FOR YOUR ATTENTION