Translohr

the other tramway

Transport systems comparison

trams on tires / trams on rails

Transport systems comparison trams on tires / trams on rails

Introduction

Transport systems comparison trams on tires / trams on rails

Introduction

Contents

The Translohr tramway on tires is part of a new generation of urban light-rail tramways.

The major innovation lies in the use of tyres to replace the traditional railway bogie.

The performance of the tires give Translohr significant advantages: silent operation, no vibrations transmitted to the ground, steep slope capability (13%), efficient, safe braking, easy insertion into the environment (turning circle 10.5 metres), fast economical installation of the tramway, and simplified maintenance.

Its unique width and transparency makes Translohr the structured transport system that is best incorporated into an urban environment.

Furthermore it combines all the characteristics of a modern tramway: large transport capacity, complete range of trams (25 to 46 metres), tram reversibility (2 driving cabs), integral low floor, integral permanent guidance (by central rail), and electric traction power.

Transport systems comparison trams on tires / trams on rails

Cost of infrastructure

The infrastructure for separate public transport of the tramway type includes the complete system with the rails, civil engineering, site installations, electrical equipment (sub-stations and overhead contact line), railway signalling, engineering and project management.

In Europe the total costs of the infrastructure for the Translohr system is 25 to 40% less than for a rail tramway. This saving is even greater with a solution providing a concrete track way (recommended for Translohr), as it is simple to implement and has a service life of 30 years.

Several characteristics explain this significant saving.

Transport systems comparison trams on tires / trams on rails

Cost of infrastructure

Track way thickness

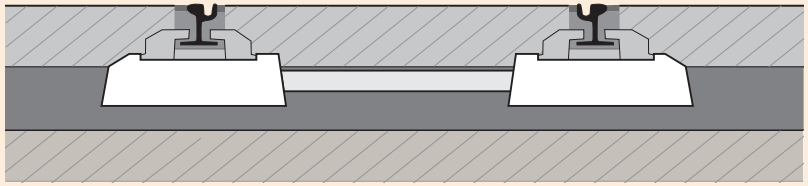
The separation of the functions of load-bearing (provided by the tires) and guidance (provided by the central rail) makes it possible to reduce the sizing of the Translohr tramway, with a thickness of 30 cm in comparison to the 70 to 100 cm required for a rail tramway system.

Guide rails

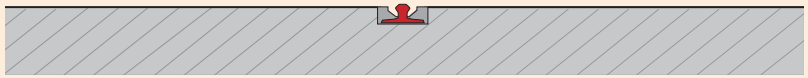
A single 8 cm high rail for Translohr as opposed to two 21 cm rails for a rail tramway.

The laying of the Translohr rail is fast and economical (resin bonding in an existing emplacement).

In contrast, the installation of the two rails is more complex, more difficult and takes longer as these both guide and support the weight of the tram.



Trams on rails - 70 - 100 cm



Translohr - 24 - 30 cm

Trams on rails

Translohr

Transport systems comparison trams on tires / trams on rails

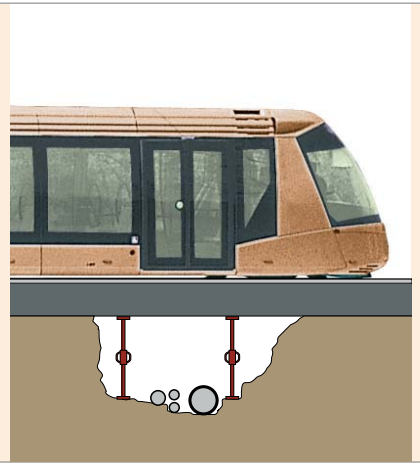
Cost of infrastructure

Deviation of networks

The rail track way makes it necessary to move all the networks present due to the thickness of its track way.

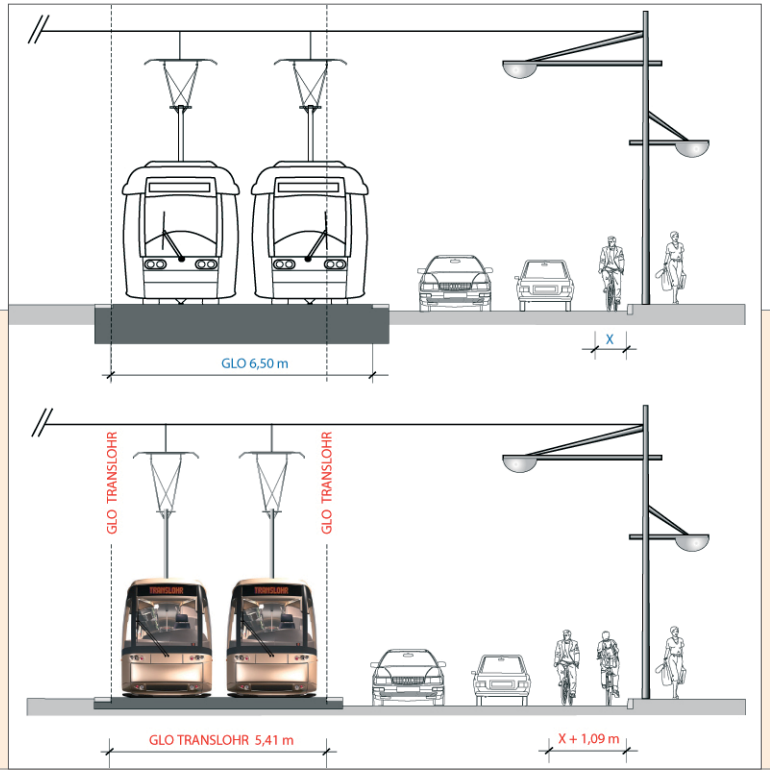
On the other hand with Translohr the movement of all or part of the networks can, in some cases, be avoided.

Furthermore, the concrete Translohr track way is installed in one continuous operation. Thus with limited shoring-up the underground area remains accessible if it is necessary to work on the networks that have not been displaced.



Gauge

The Translohr ground coverage, and therefore the surface area of its track way, is nearly 20% less than that for a traditional tramway (5.41 metres wide as opposed to 6.50 metres).



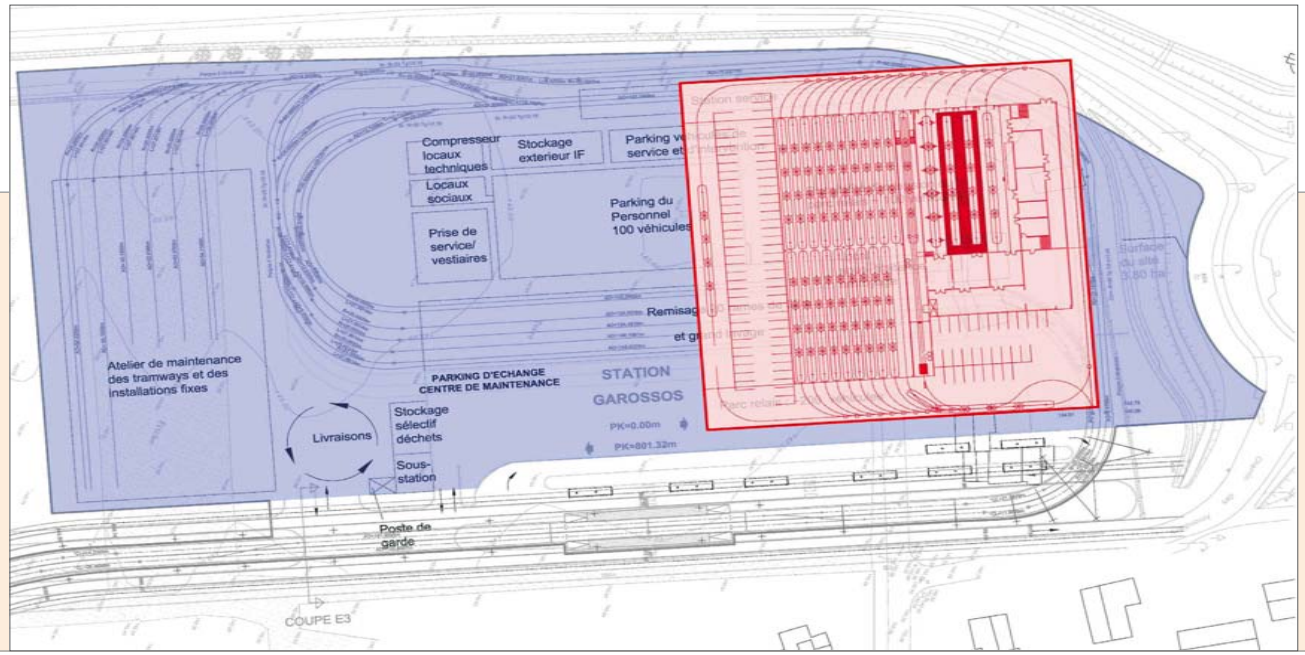
Transport systems comparison trams on tires / trams on rails

Cost of infrastructure

Land occupancy of the depot

With its 10.5 metre turning circle and narrow gauge, Translohr has reduced the space required for the depot to at least half that required for a rail track way (minimum turning circle of 25 metres) for the same number of trams.

For example, for a complete fleet of twenty 39 m long vehicles, the Translohr depot including the adjoining maintenance shed and other staff facilities (offices, cloakrooms, parking, etc.) will occupy a surface area of 10,000 m^2 instead of 25,000 m^2 for a traditional rail track way.



Trams on rails (25000m²) *Translohr (10000 m²)*

Transport systems comparison trams on tires / trams on rails

Cost of infrastructure

Points and crossings

Translohr points and crossings are compact and easy to install.

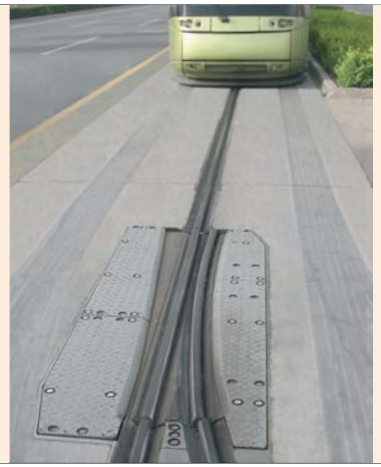
They cost less than those for a standard track way.

Structural works

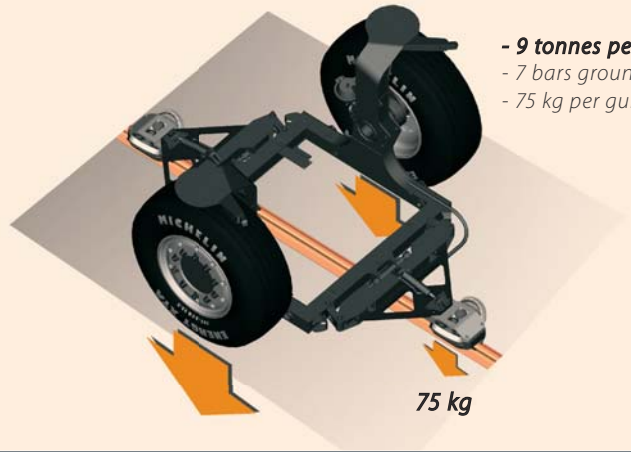
Depending on the characteristics of the track way line layout, the construction of new structural works may be avoided. The Translohr narrow gauge (2.20 m wide – 2.9 m high) and its limited axle load (9 tonnes maximum load) may, in fact, make insertion possible with the existing structural works, or a substantial reduction in the amount of resizing for the structure concerned.

Translohr performance in terms of slope capability also contributes to reducing the size of structures..

Trams on rails



Translohr



Transport systems comparison trams on tires / trams on rails

Cost of infrastructure

Simplified track way construction

The construction of the Translohr track way requires a limited number of operations:

1. Casting the concrete to a depth of 24 to 30 cm with an emplacement for the guide rail. The concrete provides both a foundation for the track way and a track for the vehicles.
2. Placement of the rail using resin bonding.

For a standard tramway the construction requires more operations :

1. The lower layer foundation,
2. Construction of the track base,
3. Placement of the sleepers or tie plates,
4. Placement and fixing of 4 grooved rails,
5. Rail coating (filling profile),
6. Putting on the final surfacing for the tramway (concrete, paving stones, tarmac).

This simplification in the favour of Translohr optimises the duration of the work and reduces nuisance during the track way construction phase, both for road users and residents.

Translohr roadway

Trams on rails roadway

Transport systems comparison trams on tires / trams on rails

Design and layout

Clermont-Ferrand, France

Padua, Italy


Tianjin, China

Mestre - Venice, Italy


Shanghai, China


Saint-Denis - Sarcelles , France

Transport systems comparison trams on tires / trams on rails

Design and layout

Through a complete range of harmonious colours, materials and shapes, Translohr responds to the requirements of the municipality, identifying Translohr with the city. It moves away from the standardisation noted in rail tramway ranges (limited colour choice and basic interior accommodation).

Furthermore many designer elements encourage ease-of-maintenance for the vehicle:

- Floor covering
- Choice of seat covers
- Cantilever-mounted seats (no support foot)
- Oval grab handles attached to the seats (no floor mounting)
- Seat fittings totally integral (no "lost" areas where objects may be deposited)
- Continuous interior fitting from floor to ceiling (no "lost" areas where objects may be deposited)
- Interior fittings in soft, rounded shapes (no recesses where dirt may gather)
- Interior fittings designed in identical modules with visible joints adding to the aesthetics
- Floor carpet extended sideways up the walls
- Limited number of fitting parts (few junctions likely to encourage dirt to gather).

"Volta Celeste" 1302-1305, Giotto
Affresco Capella degli Scrovegni, Padova

"Le Mariage de la Vierge" 1302-1305, Giotto
Capella degli Scrovegni, Padova

" L'Espérance" 1302-1305, Giotto
Capella degli Scrovegni, Padova

"3Blu" Majeur Dominante Range

Transport systems comparison trams on tires / trams on rails

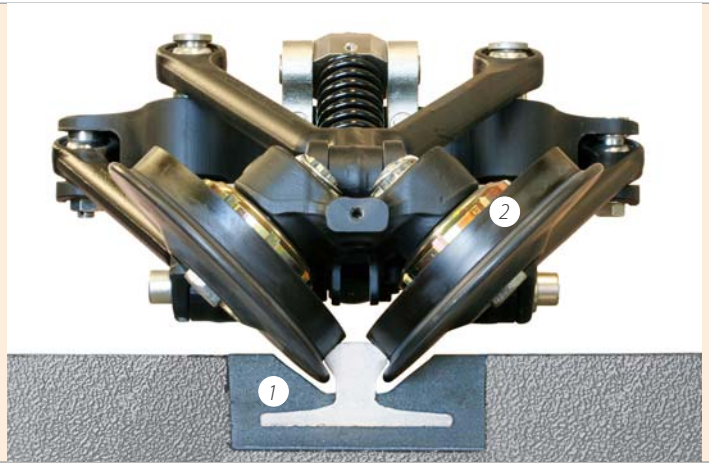
Noise and vibration levels

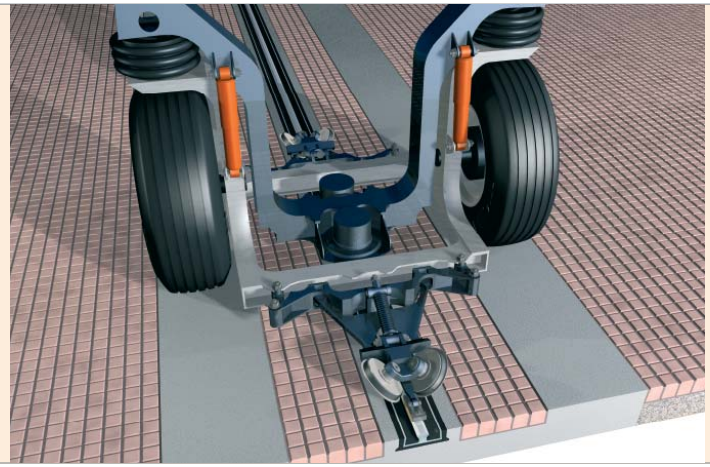
Translohr is silent.

Its tire tread and guidance system do not transmit any vibration either to the road surface or surrounding constructions.

Conversely the rail track causes high levels of unpleasant noise emissions (mechanical phenomenon that is accentuated on bends).

In urban surroundings the vibrations generated by the passage of rail trams and transmitted by the rails makes it necessary to construct the system on a raft foundation, which is difficult and takes time to construct.





1- Rail embedding with resin
2- Bearing surface over paving stones (no iron to iron contact)

Transport systems comparison trams on tires / trams on rails

Operating costs

Energy consumption

Translohr energy consumption is on average 5% less than that of a rail track way. The greater resistance to forward motion of the tyre on the track way is compensated for by the lower vehicle weight (from 10 to 15 tonnes).

Rail maintenance

The Translohr guidance system without iron-to-iron contact does not have to support vertical loads. Consequently, the Translohr rail does not require any particular maintenance unlike rail tracks which require regular maintenance, resurfacing by welding particularly on bends.

Wheels

Translohr tires are standard tyres with an average service life of more than 1 year.

Braking is of the road transport type with ABS, simple to maintain and understood by all mechanics.

Conversely the maintenance of a steel wheel mounted on bogies for a rail track way requires a high level of maintenance (regular corrections of wheel flats due to friction on the rails and emergency braking) and a significant amount of equipment in the workshop (underfloor wheel-lathe).

Other equipment

Translohr and the traditional tramway use the same electrical equipment (e.g. converters, traction chain, pantograph, motors, doors and electronic components). The maintenance for these is therefore similar.

ntl
Tramway sur pneus Translohr
20 Avenue de la Concorde
67120 Ernolsheim sur Bruche
Tel +33(0)3 88 38 98 00
Fax +33(0)3 88 96 06 36
www.newtl.com