

Urban insertion of tramways

the French approach

(Norwegian study tour)



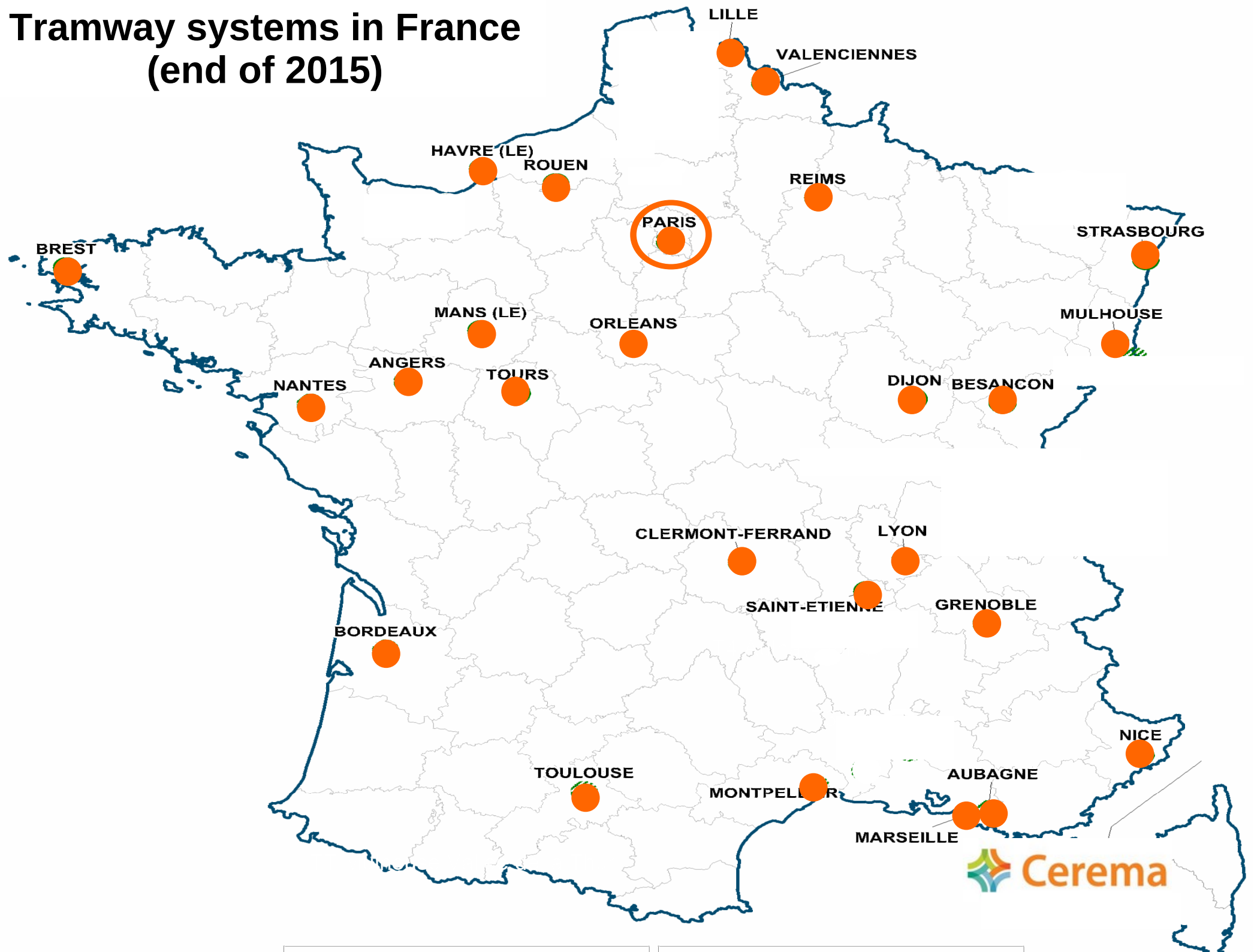
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- **French tramways : current situation**
- **a goal : the High Level of Service**
- **safety as a main way to reach High Level of Service**
- **a tool : the *urban insertion* of tramways**
- **the institutional context : some favourable points**
- **a chance : starting from no-where : re-building the street**
- **some positive aspects : design (rolling stock, layouts)**
- **more or less speedy tramways ...**
- **the legal context of urban insertion of tramways**

Tramway systems in France (end of 2015)

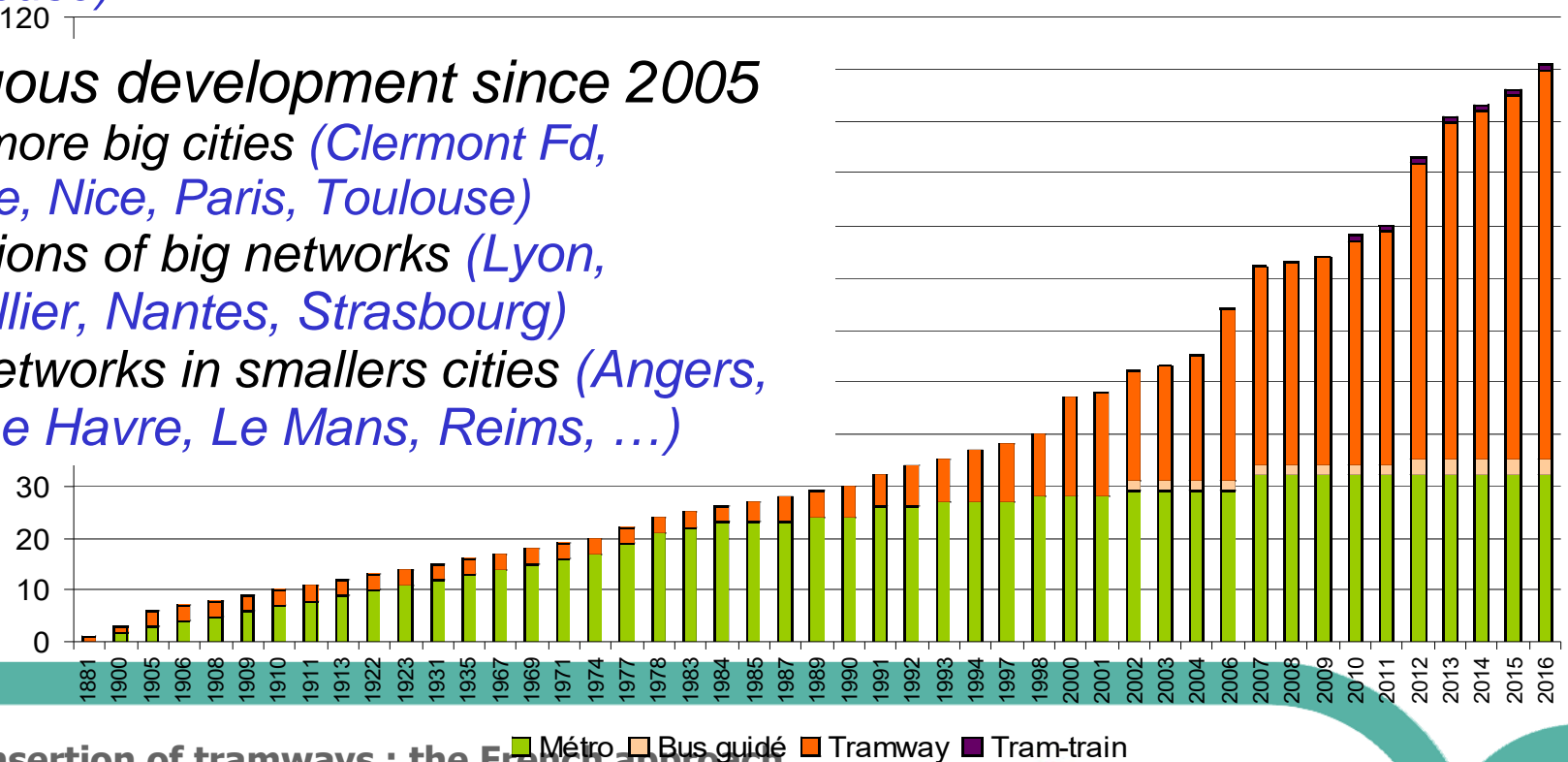


Tramways in France

- a few « historical » networks
 - 2 surviving lines (*StEtienne, Lille*)
 - A few renewal pioneers (*Rouen, Strasbourg, Grenoble, Nantes, Paris reg.*)
- a wave of new networks at beginning of Years 2000
 - Essentially in big urban areas (*Lyon, Montpellier, Bordeaux, Orléans, Mulhouse*)

- a continuous development since 2005

- A few more big cities (*Clermont Fd, Marseille, Nice, Paris, Toulouse*)
- extensions of big networks (*Lyon, Montpellier, Nantes, Strasbourg*)
- New networks in smaller cities (*Angers, Brest, Le Havre, Le Mans, Reims, ...*)



Urban insertion of tramways : the French approach

Tramways in France

- main general characteristics
 - **26 networks, 71 lines, 703 km of tracks, 1293 cars** (end 2016)
 - Radial lines through city centres, based on traffic generation hotspots (universities, hospitals) & high density housing areas
 - Tram lines = base of re-structured PT networks
 - Park & Ride in suburbs
 - Mainly **exclusive right of way** (2% of total length in mixed traffic)
 - Layouts and rolling stock oriented on accessibility for disabled people – *compulsory application of the law*



Urban insertion of tramways – the French approach



Actors in French public transport

- Regulation and control => **State**
- Management of PT systems => “**AOM**” : organising authorities
 - State => national railways & coach lines
 - Regions => regional railways, interurban coach lines
 - *Departments* => *local railways*
 - **Local “AOM” (cities) => urban transport**
- Providing of transport services => **Operator**
 - **for urban transport**
 - mainly, private companies through a contract with AOT
 - a few public companies (cities)
- Roads and public space and traffic management
 - **In towns : cities (or federation of cities)**

The regulatory framework of French Public Transport

Tramway is concerned as well as other *TCSP** systems

- **Metro** systems
- **Bus** with **High Level of Service**
- **Light Rail** systems
- *Aerial cable urban transport*
- *Sea or river shuttles*



* « *TCSP* » ⇔ *public transport system,*
(mainly) running on its own site
(No legal definition)

The regulatory framework of French Public Transport

Management of TCSP projects (as other infrastructure or building projects)

- « MOP » law of 12 juillet 1985 => relations between public contracting authority / (private) project management

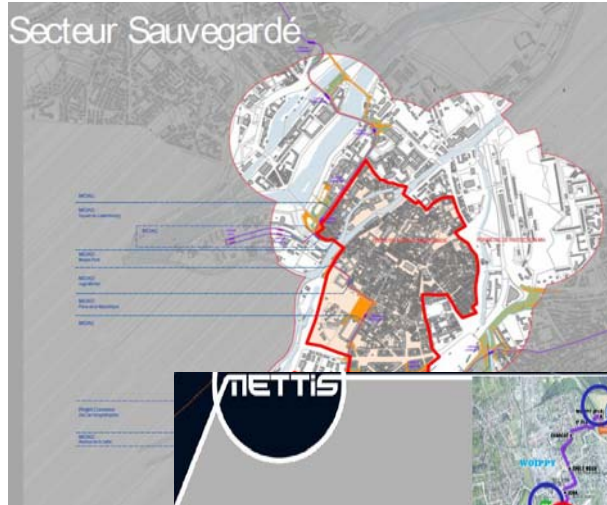
Administrative procedures

- a legal framework in constant evolution...
- Main topics
 - **Public interest**
 - **Socio-economic viability**
 - **Environmental impact**

Technical framework

- Construction issues
 - Use issues
 - Interaction with external context
- } => rules, standards
including safety issues

An example of constraints: « *Mettis* »

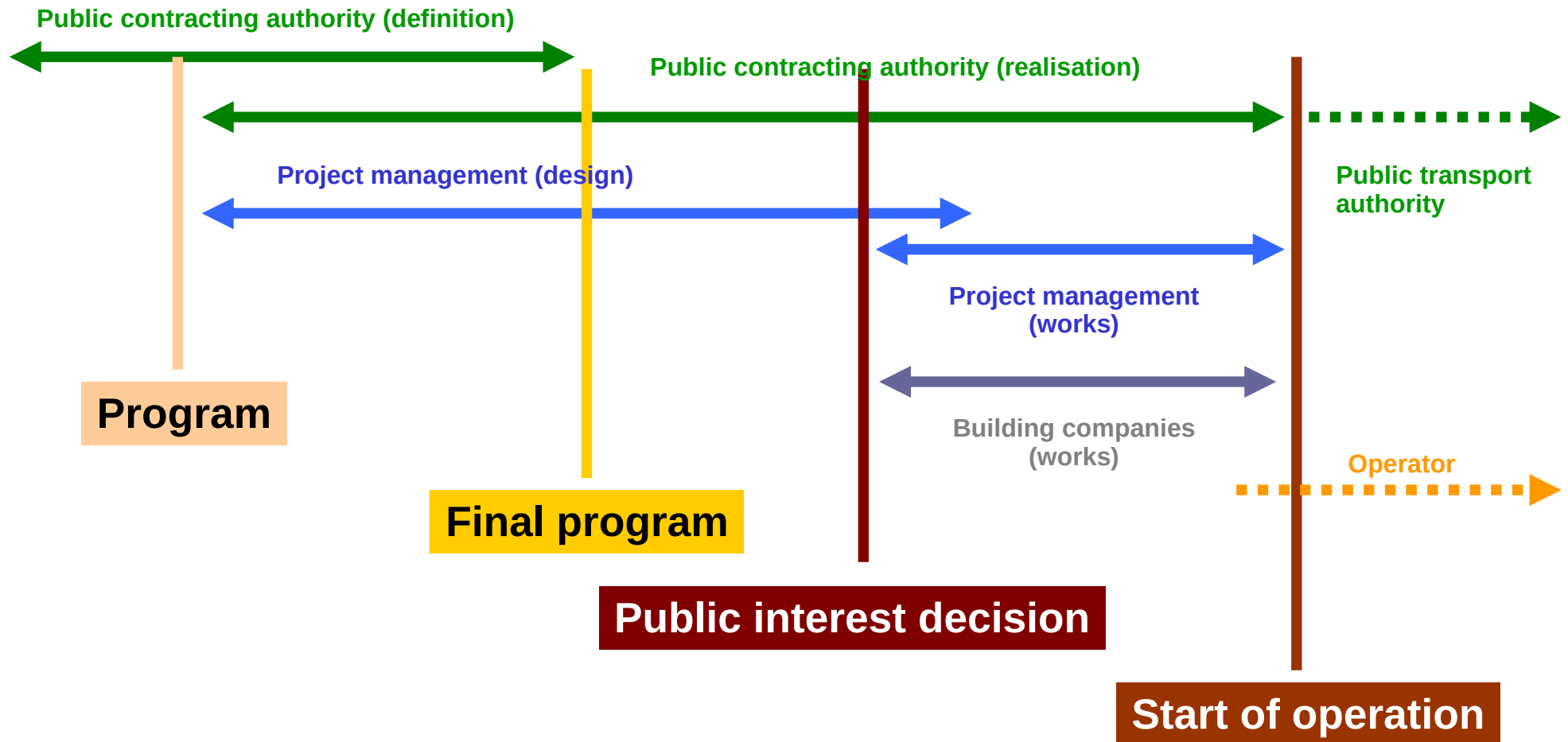


A 18km BHLS system in Metz
(2013)



- Protected area (downtown) : 25 files
 - Permit for destroy, build, authorisation for removing trees, for works, ...
- preventive Archéological process : 8 sites
 - 8 potential sites, 2 sites with excavations
- « Water » law : 11 sites
 - 1 site with a special public consultation and impact evaluation
- Pyrotechnic premediation : 1 site

The standard schedule of a TCSP project



TCSP => High Level of Service systems

Main indicators for H L S :

- **capacity**, with a sufficient comfort
- **frequency**
- **commercial speed**

+ 2 fundamental indicators for quality:

- **regularity** / *ponctuality*
- **reliability** / *availability*
- *backbones of a ranked network*
- *a systemic approach :*

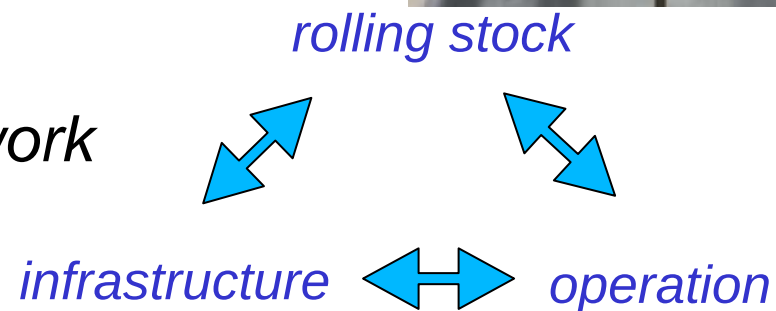


Image and design, key facts for success

Rolling stock :

- **customised** (head of) vehicles
- “clean” mode
- quiet, “friendly” vehicle



Infrastructure and layouts

- high quality materials and urban furniture
- “green tracks” (grass, plants)
- artistic acts

Operation

- effective priority
- efficient boarding/alighting
- real time information



Safety, an essential stake for HLS

a **direct stake** ...

but also an **indirect** one,
because of



impact on **productivity** :

- **regularity**
- **availability**
- **commercial speed**
- **corporate image**
- **operation costs**

disruptions due to accidents

immobilized vehicles
damaged facilities
services breaks



prevention methods

restrictives orders
distrusting driving
drivers' stress



Main key factors for tram (un-)safety

- *Obstacles to mutual visibilities*
 - *Plants, parked vehicles, urban furniture, buildings*
- *Readability of layouts*
 - *Design, materials*
- *Bad awareness of other modes needs*
 - *Pedestrians, cyclists needs*
- *Lack of attention and awareness of danger*
 - *Mobile phones, portables devices, ...*
- *Speed of vehicles (and tramways)*

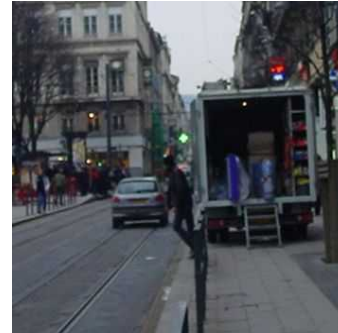
"STPG"* regulations, as a facilitator...

*** Safety for guided public transport**

What “*urban insertion of tramways*” is

= the physical integration of a transport system in the public space, and its interaction with other users and activities

- pedestrians
- bicycles
- motorized vehicles
- parking and deliveries
- residents' activities
- *urban services*
- *maintenance actions*



a tool to reach HLS and safety

- => **sharing** the public space
- => handling **uses'** conflicts
- in space => **infrastructure design**



- in time => **traffic management and operation**



The legal context of tram urban insertion

- *What is a tramway !? a train on the road !?*
 - No legal definition in French texts...
 - Mainly addressed (in [Road code](#)) through
 - exclusion of « rail vehicles »
 - requirements to other users

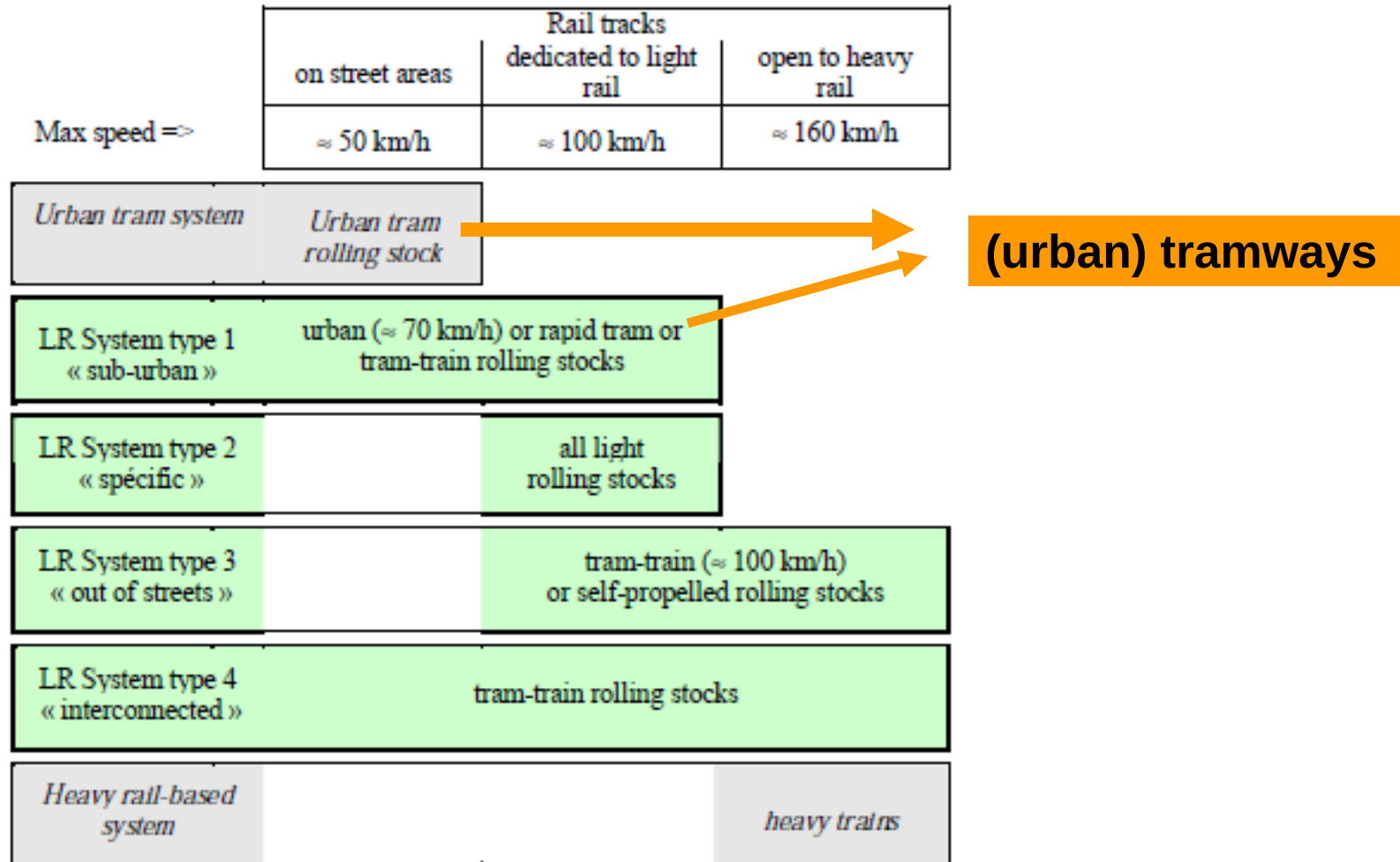
Moreover, what about a « urban » tramway?!...

Indeed, a current debate on the definition of the tramway's path when located in streets, with some control issues

- *who may do it?*
- *which level of fines ?*

A functional based definition...

about Light Rail-based systems (« SFL »)



Main texts

As the tram goes in public space :

- Road Code

- *Vienna Convention (8/11/1968)*

- *European agreement of Geneva (01/05/1971)*

- Ordinance – 24/11/1967 and Instruction (« IISR ») about Road Signalling - 07/06/1977

As the tram is a guided vehicle

- Transport code (STPG decree)

The Tramway and the road code

2 main rules...

- « Road code don't apply to tramways...

But tram drivers have to respect « requirement » signals! »

=> General rules don't apply

- * **Tramways don't have to give the priority to pedestrians « normally » crossing...**

- **Other drivers have to give the priority to the rail vehicles** and to let the tracks free when these ones are coming

Globally, despite lacks of clearness about definitions and legal status of tramway and its path, a sufficient background to operate rather correctly...

Tramway's site on public space

3 cases for Public transport running conditions

- (exclusive) dedicated lanes
- shared dedicated lanes with some other particular users
- running in general traffic

=> Also applicable for busses

Then how does it work !?...

streetcars had quite disappeared in French towns...

to let LRT run (back) in streets ...*
we had to take the cars' place !



(c) B&B / Photo: Jean-François Montoya



St -Etienne

=> getting **dedicated running ways** (most often)

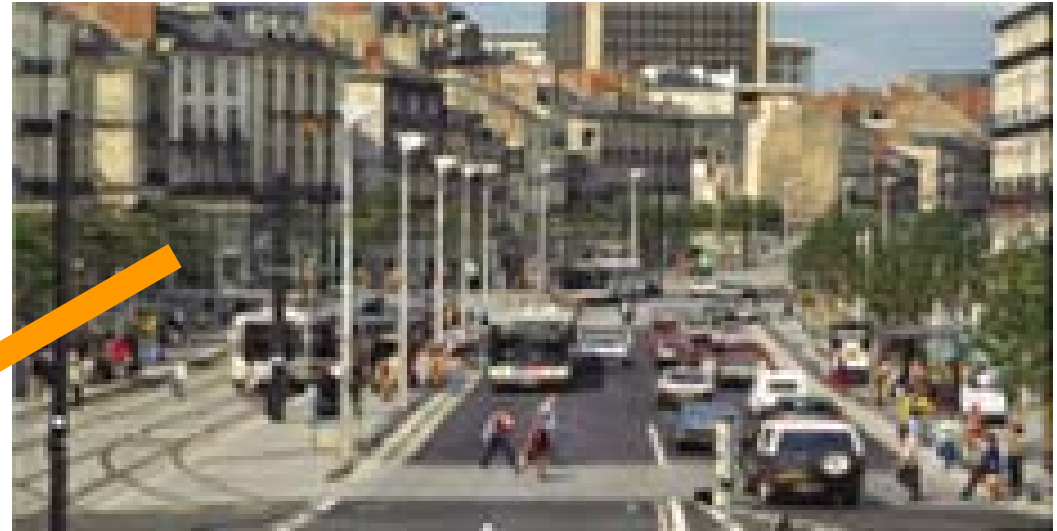


Reims

Urban insertion of tramways : the French

reducing place of cars...

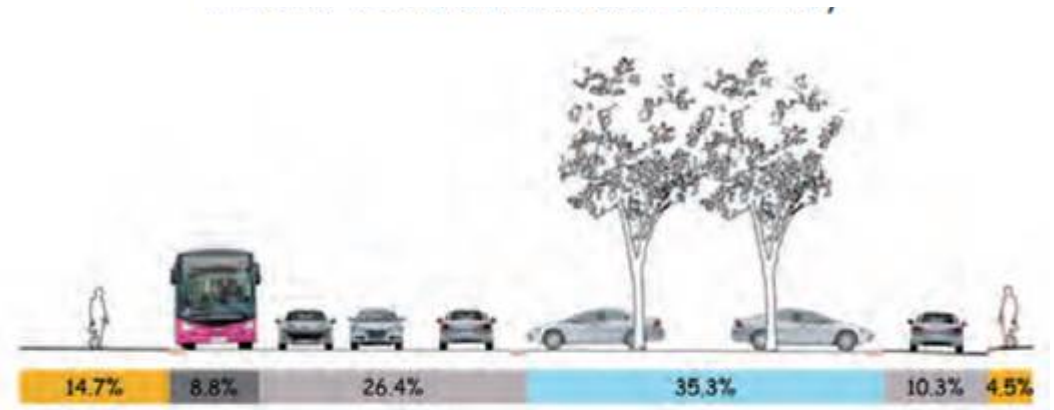
Nantes : from 8 car lanes to a limited traffic area



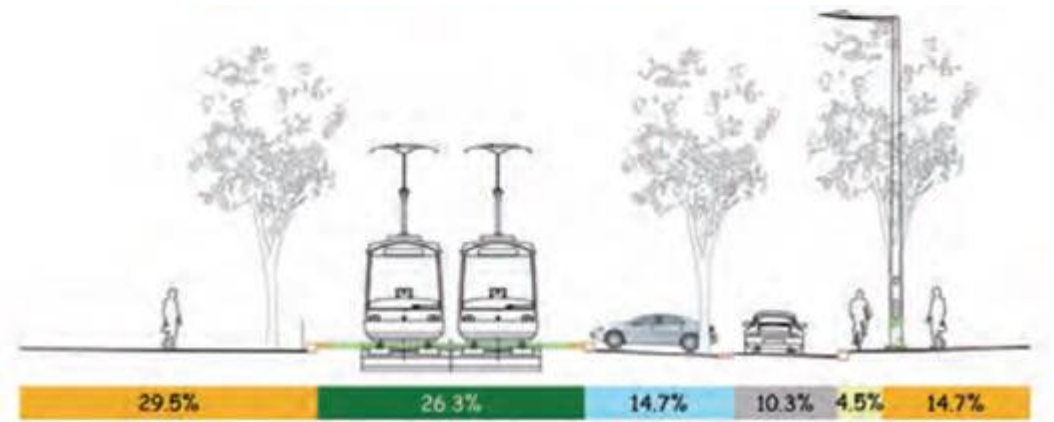
reducing place of cars...

Dijon : inversion of space distribution between modes

Before works...



after works...



Some favourable elements of context

Accessibility rules

(“handicap” law, Feb. 2005)



Promotion of active modes



Bicycles must be taken in account

in projects (“*LAURE*” law)

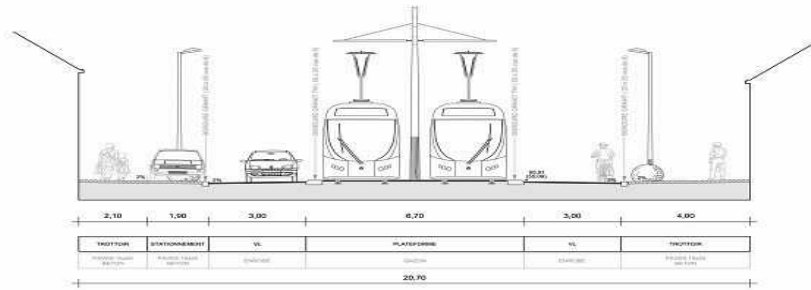
Moderation of cars in city centers

(“*Code de la rue*” decrees)



a chance to re-design public space

- . full revision of **cross-sections** (frontage to frontage)



- . introduction of singular points :



the **stops**

- . technical elements to be installed



Main basics for lines design

- *2 essential entries*
 - *Tram has got the priority, as it's a rail vehicle...*
 - *Tram drivers run « on sight »*
- **the STPG context as a strong review process**
- a few main principles
 - get the lanes (track bed) perceptible
 - materialization of the gauge limite (« G.L.O. »)
 - taking care of all uses
 - poor braking performances of tram, trapped by rail...

=> (a few) technical guidelines for layout and signalling

Main basics for lines design

- **linking sections** *between junctions and stops*
 - *Segregated lanes when relevant*
 - *Other modes taken in account (to avoid use of tram tracks)*
 - *Shared space with traffic management (put the tram in front of cars)*
- **at stops**
 - *Accessibility for disabled people, an essential tool*
 - *Taking in account pedestrians routes (they will do so anyway)*
- **at junctions**
 - *Matching of design and traffic management*
 - *Believable signage and traffic management => **priority to LRT***
 - *Mutual visibilities*
 - *avoid fixed obstacles downstream of conflicts zones*

Speed adapted to context

From...

- pedestrian areas
- mixed traffic zones



To ...

- fully segregated (and level crossings)



Urban insertion approach

Thanks !



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