

# Vejforum 2013

## Tramways safety and public space, the French case



MINISTÈRE  
DE L'ÉQUALITÉ  
DES TERRITOIRES  
ET DU LOGEMENT

MINISTÈRE  
DE L'ÉCOLOGIE,  
DU DÉVELOPPEMENT  
DURABLE  
ET DE L'ÉNERGIE

**Dominique BERTRAND**  
Certu (France)

# contents

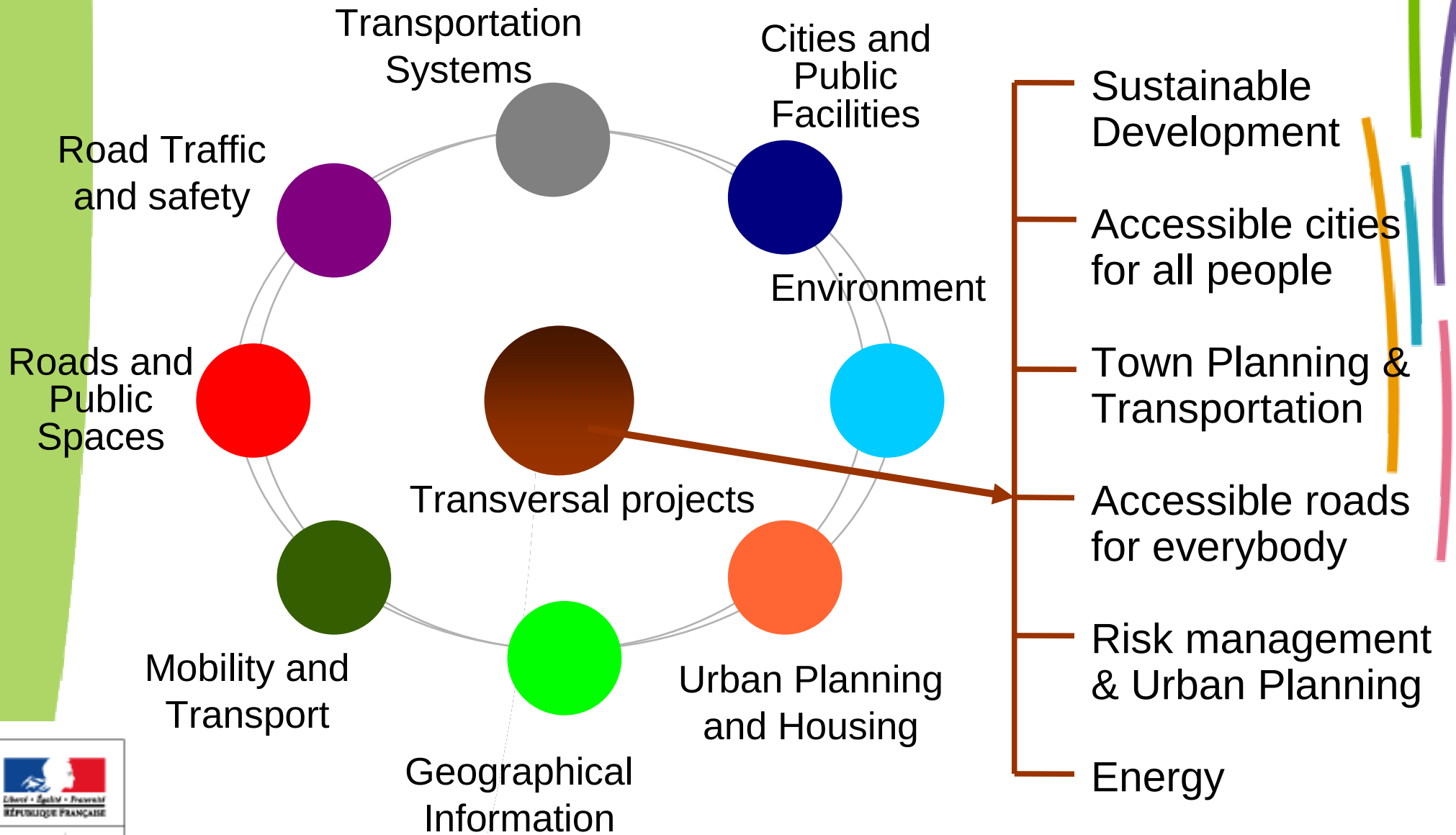
- a few words about Certu
- context of French tramways
- tramways safety : figures and facts
- tramways safety : management
- urban insertion of tramways : safety as a main goal



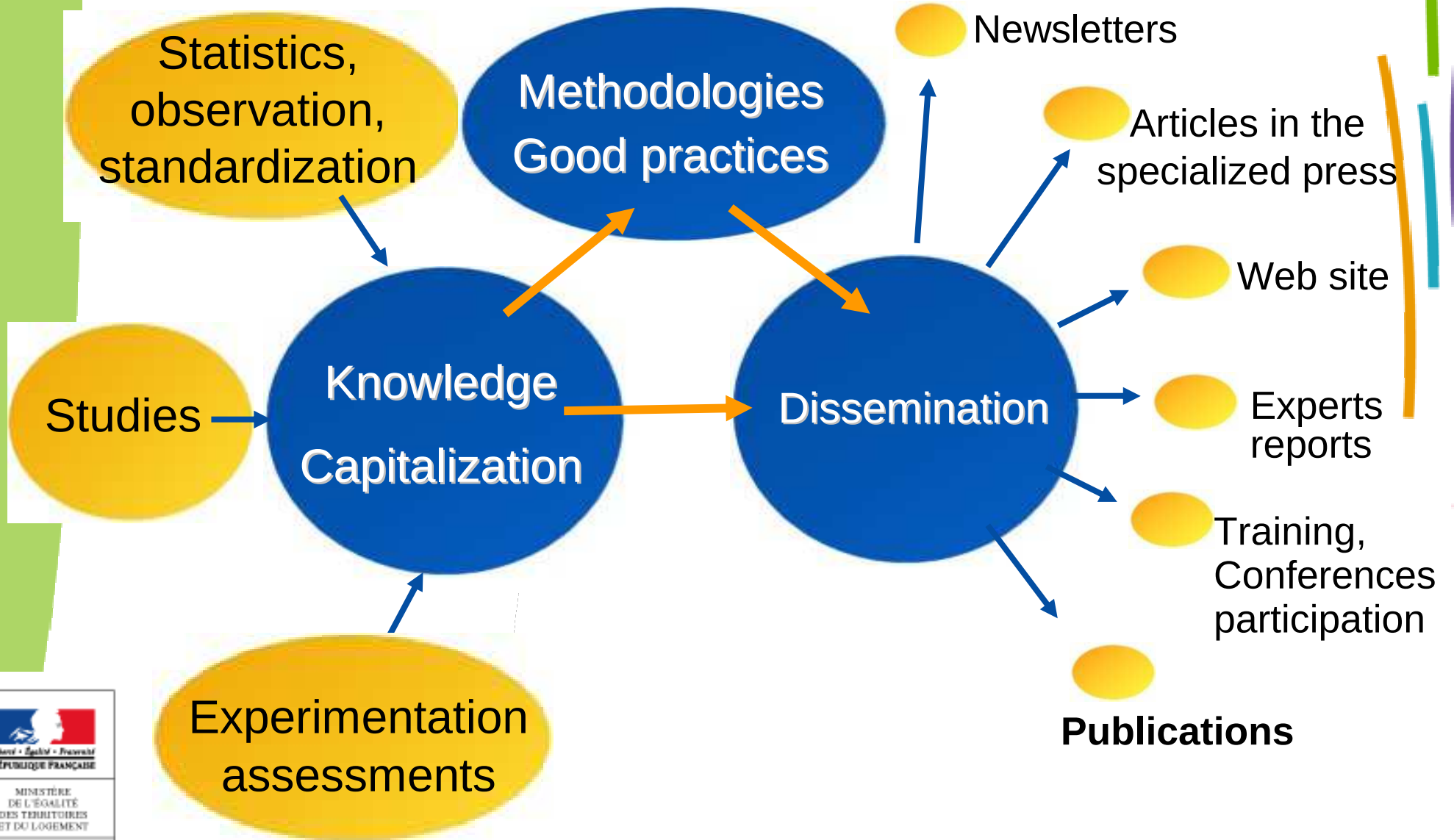
- National department of French Ministries of Ecology, Sustainable Development, Energy, Transport and Territorial planning and Housing
- Capitalizes, develops and disseminates knowledge and methodologies on a wide range of **urban issues**
- For local authorities, institutes and companies which are involved in public service activities,  
and also at an international level...



# Fields of activity



# Certu's missions



# Certu is to join CEREMA

- With 2 other technical state offices :
  - SETRA (inter-urban roads and transport, bridges)
  - CETMEF (sea and rivers)
- And with the CETE : 8 regional centres for technical studies techniques of the ministry
- A new French scientific and technical public agency :

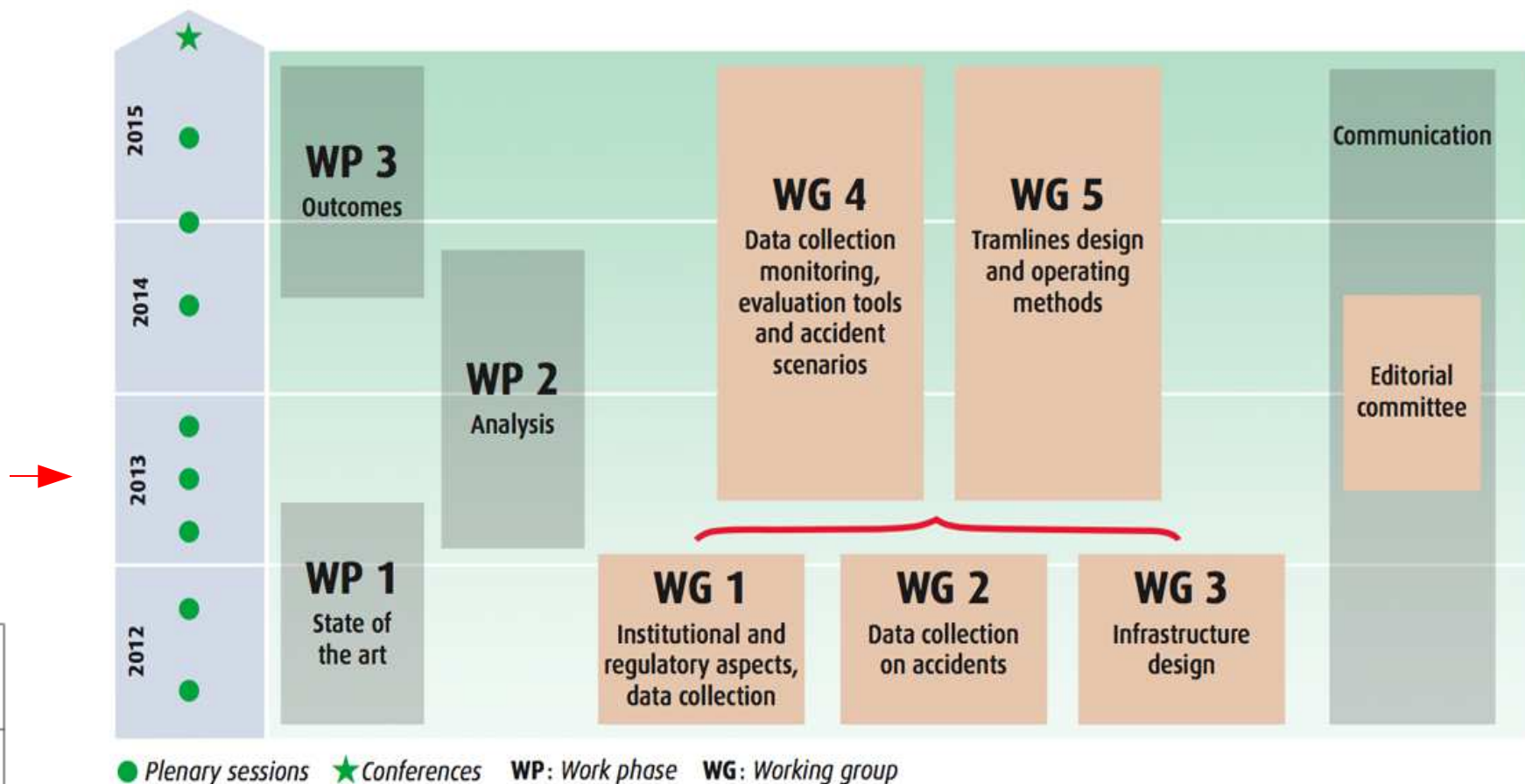
the **CEREMA** (on 1/1/2014)

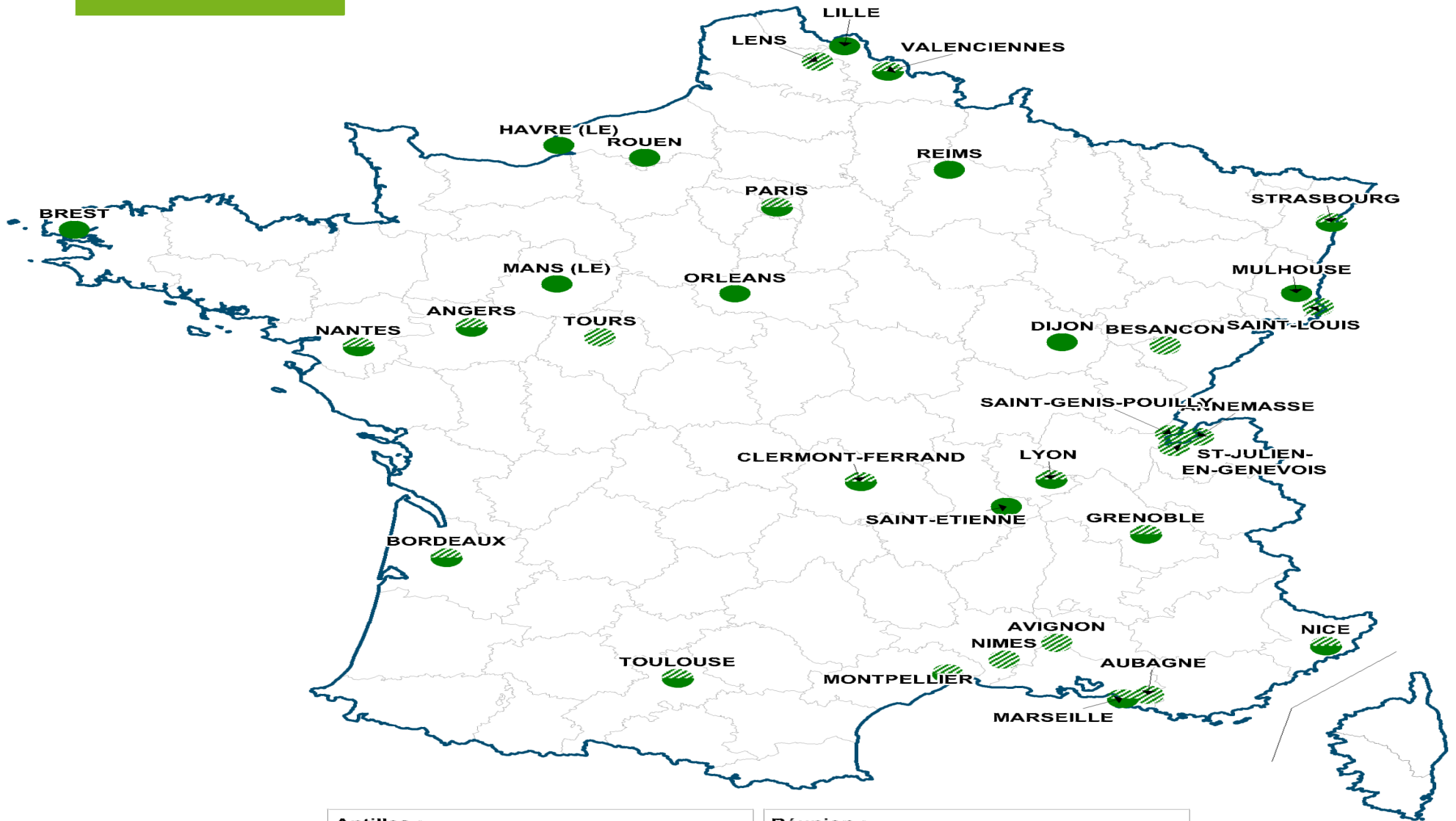


# The COST Action TU1103

Safety & operation of tramways in interaction with public space

15 countries (+ UITP), 34 partners





Antilles :



Réunion :



### Tramways

-  en service
-  en projet



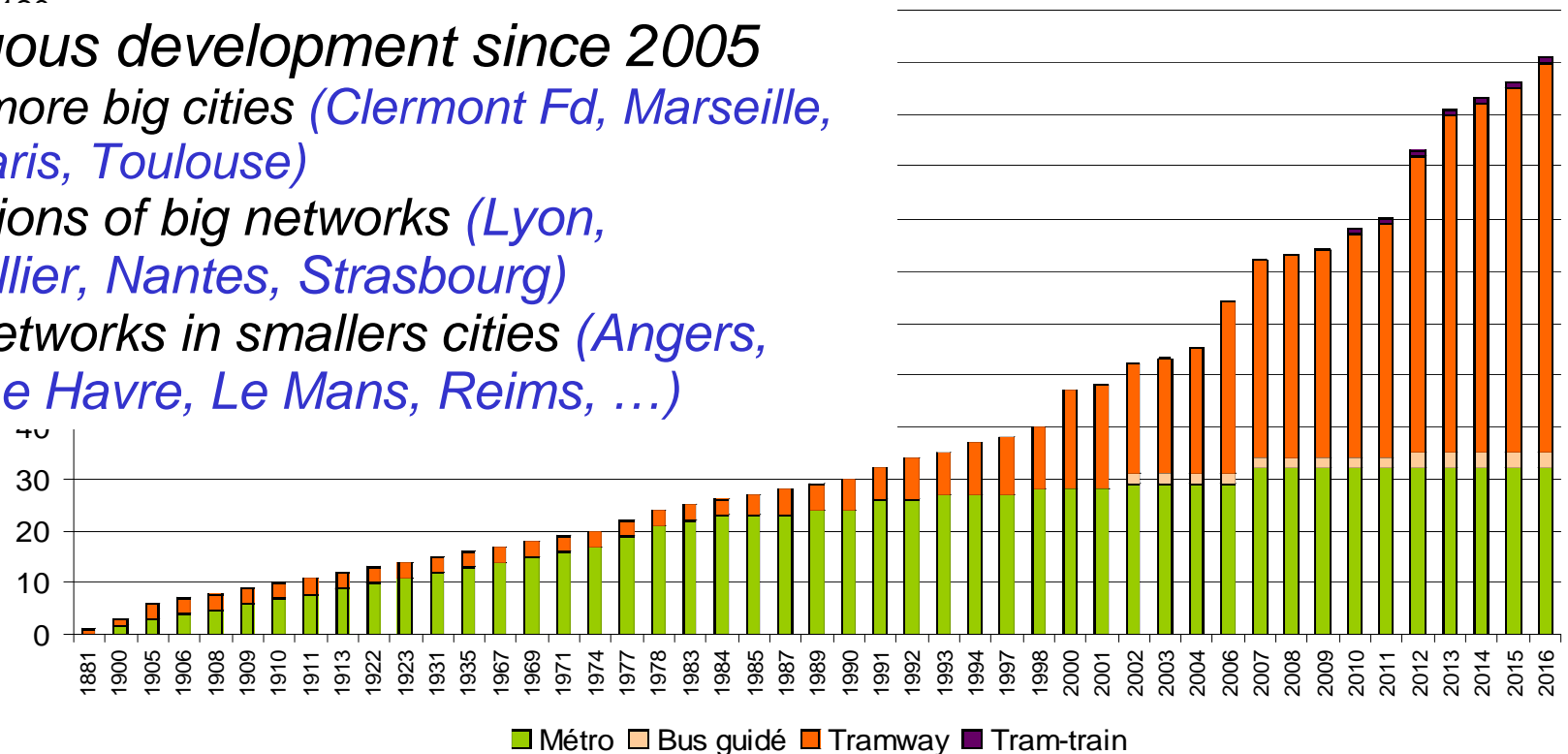
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DU DÉVELOPPEMENT  
DURABLE



# 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, ...)



# Tramways in France

- *main general characteristics*
  - **25 networks, 57 lines, 600 km** (avril 2013)
  - *Radial lines through city centres, based on traffic generation hotspots (universities, hospitals) et high density housing areas*
  - *Tram lines = base of re-structured PT networks*
  - *P+R 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*



# Actors in French public transport

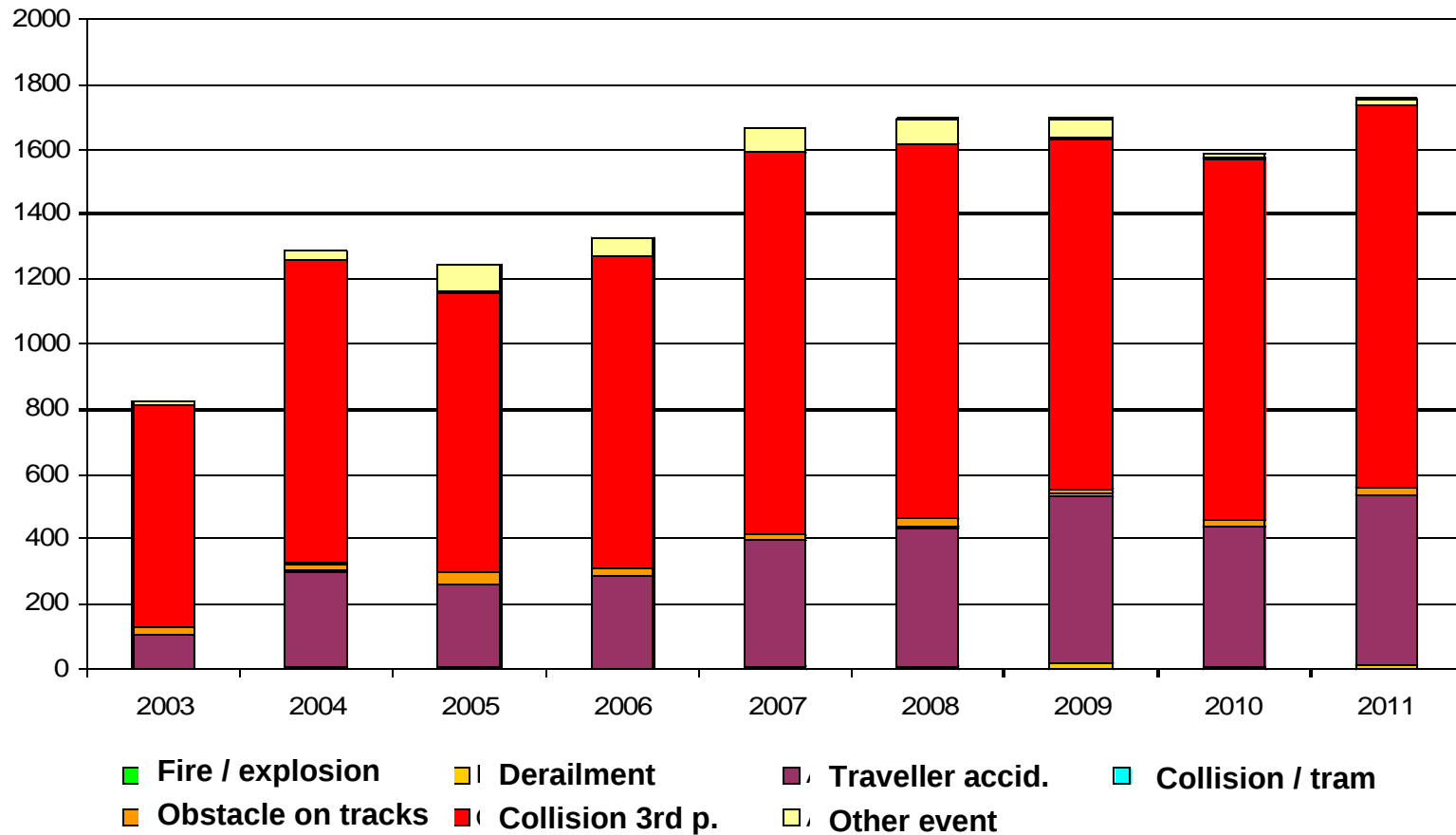
- Regulation and control => **State**
- Management of PT systems => “**AOT**” : organising authorities
  - State => national railways & coach lines
  - Regions => regional railways
  - Departments => interurban coach lines, local railways
  - **Local “AOT” (cities) => urban transport**
- Providing of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



# Accidents key figures

- a national database about « **events** » managed by STRMTG
  - data collected by operators
  - tools and results shared with operators

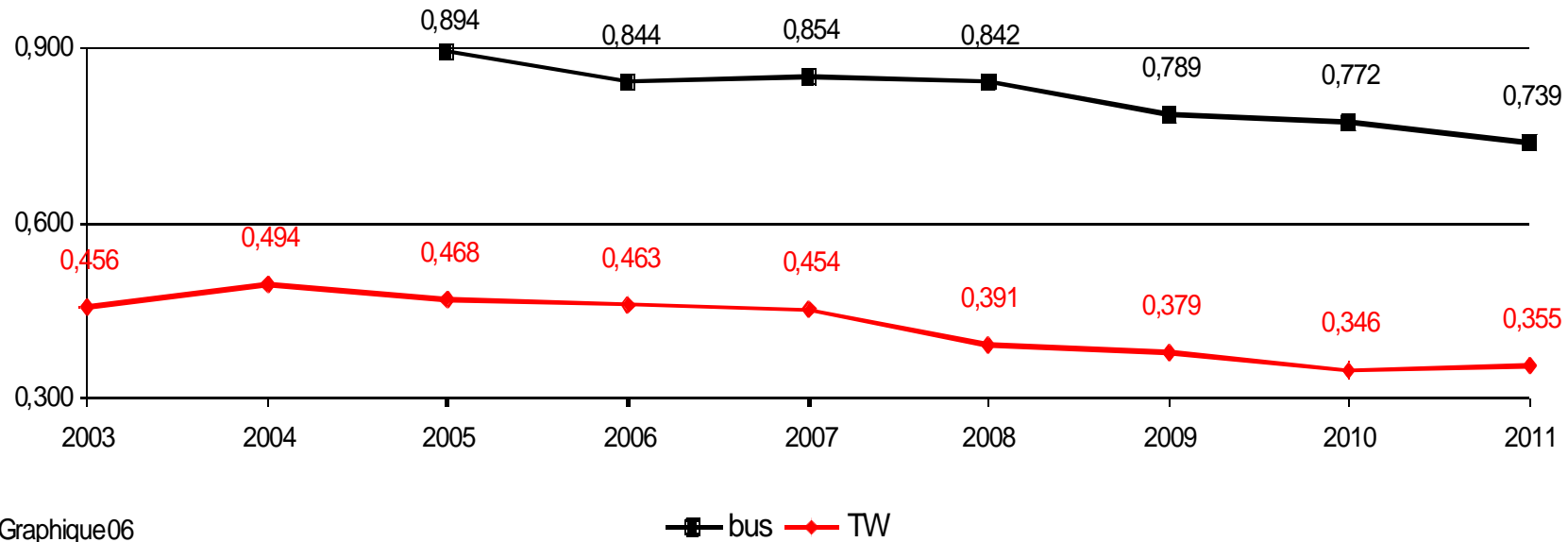
## Distribution of events by types (raw data)



# Accidents key figures

- *the aim is not to compare networks performance*
- *but to follow tendencies at national or local levels,*
- *and to identify major issues and stakes*

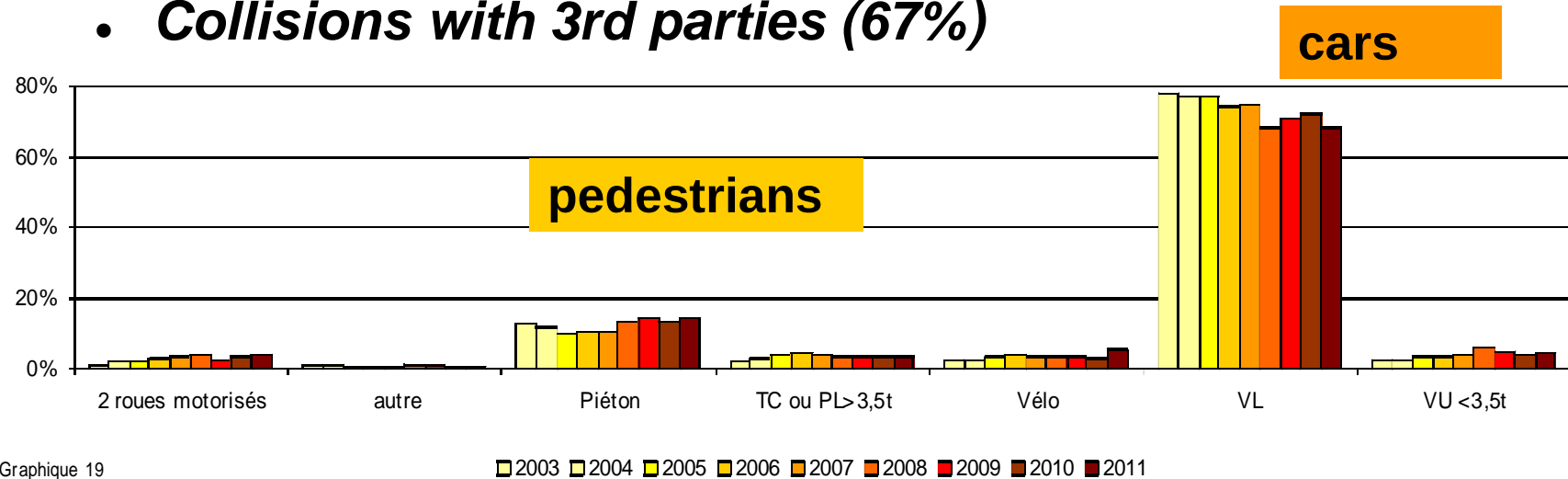
## Evolution of events / 10 000 km run



# Accidents ratios

- *main parts of events :*

- **Collisions with 3rd parties (67%)**



- **Travellers accidents (30%)**

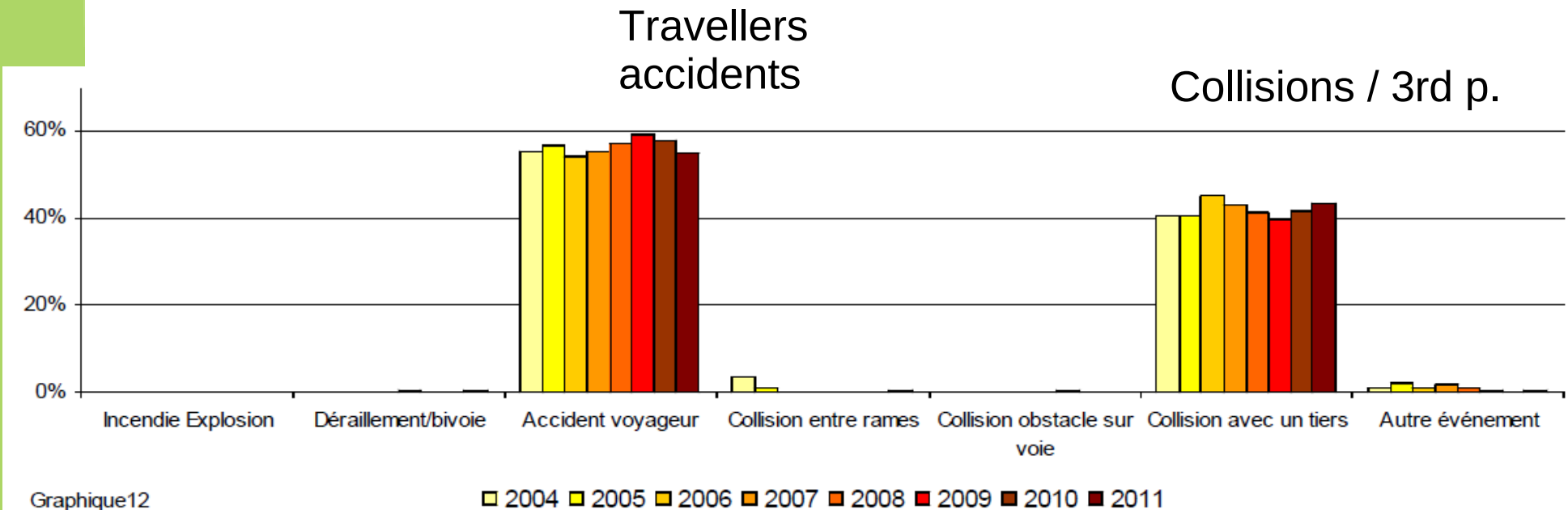
Mostly falling down inside tram 80%  
(mainly due to Emergency breaking)

Other causes : people ...  
falling on/from platforms  
caught or pulled by trams

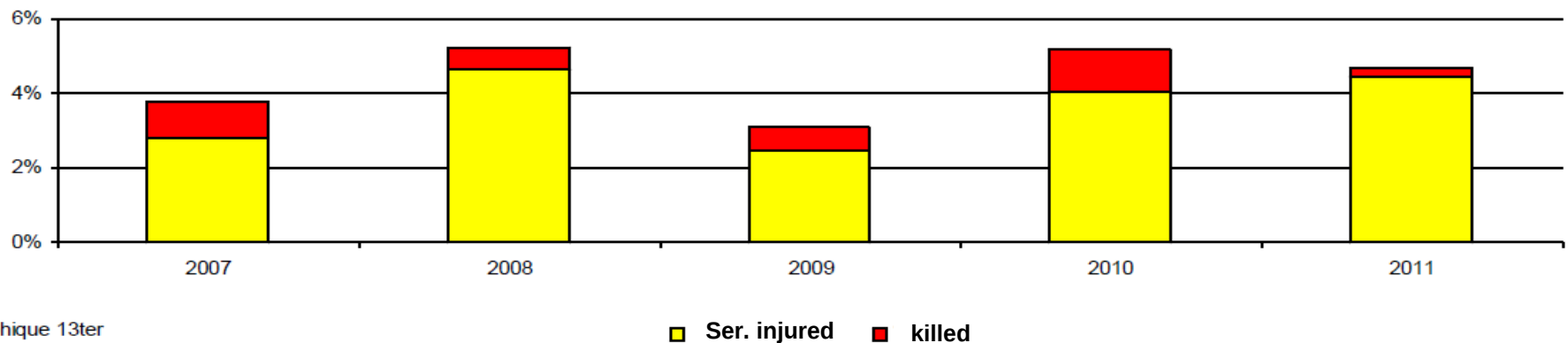


# Accidents ratios

- distribution of victims :**

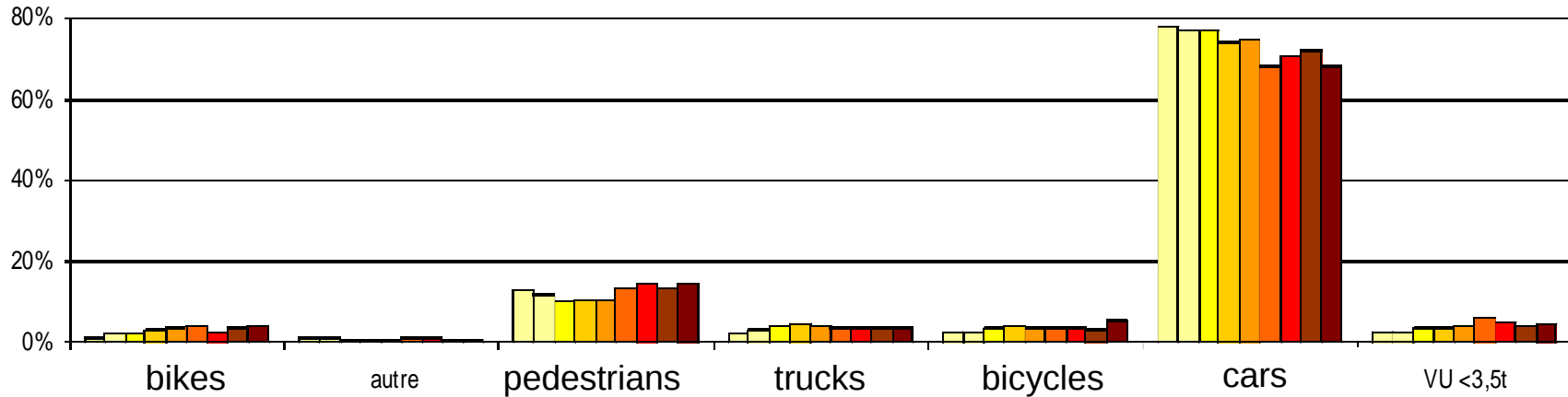


- serious victims (killed or highly injured)**



# Accidents ratios

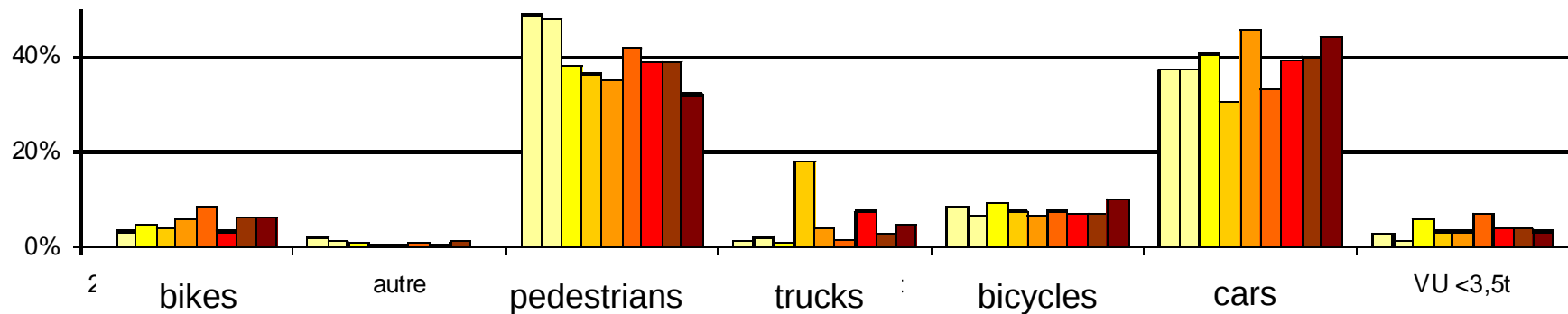
## • collisions with third parties :



Graphique 19

■ 2003 ■ 2004 ■ 2005 ■ 2006 ■ 2007 ■ 2008 ■ 2009 ■ 2010 ■ 2011

## • victims in collisions with third parties



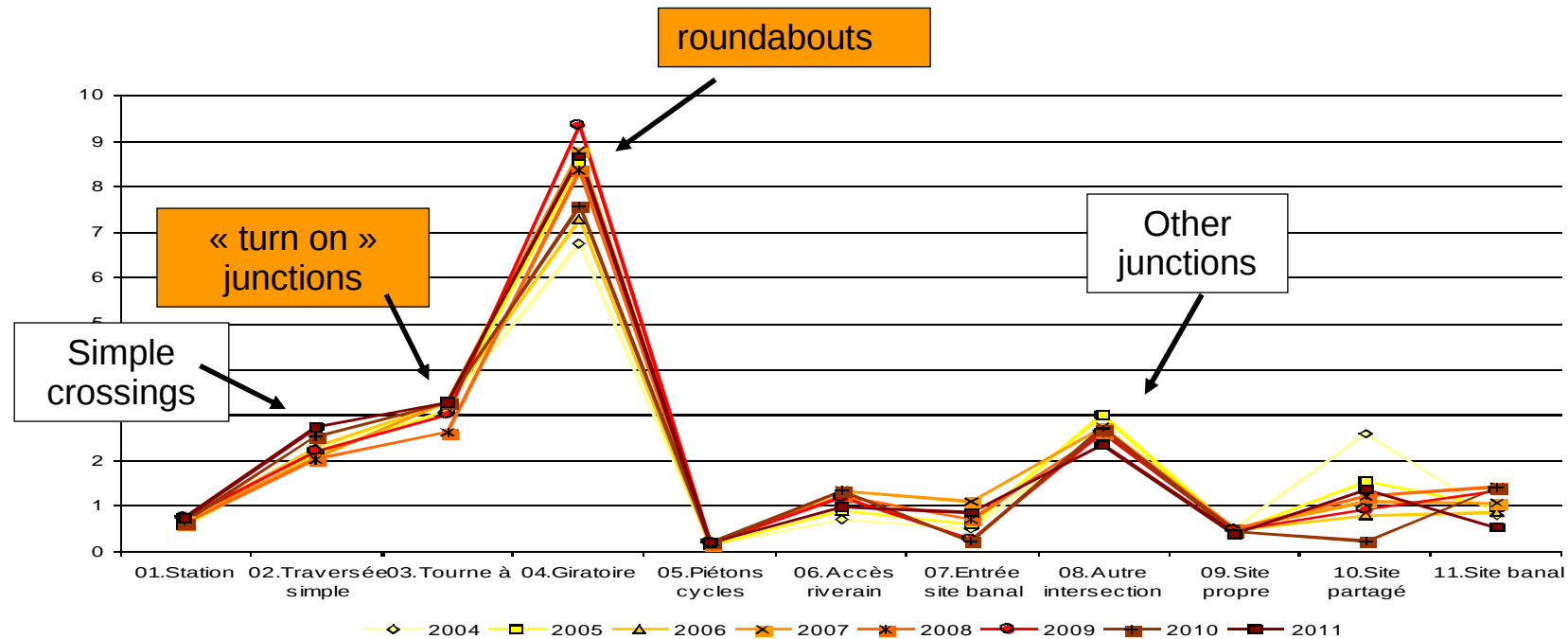
■ 2003 ■ 2004 ■ 2005 ■ 2006 ■ 2007 ■ 2008 ■ 2009 ■ 2010 ■ 2011





# Accidents ratios

- collisions with third parties : spatial distribution



- Most dangerous place are junctions with cars, especially roundabouts and « turn on » junctions (with tram in one's back)
- Shared spaces seems not to be really more dangerous than segregated lanes



# Main key factors for tram safety

- *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)*

# Safety, an essential stake

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



# “STPG”\* regulations, as a facilitator...

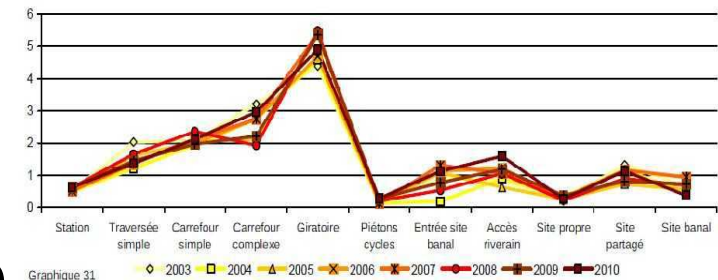
a **regulation** background :

- new projects from 2003 :  
commitments during the project
- existing lines in 2003 :  
regularization in the next 10 years



a **continuous process** :

- annual reports by operators
- a national accidents database
- technical audits in networks by STRMTG



\* STPG : safety for public guided transport (*Decree 2003-425, May 9<sup>th</sup> 2003*)

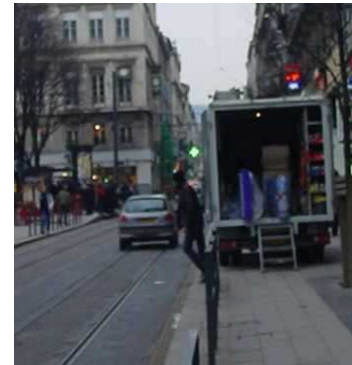
# safety, a federating issue around LRT...



# What the “urban insertion of tramways” means

= 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*





# Certu What the “*urban insertion of tramways*” means

=> **sharing** the public space

=> handling **uses'** conflicts

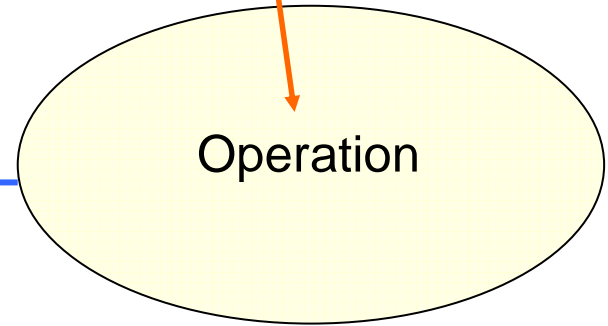
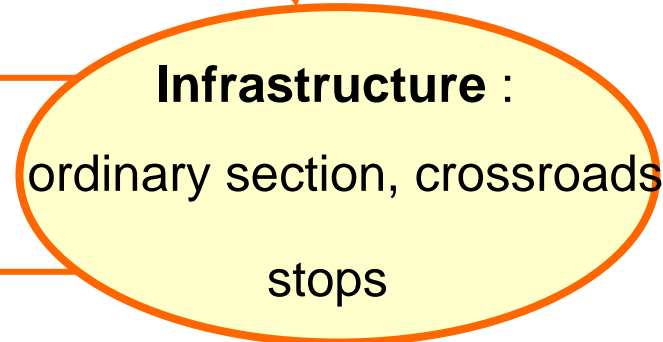
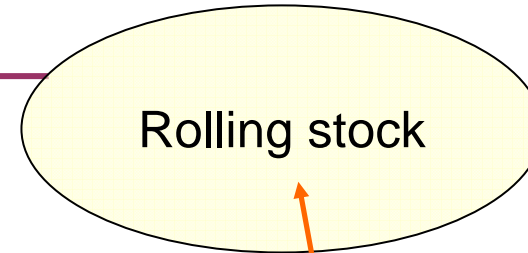
› in space => **infrastructure design**



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



# An integrated approach of transport systems



  
 Éléments • Qualité • Proximité  
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# To let LRT run (back\*) in the French streets ...

we had to take the cars' place !



(D) BART - (Photo: Jean-François Moutonnet) (R) GOM - (Photo: GOM)

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



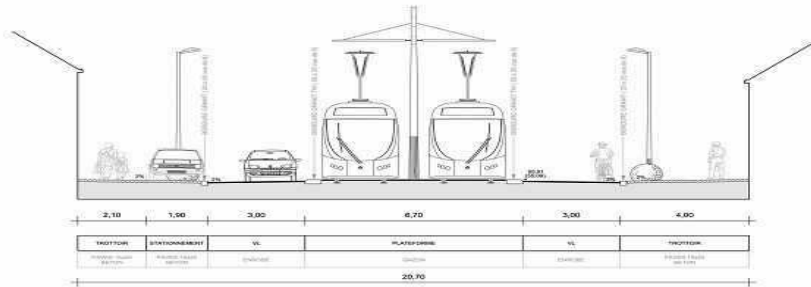
\* streetcars had quite disappeared in French towns...

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# 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



# 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)





# Main basics for road design

- *2 essential entries*
  - *Tram has got the priority, as it's a rail vehicle...*
  - *Tram drivers run « on sight »*
- *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*
  - *Mutual visibilities*



# Thanks for your attention



Mél. : [dominique-g.bertrand@cerema.fr](mailto:dominique-g.bertrand@cerema.fr)