



EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY



**COST ACTION TU1103:**

**OPERATION AND SAFETY OF TRAMWAYS  
IN INTERACTION WITH PUBLIC SPACE**

Final conference – Frankfurt, Germany – 29 September 2015

# General Introduction

## Chair and Vice-Chair

- Laetitia Fontaine (STRMTG, France)
- Manuel Teixeira (Independent Consultant – ex Metro do Porto, Portugal)

## Introduction to our 3 sessions

### Plan

1. Context
2. First phase of the Action – quick overview
3. Second and Third Phases – framework

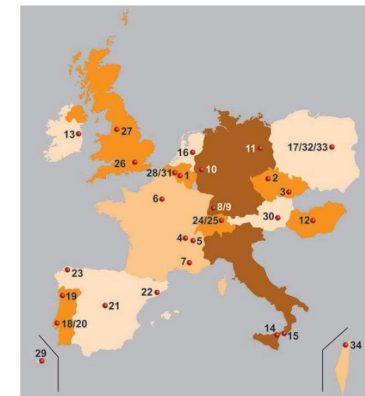
## What is COST?

- science and technology
- the oldest and widest European intergovernmental network for cooperation in research.



## What Action TU1103 is about?

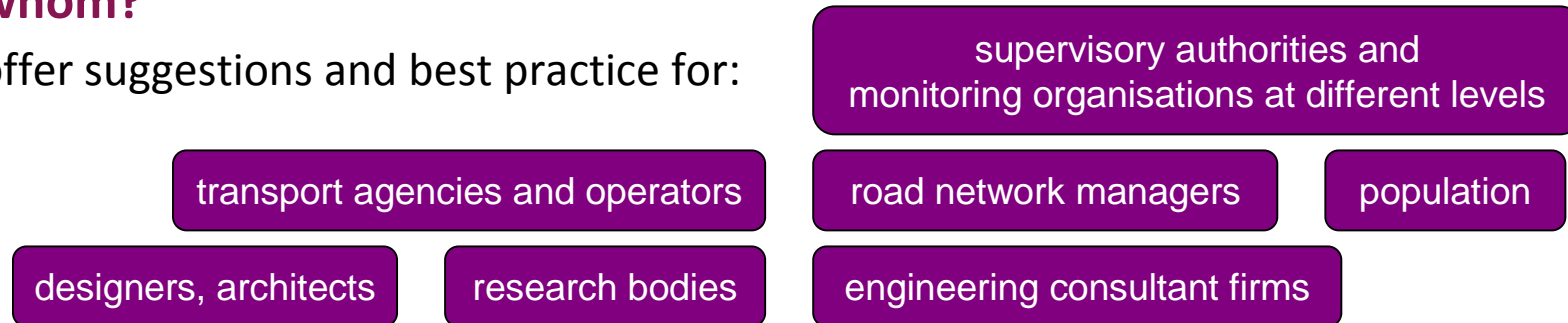
- “Operation and safety of tramways in interaction with public space”
- Trams are safe BUT any accident has big impact
- Better understanding of problems, solutions, and a shared feedback, at a European scale
- Ultimately, to improve overall safety
- Both practical and theoretical aspects



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### For whom?

- To offer suggestions and best practice for:



### Which benefits ?

- **to reduce accidents**: the primary cause of tram accidents is the conflicts with other users of public space, in relation to their behaviour and their perception of risk.
- to play a part in **improving road safety** in general and for **vulnerable road users** in particular
- **to decrease the impact of accidents** (maintenance / operating), contribute to rationalising and optimising the investment in the tramway system, improve its insertion, its safety and its efficiency and reliability
- and indirectly to go in the direction of moderating the place of the car in town.



## What is the scope of the Action?

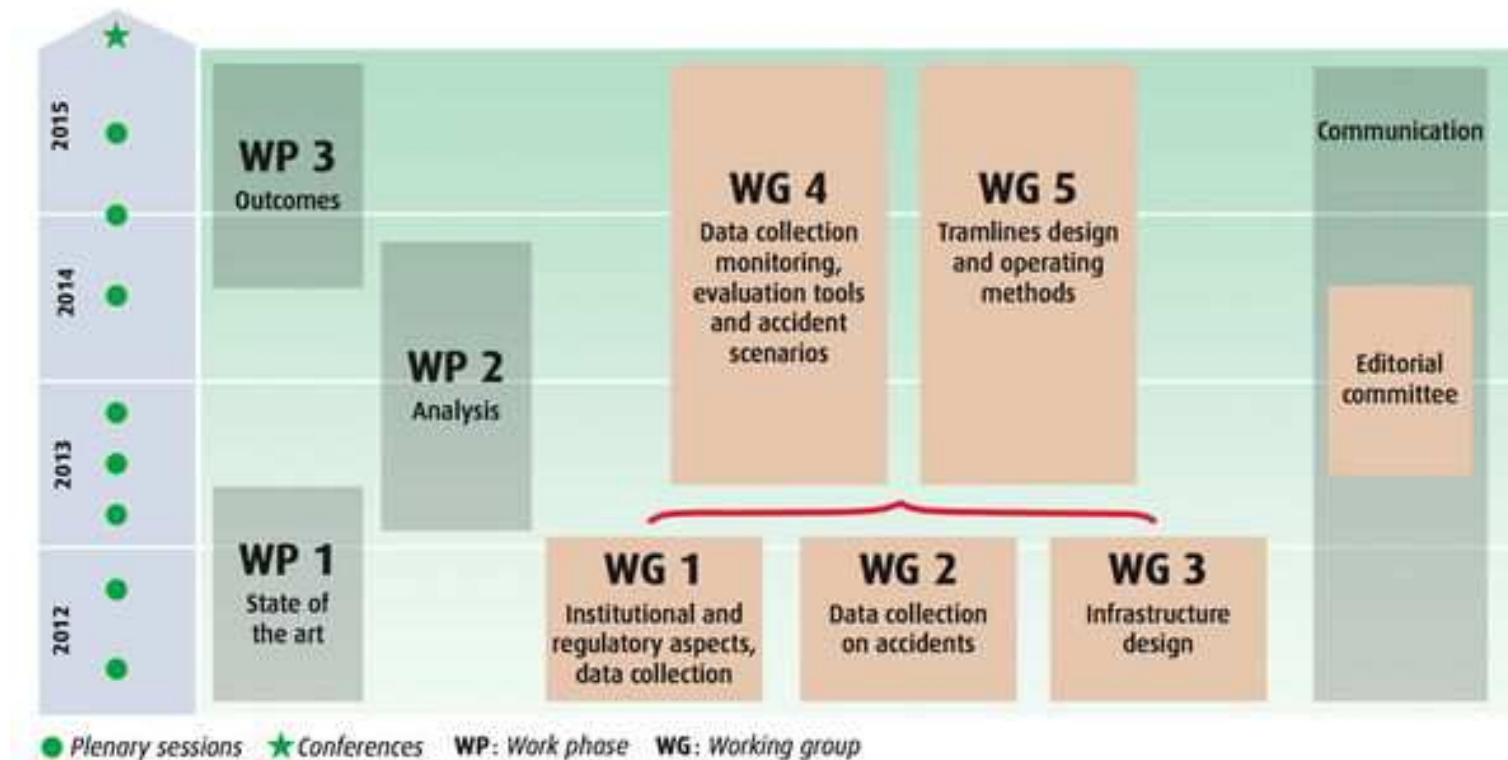
- urban **fully guided public transport** systems which **share public space** with road, bike and pedestrian traffic
- **safety deals with risk** and with the precautions taken to reduce the level of risk related to accidents and injuries, such as **urban design insertion** and **measures** which can be taken within the institutional framework
- **look at accidents and near-misses** when they are recorded + the whole tram system, including infrastructure design and equipment management, is important
- **all good ideas or bad experiences have been shared in this Action within these limits**
- **focus on the interaction between trams and other road users** (pedestrians, car drivers, cyclists...) in urban spaces - only considering accidents, which are a consequence of an urban insertion issue
- do **not include collisions between trams or derailments**, caused by track or signalling or rolling stock problems.



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### How did we do it? General Organisation of the Action:

- Divided in **3 phases**, working groups and Editorial Committee



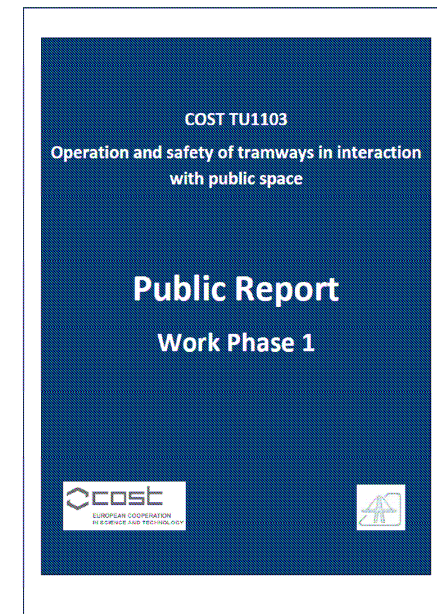


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### First phase

- Institutional and regulatory aspects: **state of the art** and **context exploration**
- Inventory of the current situation, for every participating country, regarding three main subjects:
  - **institutional and regulatory aspects**
  - **data collection on accidents**
  - **infrastructure design**
- **Work Phase 1 = first deliverable**, containing an overview of the situation in every involved country, regarding tram safety in interaction with public space: ***Operation and safety of tramways in interaction with public space - Public report Work Phase 1*** is available for downloading on our website.

See [www.tram-urban-safety.eu](http://www.tram-urban-safety.eu)



## Working Group 1 - institutional and regulatory aspects

- Legal basis and technical requirements for LRT system construction and operation, control and supervision practices, as well as operational measures to increase safety and users' awareness (considering social and cultural issues)

- ⇒ Global view per country

- ⇒ List of regulations

Similarities and dissimilarities, wide range

- Glossary

- Bibliography

### 5.2.11 The Netherlands (December 2012)

#### Network overview

Number of tramway operators: 4

Main period of LRTs' construction:  
Tram: 1900-1920 and LightRail: 2000-now

Smallest – biggest operator by:

→ Length of network: Smallest: City of Utrecht: operator OV Regio Utrecht, 20 km length, 27 vehicles. Biggest: City of Amsterdam: operator GVB, 213 km length, 215 vehicles.

→ Number of tram networks in operation, under construction and extensions: 4 networks in operation (Amsterdam, Rotterdam, The Hague, 'Randstad' (urban area around Rotterdam/The Hague) and Utrecht), 1 in construction in near future (Maastricht). Extensions are found in a few places, e.g. in Delft (The Hague network) and in Utrecht.

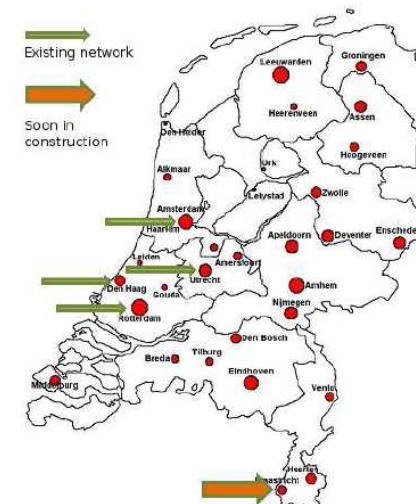


Figure 41 - Tram networks in Netherlands



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### Working Group 2 - data collection on accidents

- Tools and mechanisms for data collection and processing, at various levels, criteria of analysis, indicators and results
- Overview of organisational options in terms of gathering and using data on safety and operation



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### Working Group 3 - infrastructure design

- Practical aspects related to existing configurations, running handling, signage and operational performance, as well as tools (guidelines, regulations) related to infrastructure design existing in each country
- Compilation and analysis of practices of safe or dangerous situations





## Second and third phases

- Covered data collection on accidents (tools, indicators...) and infrastructure design (based on existing configurations and feedback from operators, consideration of hazards).
- **Best practices and their analysis** => particular attention to the causes of accidents and efforts made to identify the configurations that:



- pose recurrent problems in terms of operation or safety at intersections, stations and the intermediate sections between them,
  - correspond to sections of line that perform well and/or have no accidents,
  - are innovative in terms of design.
- To achieve this second and third work phases => two Working Groups dealing with:
    - **data collection, monitoring, evaluation tools and accident scenarios**: focuses on tools for accident analysis
    - **infrastructure design and operating methods**: an analysis made of each interaction point, identifying the risks (linked parameters, for example lack of visibility), the objectives to avoid them, and the possible measures that can be taken



## Second and third phases

■ Results of the analysis - and of the Action = **advice for safest tram insertion in urban spaces**, through **analysis with risks, objectives and possible solutions**, as data collection tools, design examples and additional measures

■ Final Report *Operation and safety of tramways in interaction with public space - Analysis and Outcomes - Detailed Report* is available for downloading on our website

■ Today, after 4 years of exchanges, we shall present you our **main results!!**





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Thank you for your attention !

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