



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

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Infrastructure and design - Introduction

Sources


TU1103 members **shared their experiences and knowledge**

- organising them by “interaction points” considering the specific place in the network and the main categories of road user
- collecting examples of practices (≈ 150)
- interviewing operators (24)

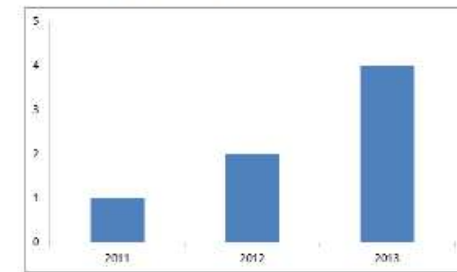
⇒ whatever the tram network, **some points/layouts deserve more attention**

Systems in every country face similar kinds of risky situations

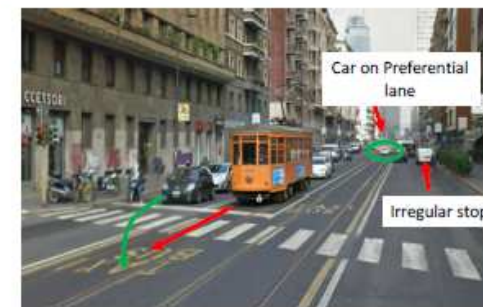
PT1 6 Metro do Porto: Fórum Maia surroundings

Location	City	Network	Line	Station
	Maia	Metro do Porto	C-aven	Parque Maia-Fórum Maia
Operation Mode	light rail / tramway		street car	Streetcar
Interaction Points between LRT and	physical stop		city	cycles
	suburban street crossing		road junction (car & tram) pedestrian level crossing	cycles with tramway
Location	Maia			
Description	<p>Forum Maia surroundings: mixed street. On the intersection of Av. Vaqueiro Avenida with the tramway station. Through the main road on a segregated tramway, the existing pedestrian crossing has a left-hand side (bicycle) and the tramway intersects the pedestrian crossing. The existing bicycle crossing is a left-hand side (bicycle) and does not function because the tramway crosses it diagonally. The pedestrian crossing 2 (see above image) is a left-hand side, but the sign is located between road and tramway.</p>			
Location	Maia			
Description	<p>Intersection involving a road intersection, it has kind of isolation with an heavy intersection (AT, cars, pedestrian, bicycle) and a very narrow tramway. The tramway is a narrow lane. On this a crowded tramway and a narrow tramway. The tramway is a narrow lane. On this a crowded tramway and a narrow tramway.</p>			
Images & Plans				

Number of accidents (in the last 3 years)



All accidents are cars that cut in front of the tram.



MEASURES IMPLEMENTED

Have you implemented corrective measures?

No

If no,

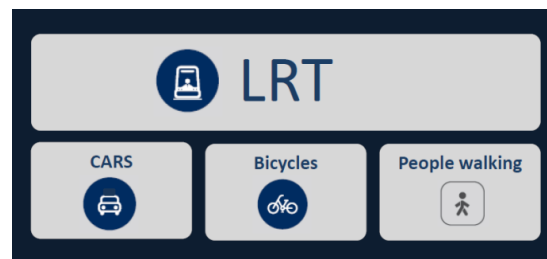
Are there any measures planned/approved for implementation?

There is a project to protect the preferential lane with a curb, but the Municipality doesn't want to realize it. They reject the project because they want to allow car parking (in "kiss and ride" mode).

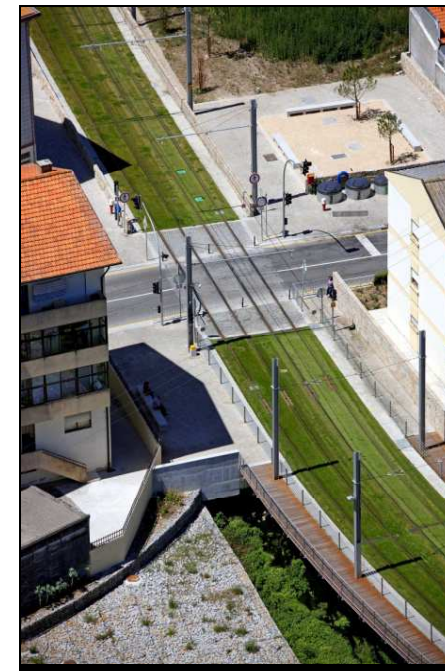
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Structure of following presentations

- Important to consider = no system is 100% safe + there **always will be people walking, cycling and driving around the tramway**



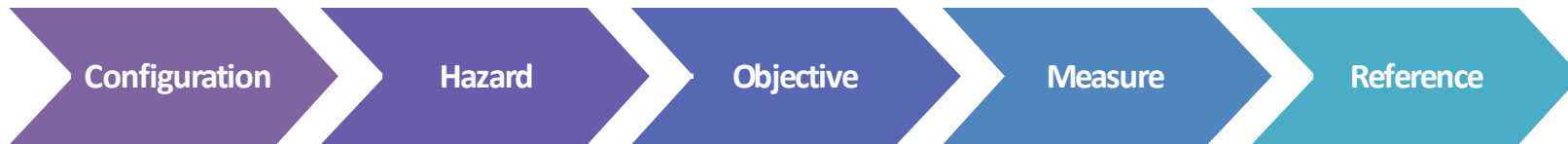
- The objective = **to agree on some measures that will protect Interaction Points in a way as natural as possible.**

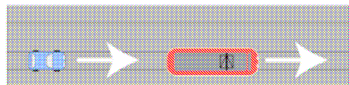

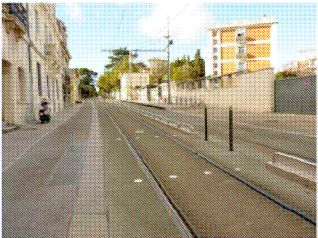


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Methodology: for each interaction points



Configuration	Hazard	Objective	Measure	Reference
<p>1.1 Tracks are located in lateral position. There is no dedicated platform. Tram shares the traffic lanes with road traffic.</p> <p>1.1.1 Configuration with one lane in each direction shared by vehicles and tram</p>  <p>1.1.1 no dedicated platform - mixed</p>	<p>When there are staggered platforms (not face to face), pedestrians might cross anywhere and in particular behind a tram when a second tram approaches from the other direction.</p>	<p>To channel pedestrians onto a designated crossing</p>	<p>A pedestrian crossing is drawn between the two platforms. Between the two tracks, there is a physical separator except at the crossing.</p>	<p>FR2_1 (Stations)</p> 
<p>1.1.1 no dedicated platform - mixed</p>	<p>Road vehicles that overtake a tram when it stops at the station surprise another tram or a vehicle arriving from the other direction</p>	<p>To avoid vehicles overtaking the tram when the tram stops in station</p>	<p>To implement a physical barrier between the two tracks.</p> <p>Other types of separator, such as a kerb, white line or rumble strip, can be used; they are less intrusive but may not be so effective.</p> <p>To ensure vehicles stop behind the tram, using Stop-lines etc</p>	<p>FR2_1 (Stations)</p> 

Example



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Thank you for your attention !

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www.tram-urban-safety.eu