

# **CHANGE! risk perception and behaviour on the railway**

Workshop – ERA safety days

Tallin, 20-22 September 2023

# Outline



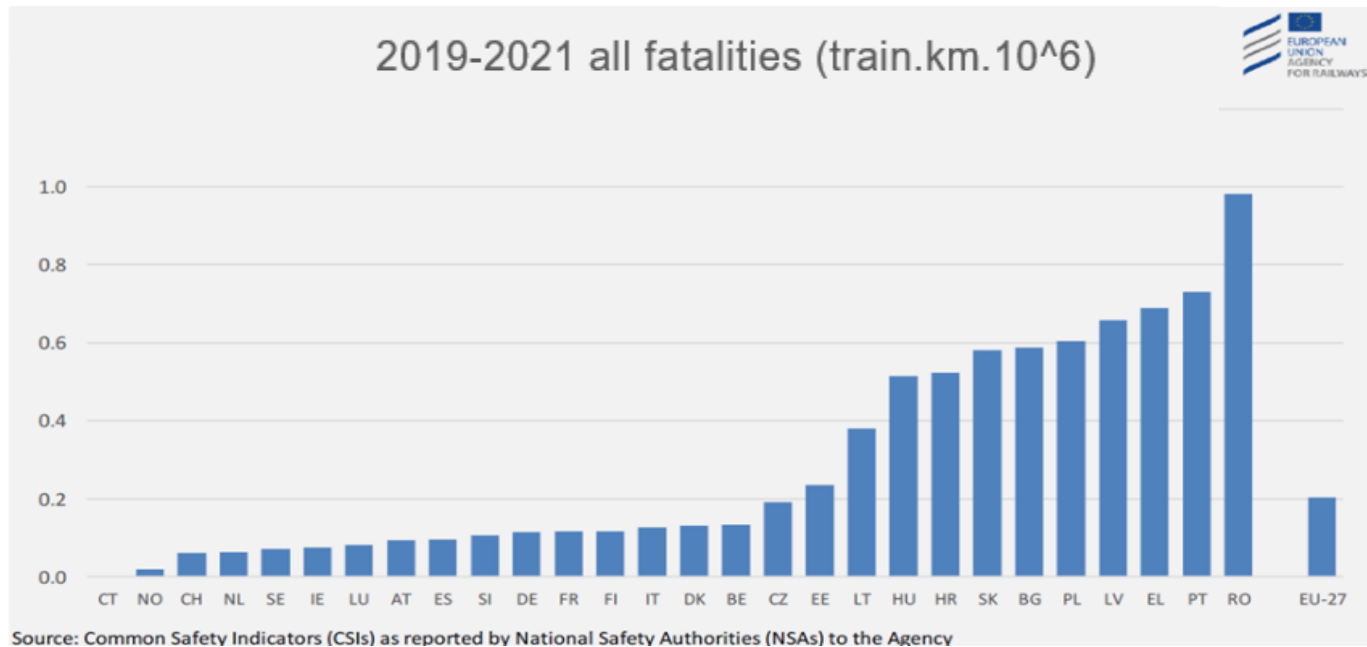
1. Rail Accidents and Suicide prevention in Portugal
2. Change! Risk perception and behaviour on the railway

1.

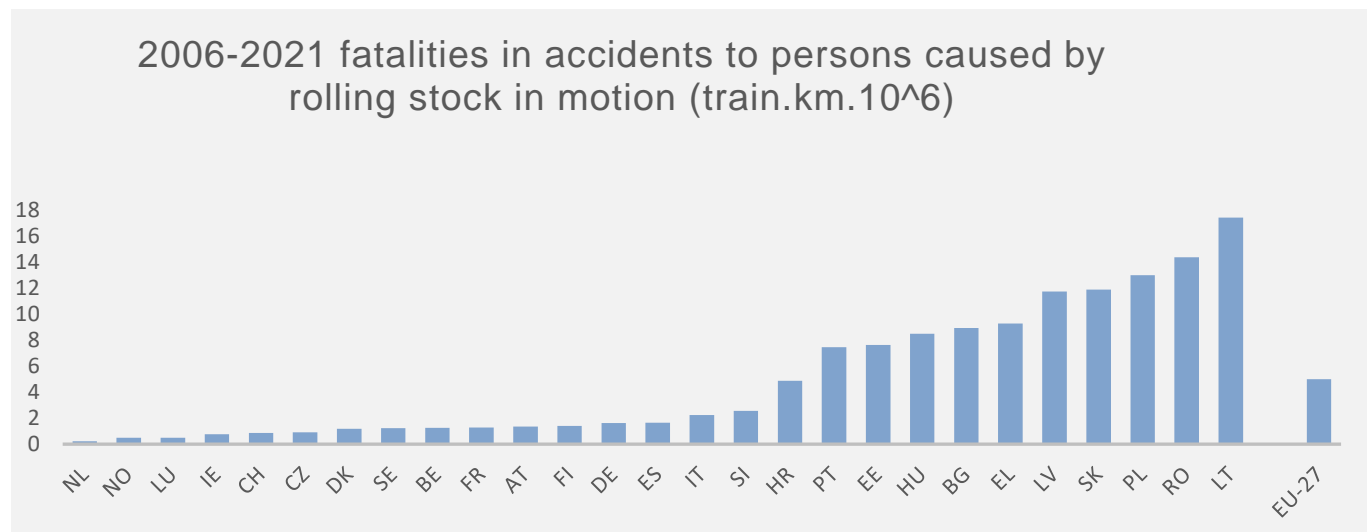
## Rail Accidents\* and Suicide prevention in Portugal

\*accidents to persons caused by rolling stock in motion  
and pedestrians in level-crossing (LV) accidents

# Why we started our study

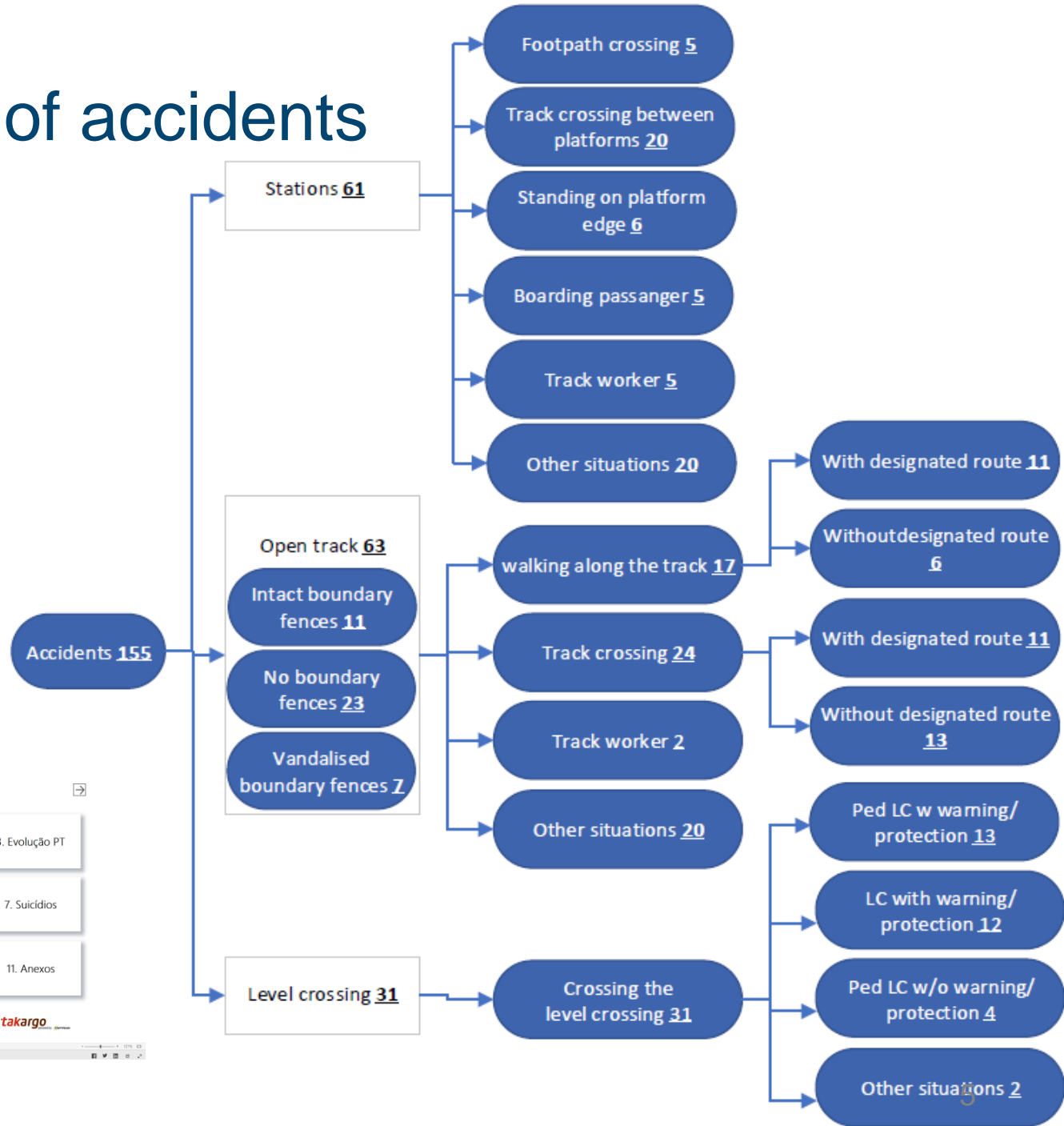



Source: ERA Safety overview report 2023



Source: ERA SCIData\_2006-2021





# Breakdown of accidents




 INSTITUTO DA MOBILIDADE E DOS TRANSPORTES, I.P.

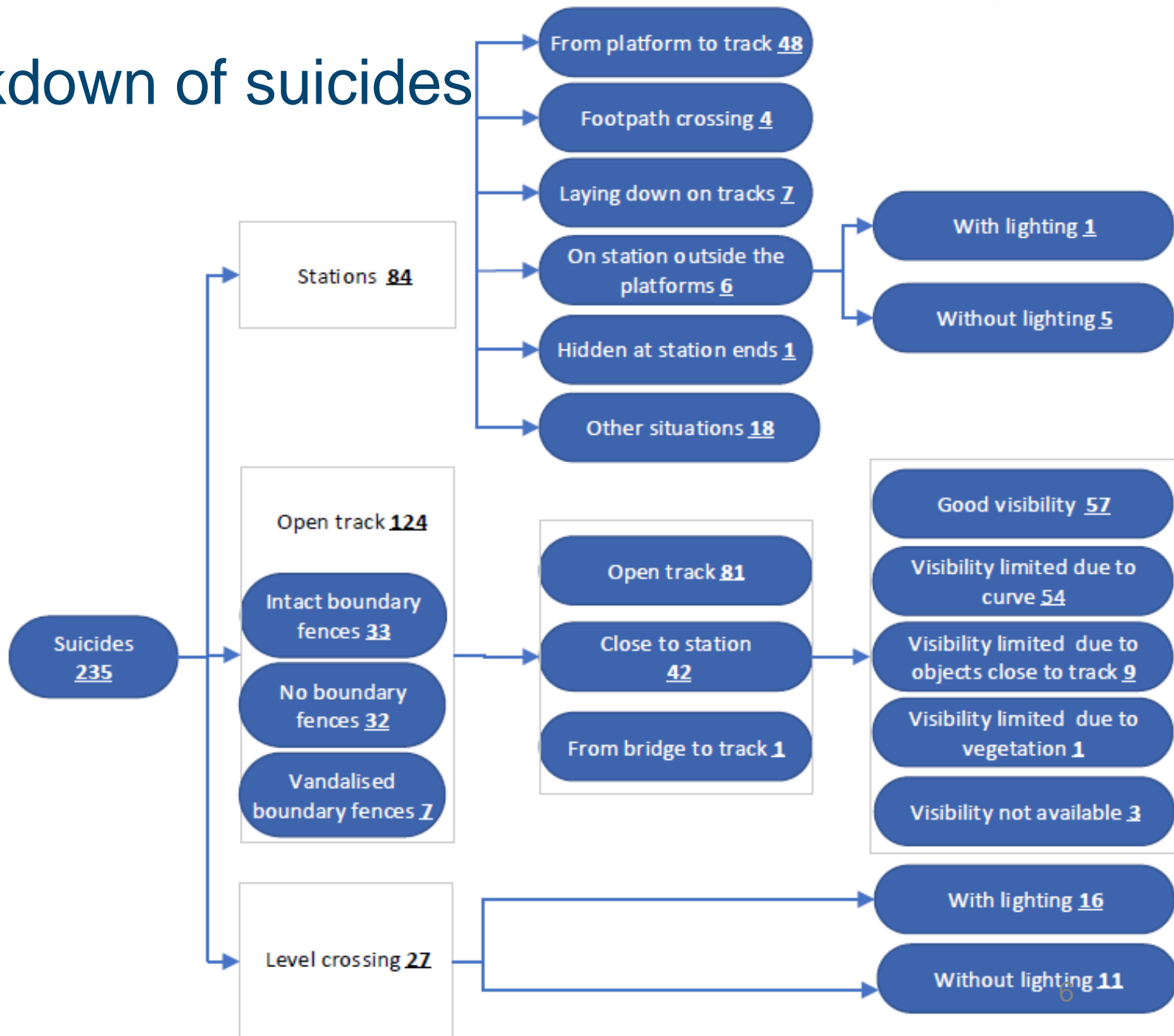
Prevenção de colidas e suicídios na ferrovia portuguesa

Sumário executivo	1. Introdução	2. Enquadramento EU	3. Evolução PT
4. Metodologia	5. Dados gerais	6. Colidas	7. Suicídios
8. Medidas	9. Recomendações	10. Conclusão	11. Anexos

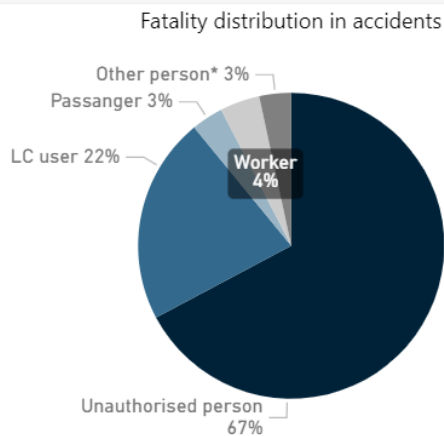
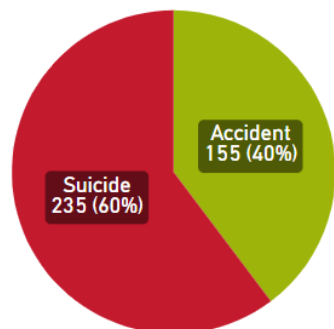
Report available [here](#)

# Breakdown of suicides



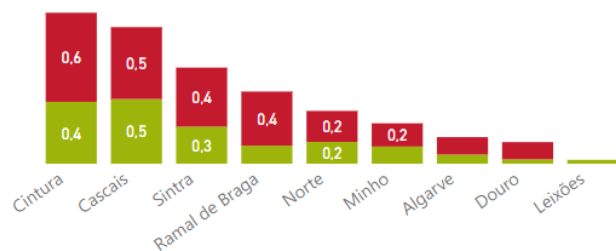
# Geographical distribution

● Accident ● Suicide



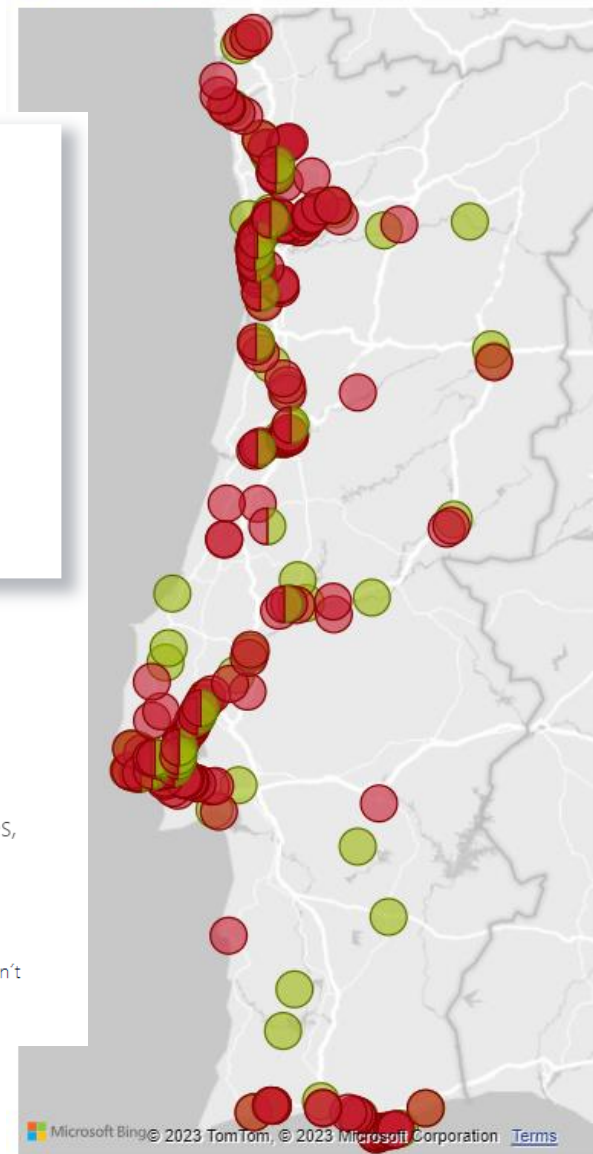
Total FWI/km with Accidents and suicides per line

● Accident ● Suicide



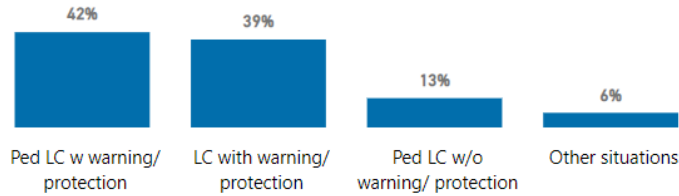
- **Suicides** are more prevalent than accidents
- ~70% of people killed on or near the tracks are "unauthorised persons"
- Most occurrences, for both accidents and suicides, take place in **urban areas**

\*It is considered "Other person" when the description of the occurrence isn't sufficient to categorise differently.



# Accidents distribution

Accidents at level crossings

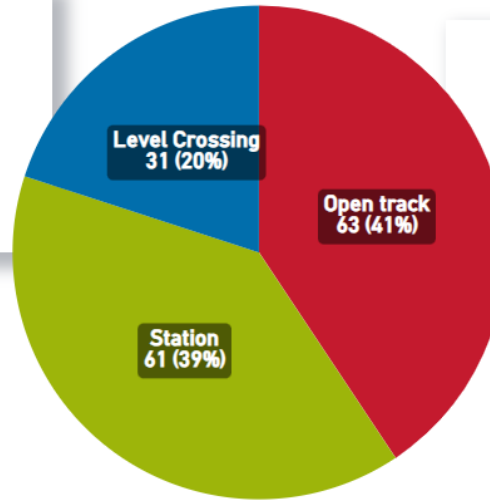
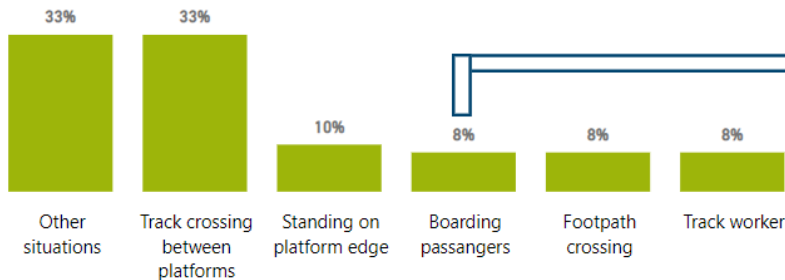


• Occurrences on **Open track** and at **Stations** are ~ 40% each

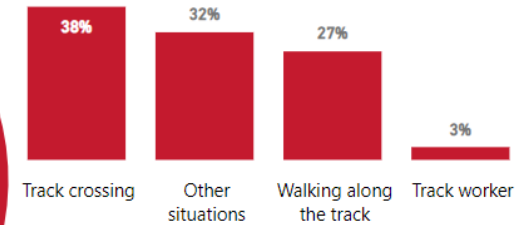
• At Stations:

- Most accidents occur with people **crossing the track between platforms** (33%)
- 60% of accidents in footpath crossings occurred in **automated crossings**

Accidents at stations



Accidents on open track

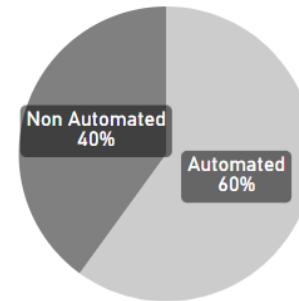


• On Open track:

- Most accidents occur with people **crossing the track** (~40%)
- ~30% of accidents occur with people **walking along the track**

• At Level crossings:

- 90% of accidents occur in **automated level crossings**
- ~50% occur at **automated footpaths** (pedestrian level crossing)

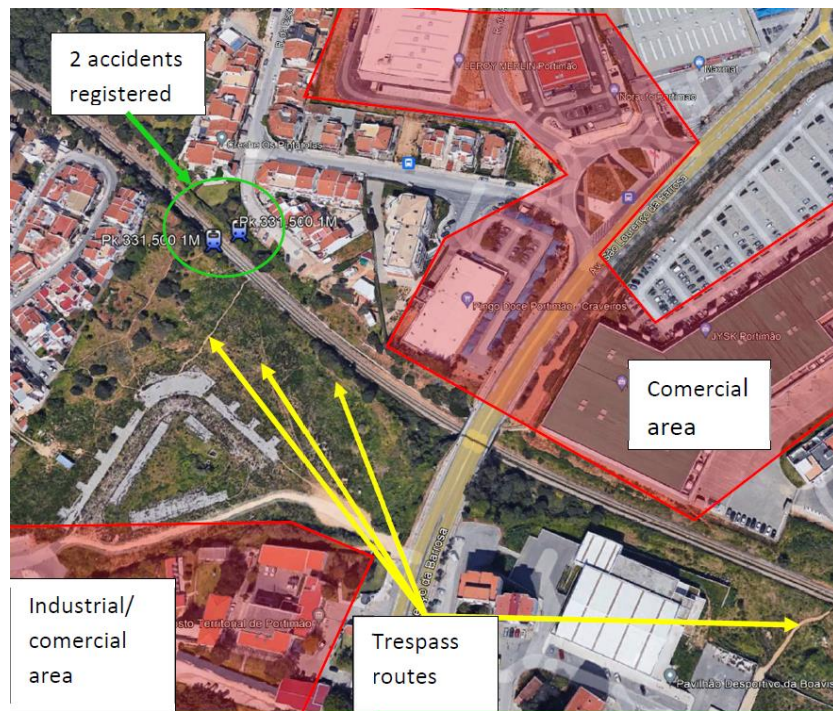


It is considered "Other situations" when the description of the occurrence isn't sufficient to categorise differently. Often describe occurrences that could be suicides but haven't been categorized as one.



# Accidents – Open Track

## Trespass routes



Trespass routes are footpaths that can be identified perpendicular to the tracks. These may be marks in the vegetation adjacent to the tracks and/ or discoloured ballast

## Designated route

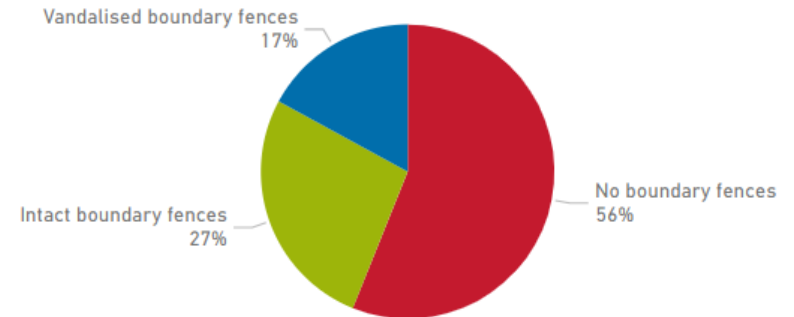


It is considered as an alternative a **designated route** that is no longer than 500m.

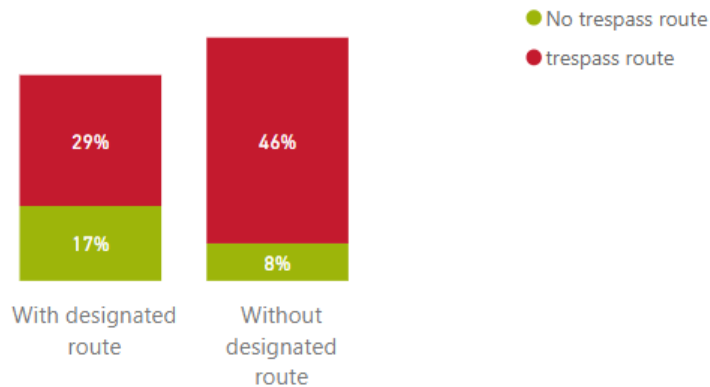
# Accidents – Open Track

- Out of the 65% of occurrences where it was possible to establish the fence condition, 70% took place in areas with **vandalised fence or no fence at all**
- A **trespass route** is visible in 75% of track crossing accidents
- An **alternative designated route** existed in 65% of accidents involving people walking along the track

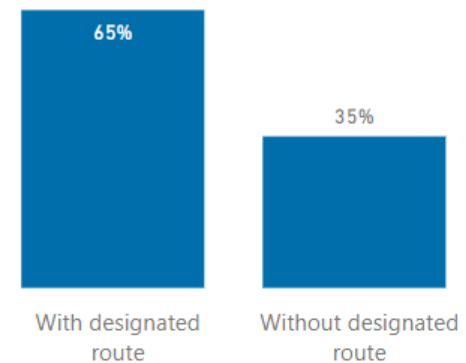
Accidents on open track according fence condition (where it has been possible to assess condition) - does not include workers



Accidents on open track - track crossing

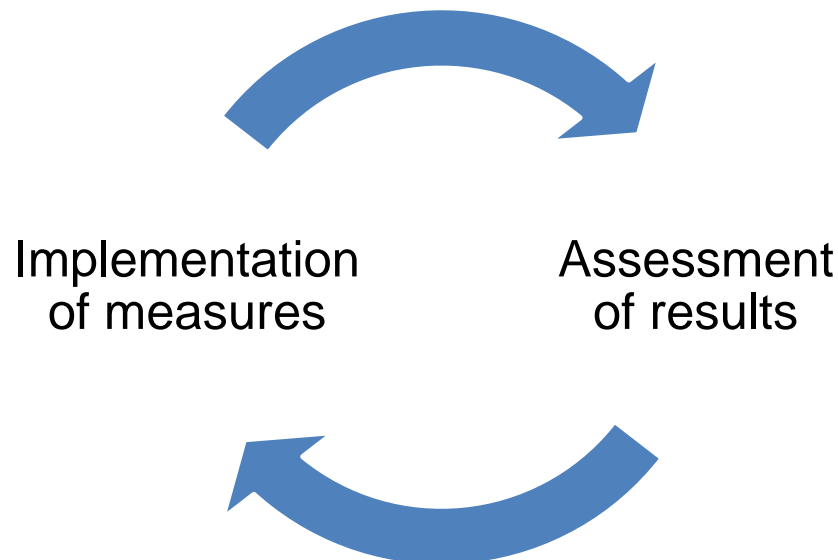


Accidents on open track - walking along the track



# Next steps with the Portuguese sector

- Selection of 8 pilot projects (hotspots):
  - 2 stations
  - 2 level crossings
  - 2 sections of open track
  - 2 locations where fence is recurrently vandalised



# Measures tool box

## Fencing

- Open track: at hotspots and critical areas, may be complemented with other devices
- Stations: along the centre of platform, between tracks or at platform ends (may be complemented with anti-trespass grids)



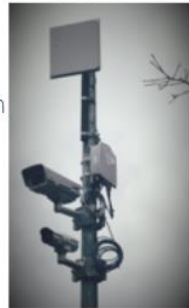
- Reassess current fencing solutions that are recurrently vandalised

Source: [restrail.eu/toolbox](http://restrail.eu/toolbox); IMT

# Measures tool box

## Detection and surveillance systems

- CCTV systems
- Intelligent systems combined with audible warnings
- Detection systems, triggering warnings or alerts



## Level Crossings

- Improved LC barriers



## Signs

- Prohibition signs
- Warning signs
- Information or advice posters



## Lighting

- To influence behaviour
- In hotspots
- Linked to movement sensors
- Dispelling lights
- Blue lights (suicides)



Source: [restrail.eu/toolbox](http://restrail.eu/toolbox)  
global railway review

# Measures tool box

## Awareness campaigns

- Targeted campaigns to raise awareness
- Dissemination initiatives using posters in stations or near the track
- Mass media campaigns
- Social media targeted campaigns
- Media guidelines



## Education and training

- Staff training
- Initiatives in schools
- Intervention in communities



Source:  
[restrail.eu/toolbox](http://restrail.eu/toolbox)  
*Strategies for Deterring Trespassing on Rail Transit and  
 Commuter Rail Rights-of-Way (Transportation Research Board)*

2.

Change! Risk perception and behaviour on the railway

In the EU, between 2006 and 2021

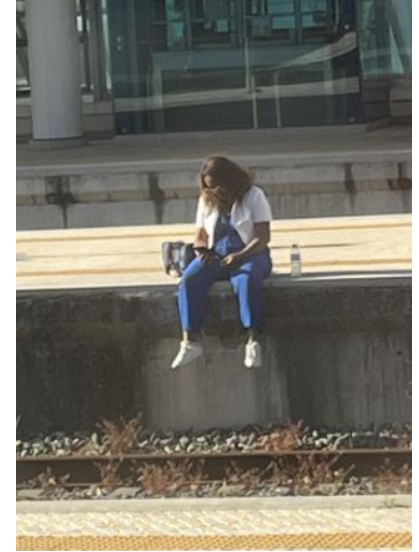
**12 000 people died**

in accidents caused by rolling stock in motion  
(source: Eradis, excludes LC)

**14 fatalities every week**



# Situations witnessed by the NSA



# Change! Risk perception and behaviour on the railway

- Most people are not **dare-devils**.
- In most cases, the victims are not fully conscious of the risks.
- This explains **careless behaviour** and **recurrent fence vandalism** even when there are **safe alternatives**.



- **Irresponsible behaviour** will not change unless **risk perception** changes.

# Your tasks

- ✓ Chose representative per group
  - ✓ Analyse the scenario and discuss potential measures/initiatives to **change risk perception and behaviour**
  - ✓ Register proposals on the flipchart
  - ✓ Group representative will present proposals to the room
  - ✓ Roundtable discussion of measures for all scenarios
- 15 min
- 5 min each
- 15 min

# Scenarios analyses

**Area overview:**



- ≈2km of beach;
- Single track runs parallel to the coast (in red);
- 6 pedestrian level crossings (LC) (yellow pins) with beach access from car park;
- Raised wood walkway, runs parallel to the coast, connected with LC and beach access (in blue);
- Maximum train speed: 90km/h;
- Peak train frequency: ≈1 train every 30 minutes.

**Typical layout of passive pedestrian LC:**



View towards the sea



View towards land (car park)

**LC crossing behaviour at a typical pedestrian LC:**

(1hour observation, 138 people, weekday August 10am)

- 35% looked both ways,
- 28% looked one way,
- 37% didn't look at all,

**Use of devices:**

- 1% on their phone,
- 0% looking at smartphone,
- 0% with earphone

**What can we do to raise awareness/change behaviour?**



# Scenario 1

**Area overview:**



# Scenario 2

**Illegal path A**



**Illegal path B and designated footbridge**



- Maximum train speed: 140km/h;
- Peak train frequency: ≈1 train every 10 minutes.




**Trespassers behaviour:**

- Crossing from the residential area to/from the shopping centre;
- Illegal paths frequently used instead of designated overpass;
- Fence recurrently vandalized.

**What can we do to raise awareness/change behaviour?**

Area overview:



-  Designated paths to cross the track (level crossing and underpass)
-  Designated paths for access to the train station
-  Illegal shortcuts used by pedestrians to access the train station platforms

# Scenario 3



- Maximum train speed: 60km/h;
- Peak train frequency: ≈1 train every 10 minutes.

**Trespassers behavior:**

- Use of illegal shortcut at the end of the platforms to access/exit the station;
- Cross the road with red signal and level crossing barriers down.

What can we do to raise awareness/change behaviour?

Area overview:



- Designated route (around 700 m/9 min)
- Trespass routes (around 280 m)
- ◆ Access to station
- Designated route within station
- Trespass route within station
- ★ Trains stop position

# Scenario 4



- Maximum train speed: 100km/h;
- Peak train frequency: =1 train every 2 minutes.

**Trespassers behaviour:**

- Illegal routes along and across the tracks frequently used, due to:
- Designated route not a practicable alternative to access the station;
  - Overpass with long ramps and not directly connected to the south exit gate (implying walking along platform).

What can we do to raise awareness/change behaviour?



## Scenario 5 – Footpath crossing – One train may hide another

### Scenario overview:



- Maximum train speed: 100km/h;
- Peak train frequency: ≈1 train every 15 minutes.

### A Point of view



### Trespassers behavior:

- Passengers cross the station footpath with red light.

What can we do to raise awareness/change behaviour?

# Scenario 5

# Scenarios solutions presentations

Thank you