
# REduction of Suicides and Trespasses on RAILway property

## How to prevent suicide and trespass on the railways and mitigate the consequences?

*Practical guide*

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# Brief outline and aims of the guidance

**This practical guide has been developed to:**

1. Lead decision-makers through the process of selecting from the range of prevention and mitigation measures by structuring the analysis of a problematic situation;

2. Provide detailed guidance on the implementation of the selected measures;

3. Provide a framework for collecting and structuring information in order to feed an accessible and documented database of implemented and efficient measures.

**There are two parts to the guidance:**

The first part provides general guidance for structuring the analysis of a problematic situation as a multistep approach. This systematic approach includes a prevention action plan as well as a plan to mitigate the consequences of railway suicide and trespass. The question answered by the general guidance is how to analyse a problem and choose the optimal preventative or mitigation measure(s)?

Part two includes the specific guidance, namely a list of preventative and mitigation measures and implementation tips, examples, empirical evidence, etc. which support the intervention steps. The question answered by the specific guidance is how to implement the selected measure(s) in order to minimise the shortcomings and enhance the expected effect?

This document includes examples only for a sample of the available measures.

The complete guidance is available online at

**www.restrail.eu/toolbox**

## The RESTRAIL Consortium

| | |
|---|---|
| UIC: International Union of Railways | France |
| VTT: Technical Research Centre of Finland | Finland |
| TRAFIKVERKET: Swedish Transport Administration | Sweden |
| IFSTTAR: French institute of sciences and technology for transport, development and networks | France |
| MTRS3: Mass Transit and Railway Security Services & Solutions | Israel |
| CIDAUT: Research and Development Center in Transport & Energy, Spain | Spain |
| HMGU: HelmholtzZentrum münchen. German Research Center for Environmental Health | Germany |
| KAU: Karlstad University Sweden | Sweden |
| TCDD: Turkish State Railway Administration | Turkey |
| FFE: Spanish Railways Foundation | Spain |
| DBAG: Deutsche Bahn AG | Germany |
| IK: Polish Railway Institute | Poland |
| PRORAIL: Dutch railway infrastructure manager | The Netherlands |
| NICE: Nice Systems Ltd | Israel |
| ASTS: Ansaldo STS | Italy |
| UNott: University of Nottingham | United Kingdom |
| INFRABEL: Belgian railway infrastructure manager | Belgium |

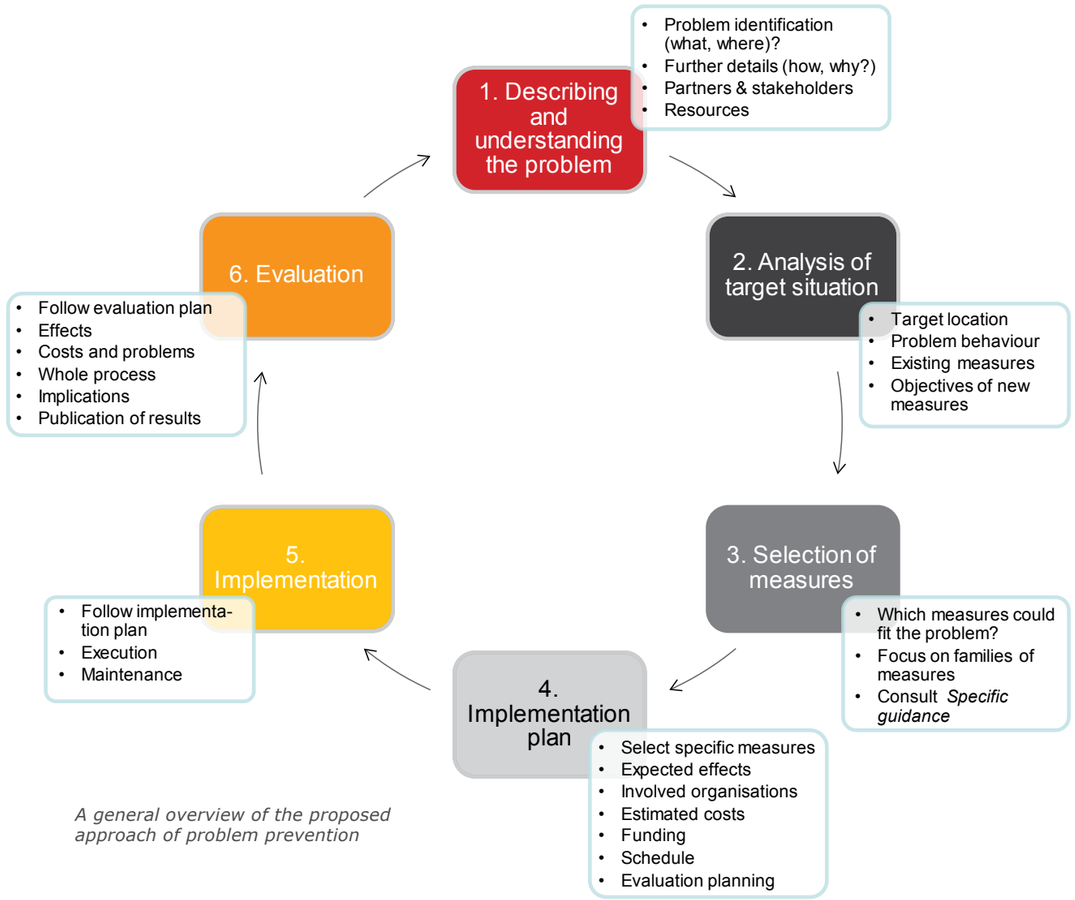


# PART 1: GENERAL GUIDANCE

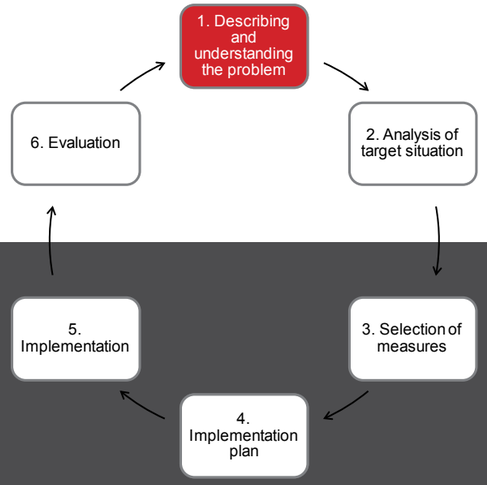
## *1.1 Prevention action plan*

The prevention action plan consists of a multistep approach which structures the analysis when addressing a suicide or trespassing problem on the railways. The model proposes six steps with several subsequent actions, which are to be applied as a recommended but flexible methodology.

For each action a checklist with prompting questions is provided. This approach is not a linear step-by-step process, although the steps taken in the guideline seem to be in perfect logic succession. The steps in the process are recurrent, allowing an iterative analysis and decision process.




*A general overview of the proposed approach of problem prevention*




# 1. Describing and understanding the problem

UNDERSTAND THE NATURE AND PROPORTIONS OF THE PROBLEM, YOUR POTENTIAL PARTNERS AND THE AVAILABLE RESOURCES.

THE PROBLEM CAN BE A SUICIDE HOTSPOT, OR A TRESPASS SITE, OR EVEN A LOCATION WHERE BOTH TYPE OF INCIDENTS OCCUR. ONE SHOULD FIRST IDENTIFY THE TYPE OF PROBLEM BY HAVING A FINE-GRAIN ANALYSIS OF THE PREVIOUS AND CURRENT INCIDENTS: COLLECT DATA, DRAW MAPS, ANALYSE THE DATA, IDENTIFY THE HOTSPOTS, ETC.

## Identification of the problem

### *What is the nature of the problem?*

- suicides
- attempted suicides
- trespassing accidents
- trespassing behaviour

### *What are the characteristics of the surrounding areas?*

- facilities attracting pedestrians (e.g. locations and building, maintenance structures open for trespassing)
- schools
- mental hospitals
- outdoor routes
- stadiums
- shopping centres

### *Which are the motives of trespassing?*

- trespassing with suicide intent
- shortcut, time saving
- graffiti / vandalism
- theft
- leisure, walking around / loitering

### *What do the accident statistics tell about the problem in the area?*

- available statistics of suicides and suicide attempts
- available statistics of fatal and non-fatal trespassing accidents
- number of events preferably for several years
- do the statistics cover all targeted incidents or some are excluded (e.g. incidents with minor consequences)?

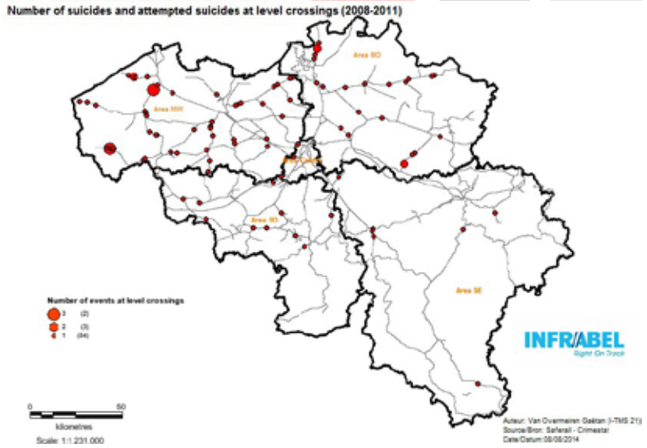
### *In which part(s) of the railway system does the problem occur?*

- station (which platform, which part of the platform, etc.)
- marshalling yard
- railway line (open line)
- level crossing
- bridge
- tunnel
- some other location

### *Where is the problem location?*

- preliminary identification of the location
- location marked in a map




## Further definition of the problem

### *What are the specific features of the occurred events?*

- time of day
- time of year
- exact location in the problem area

### *Are there existing preventative measures in the problem location?*

- technical measures (e.g. video enforcement)
- physical measures (e.g. fences)
- social measures (e.g. security patrols)
- behavioural measures (e.g. posters, campaigns)

### *What is the frequency of trespassing?*

- e.g. per day / week / month

### *What are the specific features of targeted people (based on reports and statistics of accidents/ incidents)?*

- gender (male/female)
- age (children/youngsters/adults)
- people with mental problems
- drunken people
- drug users
- homeless people looking for shelter
- tourists

### *Is it possible to identify any hot spots in the problem location?*

- exact locations in which most of the events have occurred

### *What are the nearest safe (legal) crossing places?*

- under/overpass
- legal level crossing (with or without safety devices)
- pedestrian crossing (active / passive)
- where is it located (near, far, which distance?)

## Partners and stakeholders

### *What are the relevant partners and stakeholders to be involved?*

- railway infra manager
- railway undertaking
- local authorities
- public and private institutions
- rescue services
- police
- mental health institutes, public health authorities
- media
- voluntary organisations
- local interest groups (interested citizens)

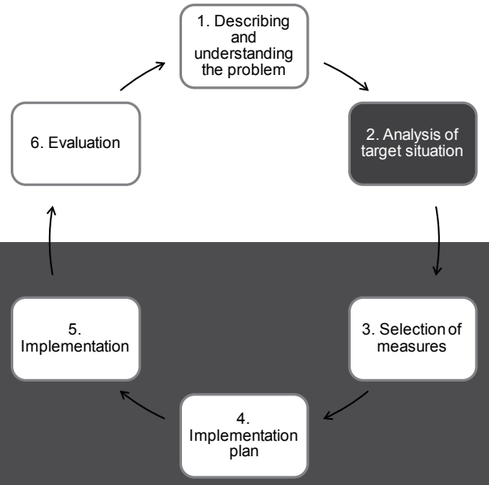
## Available resources

### *What are the constraints concerning the budget?*

- preliminary estimate of the budget
- contributions by involved organisation
- estimate of the implementation period (years)
- estimate of contributions by year

### *What are the costs and consequences of the problem?*

- financial (e.g. post incident intervention costs)
- social (e.g. time, delays)
- human (e.g. affected employees)




## 2. Analysis of target situation

USE ADDITIONAL PROMPTING QUESTIONS TO IDENTIFY MORE DETAILS ABOUT A SPECIFIC PROBLEM: LOCATION, BEHAVIOUR, EXISTING MEASURES.

ONCE THE PROBLEM HAS BEEN DEFINED GLOBALLY, THE NEXT STEP SHOULD INCLUDE THE DETAILED UNDERSTANDING OF A TARGET SITUATION WHERE MEASURES ARE CONSIDERED FOR IMPLEMENTATION. INFORMATION CAN BE COLLECTED FROM DIFFERENT DATA SOURCES SUCH AS: BEHAVIOUR REPORTS, ACCIDENT / SUICIDE INVESTIGATION REPORT (IF AVAILABLE), SPECIFIC INCIDENT REPORTS, OR CCTV FOOTAGE. THE OBJECTIVE IS TO FIGURE OUT WHAT IS NEEDED AT THAT SPECIFIC SITE TO ELIMINATE / DIMINISH THE TARGET INCIDENT.

### Definition of target location

***What is the exact location in question?***

- track address / sector
- particular station
- boundaries of targeted site (map)
- any particular configuration of the location

### Problem behaviour

***What do the statistics of suicides and attempted suicides tell about the problem?***

- distribution in time
- exact locations
- information of details

***What do the statistics of trespassing accidents tell about the problem?***

- distribution in time
- exact locations
- by severity
- other details

***What is the frequency of trespassing?***

- counts of trespassing needed, if information is not available

***Is it possible to identify the routes used by trespassers?***

- point of entry and point of exit
- trespasser flows per route

***What are the motives of problem behaviour?***

- observations
- interviews of trespassers
- interviews of local residents
- questionnaire to local residents

***What are the targeted people?***

- children playing
- children going to school
- youngsters loitering
- vandalism
- adult commuters
- people during their free time activities (e.g. walking their dog, taking photographs)
- people going to / coming from sportive activities on stadiums
- people going shopping, coming home from a bar, etc.
- people with mental problems
- people with suicide intent prone to choose the railways as a means

### Existing measures

***What are the details of existing measures?***

- lack of present safety measures
- for each measure separately
- what, where, when implemented
- current status?
- need of maintenance?

***What is the estimated effectiveness of existing measures?***

- for each measure separately
- does it work as intended?
- if not, why?
- if studies do not exist, provide expert estimate

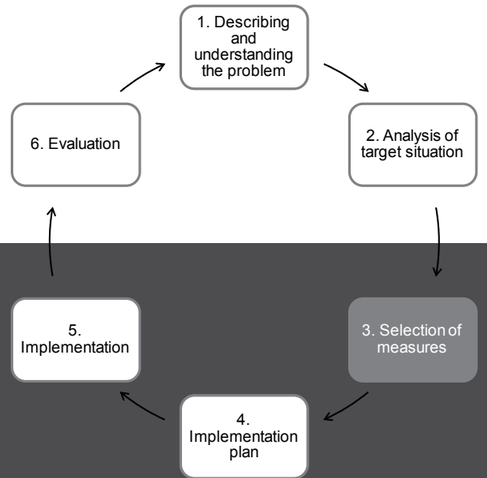
### Definition of the objectives of new measures

***What are the targeted incidents?***

- suicides
- suicide attempts
- trespassing accidents
- trespassing behaviour

***What is the targeted behaviour?***

- exactly where within the target location the targeted behaviour occurs
- is it focused in certain time periods (e.g. summer or night)
- does the targeted behaviour have some specific features (e.g. loitering on platforms, concerns especially teenagers etc.)




## 3. Selection of measures

USE THE SPECIFIC GUIDANCE TO SELECT THE SUITABLE MEASURES FOR THE TARGET PROBLEM YOU ARE ADDRESSING.

ONCE THE TARGET SITUATION HAS BEEN ANALYSED AND UNDERSTOOD IN DEPTH, YOU CAN REFER TO THE SECOND SECTION OF THIS GUIDANCE TO SELECT THE MEASURES OR COMBINATION OF MEASURES WHICH ARE MOST APPROPRIATE AND COHERENT WITH THE POLICY OF THE RU, IM, NATIONAL PREVENTION STRATEGY, ETC.

FOR ANY POTENTIALLY SELECTED MEASURE, IT IS IMPORTANT TO CONSIDER AT LEAST THE FOLLOWING QUESTIONS AND ISSUES.

### Measure or combination of measures

***Where is it implemented?***

- within target area (e.g. physical measures)
- elsewhere (e.g. education and campaigns)

***What proportion of target incidents does the measure cover?***

- a rough estimate is enough
- e.g. what percentage of trespassing in the target location
- e.g. what percentage of suicides and attempted suicides in the target location

***What is the estimated effect on target incidents?***

- a rough estimate is enough
- estimated percent reduction in incidents covered by the measure
- e.g. percentage reduction of trespassing in the path where the measure is implemented

***Are there other significant effects?***

- effects on the environment
- acceptability issues
- integration with other measures

***What is the cost of the measure?***

- rough estimate is enough
- implementation and maintenance

***What should be taken into account when planning implementation?***

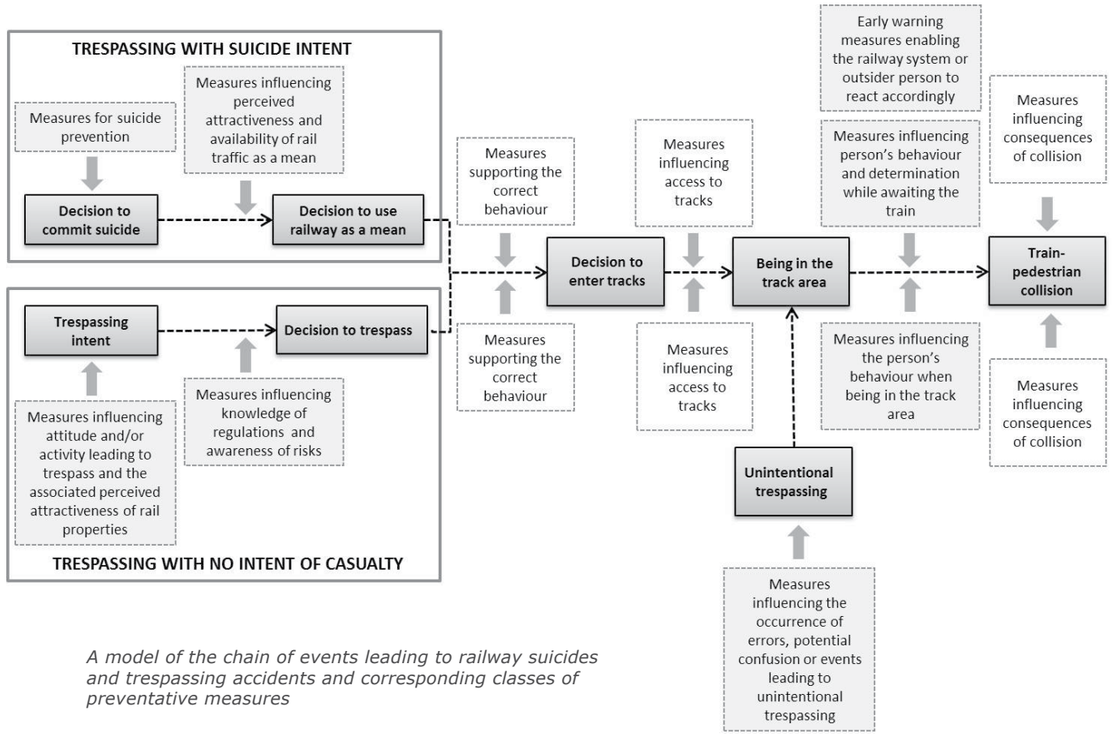
- need and organisation of maintenance
- features that may impede implementation or impair effectiveness
- cooperation between organisations
- effects on railway operations



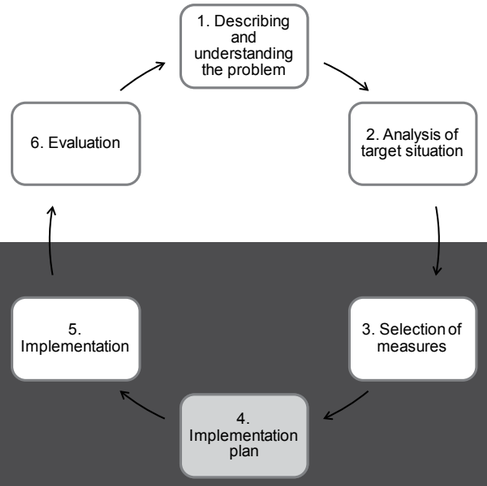
IN THE SELECTION PROCESS YOU MAY ALSO WISH TO REFER TO THE MODEL BELOW. IT DISPLAYS A CHAIN OF EVENTS LEADING TO RAILWAY SUICIDES AND TRESPASSING ACCIDENTS AND CORRESPONDING CLASSES OF PREVENTATIVE MEASURES. IT COULD HELP YOU TO BETTER DECIDE WHAT TYPE OF **EFFECT MECHANISM (IMPACT)** YOU NEED TO ACHIEVE WITH YOUR INTERVENTION:

**IMPROVE PRACTICE AND PROCESSES**
**INFLUENCE DECISION**
**DETER ACCESS**
**INFLUENCE BEHAVIOUR IN TRACK AREA**
**REDUCE SHUT DOWN TIME AND OTHER CONSEQUENCES**

THE MODEL PROPOSES DIFFERENT TYPES OF MEASURES THAT CAN BE USED IN EACH PHASE OF THE SUICIDE OR TRESPASSING PROCESS TO PREVENT THE EVENTS TO OCCUR AND TO MITIGATE THE CONSEQUENCES.




*A model of the chain of events leading to railway suicides and trespassing accidents and corresponding classes of preventative measures*




## 4. Implementation plan

Prepare the implementation of the most effective measures which you have previously selected.

In this step you draft the implementation plan with the following points in mind: expected effects and their evaluation, involved partners, funding and implementation schedule. In parallel, plan the evaluation strategy and conduct before-implementation evaluation.

### Selection of measures

***Which measure will be implemented?***

- take into account effects and costs, but also other relevant issues
- final decision may be reached only after assessing and trying several alternative combinations

### Involved organisations and their responsibilities

***Which are the participating organisations?***

Organisations and their roles:

- planning of implementation details
- implementation
- maintenance
- monitoring and evaluation

### Estimated cost

***What is the cost of selected measures?***

- total cost
- costs per measure
- implementation and maintenance
- evaluation and dissemination
- annual distribution of costs

### Assessment of expected effects

***What is the estimated effect of the selected measure on target incidents?***

- percentage reduction in target incidents?
- reduction in (annual) number of target incidents?

### Funding

***How is the funding organised?***

- contributions of involved partners
- is funding secured?
- is funding in balance with implementation schedule?

### Implementation schedule

***When are the selected measures implemented?***

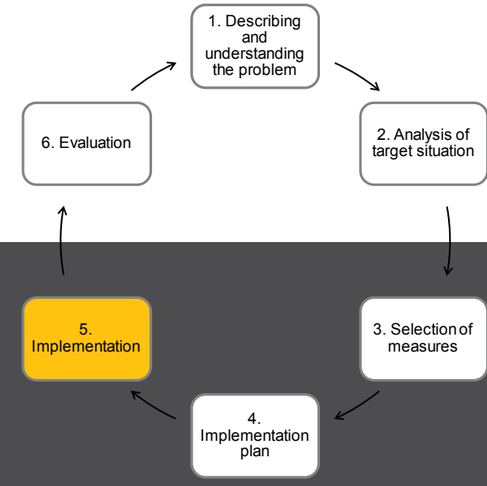
- implementation schedule of each measure
- maintenance schedules?

### Evaluation and monitoring issues

***How are the effects evaluated?***

- a brief description of main issues
- what effects are evaluated (in addition to the effects on target incidents)?
- evaluation method(s) and plan(s)?
- responsible organisations
- are the requirements for proper evaluation taken into account in the implementation plan?
- draft of the detailed evaluation plan






## 5. Implementation

Implement the measure(s) according to the implementation plan.

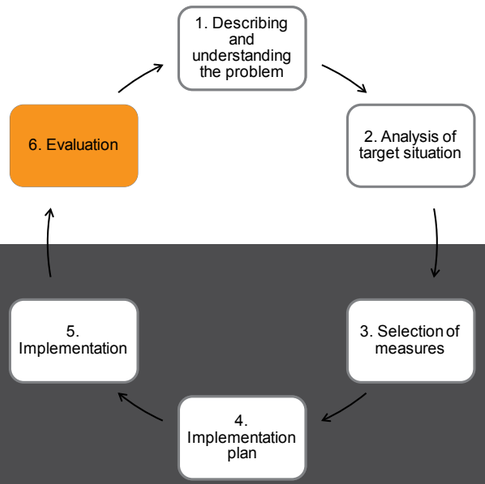
Try to stick to the plan, but in case you need to deviate from it list the reasons and the lessons learned. When implementing the chosen measure(s) also organize the follow-up (e.g. some measures such as fencing may need maintenance). During the implementation phase you will need to collect the evaluation data which can be quantitative or qualitative and which should also include cost-effectiveness information.

### Execution of implementation plan

***Were there deviations from the implementation plan(s)? If yes, why?***

- reasons for deviations
- difficulties encountered, missing elements
- lessons learned

*Source: ProRail*
*Photos © Erik van 't Woud*




# 6. Evaluation

## Evaluate the implemented measure(s) and write the report.

In this step you will determine if your intervention was effective and why or why not. Evaluate the effectiveness of your measure(s) according to the detailed evaluation plan developed in step 4. Consider both short- and long-term evaluations. Mind that every set of measures may ask for a different approach in the evaluation process.

### Evaluation of effects

***What was the result of your measure(s)?***

- displaced: Did the problem move to a different location?
- reduced: Was the problem reduced?
- unchanged: Did the problem remain?
- eliminated: Was the problem ended?

### Evaluation of costs and encountered problems

***Were the effects as expected? Did each measure achieve its aim?***

- quantitative or qualitative evaluation (quantitative preferred)
- reasons for unexpected results

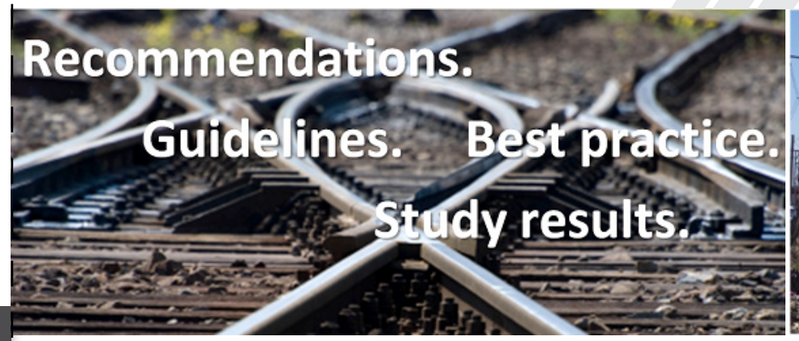
***Was any part of the plan not implemented? If so, why?***

- quantitative or qualitative evaluation (quantitative preferred)
- reasons for unexpected results

***What was the cost-effectiveness of the measure(s)?***

- CBA analysis report
- CEA analysis report







*Evaluation of interventions at Wavre, Belgium - a trespassing hotspot near a station and a level crossing - Source: INFRABEL*

### Evaluation of the whole intervention process and problem approach

***Were the underlying causes of the problem properly identified?***

- qualitative evaluation
- need to review the current intervention programme?
- need to review the current evaluation design?
- need to further analyse the problem?

***Were the key stakeholders and resources identified and included?***

- qualitative evaluation
- need to review the current intervention programme?
- need to review the current evaluation design?
- need to further analyse the problem?

***Is it necessary to return to the analysis step to re-consider the problem?***

- qualitative evaluation
- need to review the current intervention programme?
- need to review the current evaluation design?
- need to further analyse the problem?

### Evaluation of implications

***What are the conclusions and recommendations?***

- implications for policy, practice and innovation
- implications for the future of the intervention (Who will need to be further involved? What could happen if the measures are left in place? What could happen if they are taken away?)
- implications for future evaluation and research

***Will the intervention require a long-term commitment and monitoring?***

- where?
- for how long?

### Publication of results

***Will the results be available to all those who could potentially benefit from them?***

- scientific articles
- research reports
- conference papers
- website
- media announcements

## 1.2 Post incident response mitigation action plan

As with the general guidance on preventative interventions, it is important that post incident response mitigation measures are considered and a similar approach has been taken as in the checklist below: incident response planning, consultation/briefing, plan testing, actual incident response, management and review applied by RUs and IMs for any incident involving their operations (e.g. collisions and derailment).

Use of the following approach enables contextual issues to be addressed when reviewing/ developing post incident response mitigation arrangements in order to achieve a better punctuality of the services.

### 01 Analysis of incident response arrangements and decision making processes

#### Partners & stakeholders involved

***Who are the partners and stakeholders likely to be involved in incident response planning, the actual response and ongoing review of these arrangements?***

- Police
- Fire service
- EMS
- Legal entities
- RU & IM responders on & off site including media
- RU & IM contractors (e.g. clean up)

#### Identification of responsibilities

***What are the legal responsibilities of the organisations likely to be involved in an incident response?***

- Incident response management, roles & responsibilities
- Legal considerations
- Health & safety requirements
- Investigation responsibilities
- Ethical requirements

***What rail industry requirements are applicable to incident response?***

- Incident response planning
- Incident response organisation, roles & responsibilities
- Coordinated incident management



### 02 Incident conclusion delay elements

#### Identification of aspects of incident response that can extend the incident conclusion time

***What specific response and incident site aspects may delay conclusion of an incident & traffic restoration?***

- Delayed/inadequate notification of an incident from site to the RU & IM OCCs
- Inadequate liaison between RU & IM OCCs
- Delayed/unclear advice from OCCs to external responders
- Unclear identification of suitable track/location access point to responding entities including IM/RU contractors
- Distance from response resource location to the incident site
- Locations with difficult access
- Unclear understanding by responding organisations of each others expectations, roles and responsibilities
- Not making site information available quickly (e.g. train driver, OTDR, FFCCTV) and associated responsibilities
- Arrangements for safe evacuation of stranded trains and alternative transport not organized promptly and insufficiently resourced
- Arrangements for welfare of passengers in stranded trains

### 03 Incident conclusion accelerators

#### Partners & stakeholders involved

***What actions can achieve the earliest possible conclusion of an incident and traffic restoration?***

- Prompt/adequate notification of an incident from site to the RU & IM OCCs
- Making site information available quickly (e.g. train driver, OTDR, FFCCTV) and associated responsibilities
- Adequate liaison between RU & IM OCCs
- Prompt/informative advice from OCCs to external responders
- Agreed lines of communication with necessary equipment on site, between site and OCCs and between OCCs and external responders.
- Clear identification of suitable track/location access point to responding entities including IM/RU contractors
- Response resources located at appropriate distance from anticipated incident sites
- Clear understanding by responding organisations of each others expectations, roles and responsibilities
- Arrangements for safe evacuation of stranded trains and alternative transport organized promptly and sufficiently resourced
- Appropriate arrangements for welfare of passengers in stranded trains
- Making information for investigation decision making available quickly (e.g. train driver, OTDR, FFCCTV).

## 04 Evaluation pre implementation of revised arrangements

### Partners & stakeholders involved

***How effective are existing incident response arrangements?***

- Records of response time by responding entities to an incident site
- Records of times to conclude incidents and restore traffic operation

***Are there any resource constraints for revised arrangements?***

- Equipment for handling/moving fatalities to clear the site
- Clean up equipment
- Location of response staff to potential incident sites

***Are communication arrangements effective?***

- Lines of communication
- Information requirements
- Equipment

***How will revised arrangements be tested?***

- Exercises involving all responders

## 05 Implementation

### Partners & stakeholders involved

***How will revised arrangements be put into practice?***

- Revised RU/IM procedures
- Briefing response plan arrangements within RUs & IMs and their contractors
- Consultation /briefing involving external responding organisations - Memorandum of Understanding arrangements
- Production of information leaflets/documentation

### Resources availability

***Are the necessary response resources – people/equipment) available?***

- Checking resource provision
- Responsibility for resource provision
- Funding of resources & by which organisation

## 06 Evaluation

### Partners & stakeholders involved

***How will the expected benefits of the revised arrangement be evaluated?***

- Setting target time for service resumption from incident occurrence.
- Record for incidents of time from start of incident to conclusion and service resumption
- Records of arrival time of key decision makers on site (e.g. Police)
- Internal RU or IM review meetings
- Review meetings with external responders
- Review of individual incident response arrangements

### Plan review

***How will identified improvements be promulgated***

- Internal RU or IM review meetings
- Review meetings with external responders



# PART 2: SPECIFIC GUIDANCE

This part of the guidance includes details about the implementation of different preventative or mitigation measures. The question answered by the specific guidance is how to implement the selected measure(s) in order to minimise the shortcomings and enhance the expected effect?

70 different specific measures have been selected in the RESTRAIL toolbox as recommended solutions for prevention or mitigation, and some of these have been pilot tested during the project.

For clarity and pragmatic purposes, these measures were grouped into a lower number of subsets (i.e. 25 families of measures) sharing common typologies or common effect mechanisms to influence suicidal and trespassing behaviours.

The families are grouped in 3 broader categories according to their type and general mode of intervention.

These are strategic, collaborative, enforcement and process related measures (e.g. risk assessment, collaboration between organisations, enforcement patrols, etc.) with cross-cutting effects on safety practice in general and on the following measures.

**Organisational and procedural measures**

| | |
|---|---|
| 1. Risk assessment | 1.1 Identification of hotspots<br>1.2 Monitoring of hotspot evolution<br>1.3 Planning for special circumstances<br>1.4 BTP PIER plans |
| 2. Learning from best practice | 2.1 Learning from international experience<br>2.2 Learning from national experience<br>2.3 Learning from research studies |
| 3. Collaboration between organisations | 3.1 Clarification of responsibilities<br>3.2 Communication strategy<br>3.3 Consultation with psychiatric hospitals<br>3.4 Collaboration with authorities<br>3.5 National Suicide Prevention Strategy<br>3.6 Innovative collaboration |
| 4. Societal collaboration to prevent railway suicide | 4.1 Societal collaboration to prevent railway suicide |
| 5. Information sharing at regional level | 5.1 Surveillance based on local intelligence |
| 6. Patrols and enforcement | 6.1 Suicide patrols<br>6.2 Security patrols able to fine |
| 7. Cooperation of the police and legal entities | 7.1 Meetings of the IM / RU and the police and judicial entities<br>7.2 Memorandum of Understanding with the police and judicial entities<br>7.3 Agreed response plans and procedures<br>7.4 Police and judicial entity visits to rail facilities<br>7.5 Information for the police and judicial entities |



These are measures related to engineering or technology such as fencing, landscaping, detection systems, lighting devices, etc.

**Physical and technological measures**

| | |
|---|---|
| 8. Fences at stations | 8.1 Intermediate fencing between tracks<br>8.2 Mid platform fencing<br>8.3 Fencing platform ends<br>8.4 Sliding doors at platforms<br>8.5 Anti-trespass grids<br>8.6 Symbolic deterrent fencing |
| 9. Fences outside stations | 9.1 Fencing at hotspots<br>9.2 Nets at bridges<br>9.3 Fencing off objects close to the tracks<br>9.4 Measures to soil clothes |
| 10. Landscaping | 10.1 Removal of vegetation to increase visibility |
| 11. Detection and surveillance systems | 11.1 Intelligent CCTV combined with sound warnings<br>11.2 Detection systems combined with sound warnings |
| 12. Lighting devices to influence behaviour | 12.1 Dispelling light source<br>12.2 Lighting linked to a movement sensor<br>12.3 Tracking spotlight linked to a movement sensor |
| 13. Light to increase visibility at hotspots | 13.1 Increased visibility by lighting at specific identified hotspots |
| 14. Safety and emergency devices at stations | 14.1 Emergency information at stations to ensure rapid intervention<br>14.2 Information encouraging help seeking for people with suicide intent |
| 15. Incident management and information platform | 15.1 Geo-data relating to the incident location and access points<br>15.2 Incident information, including third party involvement<br>15.3 Essential response actions |
| 16. Forward facing CCTV | 16.1 Forward facing CCTV |



These are measures which improve the knowledge or skills of various categories of people (communication campaigns, signage, education in and outside schools, media guidelines, training and exercises, etc.).

**Public awareness and educational measures**

| | |
|---|---|
| 17. Campaigns to raise awareness | 17.1 Targeted campaign to prevent suicide<br>17.2 Targeted campaign to prevent trespassing<br>17.3 Targeted campaign towards vulnerable categories |
| 18. Mass media campaigns | 18.1 National campaign to prevent suicide<br>18.2 Campaign about safety |
| 19. Media guidelines | 19.1 Media guidelines to avoid copycat effect<br>19.2 Publishing statistics<br>19.3 Announcements made to passengers after an incident<br>19.4 Removal of death memorials |
| 20. Posters and warning signs | 20.1 Posters<br>20.2 Warning signs |
| 21. Prohibitive signs | 21.1 Prohibitive signs |
| 22. Education in and outside schools | 22.1 Education at school dedicated to risk and safety<br>22.2 Integration of safety messages in school disciplines<br>22.3 Education for pupils outside of schools<br>22.4 Education for adults in locations close to the tracks |
| 23. Training to prevent suicide | 23.1 Gatekeeper training for front line staff |
| 24. Training to prevent trespass | 24.1 Training of staff to identify different trespassers |
| 25. Training and exercises to mitigate the consequences | 25.1 Training for relevant IM & RU staff<br>25.2 Exercises for relevant IM & RU staff<br>25.3 Provide advice to staff on coping with traumatic events<br>25.4 Rail incident lessons in police training programmes<br>25.5 Conducting joint incident response and management exercises |

*2.1. Some examples of measures focused on suicide prevention*

## M8.2 Mid platform fencing

### Description

This measure consists of the installation of a fence along the center line of a platform (usually an island platform) to split it in two parts, thus blocking access from one edge of the platform to the other edge. It is usually used to separate people from the trains passing at high speeds or to isolate fast lines where trains might not stop from the regular lines which should be easily accessible.

| | |
|---|---|
| Type of measure | Organisational and procedural<br>**Physical and technological**<br>Public awareness and educational |
| Target problem | **Suicide**<br>Trespass<br>Mitigation |
| Effect mechanism | Improve practice and processes<br>Influence decision<br>**Deter access**<br>Influence behaviour in track area<br>Reduce shut down time and other consequences |
| Family | **Fences at stations** |
| Evaluation studies | **RESTRAIL**<br>**Other**<br>None |

### Recommendations

- For practical grounds there needs to be a gate in the linear fence to provide access to the tracks in case this is needed.
- The systems for securing gates and their use need to be considered. Gates operable with a standard industry carriage key can be, and generally are, provided, to allow access for rail operations and maintenance staff. They are also needed as an escape route in case of emergency.
- Try to fit the fencing to the trespassing pattern and environment.
- Try to reinforce the desired behaviour by providing an attractive corridor alternative for biking, hiking, jogging, and walking (such as using an overbridge).

### Warning points

- Building of fences would also require the building of under- or overpasses to enable safe access from one side of the track to the other. This also applies the other way around. Fencing will likely be considered in conjunction with one or two other measures: surveillance, cameras or operational planning (e.g. fast trains running close to platforms with easy access).
- The effect is stable assuming that control and maintenance is done. However, trespassers might change location over time and fencing could result in more dangerous routes for trespassers. Therefore, maintain the integrity of the fences and repair defects without delay. At the same time keep monitoring a much wider perimeter than the fenced area in order to spot possible new trespassing locations.

### Observations

- The type of fencing needs to be considered - strand, chainlink, paling, security - height, etc.
- The measure can be applied in different scale and different kinds of environments.
- Fencing can also be combined with warning or prohibitive signs. The signs can be posted on the fence itself.

### Study results

- Mid-platform barriers were rated highest of all programme activities in terms of their effectiveness with 65.9% (338 / 513) of respondents stating that they believed that these would decrease the number of suicides (RSSB, 2013).
- Mid platform fencing was tested by UNOTT in several stations in Great Britain as part of RESTRAIL pilot tests conducted in 2014. Early data show a net reduction of fatality incidents when incidents from fast and slow lines at these stations are combined. Staff and stakeholders have been very supportive of the mid-platform fencing programme. It is thought to be very effective in stations with a specific layout and where closure of the gates after use can be assured.

*Example from the UK - Source: Network Rail*

*Example of mid-platform fencing with gate*
*Source: Network Rail*

# M19.4 Removal of death memorials

## Description

This measure consists in removing or hiding death memorials at stations or along tracks in order to prevent people with potential suicide intent from being death primed and train drivers from being reminded anymore than necessary of an incident that happened at a specific location. Death memorials are usually a collection of mourning artefacts (e.g. cross, candles, flowers, photo of the victim etc.) placed at an accident site as a constant reminder that somebody passed away in that very location. These memorials are therefore very likely to activate mortality ideas in people who see them.

| | |
|---|---|
| Type of measure | Organisational and procedural<br>Physical and technological<br>**Public awareness and educational** |
| Target problem | **Suicide**<br>Trespass<br>**Mitigation** |
| Effect mechanism | **Improve practice and processes**<br>**Influence decision**<br>Deter access<br>Influence behaviour in track area<br>**Reduce shut down time and other consequences** |
| Family | **Media guidelines** |
| Evaluation studies | RESTRAIL<br>Other<br>**None** |

## Recommendations

- Create an alternative memorial site for mourners (for example one per country / province) and communicate about the alternative memorial site in media.
- Make it a specialised task for one trained employee to contact the families. Train this person on how to communicate with the public about announcements (keeping people informed) and with families about the prohibition of memorials.
- Make sure no 'silent' or 'memorial parade' is organized to commemorate someone who committed train suicide. In the Netherlands such a planned parade was prevented. The plan was to start this parade near the level crossing where she committed her act. ProRail and NS were in touch with the school of this girl. A letter was sent to all the parents of the students to explain that this would have drawn even more attention to the train as a means for suicide, also in the press.

## Warning points

- Do not remove memorials without consulting family of deceased. Explain why it is dangerous to have such a memorial and point out how traumatic such a memorial can be for train drivers.

## Observations

- Another reason for removing death memorials is that it is usually not at a safe location for relatives to mourn the loved one or to hold gatherings. In the Netherlands the memorials are removed after being in touch with the survivors and after photographing the site. The survivors are explained that there is a special national monument where they can mourn the deceased person. The victim's relatives appreciate if they are accompanied by someone from the railways (e.g. NS Aftercare) to visit the monument.

## Study results

- A policy provided to all managers of stations to advise that memorials for deceased are not to be placed at railway stations due to risk of copycat suicides and upset to staff involved (RSSB, 2013).

*Example of a national monument for railway incidents ("Landelijk monument spoorwegongevallen", Utrecht, the Netherlands)*

*Source: ProRail*

In addition to the removal of death memorials in the Netherlands railway staff of ProRail and NS refers to one national monument for railway casualties. It was erected in 2004 to fulfil the need to commemorate the deceased. It is located in the center of the Netherlands in Utrecht, between the two railway offices of NS and ProRail and was designed by Anton Broos. A poem of theologist and preacher Anne van der Meiden is written on the monument. The poem shows the dynamics of life and the silence of death in a bold and strong way (unofficial translation): "Memories accompany those who passed the switch of death. Our feet measure pain and sadness. A heartfelt note from this silenced station. Until we meet again at the next stop..."

# M23.1 Gatekeeper training for front line staff

## Description

Gatekeeper programmes include a range of interventions focused on community or Organisational gatekeepers (e.g. railway personnel, security personal, local charity workers) whose contact with potentially vulnerable populations provides an opportunity to identify at-risk individuals and to engage in preventive action. The gatekeeper training teaches specific groups of people to identify people at high risk for suicide by recognising suicidal risk factors, to assess the levels of risk, and to manage the situation appropriately by employing adequate approaching tactics.

Gatekeepers are those who come into frequent contact with members of the community on a regular basis, usually, but not exclusively, on account of their professional status. Gatekeepers interact with community members in natural and often non-medical environments and can be trained to recognize risk factors for suicide.

| | |
|---|---|
| Type of measure | Organisational and procedural<br>Physical and technological<br>**Public awareness and educational** |
| Target problem | **Suicide**<br>Trespass<br>Mitigation |
| Effect mechanism | **Improve practice and processes**<br>Influence decision<br>Deter access<br>**Influence behaviour in track area**<br>Reduce shut down time and other consequences |
| Family | **Training to prevent suicide** |
| Evaluation studies | **RESTRAIL**<br>**Other**<br>None |

## Recommendations

- Education of gatekeepers covers awareness of risk factors, policy changes to encourage help-seeking and availability of resources.
- In order to be effective, gatekeeper training must be a continuous, sustained effort with close monitoring and evaluation, ideally as part of a professional training curriculum.
- It can take the shape of a training of voluntary staff to first contact the person at risk of suicide.
- Training should be implemented into gatekeeper inductions to ensure all new staff are covered.
- Training staff to know how to sensitively resolve a contact with a potentially suicidal person is very important, particularly ensuring they are referred onto the appropriate care (e.g. police force, mental health or friends and family). Failure to do this may see the suicidal person travel to another location to try again.
- Training should be developed in collaboration with experienced partners (e.g. department for health, suicide prevention/mental health charities).
- Training should ideally be at least a day in length and tailored for the rail industry to improve effectiveness and to better equip attendees with the skills and confidence to put what they have learned into practice.
- In Great Britain and the Netherlands this is a one day briefing on how to start a conversation when you suspect that someone is about to commit suicide. The Samaritans Managing Suicidal Contacts course delivered in the UK focuses on training attendees with speaking and listening skills, tips for identifying a potentially suicidal person and effective referral of the individual to help improve ongoing care and reducing the chance the individual will return to the station again.



## Warning points

- Not everyone is fit for this task.
- Trainers need to be aware – more so than with other courses – of possible emotional reactions from the participants by past experiences.
- For a franchised rail network with multiple train operators it can be difficult to get gatekeepers the time away from work to do the training. The benefits of the training need to be communicated at a senior level.
- Health and safety policies should be taken into consideration with the training development. Gatekeepers should be clear on how much risk they should take.

## Observations

- Evaluation of actual decrease in suicide numbers as a consequence of this measure can be difficult.
- You should establish an effective means of reporting interventions made at stations as they can be an effective indicator of an area of high risk. Such statistics can complement suicide and attempted suicide statistics and can ensure resources are allocated to the right places.

## Study results

- RSSB (2013): General positive attitude about the training (an average of 4.8 out of 5 on a satisfaction scale): 63.1% of respondents appreciated that the training may decrease the number of suicides. Participants reported an increased likelihood of taking actions seen to be 'desirable' upon encountering a potentially suicidal person. Confidence: staff felt more confident following training in making an intervention. Evidence in terms of changing staff behaviour: 14% of participants reported that they had engaged with a potentially suicidal person and used the skills they had learnt.
- Gatekeeper training was tested by HMGU in Germany and by ProRail in the Netherlands as part of RESTRAIL pilot tests conducted in 2014:
  - In Germany, the Median of the knowledge score at t1 was 17.00, compared to a Median of 37.00 at t2 and of 44.00 at t3. The increase in knowledge from t1 to t2 was a significant (p=0.001). The Median of the attitude score at t1 was 12.00, compared to a Median of 14.00 at t2 and a Median of 13.00 at t3.The increase from t1 to t2 was a significant (p=0.001).
  - The results from the Netherlands indicate that: (1) the course provides necessary information and topics and fulfils a need for railway staff to tackle this theme; (2) the feeling of competence increases significantly in contact with a potentially suicidal person; (3) knowledge level increases significantly regarding suicide and effective behaviour in contact with potentially suicidal people; (4) after care is important for staff after contact with a potentially suicidal person.

*Example of gatekeeper interventions (the Netherlands) - Photos © Erik van 't Woud*


*Cover of the gatekeeper training brochure by ProRail and NS*


*Example of a quick gatekeeper guide: Suicide Prevention and Support on the Railways Pocket handbook and 'TACTICS' card (UK)*

## *2.2. Some examples of measures focused on trespass prevention*

# M6.2 Security patrols able to fine

## Description

This measure refers to surveillance patrols (not necessarily visible) to deter access to high risk areas and to intervene when trespassing situations are identified. These patrols are primarily security oriented and less safety oriented. Therefore, this measure is more focused on trespassing and law enforcement.

| | |
|---|---|
| Type of measure | **Organisational and procedural**<br>Physical and technological<br>Public awareness and educational |
| Target problem | Suicide<br>**Trespass**<br>Mitigation |
| Effect mechanism | Improve practice and processes<br>Influence decision<br>**Deter access**<br>Influence behaviour in track area<br>Reduce shut down time and other consequences |
| Family | **Patrol and enforcement** |
| Evaluation studies | RESTRAIL<br>**Other**<br>None |

## Recommendations

- Visibility of patrols is a key issue of a preventive strategy. Plain clothes should be used by security and cleaning staff.
- It is preferred to do surveillance by foot rather than by car. This gives a more preventive effect.
- When surveillance is done by car, mark the cars with text as 'Rail Surveillance'. Make them visible as much as possible.
- If the patrols are continuously on duty the effect on prevention is sustainable. If they stop the effect lasts no more than a few months.
- When surveillance is done at night the effectiveness rises when they are given night sight camera's (e.g. FLIR). Night sight will be increased to about 500 to 750 meters.
- Suicide patrols can be implemented independent of other measures. It is important that they are well informed using other methods, analysis, measures. Knowledge about hotspots and the behaviour of suicidals can enhance the effectiveness. Patrols should be trained to look for and recognize examples of suspicious behaviour on particular parts of stations (e.g. platform ends).
- Concerning vandalism, patrolling should be done particularly during the period after 15hrs (peak periods for graffiti activity and vandalism).
- When security patrols are used to prevent trespass it helps enormously when they are authorized (if possible by law) to fine people.
- Working together with police forces, municipal supervisors or other present security forces helps to increase the effectiveness.
- Communicate in the media that you are performing surveillance and persons caught will be fined (if allowed).



## Warning points

- On special circumstances, such as music festivals etc., when you know that there will be a lot of people, it is important that you use this as a temporary measure.
- The ratio of surveilling persons per targeted areas has to be considered. The higher this ratio, the better.
- Security patrols' intervention can be effective when it is targeted and based on information.

## Observations

- In the Netherlands, ProRail makes use of such patrols to prevent and limit the number of copper thefts. However there is an internal discussion about the hazards and related risks that can be caused by these measures for the patrols (e.g. incidents with firearms).

## Study results

- Significant improvement in the amount of reported safe crossing compared to unsafe crossing, with no age effects (Lobb, Harré & Terry, 2003)
- Punishment raised awareness towards trespassing being illegal and reduced trespass behaviour even more than public communication or education (Lobb, Harré, & Terry, 2003).
- Horton (2009) showed globally that the association between Education & Enforcement is efficient.
- The risk of being caught has the power to act as a real deterrent in some area, but only if the risk is real (RSSB, 2006).
- Plain-clothed transit and police officers resulted in a 40% reduction in the number of incidents and an estimated saving of UK$10,000 per week (Thompson et al., 2012).
- Implementation in the Cape Town rail system has done little to reduce injury rates (Lerer & Matzopoulos, 1996).


*British Transport Police, UK*

*Source: BTP*

*SNCF patrol, France*

*Car patrol in The Netherlands*
*Source: ProRail*
*Photo © Erik van 't Woud*

# M8.5 Anti-trespass grids

## Description

This measure consists of the installation on the ground of rubber panels on which walking is almost impossible. This is because of the panel's profile which is pyramidal shaped. The aim is to act as ground-level physical barriers which restrict pedestrian access or at least make it more difficult. They are also named "anti-trespass panels" or "cattle grids".

| | |
|---|---|
| Type of measure | Organisational and procedural<br>**Physical and technological**<br>Public awareness and educational |
| Target problem | **Suicide**<br>**Trespass**<br>Mitigation |
| Effect mechanism | Improve practice and processes<br>Influence decision<br>**Deter access**<br>Influence behaviour in track area<br>Reduce shut down time and other consequences |
| Family | **Fences at stations** |
| Evaluation studies | **RESTRAIL**<br>**Other**<br>None |

## Recommendations

- Combine with fences. The space beside the grid should be guarded by fences for a quite long distance. In some cases 500 meters of fencing were reported.
- Create with the fences a virtual tunnel close to the track for a suitably long distance. Some IMs reported distances of at least 7 to 9 meters.
- Make sure that in the fences there are escape routes for train passengers in case of emergency (and emergency response access) and entry gates for railway workers and their materials.
- Communicate when installing to avoid pedestrians injure themselves (e.g. by trying to walk on the panels). Combine with warning or prohibitive signs installed in visible places. These should also be visible during night-time.



## Warning points

- Anti-trespass panels do not completely eliminate the possibility of direct contact between persons and moving trains as would a solid fence. Young trespassers with good moving skills could still walk on the panels and access the tracks illegally.

## Observations

- They are usually installed in locations very close to the tracks where fencing is impossible (e.g. at the station's extremities, next to a level crossing).
- They are designed to deter people or animals from crossing the track at unauthorised places in open line. They are also suitable for sensitive hotspots in the vicinity of stations (e.g. to deter access for metal thefts).

## Study results

- A pilot study conducted in 2014 in Belgium by INFRABEL evaluated the effect of this measure at a trespassing hotspot close to three schools and a level crossing. Anti-trespass panels were installed in combination with fences, warning signs and a surveillance camera. The number of trespassers during the three months after the implementation decreased with 78% compared to the three months before installation..
- Anti-trespass panels was tested by TCDD at Aydin station in combination with other measures as part of RESTRAIL pilot tests conducted in 2014. Results indicate that the combination of all these measures can reduce trespassing significantly. The calculated effect was quite high: -87 % trespasses during one month of observation after the implementation of the measure.
- An exploratory study is also carried out by RFF and SNCF-Infra in two locations in France but results are not available.


*Examples from the UK*

# M17.2 Targeted campaign to prevent trespassing

## Description

This measure aims to inform the public of new or little known rules, increase problem awareness or convince people to refrain from hazardous behaviours and adopt safe behaviours.

| | |
|---|---|
| Type of measure | Organisational and procedural<br>Physical and technological<br>**Public awareness and educational** |
| Target problem | Suicide<br>**Trespass**<br>Mitigation |
| Effect mechanism | Improve practice and processes<br>**Influence decision**<br>Deter access<br>Influence behaviour in track area<br>Reduce shut down time and other consequences |
| Family | **Campaigns to raise awareness** |
| Evaluation studies | RESTRAIL<br>**Other**<br>None |

## Recommendations

- Effectiveness depends on having a targeted type of incident and audience. To be effective, a campaign should address target incidents that are locally and temporarily relevant. Example of target incidents can be shortcutting, rail crossing in station, loitering, vandalism, risk-seeking, etc. Both the target incidents and the audience should be clearly identified in order to design the campaign as well as to assess it impact. This can be done through data collection and observation at site. We recommend that campaigns be based on a solid foundation: databases, statistics, and research.
- The message should be optimised for different media channels.
- Collaborative approach involving stakeholders has been also emphasized as a success factor.
- The responsible staff must be trained so that they have the knowledge and skills of how to design and implement effective targeted campaigns.

## Warning points

- Fast decline expected; needs to be repeated for durable effect.
- Be aware that sometimes in an environment your main language is not the only spoken one. So maybe your text on flyers, billboards or messages in community centres should also be in foreign languages. In this sense, pay special attention to the areas with high ethnic minority populations.
- Acceptance may depend on the target incidents as well as on the approach chosen to deliver the message. For example, fear appeals (using explicit pictures of crashes, casualties, injuries and blood, and the related emotions of pain, sorrow and grief of victims and relatives) might have contrasted effects depending on the culture and the group.
- Poorly designed campaigns can be counterproductive e.g. regarding suicide. Campaigns might also have the contrary effect of informing about the railway as a means of suicide (for some) rather than dissuading use of the railway as a means of suicide. Be careful with the message "trespassing is dangerous" this could attract possible suicidal persons to the tracks. It is better to address to "the delays caused by trespassers" and "the number of people that are inconvenienced by those delays".



## Observations

- A media campaign has virtually no effect if it is not combined with other measures. It is recommended to reinforce information campaigns by combining them with physical / environmental measures (such as fencing or prohibitive signs), education (e.g. talk at school and at rail side factories, leaflets distribution) or supplementing them by incentives (rewards for safe behaviour) or enforcement procedures (such as punishment or police enforcement).
- Interactions with external elements passing contrasting messages (e.g. action movies) can yield unexpected results.
- Try to get authority to fine trespassers and communicate about this in the media.
- A campaign and discussions in the society that leads to preventative measures would give more long term effects.
- Technologies like websites, mobiles devices etc. may provide new access to targeted audiences. They can also decrease costs related to media coverage.
- In Belgium the cost of the measure was € 800,000.

## Study results

- A campaign consisting of environmental intervention (fencing repairing), educational campaign (talk at school and at rail side factories, leaflets distribution) and new warning signs and posters resulted in changing the occurrence of unsafe track crossing behaviour from 65% to 37% for adults and from 47% to 34% for children (Lobb et al., 2001).
- Public communication alone did not decrease unsafe crossings (Lobb et al., 2003)
- A media campaign has virtually no effect if it is not combined with other measures like enforcement and/or education (Hoekstra & Wegman, 2011)
- Prohibitive and warning signs combined with posters as part of an anti-trespass campaign were tested by CIDAUT in Valladolid Universidad station (Spain) as part of RESTRAIL pilot tests conducted in 2014. The trespassers have been significantly reduced from 128 to 77 after the implementation of the warning signs that indicated the possibility of being fined for trespassing ($p=0.025$).


*Example from Operation Lifesaver*

*One of the latest targets of OLI is Kiloo Games, the Denmark-based maker of "Subway Surf", a video game app in which cartoon characters surf on railroad tracks and try to dodge oncoming trains. OLI has written to Kiloo officials, asking if they would consider modifying or taking down the app.*

*Screenshots of the Subway Surf game which may encourage vandalism and trespassing behaviour*


*Example from INFRABEL (Belgium)*

*The campaign aims to help reduce the number of trespassers on the railways and consists of two TV awareness-films, distribution of flyers, enforcement, a press-campaign, a dedicated webpage and a Facebook page.*


*Example of trespass awareness posters from Kiwi Rail (New Zealand)*


*Example of trespass awareness posters from RFF (France)*

*2.3. Some examples of measures focused on consequences mitigation*

## M15.3 Essential response actions

### Description

This measure refers to 3 key phases in the response action: immediate safety actions on site and reporting the circumstances; on-site management of an incident and provision of support responding bodies; and restoration of routine operation.

| | |
|---|---|
| Type of measure | Organisational and procedural<br>**Physical and technological**<br>Public awareness and educational |
| Target problem | Suicide<br>Trespass<br>**Mitigation** |
| Effect mechanism | Improve practice and processes<br>Influence decision<br>Deter access<br>Influence behaviour in track area<br>**Reduce shut down time and other consequences** |
| Family | **Incident management and information platform** |
| Evaluation studies | RESTRAIL<br>Other<br>**None** |



### Recommendations

#### Safety

An uncategorised incident with casualties can be divided into three phases:

***1st phase: immediate safety actions on site and reporting the circumstances***

- Initial on site safety actions by the train crew applying protection of the site to prevent other trains or people being put at risk.
- Reporting of casualties or of an incident that has caused stoppage of train traffic – reporting usually depends on the location of the train, and is most often undertaken by the driver
- Managing train traffic – complete stoppage of train traffic at the site or operation in degraded mode, based on the incident characteristics, the infrastructure capacity and the IM's technical capabilities at the specific segment of the tracks
- Arrival of first responders to the site. The IM and RU have staff available on a 24/7 basis covering the entire network, enabling an incident response manager to arrive as quickly as possible. The initial response organisations dispatch municipal or regional responding bodies to the incident site with the arrival of railway police staff dependent on the network deployment and availability of their teams.
- Initial actions at the site include providing initial support and assistance to passengers, including attending to the injured and evacuating them to hospitals, and ensuring safety at the site.

***2nd phase: on-site management of an incident and provision of support responding bodies***

- Provision of medical assistance to any injured staff and evacuation to hospital
- RU actions aimed at promoting the welfare of passengers and staff until they can be moved from the site either onboard the train involved or detrained and moved to a location with other rail or bus transport;
- Investigation of the incident by the police – an investigation whose purpose is very simple and clear: "To verify whether or not a third party was involved in the incident." If the involvement of a third party is suspected, the police investigation, as with any suspected homicide, will be detailed and usually very time consuming;
- Instructions of the police and based on agreement reached between the police and the on-site IM representative. This will take into account the need for incident site safety, the particular characteristics of the incident, whether it is possible to cover the body, the infrastructure and the IM's technical capabilities in the specific segment of the tracks.
- Technical assistance and engineering works – these will be supplied by the IM's technical teams on matters relating to the infrastructure, and by the RU's technical teams when involving technical issues relating to the trains.

***3rd phase: restoration of routine operation***

After receiving approval from the police, the IM will take the necessary steps to resume routine operation. Resumption of routine operation includes the following actions, among others:

- In cases of fatality - removing the body from the site;
- Cleaning the site and the train;
- Repairing the infrastructure and basic repair of the train;
- Implementing safety arrangements, to allow train traffic to resume;
- Identifying faults and infrastructure repairs that are not critical for the safe operation of trains and do not need to be executed immediately (such as infrastructure in the area of the tracks).

## Recommendations

### Incident response time

The incident response time of IMs, RUs and external incident responders can be shortened by use of the following systems and solutions:

***Information sharing platforms***

Information sharing platforms serving relevant responders, for the real time transfer of essential information among them, for example:

- Geo-data concerning the incident site and the track access points;
- Information on the circumstances of the incident and the possible involvement of third parties, which is essential for police work;
- Critical actions during the course of the response – relating to safety, assistance required by passengers, evacuation.

***Business process and information management***

Specially designated systems for incident management that utilize the business process – from the response procedure to manual and automatic actions of the entities involved on behalf of the IM. These greatly assist the achievement of systematic, orderly incident management that is based on the predefined emergency plan and procedures. These systems are highly useful in the execution of automated actions, such as sending alphanumeric messages, images or video among the on-site and off-site incident managers. They also contribute to incident debriefing and arriving at conclusions regarding the effectiveness of response of each responder and of all the involved responders working together.

***Mobile devices***

Incident response managers (incident manager, technical entities, mobile units) mostly communicate using basic devices – cellular phones operating on the regular commercial network or on GSM-R, or use smartphones, which enable the execution of a variety of actions, such as automatically sending messages, navigating, providing geo-data, disseminating and receiving images and video files. This also includes business process applications, enabling the execution of ad-hoc tasks and receiving an updated situational picture. Widespread use is made of digital cameras to record evidence, e.g. the position of a body, means of access to the railway, before anything is touched, moved or repaired.

***Forward facing CCTV***

Forward facing on train CCTV cameras can provide the police with critical information required for its investigation concerning the circumstance of the incident. They enable determination with a high degree of certainty whether or not a third party was involved. For maximum effectiveness the images would need to be readily accessible on site or even better off site as well. Importantly this decision could be made quickly reducing the time for investigation hence service restoration to a minimum. Unlike the information recorded by OTDRs the data collected by forward facing CCTV could involve images of individuals and be subject to application of data protection requirements. From a police investigation point of view preservation of evidence integrity is also essential.

***Interoperable protocols for information sharing***

The issue of standard and interoperability protocols for information sharing is linked to a significant extent to section above. The basic assumption is that the IM, RU and the various responders do not utilize identical IT systems; therefore, standard and interoperability protocols would allow information sharing among them all, with each operating in his own IT environment. Such standards and interoperability are critical with regard to the following:

- Geo-data;
- Information sharing at a particular instance, or a continuous flow of information that provides a situational picture of the incident;
- Sharing of video and audio files.

Within the framework of this research, we have learned that IMs use Web platforms and off the shelf products to share information concerning an incident and the response actions taken.



# M16.1 Forward facing CCTV

## Description

Forward facing closed circuit cameras (FFCCTV) can provide the police with critical fatality investigation information, in particular – determination of any third party involvement, with a high degree of certainty. Images readily accessible on site or, even better – also off site, would speed up decision making and reduce investigation time; hence reducing service restoration time to a minimum.

| | |
|---|---|
| Type of measure | Organisational and procedural<br>**Physical and technological**<br>Public awareness and educational |
| Target problem | Suicide<br>Trespass<br>**Mitigation** |
| Effect mechanism | Improve practice and processes<br>Influence decision<br>Deter access<br>Influence behaviour in track area<br>**Reduce shut down time and other consequences** |
| Family | **Forward facing CCTV** |
| Evaluation studies | **RESTRAIL**<br>Other<br>None |

## Recommendations

- Provide the police with important information required for its investigation on the incident circumstances.
- Enable the police to quickly determine, with a high degree of certainty, whether or not a third party was involved in the incident. It speeds up decision making by the police and involved off-site responders.
- Images would need to be accessible on site and off site as well. Thus, the decision could be made quickly reducing the time for investigation.
- Complete the investigation within a shorter period of time allows restoring train circulation with minimum delay.
- May bring additional benefits: rear-facing CCTV for vandalism or other problems: trespass, misuse of level crossings, night vision.
- A typical FFCCTV system includes four operating modes:
  - Active mode. The camera and recorder are connected to a power supply, and the system is fully functional. In this mode, the status display panel shows that the system is operating properly.
  - Inactive mode. The power supply to the camera and/or recorder is disconnected, or alternatively, the system is connected to the power supply and the camera, but is switched off.
  - Debriefing mode. An external viewing device (tablet or smartphone) is connected to the system for the purpose of viewing recorded video.
  - Malfunction mode. The system is connected to the power supply and to the camera, but there is a malfunction in the system (whether power, communication, hardware, software), which is displayed in the status display LED.

## Warning points

- There is no technical obstacle to the installation of cameras for this purpose and there are already many active installations. However given the number of driving cabs involved, across-the-board installation would be costly. Potentially difficult cost benefit decisions might be eased with greater knowledge of the actual total costs of service disruption. In addition there are other outputs from FFCCTV that can be of benefit to the IM and RU (e.g. for the examination of infrastructure, investigation of incidents involving other than suicide or fatal trespassing).
- Requirements for the handling of images and data protection will need to be applied.
- FFCCTV could involve images of individuals and be subject to application of data protection requirements.
- It preserves evidence integrity from the police investigation point of view.
- FFCCTV data could involve images of individuals and be subject to data protection requirements and preservation of evidence integrity – an essential police requirement.

## Observations

- FFCCTV can provide important information for a wide range incidents also track and lineside condition.
- Information recorded on OTDRs can assist with incident investigation (e.g. train speed and braking information).
- In some cases, it was implied that FFCCTV are not more widely used because of concerns expressed by drivers that these solutions also record the drivers' actions when they are driving. It's possible that this apprehension has more to do with what they consider as an infringement on their privacy, and concern that the information collected may be used for other than the stated purpose. However, guidelines on the handling of images and data protection will need to be provided in order to preserve a clear evidence trail.
- The cost-benefit for individual train operators may be questionable.

## Study results

FFCCTV was tested by MTRS3 in the UK in collaboration with Virgin trains, Greater Anglia, and South Eastern Railways as part of RESTRAIL pilot tests conducted in 2014. The main results indicate that FFCCTV with a wireless link providing real time remote access to images by key decision makers, particularly the police, facilitates the earliest possible decision making on the circumstances involved with rail fatalities.

### Forward Facing Closed Circuit Cameras on trains (NS, The Netherlands)

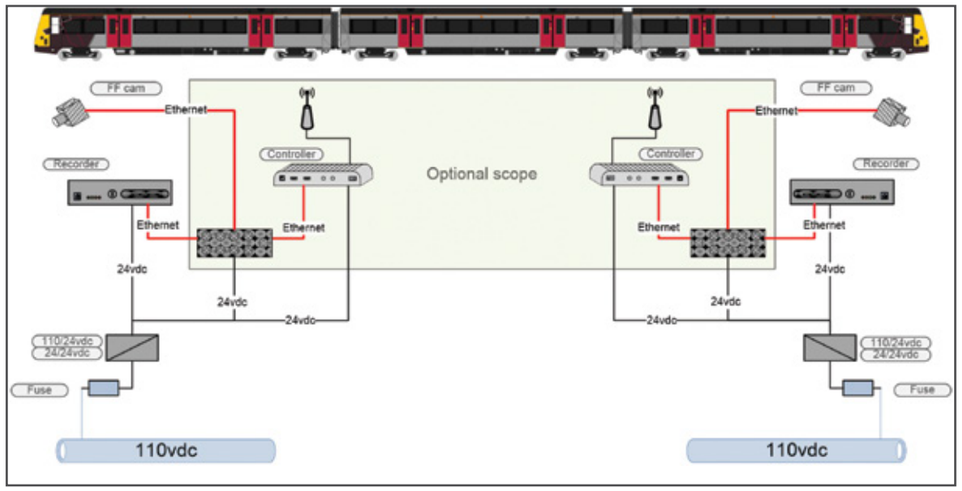
In October 2013 NS started a pilot with FFCCTV in trains. The pilot has ended 1 May 2014.

Aim of this pilot, in cooperation with National Police and Department of Security and Justice was to:

- Determine whether footage is usable to exclude crime scene investigation. This investigation of the police is done on location by the police and is next to salvage and cleaning a major contributor (delaying factor) in the incident handling time.
- Determination of functional and technical specifications related to the FFCCTV-system itself.
- Developing procedures with police and operator when using footage.
- Outcomes:
- Police and Department of Justice see added value in using FFCCTV-footage to exclude "foul play" or determine suicide. Nevertheless also witness reports, known "hot zones" and the presence of mental care institutions in the vicinity of the suicide location must also be taken into consideration in the assessment.
- Specifications have been determined
- Input for joint ProRail-NS business case for investing in FFCCTV (other areas are metal theft, vandalism, infrastructure inspection etc).

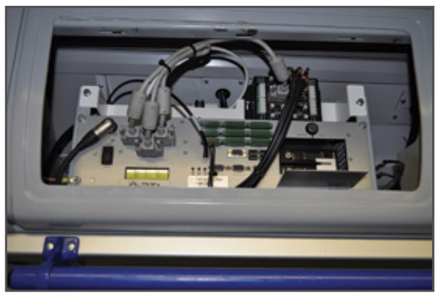


*Examples of forward facing CCTV image and portable kit*




*Schematic overview (digital system)*

*315 & 321 Class units, equipped with FFCCTV*



*On board recording unit installation*

# M25.2 Exercises for relevant IM & RU staff

## Description

Exercises for IM/RU incident response units (e.g. staff of the OCC, situation room, infrastructure maintenance and other logistical support staff) are a crucial element in improving incident management, as they transfer the knowledge and experience acquired by the organization in a methodical, focused manner to all relevant entities. It also supports a clear understanding of the needs of the police, whose representatives may participate in the training to mutual benefit. Information leaflets/ packages/ kits can be used to support formal exercises.

| | |
|---|---|
| Type of measure | Organisational and procedural<br>Physical and technological<br>**Public awareness and educational** |
| Target problem | Suicide<br>Trespass<br>**Mitigation** |
| Effect mechanism | Improve practice and processes<br>Influence decision<br>Deter access<br>Influence behaviour in track area<br>**Reduce shut down time and other consequences** |
| Family | **Training and exercices to mitigate the consequences** |
| Evaluation studies | RESTRAIL<br>Other<br>**None** |

## Recommendations

- Exercises are a way of testing incident response plans and are regularly organised by IMs and RUs to ensure, for example, over a period of time, that:
  - Plans are effective with the necessary resources (people and equipment) available;
  - The planned IM and RU relationship is effective;
  - IM and RU organisations and individuals understand their allocated roles and apply these properly;
  - There are effective relationships between responders, e.g. between the IM's Lead Person, external incident responders on site, the OCC and external incident responders control centres;
  - Incident response arrangements are effective in locations with difficult access e.g. sub- surface stations and cuttings.
- IMs and RUs may seek to involve external incident responders in these exercises to test the robustness of planned interfaces and a co-ordinated response. In addition to testing their own plans IMs and RUs PTOs/IMs need to liaise with and support relevant exercises organised by external incident responders. Information may be obtained and lessons learned by attending other organisations exercises and IMs and RUs may do this as observers even when not directly involved in the plan being exercised.

## Warning points

As an input to ensuring staff training and competence IMs and RUs record those staff attending exercises.

## Observations

Deficiencies in plans identified during exercises will need to be corrected as soon as possible, ideally before subsequent use of the plans.


*Exercise in collaboration with police (the Netherlands) - Source: ProRail - Photos © Erik van 't Woud*

## Abbreviations

**BTP**: British Transport Police
**CBA**: Cost-Benefit Analysis
**CCTV**: Closed Circuit Television
**CEA**: Cost-Effectiveness analysis
**CIDAUT**: Foundation for Transport and Energy Research and Development (Fundación para la investigación y Desarrollo en Transporte y Energia)
**FFCCTV**: Forward / Front Facing Closed Circuit Television
**FLIR**: Forward Looking Infrared (camera)
**GSM-R**: Global System for Mobile Communications – Railway
**HMGU**: Helmholtz Zentrum München, GmbH (German Research Center for Environmental Health / Deutsches Forschungszentrum für Gesundheit und Umwelt)
**IM**: Infrastructure Manager
**INFRABEL**: Belgian infrastructure manager
**LED**: Light-Emitting Diode
**MTR**: MTRS3 Solutions and Services LTD
**NS**: Dutch Railways
**OCC**: Operation Control Centre
**OLI**: Operation Lifesaver Inc.
**OTDR**: On Train Data Recorder
**PIER plans**: Prevention, Intelligence, Enforcement & Reassurance action plans
**RESTRAIL**: REduction of Suicides and Trespasses on RAILway property
**RFF**: French Rail Network (Réseau Ferré de France)
**RSSB**: Rail Safety and Standards Board
**RU**: Railway Undertaking
**SNCF**: French National Railway Company (Société Nationale des Chemins de fer Français)
**TCDD**: Turkish State Railway Administration
**UIC**: International Union of Railways (Union internationale des chemins de fer)
**UNOTT**: University of Nottingham

## References


Burkhardt, J-M., Rådbo, H., Silla, A., & Paran, F. (2014). ***A model of suicide and trespassing processes to support the analysis and decision related to preventing railway suicides and trespassing accidents at railways***. Paper presented at Transport Research Arena 2014, 14-17 April 2014, Paris La Défense, France.

C.A.R.E. (Community, Analysis, Response and Evaluation) (2006). ***Trespassing on Railway Lines. A Community Problem-Solving Guide: Direction2006***.

FRA (2011). ***Community Trespassing Prevention Guide***. Federal Railroad Administration. U.S. Department of Transportation.

Havârneanu, G.M., Papillault, V., & Bonneau, M.-H. (2014). ***Preventing railway suicide and trespass: A toolbox for evaluation and implementation of measures***. Paper presented at the Global level crossing safety & trespass prevention symposium (GLXS 2014), 3-8 August 2014, Urbana, Illinois, USA.

Hoekstra, T., & Wegman, F. (2011). ***Improving the effectiveness of road safety campaigns: Current and new practices***. IATSS Research, 34(2), 80-86.

Horton, S. (2009). ***Success factors in the reduction of highway-rail grade crossing incidents***. U.S. Department of Transportation, Research and Innovative Technology Administration, Volpe National Transportation Systems Center, Cambridge, MA USA.

Lerer, L., & Matzopoulos, R. (1996). ***Meeting the challenge of railway injury in a South African city***. Lancet, 7(348), 664-666.

Lobb, B., Harré, N. & Terry, N. (2003). ***An evaluation of four types of railway pedestrian crossing safety intervention***. Accident Analysis and Prevention, 35(4), 487-494.

Lobb, B., Harré, N., & Suddendorf, T. (2001). ***An evaluation of a suburban railway pedestrian crossing safety programme***. Accident Analysis and Prevention, 33(2), 157-165.

NIMH (2006). ***Guidance on action to be taken at suicide hotspots***. National Institute for Mental Health in England, Dept. of Health, UK.

RSSB (2006). ***Improving the content and placement of anti-trespass signs***. Final Report No. T555 Halcrow Group Limited in partnership with Human Engineering Limited.

RSSB (2013). ***Improving suicide prevention methods on the rail network in Great Britain***. Annual Report 2013 (T845). Rail Safety and Standards Board. http://www.rssb.co.uk

Thompson, K., Offler, N., Hirsch, L., Every, D., Thomas, M. J., & Dawson, D. (2012). ***From broken windows to a renovated research agenda: A review of the literature on vandalism and graffiti in the rail industry***. Transportation Research Part A: Policy and Practice, 46(8), 1280-1290.


# RESTRAIL

REduction of Suicides and
Trespasses on RAILway property

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## RESTRAIL coordinator

uic

RESTRAIL website
**www.RESTRAIL.eu**

## UIC Coordinator contacts

**Jacques COLLIARD**
*UIC Head of Security Division*
colliard@uic.org
tel. +33(0)1 44 49 21 45
fax +33(0)1 44 49 20 59

**Marie-Hélène BONNEAU**
*UIC Senior Advisor - Security Division*
bonneau@uic.org
tel. +33(0)1 44 49 21 43
fax +33(0)1 44 49 20 59

RESTRAIL toolbox website
**www.RESTRAIL.eu/toolbox**

## RESTRAIL partners

VTT · TRAFIKVERKET SWEDISH TRANSPORT ADMINISTRATION · IFSTTAR · MTRS · Foundation cidaut · HelmholtzZentrum münchen German Research Center for Environmental Health · Fundación de los Ferrocarriles Españoles · TCDD · DB Mobility Networks Logistics · CIK Instytut Kolejnictwa · ProRail · NICE · AnsaldoSTS · The University of Nottingham · INFRABEL Right On Track

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