

Jean-Pierre Loubinoux  
Director General UIC

“ In its role as technical platform and forum for gathering and expressing members’ ideas, UIC is able to synthesise these research needs, along with members’ concerns regarding management or technical matters. Thanks to its wide panel of competencies,

UIC is able to play several roles in EU-funded projects, starting with the technical, financial and administrative coordination of a project, passing through the technical research work and continuing until the end of the project when UIC takes on the disseminator’s role according to the principles agreed with the Commission. ”

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## A global vision : innovation serving comprehensive protection

### EUROPEAN RESEARCH PROJECTS INVOLVING THE UIC SECURITY DIVISION WITHIN THE UIC FUNDAMENTAL VALUES DEPARTMENT

#### WHY?

The main role of the security division is to meet the requirements of UIC members in matters of security and, with regard to technology, support (if not defend) their needs and priorities vis-à-vis the supply industry. In particular, the division represents members through European projects, where the aim is to pool efforts in the general interest.

The security division strives to anticipate members’ needs and to respond by pooling their research efforts, thus enabling members to benefit from progress made in the area of research while spending less.



By participating in European projects, the security division strengthens the representation of the railway sector compared to other transport sectors, and helps members to look forward and develop future strategies in the area of security. Therefore, whenever possible, the security division tries to anticipate threats and vulnerabilities to the railway system ahead of time, with a view to ensuring comprehensive protection of railway activities and strengthening the resilience of systems and organisations.

#### How?

The range of projects in which the security division is involved focuses on current and innovative issues within the field of security, addressing topics such as cyber crime, crisis management, media management in crisis situations, human and organisational factors, and security culture. This therefore helps to consolidate knowledge, developments in new technology and innovative concepts both from a technological as well as a human and organisational standpoint.

In practice, the security division coordinates and/or has an active role in several European projects such as PROTECTRAIL, RESTRAIL, SECRET, CIPRNet, PREDICT, GRAFFOLUTION, and TETRIS, and has positioned itself strategically with regard to future projects. The division can have a number of roles: disseminating results, or positioning itself more strategically, particularly on subjects where the outcomes may impact the railways; it also acts as project coordinator when required, with the aim of defending and providing for the needs of members.

## TECHNOLOGY SERVING RAILWAY SECURITY

### PROTECTRAIL:

*The Railway-Industry Partnership for Integrated Security of Rail Transport*



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 242270

**WEBSITE:**

[www.protectrail.eu](http://www.protectrail.eu)

**DURATION OF THE PROJECT:**

01/09/2010 - 30/06/2014

**CONTACT:**

Marie-Hélène Bonneau  
[bonneau@uic.org](mailto:bonneau@uic.org)

### PROJECT DESCRIPTION:

The European PROTECTRAIL project was developed as an extension of the TRIPS (TRansport Infrastructures Protection System) project. The main goal of TRIPS was to investigate the possibilities offered by technology and improve processes to consider innovative solutions that would increase the effectiveness and reactivity for the protection of passengers and infrastructure.

### PROJECT OBJECTIVES:

The main goal of PROTECTRAIL was to develop an integrated system to improve the security of rail transport through better protection of railways and trains, and to reduce disparities in security between European railway systems. This included the immunity of signal and power distribution systems against electromagnetic terrorism, the detection of abnormal objects on or under ballast; clearance of trains before daily use; control of access to the driver's cabin, detection of unauthorised drivers; new methods/tools to isolate and secure luggage; as well as a study and tools to reduce security disparities in European railway systems. The initiative had to demonstrate the potential of the European rail transport systems for improved protection and homogeneity.

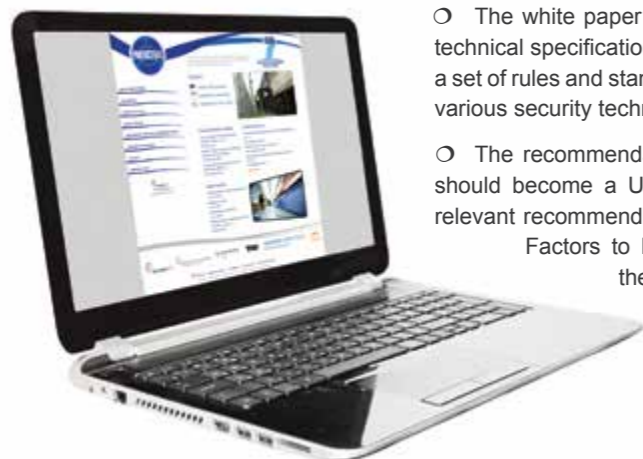
### PROJECT RESULTS:

The result of the PROTECTRAIL project is the design and demonstration of an interoperability framework built on a systems approach. This is a modular architectural framework into which asset specific and interoperable security solutions can be "plugged", giving operators and infrastructure managers the possibility to continuously adapt their security systems to the changing security needs with minimal non recurring engineering costs. This framework basically consists of a set of rules and standards which facilitate the integration and communication among various security technologies.

### LESSONS LEARNT:

The lessons learnt from PROTECTRAIL are summarised in two main public documents:

- The white paper prepared by the industry partners which gives an outline of the technical specifications of the PROTECTRAIL interoperability framework. It consists of a set of rules and standards which facilitate the integration and communication amongst various security technologies.
- The recommendations on Organisational and Human Factors for security which should become a UIC leaflet. This document gives members the major and most relevant recommendations and information. It focuses on Organisational and Human Factors to be taken into account especially when they design or improve their security organisation. The recommendations concern the rail security system, the video surveillance system, the design and management of a Security Operation Control Center (SOCC) and the Crisis Management System.



*The role of the UIC Security Division within the project was to collect members' requirements. Moreover, UIC was the leader for the dissemination and exploitation of results*

## ADDRESSING SECURITY AND SAFETY IN THE RAILWAYS

### RESTRAIL:

*Reduction of suicides and trespasses on railway property*



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 285153

**WEBSITE:**

[www.restrail.eu](http://www.restrail.eu)

**DURATION OF THE PROJECT:**

01/10/2011 - 30/09/2014

**CONTACT:**

Marie-Hélène Bonneau  
[bonneau@uic.org](mailto:bonneau@uic.org)

### PROJECT OBJECTIVES:

- Analyse the causes of suicide and trespass on railway property based on existing data, studies and research results
- Identify the most efficient prevention and mitigation measures and analyse their conditions of success in the rail environment
- Field test some selected measures and evaluate their effectiveness
- Propose a toolkit of the most relevant and cost-effective measures and recommendations at European level both to reduce the occurrence of incidents as well as to manage incidents.



### PROJECT RESULTS:

The final result of this project is the RESTRAIL toolbox available to decision makers. It is a free tool which helps save lives along the railways. It summarises the practical information collected and produced during the project (guidelines, best practice and empirical evidence for effectiveness of measures). It is available online and as a short practical guide:

- The online Toolbox, implemented and hosted by UIC, helps railway undertakings (RUs), infrastructure managers (IMs), station managers and other concerned decision makers in three ways:
  - lead them through the process of selecting from the range of measures,
  - provide detailed guidance on the implementation of those measures,
  - provide a framework for collecting and structuring information in order to feed an accessible and documented database on measures across the rail community and beyond.
- The RESTRAIL practical guide is a guidance paper on how to prevent suicide and trespass on the railways and mitigate the consequences.

*The role of the UIC Security Division within the project was to ensure the overall coordination of the project*



## RAILWAY SECURITY IN THE FACE OF THREATS

### SECRET:

**SECurity of Railways against Electromagnetic aTtacks**



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 285136

**WEBSITE:**  
[www.secret-project.eu](http://www.secret-project.eu)

**DURATION OF THE PROJECT:**  
01/08/2012 - 31/07/2015

**CONTACT:**  
José Pires, [pires@uic.org](mailto:pires@uic.org)

### PROJECT OBJECTIVES:

- Identify the vulnerability points at different levels (from the electronic to the systemic vision)
- Identify electromagnetic (EM) attack scenarios and risk assessment (service degradation, potential accidents, economic impacts...)
- Identify public equipment which can be used to generate EM attacks
- Develop protection rules to strengthen the infrastructure (from an electronic, architecture and systemic point of view)
- Develop EM attack detection devices and processes
- Develop resilient architecture able to adequately react in case of EM attack detection
- Extract recommendations to ensure resilience and contribute to standards



### PROJECT RESULTS:

The expected results are to support the interoperability of the European Railway network and to provide the EM robustness and resilience for Global System for Mobile Communications for Railways (GSM-R) and European Train Control System (ETCS) and improve the harmonisation of the European network. The results of this project will be a broken down form of technical recommendations that will be presented to the European standardisation bodies.



*The role of the UIC Security Division is to contribute to the railway requirements. It is also to disseminate the project results and recommendations to UIC members*

### TETRIS:

**Terrorists in Europe Targeting Railway Infrastructures**

This project has received funding from the European Commission DG Home's CIPS programme

**DURATION OF THE PROJECT:**  
01/07/2014 - 30/06/2016

**CONTACT:**  
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### PROJECT DESCRIPTION:

TETRIS supports member States in their counter-terrorism strategies by developing tools allowing for a better understanding of the terrorist threats targeting railway systems and training those involved in managing the consequences of an attack. The development of different types of terrorist groups, focusing on their operational techniques, capabilities and motivations for attacking railway systems, and the identification of typical scenarios of attacks will allow the project team to analyse the target selection process of terrorists operating in Europe. Then, during an exercise, the end-users will be immersed in a crisis management during which the tools provided by the project will enable them to visualise the consequences of a terrorist attack and take decisions to mitigate the crisis with the support of a role-play tool.

### PROJECT RESULTS:

The expected result is the production of three readily available and operational deliverables: a threat assessment tool (analysis grid) and related scenarios of potential attacks; a simulation of the consequences of an attack based on a scenario chosen by end-users and developed by a 3D simulation tool. Finally, the project will develop and conduct a role-play crisis management exercise. Building on the lessons learned, the project will deliver a user-manual for future exercises.

*The role of the UIC security division is to contribute to identifying scenarios and disseminating the results*

## SECURITY BEYOND THE RAILWAYS

### PREDICT:

*PREparing for the Domino effect in crisis situation*



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 607697.

#### WEBSITE:

[www.predict-project.eu](http://www.predict-project.eu)

#### DURATION OF THE PROJECT:

01/04/2014 - 31/03/2017

#### CONTACT:

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José Pires, [pires@uic.org](mailto:pires@uic.org)

### PROJECT RESULTS:

The expected results are to deliver software tools bundled in the PREDICT Incident Evolution Tool, which will consist of two core components: a Foresight and Prediction Tool (for simulation of the evolution of cascading effects and impact on multi-sectoral dependencies) and a Decision-Support Tool (for determining the best course of action and to calculate the risk associated with them).

The high-quality of the developed solutions will also be ensured by the strong involvement of end-users (UIC security division in the rail sector) in the project. End-users will intervene on three levels: as partners of the consortium, as members of the Advisory Board, and representatives from relevant organisations across Europe invited to regular workshops.



*The role of the UIC security division is to act as an end-user representing the railway sector and to be involved in the description of a rail scenario, the definition of rail requirements and the dissemination of the results*

### PROJECT DESCRIPTION:

The PREDICT project started from an in-depth analysis of recent cases (over 8500 incidents worldwide), which will be accompanied by scenarios of potential crisis. Project partners will set up a generic approach (common framework) to prevent or mitigate cascading effects which will be applied in selected cases agreed with end-users. As modelling each phenomenon separately in a specific environment is not effective, the PREDICT project will propose cohesive and comprehensive models of dependencies, cascading effects and common mode failure which will include causal relations, multi-sectoral infrastructure elements and environment parameters, as well as the human factor aspects.

### CIPRNet:

*Critical Infrastructure Preparedness and Resilience Research Network*



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 312450

#### WEBSITE:

[www.ciprnet.eu](http://www.ciprnet.eu)

#### DURATION OF THE PROJECT:

01/03/2013 - 28/02/2017

#### CONTACT:

José Pires, [pires@uic.org](mailto:pires@uic.org)

### PROJECT OBJECTIVES:

The objectives are to implement new capabilities for supporting more effective responses to disasters that affect or originate from multiple Critical Infrastructures (CI). In particular, create added-value decision-support capabilities for national and multi-nation emergency management and CI owners based upon integrating technologies available at CIPRNet partners. Also to support the secure design of Next Generation Infrastructures, demonstrate timely, actionable, risk-informed Critical Infrastructures Protection (CIP) analyses and strategies for authorities (both nationally, cross-border, and EU-wide) and CI owners.



### PROJECT RESULTS:

The expected results will reinforce and extend the existing cooperation and integration of the CIPRNet core partners and will turn it into a long-lasting integration.

The CIPRNet consortium represents experiences with over sixty CIP-related research projects from all of the major EU funding lines. This constitutes an unprecedented assembly of excellence and top expert knowledge in the CIP research area.

*The role of the UIC Security Division is to be an end-user in the railway infrastructure sector. Additionally, UIC will actively contribute to dissemination activities among its members, within CIPRNet, and more. UIC will also add end-user perspectives from the railway transport domain to the joint research activities, the Virtual Centre of Competence and expertise in CIP (VCCC), and the definition of realistic scenarios. UIC will host one of the CIPRNet workshops with end-users*

## GRAFFOLUTION:

**Awareness and Prevention  
Solutions against Graffiti  
Vandalism in Public Areas and  
Transport**



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 608152

### WEBSITE:

[www.graffolution.eu](http://www.graffolution.eu)

### DURATION OF THE PROJECT:

01/03/2014 - 29/02/2016

### CONTACT:

José Pires, [pires@uic.org](mailto:pires@uic.org)

## PROJECT OBJECTIVES:

Graffolution aims to contribute to counteracting the increase of graffiti vandalism focusing on smart awareness and prevention solutions for all affected stakeholder groups summarised on an innovative web based platform.

This project will lead to elementary research results and joint approaches integrating all interest groups to reduce illegal graffiti in Europe with a strong pioneering nature in a global context. The created web platform will serve as a central body against graffiti vandalism for all experts, stakeholders and citizens being expandable with future data, apps and effective solutions that support artistic expression while preserving public and private property and safety.

## PROJECT RESULTS:

- provide an extensive “Collaborative Knowledge Base” empowering city administrations, public transport services and law enforcement agencies to share statistics, knowledge, good practices and prevention strategies using intuitive modules and cooperation features.
- additionally, the Graffolution platform will contain an interactive “Open Information Hub”, addressing local communities, citizens and sprayers to strengthen public awareness and enforce the prevention of illegal spraying activities, using effectual tools and visuals. Through the integration of social media features and channels young people and especially the sprayer community will be reached.



**The role  
of the UIC Security Division is  
to contribute to collecting information on the  
European railways graffiti prevention initiatives and  
best practices, the demonstration activities, the end  
users' needs and expectations for the rail sector  
and the dissemination activities**

## AND LOOKING AHEAD...

- Extending RESTRAIL and taking into account level crossings
- Extending PROTECTRAIL and seeking innovative solutions to better protect rail transport in the face of future threats
- Managing human factors at border-crossings
- Enhancing security and freight: Technologies for inspecting large volumes of freight

## CONTACT

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