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Participants in the Project

Coordinated by Spanish defence company Isdefe, ten organisations from across Europe form the consortium set up for SecureStation:

1. **Ingeniería de Sistemas para la defensa de España (ISDEFE)**
   Securities and defence consultant - Spain, Project coordinator

2. **MTRS3 Solutions And Services Ltd**
   Risk management and security - Israel

3. **University of Sheffield**
   Mechanical Engineering Railway Research Group - United Kingdom

4. **Integral Consulting R&D**
   Consultancy, research, and innovation - Romania

5. **D’appolonia S.p.A.**
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   Problem solving in engineering - Switzerland

9. **Fundacion Tecnalia Research & Innovation**
   Technology / materials innovation - Spain

10. **Azienda Trasporti Milanesi**
    Milan transport operator - Italy
Structure of Design Guidelines

Layout design
- Site design
- Station design

Design and engineering
- Secured evacuation requirements
- Fire protection and smoke management as key factors for evacuation
- Physical reinforcement against blast
- Protection against CBR
- Design strategies to protect critical systems

Crossrail Bond Street, London – The site design enforces speed reduction for vehicles approaching the station and bollards are placed to create the stand-off distance.
Background

Railway stations and public transport systems have been the target of past terrorist attacks and as a public and open, but crowded environment, the threat to stations and transport systems means that security should be considered at the earliest stages of a new design or refurbishment project. The threat to the transport system is demonstrated with the attacks on London’s public transport network in 2005, the Madrid bombings of 2004 and more specific attacks targeting station environments in Mumbai Chhatrapati Shivaji Terminus, 2008; Moscow Metro Stations, Lubyanka and Park Kultury, 2010; Volgograd, 2013; and Kunming, 2014.

Design Guidelines for Station Security

In the Design Guidelines for Station Security chapter, the strategies and recommendations for the design of new stations and retrofit of existing ones are outlined. Guidance is given with respect to the types of attacks described in the Risk Identification and Mitigation chapter. The recommendations identify best practice which may be incorporated into each design stage after a cost-benefit analysis has been carried out. They are based on a wide range of existing guidelines and station standards. Additional security measures and design recommendations have also been made based on the modelling and simulation work carried out within the SecureStation project.

![Diagram showing effective design width and agglomeration point](image)

The design of the evacuation routes can help improve passenger flow while keeping the same effective width.
Risk Identification and Mitigation

The **Risk Identification and Mitigation** chapter informs the reader of the most probable categories of terrorist attacks on a station and explains the impact of their consequences. A series of potential attack scenarios are presented as examples to identify the relationship between the attack type, severity of its effects, station vulnerability and possible means of mitigation.

### Explosives and weapons
- IED
- PBIED
- VBIED
- Weapons

### Fire
- Arson
- Timed IED
- Home made petrol bomb

### Dispersion of toxic materials
- Toxic industrial chemicals
- Acid attack
- Nerve agents

### Sabotage
- Signalling systems
- Infrastructure
- Structures

### Cyber attacks
- Physical access to MCS
- Hacking into IT systems
- Diffusion of malware
- Interception of information

Scope of SecureStation Project and Design Guidelines

SecureStation is an EU 7th Framework Programme funded project with the objectives to:

- Develop a quantitative risk assessment methodology
- From modelling and simulations provide guidance for resilient design
- Develop the **Design guidelines for railway station security** comprising best practice design methodologies and considerations for secure station design, as well as the guidance developed throughout the project.

Over a period of three years, from 2011 to 2014, the SecureStation team analysed past terrorist incidents, assessed end-user requirements and conducted computational and physical simulations of the most probable attacks in stations to understand their impact. The results of these studies generated a quantitative risk assessment methodology and guidance to protect against terrorist threats.

The SecureStation key outputs are:

- **The SEST-RAM quantitative risk assessment methodology**
- **The Design guidelines for railway station security**
Introduction to the SecureStation Design Guidelines for Railway Station Security

The Design Guidelines for Railway Station Security provide guidance for anyone involved in the design or operation of stations, including infrastructure managers, transport operators, planners and architects. They lead the reader through the design process and identify the security features and best practice which should be considered at each stage, as well as the relevant stakeholders who should be involved in the security specifications.

The Design Guidelines for Railway Station Security are broken down into three main chapters:

- General Station Design Principles
- Risk Identification and Mitigation
- Design Guidelines for Station Security

King’s Cross station, London – the station concourse is a large open area which allows people to move freely or wait without causing congestion points. It is well lit and the signage is clearly legible.

General Station Design Principles

The General Station Design Principles chapter describes the general principles of station planning that need to be considered from the beginning of the design process. It identifies the key stakeholders and decision makers in the design of the station, categorises station types and users and offers an overview of the functional relationships within the station’s layout.

Amsterdam Central is an international transport hub with 91 million passengers/annum, interchange between 7 transport modes, high symbolic value.
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