



AllTrain

All-Hazard Guide for Transport Infrastructure
www.alltrain-project.eu



WP6 Report

Demonstration and Validation

The following report summarizes the results of Work Package 6 – *Application of the Guide on selected examples in different countries to give feedback to the developed Guide of the EU CIPS Project AllTrain.*



With the financial support of the Prevention, Preparedness and Consequence Management of Terrorism and other Security-related Risks Programme (CIPS)
European Commission – Directorate-General Home Affairs

Project Information

Project Duration:

01/07/2013 – 31/06/2015

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1. Introduction

The AllTrain project is funded by the European Commission – DG General Home Affairs under the *Prevention, Preparedness and Consequence Management of Terrorism and other Security-related Risks* Program (CIPS). During the two-year course of the project, several work package reports will be issued, including the present report on WP4 – Approach for Assessment.

Background & work-package structure

The project AllTrain is divided into 7 work packages:

- WP1 – State of the Art
- WP2 – Threats
- WP3 – Important Infrastructure
- WP4 – Approach for Assessment
- WP5 – All-Hazard Guide for Transport Infrastructure
- **WP6 – Demonstration & Validation**
- WP7 – Monitoring & Dissemination

Figure 1 illustrates the work-package structure of the AllTrain project.

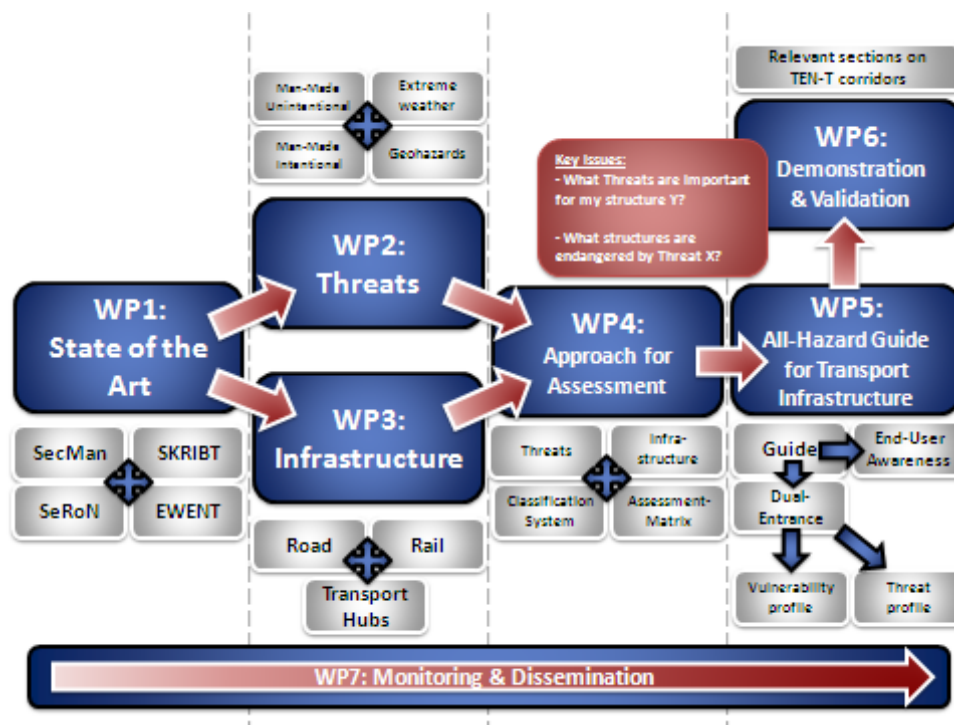


Figure 1 – Work-package structure AllTrain

- Work Package 1 identifies the state of the art regarding security research. Focus is given to already existing methodologies and approaches which could potentially be used or adapted within the AllTrain project. Work Package 2 deals with the identification of all possible hazards to transport infrastructures. These include (but are not limited to) man-made hazards (intentional and unintentional) as well as natural hazards. The outcome is a substantial list of possible hazards which are potentially relevant for transport infrastructure. Work Package 3 aims to identify and develop criteria for the identification of relevant infrastructure types and sub-types that can play a role in terms of susceptibility to different hazards. Work Package 4 develops a methodological approach for the assessment of hazards and assets, combining the information of the previous work packages. Work Package 5 aims to develop a practicable and user-friendly all-hazard guide for transport infrastructure, which is demonstrated and validated in Work Package 6. Work Package 7 deals with the dissemination and management activities within the project.

2. Validation Sheets

Validation Sheet No. 1

Asset type: Bridge

Section type: Road

Picture/scratch:



Description/ Technical Details:

- (Highway-) Bridge across the Elbe marschland located in Hamburg, Germany
- Crossing roads and river
- T-beam bridge, concrete
- Construction year 1974, will be restructured 2016
- 4258 m length
- Longest span 35m

Structural factors:

- Neither cable-stayed nor suspension bridge
- Alignment crosses Valley/Gully
- Ballasted track
- Explosion can reach pillars/super-structure or catenary
- Poor structural condition
- Long span (longer than 10 m)
- Steel or composite materials used

Environmental Factors:

Disposition criteria

- Flood-endangered area
- High groundwater level
- Trees in the nearby area
- Snow or ice coverage

Triggering events

- Extreme snowfalls
- Frost-thaw cycles
- Icing

Resulting hazard list:

Meteorological Hazards:

- Extreme Snowfall
- Icing
- Fog
- Hail

- Extreme high temperatures
- Extreme low temperatures

Geophysical Hazards:

- Soil liquefaction

Man-Made

- Blockade
- Expulsion
- Fire
- Sabotage
- Ramming

Validation Sheet No. 02

Asset type: Cut

Section type: Road

Picture/scratch:



Description/ Technical Details:

- Cut in an important highway of the external ring of Lisbon

Structural factors:

- Drainage system non-existent
- Slope height superior to 50 m
- Slope face degree: 45°

Environmental Factors:

Disposition criteria

- Difficult geotechnical conditions (soft soil)
- Seismic zone
- Superficial water level
- Intense rain period

Triggering events

- Intense rain period
- Human misusage of land

Resulting hazard list:

Extreme rainfall
Ground deformation;
Soil liquefaction;
Rock fall
Rock collapse
Cliff fall
Explosion
Sabotage