

AllTrain – NEWSLETTER

No. 3 (January 2015)



Dear Sir or Madam

The AllTrain consortium would like to inform you about the results of the first AllTrain (“All-Hazard-Guide for Transport Infrastructure”) Workshop (www.alltrain-project.eu), which has taken place on the 23rd of October in Bonn, Germany.

THE PROJECT

The project AllTrain – being 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) - aims to contribute to the development of a secure, effective and functional transport network across Europe by identifying and assessing all possible threats to transport infrastructures. By considering road and rail structures, as well as multi-modal transport hubs, the project accounts for the interconnectiveness of transport across Europe. Furthermore, the final assessment of transport infrastructure regarding various threats will be compiled into a guide for owners and operators of transport networks in order to enable them to obtain information on which of their infrastructures might potentially be susceptible to a specific threat and which specific threat might potentially have the largest impact on their structures.



1ST ALLTRAIN WORKSHOP – REVIEW

The first AllTrain-Workshop was held on the **23rd of October 2014** in **Bonn**, Germany.

22 security and risk experts as well as infrastructure owners and operators discussed the first project results with the project consortium members.

Hazard identification and infrastructure vulnerability

Besides a general introduction to the project itself, presentations were given on the topics “hazard identification” (Czech Transport Research Center CDV) as well as “Infrastructure criteria and threat vulnerability” (CENOR Consulting Engineers). CDV presented the hazard catalogue being developed within the project and gave examples of major events causing severe damage to infrastructure. Since the project AllTrain aims at the identification of all possible hazards to transport infrastructure (road and rail) natural (such as events resulting from extreme weather) and man-made hazards (such as criminal or terrorist acts) were presented. The project distinguishes between *an initial event* (top level hazard event) and a respective *local phenomenon* (lower level hazard event) which acts on the infrastructure itself (an example would be extreme rainfall as *initial event* and flooding as *local phenomenon* at a given road or rail infrastructure).

In the discussion round the participants discussed also the relevance of different hazards not being in the scope of AllTrain such as permafrost and alpine tsunamis being hazards linked to specific European regions (Alps) and further hazards related to creeping or cascading effects.

Further on, CENOR presented on infrastructure categories that might influence the vulnerability of a specific infrastructure towards a specific hazard. The project considers tunnels, bridges, cuts and embankments as main road and rail infrastructures. The vulnerability of each of them is influenced by structural (design specifications of the infrastructure itself), natural (external environment where the infrastructure is built) or traffic factors (type of traffic or volume). For example, for an infrastructure being constructed on a specific soil type the effects of a potential flooding scenario might cause landslides leading to high damage and out-of-service times at the infrastructure site. Important infrastructure criteria being considered in AllTrain are, for example, construction type, cross-section or geological, geotechnical foundation conditions (for tunnels) or system, material and crossing characteristics (for bridges).

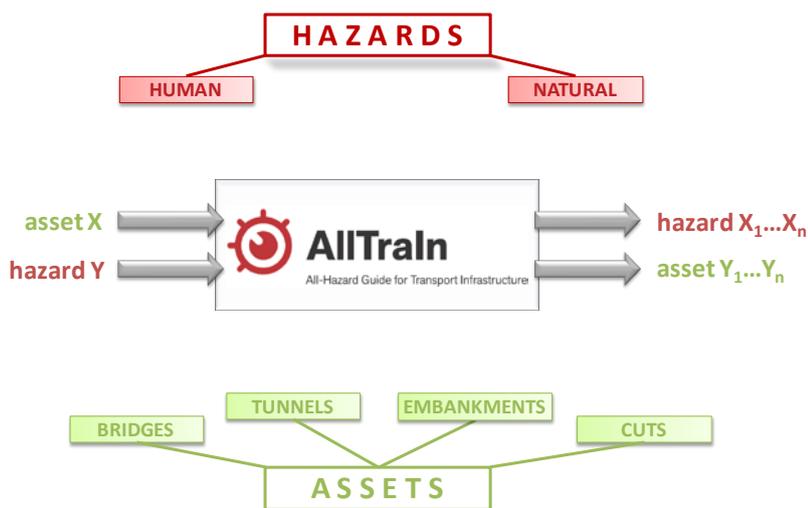
For the special case of railway systems, it was discussed whether centralized power or control stations do have to be addressed separately since they are the most sensitive and vulnerable parts for the operation of whole networks. In case of road transport, especially tunnel or traffic control centres do fulfill functions that could interfere with the operation of whole networks.

The presentation of CENOR was followed by a statement from two Portuguese infrastructure owners representing the road and railway sectors. Both addressed and highlighted hazards they already experienced in their networks and gave examples for the real impacts on the infrastructure and traffic flow.

Assessment methodology

The larger part of the workshop was dedicated to the presentation and discussion of the assessment methodology used in AllTrain to assess combinations of infrastructure and hazards. The assessment approach should present opportunities for the user (owner or operator of a transport infrastructure)

- a) to either enter the assessment with a specific asset for which he wants to identify what kind of hazards are relevant, or
- b) to enter with a specific hazard for which he wants to identify the vulnerable assets in his network.



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ILF presented the working mechanism of the assessment methodology based on so called hazard trees (being a combination of event and fault trees without assigned probabilities). These hazard trees include all relevant information for the assessment structured according to a specific hazard (such as flooding, landslide, explosion, fire, etc.). They contain information on the environmental factors necessary for a hazard to occur (such as slope, soft rock conditions, gully and water for debris flow/landslide, etc.) as well as information on relevant asset factors as described above influencing the vulnerability of an asset towards a specific hazard. In addition to this, the hazard trees give information on the potential local impacts to the infrastructure in terms of out-of-service times expected due to a specific hazard event acting on a specific type and the specific properties of an infrastructure object in a given setting.



Discussion

The presentations were followed by a discussion part addressing questions such as the completeness of hazards and infrastructures considered, the level of detail of infrastructure categorization and the applicability/usability, and the generated output.

A question was raised to what degree multi-hazards and the combination of events as occurring typically in real situations can be addressed by the AllTrain approach. Given the separation into single hazards, the AllTrain assessment methodology is not able to cover combinations of events due to the high complexity of sequence chains for events causing each other and the general limits to cover this in a theoretical framework. Also, the magnitude of impacts can be influenced by a parallel occurrence of events because the “damage function” is not linear (two events at the same time can cause multiple damage than both events occurring in separation).

Another discussion point addressed the question if frequencies in relation to the occurrence of events would be beneficial for the assessment methodology in terms of risk prioritization. Also, it was asked whether detailed scenarios would improve the accuracy and relevance of the results. Responding to this view, it was stated that the AllTrain project does not aim at a quantification of single events and their likelihood of occurrence. Rather, the central aim is to provide a starting point for an owner or operator to consider a specific hazard which can then be followed by a detailed quantitative risk analysis. Furthermore, for an All-Hazard Guide which should cover all possible hazards and infrastructure in Europe, it is simply not possible to work with quantifications since very detailed knowledge on the region, infrastructure conditions and hazard statistics would be needed in order to apply the methodology in practice. This is also the reason that only potential consequences and not expected ones are considered while the term “risk” is avoided overall.

The workshop closed with a presentation of BAST on the planned structure of the All-Hazard Guide which will contain information on hazards, infrastructure factors relevant for the determination of vulnerability and a detailed and step-by-step application of the AllTrain assessment methodology including a software demonstration. Besides this, also strategies for measure implementation will be addressed on a more global level.

More information on the workshop/slides can be found on the website www.alltrain-project.eu.

Outlook – 2nd Workshop

The 2nd AllTrain Workshop will take place in mid-2015 and will present the final results of the project including the All-Hazard Guide. More information on time and venue will be provided in Spring 2015.



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

For more information (reports, activities, etc.) please visit our project website under www.alltrain-project.eu.

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With kind regards
The AllTrain Consortium



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CDV
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