

Research Thrust: High-Speed Rail (HSR)

Project 1: Development of Tools for HSR Lifecycle Cost Estimation for Track Design and Maintenance (LCC)

Duration: (November 2007 – October 2010)

Description: The implementation of HSR networks involves a large amount of financial support imposing, at the conception and design stage, a complete and rigorous estimation of the total costs involved in the lifecycle of the system. Using appropriated tools for HSR lifecycle costs (LCC) estimation, it is possible to minimize the final cost and, at the same time, to identify the most important aspects, and parameters, that influence the cost evaluation. However, so far the reduced practical experience available on the long-term behaviour of high-speed railway infrastructure (and no experience at very high speeds up to 350 km/h) makes it difficult to accurately estimate the efficiency of a given design or maintenance strategy. Research is required not only on LCC modeling but also particularly on the estimation of major degradation factors and on the assessment of its impact on maintenance needs. This project will address these questions by developing improved performance indicators and a Maintenance Management System for future high-speed railway, which together with a new LCC tool should contribute to the increase of HSR efficiency.

Objectives/Deliverables: The project is organized around the following specific objectives:

- * Performing a complete analysis and a benchmark of existing European LCC models and tools, and assessing the potential of RAMS (reliability, availability, maintainability and safety) analysis for railway infrastructure
- * Defining infrastructure performance indicators that would be able to better characterize the quality of the railway system from the structural safety, track safety and comfort point of views
- * Developing a Maintenance Management System adapted to HSR and integrating the necessary information from track state, from behaviour models for the life cycle, and from the organization as an active part of the process
- * Assessing the impact on LCC of different design and maintenance strategies for high-speed and very high-speed lines in different operational scenarios

Industry Involvement: The experience and expertise of railway engineering and management organizations will be sought in all project phases.

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Financial Resources: TBD

