



MAINLINE

MAINTenance, renewal and Improvement of rail transport iNfrastructure
to reduce Economic and environmental impacts

Collaborative project (Small or medium-scale focused research project)

Theme SST.2011.5.2-6.: Cost-effective improvement of rail transport infrastructure

Deliverable D8.1: First report on Advisory Committee recommendations

Grant Agreement number: 285121

SST.2011.5.2-6.

Start date of project: 1 October 2011

Duration: 36 months

Lead beneficiary of this deliverable:

Participant short name

Due date of deliverable: 30/09/2012

Actual submission date: 31/05/2013

Release:

Final

Project co-funded by the European Commission within the 7th Framework Programme		
Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Abstract of the MAINLINE Project

Growth in demand for rail transportation across Europe is predicted to continue. Much of this growth will have to be accommodated on existing lines that contain old infrastructure. This demand will increase both the rate of deterioration of these elderly assets and the need for shorter line closures for maintenance or renewal interventions. The impact of these interventions must be minimized and will also need to take into account the need for lower economic and environmental impacts. New interventions will need to be developed along with additional tools to inform decision makers about the economic and environmental consequences of different intervention options being considered.

MAINLINE proposes to address all these issues through a series of linked work packages that will target at least €300m per year savings across Europe with a reduced environmental footprint in terms of embodied carbon and other environmental benefits. It will:

- Apply new technologies to extend the life of elderly infrastructure
- Improve degradation and structural models to develop more realistic life cycle cost and safety models
- Investigate new construction methods for the replacement of obsolete infrastructure
- Investigate monitoring techniques to complement or replace existing examination techniques
- Develop management tools to assess whole life environmental and economic impact.

The consortium includes leading railways, contractors, consultants and researchers from across Europe, including from both Eastern Europe and the emerging economies. Partners also bring experience on approaches used in other industry sectors which have relevance to the rail sector. Project benefits will come from keeping existing infrastructure in service through the application of technologies and interventions based on life cycle considerations. Although MAINLINE will focus on certain asset types, the management tools developed will be applicable across a broader asset base.

Partners in the MAINLINE Project

UIC, FR; Network Rail Infrastructure Limited, UK; COWI, DK; SKM, UK; University of Surrey, UK; TWI, UK; University of Minho, PT; Luleå tekniska universitet, SE; DB Netz AG, DE; MÁV Magyar Államvasutak Zrt, HU; Universitat Politècnica de Catalunya, ES; Graz University of Technology, AT; TCDD, TR; Damill AB, SE; COMSA EMTE, ES; Trafikverket, SE; SETRA, FR; ARTTIC, FR; Skanska a.s., CZ.

WP 8 in the MAINLINE Project

D8.1 is the first deliverable in WP8.

The main objectives for WP8 are:

- To ensure governance and coordination at project level and the achievement of the project objectives. Make sure that project results can successfully be implemented into guidelines for Infrastructure Managers (IMs).
- To select the members of the advisory committee, coordinate their action and organize their participation in key meetings.
- To assure the liaison with other projects, e.g. SMARTRAIL.

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Glossary

Abbreviation / acronym	Description
AC	Advisory Committee
EB	Executive Board
IM(s)	Infrastructure manager(s)
PoSE	UIC Panel of Structural Experts
TEG	UIC Track Experts Group
WP	Work Package

1. Executive Summary

Deliverable 8.1 is the first deliverable of Work Package 8 (WP8) “Scientific and Technical Coordination” in MAINLINE. It is especially linked to the Task 8.2 “Technical Advisory Committee”, with the aim to set up an Advisory Committee (AC), whose recommendations for the project would be summed up in two deliverables: D8.1 in M12 and D8.3 (Second report on AC recommendations) in M24.

This report gives the recommendations from the Advisory Committee after its first a meeting in Paris on May 14-15, 2013, in connection with a common seminar of MAINLINE and the parallel project SMARTRAIL.

The main points in the comments may be summarised as:

- It is valuable to have a cooperation between MAINLINE and SMARTRAIL. Try to coordinate work in the cases where similar questions are studied.
- Some specific points were given for consideration in the different work packages. The focus on climate change could be increased.
- Dissemination is very important. Present case studies and compare what is going on in other projects. Consider how the work can be exploited by industry and other stakeholders. Organise workshops, conferences and short courses. Try to evaluate possible impact on codes and standards.

2. Acknowledgments

This present report has been prepared within Work Package WP8 of the MAINLINE project by the Task leader UIC based on the contributions from the following AC members:

- Rosemarie Helmerich, BAM (Federal Institute for Materials Research and Testing, Germany)
- Livia Pardi, Autostrade, the Italian national system of motorways
- Kenneth Gavin, University College Dublin
- Paul Godart, INFRABEL, the Belgian Railway Infrastructure Manager
- Patrice Schmitt and Suzhe Yang, SNCF, the French Railway Infrastructure Manager.

3. Introduction

The background of having an Advisory Committee was to look at MAINLINE with a new perspective.

At the beginning of the project, the following persons were identified as AC members:

- Rosemarie Helmerich, BAM (Federal Institute for Materials Research and Testing, Berlin, Germany). She is a specialist in measuring technique.
- Livia Pardi, Autostrade per l'Italia (the Italian national system of toll motorway construction and management). She has a long experience in European cooperation regarding transport issues.
- Kenneth Gavin, University College Dublin, is a Lecturer in geotechnical engineering and the Coordinator of SMARTRAIL project.
- Paul Godart, INFRABEL, the Belgian Railway Infrastructure Manager. He is also the Chairman of the UIC Track Expert Group (TEG).
- Patrice Schmitt, SNCF, the French Railway Infrastructure Manager. He is also a member in the UIC Panel of Structural Experts (POSE).

With their expertise, the comments from the Advisory Committee are of great importance for MAINLINE.

The Advisory Committee met for the first time on May 15, 2013, at UIC in Paris, in connection with a common seminar of MAINLINE and the parallel project SMARTRAIL during May 14-15, 2013.

During the meeting, the present members presented their views. They have afterwards also given some written comments. Those are given in the next sections. During the meeting, we also discussed which deliverables would be especially interesting for the members to read and review. This is also indicated in the following sections.

4. Recommendations from Rosemarie Helmerich, BAM

4.1 First recommendations given by Rosemarie Helmerich during the EB-AC meeting

During the EB-AC meeting on May, 15th 2013, Rosemarie Helmerich gave a presentation based on a Powerpoint detailing her recommendations and setting a basis for discussion.

Her observations regarding the project were the following:

- It was a good start to cooperate between SMARTRAIL and MAINLINE
- MAINLINE is a successful extension of Sustainable Bridges and other projects related to earthwork, track, tunnels, assets.

She also made a few proposals with the objective of making the role of the AC more visible, e.g. on MAINLINE collaborative Website:

- Add a dedicated directory in the Extranet for contact and tasks to the AC
- Prepare a contact list with the list of roles of the AC
- Prepare a list of deliverables to be reviewed
- This review should take place 30 days before the deadline for submission (D-30)
- Successful on-going work according to the schedule, sometimes there are delays due to questionnaires but it is normal for a big project.

4.2 Further recommendations from Rosemarie Helmerich

According to Rosemarie Helmerich, it would be good to incorporate other project partners to obtain data or product information from other EU-countries instead of having deliverables about methods based on one country's information, for example:

- Products for case studies: Work with CFRP-materials from other producers free accessible on the market (e.g. compare the use of near surface mounted reinforcement CFRP (rods) with square cross section with those having a rectangular or round cross section regarding their advantages/disadvantages (only one saw-cut groove instead of cutting two slits with two saws), optimum use of material)
- Slope calculation: Try to find other rules for the further developed rules for slopes (UK: SSHI and RSHI) and eventually adapt the further developed calculation during a case study in a second European country.

She also proposed to establish measures to evaluate overlap between SMARTRAIL and MAINLINE: e.g. Whole life cycle analysis, probabilistic methods, assessment modelling, β -index

It would be interesting to:

- Prepare a joint strategy/exemplary report: e.g. a case studies report about Nieporet bridge and a Swedish steel bridge testing with 2 analyses that would then be compared
- Increase disseminations, e.g. including Joint publications.

There should be a better visibility of a new approach as output:

- Emphasize new tools on the website or with press releases
- Emphasize European-wide applicable new results.

The comment from Jens S. Jensen (EB member) during the Advisory Board meeting should be followed: it is better to solve a simple problem or a list of single issues than making the problem more general and not everywhere applicable.

5. Recommendations from Livia Pardi, Autostrade

Livia Pardi was not present at the first AC meeting but sent a report describing the following recommendations for MAINLINE in the form of the following actions to be taken:

- Have overviews of existing practice or proposals of new methods, but results from the project should be organised, where possible, in the form of guidelines or “handbooks” to be used in daily practice.
- Offer solutions for real problems.
- Show applicability to real cases.
- Offer a set of case studies approached with the proposed methods, algorithms and new tools. This should be done also in workshop/conferences.
- Compare project’s results with those of other running projects useful to update the proposed methods and algorithms and dissemination (question: where is Europe going?).
- Evaluate possible impact on standards.
- Dissemination: present results at workshops and/or conference.
- Organise short courses for practitioners or short courses/lessons for students.
- Evaluate the possibility of giving short presentations to individual railways owners. Promote results to individual railways owners (dedicated presentations with customised examples of application).
- Increase dissemination towards stakeholders and railways owners.

6. Recommendations from Kenneth Gavin, University College Dublin

Following his participation to the first AC meeting and the whole MAINLINE and SMARTRAIL Workshop, Kenneth Gavin gave the following observations and recommendations:

- Future dissemination activities should concentrate on provision of solutions to the Infrastructure Managers from Railway companies and concentrate less on the administrative aspects of the project or specific deliverables. MAINLINE partners should consider how the work could be exploited by industry.
- He considered that there was relatively little focus on the effects of climate change in many of the WPs.
- Close liaison with SMARTRAIL in the area of Whole Life Cycle Analysis and work towards a unified industry model would be very welcome.
- A workshop (or a number of workshops) on degradation models for common elements of infrastructure, bridges, slopes etc. could be considered.
- Liaison between MAINLINE and the COST Action TU1202 “Impact of climate change on engineered slopes for infrastructure” should be encouraged in the context of understanding the state of the art on risk assessment of slopes in response to climate change (http://www.cost.eu/domains_actions/tud/Actions/TU1202).

7. Recommendations from Paul Godart, INFRABEL

The recommendations from Paul Godart, following his participation in the first AC meeting and the MAINLINE and SMARTRAIL Workshop, are listed below:

- In several presentations during the workshop, the responsible mentioned that few answers to the questionnaire sent had been received: he suggested that these kinds of questionnaires are sent to Infrastructure managers (IMs) through the UIC Panel of Structural Experts (PoSE) and UIC Track Experts Group (TEG) where a lot of IMs are represented;
- MAINLINE focuses mostly on civil engineering structures but also for a small part on the track: it is suggested to give some more importance on deliverables dealing with track;
- In WP1 “Benchmark of new technologies to extend life of elderly rail infrastructure”, little new technologies for reinforcement and/or repairing are mentioned, should it not be interesting to try to enlarge this aspect ?
- As for other European projects, it is of the greatest importance to organise the dissemination of the information and to look if it can be possible to edit guidelines/best practices documents that can be used by the IMs and the contractors, engineering offices.

Concerning the review of deliverables, Paul Godart proposed during the AC meeting to follow those of WP3 “New construction methods”.

8. Recommendations from Patrice Schmitt and Suzhe Yang, SNCF

Suzhe Yang represented Patrice Schmitt during the AC meeting since he could not be present. It was decided during the meeting that Patrice Schmitt would follow the deliverables of WP1 and WP4. Therefore the recommendations listed below are focused on those Work Packages.

In general, all the deliverables should be sent to the AC members before the communication or the teleconferences in order to leave the time for the AC members to read and give their comments or recommendations. According to the meeting of 15 May in Paris, the AC members from companies are not enough to give their comments. To let the project more feasible and more useful, more railways companies should be requested.

Regarding the project, the work carried out in WP1 is very interesting and also follows the schedule. One benchmark of new technologies to extend life of old infrastructures has been done. Different assessment methods, monitoring methods and repair and strengthening methods have been described for the different infrastructures. The methods of repair and strengthening may give guidance or advice for the engineer to improve or ameliorate their projects. But the difficulty of the assessment methods and monitoring methods is how to increase the confidence of results for the engineers. For example, the method of Bayesian is one efficient method for updating the material properties or calibrating analytical and numerical model. However, it is indispensable to have much data of different structures to increase the confidence of the results. The most important task of this part is to communicate with infrastructures managers as much as possible. It would be interesting to work together with WP3 of SMARTRAIL.

Effectively, nowadays more and more new monitoring techniques emerge, which have different advantages and shortcomings. The WP4 reviewed each of the M&E techniques and summarised their different capabilities and their applications. It is very interesting and useful for the engineers of maintenance. But is it possible to replace the manual or visual inspection completely? The members of the project have to reflect about how to have the repeatable and validated data with the new technique. We certainly need sufficient information about all the assets concerned. Also, there is the risk to have a huge amount of data to treat for certain assets. To develop one similar degradation model for the different assets is one excellent idea but with so many difficulties because of different pathologies of different assets. The project members should think about how to validate it and how to persuade the engineers to use it. To solve this problem, the gap between the researchers and the engineers should be reduced. WP4 can have some overlap with WP1 of SMARTRAIL.

9. Conclusions and actions

Below follows a summary of some of the main comments from the members of the Advisory Committee:

- It is valuable to have a cooperation between MAINLINE and SMARTRAIL. Try to coordinate work in the cases where similar questions are studied.
- Try to work more with track issues and emphasize new methods for reinforcing and repairing of structures.
- When can manual or visual inspections be substituted by automatic monitoring?
- Try to give examples of procedures not only from one country but compare what is done in different countries.
- Dissemination is very important. Emphasise new tools, European-wide applicability and Practical Guidelines to real problems. Try to be as specific as possible, give advice on relevant direct problems in a concrete way and avoid general superficial discussions. Present case studies and compare what is going on in other projects. Consider how the work can be exploited by industry and other stakeholders.
- Organise workshops, conferences and short courses
- Try to evaluate possible impact on codes and standards
- The focus on climate change could be increased in some of the work packages, for example regarding slope stability
- Improve the administrative support for the Advisory Committee.

The Executive Board agreed with most of the suggestions and will try to implement the ones which are not already being taken care of.