

## PARTNERS

The 19 partners of MAINLINE have been chosen to bring a mix of competencies and experiences into the consortium as well as to ensure a suitable geographical coverage across Europe (11 countries are represented):

### INFRASTRUCTURE MANAGERS:

- » The International Union of Railways (UIC), France;
- » Network Rail Infrastructure Limited, United Kingdom;
- » Deutsche Bahn, Germany;
- » MÁV Magyar Államvasutak, Hungary;
- » TCDD, Turkey;
- » TRAFIKVERKET, Sweden

### INDUSTRY PARTNERS:

- » COWI, Denmark;
- » TWI, United Kingdom;
- » COMSA, Spain;
- » SKANSKA, Czech Republic;
- » Sinclair Knight Merz (SKM), United Kingdom

### UNIVERSITIES:

- » University of Surrey, United Kingdom;
- » University of Minho, Portugal;
- » University of Luleå, Sweden;
- » Polytechnic University of Catalonia, Spain;
- » Graz University of Technology, Austria



### SMEs:

- » ARTTIC, France;
- » DAMILL, Sweden

### A GOVERNMENTAL ORGANISATION:

- » SETRA, France

## CONTACTS

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**MAINLINE Website:**

<http://www.mainline-project.eu/>

### MAINLINE ON-GOING FOR 2 YEARS!

The MAINLINE project, launched on 1<sup>st</sup> October 2011, is now entering its third and final year already. The first 18 months have been concentrated on data gathering and analysis in order to give input to the project final result: a Life Cycle Assessment Tool (LCAT).

During the first 18-month period, **11 technical deliverables** have been prepared. They are all available on the **Results section of MAINLINE Public Website**, you are invited to read them.

In September 2013 an Extended Executive Board meeting gathering more than half of the partners took place at TWI in Abington, near Cambridge, UK (see picture below). The partners exchanged on the latest developments of the project and discussed future dissemination activities.

Please note that MAINLINE plans to organise the following events in 2014:

- A **workshop next to UIC PoSE/TEG meeting** (Panel of Structural Experts and Track Expert Group of the International Union of Railways) presenting the methods regarding **life extension and replacement** of elderly infrastructure as well as the **Life Cycle Assessment Tool** (WP1/3/5), on **29 January 2014 in Paris**
- A **workshop in May 2014 in Budapest**, aiming at transferring the project results to **Central and Eastern European countries**
- A **training session** explaining the **Life Cycle Assessment Tool**, planned around **June 2014** (date and place to be determined)
- A **final workshop** presenting all results from the project around **September 2014 in Paris**.



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**WP1 – Life Extension**  
**Application of new technologies to elderly infrastructure**

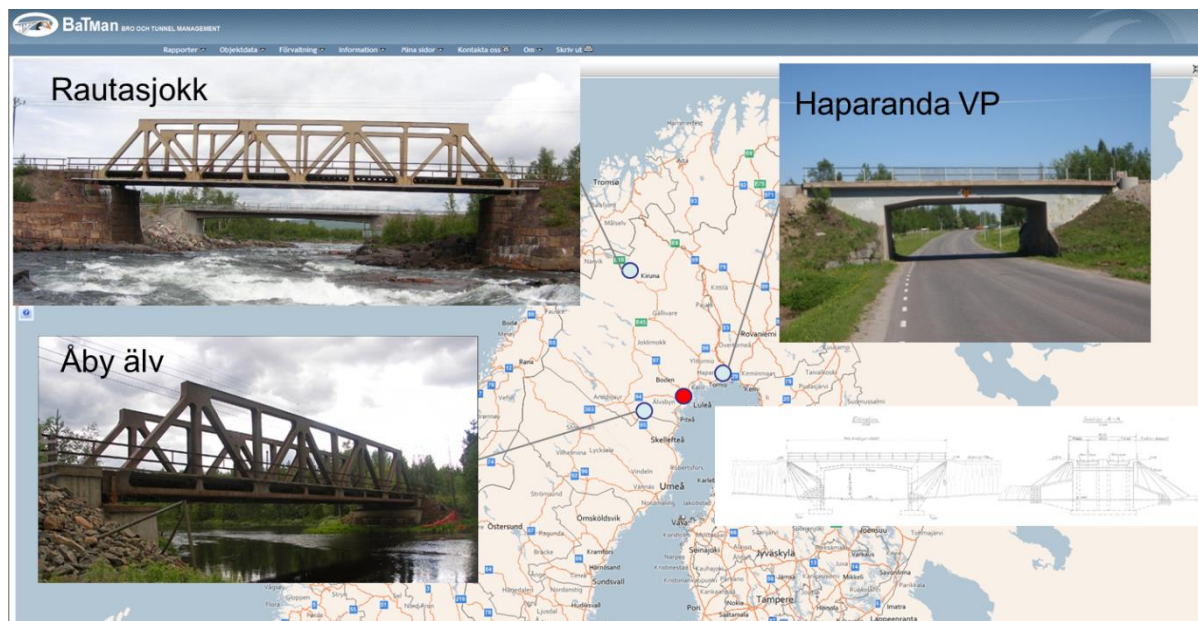
Work in the exploration and evaluation of new technologies to extend life length has been performed, which resulted in the production of the report D1.1 “Benchmark of new technologies to extend the life of elderly rail infrastructure”.

The second report D1.2 “Assessment methods for elderly rail infrastructure” has just been finished and published on MAINLINE website.

Work is on-going in the development of new technologies to extend life, that will result in the report D1.3 “New technologies to extend the life of elderly infrastructure”.

Work has also started on the outcome of the WP: the production of a guideline for the application of those new technologies that can be used by infrastructure owners and their consultants and contractors, in the form of deliverable D1.4 “Guideline for application of new technologies to extend life of elderly rail infrastructure”.

Meanwhile, three bridges located in Sweden are being tested: one trough bridge and two metal truss bridges. For the Åby bridge an analysis and test to failure has already been performed after the bridge was moved to be replaced.



**WP2 – Degradation and structural models**  
**to develop realistic life cycle cost and safety models**

The first task of WP2 has been completed with the definition of damage and deterioration scenarios for selected asset types, integrated in the report D2.1 “Degradation and performance specification for selected assets”. The selected assets were: cuttings, metallic bridges, tunnels, plain line and switches & crossings, retaining walls.

Work has also been performed on a review of available damage and deterioration phenomena and the implications of intervention strategies, summed up in D2.2 “Degradation and intervention modelling techniques”. Deterioration modelling was studied for plain track, soil cuttings, metallic bridges and tunnels with concrete linings.

WP2 has thus well progressed on deterioration and performance modelling thanks to physically based models with a wide range of input conditions and profiles suitable for Life Cycle Assessment (LCA) and Life Cycle Cost (LCC) analysis. This will give input to D2.3 “Time-variant performance profiles for LCC/LCA”, soon available on MAINLINE website.

**WP3 – Replacement of obsolete infrastructure**  
**New construction methods and logistics**

Work in WP3 is focused on the investigation of construction methods that minimise the time and cost required for replacement of old infrastructure. With the production of deliverable D3.1 “Benchmark production and replacement of railway infrastructure”, there is now a collection of existing methods regarding bridges, track and switches and crossings. A methodology for benchmarking has also been developed in the form of a table presenting the main parameters for decision-making.

The next two deliverables to be published in May 2014 will study new technologies for replacement, each one focusing on a particular asset: bridges for D3.2 and switches & crossings for D3.3.

The final result of WP3 will be the production of a “Guideline for replacement of elderly infrastructure” (D3.4), in which costs, economical factors, logistics needed and environmental impact of selected techniques will be presented. Infrastructure Managers will thus find guidance on how to determine the suitable methods corresponding to their specific demands.

**WP4 – Monitoring and examination techniques**

The first task of WP4 has been completed with the submission of the first deliverable D4.1 entitled “Report on assessment of current monitoring and examination practices in relation to degradation”. Five different assets were selected and studied: cuttings, metallic bridges, tunnels, plain line switches & crossings, retaining walls.

In D4.2 “Solutions to gaps in compatibility between monitoring and examination systems and degradation models” a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) will be used to identify those gaps and propose optimal solutions to address these. This deliverable will soon be published on MAINLINE website.

The final deliverable of WP4 will be a “Report on case studies”, for which validation exercises will be performed on at least one rail bridge and one earthworks asset to be determined by the consortium.

**WP5 – Whole life environmental and economic asset management**

WP5 is the WP where the concluding result will be produced: a Life Cycle Assessment Tool (LCAT). Several analyses necessary to the development of the MAINLINE Life Cycle Assessment Tool (LCAT) have been performed so far, resulting in the production of four deliverables:

- D5.1 “Assessment of asset management tools” concluded that Infrastructure Managers tend to use Life Cycle Costing for both maintenance and renewal projects, which means that planning and forecasting can be improved through financial, environmental and risk benefits thanks to the MAINLINE LCAT.
- D5.2 “Assessment of environmental performance tools and methods” revealed that none of the currently available tools reviewed convert the environmental impacts into monetary terms while the LCAT could do that, what would be challenging.
- D5.3 “Recommendations for Format of a Life Cycle Assessment Tool (LCAT)” recommended that the conversion of LCA results into environmental cost for LCC evaluation is used as the best option to evaluate carbon emission and waste.
- D5.4 “Proposed methodology for a Life cycle Assessment tool (LCAT)” concluded that the LCAT should be a flexible tool that can be used along with the Infrastructure Managers’ own asset management tools and only partly if needed.

The prototype of the tool will be ready by the end of 2013 and the final version with its manual towards the end of the project.