



# Exploitation Plan

## D5.2

### Authors

\* Michael Robson (Robson's International Rail Consultancy)

\*Corresponding author: Michael Robson, maralnwick@yahoo.co.uk

**Date:** 11 January 2016

**Dissemination level:** (PU, PP, RE, CO): PU

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 636285



This project is funded by  
the European Union



## Table of Contents

1	Executive Summary .....	4
2	Introduction .....	6
3	Exploitation Objectives and Target Audience .....	8
3.1	Objectives.....	8
3.2	Target Audience .....	9
4	Actions to be taken to achieve the Exploitation objectives.....	10
5	IPR Guidelines .....	18
6	Summary .....	18





## DOCUMENT HISTORY

Number	Date	Author(s)	Comments
01	06/07/2015	Michael Robson (MR)	MR sends first draft of the document to Ken Gavin (KG) and Carla Soriano (CS) for review
02	08/07/2015	Ken Gavin/Carla Soriano	KV and CS return reviewed document with comments to MR
03	12/07/2015	Michael Robson	Final report complete
04	17/12/2015	Michal Klima (MK)	MK requires revisions
05	02/01/2016	Michael Robson	MR reviews document and send to KG and CS for a second review/approval
06	11/01/2016	Ken Gavin/Carla Soriano	Final report complete





## **1 Executive Summary**

The exploitation activities are vital to the success of the project as they bring the research results to life. The consortium will develop various channels to engage the end users of the outputs from DESTINATIONRAIL. This will lead to a higher rate of exploitation. These activities, which form a discrete work package within the project, will be led by Robson's International Rail Consultancy (RIRC) which has an excellent network of contacts across the rail sector.

An exploitation sub-committee of the Executive Board (EB) will be chaired by RIRC. Its objective will be to insure that the outputs from the project are implemented (in the practice of rail asset management), commercially exploited and that opportunities for collaboration and commercialisation are identified and followed through. The opportunity to build on the research work via academic institutions and SMEs will also be progressed with two assistant exploitation partners; ZAG who have a large in-house PR, marketing and web-development department and GDG who have experience of the targeted exploitation required for the SMEs.

The three main partners will receive significant support from all Work Package leaders including SMEs, Universities, Research Institutes and Infrastructure Managers. The combined resources of these complementary industry groups will ensure widespread opportunities for exploitation of the results amongst the various stakeholders including infrastructure managers, the research community, policy makers, and standards authorities. The multi-sectorial nature of the exploitation partners will help to meet the goals for the cross-thematic and multi-disciplinary research communication.

Exploitation will take place on many levels, including to stakeholders within the industry at a one to one level e.g. meetings with selected Infrastructure Managers, and in groups, by inviting industry leaders to briefings. These will be arranged around key events e.g. UIC expert group meetings, the bi-annual TRA and TRB conferences. Special sessions, led by DESTINATIONRAIL in association with other complementary projects, will be organised at these large events.

A number of one day workshop/showcase events, including visits to pilot sites, will be held to demonstrate the technological innovations emerging from the project. There will be workshops to enable early evaluation of the Decision Support Tool. These are intended to be interactive and to increase understanding of how the project results can improve rail performance and sustainability leading to a higher degree of engagement with the project.





The project will also produce a number of research papers for use by academic institutions along with non-technical guideline documents detailing the principle outputs from each of the four technical work packages. These will form useful references for infrastructure managers and provide a lasting record of the project.

Exploitation activities will run in parallel with the dissemination activities as a means of reaching all the target audiences by using a variety of media e.g. newsletters, website and research papers. These actions are described in more detail later in the document. The DESTINATIONRAIL consortium recognises that a collaborative effort is needed to improve the efficiency of European rail infrastructure. Our exploitation plan will therefore develop active links with complementary projects and in particular joint exploitation events will be organised whenever possible e.g. Shift2Rail. Section 5 of this report deals with how the project will manage IPR issues.

The following table provides an overview of how the exploitation goals will be achieved with more detailed explanations and tables contained in the relevant chapters.

**Table 1 Overview of the planned Exploitation of the project**

Goals	Steps needed to achieve this	Relevance of outputs to the lead users	D= During A= After the project
Move from Visual Assessment to the use of instruments in monitoring	R&D by SMEs, IMs and Universities. Implementation in Demonstration Projects, Guidelines, and in some cases Certification will be required.	A number of novel monitoring techniques will be developed. E.g. bridge scour, slopes, switches and crossings. These will be individual products e.g. App for scour monitoring and algorithms used by specialist SMEs	D and A
Develop advanced probabilistic tools and models for the analysis of rail objects, including bridges, earthworks, train-track interaction	R&D by SMEs, IMs and Universities, Scientific publications, Guidelines and in some cases certification will be required.	Algorithms will be developed which will address deficiencies in existing analyses, thus resulting in better, safer answers. Implementing these approaches offers value to the user (industry and IMs) and allows the SMEs to offer high-value services, thus increasing their competitiveness.	D





A cross-network risk management tool implemented in a probabilistic framework	SME, IMs and Universities, Implemented by IMs, include, site visits to IMs, training workshops and seminars for end users	The Decision Support Tool Software will be available as a free download. The structure will be flexible enough to allow for implementation over a range of networks. The SMEs and RIs will provide services to allow implementation for specific problems.	D
Low maintenance remediation techniques with low environmental impact / New products for industry	IMs and Universities. IMs will perform demonstration projects and LCA	This will allow user to reduce the economic and environmental costs associated with remedial works.	D

## 2 Introduction

The DESTinationRAIL Exploitation Plan represents one of the first deliverables of the project. The importance given by the project to this topic is emphasised by having a sub-committee of the Executive Board focussing on exploitation in addition to a complete work package being dedicated to dissemination and exploitation. The Exploitation sub-committee will meet prior to the main Executive Board to review progress and to discuss any IPR issues thus ensuring that exploitation is discussed at the highest level within the project.

Dissemination, exploitation, and knowledge management/transfer have been prioritized throughout the project by designing WP 5 as a dedicated horizontal, crosscutting measure that interfaces with all R&D work packages. Through participation in WP 5, all Work Package Leaders will act as conduits for knowledge transfer from individual research activities into the designated exploitation routes.

The DESTinationRAIL exploitation plan is targeted at a number of key stakeholders including:

- the Infrastructure Managers (through face to face meeting and collaborative activities with CER,EIM,UIC and EURNEX)
- Scientific community (incl. engineers and research test facilities/ institutes)
- Policy Makers and Trade Bodies (National and International politicians, investment bodies, International Bodies e.g. UNECE,OECD, Danube Strategy)
- Other complimentary projects (co-funded projects under the call, outside the call, Shift2Rail etc.)
- Interest groups e.g. road operators through FEHRL
- Standardisation Bodies e.g. CEN,ERA





- Other rail organisations including rail user groups etc.

The Exploitation plan falls into three distinct phases:

**(i) Awareness and Visibility of the project**

A series of presentations will be made at selected industry and research conferences during the first few months and articles will be submitted to trade journals describing the project to raise awareness of its aims. A newsletter will be sent to the target audience which will also include details of the website where further information on the project can be found.

**(ii) Engagement with the Project**

This will be the longest of the three phases lasting approximately twenty-nine months with the progress of the project being disseminated via various interactive means to encourage engagement e.g. workshops to demonstrate tools, visits to test sites and face-to-face meetings with Infrastructure Managers/ Infrastructure groupings, meetings with Policy Makers and researcher bodies. These face-to-face activities will be of particular importance in gaining support from the key players. The exploitation work will be supported by the dissemination strategy reinforcing the message via appropriate media using the website, magazines/ research papers, “Linkedin” site going live, regular newsletters and conference presentations.

**(iii) Exploitation of the Project**

The exploitation of the results will happen at various stages during the project when work packages deliver their outputs and by visiting test/pilot sites where the host infrastructure manager will present how the project is to be implemented on the network. This is a crucial part of the strategy to encourage Infrastructure Managers to exploit the results on their own networks, further details of the dates for delivery of these results is shown in Table 3, See Section 4.

The conclusion of the project will be marked by a final conference at which the results of DESTinationRAIL will be presented. The main deliverable of the project being the Decision Support Tool which will be demonstrated during the conference for those who were unable to attend the workshop. This will be followed up with articles in trade and research journals, on the website as well as publication of the final newsletter. In addition, appropriate media will be used to provide the information which will assist exploitation of the project results.

Details of how exploitation will be delivered during each of these three phases are summarised in the following section. A separate Dissemination Plan, to support the exploitation plan, has been prepared and submitted as Deliverable D5.1, which is also available on the project website [www.destinationrail.eu](http://www.destinationrail.eu)

**Role of consortium partners in the exploitation plan**

The fifteen members of the consortium will play an important supporting role in the





exploitation plan. These include three rail infrastructure managers who are providing the key test/pilot sites. The diverse geographical locations and contacts of the consortium members means that they will be able to assist in ensuring that the progress and outputs of the project are shared across a wide variety of institutions and institutional groupings. The table at the start of the document lists the members of the consortium and their geographical range.

### **Exploitation Subcommittee of the Executive Board**

An Exploitation subcommittee of the Executive Board has been formed consisting of representatives from RIRC, GDG and ZAG. The subcommittee, chaired by Michael Robson, is charged with ensuring that the outputs from DESTinationRAIL lead to;

- Implementation of improved practices in rail asset management
- The identification and follow through of opportunities for collaboration and commercialisation
- Commercial exploitation.

## **3 Exploitation Objectives and Target Audience**

### **3.1 Objectives**

The objective of the exploitation plan is to ensure that the results of the project are implemented and used by the various target audiences to achieve:

#### **In terms of rail asset management**

- A reduction in recurrence of costs, within the range of 25% to 45%, through the use of the Life Cycle analysis tool leading to a reduced total Capital Expenditure (CAPEX) and Operational Cost (OPEX) over the asset life cycle.
- A reduction in costs through lean design procedures based on the O'Connor et al 2009 study
- Moving from reactive to proactive asset maintenance by the use of Structural Health Monitoring equipment thus improving capacity and performance of the networks operated by the Destination Rail Infrastructure Managers
- Increased reliability and capacity through the use of the Advanced Traffic Model and demonstrated on the Irish Rail Network
- Improved ability to handle major changes in weather patterns by better understanding how the certain parts of the rail infrastructure performs and by being able to predict which parts are more prone to failure thus improving performance of the network.

These will contribute to the delivery of a sustainable infrastructure with improved







reliability and capacity, lower cost and higher levels of safety.

### **In terms of Research**

- The development of new techniques which will have wider use than in rail alone
- The development of the next generation of engineers. The project currently employs 7 Ph.D. students
- Enhancing the reputation of top European Universities in these fields enabling them to continue to attract top talent and drive forward world class research and innovation
- The potential development of new IPR that could be exploited world wide
- Interaction with other research platforms to drive new ideas
- The movement of at least 13 individual elements from Technology Readiness Levels (TRL) 1 to 5 to levels 6 to 9 TRL

### **In terms of SMEs**

- Providing SMEs with opportunities to showcase their products and increase markets. The Irish SME's propose to target 20% of their turnover from the development and operation of Rail Asset Management Tools.
- SMEs cooperating with IMs to develop and implement the new ideas/products to improve productivity and reliability thus helping to deliver a sustainable rail network.

## **3.2 Target Audience**

The target audience for the exploitation activities has been identified using:

- The knowledge of the consortium partners, including the extensive network of railway, industry and political contacts built up by RIRC which will also be used to ensure wide end user coverage and exploitation.
- Knowledge gained by the participants from previous projects
- Research into other potential groupings that would benefit from exploiting the results of the project.

The target audiences for exploitation of the results of DESTinationRAIL are shown in table 2.





**Table 2 Target Audience for the Exploitation activities of the project**

Grouping	Examples	Examples
Policy Makers	MEP's Transport Committee	Independent Regulators Group (Rail)
	Danube Strategy Group	European Railway Agency
	South East Europe Transport Observatory	European Commission Directorates
	UNECE	Transport Ministries
	OECD	
Rail Industry	Infrastructure Managers	Railway Contractors
	Railway Suppliers	
Rail Industry Bodies	CER,EIM,UIC,	UNIFE,EFRTC
Rail Conferences	Wider Black Sea Area	Iberian Rail
Rail Industry Research Platforms	Shift2Rail	ERRAC
Research Bodies	EURNEX	New Rail
Research Conferences	TRA, TRB,IRRC	CETRA
General Interest	General Public	Passenger and Freight bodies
Standards Bodies	CEN	European Railway Agency

#### **4 Actions to be taken to achieve the Exploitation objectives**

The following are the main actions which will be taken to help achieve effective exploitation of the project outputs. Table 3 at the end of this section provides an overview of the actions in date order.

##### **Face to Face Meetings with Infrastructure Managers**

This is the most important group to influence in terms of achieving exploitation on the ground therefore one to one meetings between the project and selected Infrastructure Managers will be organised. These meetings will build on the work of the site visits and workshops by providing Infrastructure Managers with the opportunity to engage and discuss practical issues of how best to implement the





emerging results on their network. It must be remembered that whilst some work can be implemented quickly other results will need time to allow for investment or standards to be changed.

The meetings with selected Infrastructure Managers are planned to run from May 2016 to October 2017 with a target of 12 Infrastructure Managers to be met in one to one meetings. The selection of Infrastructure Managers to meet will be based on knowledge of their network and the types of problems which they encounter on their networks. The opportunity will be taken during these discussions to estimate the benefits to the particular Network.

### **Visits to test sites**

These will provide the opportunity for infrastructure managers and others to see a demonstration of the project work in a live railway environment. The infrastructure manager, on whose railway network the work is being carried out, will explain to his peers, how the work has been implemented and the benefits resulting from using this new approach. Visits are currently planned to see:

- the instrumentation of the Boyne Viaduct in Ireland using accelerometers and strain gauges
- switch and crossing monitoring in Norway
- rock slope surveying using drones in Croatia and Ireland
- large scale testing of triaxial along with the testing of Geosynthetic Reinforced Soil in Slovenia

### **Interactive workshops**

These will provide an opportunity for infrastructure managers and other users to gain “hands on” experience of the new tools being developed in terms of:

- Demonstration workshop on “Testing of the Traffic Flow model” planned for September 2016
- Demonstration workshop on the “Integration of WLCA model into the DST” planned for February 2017

### **Reports**

A number of reports on key topics will be made available during the course of the project. These will form the basis of the discussions with the Infrastructure Managers and be incorporated in any meetings or presentations to technical groups.

### **Targeted technical group presentations**

These groups, CER, EIM, EFRTC, UIC, UNIFE etc. will be invited to participate in visiting pilot sites and the interactive workshops to further spread the potential for exploitation of the results. Presentations are planned to these groups throughout the life of the project to fit in with the planned meetings of these groups





### **SME Involvement**

The SME's, will use various events e.g. trade shows to present and market the new products as part of their normal business development. The SME's will also be involved in visiting the Infrastructure Managers in order to promote technical discussion within the company on the results of the work being carried out.

### **Scientific Output**

Research papers will be aimed at the academic and research bodies with a view to stimulating research in areas covered by the project. The target is to have 2 papers published per year. It is anticipated that these ideas could also be used in the development of new products for the industry. Specific workshops will be organised TRA/TRB and CETRA as part of the exploitation process.

### **Standards proposals**

The research may result in proposals to change standards and specifications. Therefore the ERA, CEN and the UIC will receive regular updates on progress as a means of exploiting the ability to change standards/specifications.

### **Guidance documents**

Guideline documents will be produced by Work Packages 1 to 4 near the end of the project. These will be 10-20 page documents in pdf form and will serve as a non-technical summary of the principal outputs in each of the four sectors, Find, Analyse, Classify and Treat. This will enable non-technical target audiences e.g. Ministries or UNECE to discuss possible exploitation amongst infrastructure funders alongside Infrastructure Managers leading to greater probability of exploitation of the results of DESTINATIONRAIL.

### **Final Conference**

This will provide the showcase for the final results of the project. In addition to giving presentations, the format will allow for small workshops on specific topics along with one to one discussions to assist in the exploitation of the results by allowing participants time to further explore how the results can be implemented to develop a sustainable railway.

### **Supporting actions**

Supporting all of the above is the Dissemination Strategy, a copy of which can be found on the DESTINATIONRAIL website [www.destinationrail.eu](http://www.destinationrail.eu), which details how the use of appropriate media will be harnessed e.g.:

- Written material in the form of Research Papers in Scientific Journals, Magazine Articles. The target is for 2 Research Papers and 2 articles in Railway Magazines per year.
- DESTINATIONRAIL newsletter which will be issued on a 6 monthly basis and available through the website





- Technology driven, Webinar, TEDx, LinkedIn
- Conference presentations, The target is 4 per year
- Stands at Trade Shows hosted by SMEs to promote the results/technology

**Table 3 Planned Delivery Dates for test sites, workshops, key material to support the Exploitation plan along with Areas of Benefit to the Network.**

EVENT	PLANNED DATE	TARGET AUDIENCE	EXPLOITATION ACTIONS	BENEFITS TO THE NETWORK
Report on common problems faced by rail infrastructure	October 2015	Infrastructure Managers, Rail Regulators, SMEs	Article in the Newsletter and upload to website	Provides information for industry to work on solutions for the railway
Workshop to demonstrate the Traffic Flow model	July 2016	Infrastructure Managers, Rail Regulators, Capacity Allocation bodies	Practical involvement in the workshop to show the benefits to IMs and Capacity Allocators	Improved network performance once the model is in use
Site visit to Boyne Bridge to Assess use of sensors	TBA	Infrastructure Managers	Practical discussions by IM experts on the work and demonstrating how it can be implemented	Reduced down time on the network and reduced maintenance costs once implemented.
Site visit to Embankment in Slovenia to view novel methods of construction	TBA	Infrastructure Managers	Practical discussions by IM experts on the work and demonstrating how it can be implemented	Reduced down time on the network and reduced maintenance costs once implemented





Visit to test site in Norway to see switch/crossing and track monitoring equipment in action	TBA	Infrastructure Managers	Practical discussions by IM experts on the work and demonstrating how it can be implemented	Reduced down time on the network and reduced maintenance costs once implemented
Visit to test site to see drones in action for monitoring slope stability in either Ireland or Croatia	TBA	Infrastructure Managers	Practical discussions by IM experts on the work and demonstrating how it can be implemented	Reduced down time on the network and reduced maintenance costs once implemented
Workshop to demonstrate the WLCA model	October 2016	*Infrastructure Managers, Rail regulators.	Practical involvement in the workshop to show the benefits to the IMs	Improved Network performance once the model is in use
Guidelines on methods to find hot spots on rail networks	October 2016	*Infrastructure Managers Railway Industry Suppliers Research Institutions	Article in the Newsletter and upload to the website.	Enabling proactive action to be taken on developing problems leading to reduced delays. New methods of working leading to improved productivity
Report on monitoring switches and crossings	April 2017	*Infrastructure Managers Railway Industry Suppliers Research Institutions	Article in the Newsletter and upload to the website	Enabling proactive action to be taken on developing problems with switches and crossings leading to reduced delays. New methods of working leading to improved productivity





Guidelines for Probability Based Multi Criteria Performance Optimisation of Railway Infrastructure Climatological Hazards	April 2017	*Infrastructure Managers, Research Institutions  Government Departments  UNECE. OECD	Article in the Newsletter and upload to the website together with publication of a Research paper	Enabling proactive action to be taken mitigate the effects of Climatological Hazards leading to more effective targeted investment and maintenance
Report on Pilot Projects	April 2017	*Infrastructure Managers, Research Institutions	Article in the Newsletter and upload to the website	Provides information on different ways of doing things allowing new proven ways of carrying out work to implement across networks reducing cost and improving capacity and performance.
Report of Assessment on Earthworks	August 2017	*Infrastructure Managers  Railway Industry Suppliers  Research Institutions	Article in the Newsletter and upload to the website	Enabling proactive action to be taken on developing problems with earthworks leading to reduced delays. New methods of working leading to improved productivity
Report on the use of remote monitoring for slope stability assessments	October 2017	*Infrastructure Managers  Railway Industry Suppliers  Research Institutions	Article in the Newsletter and upload to the website	Enabling proactive action taken on developing problems with slope stability leading to reduced delays. New methods of working leading to improved productivity  <b>Croatian Railways will be implementing this by 2018</b>





**D5.2 Exploitation Plan**  
**DestinationRAIL-Decision Support Tool for Rail Infrastructure Managers**

Report on Assessment of Bridges	October 2017	*Infrastructure Managers Railway Industry Suppliers Research Institutions	Article in the Newsletter and upload to the website	Enabling proactive action to be taken on developing problems with bridges leading to reduced delays. New methods of working leading to improved productivity
Guidelines on the use of novel construction and maintenance techniques within the operational railway environment	October 2017	*Infrastructure Managers, Research Institutions Railway Suppliers Government Departments UNECE. ECD	Article in the Newsletter, upload to the website and publication of research papers	Enabling novel construction methods to be applied to rail thus reducing cost and improving capacity  <b>Slovenian Railways will be using these techniques in 2017</b>
Webinar demonstration of the Decision support tool (DST)	October 2017	*Infrastructure Managers	Practical involvement of IMs in fine tuning the DST	Improved network performance once the model is in use
Report on Assessment of Tracks	October 2017	*Infrastructure Managers	Article in the Newsletter and upload to the website	Enabling proactive action to be taken on developing track problems leading to reduced delays. New methods of working leading to improved productivity





Implementation of complete vibration monitoring system on Irish Rail Bridge	December 2017	Infrastructure Managers Railway Industry Supplier Research Institutions	Article in the Newsletter and upload to the website	Reduction in maintenance costs and improved capacity/performance through fewer interventions to maintain the bridge  <b>Irish Rail will use this system on the Boyne Bridge from January 2018</b>
Production of Guidelines documents	March 2018	Infrastructure Managers	Delivery of Guidelines booklet to the Infrastructure Managers	Enabling all rail Infrastructure Managers to understand the benefits of the project deliverables helping them to adopt new ways of working.
Public workshop on DST hosted by an Infrastructure Manager	March 2018	Infrastructure Managers, Research Institutions, Rail Regulators. Industry Supplier Government Departments Freight Corridor Managers UNECE.OECD	Interactive involvement to demonstrate practical value of the tool	Improved performance/capacity on the network along with cost reductions for maintenance and renewal by presenting the Infrastructure Manager with options for the work and affected traffic flow.  <b>Irish Rail will use the model to provide validation of its capabilities in May 2018. The target is to have 3 Infrastructure Managers using the system within a year of completion and 10 by 2021</b>





\*During the period May 2016 to October 2017 a series of 1 to 1 meetings will be held between the DESTinationRAIL project team and Infrastructure Managers to further develop ways of exploiting the project results on their networks.

## 5 IPR Guidelines

The consortium believes that at least one IPR proposal will be developed and therefore it is for this reason that guidelines are incorporated in the exploitation plan document. The standard DESCA Consortium Agreement (CA) has been adopted, noting that important changes with relation to IPR have been made since FP7. Specifically in the areas of: joint ownership in order to recognise the difference between commercially exploitable and non-commercial IPR; an explicit background list of IPR brought to the project by each partner forms an annex of the CA; the introduction of a suggested one year time limit (after the end of the project) for the requirement for approval to project partners for the publication of results and clear rules on the procedures for requesting exclusive licences.

The Exploitation subcommittee of the Executive Board is the body charged with following through opportunities for commercial exploitation of results, however it is for the individual partners to present the results which they believe could have commercial potential. A list will be prepared, which will form an appendix to the Exploitation subcommittee notes, of any results which are proposed for commercial exploitation. It will be the responsibility of the party which generates the request for a result to be progressed as an IPR to follow through the process as described in the Consortium Agreement.

## 6 Summary

The Exploitation Plan has illustrated how the target audience will be encouraged to implement the results of the DESTinationRAIL project by means of “hands on” involvement through site visits and workshop events. This “hands on” approach will be reinforced through one to one discussions in particular with Infrastructure Managers on the various reports being delivered as the project progresses. The various other audiences will be targeted via presentations and other media.

It is recognised that the one to one meetings with Infrastructure Managers, workshops and site visits alone will not ensure widespread exploitation therefore the following additional actions have been identified to support effective engagement and exploitation:

- Production of non-Technical Guidelines documents for each work package
- Opportunities provided to go into further detail with attendees at the final conference





## D5.2 Exploitation Plan

### DestinationRAIL-Decision Support Tool for Rail Infrastructure Managers

- The writing, publication and presentation of research papers
- The use of the website [www.destinationrail.eu](http://www.destinationrail.eu) to showcase the work of the project using different media which will appeal to different audiences.

This plan has a dedicated work package to implement the exploitation strategy. It has the full commitment of all the DESTinationRAIL consortium members. Progress will be regularly monitored by the Executive Board.

