FOCUS
Sustainable Development
INTERNATIONAL UNION OF RAILWAYS
Noise
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In this edition:

EuropeTrain – a successful conclusion

By Nick Craven, UIC

Introduction to the EuropeTrain

The replacement of cast iron brake blocks to achieve smooth wheel surfaces and therefore low levels of rolling noise was first identified as the most cost effective method for railway noise reduction by the STAIRRS project in 2002 (www.stairrs.org).

This finding had driven policy railway noise reduction at European level for more than 10 years.

In response to this, the EuropeTrain was conceived to accelerate the process of proving low-cost low-noise technology (LL-blocks). The project started as a German initiative but has been supported by 29 railways, the sector organisations CER, EIM and UIC and eight industry partners.

Launched in 2010, the EuropeTrain completed over 200,000 km of in-service testing of LL brake blocks. The data collected is representative of operating conditions for the whole of Europe (i.e. different gradients, operational modes, arctic winter areas and high temperature zones).

Success

The UIC EuropeTrain project has finished with a successful homologation of two types of low noise brake blocks; IB116* and C952-1 by the UIC. On 1 June 2013 the European Railway Agency (ERA) published a revision of its Technical Document 02 including the new low noise LL-blocks. This document is now available to the whole freight wagon sector.

This is a landmark moment for railway noise control in Europe as it enables cost-effective retrofitting for the majority of the existing freight wagon fleet. A large reduction in freight noise is now a realistic and economically feasible prospect for coming decade. It is hoped that this will remove one the most difficult barriers to modal shift.

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Usage guidelines

UIC has updated the usage guideline for composite (LL) blocks to accompany this new low noise technology (available for download from the UIC website https://www.uic.org/spip.php?article1524). The technical document 02 of ERA also refers to this document.

Within this guideline, the technical and operational boundary conditions for the safe and most cost effective use of LL-blocks are described, e.g. monitoring intervals for the wheel profiles, the conditions for the free exchangeability with cast iron blocks and more.

Block wear, wheel wear & life cycle costs

The project was designed to deliver field experience on the wear of blocks and wheels. A huge database has now been complied to inform Life Cycle Cost (LLC) analysis.

The results show that LL-blocks have lower wear than cast iron blocks (up to 50% less for loaded wagons). However, this is largely influenced by the type of block used for other wagons in the train and also the load spectrum (i.e. topography, loading status, design of the wagon, braked weight).

The data also show that the use of LL-blocks increases the wheel wear rate. This is heavily dependent on wagon loading, type and route.

The average wheel wear (expressed as change in flange height) for all brake blocks and all loading condition is 1.35 mm / 100,000 km. When using LL-blocks, wheel re-profiling intervals between 150,000 and 250,000 km can be expected. However, a detailed forecast in general is not possible as this is dependent on the service conditions. UIC has started a project to determine detailed LCC for LL-blocks, this will allow calculations specific to individual operators.

The author would like to acknowledge the support for preparing this article provided by Johannes Gräber, Torsten Hilker, Dr. Stefan Dörsch of DB Systemtechnik GmbH, Minden, Germany.

For more detailed technical information please refer to:

- UIC B126 RP 43 - Synthesis of the EuropeTrain operation with LL brake blocks - Final report (2013)
- UIC B126 DT 440 - Exchangeability of the LL-blocks IB116* and C952-1 with cast iron blocks (type P10) (May 2013)
- UIC Usage guideline for composite (LL) brake blocks, 9th Edition, 01 May 2013
- EuropeTrain - a pan-European operating Train to Speed-up the Homologation of a low noise Brake System with LL Brake Blocks: http://www.uic.org/spip.php?article3126

Rail Dampers, Acoustic Rail Grinding, Low Height Noise Barriers

A UIC report on the state of the art

By Jakob Oertli, SBB Infrastructure

There are many noise mitigation options open to railways. Some of them – such as noise barriers – have a known effect and are used widely, others such rail dampers, acoustic rail grinding or low height noise barriers are still controversial for various reasons. Since each railway has limited opportunities to extensively test these controversial measures, the Network Noise of UIC decided to collect results and measurement conditions of these three noise abatement measures. This report first describes some aspects of noise control as well as quantities that are important for understanding the arguments made. It then describes the three noise mitigation methods in more detail, explains why they are controversial and finally lists and comments on the experience made to date.

The experience in other countries was obtained by asking members of the UIC Noise Network as well as representatives from other European countries. The request for information was sent in mid 2011. In addition this report was sent to the Noise Network members in mid 2012 for comments and for additional results not available in 2011. A limited number of results were obtained from other sources. The main conclusions of the report are:

Rail dampers:

- There is a large variability in the results ranging from small increases in noise to a maximum noise reduction of usually not more than 3 dB.
- The effects of dampers are influenced by many parameters such as construction (rail pad stiffness) or traffic. However for many of the results these parameters were not measured. Therefore it is difficult to compare the results or to use the results from one situation in order to predict the effects in another one.
- Network wide cost-benefit analyses have not been undertaken to date. The ongoing Swiss project is the first to attempt this.
- The STARDAMP project and the ongoing Swiss trials are the first systematic approaches to the problem measuring all relevant parameters. At the time of writing, the results were not available and are therefore not included in the report.

Rail grinding:

Only two countries – Germany and the Netherlands – have implemented acoustic rail grinding procedures. In Germany the procedure allows a legal noise reduction of 3 dB, while in The Netherlands specific noise reduction aims are defined.

Lacking are network wide cost benefit analyses. It is suggested that these are best undertaken in a cooperative approach by the railways.

Low height noise barriers:

There is not much information available on low height noise barriers to date and the trials are mostly not precise enough to undertake a final conclusion on the issue. The basic arguments are still the same: from an acoustical point of view low height barriers are comparable to normal barriers and they have the advantage of fitting into the landscape. On the other hand, there is not yet enough experience to satisfactorily address maintenance and security questions. Some countries (e.g. Norway) do not report problems, others (e.g. Switzerland) are not pursuing the issue because of these concerns.

The full report is available on the UIC homepage:
http://www.uic.org/IMG/pdf/dampers_grinding_lowbarriers.pdf

Illustration: Examples of four rail damper types as tested on softly layered rails (car park test) as part of the Swiss rail damper trials. The track decay rates measured in this set-up are added to track decay rates measured in real situations on the track to allow calculation of the noise reduction potential of rail dampers.

From top to bottom: Tata Steel, Schrey & Veit, Vossloh, STRAIL

Railway noise Technical Measures Catalogue

By Frank Elbers and Edwin Verheijen, dBvision

There is a growing awareness of the possible impact of railway noise on public health, which has resulted in pressure from line-side inhabitants, governments and health organisations for increased noise mitigation. As a consequence, noise can be a limiting factor for many railway operations. Recent years have seen the development of strategies and technologies for noise management. Railway companies often face calls to implement these.

This new catalogue collates best practice and case studies from "real life" tests and adds theoretical knowledge. Through this catalogue, UIC stimulates the implementation of publically available knowledge, demonstrates the progress that has been made and also manages stakeholder expectations.

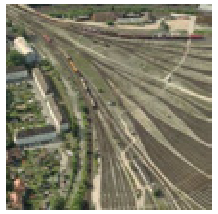
This Noise Technical Measures Catalogue surveys recent developments for three topics in separate chapters:

1. Curve Squeal,
2. Noise from freight marshalling yards,
3. Noise from switches.

In addition, one final chapter is dedicated to other measures: rail and wheel dampers, K and LL-blocks, noise barriers and acoustic grinding.

Curve squeal

Curve squeal is a highly annoying sound that is radiated by trains running through sharp curves. Flange lubrication and top-of-rail application of friction modifiers have demonstrated to be very effective (reduction[1]: 5-20 dB(A)). Friction products can be applied from track-based as well as vehicle-mounted devices. Special bogie designs reduce squeal noise and are potential solutions for the future.

Noise from freight marshalling yards

Marshalling yards are areas where freight trains are decoupled and coupled. Among the most important noise sources are screeching rail brakes (retarders), peak noise from coupling vehicles and steady noise from locomotive engines. New solutions for noisy rail brakes have been developed recently, showing promising noise reduction (5-15 dB(A)). For stationary noise of locomotives, technical modifications have been developed. Stationary noise of diesel engines and cooling vents may be avoided by using a way-side electric power supply.


Noise from switches

Switches and crossings are among the most sensitive parts of the railway system, claiming a large part of the maintenance budget. Switches and crossings produce impact noises from joints (if present) and screeching noise similar to curve squeal. A traditional switch produces a rattling sound during train pass by. Jointless switches are state-of-the-art nowadays (2-4 dB(A)) on lines where trains run at operational speeds. Squeal noise and flange rubbing noise in switches may receive the same treatment as squeal noise in curves (5-20 dB(A)).

Rolling noise

Rolling noise is the most common type of railway noise. There are many technical measures that reduce it. High levels of rolling noise arise from irregularities (roughness) on the wheel tread and rail head. This rail roughness can be controlled by acoustic grinding. This requires the rails to be ground or polished as soon as a certain reference noise level is exceeded (reduction: 1-3 dB(A)). The potential of acoustic grinding increases if all train wheels are smooth as well. A large improvement in this field is expected from homologation of LL braking blocks. This makes retrofitting of freight vehicles a cost-effective option (reduction 8-10 dB(A)).

Application of rail dampers (0-3 dB(A)) and wheel dampers (0-2 dB(A)) make further noise reduction possible. The noise reduction depends largely on the characteristics of the track system without rail dampers.

Promising developments for urban areas are so-called low-close barriers, typically placed at 1.70 m from the track and 0.70-0.85 m height. In certain situations these barriers can be used to replace (or avoid) higher conventional barriers and they do not block the view. However, there are safety issues with barriers placed close to the traffic. While in certain countries low-close barriers have been admitted, in others the homologation process has been halted for safety reasons.

1. The ranges for noise reduction given in this letter depend on the reference situation

The real costs of noise mitigation

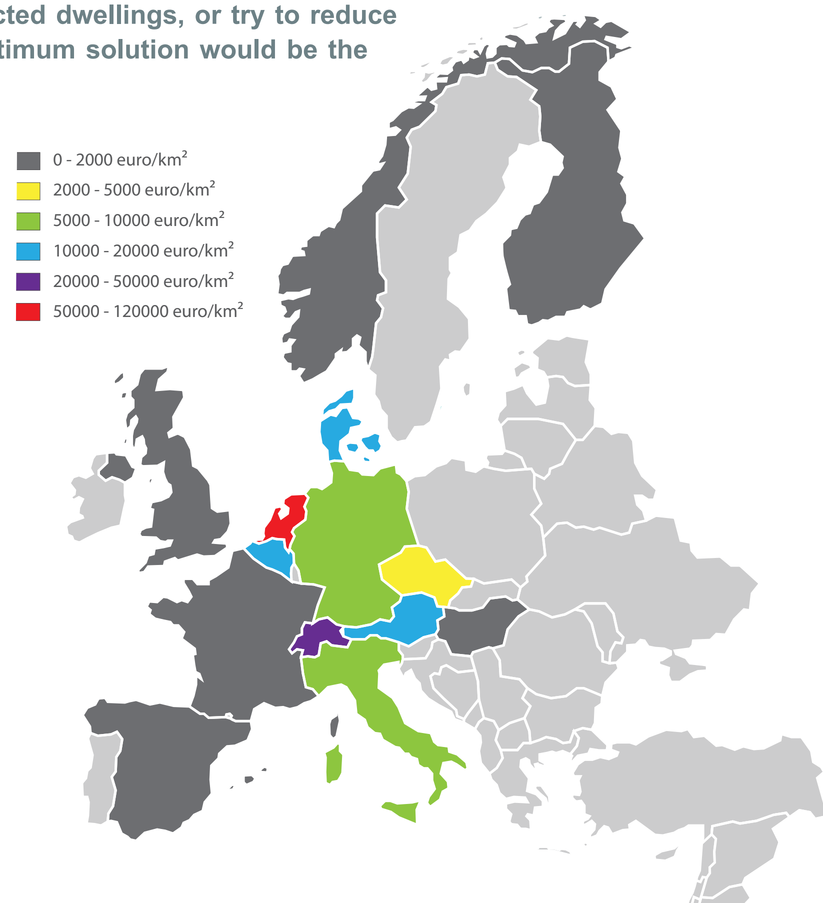
By Paul de Vos, Royal HaskoningDHV

Over the past decades and in certain areas of Europe, both freight and passenger traffic have substantially increased. In some cases tracks have been extended. Often, these developments lead to strong adverse reactions from residents and local politicians, based on increasing noise levels due to the traffic increase. From a strategic point of view, there are a range of options for noise control to cope with such circumstances: infrastructure managers may erect noise barriers or install rail dampers, grind the track, provide façade insulation for affected dwellings, or try to reduce the noise created by the train itself. The optimum solution would be the one that generates the best cost efficiency.

The STAIRRS project (1996 to 1999) completed an extensive cost benefit analysis. The graph summarising the results has been presented many times since, influenced strategies for noise mitigation and justified the retrofitting of freight wagons with low noise braking technology as the preferred option.

UIC assigned Royal HaskoningDHV with the task of updating the famous STAIRRS graph to reflect the sectors experience over the last decade. Recent developments that could affect the results of this study include:

- Field studies and experiments leading to improved understanding of the durability and life cycle cost for different types of brake block,
- Freight wagon retrofitting is close to realisation following various initiatives to stimulate and/or enforce this option,
- Rail dampers are now an established option for noise control at source.



NPV per km² for noise barriers, track absorbers and window insulation

For the purpose of the study, a comprehensive digital questionnaire was composed with the objective to collect data at a national level on length of rail network, the amount of noise control measures in place, those planned and the associated lifecycle costs. During the study it became apparent that data on life cycle costs are not readily available. The investment cost for noise reducing measures may be known, but the cost for maintenance, replacement, renewal and waste disposal are not easily identifiable in the railway infra manager's books. Life cycle costing is still a rather new phenomenon in organisations that were used to be financially managed by planning budgets.

In response to the difficulty experienced in collecting detailed cost data, a second approach was adopted. The data from an extensive study in the Netherlands were used as a starting point. These cost data were corrected using an indicative price index comparison between the country under concern and the Netherlands. Assumptions regarding planned extensions to the existing network length were agreed. And finally, data on amount of noise barriers already installed were taken from a 2007 UIC report (Noise Reduction in European Railway Infrastructure – status report 2007. UIC/CER 2007).

With this approach it was estimated that the current noise measures in 13 countries include some 5.5 billion euros (net present value) and 0.4 billion for façade sound insulation. The following graph presents the cost per length of network in the countries included in the study.

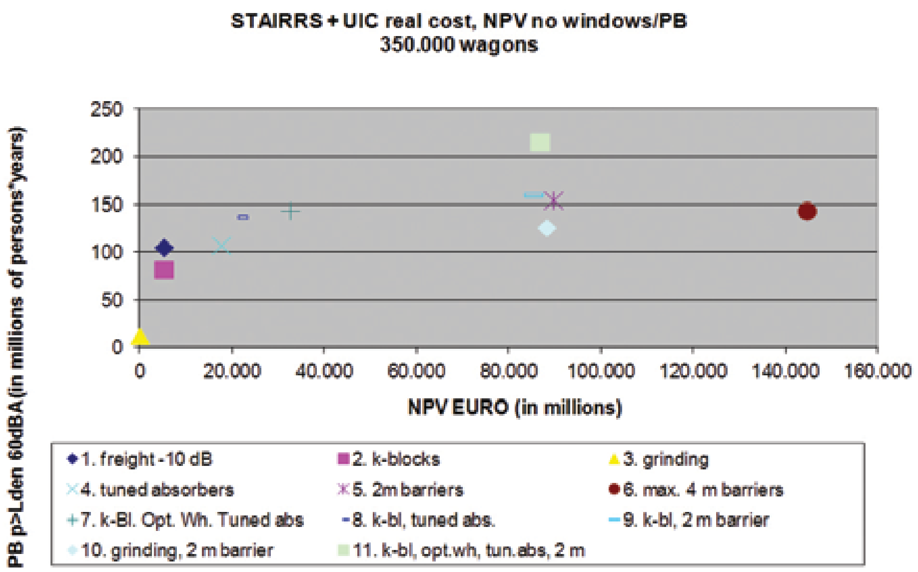
From the graph it is clear that Switzerland and the Netherlands spend the most on noise control, followed by Austria and Belgium and then by Germany and Italy.

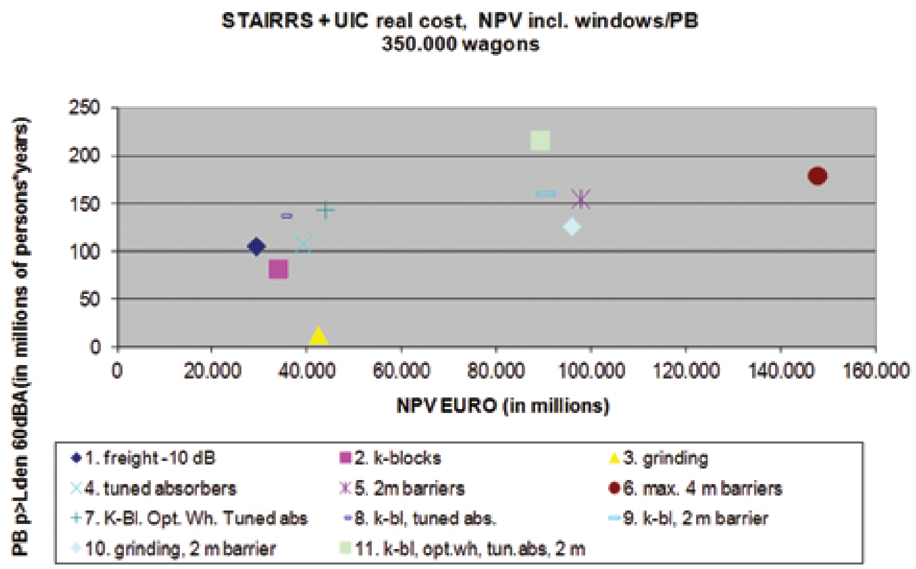
In order to compare these costs with those of wagon retrofitting (which clearly would have to happen at European level), five planning scenarios were investigated, ranging from "do nothing" to "retrofit all wagons in 2012". Net Present Value of the costs range from 5 billion Euro for "K-blocks in 2012" down to 1.7 billion euros for "LL-blocks in three maintenance cycles of seven years".

In order to compare these findings with the STAIRRS graph, the latter was updated first. After all, the STAIRRS project assumed that more than 700,000 wagons would have to be retrofitted, the current numbers are less than half that figure. As a result, the Net Present Value for the options that include retrofitting is substantially reduced. The original and updated STAIRRS graphs are shown in the following graphs.

The updated graph reconfirms and emphasises the findings of the STAIRRS project, viz. that retrofitting is by far the best option from a cost point of view, even when one includes a full life cycle analysis. LL-blocks are less costly than K-blocks and represent the preferred alternative. Options with noise barriers (the usual measure applied today) are the least cost effective.

The full report is available on the UIC website: http://www.uic.org/IMG/pdf/ba7041-101-100-md-af20130168-lok__final_report_uic_real_costs_30jan13.pdf





Noise reduction of freight wagon retrofitting

By Paul de Vos and Mark de Groot, Royal HaskoningDHV

Since the Action Program on Noise was adopted by UIC and other major railway associations, retrofitting of freight wagons with low noise braking technology has been the preferred strategy for railway noise control in Europe. In order to comply with the Noise Technical Specification for Interoperability (TSI Noise), new and refurbished freight wagons are currently equipped with composite brake blocks, so-called K-blocks. However, most of the existing wagons use "noisy" conventional cast iron brake blocks. For over half a century these blocks have been known to cause wheel defects such as corrugation and polygonisation that in turn cause high levels of rolling noise. Building on the experience with composite brake blocks in passenger transport, retrofitting existing wagons with K-blocks has been suggested as a solution to reduce rolling noise. Due to the friction behaviour however, K-blocks require significant changes to the braking system (cylinders, valves and rigging) and therefore incur additional costs. LL-blocks (i.e. organic or sintered metal blocks) have friction behaviour similar to cast iron, allowing easy exchange. However, acceptance (i.e. homologation) of LL-blocks is first dependent on the completion of rigorous safety tests.

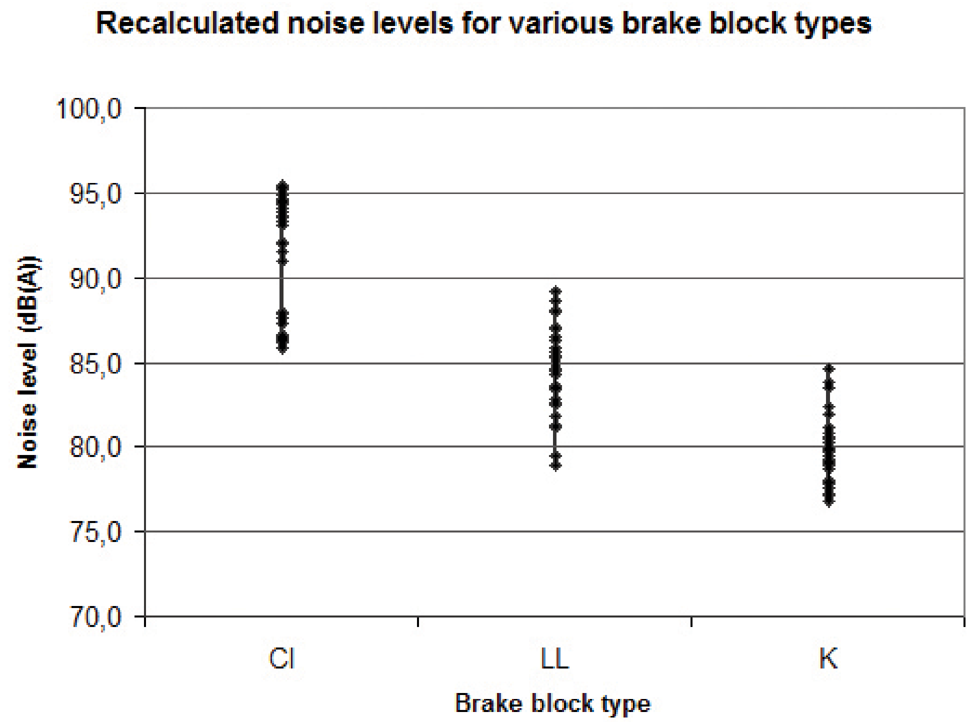
Recently, the EuropeTrain project has produced promising results leading to an expectation that LL-blocks will be available for use by mid 2013. It should also be noted that financial incentives for retrofitting (state aid and track access charging) are gaining momentum at national and European level. In addition, the Swiss Federal State proposes a total ban of cast iron braked wagons by 2020. Retrofitting on a large scale is expected in the coming years, but what will this achieve in terms of noise reduction?

This question has been the subject of a study by Royal HaskoningDHV, commissioned by the UIC. This study completed a comprehensive review of more than 120 measurement reports for different kinds of composite brake blocks. Only 38 of the 120 reports turned out to include noise data with sufficient support detail (i.e. track condition). An analysis of these data showed significant spread in absolute pass-by level, even for wagons equipped with the same type of brakes.

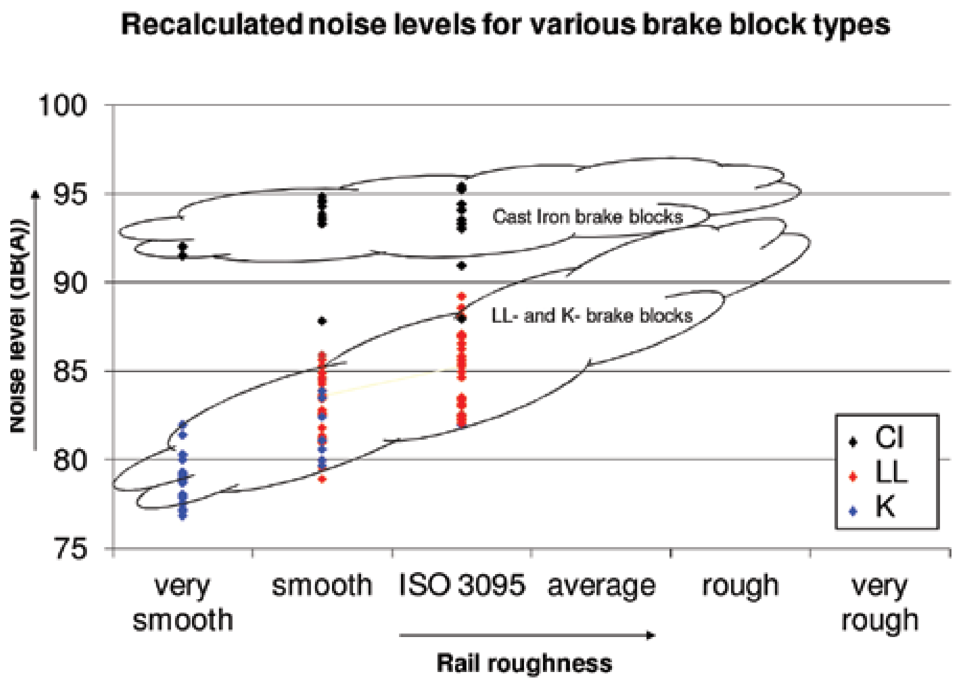
The data were then normalised to the same number of axles per wagon length and the same speed, following which there was still quite a spread due to differences in track roughness and track dynamics (see graph 1).

In order to allow a better comparison, the data was converted to a standard track roughness, in conformity with the CEN ISO3095 limit curve. After this normalisation, the results of a range of different studies turned out to be remarkably consistent.

On a smooth track, comparable to the 3095 curve, the observed differences in pass-by noise level between cast iron blocks and any type of composition block are between 7 and 10 dB(A). This means that between 5 and 10 times as many wagons could be operated on a particular railway line without incrementing the average noise level (Leq), once all wagons have been retrofitted to K- or LL-blocks.



Graph 1: Results for absolute pass-by levels normalised to number of axles per wagon length of 0,2 and speed of 80 kph



Graph 2: Noise levels recalculated to a comparable APL of 0,2 and a train speed of 80 kph for variable rail roughness (typical examples of rail roughness spectra for smooth and very smooth tracks can be found in chapter 3, for instance figure 3 for smooth tracks and figure 1 for very smooth tracks)

The report contains data on different makes of LL-blocks. Because the information on K-blocks was not always clear, all makes of K-blocks have been treated as one. One has to bear in mind that the indicated reduction applies to a smooth track. Larger reductions are possible on very smooth track, and conversely smaller reductions will be achieved for rougher track. In the case of an extremely corrugated track, there could even be no difference at all. This is illustrated in Graph 2.

The full report is available on the UIC website: http://www.uic.org/IMG/pdf/md-af20120302_noise_reduction_by_freight_wagon_retrofitting_synthesis_report_update_18012013.pdf

RIVAS – A European approach to reduce the impact of vibration from rail traffic

By B. Asmussen, UIC/DB Systemtechnik

Noise and vibration are often perceived as weaknesses in rail's environmental credentials. While noise is an issue for all modes of transport, vibration is specific to rail and therefore stands out all the more as a criticism of rail transport. The R&D project RIVAS, co-funded by the European Commission within its 7th Framework programme, is dedicated to the development of measures for reducing ground vibrations and vibration induced noise from rail traffic.

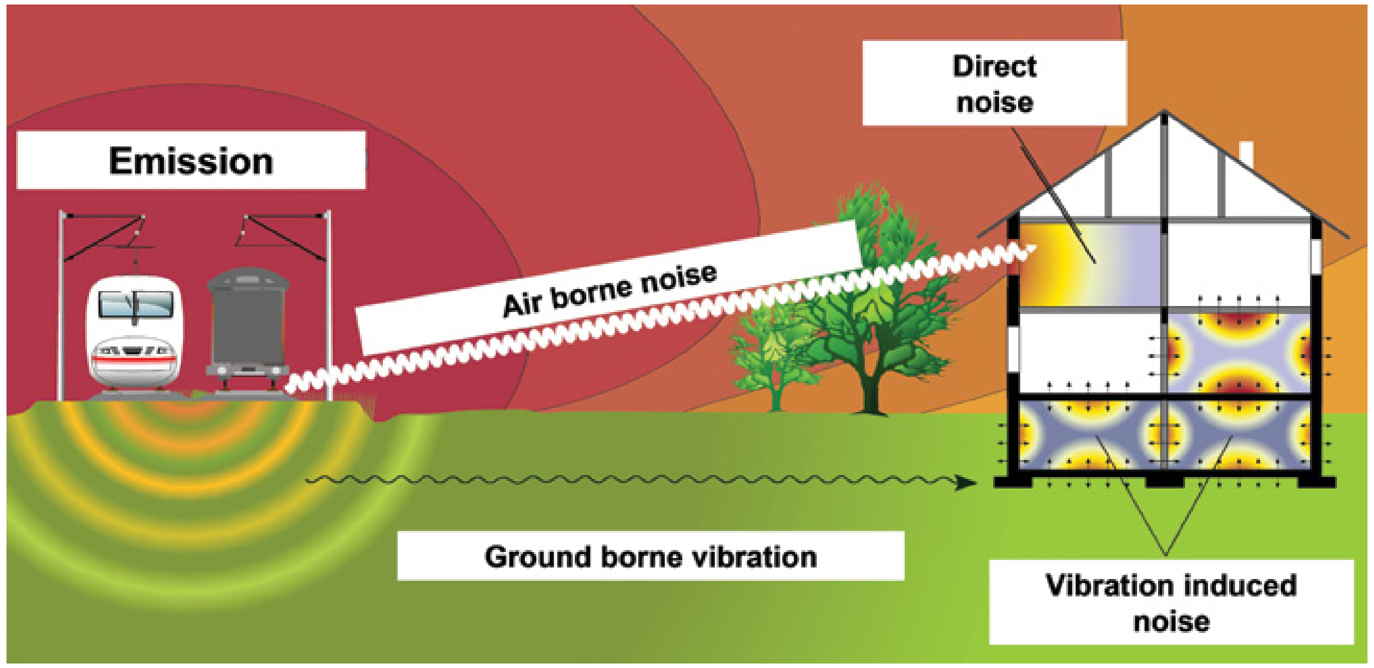


Fig. 1: General scheme of emission and transmission of noise, ground borne vibration and vibration induced noise

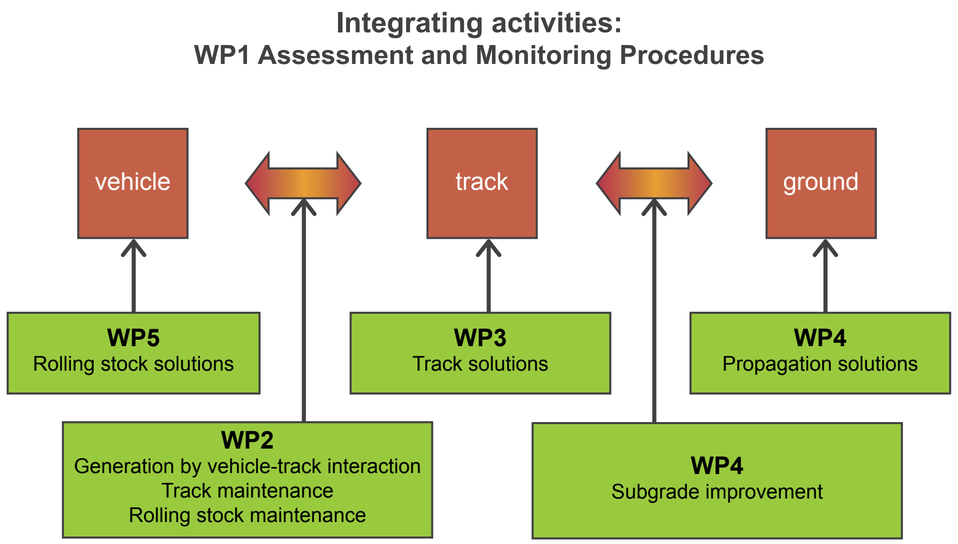


Fig. 2: Project structure of RIVAS. Work packages (WP) are dedicated to the sub-systems and their interfaces.

Early 2011, 27 partners from all over Europe formed the RIVAS (Railway Induced Vibration Abatement Solutions) consortium to come up with implementable solutions after three years of project lifetime. The partners, led by UIC, represent Infrastructure Managers, Train Operating Companies, Manufacturers and Suppliers as well as Universities and Research Institutes. Potential end users of the RIVAS results are strongly represented in the consortium. (e.g. ADIF, DB, SBB, SNCF, Trafikverket). The key objective of RIVAS is the development of innovative solutions for vibration mitigation technologies and of standardised assessment procedures for vibration mitigation measures by taking into account the full system (see Fig. 2) including the three sub-systems vehicle, track, ground as well as their interfaces.

Low vibration track design requires reducing the global stiffness of the track. Parametric studies have been performed using coupled Finite Element/Boundary Element models both for ballasted track and for slab track. Various modifications of the rail-sleeper interface as well as of the sleeper-ballast interface have been simulated taking into account different types of soil and of rolling stock with the overall target of vibration reduction. Designs of wide sleepers in combination with soft under sleeper pads and of rail fastening systems with soft under rail pads have been proposed as being the most promising solutions. Prototypes have been subjected to laboratory tests. Field tests are planned for year 2013 in France and Germany. Solutions especially dedicated to reducing vibrations emitted from curves and switches are under development.

As ground vibration from railway traffic is generated either by the static axle loads moving along the track or by the dynamic forces arising from wheel and track irregularities, it is necessary to take into account vehicle parameters e.g. wheel set mass, axle distances, and properties of primary and secondary suspension. Their influence has been quantified in a combination of state-of-the-art numerical modelling using train-track-soil models and the analysis of measurements. A similar approach has been applied to study the influence of wheel defects (most notably wheel flats and wheel polygonalisation) and of track irregularities.

A separate work package of RIVAS focuses on vibration reduction technologies in the transmission path, either under or next to the track. The options that have been studied include trenches, buried wall barriers, subgrade stiffening, horizontally-layered wave impeding blocks, and wave reflectors at the soil's surface. In a first step, these options were studied by means of computer simulations for a range of possible designs in a set of different ground types (Fig. 3). Based on these design studies field tests are planned to demonstrate the effect of soil stiffening next to the track in alluvial conditions in Spain and the effect of a soft trench barrier in Switzerland.

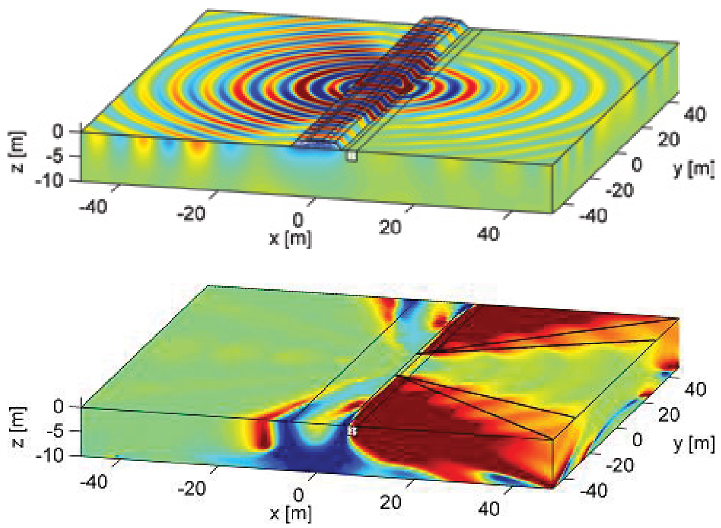


Fig. 3: Wave propagation in the ground in the presence of a trench (top) and resulting insertion loss (bottom). Computer simulation carried out by KU Leuven.

The measured vibration reductions in the ground following standard measurement procedures will be translated in terms of attenuation of vibration and ground borne noise exposure in buildings. Finally, the corresponding decrease of annoyance of people in buildings will be evaluated. Appropriate procedures have been developed within RIVAS and will be presented at the end of the project.

For more information please visit the RIVAS homepage (www.rivas-project.eu) or contact the project coordinator (asmussen@uic.org).

Development of a good practice guide for the evaluation of the human response to vibration from railways in residential environments

Within the current EU FP7 project CargoVibes (www.cargovibes.eu), the University of Salford is developing a good practice guide on the assessment of the human response to railway induced vibration in residential environments. The aim of the guidance is to provide end users with a set of practical tools to assess the human impact of "steady state" railway vibration primarily in terms of annoyance and sleep disturbance. To be published in September 2013 incorporating the views of a wide selection of stakeholders, it is intended that this good practice guide will promote policy and standard development in this field.

Good practice guide

The good practice guide will present the current state of knowledge regarding the human response to vibration in residential environments alongside the practical outputs of the CargoVibes project. The guide will aim to promote a harmonised approach to the assessment of vibration with regards to human response, whilst recognising that in current practice a range of standards are in existence in different countries. Three broad areas related to the human response to railway induced vibration will be addressed:

1. annoyance,
2. sleep disturbance, and
3. non-vibrational factors.

Whilst the primary aim of the CargoVibes project relates to freight operations, it is not intended that the good practice guide be restricted purely to freight but to be applicable more generally to railways. Although recent research by the University of Salford has suggested that there is a difference in response between vibration from freight and passenger trains, most studies into the human response to vibration have not separated the effects of vibration from passenger and freight activities.

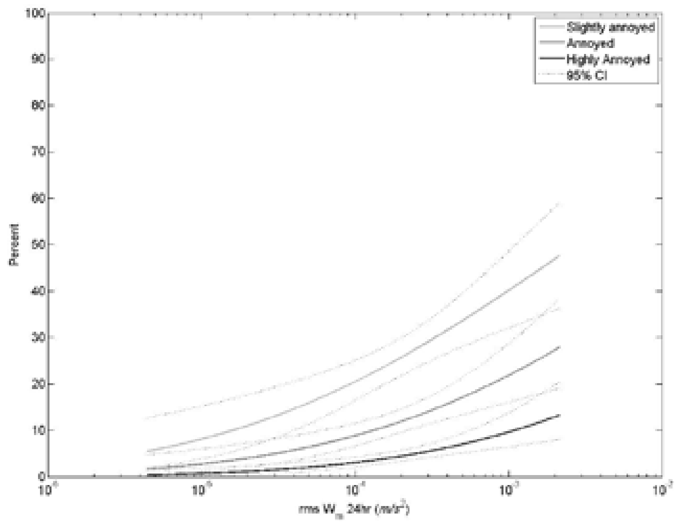
International workshop

The development of the good practice guide will include a workshop hosted by the University of Salford in May 2013, the outcomes of which will be incorporated into the document. The primary aim of the workshop is to gather a variety of stakeholders, not restricted to members of the UIC and CargoVibes, to discuss key aspects and challenges of the evaluation of vibration in residential environments with respect to human response. The workshop will consist of three sessions:

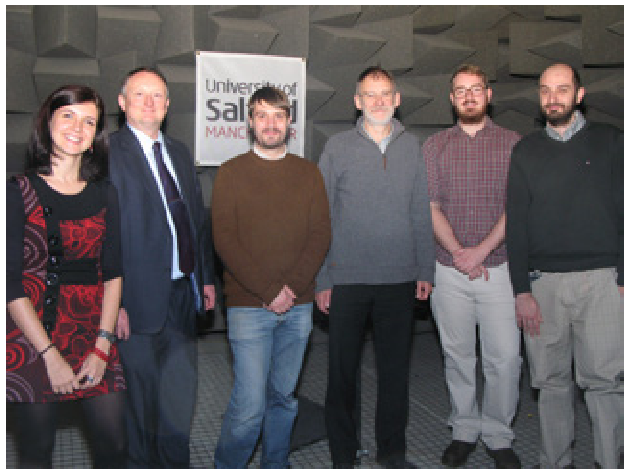
1. Issues related to annoyance will be led by Sabine Janssen (TNO, Netherlands) and Bernd Assmussen (DB, Germany),
2. Sleep disturbance will be led by Kerstin Persson-Waye (Goteborg University, Sweden) and Martin van den Berg (Ministry of Infrastructure and Environment, Netherlands), and
3. Non-vibrational factors will be chaired by Ronny Klæboe (TØI, Norway).

Annoyance

Annoyance is one of the most widely used measures of the impact an environmental stressor has on the population and is often the measure on which policy development is based. Although there are a number of field studies that have related vibration exposure to annoyance, comparison of the results of these studies is problematic due to differences in the metric used to express vibration exposure. The good practice guide will review these studies and present the initial efforts of harmonisation of socio-vibrational field data by TNO. Practical issues relating to the measurement of vibration and current vibration limits will also be discussed.



Exposure-response relationship developed by the University of Salford for railway vibration in the UK



University of Salford Noise and Vibration Research Group, left to right: Eulalia Peris, David Waddington, James Woodcock, Andy Moorhouse, Calum Sharp, Gennaro Sica.

Sleep disturbance

Sleep is considered by the World Health Organization as an important biological function – the disturbance of which can deeply impair health. There is clear evidence that exposure to environmental noise can result in sleep disturbance but as there are comparatively fewer studies, the evidence is less clear for sleep disturbance caused by vibration. The good practice guide will review available evidence relating vibration exposure to sleep disturbance and outline the main results of a laboratory based sleep study conducted by the University of Gothenburg for the CargoVibes project.

Non-vibrational factors

It is well established that the human response to environmental noise is strongly influenced by non-acoustical factors and there is no reason to assume that this is not the case for the human response to environmental vibration. Situational and attitudinal factors that have been found to influence response to vibration in research by the University of Salford and by TNO will be reported and discussed in the guidance document.

Banner for the international workshop

Further Information

The good practice guide will be published in September 2013. A draft of the guide will be presented at the International Workshop on Railway Noise 2013 where the authors will be available to take comments and contributions.

Contact:

James Woodcock: j.s.woodcock@salford.ac.uk

For further information please visit

http://hub.salford.ac.uk/vteam/workshop and www.cargovibes.eu.

News & next events to note

9 September 2013

The next Noise Network meeting will be held on 9 September in Uddevalla, Sweden. This will immediately precede the 11th International Workshop on Railway Noise (http://www.chalmers.se/am/iwrn11-en) and has been organised with the generous assistance of Chambers University and TrafikVerket.

IWRN11
Uddevalla 9-13 September 2013

25-28 November 2013

The next World Rail Research Congress will be held on 25 to 28 November 2013 in Sydney, Australia.

Proposals for the control of freight noise by the European Commission

The European commission has launched a study on policy options for "Effective reduction of noise generated by rail freight wagons in the European Union". A more detailed description of this "Roadmap" can be found here: http://ec.europa.eu/governance/impact/planned_ia/docs/2014_move_008_noise_reduction_rail_fraight_wagons_en.pdf

An impact assessment will be completed in January 2014 considering seven policy options:

1. Status quo, voluntary implementation of NDTAC [baseline scenario]
2. Increased financial support for retrofitting of existing wagons with low-noise blocks [incentives approach]
3. Mandatory application of noise-differentiated track access charges ["NDTAC approach"]
4. Mandatory application of TSI-noise limits to all existing railway wagons ["TSI Noise approach"]
5. Introduction of a noise limit along the TEN-T railway network ["TEN-T approach"]
6. Introduction of a general maximum transport-related cumulative noise exposure ["environmental health approach"] (inter-modal)
7. Introduction of a noise limit for the entire rail network, but with some cost-benefit analysis considering population size and density.

Both public and stakeholder consultations will be completed during summer/autumn of 2013. UIC will continue to work closely with CER and other stakeholders to promote effective noise control in context with Sustainable Development.