

Documentation on Noise-Differentiated Track Access Charges Information on Status, Background and implementation

Documentation on Noise Differentiated Track Access Charges: Executive Summary

> **Railway noise reduction is on the political agenda.** Noise on Europe's rail routes is increasingly resented by the population, leading to demands for operational restrictions. The main sources of noise are freight wagons fitted with cast iron brake blocks. This braking technology produces rough running surfaces on wheels which cause the noise. A solution would be to convert the European fleet of freight wagons to synthetic brake blocks. This requires braking technology that is available, safe and economical. Status of these developments is documented in several UIC documents, for example the UIC Status Report 'Noise Reduction In Rail Freight (2008)' and the information is regularly updated in UIC's newsletter 'Focus' which is available at UIC's homepage. Retrofitting the European rail freight fleet involves total costs of €1 - €3 billion, which the railways cannot meet. Possible finance models are either direct subsidy for the conversion or indirect subsidy in the form of a noise-related bonus on track access charges.

The Commission's Communication on railway noise, published in July 2008 as part of the Greening Transport package, recognizes that the most efficient way to reduce railway noise consists in retrofitting the existing freight fleet to low noise technology using composite brake shoes instead of cast iron shoes. The Commission wishes to stimulate the retrofitting process by introducing noise related track access charges (NRTAC), first on a voluntary basis, then through a mandatory regulation. The noise related component of the track access charge will first be a bonus for low noise trains or vehicles, later on it can be complemented by a malus for noisy trains or vehicles.

> **This documentation summarizes the processes and conditions** to be taken in account when discussing the introduction of noise-related track access charges in order to make them both efficient and effective as well as the practicable means to implement such processes.

> UIC's "**Status Report and background information on noise related track access charges (2007)**" gives an overview on processes and conditions to be taken in account when discussing the introduction of noise-related track access charges:

Track access charges are imposed on all European rail networks on the basis of EU Directive 2001/14/EC. These charges differ greatly in amount and type between the different rail networks. The charges are imposed for whole trains, not for individual wagons - the types of vehicle or their equipment plays practically no role. Switzerland is acquainted with noise-related track access charges. In a pragmatic approach a noise bonus of ~5% of the track access charge is credited. Also the Netherlands did introduce noise related track access charges in 2008. For single wagons, the administrative cost of determining the noise refund is practically the same as the refund itself. However, the costs may be justifiable for whole trains.

Rail freight traffic forms a complex business involving a variety of parties, in clearly defined roles in operating the railway transport system. Liberalisation of the railways has led to a multitude of transport undertakings being established in place of the state railway in practically all states, thus also generating new roles: wagon rental companies, as logistics companies, offer whole rail transport and thus take over roles previously reserved for the railways. Nowadays, the "freight train" system is a complex method of transport with a high number of participants and the image of a freight train belonging to one railway and running on one rail network is a thing of the past. Today there are three levels involved: the infrastructure operator, the RUs providing the train and motive power and the wagon leasers/owners. Various stakeholders or businesses are frequently represented on each of these levels. Correspondingly, the party paying the track access charge is seldom the owner of the railway wagons. There is a lack of railway sector-wide systems determining which vehicles operate where.

The introduction of NRTAC will need new processes and new technical means for tracking single wagons and to record of tracking history on the various networks. The "**Annex on Implementation (2009)**" provides an overview on the various implementation possibilities for introducing NRTAC, and the related technical and financial consequences, it was elaborated jointly by CER, UIC and EIM.

Existing NRTAC applications are pragmatic: There are two existing pragmatic implementations of NRTAC (in Switzerland and the Netherlands) as well as some existing pilot applications to monitor existing noise in the Netherlands. In both countries the NRTAC was not used by any company as incentive to retrofit a

vehicle, either due to the too low level of the bonus or due to the too small mileage achievable in these two countries (Swiss rolling stock retrofitting is fully financed by the state).

Future tools and processes which might be used for the purpose of NRTAC have been described and evaluated in depth. Concerning the investigated existing international data exchange between the railways, the conclusion is that between most European railway freight undertakings, data exchange supported by powerful data networks and systems is already in use. This data exchange is dedicated to improve international traffic, to reduce costs and to improve transport information between the various actors. Data exchange emphasizes train movement, but it includes also data concerning the wagons and its equipment. However data exchange is focused on the business needs of freight transport. The information needed to raise NRTAC is not available from this but might be added with reasonable and feasible efforts. All the RU's have to take part if the systems are to be useful.

An evaluation using customer consignment note data and/or an the various wagon register data was carried out as well as an evaluation of the wagon tracking technologies including RFID-technologies, GPS-technology and video technology. Special emphasis was laid on an evaluation whether to use the technology offered in the framework of the TAF TSI. The evaluation using TAF-TSI showed that additional functionalities have to be developed and integrated within the TAF TSI Regulation. This process will require time and significant sums of money. Additionally the processes of production for RUs and billing for IMs would be confronted with significant changes and new requirements. For example, a number of IMs in Europe bill the kilometric performance based upon the timetable while others bill on the basis of operated kilometres. Any train path kilometre registered in a TAF TSI system will cause incompatibility with the existing billing systems of some IMs. In conclusion, the use of TAF TSI faces two major problems: the existing legal and technical framework for TAF TSI does not contain any type of message which would allow the operation of a NRTAC. Finalization of the TAF TSI framework also cannot be expected before 2014. The adaptation of TAF TSI would need a revised TSI, causing substantial additional costs and needing 1-3 additional years. In addition there will be the need to increase the bonus to finance the retrofitting of wagons with LL-blocks significantly to include these implementation costs.

For every efficient alternative the National Vehicle Register data will in any case form the most important source of information on the wagon which has to be gathered as one basic component to raise NRTAC. However this information has to be integrated in all the various existing databases and supplemented if needed with recent information (wagon data including braking equipment); further the data must be regularly updated either by the RU, the wagon owner, infrastructure manager, a railway organization or a railway agency. Currently the owner of the relevant data differs all over Europe. Minimum requirement will be to introduce the needed characteristics to raise noise-related components of track access charges as a mandatory component of the train/wagon data acquisition and their mandatory passing on according to the international TSI, including an appropriate marking of the wagons. The starting point for such a procedure has to be an internationally coordinated definition of low-noise wagons.

The mileage of the vehicle on a specific network has to be gathered from other sources to enable the infrastructure manager to raise NRTAC. Even if every infrastructure manager has this information at his disposal it cannot be neglected, that at a European level there will be some 25 ways to come to a solution. Generally speaking the IM will have the information about trains (but not always about wagons), and RUs and IMs will need in any case information about wagons for safety reasons, and this information has to be combined.

For automated tracing and tracking of the vehicles for instance RFID could form a possible solution, at least on a national scale. In the past, general deployment of such equipment was discussed and checked, but could not even been decided positively when companies were still integrated; the splitting between IMs and RUs will make introduction of such a system even more complex.

At the other hand, combining the existing data of the NVR and from the General Contract of Wagon Use offers a simple, manageable solution with clear cost advantage over the introduction of expensive, sophisticated systems for NRTAC. In addition, this solution can be implemented Europe-wide and in a relatively short term. However this data will have to be combined with the mileage data of the wagons driven on the various networks.

Cost considerations include retrofitting costs, the operational costs and the transaction costs - therefore the introduction of noise related track access charges will have a considerable impact of costs. Costs are for one part caused by the installation and maintenance of any recording system and in the other part by the operating of the recording and billing system needed to raise NRTAC. All these cost will have to be added to the costs for retrofitting the freight vehicle fleet to low noise technology. The magnitude of implementation costs are –depending on the chosen solution- for the installation and maintenance between zero (self declaration) and ~300 Mio € (GPS-Technology) and for the operating the system only for Germany between 12 Mio €/y and up to over 100 Mio €/y. These costs have to be put in relation to the retrofitting costs of ~650 Mio €. While the retrofitting costs have the benefit of direct noise reduction it has to be pointed to the fact, that the implementation costs of NRTAC have no direct impact or benefit regarding the envisaged noise reduction. In order to really have an incentive for retrofitting other models, than NRTAC with a more direct cost flow to the wagon owner should also be considered.

Conclusions

> **The introduction of noise-related track access charges is not easy.**

Allowance must be made for the complexity of existing freight traffic and all its processes, which prevents the introduction of "simple" systems.

> **If noise-related track access charges are to be introduced, they must be harmonised across Europe.**

Only harmonisation can ensure that the administrative and technical outlay remains within reasonable limits.

> **For a fast implementation of NRTAC, the availability of LL-blocks is a prerequisite.**

> **Self declaration using Wagon Register and General contract of use data forms an efficient possibility of implementation** - at least for a starting period.

> **Preparation of vehicles is indispensable.**

For any tracking technology Preparations of vehicles and installations (TAF-TSI) are indispensable for efficient, effective application.

> **The introduction of noise-related track access charges must be prepared well and needs time.**

The probable time frame is at least 4-8 years.

> **Direct subsidy could be introduced more quickly as an incentive system.**

However, direct subsidy of low-noise vehicles requires administrative preparation, but overall could be achieved more quickly.

> **Direct subsidy first, noise-related track access charges later.**

In order to quickly reduce noise in Europe, direct subsidy, which can be introduced more quickly, should be implemented. Direct subsidy can be replaced by noise-related track access charges later. Benefit from direct subsidy should be recorded in the vehicle data. Such vehicles could not benefit from a noise bonus.