# Rail Charging and Accounting Schemes in Europe

## Case studies from six countries

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# 1. INTRODUCTION

The European railway market has undergone important restructuring over the past two decades. EU policy has been aimed at increasing the integration of the railway sector as part of completing the internal market and achieving sustainable mobility. Directive 2001/14/EC provides a general framework for setting rail infrastructure charges for the use of domestic and international services. It also aims at reducing the variation in the structure and level of railway infrastructure charges and to ensure transparency and non-discriminatory access to rail infrastructure.

Infrastructure charges can account for a significant part of the costs of a railway operator. The levels and structure of the charge are therefore crucial in determining the competitive position of rail in relation to road transport. It is, however, noteworthy that directive 2001/14 does not set the objective of a common level of track access charges all over the EU. On the contrary, the directive allows, and in some cases even requires, infrastructure managers to spread charges on their network, for instance to reflect different costs of operation, or to reflect scarcity of rail capacity in the charges.

The railway market, however, is developing; most markedly in the Central Eastern European countries where the market is still in a transitional phase. The situation today relating to charging systems in Europe can be characterised by the variety of charging systems in application. This has led the European Commission to develop the RailCalc project[1] which has a double aim: a) to develop a best practice guide to verify compliance of rail infrastructure charges within the rules of Directive 2001/14 and b) to analyse the way infrastructure charges are calculated in Member States and to thereby harmonise accounting practices in this domain.

Even though a higher degree of harmonisation can be helpful under certain conditions, the differences in operating conditions of the Infrastructure Managers (IMs) should not be forgotten. National access charge regimes should be related to the complexity and intensity of the use of their rail network and should respect specific market conditions within their environment. Furthermore, the costs of the Infrastructure Manager (IM) are to be covered jointly by the access charges as well as by government funding. This means that the level of government funding (dependent on national policy) has a direct impact on the setting of infrastructure charges.[2] In addition, costs largely reflect the size and equipment of the network, which is mainly determined by market and public requirements, the labour force employed and past funding decisions. Decades of underinvestment, in particular in parts of Central and Eastern Europe, make current operating costs in many cases very high. Of course, the need to preserve the managerial freedom of the IMs in order to fulfil their business plan should not be questioned. However, this freedom should not lead to a disregard for the reasonable requirements of their customers – the railway undertakings.

The railway sector cannot be viewed as detached from the rest of the economy. As one of the modes of transport, rail has to deal with competition from other modes. At the same time, one key issue for logistic operators is the cost – including quality - of using different modes of transport along a corridor. The setting of charges for infrastructure must therefore be done so as not to reduce the competitiveness of the rail sector in relation to other transport modes.

Any attempt therefore to harmonise the charging framework would not be effective if it did not take into account these differences. The aim of this booklet is to supplement and expand on the RailCalc study of the European Commission by looking at six case studies from the European railway sector.

1 The study started in October 2006 and is expected to be completed in May/June 2008.

2 The level of government funding varies around Europe. Where the State provides a high degree of funding, IMs can afford to set low access charges, usually referred to as marginal cost. In parts of Central and Eastern Europe, by contrast, the government provides no or insufficient funding. The important point to recognise here is that IMs cannot freely choose the level of access charge.

These case studies are an interesting representation of the existing situation in the European railway sector.

The booklet focuses on the principles of the access charges applied in each presented case study, not only providing an overview, but also showing the link to the operating environment for which they apply. The related accounting systems are also included. More specifically the following country cases are examined in the booklet (see also Table 1.1 for an overview):

Belgium (chapter 2). Infrabel – part of the SNCB group – has been in charge of rail infrastructure management since January 2005. Infrabel is developing an Activity-Based Cost approach in its accounting practices.[3] Of specific interest is the decision to include the environmental parameter in the calculation of the line charge.

France (chapter 3). Réseau Ferré de France (RFF) is a Public Entity which owns the French rail network and is responsible for upgrading, developing, and enhancing the network whilst guaranteeing its overall coherence. RFF has one major customer (SNCF) and – at this point in time - six others. Relating to its pricing policy RFF aims at contributing to the infrastructure costs through its charging scheme, while charging is also based on the segmentation of the railway lines.

Germany (chapter 4). Here the IM (DB Netz) is a separated subsidiary of DB AG, a holding company. While DB AG also has the main railway undertakings under its roof, the market is very dynamic, with 328 independent railway companies operating on the network of DB Netz AG. For example, in the freight market the market share of DB's competitors rose to 16.4% in 2006 (a 27.9% increase from 2005). The infrastructure charging system of DB Netz aims towards full cost recovery after consideration of subsidies plus return on investment. The accounting system follows a decentralised structure, which guarantees full compliance with the strict legal requirements regarding accounting and organisational unbundling. Sophisticated cost accounting instruments have been gradually implemented since DB was set up as a privately managed company in 1994. This includes a target costing scheme and the use of direct costing ("Deckungsbeitragsrechnung").

Great Britain (chapter 5). Network Rail is the IM for Great Britain and runs, maintains and develops Britain's tracks, signalling system, rail bridges, tunnels, level crossings, viaducts and 18 key stations. Network Rail is a private company limited by guarantee. It is for-profit, but not for dividend, implying that profits are re-invested in the rail network. Network Rail's charging is developed as part of the multi-annual contract review conducted by the independent regulator (Office of Rail Regulation) involving a key role for Government in terms of industry service specification. Charges are set to reflect the costs caused by different vehicles, and Network Rail is improving the models and information available to accurately estimate these costs.

Hungary (chapter 6). The IM in Hungary is a separate organisational entity within MAV Co. Pricing aims at achieving full cost recovery, (except approx 10-12% State subsidy) without profit. The company has recently introduced a new Activity-Based Cost accounting system.

Latvia (chapter 7). Latvia is a typical case from the three Baltic States, with high volumes of cargo traffic and limited passenger demand. LDZ, the IM, is part of a holding company. It is already using a rather advanced Activity-Based Cost model, which requires very fine distinctions between cost centres, but also within each cost centre. Two more companies (along with the freight operator of LDZ) offer cargo services, while passenger services are handled by LDZ. The basic approach to charging is the full cost recovery method taking into account state funds.

3 In railways, infrastructure Activity-Based Cost accounting (ABC) is a system for assigning costs related to network provision based both on the activities required and on the actual use of assets it implies, using discrete information, as much as possible.





**Table 1.1 Overview of booklet country chapters**

| Country | Infrastructure Manager | Main charging principle |
|---|---|---|
| Belgium | Infrabel | Full costs after subsidies |
| France | RFF | Marginal costs with mark-ups |
| Germany | DB Netz | Full costs after subsidies |
| Great Britain | Network Rail | Marginal costs with mark-ups |
| Hungary | MAV Co | Full costs after subsidies |
| Latvia | LDZ | Full costs |

Looking at the structure of the access charges, these case studies confirm the wide variety of systems currently in application. Looking at the level of charges it is clear that these have to reflect the individual situations and goals. Differences also appear in the accounting systems, which are adapted to the different background and needs of each IM.

These examples, therefore, illustrate clearly the complexity of the market. By looking at the charging and accounting principles applied in each case, it becomes clear that different practices can exist for different operational and political goals.

A common system for the provision of cost information as an input to the calculations of access charges by the IM would, in principle, be welcomed. However, the charging principles relate to the targets, the individual operating environment and the business case of each IM. It should also not be forgotten that fixing infrastructure charges is also a political issue and differs from one country to the other because of different political objectives being pursued. Against this background, harmonisation of infrastructure access charges seems to be extremely difficult, if not impossible. Perhaps future market development and practical experience after the liberalisation of the rail freight (2007) and passenger (2010) markets will deliver indications of whether and how harmonisation of rail infrastructure access charges should be further pursued.

# 2. BELGIUM

*Veerle De Roock, Infrabel*

## 2.1 Introduction - Infrabel

Infrabel is part of the SNCB group and is a subsidiary of SNCB Holding. Since January 2005, Infrabel has been in charge of rail infrastructure management and has encouraged intermodal and intramodal competition. Over the period 2005-2007, Infrabel has invested more than € 3.3 billion with a particular focus on the extension and the modernisation of the Belgian network.

## 2.2 Current charging & accounting principles

### Legal framework

The track access charges of Infrabel are based on the following legal texts:

- Directive 2001/14/EC of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification, and in particular, chapter II (Articles 4 to 12): Infrastructure charges;
- The Belgian law dated 04/12/2006 and in particular chapter V (Articles 46 to 60): Infrastructure charges.

### Services covered by the charge

The track access charge covers:

- the minimum service package:
  - handling of requests for infrastructure capacity;
  - the right to use capacity, which is granted;
  - use of running track points and junctions;
  - train control including signalling, regulation, dispatching and the communication and provision of information on train movement;
  - all other information required to implement or operate the service for which capacity has been granted.
- the access to service facilities and supply of services:
  - use of electrical supply equipment for traction current, where available;
  - refuelling facilities;
  - passenger stations, their buildings and other facilities;
  - freight terminals;
  - marshalling yards;
  - train formation facilities;
  - storage sidings;
  - maintenance and other technical facilities.

### Composition & structure of the charge

The track access charge is made up of four components:

- **The train path-line charge** for access and use of the lines is the sum of the charges due for each section of line travelled. The charge per section results from the multiplication of a unit price per kilometre by coefficients:

$$TR\text{-}L = P \times Pt \times \sum L(i) \times C1(i) \times C2(i) \times Ce \times C(i) \times H(i) \times T(i)$$

P : indexed unit price per kilometre, used for all the lines in the railway infrastructure

Pt : coefficient of priority of movement, a function of the quality of the service offered by the Infrastructure Manager (IM) and in particular the level of priority allocated to the train compared to other movements in the event of traffic disruptions

(i) : the section travelled on the route

L(i) : length of the section expressed in kilometres, determined when the train path is allocated

C1(i) : coefficient relating to the operational importance of the section

C2(i) : coefficient relating to the technical equipment on the section

Ce: coefficient of environmental impact (currently Ce = 1)

C(i) : coefficient of mass (tonnage) of the train

H(i) : coefficient relating to the time slot, the day and the direction of movement, depending on the time and the day where the train path is situated on the section of line

T(i) : coefficient of deviation compared to the standard train path depending on the difference between the travelling time needed for the train path on the section of line and the standard time.

- **The train path-installations charge** for access and use of the tracks with a platform and certain arrival and departure tracks is calculated using the following formula:

Passenger trains:
$$TR\text{-}I = Pv \times Cu \times C(i) + Pv \times \frac{C(i)}{5} \times time\ (1 + \frac{C(i)}{100})$$

Freight trains:
$$TR\text{-}I = Pm \times Cu \times C(i) + Pm \times \frac{C(i)}{100} \times time\ (1 + \frac{C(i)}{10})$$

Pv/Pm : the indexed unit prices relating to the category of train (Pv for passenger trains and Pm for freight trains)

(i) : installation (platform, arrival or departure track)

Cu : coefficient relating to the nature of the use of the installation (train departure, arrival, commercial stop or an obligatory service stop)

C(i) : coefficient relating to the operational importance of the installation (i) and its equipment

time : time (expressed in minutes) of occupation of the track beyond the flat-rate deadline defined. The flat-rate deadline for a passenger train is 30 minutes and for a freight train 120 minutes

- **The shunting charge** for access and use of the installations for the formation of trains, train marshalling and the parking of rolling stock is calculated as follows:

RR = M x [Co x RB x (1 + S Cn ) + C(IB) ] per metre (*) on an annual basis

M : unit price on an annual basis, indexed, utilised for all the railway infrastructure installations concerned

Co: coefficient of increase relating to the operational importance of the tracks or sidings

RB : charge for a siding with dead-end tracks and no particular equipment

Cn : coefficient of increase relating to the equipment of the siding: depending on the equipment, one or more Cn coefficients may be applicable

C(IB) : possible supplement in the event of service of track and signalling appliances operated by the IM.

(*) a track made available to a user is always billed for its total length.

The **administrative costs** for the handling of the capacity demands are billed for any study, request or modification of capacity (train path or shunting capacity) coming from a Railway Undertaking (RU). It is a flat rate sum independent of the length and the number of days that the train path is used:

AK = A Euro, with A = annually indexed unit price

The above listed formulas, and also the unit prices and the values of the parameters used in the formulas are described in the Network Statement (chapter 6 and annexes 31, 32 and 33) and are published by Infrabel on http://www.railaccess.be.

### Adaptations of the track access charge

The values of the various parameters for the calculation of the charges remain valid throughout the duration of the current duty roster. Except the annual indexing of the unit prices, the track access charge can only be changed in case of: modification of the legislative framework governing the charge, modification of the



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contribution of the State to the public service obligation relating to infrastructure management or under the conditions laid down in the framework agreement (for example, modification of the infrastructure).

### Charge collection arrangements

The train path and shunting charges are payable in advance every month. These advance payments are to be made to the IM by the 20th of the month preceding the month of utilisation. Failing such advance payment, the IM may withdraw the capacity granted.

In principle, the charges for train path lines and train path installations for the capacities granted are payable in full by the RU. In the event of cancellation of the train path, the amount payable for the unused train paths will be calculated as follows:

**Table 2.1**

| Announcement of cancellation (time before planned movement) | Percentage of charge payable |
|---|---|
| < 1 day | 100% |
| Between 1 day and 30 days | 30% |
| Between 30 days and 60 days | 15% |
| > 60 days | 0% |

At the end of each month, the IM calculates the total charges due for the use of the railway infrastructure. When these bills are drawn up, account is taken of the advances already invoiced and paid. Invoices are payable within 30 days.

## 2.3 Past development

### From two components to four components

Before 2006, the track access charges were made up of only two components: a train path-line charge and a train path-installations charge. The train path-installations charge was calculated independently of the time really consumed by the RU in the installation. Moreover, in some installations the train path-installations charge was not calculated, which meant that some RU's were using marshalling yards without being charged.

In 2005, this led to a restructuring of the track access charge. From then on, the charges were made up of four components: train path-line charge, train path-installations charge, shunting charge and administrative costs. In the train path-installations charge a component was added to the formula dependent on the time consumed by the RU in the installation. Secondly, the shunting charge was defined to cover the use of all other installations that are not covered by the train path-installations charge. Administrative costs were also introduced to cover the costs for the handling of the capacity demands.

### Introduction of ArtRob

Before the start of the 2006 timetable, Infrabel invoiced the track access charges by multiplying an average track access charge calculated on the planned trains by the total number of train-kilometres run on the network. The RU's provided the data of these train-kilometres.

This meant that Infrabel could not automatically generate detailed bills of the track access charges train by train. Following the liberalisation of the railway traffic and the independence of Infrabel, the calculation of the track access charges needed to be based on own information. In addition, the restructuring of the track access charges at the end of 2005 as described above (see paragraph 2.1), meant that a lot of new components (e.g. charge for capacity granted and not used, time dependent component in the formula of TR-I, administrative costs, etc.) needed to be calculated from the start of the time table in December 2005.

Therefore, Infrabel developed an IT-application called ArtRob (Advanced Railway Traffic Rail Operator Billing) to support the calculation and billing of the track access charges. ArtRob calculates train per train and day per day the corresponding track access charges based on the planned timetable and taking into account real-time data of the trains (e.g. modifications of the path, tonnage). To limit manual interventions to a minimum, organised and structured data management was necessary for the correct calculation and billing of the track access charges.

## 2.4 Recent development and upcoming reforms

### Improvement plans

**ABC-Cost Model**

According to the management contract between Infrabel and the Belgian State, Infrabel is to start a study to objectify the parameters used in the formulas for the calculation of track access charges. The intermediate objective is to check if the total amount of track access charges covers the costs related to the exploitation of the network. Ultimately, this study should optimise the charging structure to stimulate the optimal use of the infrastructure.

Therefore, Infrabel built an Activity Based Cost model. In the first iteration of the model, the aim was to chart all exploitation costs made by Infrabel for all the products and services offered. In the model, the costs are allocated directly to the products and services offered or indirectly by using activities based on the organisation chart of Infrabel. In the meantime, the first run has finished and Infrabel is refining the model and cost allocations. In the long-term, Infrabel should introduce an Enterprise Resource Planning (ERP) system (see also in paragraph 3.4). This ERP-system will provide more detailed information about cost allocations to the individual products and services offered by Infrabel.

**Shunting charge**

Infrabel defined in 2005, as described above, the shunting charge as a new component in the formulas of the track access charges. Currently, Infrabel has difficulties in collecting the data about real-time occupation of the tracks needed for the billing of the shunting charge. As a result, the shunting charge is not yet used. Nevertheless, Infrabel plans to activate this formula and therefore it started registering demands of capacity in marshalling yards and real-time occupation of the tracks to make it possible to bill the shunting charge. Activating the shunting charge will also facilitate operations of the movements in some installations where several RU's are active by the use of defined time slots.

### Rationalisation

**Service Level Agreements**

Through a series of Service Level Agreements (SLAs), Infrabel is formalising its commitment to offer a quality service to every RU present on the Belgian network, in particular with regard to the fluidity and punctuality of traffic.

This agreement is, however, a first step towards Infrabel's self-imposed improved quality. Other similar agreements are being prepared, for mobile signallers, respecting opening hours of sites (shunting/marshalling yards), the advanced notification of upcoming works, delays in allocating train paths according to the presently valid standards and, if need be, the tracing of efficient alternative itineraries.

At this point in time, these SLAs do not have defined monetary values attached to them and no financial retribution is due. However, at the end of a test period, it will be possible for the different players to take a unanimous decision to link financial repercussions to the penalties incurred.



**Capacity granted and not used**
In order to rationalise the use of the infrastructure and to prevent RUs from reserving capacity to block the development of another RU, Infrabel introduced in 2006 the principle of paying for cancelled train paths. The amount of track access charges that have to be paid depends on the time of cancellation.

In practice, it seemed very difficult for freight operators to respect the initial timeframe of 3 days to cancel a path, as foreseen between 2006 and 2008. For this reason, Infrabel decided to propose a motion of the legal text that was adopted in 2008 (see Table 2.1).

**Administrative cost**
Each capacity demand by the RU requests a specific study by Infrabel. To avoid that a RU asks for unproductive studies, Infrabel charges the RU a flat rate sum for any study, request or modification of capacity (train path or shunting capacity) to cover its administrative costs. This administrative cost needs to be paid by the RU even if the capacity granted is not used afterwards. These administrative costs give the RUs an incentive to cluster their capacity demands and to avoid needless demands.

**Weighing system**
One of the parameters in the formula of the train path-line charge is the total mass of the train. At the moment, Infrabel uses information on train weights gathered by the RUs. Before the departure of the train, the RU has to give, via a web-application, information about the composition of the train, the type of dangerous goods it is transporting and the weight of the convoy.

In order to have more accurate information about the weight of the train and in order to simplify the operations before the departure of the trains by avoiding the input of some data, Infrabel has started a study on the possibility of implementing a weighing system all over the Belgian Network. The information collected by this system could also be helpful to make more precise bills regarding the electric traction power that is consumed by the RUs (see next paragraph).

### Environmental concerns

**More precise measuring of the consumed electric traction power**
The whole process of billing electric traction power is based on computer programs taking into account, among others, the type of traffic and weight of the train. Although, this method is quite well accepted today, it is not the optimal one because:

- it does not allow billing for what a RU has consumed in real terms and;
- it gives no incentives to save energy and to use it efficiently.

The first step in calculating bills that are more precise is to determine the weight of the trains using a weighing system, which is currently in the study stage.

At the same time, Infrabel has started a project to test meters placed on locomotives in order to obtain better data on consumption of traction power. This should help to further improve the accuracy of the energy bills to the RUs and should help the RUs to improve their way of driving and thereby reducing their energy consumption.

**Environmental parameter Ce in formula**
The formula to calculate the train path line charge contains an 'environmental cost' parameter Ce. This parameter multiplies in a linear way the cost for the use of a stretch of track. At the moment, by default, the value of this parameter is 1.

In the future, this parameter could be modulated according to the lines; the rolling stock used etc., in order to take into account the environmental nuisances such as noise or traction energy used.

### New accounting rules taken into account

**Enterprise Resource Planning (ERP)**
Infrabel has started implementing an ERP organisation. The ERP with regards to 'charging methods' can be summarised as an industrialisation of the existing costing models. This costing model has been developed in order to verify whether the price of Infrabel's products matches the costs involved. The model is run once a year, and updated according to Infrabel's accounting information.

In the future, Infrabel will be able to tell the cost of its products in 'real time'. It will then be easier to fine-tune its 'charging methods'. This is thanks to the EPR structure of the Cost Centres, to the improved update of the centralised data and to better fine-tuning of repartition keys.

## 2.5 Recommendations

**An open framework for track access charges**
Today, there is a huge difference in the way the track access charges are calculated throughout the different European countries. Some Member States consider the distance as an important parameter, others prefer taking into account the weight of a train and a third group takes both factors into consideration.

The formulas used are also very different from one country to another. In some cases, the formula is rather simple and in others, it is more complicated.

Even if one unique formula is not realistic because each country has its own specificities, a common framework for the access charges could be a positive element to allow the RU's to have a better view of the price they pay. It could also allow for easier comparison of the level of charging between the countries.

Another element that makes matters more difficult is the level of subsidies paid by Member States. Comparing the access prices of one IM that has to cover 50% of its costs by track access charges, with the price applied by another IM that only has to cover 20% of its costs is neither fair nor transparent.

**Discounts and mark-ups**
The framework defined in the European Directives with regards to discounts and mark-ups is too restrictive. Discounts are only authorised in a certain limited number of circumstances and the way mark-ups could be applied is not clear. This should be further reviewed.

**Fair competition between different transport modes**
The European Commission has launched a study on internalising the external costs of the different transport modes. This will help to put all transport modes on the same level playing field. Transport by rail offers some advantages today that are not taken into account, while other modes of transport are considered as cheaper and better because they do not have to support all the costs they generate.

Participating in these studies should be considered as very important to all IM's as they will be a central part of promoting transport by rail.

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## Example 1. International passenger train

Unit Price = P = 0,301697 — Priority of circulation = Pt = 1,5

| | | | | | | Length of section | coeffi-cient mass | coeffi-cient enviro-nment | Operational importance | Technical equipment | peak hours | Deviation standard train path | Charge Access |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Departure** | **Arrival** | **Time** | **Time** | **Line** | **Mass** | **Li** | **C** | **Ce** | **C1** | **C2** | **H** | **T** | |
| HERGENR-FR | Y.HAMMERBR | 15:27 | 15:28 | 37 | 400-800T | 1,90 | 1,55 | 1 | 1 | 1,5 | 1 | 2,35 | 4,71 € |
| Y.HAMMERBR | WELKENRAEDT | 15:28 | 15:34 | 37 | 400-800T | 7,44 | 1,55 | 1 | 1 | 1,5 | 1 | 1,45 | 11,35 € |
| WELKENRAEDT | DOLHAIN-VIC | 15:34 | 15:39 | 37 | 400-800T | 5,26 | 1,55 | 1 | 1,75 | 1,25 | 1 | 1 | 8,06 € |
| DOLHAIN-VIC | VERVIERS-EST | 15:39 | 15:46 | 37 | 400-800T | 5,35 | 1,55 | 1 | 1,75 | 1,25 | 1 | 1,9 | 15,58 € |
| VERVIERS-EST | VERVIERS-C | 15:46 | 15:48 | 37 | 400-800T | 2,50 | 1,55 | 1 | 1,75 | 1,25 | 1 | 1,6 | 6,14 € |
| VERVIERS-C | PEPINSTER | 15:48 | 15:51 | 37 | 400-800T | 4,30 | 1,55 | 1 | 1,75 | 1,25 | 1 | 1,9 | 12,54 € |
| PEPINSTER | OLNE | 15:51 | 15:57 | 37 | 400-800T | 7,60 | 1,55 | 1 | 1,75 | 1,25 | 1 | 1,6 | 18,66 € |
| OLNE | CHENEE | 15:57 | 16:03 | 37 | 400-800T | 8,50 | 1,55 | 1 | 1,75 | 1,25 | 1 | 1,75 | 22,82 € |
| CHENEE | Y.AGUESSES | 16:03 | 16:05 | 37 | 400-800T | 2,20 | 1,55 | 1 | 1,75 | 1,25 | 1 | 1,15 | 3,88 € |
| Y.AGUESSES | Y.VAL-BENOIT | 16:05 | 16:06 | 37 | 400-800T | 0,70 | 1,55 | 1 | 1,75 | 1,25 | 1 | 2,2 | 2,36 € |
| Y.VAL-BENOIT | LIEGE-GUILL | 16:06 | 16:08 | 37 | 400-800T | 1,25 | 1,55 | 1 | 1,75 | 1,25 | 1 | 2,65 | 5,09 € |
| LIEGE-GUILL | ANS | 16:10 | 16:17 | 36 | 400-800T | 6,15 | 1,55 | 1 | 2 | 1,5 | 1 | 1,3 | 16,82 € |
| ANS | POUSSET | 16:17 | 16:23 | 2 | 400-800T | 15,96 | 1,55 | 1 | 2 | 3,5 | 1 | 3,25 | 254,62 € |
| POUSSET | HOEGAARDEN | 16:23 | 16:31 | 2 | 400-800T | 28,95 | 1,55 | 1 | 2 | 3,5 | 1 | 1,75 | 248,77 € |
| HOEGAARDEN | LEUVEN | 16:31 | 16:38 | 2 | 400-800T | 21,32 | 1,55 | 1 | 2 | 3,5 | 1 | 2,5 | 261,67 € |
| LEUVEN | Y.HERENT | 16:38 | 16:41 | 36N | 400-800T | 5,19 | 1,55 | 1 | 2 | 1,5 | 1 | 2,2 | 24,03 € |
| Y.HERENT | NOSSEGEM-C/D | 16:41 | 16:45 | 36N | 400-800T | 10,40 | 1,55 | 1 | 2 | 1,5 | 1 | 2,8 | 61,28 € |
| NOSSEGEM-C/D | Y.ZAVENTEM | 16:45 | 16:46 | 36N | 400-800T | 3,00 | 1,55 | 1 | 2 | 1,5 | 1 | 2,95 | 18,62 € |
| Y.ZAVENTEM | ZAVENTEM-P/Q | 16:46 | 16:47 | 36N | 400-800T | 1,10 | 1,55 | 1 | 2 | 1,5 | 1 | 1,15 | 2,66 € |
| ZAVENTEM-P/Q | Y.DIEGEM-O | 16:47 | 16:48 | 36N | 400-800T | 2,27 | 1,55 | 1 | 2 | 1,5 | 1 | 2,65 | 12,68 € |
| Y.DIEGEM-O | SCHAERBEEK | 16:48 | 16:50 | 36N | 400-800T | 4,26 | 1,55 | 1 | 2 | 1,5 | 1 | 2,5 | 22,38 € |
| SCHAERBEEK | BRUXELL-ND-F | 16:50 | 16:52 | 36N | 400-800T | 1,60 | 1,55 | 1 | 2 | 1,5 | 1 | 1,75 | 5,89 € |
| BRUXELL-ND-F | BRUXELLES-ND | 16:52 | 16:53 | 36N | 400-800T | 0,77 | 1,55 | 1 | 2 | 1,5 | 1 | 1,75 | 2,84 € |
| BRUXELLES-ND | BRUX-M-JNM | 16:55 | 17:00 | 0/2 | 400-800T | 3,09 | 1,55 | 1 | 2 | 2,5 | 4 | 1,15 | 49,87 € |
| BRUX-M-JNM | BRUXELL-MIDI | 17:00 | 17:01 | 0/2 | 400-800T | 0,73 | 1,55 | 1 | 2 | 2,5 | 4 | 1,15 | 11,76 € |
| | | | | | | **151,78 km** | | | | | | | **1.105,09€** |

Track Access Charge = Li * C * Ce * C1 * C2 * H * T * Pt * P

| | | | | | | Charge Basis | Charge suppl. | Charge Installation |
|---|---|---|---|---|---|---|---|---|
| **Installation** | **Time** | **Time** | **Occupation** | **Ci** | **Cu** | | | |
| LIEGE-GUILL | 16:08 | 16:10 | 2 | 10 | 3 | 57,16 | - | 57,16 € |
| BRUXELLES-ND | 16:53 | 16:55 | 2 | 10 | 3 | 57,16 | - | 57,16 € |
| BRUX-MIDI | 17:01 | | | 10 | 3,5 | 66,69 | - | 66,69 € |
| | | | | | | | | **181,02 €** |

## Example 2. Freight train 3000T

Installation charge = 1.905 * Ci * Cu + Charge Suppl

Unit Price = P = 0,301697 — Priority of circulation = Pt = 1

| | | | | | | Length of section | coeffi-cient mass | coeffi-cient enviro-nment | Operational importance | Technical equipment | peak hours | Deviation standard train path | Charge Access |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Departure** | **Arrival** | **Time** | **Time** | **Line** | **Mass** | **Li** | **C** | **Ce** | **C1** | **C2** | **H** | **T** | |
| MOUSCRON-FR | MOUSCRON | 19:43 | 19:45 | 75 | 3000 | 2,94 | 3,65 | 1 | 1,25 | 1,5 | 1 | 1 | 6,07 € |
| MOUSCRON | LAUWE | 19:45 | 19:50 | 75 | 3000 | 6,001 | 3,65 | 1 | 1,25 | 1,5 | 1 | 1 | 12,39 € |
| LAUWE | KORTRIJK-RLN | 19:50 | 19:53 | 75 | 3000 | 3,691 | 3,65 | 1 | 1,25 | 1,5 | 1 | 1 | 7,62 € |
| KORTRIJK-RLN | Y.BETHUNE | 19:53 | 20:00 | 75L/1 | 3000 | 1,806 | 3,65 | 1 | 1,75 | 1,5 | 1 | 1,2 | 6,26 € |
| KORTRIJK-RLN | KORTRIJK | 20:00 | 20:01 | 75C | 3000 | 0,802 | 3,65 | 1 | 1,25 | 1,5 | 1 | 1 | 1,66 € |
| KORTRIJK | Y.ZANDBERG | 20:01 | 20:04 | 75 | 3000 | 2,5 | 3,65 | 1 | 2 | 1,5 | 1 | 1 | 8,26 € |
| Y.ZANDBERG | WAREGEM | 20:04 | 20:14 | 75 | 3000 | 11,5 | 3,65 | 1 | 1,75 | 1,5 | 1 | 1 | 33,24 € |
| WAREGEM | DEINZE | 20:14 | 20:24 | 75 | 3000 | 12,4 | 3,65 | 1 | 1,75 | 1,5 | 1 | 1 | 35,84 € |
| DEINZE | DEINZE-WIJK | 20:24 | 20:25 | 75 | 3000 | 1,434 | 3,65 | 1 | 1,75 | 1,5 | 1 | 1 | 4,15 € |
| DEINZE-WIJK | DE PINTE | 20:25 | 20:31 | 75 | 3000 | 6,849 | 3,65 | 1 | 1,75 | 1,5 | 1 | 1 | 19,80 € |
| DE PINTE | Y.GENT-WEST | 20:31 | 20:36 | 75 | 3000 | 6,165 | 3,65 | 1 | 2 | 1,5 | 1 | 1 | 20,37 € |
| Y.GENT-WEST | GENT-ST-P | 20:36 | 20:37 | 75/1 | 3000 | 0,935 | 3,65 | 1 | 1,75 | 1,5 | 1 | 1 | 2,70 € |
| GENT-ST-P | Y.W.LEDEBERG | 20:37 | 20:42 | 50 | 3000 | 2,7 | 3,65 | 1 | 2 | 1,25 | 4 | 1 | 29,73 € |
| Y.W.LEDEBERG | Y.O.LEDEBERG | 20:42 | 20:43 | 50 | 3000 | 0,7 | 3,65 | 1 | 2 | 1,25 | 4 | 1 | 7,71 € |
| Y.O.LEDEBERG | MERELB-BL27 | 20:43 | 20:46 | 50 | 3000 | 3,4 | 3,65 | 1 | 2 | 1,25 | 4 | 1 | 37,44 € |
| MERELB-BL27 | Y.MELLE | 20:46 | 20:47 | 50 | 3000 | 0,775 | 3,65 | 1 | 2 | 1,25 | 4 | 1 | 8,53 € |
| Y.MELLE | SCHELLEBELLE | 20:47 | 20:56 | 50 | 3000 | 9,198 | 3,65 | 1 | 2 | 1,25 | 4 | 1 | 101,29 € |
| SCHELLEBELLE | DENDERMONDE | 20:56 | 21:07 | 53 | 3000 | 13 | 3,65 | 1 | 1,75 | 1,25 | 1 | 1 | 31,32 € |
| DENDERMONDE | LONDERZEEL | 21:07 | 21:19 | 53 | 3000 | 13 | 3,65 | 1 | 1,75 | 1,25 | 1 | 1 | 33,72 € |
| LONDERZEEL | Y.HEIKE | 21:19 | 21:28 | 53 | 3000 | 8,3 | 3,65 | 1 | 1,75 | 1,25 | 1 | 1 | 19,99 € |
| Y.HEIKE | MECHELEN | 21:28 | 21:33 | 53 | 3000 | 4,8 | 3,65 | 1 | 1,75 | 1,25 | 1 | 1 | 11,56 € |
| MECHELEN | MECH-DIJKSTR | 21:33 | 21:35 | 27 | 3000 | 2,314 | 3,65 | 1 | 2 | 1,25 | 1 | 1 | 6,37 € |
| MECH-DIJKSTR | Y.OTTERBEEK | 21:35 | 21:37 | 27 | 3000 | 1,886 | 3,65 | 1 | 2 | 1,25 | 1 | 1 | 5,19 € |
| Y.OTTERBEEK | Y.ST-K-WAVER | 21:37 | 21:38 | 27 | 3000 | 1,7 | 3,65 | 1 | 2 | 1,25 | 4 | 1 | 18,72 € |
| Y.ST-K-WAVER | Y.DUFFEL | 21:38 | 21:43 | 27 | 3000 | 6,1 | 3,65 | 1 | 2 | 1,25 | 4 | 1 | 67,17 € |
| Y.DUFFEL | KONTICH | 21:43 | 21:45 | 27 | 3000 | 1,3 | 3,65 | 1 | 2 | 1,25 | 4 | 1 | 14,32 € |
| KONTICH | Y.LIERSESTWG | 21:45 | 21:49 | 27 | 3000 | 4,5 | 3,65 | 1 | 2 | 1,25 | 4 | 1 | 49,55 € |
| Y.LIERSESTWG | Y.KRIJGSBAAN | 21:49 | 21:52 | 27A | 3000 | 1 | 3,65 | 1 | 2 | 1 | 4 | 1,4 | 12,33 € |
| Y.KRIJGSBAAN | Y.Z.GROENENH | 21:52 | 21:55 | 27A | 3000 | 2,7 | 3,65 | 1 | 2 | 1 | 4 | 1 | 23,79 € |
| Y.Z.GROENENH | Y.O.BERCHEM | 21:55 | 21:56 | 27A | 3000 | 0,9 | 3,65 | 1 | 2 | 1 | 4 | 1,2 | 9,51 € |
| Y.O.BERCHEM | ANTW-OOST | 21:55 | 21:57 | 27A | 3000 | 1,1 | 3,65 | 1 | 2 | 1 | 4 | 1 | 9,69 € |
| ANTW-OOST | Y.ANTW-SCHPT | 21:57 | 21:59 | 27A | 3000 | 1,3 | 3,65 | 1 | 2 | 1 | 4 | 1 | 11,45 € |
| Y.ANTW-SCHPT | Y.HOLLAND | 21:59 | 22:01 | 27A | 3000 | 1,4 | 3,65 | 1 | 2 | 1 | 4 | 1 | 12,33 € |
| Y.HOLLAND | LUCHTBAL-BL8 | 22:01 | 22:08 | 27A | 3000 | 4,9 | 3,65 | 1 | 2 | 1 | 4 | 1 | 43,17 € |
| LUCHTBAL-BL8 | Y.DRIEH.STR | 22:08 | 22:10 | 27A | 3000 | 2,9 | 3,65 | 1 | 2 | 1 | 4 | 1 | 25,55 € |
| Y.DRIEH.STR | Y.SCHIJN | 22:10 | 22:11 | 27A | 3000 | 1,1 | 3,65 | 1 | 2 | 1 | 4 | 1 | 9,69 € |
| Y.SCHIJN | ANTW-N-INC1 | 22:11 | 22:12 | 27A | 3000 | 0,9 | 3,65 | 1 | 2 | 1 | 1 | 1 | 1,98 € |
| ANTW-N-INC1 | ANTW-ND-D | 22:12 | 22:14 | 27A/1 | 3000 | 0,6 | 3,65 | 1 | 1 | 1 | 1 | 1,4 | 0,93 € |
| | | | | | | **150,49 km** | | | | | | | **761,41€** |

Track Access Charge = Li * C * Ce * C1 * C2 * H * T * Pt * P

Installation charge KORTRIJK-G + ANTW-ND-D = 30,96€

# 3. FRANCE

*Zineb Benchekroun, RFF*

## 3.1 Introduction - Réseau Ferré de France (RFF)

Réseau Ferré de France is a Public Entity of an Industrial and Commercial nature, or "EPIC", that was created in 1997. The company owns the French rail network and is responsible for upgrading, developing, and enhancing the network whilst guaranteeing its overall coherence. The maintenance of the rail network to a high level of quality is a priority. RFF allocates € 1.7 billion of its operating budget each year to day-to-day maintenance. In addition to this, around € 750 million from RFF's investment budget each year is allocated to renewal and modernisation of infrastructure. Since March 2003 RFF has also been in charge of the allocation of train paths to train operators. One of the main objectives of RFF is to actively promote open access to the network.

## 3.2 Charging principles

The new institutional context in France, with the creation, in 1997 of RFF (law n° 997-135 of 13 February 1997), as the owner and the manager of railway infrastructure, and at European level with the directives forming the first railway package in 2001 (Directive EU 2001/14), has triggered changes in the French infrastructure charging system.

Since its creation, RFF invoices SNCF (Société Nationale des Chemins de Fer), the incumbent railway company, for the use of the railway infrastructure. In mid-2005, the first new operator ran on the French railway network and was invoiced by RFF. Since then, RFF has five further customers operating on its network.

From 1997 until 2001, RFF invoiced SNCF, its sole customer on a global fixed amount basis. Since 2002, RFF has based all of its invoicing on reservations made for clearly identified units of capacity and on the capacity actually used in practice.

### Legal framework

The access charging system is based on both the European regulatory framework (mainly the European Union Directive 2001/14) and the French one (law n° 997-135 of 13 February 1997, decrees and orders relating to fees for use of the national rail network).

The fees for use of the national rail network take into account, on the one hand, the minimum services due for the use of the railway infrastructure. On the other hand, the fees for access to equipment and for complementary and related services payable in the case of the use of a specific service (electric installations, installations of the combined transport terminals, marshalling yards, etc) are accounted for.

The fees scale for minimum services is established every year by an administrative order based on RFF's proposal. RFF is the only responsible body for the yearly release of the fees scale for access to equipment and for complementary and related services.

### RFF's pricing policy

RFF's pricing policy is based on both transparency and non-discrimination principles. Therefore, the fees scales are communicated to all interested parties a year before the start of the timetable, by the release of a network statement. Regardless of who the customer might be, the same service is available for the same price.

RFF has to favour optimal usage of the railway network. By issuing a network statement with a fees scale, a year in advance, RFF sends an economic signal to its customers. This assists all stakeholders in making the most favourable choices from a collective viewpoint.

Through its charging policy, RFF is seeking to:

- contribute to cover all or a share of its infrastructure costs by covering maintenance and operating expenses and paying a part of renewal or development projects; therefore, RFF aims to cover routine costs for maintenance and operation of the network by the year 2008, though its charging policy.
- provide an incentive for optimal usage of the network as capacity is a scarce resource and as prices are a relevant micro-economic signal;
- contribute to balanced regional development ;
- give an incentive to use rail transport.

### The actual fees scale structure

In 2007, RFF's access charging was based on a segmentation of the railway lines in 1199 elementary sections grouped into 13 rate categories according to traffic characteristics (see annex 3.1 and 3.2 for the tariff map and the distribution of the network by rate category).

The track access charges for the minimum package covers:

- the processing of requests for infrastructure capacity;
- the right to use the capacities granted;
- the use of the junctions and switches of the network;
- the services necessary for the running of trains including; signalling, traffic control, traffic management, communication, and the provision of information concerning the running of the trains ;
- any other information necessary for the implementation of the service for which the capacities are requested.

These charges are composed of the sum of three variable terms based on the reservation of capacity and the effective consumption of capacity (see annex 3.3).

**Access Charge (droit d'accès – DA)**

The access charge takes into account the allocation process and marketing costs (timetable, One- Stop-Shop, etc). It is based on path-kilometres, i.e. the distance of the path reserved, differentiated according to rate category of elementary sections.

**Reservation Charge (droit de réservation)**

The main goal of this charge is to provide an incentive for the railway undertakings to use the network in an optimal way.

The reservation charge is divided into two charges:

- a path reservation charge (droit de réservation des sillon – DRS), which is based on path-kilometres and differentiated according to the rate category of the section, the period of the day when the section is crossed and the quality of the path for freight traffic (freight and light running traffic, of which the length is less than 300 km or the mean speed is greater than or equal to 70 km/h, benefits from a reduction of 40% in path reservation charge)
- a station stop reservation charge, (droit de réservation des arrêts en gare – DRAG), which is based on stops in passenger stations and differentiated according to rate category of the station and the period of the day when the train is due to stop.

The fact that the reservation charge, for both path and stop station, is differentiated according to the rate category of the section or the station, and by the time period, leads to optimal use of the network by the railway undertakings. The higher the traffic is on a section, the more expensive this section is.

**Running charge (droit de circulation – DC)**

The running charge covers a part of the routine maintenance and operating costs resulting from the train running. This charge is invoiced only if the path reserved is actually run.

The running charge is based on train-kilometres and is differentiated according to the type of traffic. In fact, as maintenance costs are lower for lines used exclusively by freight traffic than mixed lines (freight and passenger), the running charge is accordingly lower for freight and light running traffic.

With reference to the access to equipment and complementary related services, RFF provides the railway undertakings with access to the following equipment: electric traction installations, including traction energy transmission and distribution installations; rail installations of combined transport terminals; marshalling yards; sidings; lines related to

specific investment projects financed by RFF. (See annex 3.4 for details for the charges for access to equipment and for complementary and related services).

The charge for access to electric traction installation (RCE) covers part of the maintenance costs of the electric network of transport and distribution that belong to RFF. The charge for the transmission and distribution of traction power (RCTE) refers to the charges for transport of the high tension upstream RFF's network.

This service does not include the electric power, necessary for the railway undertaking, which is invoiced separately and directly by the power provider.

The other additional charges refer mainly to freight traffic, for instance the charge for access to the rail installations of combined transport terminals, the marshalling yards and the sidings.

The latter category of additional charges is related to development projects financed partly or totally by RFF if a third party requests the project. In fact, in agreement with article 4 of the administrative order n°97-444 of 05/05/1997, RFF's contribution to development projects has to be totally covered, either through the charges for minimum services, or through a specific complementary charge.

### Impact of the actual pricing policy

As a result of RFF's actual pricing policy and the linked information system called "facturateur", the main impact on the customer's behaviour (railway undertakings) is the decrease in path-kilometres not actually used. As almost 75% of the access charges are based on the reservation, railway undertakings have to make sure that they will actually use their reserved path, otherwise they will be charged for it. Therefore, train-kilometres tend to equal path-kilometres for all activities except for freight traffic, which needs more adaptable slot allocation.

Furthermore, RFF has noticed that high-speed trains and the Paris area passenger trains are RFF's most important revenue contributors (see Figures 3.1 and 3.2). In fact, the high-speed trains and the Paris area passenger trains reserved respectively 21% and 10% of the path-kilometres in 2006, whilst they contributed to almost 40% and 23% of RFF's revenues. On the other hand, freight trains represent about 26% of path-kilometres booked, whereas they contribute only to 9% of RFF's total revenue from access charging.

**Figure 3.1 Distribution of path-kilometres according to business units in 2006**

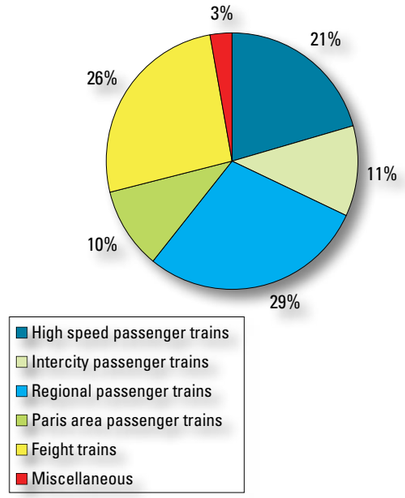
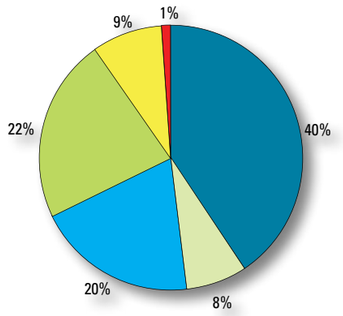



**Figure 3.2 Distribution of fees according to business units in 2006**




### Recent evolution and upcoming reforms

Comparing 2008's fees to the 2007 level, the fee scale does not fundamentally change structure. As the network statement / timetable for 2009 has been released, one will find hereafter the structural evolutions that will lead to:

- charge requests for cancellation or modification of paths made by railway undertaking after the initial capacity allotment. This charge would make the railway undertaking responsible for changes to their capacity demands. This charge would be set around €30 per request for path cancellation or modification;
- modification of the current modulation of the path reservation charge according to the path quality for freight traffic. In fact, RFF aims to offer to its customers better services (in response to their requests) for capacity allotment by improving the average speed of freight trains. Therefore, four categories of freight paths would be differentiated:
  - freight and light running traffic, operating over less than 300 km or with mean speed greater than or equal to 70 km/h, benefit from a reduction of 40% of the path reservation charge;
  - freight and light running traffic, operating over more than 300 km with mean speed between 70 km/h and 84 km/h, would pay the entire level of the path reservation charge;
  - freight and light running traffic, operating over more than 300 km and with mean speed between 85 km/h and 104 km/h, would pay 15% more of the path reservation charge;
  - freight and light running traffic, operating over more than 300 km and with mean speed of more than 105 km/h, would pay 30% more for the path reservation charge.

## 3.3 Cost accounting principles

As an introduction to the cost accounting principles, it is worthwhile giving an outline of the financial context of RFF's formation.

RFF is a State-owned company established by Act no. 97-135 of 13 February 1997 ("the 1997 Act"), with retroactive effect from 1st January 1997. This Act and the related enabling legislation (Decree nos. 97-444, 97-445 and 97-446) transferred ownership of the French rail infrastructure previously held by SNCF to Réseau Ferré de France (RFF).

The purpose of this legislation was to separate ownership of the rail infrastructure (devolved to RFF) from its operation (devolved to SNCF). However, under the terms of the 1997 Act, SNCF is responsible for managing and maintaining the infrastructure on behalf of RFF. The services to be provided by SNCF and the related fee arrangements are specified in an agreement between RFF and SNCF. The Act of 5 January 2006 and the accompanying Decree no. 2006-1534 of 7 December 2006 set out the missions of both organisations as well as the practical aspects relating to the performance of said missions.

Therefore, the principles applied to prepare RFF's opening balance sheet of 01 January 1997 were as follows:

- the assets taken over by RFF as of 31 December 1996 were recorded at their net book value in SNCF's accounts;
- grants transferred to RFF's balance sheet included all grants relating to:
  - investments in the Paris commuter network, for a total of €1.068,8 million (€556 million for commissioned assets, and €512,8 million for assets under construction);
  - assets under construction for the main network amounting to €164,5 million, representing a total of €677,3 million in grants relating to assets under construction.

# FRANCE

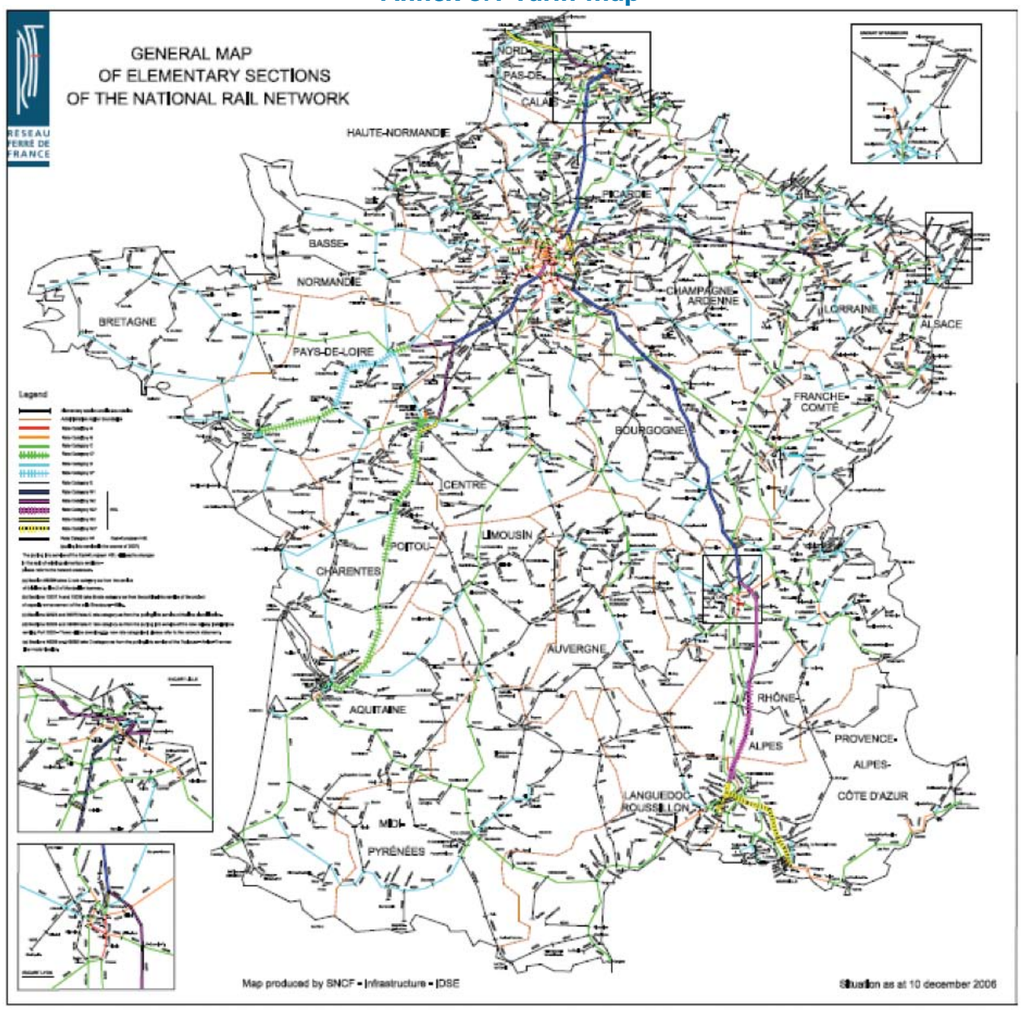
As provided for under the 1997 Act, RFF also recorded in its opening balance sheet €20,5 billion worth of debt transferred from SNCF.

## Current costs accounting principles

Until 2006, the financial statements of RFF were prepared in accordance with French general accounting principles (1999 Plan Comptable General). Article 3 of the 1997 Act stipulates that RFF is subject to the rules applicable to industrial and commercial entities with respect to its finances and accounts.

The financial report 2006 was therefore established in accordance with French general accounting principles.

## Annex 3.1 Tariff map




The main accounting principles in force until 2006 were:

- tangible assets are stated at acquisition cost or production cost. Production costs include research costs (except preliminary costs), construction work, land acquisition and compensation charges, and direct operating expenses;
- an impairment test is done every six months using the values given in method IAS 36 (Impairment of assets);
- interest costs are not included in the cost of production of RFF's fixed assets;
- depreciation of tangible fixed assets is based on a linear method.

## Recent evolutions and upcoming reforms

Since 2007, RFF has been required to adopt IFRS (International Financial Reporting Standards), as RFF issues debt securities. Therefore, the financial consolidated statements of 2007 are based on the IFRS.

## Annex 3.2 Distribution of the railway network by rate category

| Categories of elementary sections | Designation | Total length in km from 10 June 2007 | Network part |
|---|---|---|---|
| **Peri-urban lines** | | **1311** | **4,5%** |
| High-traffic | A | 289 | 1,0% |
| Medium-traffic | B | 1022 | 3,5% |
| **Main Intercity lines** | | **13 107** | **45,0%** |
| High-traffic | C | 6806 | 23,4% |
| High-traffic, maximum speed 220km/h | C* | 404 | 1,4% |
| Medium-traffic | D | 5802 | 19,9% |
| Medium-traffic, maximum speed 220km/h | D* | 95 | 0,3% |
| **Other lines, excepted high-speed lines** | **E** | **12 888** | **44,3%** |
| **High-speed lines** | | **1813** | **6,2%** |
| High-traffic | N1 | 718 | 2,5% |
| Medium-traffic | N2 | 332 | 1,1% |
| Medium-traffic HSL Méditerranée | N2* | 124 | 0,4% |
| Low-traffic | N3 | 195 | 0,7% |
| Low-traffic HSL Méditerranée | N3* | 127 | 0,4% |
| East European high-speed line | N4 | 317 | 1,1% |
| **TOTAL** | | **2 9118** | **100,0%** |

## Annex 3.3 Fees scale for minimum services, Timetable 2007

| Fees | Rate category | A | B | C | C* | D | D* | E | N1 | N2 | N2* | N3 | N3* | N4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DA | | 0,015 | 0,015 | 0,015 | 0,015 | 0,000 | 0,000 | 0,000 | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 |
| DRS | Off-peak hours | 1,850 | 0,650 | 0,650 | 0,650 | 0,010 | 0,010 | 0,000 | 5,408 | 1,264 | 1,264 | 0,904 | 0,904 | 0,700 |
| | Normal hours | 5,034 | 1,250 | 0,650 | 0,650 | 0,050 | 0,050 | 0,005 | 11,103 | 3,510 | 3,510 | 1,905 | 1,905 | 1,700 |
| | Peak hours | 14,500 | 3,280 | 1,500 | 1,500 | 0,050 | 0,050 | 0,005 | 13,310 | 6,320 | 6,320 | 3,604 | 3,604 | 2,980 |
| | Coefficient of modulation freight and light running (HLP)* | 0,6 | | | | | | | | | | | | |
| DRAG passengers | Off-peak hours | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 |
| | Normal hours | 8,000 | 5,500 | 5,500 | 5,500 | 5,500 | 5,500 | 5,500 | 8,000 | 5,500 | 5,500 | 5,500 | 5,500 | 5,500 |
| | Peak hours | 25,000 | 21,200 | 21,200 | 21,200 | 21,200 | 10,000 | 25,000 | 21,200 | 21,200 | 21,200 | 21,200 | 21,200 | 21,200 |
| DC freight trains and light running (HLP) | | 0,400 | | | | | | | | | | | | |
| DC regional passenger trains | | 0,806 | | | | | | | | | | | | |
| DC other passenger trains | | 1,200 | | | | | | | | | | | | |

*The coefficient of modulation does not apply to freight paths of which the lenght is 300km or more and of wich the mean speed is greater than or equal to 70km/h (not counting stops requested by railway undertaking).

A : High-traffic peri-urban lines
B : Medium-traffic peri-urban lines
C : High-traffic intercity main lines
C* : High-traffic intercity main lines for running at 220km/h
D : Medium-traffic intercity main lines
D* : Medium-traffic intercity main lines for running at 220km/h
E : Other lines, other than high speed lines
N1 : High-traffic high-speed lines
N2 : Medium-traffic high-speed lines
N2* : Medium-traffic Méditerranée high-speed line
N3 : Low-traffic high-speed lines
N3* : Low-traffic Méditerranée high-speed line
N4 : East-European high-speed line

In rate category C* et D*, high speed passenger train paths (i.e. 220km/h and more) pay the N3 tariff for the DRS and the DRAG.





## Annex 3.4 Fees scale for access to equipment and for complementary and related services, Timetable 2007

### Access to equipment

#### Charges for access to electric traction installations

| Types of services | Manner of calculation of charge | Unit price (Euro w/o VAT) |
|---|---|---|
| Availability of traction electricity | Price per electric train-km | 0,214 |

#### Charge for the transmission and distribution of traction power (1)

| Types of services | Manner of calculation of charge | Unit price (Euro w/o VAT) |
|---|---|---|
| Transmission of electricity | Fee per electrical train-kilometre for : | |
| | High speed national and international passenger trains | 0,454 |
| | Other national and international passenger trains | 0,344 |
| | Ile de france regional passenger trains | 0,445 |
| | Other regional passengers trains | 0,218 |
| | Freight trains | 0,416 |
| | Other trains (light running, rolling stock,...) | 0,082 |

(1) This fee may be periodically adjusted to reflect the cost borne by Réseau Ferré de France, notably due to the evolution of public electricity charging.

#### Charge for access to the rail installations of combined transport terminals

| Types of services | Manner of calculation of charge | Unit price (Euro w/o VAT) |
|---|---|---|
| Access to the rail installations of combined transport terminals | Fee per terminal and per month | Refer to Annex 12 of the 2007 timetable Network Statement |

#### Charge for access to marshalling yards

| Types of services | Manner of calculation of charge | Unit price (Euro w/o VAT) |
|---|---|---|
| Access to marshalling yards | Fee per marshalling yard and per month | 34 391,30 |

#### Charge for access to sidings (2)

| Types of services | Manner of calculation of charge | Unit price (Euro w/o VAT) |
|---|---|---|
| Access to sidings | Fee per marshalling yard and per month | 53,29 |

(2) The invoice will be drawn-up with a fixed price for the SNCF, until the setting-up of a information procedure on the use or non-use of sidings, to establish between both companies.

#### Charge for access to the tracks of the "Futuroscope" station

| Types of services | Manner of calculation of charge | Unit price (Euro w/o VAT) |
|---|---|---|
| Access to the track of the "Futuroscope" station | Fixed monthly fee, in consideration of the investment made by Réseau Ferré de France | 63 988,00 |

#### Charge for access to the section 58069 "Saint-Jean-de-Védas-Monpellier" (3)

| Types of services | Manner of calculation of charge | Unit price (Euro w/o VAT) |
|---|---|---|
| Access of tramways to the elementary section 58069 "Saint-Jean-de-Védas-Montpellier" | Fixed monthly fee, in consideration of the investement made by Réseau Ferré de France | 13 787,50 |

(3) This fee applies as from the putting into service of Line 2 of the Montpellier tramway on this section.

#### Charge for access of freight trains to the section 34009 "Le Havre-Faisceau alluvionnaire" (4)

| Types of services | Manner of calculation of charge | Unit price (Euro w/o VAT) |
|---|---|---|
| Access of freight trains to the elementary section 34009 "Le Havre-Faisceay alluvionnaire" | Fee per path-km, in consideration of the investment made by Réseau Ferré de France | 25,86 |

#### Charge for access of freight trains to the section 38080 "Montérolier-Buchy-Motteville" (4)

| Types of services | Manner of calculation of charge | Unit price (Euro w/o VAT) |
|---|---|---|
| Access of freight trains to the elementary section 38080 "Montérolier-Buchy-Motteville" | Fee per path-km, in consideration of the investment made by Réseau Ferré de France | 0,80 |

(4) These fees apply as from the putting into service of the rail service of Port 2000 at le Havre.

## Annex 3.5 Examples of track access charges for minimum package, Timetable 2008

| Passenger train on high speed line in normal hours (Paris-Reims, 149 km) | |
|---|---|
| **Length of elementary sections per rate category : A = 22,5 km ; B = 7,6 km; N4 = 114,3 km<br>Number of stop stations per rate category : A = 1** | |
| Access Charge - DA | 118,18 € |
| Path Reservation Charge - DRS | 408,89 € |
| Station Stop Reservation Charge - DRAG | 8,90 € |
| Running Charge - DC | 208,00 € |
| **Total of track access charges for minimum package** | **743,97 €** |

| Passenger train on high speed line in normal hours (Paris-Tours, 224 km) | |
|---|---|
| **Length of elementary sections per rate category : C = 3,8 km ; N1 = 116,4 km ; N2 = 97,8 km<br>Number of stop stations per rate category : N1 = 1** | |
| Access Charge - DA | 220,60 € |
| Path Reservation Charge - DRS | 1.828,60 € |
| Station Stop Reservation Charge - DRAG | 8,90 € |
| Running Charge - DC | 313,60 € |
| **Total of track access charges for minimum package** | **2.371,70 €** |

| Regional passenger train on conventionnal line in normal hours (Nantes-Rennes, 149 km) | |
|---|---|
| **Length of elementary sections per rate category : C = 39,1 km; D = 113,2 km<br>Number of stop stations per rate category : C = 2; D = 1** | |
| Access Charge - DA | 0,60 € |
| Path Reservation Charge - DRS | 35,00 € |
| Station Stop Reservation Charge - DRAG | 16,50 € |
| Running Charge - DC | 123,00 € |
| **Total of track access charges for minimum package** | **175,10 €** |

| Freight train on conventionnal line in normal hours (Metz-Strasbourg, 158 km) | |
|---|---|
| **Length of elementary sections per rate category : B = 28,1 km ; C = 135,6 km<br>Coefficient of modulation for freight and light running trains of the path reservation charge = 0,6** | |
| Access Charge - DA | 2,40 € |
| Path Reservation Charge - DRS | 80,40 € |
| Station Stop Reservation Charge - DRAG | - |
| Running Charge - DC | 71,12 € |
| **Total of track access charges for minimum package** | **153,92 €** |





# 4. GERMANY

*Mario Theis, Norbert Blaschta and Martin Ihling, DB Netz*

## 4.1 Introduction – DB Netz

Deutsche Bahn AG was founded as a joint stock company in January 1994, with two state-run railways (Bundesbahn; Reichsbahn) now combined into one privately-run company. The introduction of the train-path pricing system – DB being the first company in the world to develop such a system – was part of the new concept. Deutsche Bahn meets the challenge of competition and presents itself as the most environment-friendly form of transport.

Deutsche Bahn AG (DB AG) functions as a Group-wide management holding company for the integrated Deutsche Bahn Group. The business portfolio is basically divided into ten business units that are organised under three Group divisions: Passenger Transport, Transport and Logistics, and Infrastructure and Services. DB AG has been a corporation established in accordance with German law since it was first founded in 1994, and therefore has a dual management and supervisory structure.

The Infrastructure and Services Group division comprises passenger stations, the track infrastructure, energy supply and services, facility management, fleet management, IT-telematics and vehicle maintenance areas. Construction project activities are also a part of the organisation.

The Track Infrastructure business unit consists of DB Netz, a service provider to currently about 350 rail transport companies – including 328 non-Group railways.[4] DB Netz acts as an independent network operator to ensure non-discriminatory access to its infrastructure. Funding provided by Federal Government and States to finance the infrastructure plays a central role.

4 The form of the market is dynamic. For example in the freight market the market share of DB's competitors rose up to 16,4% in 2006. This is an increase of 27,9% compared to 2005, which is related to traffic performance in tkm.

The operation of passenger stations is provided by DB Station & Service AG, an independently acting company. DB Station & Service AG is providing non-discriminatory access to its infrastructure.

DB Energy GmbH is responsible for supplying the DB Group and other companies with all energy-related services and providing a single source for the corresponding technology know-how and control technology, providing power and fuel on a non-discriminatory basis to all railway companies in Germany.

### The railway market

In 2006, rail freight transport in Germany booked its strongest growth in 25 years, setting a new record of approx. 107 billion tonne-kilometres. In a comparison with all transport modes, rail boasted the highest growth rate of around twelve per cent, which is more than three times higher than in the preceding year. The trend towards globalisation and ongoing liberalisation in Europe are opening up good growth prospects for rail freight transport.

For passenger traffic, 2006 again saw a positive development for long-distance rail transport, including night and motorail services. In the segment of regional and local transport services, the steadily rising demand also continued in 2006. Regional rail services enjoyed a year-on-year increase of 4,9%, achieving a total of 43,3 billion passenger-kilometres.

Ever growing numbers of non-DB Group railways are taking advantage of the 1994 market liberalisation to increasingly utilise the rail infrastructure within Germany. About 350 rail companies (of which 328 were non-DB Group) were active in 2006, which is the highest number Europe-wide. Slight increases were noted in demand for track access as well as the number of station stops in 2006. In view of the transport markets, DB-Infrastructure-Companies are indirectly exposed to heavy market pressure from their customers. This stems from intensive inter- and intramodal competition



# GERMANY

in the transport market and the related mobility and logistics markets.

## Conditions for the Infrastructure Manager

In January 2006, regulation of access to railway infrastructure was transferred from the Federal Railway Authority (EBA) to the Federal Network Agency (BNetzA). The EBA still monitors compliance with the specifications for separating infrastructure and transport services (unbundling), the correct and efficient spending of public funds and issues related to railway safety and quality. The administrative cases initiated by BNetzA refer to all areas of responsibility, including concrete conditions of access, charges for track and service facility access as well as miscellaneous detailed issues.

The terms of use for railway infrastructure that are part of the network statement, are subject to particularly strict control by the authorities. If an infrastructure manager plans to amend or review its terms of use, these amendments must first be submitted to the Network Agency, which then has four weeks in which it may veto the terms of use as a whole or individual clauses, in which case the relevant clauses cannot be put into effect. In addition to this precursory ex-ante control, the authority is also entitled to object ex-post to clauses that are already in force.

## 4.2 Principles of the current charges

The German infrastructure charging system aims at full cost recovery, after consideration of subsidies, plus a return on investment. In return for maintaining and upgrading the railway infrastructure, DB Netz receives investment funding from the Federal government. The planned multi-annual contract, the so-called Service and Financing Agreement (LuFV), will substantially simplify the calculation of the provision of funds. This has to date been project-based. When that agreement comes into force, the infrastructure managers within the DB group will have a fixed annual budget for providing the existing infrastructure in an agreed quality. The required funds can only be calculated by taking the anticipated track access revenues into account. Accordingly, it must be possible to plan these revenues reliably and over the long term. This is not without problems considering that there still exists a considerable lack of clarity regarding the legal interpretation and practical application of the existing price regulations.

Until now, revenues from access charges do not cover the cost of the infrastructure after public funding. One reason for the funding gap is that DB Netz takes into account the market situation and the ability to pay of the railway undertakings when calculating the prices. Consequently, the current pricing levels do not fully reflect the cost of rail infrastructure in Germany. Nevertheless, DB Netz aims to reach full cost recovery (after consideration of subsidies plus an adequate return on capital employed by DB Netz) in the near future through cost reductions, quality improvements and market-oriented price adjustments. A return on investments financed from public funds is not provided for.

More specifically the following main types of access charges are considered within the DB-Infrastructure companies:

**Track access charges – DB Netz**

The structure of the current rail infrastructure charges of DB Netz takes into account entrepreneurial, market and legal aspects. The EU and national railway law provide the legal framework for the German rail infrastructure charges. The level of the access charges is determined by the cost of infrastructure, the level of public funding and last but not least the market environment. Access charges are calculated in the same way for each customer.

**Access charge for facilities – DB Netz**

Besides the usage of tracks, DB Netz provides track facilities (service installations) for the purpose of supporting train movements. They are used for the formation and provision of trains as well as for the stabling of vehicles. There are service installations with differing functionalities, equipment levels and output capacities. They enable rolling stock to be prepared for running and made fit for the customer's purpose. Peripheral facilities are provided for special activities involved in the pre/post-processing of train movements.

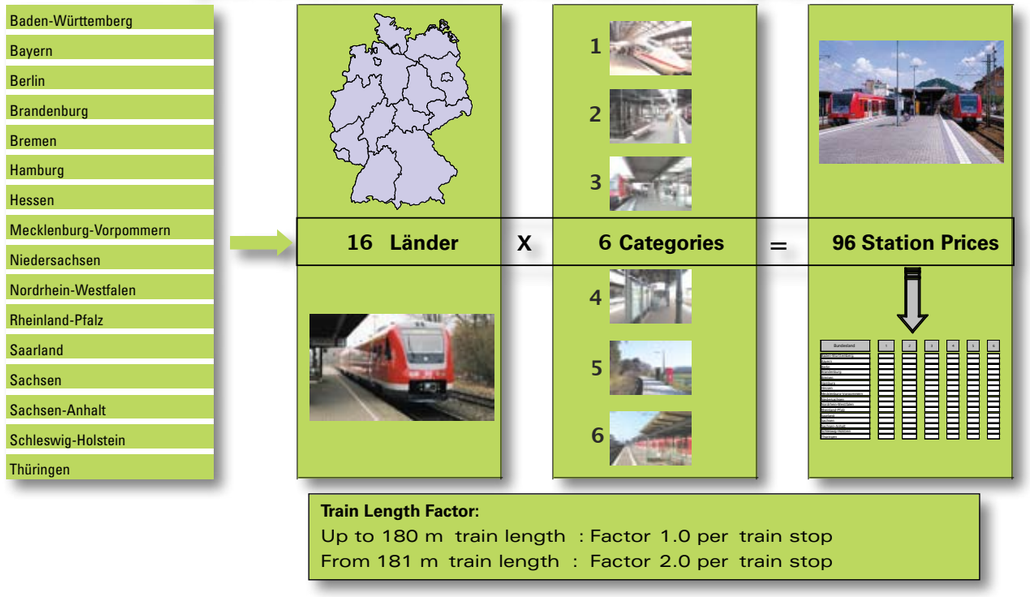
**Services by DB Station & Service**

DB Station & Service AG grants the use of the infrastructure of passenger railway stations and stops to the railway undertaking (EVU/ZB). Depending on the offered services, DB Station & Service AG has subdivided the passenger railway stations into 6 different station categories. In addition, each of the 16 German "Länder" regionally differentiates categories, so that there are 96 different station prices altogether. The following services are offered by DB Station & Service AG to the EVU/ZB at each passenger railway station: Station name plate, Timetable notice, Information surface, Surfaces for ticket automats and ticket canceller. DB Station & Service AG offers additional services to the EVU/ZB at selected passenger railway stations.

**Services by DB Energy**

The DB Energy portfolio offers the following services: the entire 16,7-Hz traction current supply/network utilisation, 50-Hz electric lighting and non-traction current, D.C. power, tank services (diesel fuel, auxiliaries and consumables) and energy services/ savings management.

### Figure 4.1 Basic Structure of the Station Pricing System



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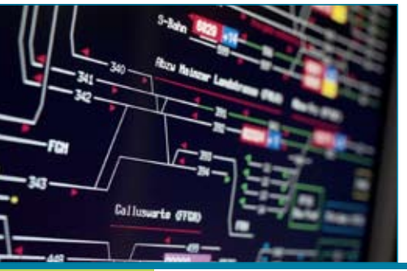


## 4.3 Structure of the current track access charging system

The principle charging structure of the modular Train-Path Pricing System (TPS) has seen no significant changes since 2001. In 2007, DB Netz reduced the number of supplements in order to make the system more transparent and effective.

The TPS in use at DB Netz must meet various market requirements. On the one hand, it must reflect the operational cost structure, i.e. the operating and investment expenditure associated with the various train path products available in its entirety. On the other hand, the TPS must be in line with the current demand. Therefore, very different criteria have to be taken into account in the modular structure of the TPS. Taken as a whole, DB Netz's modular TPS provides a transparent and logical method of fixing charges that takes into consideration both the infrastructure cost induced by the customers' needs and the provision of competitive prices for the individual user groups. At the same time, compatibility with the general legal conditions is achieved, in particular the condition of non-discrimination, while DB Netz AG's corporate goals are also reached.

Based on the TPS, all customers pay the same price for the same service (train path products). Charges are levied for the use of DB Netz AG's service facilities based on the facilities pricing system. DB Station & Service AG levies additional charges for the use of stations in the case of passenger transport services. Traction energy is excluded from the train path price.

**Figure 4.2**

**Formula for calculating the path price (subject to reduction and terms):**

| | | |
|---|---|---|
| 1. | Usage-based component | (Route availability and pathing products) |
| 2. | Performance-based component | (Utilisation factor, minimum speed) |
| 3. | Other charge components | (Regional multipliers, load component) |
| **Basic category price:** | | (as per route category) |
| x | Product factor | (as per train-path product) |
| x | Performance-based component | (as per system of incentives to increase output capacity) |
| x | Regional factor | (as per other charge components) |
| + | Load component | (as per other charge components) |
| = | Price per train-path kilometre (tp-km) | |

**Figure 4.3**

Train-Path Pricing System 2008 valid from 09.12.2007
Overview on Components and Charges

**Use-based component**

Route category – Basic price

| | |
|---|---|
| Fplus | 8,09€/tp-km |
| F1 | 4,12€/tp-km |
| F2 | 2,85€/tp-km |
| F3 | 2,53€/tp-km |
| F4 | 2,42€/tp-km |
| F5 | 1,86€/tp-km |
| F6 | 2,18€/tp-km |
| Z1 | 2,26€/tp-km |
| Z2 | 2,34€/tp-km |
| S1 | 1,59€/tp-km |
| S2 | 2,14€/tp-km |
| S3 | 2,57€/tp-km |

Train-path product – Factor

| Passenger transport | | Freight transport | |
|---|---|---|---|
| Express | 1,80 | Express | 1,65 |
| Regular | 1,65 | Standard | 1,00 |
| Economy | 1,00 | Single Engine | 0,65 |
| Single Engine | 0,65 | Feeder | 0,50 |

**Performance-based component**

Utilisation factor
An utilisation multiplier of 1,2 applies on particularly busy routes as an incentive to make efficient use of rail infrastructure

Non -compliance with minimum speed (<50 km/h) on design grounds
A 1,5 multiplier applies as a means of encouraging more efficient use of rail infrastructure where a minimum speed of 50 km/h is achieving on long-distance routes and urban rapid transit routes for design-related reasons.

Performance regime
The system of incentives to reduce disturbances is three-pronged: [illegible] routes, delay caused [illegible] the end of each month, [illegible] initiates in ...
Intermission of performance regime – New system under construction

**Other components**

Regional factor
Multiplier for specific regional networks

Load component
Gross train weight of 3.000t upwards 0,92€/tp-km

Offer charge
Charge where a train-path ordered is not taken: €80

Cancellation charge

| | |
|---|---|
| > 60 days | €80 |
| > 30 days | €80+25% |
| > 24 h: | €80+50% |
| < 24 h: | Full price |

Further components
- On- demand train path
- Alternative routes
- Pre-designed train path
- New train service

**Route Category**

To meet the requirements in terms of both the diversity of the infrastructure assets and the customer's need for simplicity and transparency, DB Netz has subdivided its routes into 12 categories.

The classification is based on the specific infrastructure elements that are allocated to expenditure. However, it also takes into account the importance that each route section has as part of the whole network. Subdivision of routes into categories enables DB Netz to offer a market-driven price differentiation, while at the same time avoiding the negative effects of an "atomised" system of individual cost-driven route prices. The basic price per train-path kilometre is determined by the route category.

**Train-path products**

There is a large variety of train-path products, which ensure a market-orientation of TPS. The target of this product differentiation is to meet the individual needs of the market. The portfolio of products available is based on a choice of four train-path products for freight transport services or five train path products for passenger. Each of these train-path products, in addition to the costs resulting from the customer's requirements, in particular takes into account the effect of the charge on the competitiveness of the railway undertakings, i.e. their willingness to pay. The products are included in the train-path price by means of a multiplicative train-path product factor.

**Utilisation factor**

In order to create incentives designed to bring about efficient use of the track infrastructure, a utilisation factor is applied on very busy routes.

**Non-compliance with the minimum speed on design grounds**

One means of creating incentives to raise the performance capacity of the rail network involves levying a surcharge if, for reasons relating to the design of the rolling stock, a minimum speed of 50 km/h is not achieved and there is hence a significant rise in capacity requirements.

**Regional factors**

Regional factors are used for the continuing operation of routes in the regional network that can only be achieved by improving cost coverage. Regional factors, therefore, are applied on routes that do not yet have a viable cost/revenue structure.

Regional factors differ locally depending on the regional network concerned. They represent a supplement on top of the train path price. Their application is restricted to local rail passenger transport services, as the principal user of the regional routes.

**Payload component**

The train-path price for rail freight transport services contains a charge component that is determined by the gross weight of the trainload. For train weights of 3.000 tonnes and above, additional charges of €0,92/tp-km will be levied. The weight-based payload components reflect the additional costs caused by the use of heavy trains, due to the increase in wear and capacity utilisation.

**On-demand train path**

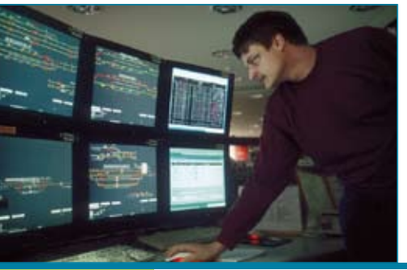
Customers of DB Netz have the possibility of registering on-demand train paths. If the on-demand train path is used, the corresponding train path price is to be paid. If the on-demand train path is not or only partly used, a reservation charge for the unused part of the train path will be levied.

**Fee for preparing an offer**

The costs for processing the applications for train path allocation are included in the train path charge. For this reason, a processing fee is charged for not accepting a train path offer. This regulation does not apply in the case of justified complaints submitted by the customer.

**Cancellation fees**

A minimum cancellation fee is to be paid for cancelling a train path amounting to the fee required for preparing the offer. In addition, a percentage-based cancellation fee will be levied depending on when the cancellation was made. Cancellation means complete withdrawal of one or more train running days on a train path.



**Reduced charge if the condition of the track infrastructure does not comply with the terms of the contract**

In the case that the condition of the track infrastructure, the associated command and control technology and facilities for the supply of traction current do not comply with the terms of the contract, the charges for the use of the infrastructure are to be reduced. The train path charges shall be reduced once the level of non-compliance with the agreed infrastructural quality exceeds 10% and/or if the overall timing for a specific train movement varies by more than 10 % from the agreed train path.

**Limited-period discounts to promote the use of lines with low levels of utilisation**

On selected lines with a low level of utilisation, DB Netz grants limited-period discounts. These are designed to act as an incentive to use alternative routes with a low level of utilisation.

**Charging arrangements for pre-designed train paths**

To promote the use of lines with a low level of utilisation, DB Netz may target free capacity on such lines for marketing in the form of pre-designed paths once the working timetable has been drafted. Pre-designed train paths are offered at a discount of 10 % on the regular usage charge. The discount is only granted if train paths are ordered in unaltered and complete form.

**Discount to promote new services**

As a means of promoting the development of new train services, DB Netz grants all Access Parties limited period discounts in the form of a 10% discount on the regular usage charge. New train services need to fulfil certain preconditions.

## 4.4 Principles of cost accounting

Since its foundation in 1994, DB AG has developed from an authority to an active enterprise organised and managed according to private corporate law. The organisation is close to the market and result-oriented: tasks, competencies and responsibilities are decentralised. The result-responsible units are solely responsible for their business development and are independently based on the company goals (profitability and customer orientation) and their independently agreed objectives. The "Controlling" supports the units in their solely responsible self-control. The most important controlling-tool is the cost accounting system, aligned specifically to the interests of DB AG and with consideration for accounting and fiscal regulations as well as the information requirements of internal control and of the stakeholders. DB has a standard accounting system with integrated financial accounting and management accounting.

The decentralised structure of the accounting and controlling architecture also guarantees full compliance with the strict legal requirements regarding accounting and organisational unbundling.

Within the integrated accounting system, the following instruments are available for the decentralised supervision and control:

- Financial Accounting
- Cost-Type Accounting
- Cost-Centre Accounting
- Cost-Unit Accounting

The starting point is the financial accounting, where each business transaction is immediately entered. From this basis, both the financial reporting and the cost accounting systems for companies and the DB group (individual financial statement, consolidated financial statement) are organized. That way, any value generated in internal cost accounting can be traced back to the original entry in financial accounting."

In 2004, DB AG adopted International Financial Reporting Standards (IFRS). Due to internationalisation, it became more important for consolidated accounts to be transparent and comparable worldwide. Therefore, DB focussed on the information requirements of investors to gain access to the international financial markets.

There is the profit and loss account structured in revenues and cost types within a period of time in the total expenditure format.

The function of cost-type accounting is the entire classification of accumulated costs in relation to the particular type of costs. This controlling instrument surveys accumulated costs in a defined structure (e.g. on the basis of a standard chart of accounts) within a period. The basis for the analysis is, for example, personnel costs, costs of materials or depreciation.

Information from financial accounting is not sufficient for the purposes of internal control. Therefore, DB has a management accounting system consisting of cost accounting and cost-unit accounting.

Due to the common database, financial accounting and cost accounting are to be regarded as one unit, as the Account System. This interlocking makes it possible to get co-ordinated results by using the same data.

Essential element of the cost accounting system is the cost-centre accounting. The cost-centre accounting differentiates the cost for organisation and process based aspects. The cost-centre accounting is based on the point of cost origin and gives answers to the following questions: Where and especially what specific costs have been accumulated during a period? The cost-centre accounting serves the following functions:

- Cost control (plan/actual/year on year comparison and the comparison of accumulated actual costs with total costs by services), planning, implementation and monitoring of cost reduction arrangements
- Deduction of accounting cost rates for internal cost allocation

The cost-centre accounting reflects the valid organisational structure of the corporation. This relation builds the basis for self-dependent controlling of each organisational unit. The cost centre therefore represents an elementary organisational entity.

Due to the complex production structure, the differentiated operational steering of products, processes and structures succeeds with the aid of the cost-unit accounting. This way, a comparison of sales and the costs closely connected with the sales is possible. The costs are functionally divided according to their relation to sales (e.g. production costs, marketing, selling and general administrative costs).

The costs taken over from the financial accounting are transferred to organisation and process-based cost–centres. Afterwards standard costs of production are allocated to products by standard industry principles.

The cost-unit accounting is the base for steering the units that are responsible for their products and the related financial results. cost unit accounting therefore is based on two subsystems, which are a period accounting for the results and a product costing.

The cost-unit accounting gives answers to two questions:

- What results do the responsible units achieve?
- How profitable are the products (Line, Facility) of DB Netz AG in detail?

The cost unit "line" is assigned to the TPS. An aggregation of the "line" sections makes it possible to build line categories. Sales are accounted for according to the same criteria.

## 4.5 Interaction between Pricing and Accounting

DB Netz AG oriented its infrastructure pricing system according to the specific conditions which apply to the supply of railway infrastructure in Germany. The legal

requirements of Article 14 §4 AEG (German Railway Law) and § 21 ff EIBV (Regulation for the use of railway infrastructure) are fulfilled. On the one hand, charges that are raised for the provision of the mandatory services (minimum access package), do not exceed the legal upper limit of § 14 Par. 4 sentence 1 AEG - full cost plus a return on investment attainable at the market. On the other hand, DB Netz AG assures by legal default that the charges cover at least the costs that are a direct result of the train operation. Beside the charges, it is also ensured that the competitiveness of the individual user groups and the operability of the railway traffic markets persist. The pricing follows the principle of non-discrimination.

All furnished services are provided with the purchase of a train path. The individual prices that are published in the list of charges are not solely determined on basis of cost calculation. They are rather the result of a simultaneous optimization of all pricing components in consideration of the existing cost of infrastructure on the one hand and the competitiveness and expected growth of the different demand segments on the other. Finally, the aim of reaching a financially sustainable level of funding for DB Netz is also considered.

A purely cost-oriented pricing in the sense of a simple cost reallocation on the enquired train-path kilometres, would generate prices that either exceed the viability of the market or make the continuing operation of all routes impossible.

## 4.6 Examples of price calculations

### Köln Messe/Deutz ➥ Frankfurt am Main Flughafen
### Price calculation for a high speed passenger train (TPS 2008)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| High Speed passenger train (up to 300 km/h) | | 7,8 km (F3 without utilisation factor) | | | | 159,65 km (FP without utilisation factor) | | | | Σ: 167,45km | |
| | | Köln Messe/Deutz | | | | Köln Steinstraße | | | | Frankfurt am Main Flughafen | |
| **Use-based component** | | | | | | | | | | | |
| Category x Product | F3 = 2,53 €/km | x | 7,8km | = | 19,73€ | FP = 8,09 €/km | x | 159,65km | = | 1291,57€ | Σ: 2163,63 € |
| | Long-distance regular interval train path= 1,65 | | | | | | | | | | |
| **Performance-based component** | | | | | | | | | | | |
| Utilisation | low | 19,73€ | x | 0,00 | = | 0 € | low | 1291,57€ | x | 0,00 | = 0€ | Σ: 0 € |
| + Delays | no | 0 min | x | 0,10€ /min | = | 0 € | no | 0 min | x | 0,10€ /min | = 0 € | |
| | | | | | | | | | | | Σ: 2163,63 € |

### Hannover ➥ Bremen
### Price calculation for a mid-range passenger train (TPS 2008)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mid-range passenger train (prevalent 160 km/h) | | 21,44 km (F2 without utilisation factor) | | | | 101,01 km (F3 without utilisation factor) | | | | Σ: 122,45km | |
| | | Hannover Main station | | | | Wunstorf | | | | Bremen Main station | |
| **Use-based component** | | | | | | | | | | | |
| Category x Product | F2= 2,85€/km | x | 21,44 km | = | 61,10 € | F3 = 2,53€/km | x | 101,01km | = | 255,57€ | Σ:522,50€ |
| | Long-distance regular interval train path= 1,65 | | | | | | | | | | |
| **Performance-based component** | | | | | | | | | | | |
| Utilisation | low | 61,10 € | x | 0,00 | = | 0 € | low | 255,57€ | x | 0,00 | = 0 € | Σ : 0€ |
| + Delays | no | 0 min | x | 0,10€ /min | = | 0 € | no | 0 min | x | 0,10€ /min | = 0 € | |
| | | | | | | | | | | | Σ: 522,50 € |

### Kassel-Wilhelmshöhe ➥ Gelnhausen
### Price calculation for a freight train (TPS 2008)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 89,96 km (F1 without utilisation factor) | | | | 58,26 km (F3 with utilisation factor) | | | | Σ: 148,22km | |
| | | Kassel- Wilhelmshöhe | | | | Fulda | | | | Gelnhausen | |
| **Use-based component** | | | | | | | | | | | |
| Category x Product | F1 = 4,12 €/km | x | 89,96km | = | 370,64€ | F3 = 2,52 €/km | x | 58,26km | = | 147,3€ | Σ:518,03€ |
| | Standard Freight Path = 1,00 | | | | | | | | | | |
| **Performance-based component** | | | | | | | | | | | |
| Utilisation | low | 370,64€ | x | 0,00 | = | 0 € | high | 147,39 € | x | 0,20 | = 29,48 | Σ: 30,48€ |
| + Delays | no | 0 min | x | 0,10€ /min | = | 0 € | # 55 | 10 min | x | 0,10€ /min | = 1 € | |
| **Other components** | | | | | | | | | | | |
| Load | >3000t = 0,92 €/km | x | 148,22 km | = | 136,36 € | | | | | | Σ:136,36€ |
| | | | | | | | | | | | Σ: 684,87 € |

# 5. GREAT BRITAIN

*Geoff Jones, Network Rail*

## 5.1 Introduction – Network Rail

Network Rail maintains and develops Britain's tracks, signalling system, rail bridges, tunnels, level crossings, viaducts and 18 key stations. Over the last three years, Network Rail has beaten its principal safety targets and has reduced delays by 28% since 2002/03. Network Rail has also cut costs significantly by taking maintenance in-house, rolling integrated control centres out across the network, continuing its massive programme of rebuilding the railway and working more closely with train and freight operators.

Network Rail's objectives are to:

- improve train punctuality "year-on-year";
- reduce the annual running cost of the railway infrastructure to £4,3 billion by 2008/09.

Also, through its Route Utilisation Strategies (RUS), Network Rail is looking to grow the rail network where passenger and freight demand requires.

Network Rail is a private company limited by guarantee. It is a for-profit, but not for-dividend company, meaning that profits are re-invested into the rail network. Network Rail is directly accountable to its members and regulated by the Office of Rail Regulation (ORR). Its Board runs Network Rail to the standards required of a publicly listed company (PLC).

## 5.2 Context & overview

Network Rail is currently engaged in the regulatory review process to assess its costs and to set its charges for the next five-year period from 1 April 2009 to 30 March 2014. The basic process is that:

- Government[5] describes the industry outputs that it wants to be delivered including a statement of the public funding it is making available for this[6] (alongside funding from the fare box from franchised services and other parties such as freight and open-access passenger operators);
- Network Rail proposes the approach and cost of meeting this output specification, as well as the structure of charges; and
- The Office of Rail Regulation (ORR – the regulator) makes a final determination on the level of efficient expenditure, and the appropriate structure of charges. This determination takes account of the Government's specified outputs and also the amount of available public funding (i.e. the SoFA).The Periodic Review process lasts for approximately two years and involves significant interaction and iteration between the parties. For example, the Government may ask Network Rail to provide costs for delivering different combinations of outputs. The process is very open and transparent and includes significant consultation with industry and other stakeholders.

### Charging objectives

The main charging objectives set by the ORR are that the charging and access principles should:

- promote the objectives of the ORR duties under section 4 of the Act and be consistent with the wider objectives of funders;
- incentivise Network Rail, train operators, train manufacturers, rolling stock companies and funders to ensure the efficient utilisation and development of the network and optimisation of whole industry costs;
- not discriminate between users of the network;
- be practical, cost effective, comprehensible and objective in operation;
- be consistent with relevant legislation, including the EU Directive 2001/14/EC;
- reflect the efficient costs caused by use of the infrastructure (both to Network Rail or otherwise); and
- ensure that charges enable Network Rail to recover, but not to over recover, its allowed revenue requirement.

There are many challenges and trade-offs to resolve, including:

- Requirements of various users – including freight, passenger and open-access – who have differing needs and different price sensitivities;
- The nature of railway infrastructure investment where the costs of providing additional services can be low until a capacity constraint is reached, at which point extra capacity can be expensive and involve significant lead-times;
- Related to the previous, the balance between short- and long-term demands on the network;
- Need to balance transparency and cost-reflectivity against complexity and increased administrative burden on the industry;
- Tension between cost-reflectivity and the valuation of capacity which is a driver of future enhancement decisions.

Whereas there are many objectives, a key focus of the current review is to improve cost-reflectivity. This is important in encouraging appropriate vehicle design, as well as informing funders' decision-making. However, this must be achieved without undue complexity, although in reality greater cost reflectivity will inevitably be more complex than the present system.

The structure of charges is designed to provide a simple, certain and transparent structure for a large part of the industry activities. A number of contractual provisions that allow case-by-case treatment supplements this, for example the investment framework for new enhancements and the 'Network Code' covering issues like the process for changes to the network and associated compensation.

### Structure of charges

The current structure of charges was established as part of the review process in 2000 and is designed to address the objectives listed above. The system focuses on recovering the costs 'caused' by particular operators and has two main elements:

- Variable charges to provide signals for optimal rolling-stock development and network usage in the short-term. Variable charges are paid by all operators across the network and recover approximately 10% of Network Rail's infrastructure costs. These include:
  - variable track usage charges;
  - capacity charges;
  - electricity traction charges.

- Fixed charges enable Network Rail to recover the rest of its costs and are paid only by franchised railway undertakings. That is, freight operators or other open access passenger operators that do not have a franchise contract with Government do not pay these charges.

However, whilst some elements of Government funding are channelled through the franchise process there is also, at present, a proportion of fixed grant payable direct from Government to Network Rail. Part of this is associated with certain traffic, e.g. support for the fixed cost element of freight costs.

A summary of each of the charges, the 'objective' for the charge and the main issues to be addressed are set out in Table 5.1.

5 Department for Transport (DfT) in relation to England & Wales, and Transport Scotland (TS) in relation to Scotland.

6 This is referred to as the Statement of Funds Available (SoFA)



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**Table 5.1 Summary of the intent of the various charging components**

| Name of charge | Objective / intention | Issues |
|---|---|---|
| Variable usage (and possibly route-based charges) | To recover short-run marginal costs of additional vehicles on the network to provide the right signals to facilitate additional traffic for both operators and Network Rail. | Key decisions around the extent to which charges should vary according to the geographical location of travel, as well as the definition of capability that is assumed.<br>Calculating the short-run marginal costs is a significant task in itself. |
| Freight-only line charge | To give effect to the Government statement in the Future of Rail White Paper (2005) that freight should pay the full cost of freight-only lines. | ORR has set caps for maximum allowed increase in freight charges, as well as determining that only Electricity Supply Industry (ESI) Coal and spent nuclear fuel traffics should bear the new freight-only line charge.<br>Significant exercise to define and cost 'freight-only lines'.<br>Review of the coal-spillage charge to ensure that it fully recovers the cost to Network Rail and incentives future behaviour. |
| Capacity charge | To recover increased penalty payments generated by additional congestion on the network because of additional traffic. | Complexities of moving toward a tariff varying by location and time of day. |
| Electricity for traction charge | To recover the cost of electricity used by operators. | Providing more direct linkage between the electricity market prices and the charge to electrical traction users. Related to this, providing users with greater input into the decision-making process around purchasing decisions. |
| Station charges | To recover from users the maintenance, repair and renewal costs of stations. | Analysing the options and trade-offs around the costs of stations in total, the costs of additional usage at the margin, and the usefulness of price signals under the existing arrangements. |
| Fixed charges | To recover the residual revenue requirement netting off single-till income and government grant. | Levied on franchised TOCs only. The emphasis is on identifying a methodology that has a much tighter connection with cost-causation. |

## 5.3 Summary of approach

In the current review,[7] Network Rail has been asked by the regulator to propose a set of charges. The regulator will make its final decisions in October 2008. Network Rail is proposing to retain the same basic structure of charges set out above. There are two main matters that Network Rail is trying to do to improve through the charges being proposed:

- Modelling rail infrastructure costs. Network Rail is developing the Infrastructure Cost Model (ICM) that has significantly improved Network Rail's understanding of the cost structure of the business, and the relationships between key variables. For example, how changes in asset management policies lead to changes in activities and therefore changes in costs. The ICM has been developed at a disaggregated level – dividing the network into roughly 300 individual route sections (although there is the ability to "drill down" to further layers totalling some 3.500 sections) – so that we can understand the costs on a geographical basis. This allows the charges – both variable and fixed – to be more cost-reflective.
- Understanding the impacts of rail vehicle characteristics. The current variable usage charges are based on the 'wear and tear' caused to railway infrastructure by rolling stock, reflecting the vertical forces caused. The vertical forces are modelled as a function of weight, unsprung mass and speed. Separate formulae are used for structures and track. In recent years we have been observing and quantifying the impacts of Rolling Contact Fatigue which is caused by tangential forces on railway infrastructure. Network Rail is therefore proposing to add this new term (as well as existing formulae) to the way that charges are calculated. The methodology has been developed through extensive work by consultants TTCI (UK) and associated expert technical advice from stakeholders. This is mainly related to setting variable usage charges.

7 The current review applies to the multi-annual contract that will be in place between 1 April 2009 and 31 March 2014. Relevant documents can be found at: http://www.rail-reg.gov.uk/server/show/nav.180 and also: http://www.networkrail.co.uk/aspx/4357.aspx

There are also network availability and performance compensation regimes (known as 'Schedule 4' and 'Schedule 8') to provide compensation for disruption caused by planned and unplanned disruption. Schedule 8 applies to operational disruption caused by both Network Rail and train operators and cash can flow either way in this case.

The regulator has also considered the introduction of an environment charge and a reservation charge, but has decided not to pursue these for the time being.

While Network Rail has developed the charges individually; it has to be mindful of the overall impact of considering the charges together.

## 5.4 Key outcomes & messages

As noted above, the focus for Network Rail has been on improving the cost-reflectivity of charges. This has meant that Network Rail has not progressed issues such as quantifying and charging for external impacts of rail (noise, pollution, congestion, etc).

A useful way of providing an insight into the outcomes of Network Rail's study is to summarise how Network Rail is addressing the key policy issues. These are shown in Table 5.2.

### Table 5.2 Charging outcomes by key policy issue

| Charging objective / issue | How it is addressed | How Network Rail's approach is evolving |
|---|---|---|
| Cost recovery | Network Rail recovers all its costs in the sense that the regulatory process identifies Network Rail's allowed costs for each five-year period, and then determines how these costs are recovered. Currently, around 50% of the Great Britain rail industry funding is derived from Government either through access charges via franchises or via direct grant in lieu of access charges. | Network Rail's focus is on the infrastructure charges. A key element of overall industry cost recovery depends on Government decisions around the balance between direct Government grant and revenue from ultimate users (i.e. passengers and freight customers).<br><br>A key influence on this is beyond Network Rail's control and is determined by the level of passenger fare increases allowed by Government in setting the franchise specifications for railway undertakings. It is also heavily dependent on volume increases. |
| Pricing between transport modes | Not explicitly addressed. One of the factors taken into account by Government in deciding service specification and associated funding requirements. | Longer-term Government investigation into environmental consequences, the contribution from transport, and the means of addressing any resultant issues. Some introduction of road-pricing – for example the congestion charge in London. |
| Freight versus passenger | Freight pays short-run marginal costs. Passenger pays marginal costs plus fixed costs. | New charge for 'freight-only' lines for freight that has the 'ability to pay'. Only Electricity Supply Industry coal and spent nuclear fuel commodities deemed to have ability to pay. New modelling techniques to provide better cost-reflectivity of fixed charges. This helps provide information to funders. |
| Calculating short-run marginal cost | Via variable track usage charge. | Bottom-up approach using sophisticated cost modelling tool. Define short-run marginal costs as ±5 to10% changes in traffic around forecast over the 5 year period. Model analysis over 35 year period to smooth out lumpy renewal profiles.<br>Different charges for each vehicle based on the 'damage' done. New approach to take account of tangential forces as well as vertical forces. |
| Charging by corridor | Consideration of 'route-based charging'. | Investigating the impacts of charging by geography (not necessarily the same as a corridor). Some concerns because the most congested parts of the network are least cost – this may not provide useful incentives. |
| Peak pricing and allocation of capacity | To recover the residual revenue requirement netting off single-till income and government grant. | Levied on franchised TOCs only. The emphasis is on identifying a methodology that has a much tighter connection with cost-causation. |
| Industry certainty and transparency | Regulatory framework. | No major or fundamental changes planned. Some refinement, for example to maximise the incentive of Network Rail to coordinate with the railway undertakings. |
| Addressing environmental and wider community impacts | Environmental standards set for Network Rail and requirements for environmental policy. Not explicitly addressed in the charging regime. | Wider Government review in line with evolving European standards. Influences Government funding and service specification decisions. |





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The main messages that emerge are as follows:

- Cost reflectivity in relation to vehicle design is important to encourage optimal rolling-stock development and longer-term whole-system optimisation.
- Cost reflectivity by geographical location raises some issues about the incentives, and the practical implications. Network Rail's initial analysis suggests that unit prices (e.g.; cost per vehicle/km) are lowest for the most heavily used parts of the infrastructure.
- Introducing improved cost reflectivity requires sophisticated modelling and understanding of the cost relationships across the business.
- Balancing cost-reflectivity with simplicity requires a number of contractual provisions in addition to the charging regime.
- The GB regulatory model delivers many positive outcomes in relation to charging objectives. Benefits of determining the charges in conjunction with costs for five-yearly periods include:

  - Transparency – the process is public and provides significant opportunity for stakeholder input.
  - Certainty – charges are set for five years at a time. This provides certainty to both the industry in terms of funding commitments as well as price-levels.
  - Minimising whole-system costs – determining charges at the same time as costs allows a whole-system focus, as well as adopting appropriate incentives and efficiencies.

The regulation of Network Rail is one (important) part of the overall regulation of the rail sector. To understand the full picture one also needs to consider the Government role in the franchising of railway undertakings. Many important issues, including addressing environmental outcomes, are shaped by Government funding and service specification decisions as part of this process. For example, the balance between Government funding of services and price increases to passengers. Another example is the funding / support from Government direct to the rail-freight industry.

- It should also be noted that funding for Scotland will be separated out from England and Wales and a specific set of high-level outputs will be specified for that region.

## 5.5 Questions for the future

Many issues have not been explicitly addressed by Network Rail's work to-date, including a number of questions that are important at the European level.

Some of these outstanding issues include:

- Quantifying and charging for external impacts. This has not been part of the scope of Network Rail's analysis. There are significant challenges in building a workable approach, and it will only work if a consistent approach across all modes is adopted simultaneously.
- Clarifying the cost impacts of vehicle characteristics. Further work remains to finalise the levels of costs caused by different vehicles, including the appropriate parameters for vertical forces.
- Using pricing as a capacity allocation tool. The GB system allocates capacity through an administrative mechanism overseen by the regulator.
- Harmonising levels of charges between countries. This seems to be less important in itself as compared to moves to harmonise the level-playing field between transport modes within each country. That is, it is perhaps not so important what the differences in price for rail between countries, as compared to the difference in price between rail and other modes in each country.
- Pricing by geographical area and/or corridor. This still needs to be explored in further detail. It requires extremely robust cost-models and may produce perverse incentives if pricing as a capacity allocation tool is not addressed.



# GREAT BRITAIN

## 5.6 Example charge calculation

The following tables (5.3 and 5.4) set out example calculations for a passenger and a freight train running 150km. The charges depend on what type of rolling-stock is used, so Network Rail had to make some assumptions about what is a 'good' example to use.

For the passenger train, Network Rail has calculated the costs of a class 390 'Pendolino' which operates the fast inter-city services along the west coast main line in Britain, connecting London with cities such as Birmingham, Manchester, Glasgow, etc. The Pendolino is electrified.

For the freight example, it assumes a coal train hauled by class 66 locomotives with a total laden weight of 3000 tonnes.

There are two points to note:

- These are the variable costs only – payable by freight or other open-access operators. As noted above, passenger operators that have a franchise agreement with Government will also pay fixed costs.
- The costs reflect the current charges. These are likely to change as a result of the current regulatory review process. It is likely that the charges will reduce, mainly because of efficiency savings by Network Rail over time.

### Table 5.3 Passenger train charging example (class 390, 150km)

| Charging component | Rate | Total (€) |
|---|---|---|
| Variable usage charge | €3,30 per train mile | €310 |
| Electrification charge | €2 per train mile | €190 |
| Capacity charge | €1,25 per train mile | €120 |
| **TOTAL** | | **€620** |

### Table 5.4 Freight train charging example (coal train, 3000 tonnes, 150km)

| Charging component | Rate | Total (€) |
|---|---|---|
| Variable usage charge | €4,70 per kgtm | €1325 |
| Electrification charge | €0,10 per train mile | €10 |
| **TOTAL** | | **€1335** |

## 5.7 Conclusions

The work to develop more cost-reflective charging will continue beyond the current periodic review for the period 2009–2014. At present Network Rail is achieving a structure which allows greater accuracy based on better modelling and which is more transparent and arguably more cost-reflective.

Network Rail has made some significant advances in the area of business planning and charging by engaging with stakeholders and considering ORR guidance in respect of charging principles etc.

For the future, the aim should be to capitalise on the recent work and carry out further analysis relating to charge terms such as reservation charges, scarcity/capacity charges, environmental charges and possibly the development of route or geographical based charges, which in themselves support a greater degree of cost reflectivity.

# 6. HUNGARY

*Péter Rónai, MAV Co.*

## 6.1 Introduction and background - MAV Co.

The Hungarian State Railway (MAV Co.) – the incumbent national railway company – has experienced a vast transformation with regards to its organisation, administrative tasks and its legal environment. In the last two years, the dynamics of the changes have accelerated (see Table 6.1).

MAV Co. runs approximately 3800 trains daily that yearly perform 74 million passenger train kilometres and 14 million freight train kilometres. The Infrastructure Management Business unit of the MAV Co. (IM) is a separate organisational entity within the (still integrated) MAV Co. The network length is approximately 7700 km. The IM maintains infrastructure elements (tracks, overhead wires, signalling systems, etc), operates them and provides the necessary personnel for the operation (consignment, shunting). The overview of the organisational structure of the mentioned business parts is presented in Figure 6.1.

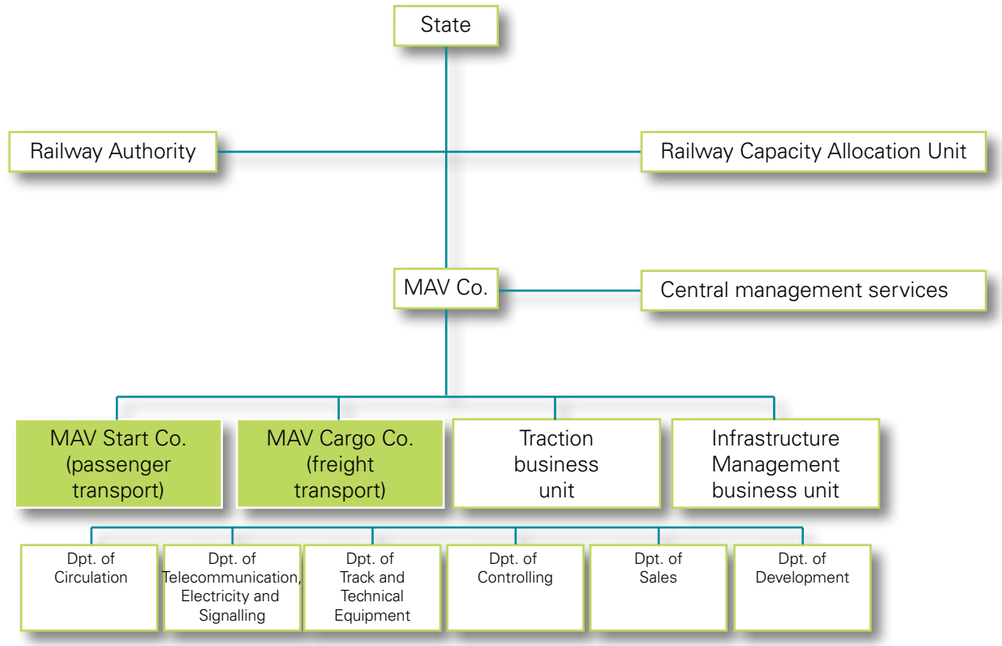
**Table 6.1 A brief overview of MAV Co.'s history**

| Year | Event |
|---|---|
| 1992 | MAV Co. is established: separation from the state, introduction of corporate accounting. |
| 2000 | "Internal" separation of accounts of the business segments (freight transport, passenger transport, traction, infrastructure, real estate). Organisational entities are developed (within the corporation) according to the main segments. |
| 2003 | The first edition of the Hungarian Network Statement, with access rules and charges. |
| 2004 | Establishment of the independent Rail Capacity Allocation Body (RCAB) – as the MAV Co. and the Raaberbahn (GYSEV) are still integrated companies. Start of the first private freight railways (4 companies are operating by the end of the year). |
| 2006 | Outsourcing of the freight transport business: establishment of the separate company MAV Cargo Co. Start-up of the Hungarian Railway Authority (HRA) to control and supervise the fair behaviour of the incumbent companies and new market entrants. |
| 2007 | Outsourcing of the passenger transport business: establishment of the separate company MAV Start Co. |





**Figure 6.1 Organisational structure of the national railways and its business environment**




## 6.2 General strategy for access charges

The IM of MAV Co has its own balance sheet following the internal separation. It accounts for access charges for users since 2003, when prices first appeared in the Network Statement.

Basic strategic issues with access charges for the IM:

1. The IM wants to achieve full cost recovery without profit. Current access charges are provided according to a full cost allocation method, where all cost components of the IM are coupled to services and "flow" into the prices of these (more details in section 6.3 below).
2. The law 66/2003 GKM-PM determines that services of the minimum access package (path allocation and train running) are not allowed to cover central management costs. This means, that after the proper allocation of central management costs to all services, the part that should be carried by the services of the minimum access package are not included in the prices, but are subject to the railway–state contract. These costs are approximately 12% of the total costs of the IM.
3. The state is willing to sign the appropriate contract with the IM to cover the part of central management costs that should be allocated to the services of the minimum access package. With this contract, the IM would achieve full cost recovery: 12% from the state and 88% from railway users.
4. Direct costs, or those cost elements that are subject to allocation procedures, are "only" those cost items that are booked in the accounts of the IM. Other



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railway costs (traction fuel, real estate maintenance used by the traction business unit, etc.) do not appear in the books of the IM and are therefore not part of the basis for cost calculations and charges. The term "full cost recovery" addressed under point 3 above means only the full costs of the IM.

5. There are no external costs or taxes, no environmental surcharges or subsidies included in the prices although these are partly allowed by the Hungarian Railway Act.
6. The cost calculation – the basis for the price determination – is done by the IM, but prices are calculated and negotiated by the RCAB. Prices do not change every year. The available history shows that price re-engineering has been carried out every two years, but this has resulted only in a slight change in the price structure, not in a change in price levels of the various market segments.

Although the price structure has seen several small changes in the last years, the nominal values of rail access prices have not changed since the first Network Statement. This means two directions of real price changes:

- As the production price index increased about 5% yearly from 2003-2007, this means approximately a 28% real value discount compared to the 2003 initial price (for all types of trains).
- The passenger transport business unit introduced integrated cyclic timetables (ITF – integrierter Taktfahrplan) for some parts of the network. This is why the performance of passenger trains improved in 2006, even though unit prices did not change. Therefore, the passenger transport business unit (later the MAV Start Co.) has nominally an approximately 22% higher expenditure on charges than before.

Because of the full cost principle, and the relatively high share of costs that are covered by the charges (approx. 88%) there are many complaints against the pricing system. Users ask for lower prices because of intermodal dynamics and especially road competition. The pricing principle itself (full cost basis) is rarely discussed, but the level of charges is continuously under heavy negotiations. The decision depends primarily on the Ministry of Finance, and the available state budget for rail infrastructure operation and investments.

## 6.3 Principles of the current access charges

The Railway Act, the Act about the rail pricing system (66/2003 GKM-PM) and the corresponding EU Directives (especially 2001/14/EC) determine the basic principles of the current pricing system. These are:

1. **Non-discrimination:** All users have to pay the same for the same service. Non-discrimination is the primary principle, meaning not only the same nominal value of prices for all users, but also the same verified algorithm, explaining in which case (for what activities) the user has to pay a certain price. The HRA is continuously supervising the market with special focus on the non-discriminatory behaviour of the IM (and partly of other stakeholders). Naturally, non-discrimination does not mean that a train between A and B will cost the very same both for user X and Y; the final access charge can heavily depend on the additional and ancillary services that users order from the IM. However, the same service (e.g. the overhead catenaries usage between A and B) has to cost the same.

2. **Strong cost basis:** The prices of the IM have to adhere strictly to the costs. The services of the IM are to be offered at the calculated total cost, as a maximum. This total price value (apart from the services of the minimum access package) is allowed to contain indirect costs as well (e.g. centrally booked depreciation, rental charges of administration buildings, central management costs), but the price is not allowed to exceed the maximum of 100% cost coverage. The HRA controls the IM thoroughly, relating to its services. If a new service is introduced, the RCAB and the IM have to prove and verify that the price of the new service is not higher than its full cost. Furthermore, if the content of a service is changing (e.g., the time availability of a shunting locomotive is shortened), a re-calculation from the beginning of the affected unit charge is desired.

3. **Differentiation of the pricing system:** Both users and the IM dislike "general" services. On one hand, a user wants to pay only for those particular services that he really needs/orders. On the other hand, the IM would like to ensure that all service components are charged. This motivation leads to the relatively fine differentiation of services, for example, the consignment of freight wagons is separated from the shunting, because in several cases no shunting is needed before the consignment movement. Or, electrical energy is separately charged from the usage of overhead catenaries wires. While the former is based on the actual consumption of a train, the latter is a train kilometre based price for electric traction.

Points 1 and 2 above allow only a very limited playing field for the IM and for the RCAB when it comes to the calculation of the charges. However, there are some cases when the direct costs cannot be defined. (For example, this can happen if the very same track is used by heavy freight trains, relatively light but frequent passenger trains, and occasionally by maintenance trains or single locomotives. The track wear and tear costs or signalling system maintenance costs cannot be measured separately for each business segment, therefore other – engineering, econometric, etc. – methods have to be used for the determination of the costs).

4. **Engineering approach:** Extending the "user pays" principle to an engineering approach addresses "the one that uses more, pays more" principle. This means that several cost items are fully or partly applied depending on the type of use, i.e. the actual wear and tear, or "consumed" resources. Although, both passenger and freight trains pay charges according to the run train kilometre, the unit prices for freight trains are more expensive, as these trains cause more wear and tear costs to the tracks. This "additional" cost component is determined by an engineering approach.

5. **Long-term orders are preferred:** As the cost structure of the IM shows the heavy dominance of fixed costs (both personnel and material costs), the user who allows the IM to plan for long term its resources use (e.g. by giving long term orders for shunting services) pays less than ad-hoc service orders.

Keeping prices fitted to the rules in points 1 and 2 needs continuous re-calculation of the unit price. The current practice, where pricing is changing usually every second year does not always allow the IM to comply with the rules above. Two reasons have already been mentioned; the production price index and the changing output level.

However, there are other reasons that underline the importance of the continuous re-engineering of unit prices:

- changing organisational background (e.g. one activity did previously not belong to the IM, but thanks to a BPR process it now does);
- changing cost structures (e.g. by outsourcing several maintenance activities);
- changing cost levels (as a result of labour union influence or state prescriptions);
- changing contents of a service (more or less time available at a station or marshalling yard), etc.

These factors make price calculation a rather continuous process instead of a do-it-once activity.

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### 6.4 Structure of the current access charges

The current charging system is the slightly developed version of the first one, introduced in 2003. In 2003, it was only used within the integrated company MAV Co., but later (2004) it appeared also in the Network Statement of the IM. One of the very first questions that had to be answered by the price calculation process is the one of the selected variables. Under this group of problems, the following main questions had to be answered:

1 How detailed should the price system be? Naturally, the easiest would be to divide all costs by the number of trains or the train kilometres, but this "solution" might not be accepted by the market (see point 3 in section 6.3 above). In Hungary, the price system uses about 5-8 variables that are available independently from each other.
2 What variables describe the service item accurately? E.g., the shunting service can be more or less independent from the axle kilometre, but may better co-relate with the number of shunted wagons or the real shunting time.
3 Which data is actually measured in real time by the IM (which data is available from own sources)? It is no use to select gross tonne kilometre for train movements as a price basis if the IM only has train kilometres available.

The IM has very limited directly measured, factual data available on passenger transport trains. Naturally, the IM has its own database of orders and the planned timetable, and can manage its task according to these data, but the logging system on stations, which could "measure" the differences between the orders and the actual services is missing for passenger transportation (it is already available for freight transportation). Previously, a separate database which was filled with the route-sheet data of train drivers was able to stand for these data, but when the traction business unit was outsourced to a separate company, this data source disappeared. This is one reason why the price

**Figure 6.2 Main services and their income share from passenger transport (absolute accounted values in €, 2006).**

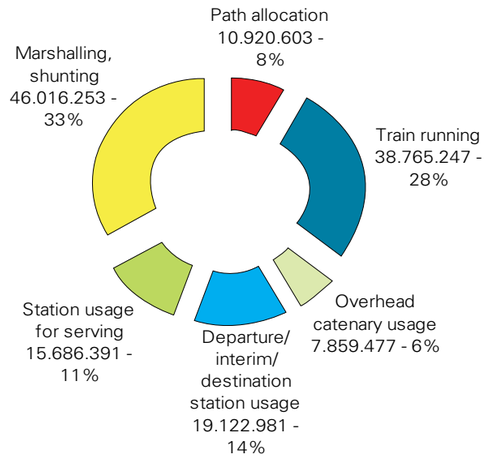


**Figure 6.3 Main services and their income share from freight transport (absolute accounted values in €, 2006).**

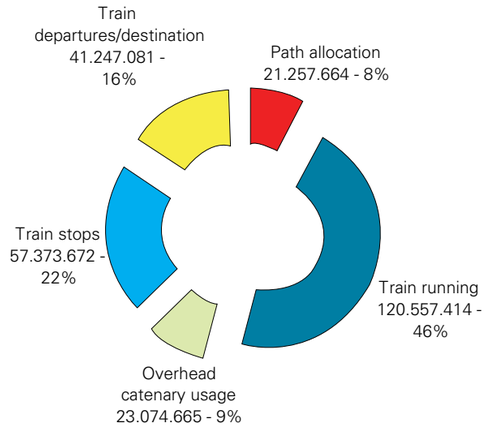


**Table 6.2 Variables and differentiation of the IM's services (based on the Network Statement)**

| Name of the service | Variables | Differentiation |
|---|---|---|
| **Minimum access package** | | |
| path allocation | number of paths | type of trains[1)], long term vs. short term orders |
| train running | train kilometres | type of trains[1)], line category[2)] |
| **Access to service facilities** | | |
| use of overhead catenaries | electric train km | type of trains[1)] |
| passenger train stops | number of stopping | station category[2)] |
| passenger train departures/ destinations | number of departures/ destinations | station category[2)] |
| freight train start/interim/ destination usage | number of cases (usage) | station category[2)] |
| freight wagon access to loading/ unloading tracks (station usage for serving) | number of wagons | station category[2)] |
| rail vehicle storage | number of wagons | long term vs. short term orders, vehicle technical features |
| access to weighting facilities | number of wagons | none |
| additional personnel | person hours | long term vs. short term orders |
| freight train check in | number of cases | none |
| **Additional services** | | |
| shunting of freight wagons (marshalling and shunting) | number of wagons | owner of shunting engine |
| consignment of freight wagons | number of wagons | owner of consigning engine |
| forwarding of dangerous and outsized goods | number of cases | type of goods / desired allowances |
| weighting | number of wagons | none |
| change of axles (normal to wide and vice versa) | number of wagons | type of goods regarding danger code |
| usage of normal gauge boogies | hours | none |
| **Ancillary services** | | |
| education and examination of RU's personnel | number of cases | type of education / examination |

1) type of trains: long distance passenger trains, local passenger trains, empty passenger trains, freight trains, maintenance trains, single engines.

2) lines and stations are classified into 3 categories according to the technical factors (e.g. signalling systems), limitations (number of tracks, axle load) and level of offered services (e.g. opening times, number of shunting locomotives). It can happen that upgrading the line for passenger traffic (e.g. raising the speed from 100 km/h to 140 km/h) causes rising prices for freight trains as well.

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system for passenger transportation is simpler than that for freight trains. This demand on data instigated and motivated the development of the station-logging system that covers all trains, and will provide basic, electronic information about all types of trains by the end of 2008. Services offered by the IM, their variables and the differentiation basis are shown in Table 6.2.

The invoices of the IM indicate the amount of measured variables in the second column of Table 6.2, and the prices for these (given in the Network Statement) are applied to the measured performance. In several cases, the actual value cannot be measured (e.g. number of passenger train stops), therefore the ordered amount is invoiced.

Practically not all service components are of the same importance. While several services provide the main part of the income of the IM (e.g. train running), others are rather of marginal importance (e.g. education for RU personnel). Figure 6.2 and 6.3 indicate the most important services and their income share for passenger and freight transportation.

Train running is a dominant service item for both types of trains. As freight trains need more marshalling and shunting, these services have a bigger share for freight trains. Path allocation and catenaries usage are of similar importance in the two groups of trains.

## 6.5 Structure of the current cost accounting system

The strict relation of charges to costs requires a well-detailed cost database. Without a proper accounting system, the adequate cost and charge calculation will not be possible. Preparation for this new cost accounting system started already in 1995, but the full and live use of the new Accounting Management System (AMS) started only in 2001.

Apart from the technical hierarchy (access to all accounting data via a Web-based application, relatively short answer time of the system, prepared queries according to main controlling and management issues, etc.) the structure of the database is of primary importance. All accounting data can be split according to the following dimensions:

1. Corporation code: indicates the partner company that released the bill (only the main partner companies are coded, the rest receive the code "other").
2. Accounting number: the appropriate numerical code that describes the position of the value in the accounting hierarchy.
3. Activity code: there are about 1600 activity codes within AMS that were derived from the main activities of the company. Although the judgement of the correct activity code can be partly subjective, a definite guide helps the work. The activity code is maybe the most important dimension of the accounting process: this helps to attach cost to different activities, is defined at a very low level (already at the level of each payment, can be either negative (representing a cost) or positive (income) and therefore support the activity-based cost calculation (ABC) that is the most important basis of infrastructure accounting.
4. Organisational code: refers to the organisational part of the company that is liable to the cost or the income. This helps to separate operational and management costs, and to join them to transport volumes (the definition of fixed and variable costs).
5. Track section code: used only in cases where costs or income can be directly attached to a definite track section. The code describes the distribution of costs according to the geographical layout of the railway network.

Since pre-defined and flexible queries can be made according to different instances, the charge calculation is supported by the accounting system. This is the basis of the cost calculation scheme that is introduced below.

In their relation to booking entities, costs can be classified into several groups. Each group might have a different allocation procedure. These groups are shown here:

1. Centrally booked costs (captured by organisational codes): IM's central management, track-independent and station-independent booked maintenance, operation and depreciation, central operation management, timetabling and path allocation, operation of information systems for freight transport, traction current. These costs need to be allocated to all services (the cost amount that is allocated to the services of the minimum access package are to be paid by the state not by the users) with the help of a properly selected cost driver and/or with the help of direct cost amounts.
2. Costs booked to open line track sections (captured by track section codes): track and signalling maintenance, operation and depreciation, overhead wire maintenance, operation and depreciation. These costs are directly linked to the services of path allocation, train running and catenaries usage, no further allocation is needed, and the costs only have to be allocated to market segments.
3. Costs booked to station track sections (captured by track section codes and activity codes):

a) Costs booked directly to services (e.g. catenaries, signalling, passenger information systems operation, maintenance and depreciation). These are direct costs, and as under point 2, no further allocation is needed.

b) Costs booked to a group of services (e.g. shunting engines – both for shunting freight wagons and for reversing passenger trains). These costs are to be allocated to those services that they are linked to, but not to those that are independent from them.

Practically, the allocation procedure contains the following three major steps:

- Step 1: Determination of a service's direct costs (point 2. or 3.a) above).
- Step 2: (If 3b exists for the selected service,) determination of costs that are booked to a group of services. The cost is then allocated according to an appropriately selected cost driver (e.g. shunting costs between freight and passenger trains are allocated according to the track usage of the manoeuvring locomotive).
- Step 3: Determination of the part of centrally booked costs that has to be allocated to the selected service. This is done in two steps: in the case of several services, centrally booked costs are allocated according to directs cost in one step, in the case of other services a further step is included, where centrally booked costs are a subject to an allocation based on a cost driver.

The total costs of a service are the addition of results of step 1, 2, and 3 above.

Unit prices are determined by using the total cost of a service. This value is divided by the planned (yearly) performance.

## 6.6 Evolutions and trends

The current cost and charge calculation at MAV Co. is a refined version of the first one introduced in 2003. As many important questions are not yet answered, even at European level (e.g. the Marginal Cost vs. Full Cost debates), there may be further changes in both the short and long terms. On the other hand, it is not only European legislation that influences the market prices and costing behaviour of the IM, but users and road competition are of high importance. There are some changes that are already foreseeable for the Hungarian infrastructure pricing scheme.

1. The IM now has a relatively low-quality dataset about actual traffic performance. Real time measurement of the performance is only available in case of services for the freight trains. This is why the IM started an ICT project to obtain actual, real time measured data from all segments of the railway transportation. The system is based on electronic log booking of station



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events. The second step will be the automation of data input from signalling systems from 2010.

2. The price system should be based more heavily on gross tonne kilometres, as this is the best indicator for track wear and tear. Research has already started to clarify the changes to the current system.
3. The network graph has to be detailed. Now the owner of industrial tracks is not indicated in the accounting system. If a shipper or any third party maintains an industrial track, different prices should apply for consignment and marshalling.
4. Shunting technologies differ from station to station. The current prices do not cover differences in the shunting technology. The reason is the missing details of cost data.
5. Border crossing procedures differ from border station to border station. The differences (similarly to shunting) are not represented by prices because of missing cost data.
6. The Network Statement does not contain anything about the warranty obligations of the IM. Users want the IM to introduce refund in case of delayed trains and to provide different levels of guaranteed paths. The cost structures behind these expectations have to be elaborated in the short run.

By developing the pricing scheme, the further and further breakdown of services seems to satisfy both the users and the IM. However, a central question always needs to be answered: does the market as a whole benefit more from further diversified services than the costs of information associated with it?

## 6.7 Recommendations

By having a look to the very wide variety on the current European organisational and pricing schemes adapted by the different IMs, the regulator might feel a motivation to try to harmonise these processes. This activity might be welcomed by all the stakeholders, but several important aspects have to be underlined.

### Level of charges

Most of the practical debates around railway pricing are definitely not about the charging principles, but about the actual level of charges. Users are less interested in econometric research at this field, but they pay attention to the total amount that they have to pay for the access to the tracks. The current levels of charges all across Europe vary from 10-12% cost coverage to 10% profit (110% of costs). Harmonisation of pricing regimes does not help much if it simultaneously ignores the question of the level of charges. On the other hand, the level of charges should be discussed with all the national governments, as it is the government that has to pay for the uncovered costs of the railways. State budgets have different limitations in each country. Therefore, an incentive for harmonisation should care about this matter as well.

### Decision about the charging principle is a decision about the level of charges

Marginal costs in the railway sector in general do not exceed 8-15% of all cost. With some gentle mark-ups this can be raised to 15-20% when it comes to pricing. Practically the preference of marginal cost based prices means the preference of 80-85% state subsidy for the railways. If a marginal cost based price is marked up to cover 100% of costs, this means, that the original marginal cost has to be multiplied by approximately a factor 5. If a marginal cost based calculation scheme is marked up heavily by a factor 4 to 6, it is no more a marginal cost scheme! It simply makes no sense to multiply marginal cost based calculation results up to cover total costs, because this implies a total distortion of the initial data. Total cost coverage can only be achieved by the Full Cost or Full Cost minus approach that needs less state subsidy, generates higher prices, and ensures full cost coverage.

### Pricing scheme vs. cost accounting scheme

If the regulator would like to have prices with a proper cost basis, it has to pay attention to the cost measurement and cost allocation system as well. In Hungary the current cost accounting system is not adjusted to serve the needs of marginal cost calculations. If the MAV Co. were motivated to introduce marginal cost based prices, it should totally re-engineer the current cost accounting system. Recommendations about the desired pricing scheme affects only the end of the pricing process. An accurate change can only be achieved if the recommendations address the cost accounting system as well.

By the time MAV Co. started the costing and pricing of the infrastructure (2002), there was no solid background information or international best practice information available from the European Commission. The available cost accounting system was established for different purposes several years earlier for the integrated national railway company. Since that time the situation has not changed radically: European and national legislation gives deficient information about the desired cost accounting and pricing strategies. National debates around the charges usually address the level of charges, not the methodology; this is why the methodology did not change much recently.

## 6.8 Example – price calculation

The following examples (Table 6.3 and 6.4) for passenger and freight trains are provided, to illustrate the price calculation method for Hungary.

For the passenger train an example is the train starting in Budapest and travelling to the border with Austria. This is a high quality line (2 tracks, electrified, 160km/h at some places). The calculation is done for the Hungarian section for a EuroCity train.

The freight train shown below travels also along the 4th European corridor, but in the other direction: It is a 1500 tonne train (a typical freight train load in Hungary), from Budapest to the Romanian border.

**Table 6.3 Charge calculation for passenger train Budapest-Austria**

| Item | amount | unit | Price | Total |
|---|---|---|---|---|
| **path allocation** | 1 | path | 23,2 | 23,2 |
| **station usage** | 1 | event | 27,8 | 55,6 |
| **stops** | 4 | stop | 13 | 52 |
| **train running** | 270 | train km | 2,3 | 431,48 |
| **overhead catenary usage** | 270 | electric train km | 0,5 | 93,8 |
| **Total** | | | | **€ 656,08** |

**Table 6.4 Charge calculation for freight train Budapest-Romania**

| Item | amount | unit | Price | Total |
|---|---|---|---|---|
| **path allocation** | 1 | path | 25,2 | 25,2 |
| **station usage** | 1 | event | 46,9 | 46,9 |
| **station usage** | 1 | event | 7,8 | 7,8 |
| **station usage** | 1 | event | 19,5 | 19,5 |
| **shunting** | 27 | no. of wagons | 4,5 | 121,5 |
| **train running I** | 270,3 | train km | 2,3 | 621,69 |
| **train running II** | 28,8 | train km | 1,4 | 40,32 |
| **train running III** | 65,5 | train km | 0,8 | 52,4 |
| **overhead catenary usage** | 270 | electric train km | 0,5 | 135 |
| **Total** | | | | **€ 1070,31** |

# 7. LATVIA

*Tatjana Kontijevska, LDz*

## 7.1 Introduction - LDz

The Latvian railway LDz is a joint-stock company, with all shares owned by the State. There are three freight operators in Latvia – one is LDz's daughter company and the others are two additional private companies. Three operators serve passenger traffic – LDz's daughter company that provides local passenger traffic, LDz – international passenger operator, and one private operator, providing local passenger traffic at narrow gauge (750 mm).

The total length of the Latvian railway main lines is 1.933,8 route-km and the length of the narrow gauge lines is 33,4 route-km. The main lines of the Latvian railway are used for both freight and passenger traffic.

### Freight operations

The largest part of railway transport in the Baltic region is freight operations, particularly the transport of oil products, mineral fertilizers and coal through Baltic ports.

The business of freight transport is related to traffic flows between Russia and Western countries (e.g. through Latvia, Estonia, Lithuania and Finland, as well as through Russian ports) and with different modes of transport (e.g. pipeline), their development being influenced by state politics and support.

The largest freight flows in the Baltic Sea Region go from East to West and vice versa. These freight flows mainly consist of export and import of Russian products.

The railways of the Baltic countries are used mainly by international freight traffic in the East-West direction. They serve as a part of a single logistics chain.

The railways in the Baltic countries operate a single technological process for international freight transport (in 1520 mm wide railway track). For freight traffic the international freight train formation plan is applied, the amount of international freight traffic is coordinated, as well as train weight, length and time of state border crossing.

### International passenger traffic

A single international passenger train timetable is in use among the railways of the Baltic States. LDz coordinates the time and sequence of train traffic with all members of the international passenger traffic group (Lithuania, Estonia, Belarus, Russia, Ukraine, Poland, Germany, etc.).

### Domestic passenger traffic

Domestic passenger traffic is organised around the fulfilment of government orders.

## 7.2 Principles of the current charges

In order to employ the appropriate charges for the use of infrastructure, EU Directives require that charging schemes ensure effective use of infrastructure and non-discriminatory access for different railway undertakings that perform services of equivalent nature in a similar part of the market. Furthermore, the responsibility of access charging schemes should be independent from any railway undertaking.

In order to comply with the non-discriminatory principle, the charges for public usage of railway infrastructure in Latvia are set by the Public Utilities Commission. This is done once a year. The charges are then applied for the next train timetable period.

### Access charges

The basic approach taken to charging is "full cost recovery" or it may be considered as "full cost recovery minus" if taking into account State budget and co-financing with EU Funds.

Access charges are designed to recover the total revenue requirement:

- track and structure maintenance and renewal;
- signalling maintenance and renewal;
- electrical supply equipments maintenance and renewal;
- real estate (station buildings) maintenance and renewal;
- train control and operation costs;
- investment costs (partly recovered by EU Funds and State budget, mainly as a co-financing with EU Funds).

The calculation is based on current year cost analysis and a forecast of future costs (next year), not taking into account the costs of borrowing (financial costs).

The Latvian Infrastructure Manager (IM) calculates charges according to the method approved by the Public Utilities Commission. The cost accounting system can be defined as an Activity Based Cost system (ABC).

The only kind of charge levied is a variable charge per train kilometre. This is applied differently to freight, passenger local and international trains and local electric passenger trains. Charges account for 100% of charging revenue.

### Additional services

The Latvian IM provides:

- processing work with wagons at stations;
- train formation;
- wagons technical inspection;
- telecommunication services;
- traction current supply;
- electrical supply;
- real estate rent.

Calculation of train formation, processing work with wagons in stations and wagon technical inspection services is based on current year costs analysis and forecast of future full costs (next year). The Public Utilities Commission sets the charges of telecommunication services and electrical supply services.

The real estate rent level is the same as for other real estate by market prices.

## 7.3 Structure of the current cost accounting system

The General Ledger Accounting system is organised by using the SAP R/3 system and the Infrastructure Manager uses one Controlling area for structural units. Each structural unit has a specified chart of accounts under the General Ledger Accounting system.

In the General Ledger Accounting system, revenues are codified per services. Coding of costs does not reflect compliance with services. When coding the revenues in the General Ledger Accounting system, neither the code of service recipient nor the code of the service provider is provided.

### General principles of cost calculation and application

The process of cost application is performed per cost groups that are connected with performance of different tasks:

- Railway track costs.
- Electrical engineering costs.
- Real estate costs.
- Costs of train traffic management.
- Costs of railway infrastructure management.

In accessioning of costs all the costs are applied to particular cost centre or service. Costs that are directly applied to cost centres are attached to particular business areas according to the configuration of the SAP R/3 system.

As a result of costs application and distribution, all the costs are re-divided between regulated services and other commercial services.

For application of the costs, numerically measurable and assessable cost drivers are used.

### Cost classification

Accessioning of costs of undertakings ensures accountancy per structural units by grouping costs of structural units that provide the same type of services. Costs are divided into the following categories:

- Direct costs that can be applied to a service directly and clearly by using its activities as a basis.
- Indirect costs that consist of common costs of different activities and can be applied to the service with help of a cost driver.
- General costs that cannot be applied to service based on causation principles.

**Direct costs**

If possible, all the direct costs are applied directly to the service. If the costs cannot be directly applied to the service, the cost centre should necessarily be indicated. Then direct costs are applied to the service using cost driver or activity.

Costs that are applied to infrastructure usage service are divided into the sections of railway infrastructure and summarized into railway line categories.

**Indirect costs**

The costs that are connected with the totality of direct costs and not possible to describe as a direct activity for a particular service are defined as indirect costs. In accessioning of costs when accounting the indirect costs for structural units, the activity corresponding to these costs needs to be defined.

Indirect costs that are applied to infrastructure usage services are divided into the sections of railway infrastructure and summarised into railway line categories using the cost driver.

**General costs**

In accessioning of costs, the activity is not indicated. General costs consist of administration and management costs, state tax for regulation of public utilities and other undistributed costs.

General costs that are applied to infrastructure usage service, are divided into the sections of railway infrastructure and summarised into railway line categories using the cost driver.

## 7.4 An example: calculation and application of railway track costs

The maintenance of railway track is performed by three regional structural units – Track Divisions in Riga, Daugavpils and Jelgava Cost centres of each structural unit are divided into three groups (according to cost category):

- For cost centres where personnel perform maintenance of a particular railway line section, engineering technical structure, railway territory and protective plantations – all the direct costs are accumulated. In accessioning for each cost centre, the appropriate activity is attached: railway track maintenance, maintenance of engineering technical structures, maintenance of protective plantations. The costs of the activity "railway track maintenance" are divided in proportion of length of railway lines in track km maintained by cost centre between the following activities:
  - Maintenance and running repairs of main lines and regular devices;
  - Maintenance and running repairs of station tracks and regular devices;
  - Maintenance and running repairs of infrastructure manager access tracks and regular devices.

Costs of level crossings maintenance, running repairs and guarding are directly applied to the appropriate railway infrastructure section. Costs that are applied to the service of infrastructure usage are divided into the sections of railway infrastructure (in proportion of length of main lines, station tracks and infrastructure manager access tracks in track km, length of engineering technical structure and area in hectare) and summarised into railway line categories.

- Cost centres whose personnel perform additional tasks for railway track maintenance. These include
  - fault detection laboratories and workshops;
  - workshops of motor vehicles and track vehicles;
  - fire brigades;
  - recovery trains;
  - trouble crew;
  - team for electric facilities;
  - workshop of power supply monitoring;
  - station of body size control;
  - station of track control;
  - thermal welding crew;
  - warehouse for complete material.

In these cost centres, all the indirect costs are accumulated and the appropriate activity is attached. It is impossible to apply indirect costs to a particular railway section. The operation of cost centres is related to maintenance of railway track in responsibility areas of regional structure units or maintenance of the entire railway network. Costs are divided into the sections of railway infrastructure (according to the length of main lines and station tracks, gross ton-km made per railway track km, excluding unused railway lines) and summarised into railway line categories.

- Cost centres related with provision of activities mentioned in paragraph 1 and 2 – management, administration costs of regional track divisions, warehouses of materials, workshops of building manager and all the undistributed costs (common for whole track division or region). In these cost centres all the general costs are accumulated and divided into the sections of railway infrastructure (according to the length of main lines and station tracks, gross ton-km made per railway track km, excluding unused railway lines) and summarised into railway line categories.

As a result of costs application and distribution all the costs are re-divided between regulated services and other commercial services.

## 7.5 Charges in practice

As mentioned previously, the charges are calculated according to costs which are caused by the activities of the Infrastructure Manager in order to make it possible to use the railway infrastructure. The calculation is based on current year cost analysis and a forecast of future costs (next year), not taking into account the costs of borrowing (financial costs). Charges are approved by the Public Utilities Commission each year.

The charge is set per train km. The operator pays for the train kilometres actually run. In accordance with this, the current charges for different types of trains are the following:

- Freight trains: 5,68 LVL/train km (8,08 €/train km);
- Passenger trains (electric): 3,29 LVL/train km (4,68 €/train km);
- Passenger trains (diesel): 2,80 LVL/train km (3,98 €/train km);
- Passenger trains with locomotive (diesel or steam traction): 3,10 LVL/train km (4,41 €/train km).

Consequently, the charge for an example passenger train (electric), running the distance 150 km is as following:
3,29 LVL/km * 150 km = 493,50 LVL = € 702,19

The charge for a freight train (3.000t) running the distance 150 km is:
5,68 LVL/km * 150 km = 852,00 LVL = € 1.212,29

# 8. SUMMARY AND CONCLUSIONS

## 8.1 A multitude of charging approaches

### Cost recovery

Any discussion on the setting of track access charges for rail infrastructure in Europe has to reflect on the interaction between economics and politics. In order to avoid further accumulation of indebtedness by the railways, which was one of the main causes for the decline of rail transport in the past century, European legislation obliges Member States to ensure that rail infrastructure managers´ costs are balanced by the income from infrastructure charges and public funding. Against this background a difference in the use of the term "cost recovery" can be observed among different EU Member States.

Firstly, experience shows that, in practice, "costs" can be defined very differently. For example, costs can be simply referring to maintenance and operation costs. In other cases, they can also encompass renewals (e.g. Great Britain and Germany). In Latvia, France and Germany, costs covered by track access charges even encompass part of the investment needs. In addition, costs can be referred to as gross costs, i.e. all network costs, or net costs, i.e. network costs after accounting for public funding.

Secondly, variations appear in the structure of the charges. Whereas for Network Rail, fixed charges account for 90% of the charging revenues paid by franchised passenger operators, the only type of charge levied by LDz is a variable charge per train kilometre (applied differently to freight and passenger trains). Naturally, this difference has little connection to real differences in the general cost structures of the companies.

Thirdly, the "recovery" objectives depend both on the specific market situation in each Member State and (probably most important) the level of State funding. In other words, the way the objectives of transport policy and public budget restrictions are weighed against each other are country specific.

For instance, Baltic countries, such as Latvia, are able to recover infrastructure costs solely from the access charges due to the different traffic situation (mainly freight traffic). Railways with captive clients hauling high value goods can recover more than 90% of their costs directly from the railway undertakings using their service. In contrast, Scandinavian Infrastructure Managers (IM) benefit from very high levels of State funding that can cover up to 98% of their costs.

In Germany, investment funding from the federal government, in return for maintaining and upgrading the railway infrastructure, entails that access charges must cover approximately 60% of gross network costs. Conversely, some States charge at high levels simply to reduce indebtedness. In Hungary, 88% of the IM's revenue has to come from railway undertakings.

In some instances, such political options could dissuade (potential) clients from using the railways. In any case, it is important to note that "full cost charging" does not necessarily mean higher charges compared to "marginal cost plus mark-ups". The level of marginal cost and mark-ups can indeed vary widely. It may depend for instance on how scarcity, congestion and environment are charged for. But the level of mark-ups can also increase with many other elements such as refuelling facilities, train formation facilities, marshalling yards, passenger stations etc.

By means of Directive 2001/14/EC, the European Commission has tried to strike a balance between the different cost recovery methods. Article 7 states that "the minimum access package and track access to service facilities shall be set at the cost that is directly incurred as a result of operating the train service". While aiming at providing a general guideline on the costs to be covered, it leaves the necessary freedom to the IMs to develop their business practice in a way that reflects their individual situation and political objectives.

### Charging structures

Levels of charges are only one element of the European diversity range. Charging structures are also very varied. This can be seen from several examples:

**Services allocated**

MAV Co. notes that both IMs and users dislike "general" services. On the one hand, IMs would like to ensure that all service components are charged for. On the other hand, a user wants to pay only for those particular services that it really needs/orders and according to a system that is transparent.

The resulting system for MAV Co. is a relatively fine differentiation of services, e.g., the consignment of freight wagons is separated from the shunting before or afterwards, because in several cases no shunting is needed before the consignment movement. Similarly, electrical energy is separately charged from the usage of overhead catenaries wires. While the former is based on the actual consumption of a train, the latter is a train kilometre based price for electric traction.

Pricing schemes that break down services further and further can satisfy both the users and the IM. Network Rail is currently working on a sophisticated model based on an engineering approach. The model will allow Network Rail to charge railway undertakings according to the precise damage that they inflict on the infrastructure.

Such a wear-and-tear-based charging system helps in developing infrastructure-friendly rolling stock as it sends signals to fund providers and operators for their decisions to operate additional trains.

However, some risks cannot be excluded: traffic could be switched to congested parts of the network if the correct match between infrastructure quality and wheel/boogie contact is disregarded. Furthermore, as suggested by MAV Co., the complicated modelling leading to better cost reflectivity can also lead to higher administrative costs. DB Netz has tried to avoid the negative effects of an "atomised" system of individual cost-driven route prices (the more price components the more complaints to the regulatory body), developing a grouping of routes into categories.

**Path installation and path reservation**

In Belgium, the train path installations charge takes into account the time of occupation of the track beyond a flat rate deadline. Some countries hardly charge for path reservation (Latvia, Hungary, and GB), while Germany practices a minimum cancellation fee amounting to the fee required for preparing a train path offer.

In France, most of the charging revenues come from reservations. RFF even distinguishes path reservation charges from stop reservation charges arguing that it leads to RUs using the network in an optimal way.

**Administrative costs**

The allocation of administrative costs in a marginal costing framework has always posed problems. Each case is dealing with these in a different way. However, it is interesting to note that these costs can have other uses. For example, some IMs (RFF, Infrabel and DB Netz) have found that administrative charges can be used as a tool to avoid too many requests for path modifications.

Accordingly, RFF proposes to charge the demand for any path cancellation or modification after the initial capacity allotment. This charge would make the railway undertakings responsible for several changes to their capacity demands. This charge will be fixed at only €30 per demand for path cancellation or modification.



**Scarcity**

The issue of scarcity in railways (as also in any other scheduled operating modes) is generally dealt with through timetable planning and sometimes through peak pricing. Even though it is theoretically acceptable to talk about harmonization on this level, this could be very difficult in practice, as the density of traffic and price elasticity of Railway Undertakings can vary dramatically from country to country or among Railway Undertakings.

In Germany, DB Netz has developed practices (such as granting discounts for limited periods in time) to promote the use of lines with a low level of utilisation, for example as an alternative to the more congested lines.

**Environmental charges**

Charging for environmental effects is possible under the provisions of Directive 2001/14, and environmental mark-ups are also continually discussed. However, only a small minority of States envisage applying them. The reason might be that rail is already considered to be the most environmentally friendly mode of transport. In Belgium, an environmental coefficient exists in the charging formula, but it has not been activated so far (=1). However, as far as energy billing is concerned, three out of the six country-cases examined (Great Britain, Belgium, Germany) show that restructuring of the energy metering is an ongoing issue with possible important impact.

National rail infrastructure managers are unanimous in denouncing the absence of a level playing field with other transport modes with respect to external costs. Infrastructure managers are also advocating simple and stable charge structures. Track access fees need to be clear and understandable. They should be as sustainable as the other main sources of financing coming from the public authorities' budget.

## 8.2 Cost accounting – supporting and complementing charging principles

The practical complexity of the railway environment makes the development of charging and accounting systems a highly technical and individual issue. For example, in Hungary, the preparation of a new cost accounting system started already in 1995, but the full and live use of the new Accounting Management System (AMS) only started in 2001. Exogenous rules can also have an influence on accounting models. For instance, as RFF and DB AG are issuing debt securities, they now have to comply with International Financial Reporting Standards (IFRS).

Infrabel recently built an Activity-Based-Costing model. In the first iteration of the model, the aim was to chart all exploitation costs for all the products and services that Infrabel offers. In the model, the costs are allocated directly to the products and services offered or indirectly by using activities based on the organisational chart of Infrabel. In the meantime, the first run is finished and Infrabel is refining the model and cost allocations. In the long-term, Infrabel is aiming to introduce an ERP-system (Enterprise Resource Planning). This ERP-system will provide more detailed information about cost allocations of the particular products and services offered.

DB Netz has implemented a direct costing system that, defines each "line" as a cost unit. The allocation of direct and common costs to cost centres and finally to cost units is based upon process-oriented cost drivers.

In Latvia, LDz is already using a rather advanced Activity-Based-Costing model. It requires very fine distinctions between cost centres, but also within each cost centre.

For instance, distinction is not always easy between:

- cost centres whose personnel performs maintenance of particular railway line section, engineering technical structure, railway territory and protective plantations and cost centres whose personnel performs additional tasks for railway track maintenance.
- management, administrative costs and other undistributed costs.

In Hungary, there are as many as 1600 activity codes within the Accounting Management System of MAV Co. They were derived from the main activities of the company. MAV Co. admits that the allocation of a correct activity code can be partly subjective. However, the activity code remains the most important dimension of the accounting process: it helps to link costs to different activities and is defined at a very low level (already at the level of each payment, negative for a cost and positive for an income).

If the regulator wants to achieve a clearer cost basis for track access charges, it has to pay attention to the cost measurement and cost allocation system as well. In Hungary, the current cost accounting system is unable to serve the needs of marginal cost calculations. If MAV Co. were to introduce marginal cost based prices, it would have to totally re-engineer the current cost accounting system. Recommendations about the desired pricing scheme affects only the end of the pricing process. An accurate change can only be achieved, if the recommendations address the cost accounting system as well.

The Hungarian cost accounting system was initially established several years ago for the integrated national railway company. However, the situation did not change too much in latter years and MAV Co. regrets that European and national legislation does not provide sufficient information about the desired cost accounting and pricing strategies. National debates around the charges usually address the level of charges, not the methodology.

The Belgian IM has more optimistic views and considers that its Enterprise Resource Planning structure, its update of centralised data and fine-tuned repartition keys will allow it to know the costs of its products in real time. It will then be easier to fine-tune its charging methods.

The introduction of a new accounting model (no matter how advanced) is not an easy process. It will demand adaptation in many levels and practice and will bring about an amount of extra cost. Further to that, there is likely to be a time lag, the duration of which will depend on a number of factors, such as inherent adaptability in the existing management and reporting system, general organisational mentality etc, to allow the organisation to get fully accustomed to the new system and fine-tune its application. Careful planning is required in order to ensure that any new accounting model will provide the required type and amount of information that each individual case requires, with the minimal cost and time of implementation. Clearly, this has led to a wide variety of different systems in use. Since these systems are also expensive, data-network related applications, they might be difficult to change, at least in the short run. Thus, any commitment to a system change would have to be subject to a detailed cost-benefit analysis.

## 8.3 Conclusions - no unique solutions for complex problems

IMs have already taken important steps forward. New charging systems have recently been set up in all cases studied. Furthermore, IMs are still running trials and learning from experience in the accounting field. They need time to test options and debate with RUs. Also, it must be remembered that much of the variation we have seen in the approaches towards charging and accounting comes from the different political and market situations facing the respective IMs.

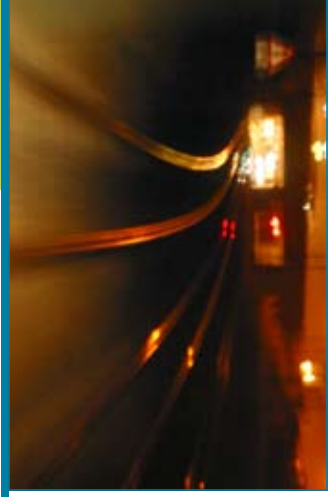
From the six cases presented in this booklet, one can conclude that:

- Charging cannot be separated from financing of the railway system.
- There are specificities for each country. The charging system is an instrument to achieve strategic goals and goals can differ from country to country.
- Attention should be paid to the level as well as to the structure of the charges. These levels are related to public subsidies and hence to the general transport policy of any public authority, be it local (régions in France, Länder in Germany) or national. It is also clear that the level of track access charges has a direct influence on the competitiveness of the railway sector vis-à-vis other modes of transport.
- Many challenges and trade-offs remain to be resolved. The treatment of freight and passenger transport will continue to be different.
- The user should at least pay for short-term marginal costs.
- Introducing improved cost accounting requires sophisticated modelling and understanding of the cost relationships across the business. In the short-term, more work can be done on cost evaluation (vehicle, geography).
- In the longer-term, one could also consider scarcity charges. In this respect, a study of infrastructure access charges for different modes along important international corridors could be useful. Such a study could also examine the possibility to introduce mark-ups along some stretches depending on environmental or quality performances.
- Simplification and stabilisation of charging structures: Track access charges need to be clear and understandable. They should be sustainable and not changed too often. Balancing the precise definition of detailed cost positions with simplicity may require a number of contractual provisions (for example General Terms and Conditions for infrastructure use and investment framework for new enhancements) in addition to the charging regime.
- A suitable cost accounting system is essential, but no guarantee for a suitable access charging system. In particular, typical problems related to high levels of fixed and common costs exist independent of the degree of sophistication of a network manager's accounting system.
- Infra Cost Modelling (Great Britain) or the ABC model (Belgium, Hungary, Latvia) bring interesting results, but several iterations are needed for the models to be optimised. For instance, ICM has helped improving vehicle designs, thereby minimising the whole-system costs.
- At the same time, it should be taken into account that even advanced cost accounting methods cannot solve the economic problems related to the typical network – cost structures that are characterized by high levels of fixed and common costs.
- Transparency and constant dialogue with Railway Undertakings (for instance to discuss practical benefits and costs of route-based charging) are crucial to the process and are high on the IMs' agenda.

IMs acknowledge achievements related to European Railway legislation regarding charging (minimum access package) and basic accounting rules (separation, transparency). However, they do not believe in over-regulation. At a time of legitimate concern about red tape and better regulation, the European Commission can be a welcome provider of recommendations based upon practices that have proven successful, but should not force all IMs to introduce a certain system. The relationship between national policies on infrastructure funding and charging must be recognised.

As a matter of fact, in February 2008, the European Commission published a communication on multi-annual contracts for rail infrastructure quality. Multi-annual contracts are medium-term (3 years or more) contracts between the State and the IM, including performance and productivity objectives, monitoring provisions and sanctions in the event set indicators are not reached.

The railway sector welcomes these types of initiatives which provide a higher degree of certainty as to its funding levels, thus allowing for improved medium term planning. A reasonably guaranteed scheme on a multi-annual basis is needed for financing both the infrastructure maintenance and renewal, also taking into account income from access charges.



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