

ACCESS PRICING IN THE GERMAN RAILWAY SYSTEM: ARE THE TRACK CHARGES COST-COVERING?

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1 BACKGROUND

In 1994, a fundamental reform of the government-owned railways Deutsche Bundesbahn DB (West Germany) and Deutsche Reichsbahn DR (East Germany) was initiated. The main features of this reform are¹:

- The foundation of Deutsche Bahn AG (German Railways PLC - DB AG) as a private sector company which emerged from the two former government-owned railways DB and DR.
- The separation between infrastructure and transport, at present realized by splitting up DB AG into four subdivisions (tracks network, long-distance passenger transport, short-distance passenger transport, freight transport) which are to become public limited companies in their own right in 1999 at the latest.
- Opening up of the rail network for third parties against the payment of track charges.
- Federal responsibility for rail infrastructure investments.
- Financial refloating measures on the part of the state.
- Regionalisation of suburban passenger transport from 1996 onwards.

An important part of the EC-directive 91/440 EWG is the obligation for the European national railways to separate between transport operations and infrastructure at least on the bookkeeping level and to open up the national rail networks for rail companies from European countries in cross-border transport.

The German reform model goes beyond these basic requirements and contains the institutional separation between infrastructure and transport, the introduction of charges for the use of infrastructure and the open access to the rail network for third parties which are defined more comprehensive than in the EC-directive. With these features, Germany belongs together with the U.K. to the most advanced countries in implementing the EC-directive 91/440 EWG.

Meanwhile two years have passed since the opening up of DB AG's network and the introduction of access pricing. The scientific as well as the political discussion based on the available experiences focusses particularly on the level and structure of the track charges.

There are several requirements to be placed on the track charges: From the viewpoint of competition policy the track company - an example for a natural monopoly - has to set access prices which are fair and free from discrimination amongst the track users. The track users are mainly interested in reasonable and fair prices. From the viewpoint of the track company the prices have to be cost-covering on the one hand and competitive on the other. However, getting the access prices both cost-covering and competitive seems to square the circle. Although there is still a considerable lack of empirical information, the available experience shows clearly that cost-coverage can not be achieved with the current level and structure of access prices.

This paper will start with a brief theoretical background of pricing principles under the conditions of monopolies. This will be followed by a description of the underlying principles and the structure of railway access charging in Germany. Based on officially available data and comprehensive own calculations the paper will then focus on the question whether the current price system of DB AG's track company is sufficient to cover the tracks costs.

2 PRICING POLICIES UNDER THE CONDITIONS OF MONOPOLIES

In the railway market the track company represents a natural monopoly with considerable market power. Although both the individuals in passenger transport and the haulage contractors can make a modal choice between rail and road the transport, companies specialized in offering rail-bounded services depend on the provision of tracks as basis to produce their services.

There are several problems in the pricing strategies of monopolists which require appropriate policy measures. A monopolist which operates in businesses with decreasing average costs (to these types of business belongs the provision of the track network) faces the general problem that charging prices according to the marginal costs would lead to a deficit because the marginal costs are lower than the average costs. Usually the monopolist avoids this deficit by charging either Cournot-prices or by using the possibility of price differentiation. In the latter case three levels of price differentiation can be distinguished:

1. Price differentiation on the first level means that the customers have to pay prices according to their individual willingness-to-pay. In practice this form is an exception due to the high information requirements.
2. Price differentiation on the second level means to charge the customers depending on the volume of purchased goods. The customers have to pay different prices per product unit within defined margins of ordered product volumes. Practical examples are the graduated tariffs of electricity companies.
3. In case of price differentiation on the third level the different customer groups have to pay prices according to the price elasticities of their demand.

Both in the case of Cournot-prices and the mentioned forms of price differentiation - although the latter tend to be pareto-optimal - there is a need of state regulation in order to avoid the mis-use of market power through the monopolist. Apart from measures to control and regulate the prices, possible policy measures are auctioning a timely limited monopoly (as practiced within the bidding processes for franchising on British Rail lines), quality regulation etc. In the context of access charges for the rail network the following policy measures for price regulation have to be mentioned:

1. The monopolist can be obliged to set the prices equal to the marginal costs. The deficit which occurs in that case has to be subsidized by the state, as widely practiced in railway policy. This form of price regulation can be suitable for lines which can not be run profitably but shall be further operated due to the public interest.
2. Another regulation measure can be to allow the monopolist a pareto-optimal price differentiation to such an extent that a deficit can be avoided. Practical examples are the graduated prices of electricity companies and the telephone tariffs which consist of a basic component for the fixed costs and a usage-related component. Particularly the telephone charges could serve as an example how to charge track costs because they are similar to the telephone costs marked by a huge share of fixed costs.
3. In a further type of price regulation the monopolist will be obliged to set cost-covering prices which can vary for the same product among the customer groups depending on their price elasticity. The optimal price structure guaranteeing cost-coverage would imply to set the highest prices for those customers which have low price elasticities. Examples for such Ramsey-prices are air ticket prices for different user groups and the price differences of electricity companies for private and business customers. However, in economic theory this form of price regulation is disputed. A further problem of this regulation form is the missing information on price elasticities.

3 OPEN ACCESS AND ACCESS PRICING IN THE GERMAN RAILWAY SYSTEM

3.1 Access to the DB AG's track network

Within the new German Railway Law, adopted in 1994, for all German railway companies as well as for railway companies from abroad the right to run services on the German rail network is fixed. Already in July 1994, the DB

AG and all other German public-transport railway companies opened their routes according to this legal framework to the following groups of users:

- public-transport railway companies which possess an own rail network,
- non-public-transport railway companies who likewise grant - under similar terms - other public railway companies access to their infrastructure,
- railway companies from EU countries for cross-border intermodal traffic,
- foreign railway companies, when mutual access to the rail network is guaranteed, otherwise on the basis of international agreements.

This definition of user groups exceeds the requirements of the EC-directive which claims only access for rail-companies from EU countries in cross-border intermodal traffic. DB AG even grants - in addition to the mentioned groups - other companies like haulage contractors, travel companies and government bodies access to its routes.²

However, due to the early date of opening the routes to third parties a detailed legal framework was missing. This holds not only true for the EC-level where the directive on allocating track capacity and calculating track charges passed just in 1995 (EC-directive 91/19 EC). Also at the German level details of the access and access pricing were not clearly defined. For example, the mechanisms to control the discrimination-free treatment of companies wishing to use DB AG's tracks and to check whether the level and structure of track charges are reasonable did either not exist or were insufficient. Also the problem of granting linear increasing discounts which clearly favoured the transport companies of DB AG as the most important customers of track company was not solved.

Meanwhile a draft of a German Law on the Use of Rail Infrastructure was presented which is expected to pass in the middle of 1997. This draft contains the following rules:

- All companies providing rail infrastructure for third parties (apart from DB AG that concerns in Germany all public-railway transport companies) can define the level and structure of track charges freely.
- It is admissible to charge average prices for the network as a whole, or to calculate charges for parts of the networks or certain routes.
- Factors to be considered in the definition of track charges can be: Types of routes, operating days and times for the services, operated vehicle types, wear-and-tear of the tracks, utilization of tracks and also the air and noise pollutions of the operated trains.
- The track charge systems must not be published but customers have the right to look into the price lists on request.
- The track companies can provide discounts for ordering a certain volume of train-kilometres. However, they have to prove (by an official certificate of an auditor) that closing contracts over a huge amount of tracks with only one customer causes less costs than contracting the same amount of tracks with more than one customer.
- In the case of competing demand for tracks the track companies are allowed to grant track access to the most-bidding customer.

So far, only a few number of contracts with non-DB AG users for operating services on DB AG's lines have been signed. Contractors are mainly the so-called non-federal railways, companies which are in the ownership of the federal states and local bodies, partly also with the participation of private industrial companies of the concerned regions. In 1994, about DM million 30 resulted from contracts with non-DB AG users of tracks. The respective figure for these revenues amounted to about DM million 50 in 1995.

However, the number of third parties using DB AG's routes has been increasing since 1994. Particularly the regionalization of suburban passenger transport since 1996 has opened new chances for rail companies because the federal states can now decide independently on how to use their budget for suburban passenger transport and which types of services (bus, rail, etc.) to order.³ The first call for tenders in that context were already published.

Most railway companies although criticise the behaviour of DB AG which raises various obstacles for third parties wanting to use DB AG's network. The main obstacles are to be seen in high requirements regarding the qualification of driver's staff which requires additional costly education for the non-DB AG drivers. Furthermore, the required high vehicle standards and problems of achieving the desired track slots are claimed. Additionally, the rail companies are faced with the problem of high track charges which shall be analyzed more detailed in the following chapter.

3.2 Level and structure of the track charges - a brief outline

The price system for the use of the tracks was introduced in 1994. In 1995 it was followed by a price system for the use of other facilities like stations etc. Meanwhile, in reaction to the heavy discussion on the track charges, the prices for short-distance passenger traffic as well as the discount system were already revised.

While the track fees are charged for providing the tracks (including passing- and crossing tracks and the tracks within stations) as well as for operating the network and compiling the time table, the use of stations, marshalling yards etc. has to be paid by special access charges defined in the mentioned additional price framework. Furthermore, the track charges do not include the consumed electric power for the electrified sections, shunting services and VAT.

The track charges consist of basic prices on the one hand which can be modified according to the user's requirements (reliability, special types of operated trains) and of discounts on the other hand which depend on the ordered train-kilometres and on the time-horizon of contracts.

Basic Prices

The definition of basic prices follows a typization of routes and operated trains. The price system distinguishes 10 types of lines which were defined according to the quality of tracks (curve gradients, maximum speed, technical equipment, signalling and communication equipment) and to the importance of the routes (track capacity, volume of passenger and freight transport on the routes, economic importance). The definition of route types regarding these factors is shown in table 1. Apart from this typisation of lines, the level of basic prices takes into account the varying requirements of different train types. The prices vary among 7 categories of passenger trains and 5 categories of freight trains which are defined mainly in terms of operated speeds, train weights and requirements to the quality of time-table (see table 2).

Modifications of Basic Prices

Individual requirements of track users regarding the reliability, the dimensions and the weight of operated trains can modify the described basic prices. One example is the additional wear-and-tear of tracks caused by very heavy trains which is considered by multiplying the basic prices with a factor of 1.1 while vice versa the basic charge for very light trains can be multiplied with the factor 0.9. Special requirements on the reliability of trains can be charged by multiplying the basic prices with factors ranging from 0.8 to 1.2 (a factor of 1.2 means that only delays of 1 to 2 minutes are allowed). Trains operated empty just for internal purposes are charged by fees being 10% lower than the basic prices. Trains which need a special time-table (one example are pendolino-trains) are calculated separately.

Discounts

Discounts can be provided either for ordering a certain amount of tracks (expressed in train-kilometres) or for contracts with a longer time-horizon (see table 3). Discounts for ordered train-kilometres can be granted from 14 million train-kilometres p.a. onwards in long-distance passenger transport and in freight transport and 0.3 million train-kilometres in short-distance passenger transport respectively.

Discounts can also be granted for ordering track capacity more than one year in advance. The possible discount starts with 2% and can reach 6% at maximum for contracts with a five years horizon.

Table 1: Route Typisation for the Track Charges

a) *Route type regarding the importance for transport*

A: Routes connecting conurbations

B: Routes connecting other large cities, ports and important touristical regions

C: other routes

b) *Route type regarding quality of line and technical equipment*

250: possible speeds from 200 km/h up to 250 km/h (high-speed lines)

200: possible speeds from 160 km/h up to 200 km/h, automatic train operation, without level crossings

160: possible speeds from 100 km/h up to 160 km/h, signalling equipment, special safety equipment on the routes, with level crossings

120: possible speeds from 100 km/h up to 120 km/h, signalling equipment, special safety equipment on the routes, with level crossings

100: possible speeds from 80 km/h up to 100 km/h, signalling equipment, with level crossings

80: possible speeds from 50 km/h up to 80 km/h, signalling equipment, with level crossings

50: possible speeds up to 50 km/h, simplified operational forms for the trains, with level crossings

c) *Combination of the route types defined in a) and b) to a matrix of 10 route types*

route type regarding quality and technical equipment	250	200	160	120	100	80	50
route type regarding the importance for transport	A	A	A B	A B C	C	C	C

Source: DB AG.

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First revision of the price system

The average prices amount to DM 9,90 per train-km in short-distance passenger transport, DM 10,50 per train-km in long-distance passenger and DM 7,50 per train-km in freight transport. These levels and particularly the structure of prices (short-distance passenger transport is charged almost to the same level as long-distance passenger transport and the track charges for freight are the lowest) have been controversially discussed since the introduction of the price system in 1994. Particularly the federal states which have been in charge both of ordering and financing suburban passenger transport since 1996, and the non-federal railways argued that the average basic charge in short-distance passenger transport (DM 9,90 per train-km) is too high compared with long-distance passenger transport and freight transport. It was assumed that the track company which still belongs to the DB AG supports cross-subsidization to the DB AG's transport companies by setting too high prices for short-distance passenger transport.

Furthermore, it was feared that because of the high track charges for suburban rail transport, the federal states would rather use their financial budget to order cheaper bus services instead of rail services. Additional arguments came from the non-federal railways which provided data on infrastructure costs which amount because of other operational forms to only the half of the DB AG's track charges.

Another point of criticism was the discount system which obviously favoured the DB AG's transport companies. While for example DB AG's company for short-distance passenger transport could easily achieve a discount of about 13 %, all other regional rail companies in Germany - even in the case they would jointly order their required track capacity - could get only a discount of 4 % at maximum. This fact was seen as discriminatory.

As a consequence of this discussion, the price system was already revised by January 1995 with the following results:

The average price level in short-distance passenger transport was reduced from about DM 9,90 (in 1994) to DM 9,00 from 1995 onwards.

- So-called additional traffic in short-distance passenger transport - that means the number of ordered train-km which exceed the train-km operated in 1993/1994 - is priced by only DM 5,00 per train-km. This revision is aimed at taking into account the argument that additional traffic on existing tracks causes only marginal costs. In order to avoid discrimination (how to treat new rail companies which did not operate services in 1993/1994) all users have to pay a mixed price consisting of charges for train-kilometres ordered before 1995 and additionally ordered tracks compared with 1993/1994.
- In order to avoid discrimination of non-DB AG user, the maximum discount rate which could be granted to the DB AG company for short-distance passenger transport (in 1994 about 13%) was limited to 5% at maximum.

Table 2: Price Categories for the Use of DB AG Tracks

Price category		Weight	Speed	Planning-requirement
Passenger transport				
P 1	High-speed trains	max. 1000 t	200 km/h and more	max. 105 %
P 2	Fast passenger trains	max. 750 t	up to 200 km/h	max. 108 %
P 3	Fast passenger trains	max. 550 t	up to 160 km/h	max. 110 %
P 4	Slow passenger trains	max. 750 t	up to 140 km/h	max. 120 %
P 5	Regional short-distance passenger trains	max. 400 t	-	max. 120 %
P 6	Local short-distance passenger trains	max. 400 t	-	max. 120 %
P 7	Suburban railways	max. 450 t	-	max. 108 %
Freight transport				
G 1	Fast and high-quality freight trains	max. 1500 t	120 km/h and more	max. 125 %
G 2	High-quality freight trains	max. 1300 t	up to 120 km/h	max. 130 %
G 3	Heavy freight trains	max. 2500 t	up to 100 km/h	max. 150 %
G 4	Other freight trains	max. 1800 t	up to 100 km/h	max. 150 %
G 5	Local freight trains	max. 800 t	up to 80 km/h	max. 170 %
¹⁾ The planning-requirement defines how many per cent of the theoretically possible travel time on a route the operated train will exceed at maximum. Source: Deutsche Bahn AG.				

4 COST COVERAGE OF THE TRACK CHARGES

There are several requirements the track charges were expected to meet:

1. The track charges should be free of discrimination for all track users.
2. The level and structure of track charges should enable the track company to cover the track costs.
3. The track charges should support an economic sufficiently use of track capacity.

Particularly on the first point a heavy discussion has been started which was already mentioned in chapter 3. The main reason for this lies in the fact that the track company which present a natural monopoly, operates at least up to the year 1999 under the DB AG's roof together with the three DB AG's transport companies. Therefore, it was feared that the track company would use its market power to favour the other DB AG's companies. As already mentioned, the discussion focussed mainly on the structure of prices regarding the transport types and on the discount system.⁴

Table 3: Discounts in the Framework of Track Charges

Discount-rate ¹⁾ (%)	Train-kilometres p.a. (from ... mill)		
	Short-distance passenger transport	Long-distance passenger transport	Freight-traffic
1	0,3	14	14
2	3	28	28
3	25	42	42
4	63	56	56
5	134	70	70
6	205	84	84
7	250	98	98
8	293	112	112
9	333	126	126
10	370	140	140
11	407	154	154
12	444	168	168
13	481	182	182
14	518	196	196
15	555	210	210
16	592	224	224
17	629	238	238
18	666	252	252
19	703	266	266
20	740	280	280
Discount-rate (%)	In case of ordering tracks for more than		
2	2 years		
3	3 years		
4	4 years		
6	5 years and more		
¹⁾ Note: Since 1995, the discount for short-distance passenger transport is limited to 5 % at maximum. Source: Deutsche Bahn AG.			

Other critics are more generally and argue that the track charges do not vary regarding seasons, days and times for which tracks are ordered. It was also claimed that the reference basis for the charges - the train-kilometres - do not take into account the length of operated trains. Furthermore, given the fact that the track company represents a natural monopoly with the problems of pricing described in chapter 2, it is remarkable that up to now any institution for price regulation does not exist and is not envisaged to create.

Up to now less discussed was the question whether the level and structure of the track charges are sufficient to cover the track costs. Therefore, the following chapter will deal with this problem. Before describing the results of empirical studies carried out by the author, some explanations on the used approach of calculating the track costs are necessary.

4.1 Calculation methodology

The calculations are based on the methodology of various infrastructure cost studies which have been carried out since 1975.⁵ These studies focus on the consideration of transport ways as part of the infrastructure. Based on this, in the following the term infrastructure costs is used synonymously with the term costs of the tracks. All costs for stations, marshalling yards etc. are excluded, corresponding to the definition of track charges which also exclude the use of other facilities than tracks.

The used definition of infrastructure costs comprises capital costs (depreciation and interests) and costs for maintenance, operation and management of the infrastructure. While the costs for maintenance, operation and management are equal to the respective expenditures of the considered year, the capital costs are fundamentally different from the annual investment expenditures.

The infrastructure assets as the basis of calculating depreciations and interests are defined according to the System of National Accounts which is used in most official statistical frameworks in Europe. The value of infrastructure assets is calculated by using the perpetual-inventory concept. Within this concept the annual investments are cumulated and added to the assets value. Those parts of infrastructure assets which exceeded their life-expectancy are estimated using probability functions for the distribution of life-expectancies for asset types. The corresponding values are subtracted from the assets value.

It is important to mention that the results provided by this macro-economic approach are not comparable with the assets values and depreciations given in an entrepreneurial balance-sheet. The differences between the macro-economic approach and the entrepreneurial balance are caused by the used methods (cumulative approach versus inventory, different calculation of depreciations, differences in the assumed life-expectancy of assets) and differences in the valuation principles for the assets. Furthermore, in the macro-economic definition of infrastructure costs interests are calculated with an interest rate formed by the long-term average of public loans (diminished by the inflation rate for infrastructure investments):

The macro-economic approach for the calculation of infrastructure costs was chosen mainly by two reasons:

1. One major argument in creating infrastructure cost studies was to investigate and compare the costs and cost-coverage of the transport modes (road, railways, waterways and aviation) in order to detect distortions of competition among the modes and to derive conclusions for infrastructure charges. As far as the road network, the waterways and railways (the privatization tendencies to be neglected) are concerned, the provision and operation of infrastructure have been in the responsibility of the state and entrepreneurial methods and approaches have not been used. Hence, the macro-economic concept of estimating infrastructure costs was the only suitable method so far. Although with the introduced railway reform entrepreneurial balance-data are available the comparability with the calculation schemes for the other modes requires the continued use of the macro-economic approach.
2. A further argument favouring the macro-economic concept is the fact that the opening balance-sheet of DB AG shows a drastical undervaluation of fixed assets (from DM billion 100 in 1993 to DM billion 20 in 1994). The tracks, however, are still used for transport operations. They cause costs and they are charged with access prices. Using the officially provided balance-sheet data seems to provide a distorted picture of the real infrastructure costs.

The breakdown of costs to the transport types (short-distance passenger transport, long-distance passenger transport, freight) was within earlier studies on infrastructure costs done by using internal calculation schemes of Deutsche Bundesbahn (DB). The results of these calculation schemes have not been available since the railway reform. Several test-runings with different allocation methods showed that using the shares of transport types on the total waggon-kilometres weighted with the number of axles, provides a good fitting to the results of the former calculation scheme of DB.

4.2 Costs and Cost-coverage of Railway Infrastructure in 1995

As table 4 shows, the track costs of DB AG amounted in 1995 to about DM billion 17,7 with a share of capital costs of more than the half (almost DM billion 10). The breakdown of these costs to the transport types allocates more than the half of costs to freight transport (55%) while short- and long-distance passenger transport have almost equal shares in the total costs.

Data about the revenues from track charges were only available for 1994. According to official statements published by DB AG at the balance-sheet press conference in 1995, the track company received about DM billion 7,3 from track fees in 1995. From available data on train-kilometres for 1995 and from the average track charges for the transport types the revenues from track charges in 1995 can be estimated to about DM billion 7,2. The slight decrease in

revenues is due to the downward revised track fees on the one hand and origins also from the slightly decreased operated train-kilometres on the other hand.

Comparing the shares of transport types on the total revenues gives another picture than the structure of track costs: While about 55% of track costs are caused by freight transport only 22% of revenues origin from track charges paid for freight trains. Short-distance passenger transport generates revenues from track charges to DM billion 3,9 which makes more than the half of the total revenues while the corresponding track costs account for only 24 % of the total costs.

Table 4: Track Costs of DB AG in 1995

	DM million
capital costs	9 733
depreciations	5 556
interests ¹⁾	4 177
costs for maintenance, operation and management of the tracks	8 467
total track costs	18 200
minus:	
costs caused by lines envisaged to close ²⁾	466
track costs	17 734
¹⁾ Calculated with the interest rate for public loans. - ²⁾ Lines with running legal procedure for closure. Sources: DB AG, calculations of DIW.	

These differences in the cost breakdown and the structure of revenues is reflected by the cost-coverage. The overall degree of cost coverage amounts to 41 % showing clearly that the price system is not sufficient to cover the infrastructure costs. Looking more detailed at the transport types provides very different results. Short-distance passenger transport reaches the highest degree of cost coverage. This disproves the arguments of the federal states that the track charges in this market segment are too high. However, the fears that obviously the high track charges in short-distance passenger transport are used for cross-subsidizing the other transport segments are confirmed by the low results in long-distance passenger transport and freight - although one should bear in mind that not even the track charges in short-distance passenger transport are sufficient to cover the costs.

One might argue that these calculations do not answer the question whether from the entrepreneurial viewpoint of the track company the track revenues cover the infrastructure costs. These entrepreneurial infrastructure costs comprise due to the mentioned undervaluation of fixed assets at present almost no capital costs. However, even with these undervalued fixed assets the track company will face serious problems of covering the track costs in the long run. A special calculation was carried out starting with a value of fixed assets equal zero in 1994. By using the available data on investments made from 1994 to 1996 and assuming that the investments planned within the Federal Masterplan on Infrastructure Development up to the year 2010 will be realized, the development of infrastructure assets and capital costs were forecasted. From this scenario the capital costs for the tracks were estimated to reach an amount of about DM billion 8,4 (at 1994 prices) by the year 2010 which would exceed the current track revenues (similar level and structure of track charges and the same train-km assumed). These model results demonstrate clearly that the problems of track costs are not served by the reflecting measures in 1994.

Table 5: Track Costs and Cost Coverage of DB AG's Tracks in 1995

Transport Type	Track Costs DM million	Revenues from track charges DM million	Cost Coverage %
passenger transport	7 927	5 672	71,5
short-distance passenger transport	3 671	1 809	49,3
long-distance passenger transport	4 256	3 863	90,8
freight transport	9 807	1 571	16,0
Total	17 734	7 243	40,8
<i>Source: Calculations of DIW.</i>			

5 CONCLUSIONS AND OUTLOOK

The presented results show that the track charges are not sufficient to cover the track costs neither at present nor in the long run. In 1995, only in the segment of short-distance passenger transport a high degree of cost-coverage was achieved. The low degrees of cost-coverage do not allow to reduce the track charges as it is claimed in the political discussion. The problem will rather strengthen in the future because of the considerable investments planned up to the year 2010. These investments which are necessary for creating a modern and competent infrastructure on the one hand will lead to increased capital costs on the other hand which have to be covered by revenues from track charges. There are several problems to be solved in future. First of all it is to be mentioned that the only way out for the track company is to implement measures aimed at reducing track costs.

Surely, continuing particularly the internal reform process of DB AG - reduction of personnel costs, lean production and lean management, more customer orientation in order to increase network utilization etc. - will help to reduce the infrastructure costs in the long run. An important point in that context is the envisaged implementation of a new network philosophy, called „Network 21“.⁶ This philosophy which sets the framework for the future design of DB AG's infrastructure can be characterized as a strategy of separating the types of traffic on transport corridors (including the definition of prime and secondary users) and of harmonizing the train speeds. The stepwise realisation of this concept will lead to lower construction standards of lines with lower infrastructure costs because the lines will no more have to meet the requirements of all train types. This is clearly the right approach for the future. However, it is obvious, that beside all these measures also the closure of costly and unprofitable lines has to be on the agenda. Meanwhile first legal procedures to close about 1000 km of lines were introduced.

Further measures concern the price system itself. Apart from the criticised structure between the transport segments the track charges should take into account the season, the weekdays and the day time for which tracks are ordered. The charges should also not only be oriented on the train-kilometres because this reference basis makes no difference whether long trains or - particularly in the segment of suburban passenger transport - short trains are operated. Problems can also arise from the role that additionally ordered train-kilometres in suburban passenger transport are charged to prices of DM 5,00 per train-km. Apart from the already mentioned problems of possible discrimination this might also under economic aspects be insufficient - in cases where the additional demand is concentrated on already over-utilized route.

Last but not least, a very important task for the competition policy is to set up efficient mechanisms of price control. Considering the experiences with the deregulation of the telecommunication market the creation of a regulatory board for track access and access charges is urgently required.

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¹ For a more detailed description see: Link, H.: Structural Reform of Germany's Railways - Could Japan Serve as a Model? In: Economic Bulletin of DIW, Vol. 31, No. 11/1994. Link, H.: Railway Reform in Germany - Chances, Risks and First Experiences. Paper presented at the Fourth International Conference on Competition and Ownership in Land Passenger Transport. Rotorua, New Zealand, 1995.

² Cf. Deutsche Bahn AG öffnet ihr Streckennetz für Dritte (Deutsche Bahn grants network access to third parties). Artikelservice der Deutschen Bahn AG, July 1994.

³ From 1996 onwards regional authorities are in the functional and financial responsibility for all public short-distance passenger traffic. The federal states receive government transfers for running the public transport system, which, on top of the regular funds under the terms of the Municipal Transportation Finance Act (MTFA funds), also include additional transfers from central government revenue yielded by the tax on mineral oil.

⁴ Cf. as an example: Aberle, G., Brenner, A., Hedderich, A.: Trassenmärkte und Netzzugang (Track markets and track access). In: Gießener Studien zur Transportwirtschaft und Kommunikation. Vol. 8. University of Gießen, 1995.

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⁶ Cf. Streit, K.D., Partzsch, L.: Netz 21 - die zukünftige Netzstrategie der Deutschen Bahn AG. (Network 21 - the future network strategy of Deutsche Bahn AG.) In: Eisenbahntechnische Rundschau, Vol. 45/1996.

