

East European Rail: the State of the Network

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Since 1990 the economies of central and eastern European countries has undergone radical restructuring. Changes in social and industrial structure as well as greater mobility have had a notable influence on railway freight traffic and passenger transport. The overall trend in transport demand has been a spectacular fall after the political change. During the accession process, each country had to adopt European legislation in its national regulatory framework. The necessary organizations were set up to ensure railway safety and to regulate and control the railway market. Transportation performance has been stabilized and now follows now the European trend. The overall development is considerably accelerated by the European contribution to numerous plans and programmes for the rehabilitation of the rail infrastructure and other railway facilities.

The main consequence of political change for railway systems in the new EU Member States was decline, characterized by decreased transportation performance, a loss of assets and human capital, and a lack of implementation of modern operational and management methods.

This trend has, however, changed slightly thanks to the accession process: the organizational framework of the liberalized market has been put in place and technical alignment to western European levels is under way, supported financially by the EU and by market incentives.

The present analysis provides a political overview of the current situation, evaluates the performance trends, identifies the common elements of the institutional background, summarizes the infrastructure development and pricing issues, and explains the different solutions for transport coordination. Table 1 provides some general characteristics for the countries referred to in this paper.

Political Overview

In all the new EU Member States, two significant periods can be identified between 1990 and 2007 with regard to rail transport policy, during which interventions by the owners' (i.e. the state) were largely identical, although the dividing line between periods is not distinct and differs slightly from country to country.

Period I. Cutbacks

In the first period, the countries were busy setting up new social and economic mechanisms in which railway transportation was not a priority. The soviet regime collapsed in 1989, at more or less the same time in each central and eastern European country. At this time, the political decision-makers focused on introducing market-based economic structures, privatizing state-owned assets and stabilizing the social supply

Table 1. Area, population and GDP data of countries referred in the paper.

	<i>EU Member since</i>	<i>Area</i> 1000 km ²	<i>Population</i> million 1 January 2007	<i>GDP</i> billion 2006	<i>GDP per head in PPP</i> EU-27 = 100 2006
<i>EU-15</i>		3236.3	389.952	10851.0	112
<i>EU-12</i>		1086.7	103.322	746.1	54
Bulgaria	2007	110.9	7.679	25.1	37
Czech Republic	2004	78.9	10.287	114	79
Estonia	2004	45.2	1.342	13.2	69
Latvia	2004	64.6	2.281	16.2	54
Lithuania	2004	65.2	3.385	23.7	56
Hungary	2004	93.0	10.066	89.9	65
Poland	2004	312.7	38.125	271.5	52
Romania	2007	237.5	21.565	97.7	39
Slovenia	2004	20.3	2.010	30.5	88
Slovakia	2004	48.8	5.394	44.6	64

Source: EU energy and transport in figures – Statistical pocketbook 2007–2008.

systems. For populist reasons, transport policy tended to focus on the development of road infrastructure. The total number of private cars rose sharply and the growing use of individual motorized transport required extension and capacity increase of the road network. At the same time railway public services remained as before while the level of subsidy was considerably reduced. The large national railway undertakings were used as a capital reserve, offering potential cost-savings for the state budget while using up their own assets. The services were run on the basis of 100 years of tradition; management and organization remained mostly untouched. Investment in railways became difficult due the undertakings' growing debt and lack of resources.

Period II. Revitalization

In the pre-accession phase, i.e. a few years prior to accession, the countries were forced to apply European legislation to the railway sector. Changes in responsibilities were accompanied by changes in management. Railway companies' budgets became closer to balance since the state playing field was levelled by strict common statistical and financial reporting requirements. The import-

ance of public transport was recognized and investments were supported by growing EU contributions. However, this period is not yet over: the railway sector, especially the public passenger transport, still depends strongly on social priorities, political decisions, while service efficiency and quality have considerable potential to improve.

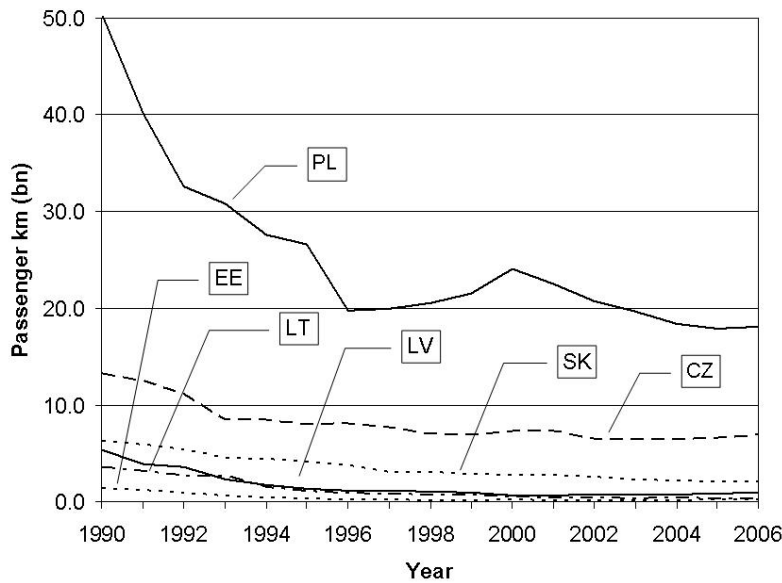
Performance Trends

Since 1990 the economies of the region have undergone radical restructuring, partly in line with trends in European economies, and partly independently. In the 1990s changes in the industrial structural brought with them the rapid decay of heavy industry and growth in the IT and telecommunications sectors. Changes in social and industrial structure, as well as greater mobility, have had a marked impact on railway freight traffic and passenger transport.

Indicators

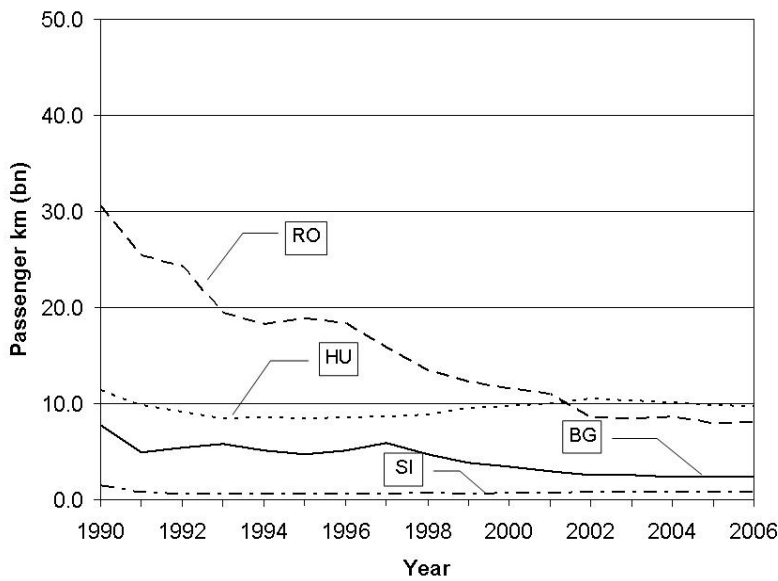
Figures 1a and 1b show passenger transportation trends in the new Member States. The overall trend has been a decrease in passenger km, although the spectacular fall after the 1990s has been followed by a more

RAILWAYS IN EUROPE: A NEW ERA?



Key: Legend: CZ – Czech Republic; EE – Estonia; LV – Latvia; PL – Poland; SK – Slovakia. (For countries from the former Czechoslovakia (CZ and SK), individual statistical data from 1993 only are available)

Figure 1a. Passenger transport (billion passenger km). (Source: EU energy and transport figures – Statistical pocketbook 2007–2008)



Key: BG – Bulgaria; HU – Hungary; RO – Romania; SI – Slovenia.

Figure 1b. Passenger transport (billion passenger km). (Source: EU energy and transport figures – Statistical pocketbook 2007–2008)

stable period. Some Member States have witnessed short periods of increase, although these are more linked to country-specific measures. Performance in the Baltic States is relatively low owing to the predominance of freight on this network: passenger services are limited to suburban traffic, and international night trains to Russia.

The overall trend in the freight business has been an initial decrease following the

reduction in bulk transport needed by heavy industry and products transported between the countries in the region. Apart from the end of 1990s, transport volumes have stabilized and now follow the European trend, with slight seasonal variations. New transport markets such as combined and multi-modal transport represent less than 10 per cent of the total transportation volumes. Only freight forwarders in the Baltic States were able to

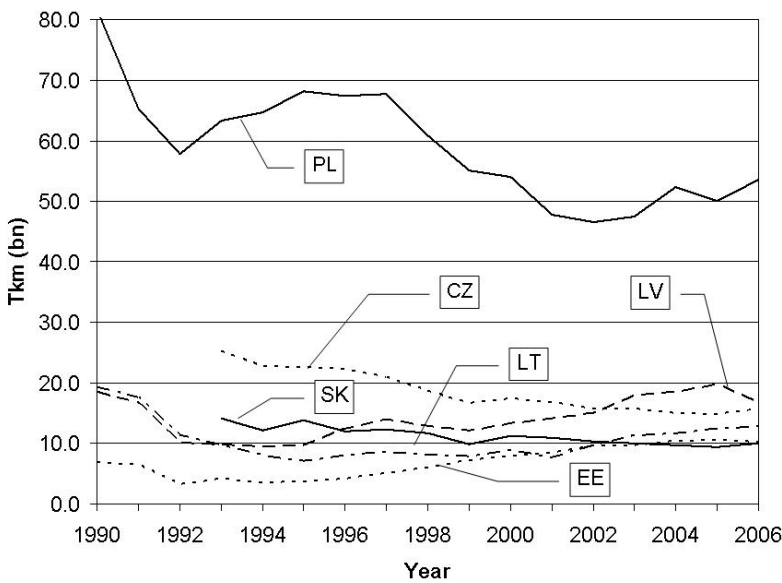
increase significantly their performance due to growing transport demands from Russia to the Baltic seaports. Figures 2a and 2b show the freight transportation trends in the new Member States.

The subsections below provide a SWOT (Strengths, weaknesses, opportunities and threats) analysis for both the passenger transport and freight business sectors.

Strengths

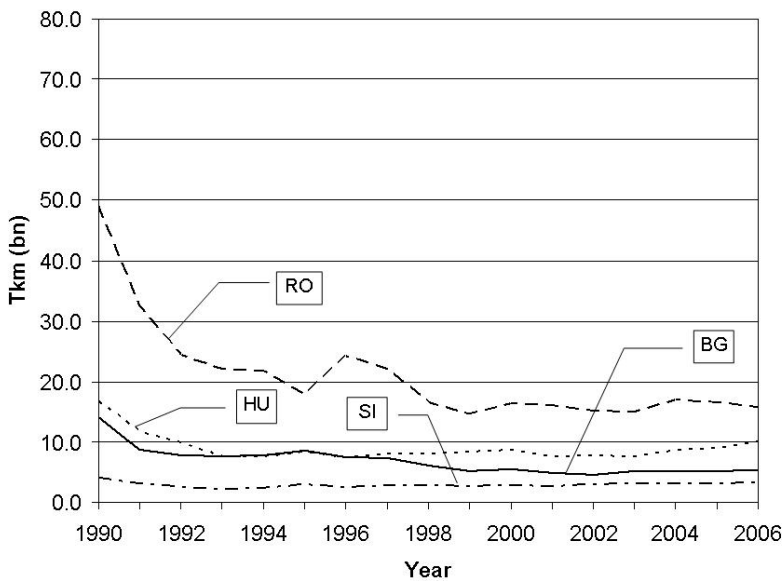
The strength of rail passenger transport lies in the extensive rail network around capital cities, namely Bucharest, Budapest Prague and Warsaw and high demand for rail travel traditionally characterizes these routes.

The strength of the freight business lies in its ability to carry large volumes of bulk and



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Figure 2a. Freight transport (billion tonne km). (Source: EU energy and transport figures – Statistical pocketbook 2007–2008)



Key: BG – Bulgaria; HU – Hungary; RO – Romania.

Figure 2b. Freight transport (billion tonne km). (Source: EU energy and transport figures – Statistical pocketbook 2007–2008)

hazardous freight at a relatively low cost with low energy consumption compared to road. Heavy industry is still dominant in Poland and the Czech Republic, where raw materials are traditionally transported by rail. Strong transit demand characterizes the following routes:

- ♦ in the Baltic States from Russia to the Baltic sea ports;
- ♦ in Central-Europe from west to east; and
- ♦ in Hungary, Romania and Bulgaria from western Europe to the Balkans.

Weaknesses

The fundamental weakness of the commuter business is the level of service quality provided to the customer as a result of limited investment in replacing 'life expired' rolling stock, infrastructure and stations. These old assets cannot easily be adapted to recent logistical requirements such as modern ticketing, passenger information and accessibility. Operational improvements are required to enhance the level of customer care, with training and personal development needed for staff dealing with customers.

The weaknesses of the freight business are linked to its high capital requirements and fixed costs, slow delivery time and poor service quality owing to the state of the infrastructure, plus lack of logistical information exchange, modern freight wagons or efficient locomotives. The current 18 km/h average speed in freight transport describes demonstratively the situation. Other important limitations include single-track lines, low permitted axle loads (210 kN on main lines, even less on feeder lines), inefficient traffic management, short station tracks and the large number of speed restrictions.

Opportunities

The opportunity exists for passenger transport to benefit from increasing road con-

gestion, particularly in the suburbs of the capital cities. To achieve this goal, the commuter network and rolling stock need to be enhanced to improve service quality and provide multi-modal connections, with particular regard to offering attractive tariffs and reliable passenger information. Fleet modernization has already started in most of the countries although new vehicles represent only a small share of the total capacity needed. Latest investments include amongst others:

Bulgaria: 25 diesel multiple units, type Desiro (manufacturer: Siemens), 61 electric multiple units, type Desiro (Siemens);

Czech Republic: 60 double deck electric multiple units, type CityElephant (CKD-Skoda);

Hungary: 60 electric multiple units, type Flirt (Stadler), 10 electric multiple units, type Talent (Bombardier);

Lithuania: 4 diesel multiple units, type RA2 (Metrovagonmas),

Poland: 14 electric multiple units, type ED74 (PESA), 14 electric multiple units, type Flirt (Stadler), 16 diesel multiple units, type SA132 (PESA);

Romania: 120 diesel multiple units, type Desiro (Siemens);

Slovenia: 30 electric multiple units, type Desiro (Siemens);

Slovakia: 15 narrow gauge electric multiple units, type GTW (Stadler).

With regard to the freight business, the new Member States encompass several important freight transit routes to and from Russia, the Balkans and potentially to the near and Far East. There have been some promising attempts to organize a regular land-bridge to China, and CEE freight operators should participate in this new service.

The development of the TEN-T railway network provides the opportunity to improve access to seaports and terminals.

The EU aims to define priority freight routes where accurate freight train timetables would ensure the basis for quality services.

The development of freight logistics centres provides an opportunity to take part in a complex logistical chain, as an alternative to or in combination with roads and waterways. These centres should be positioned strategically in those regions that exhibit a high potential for regional development. Investments into ports and inter-modal terminals are on-going, for example, in Sofia, Bulgaria; Constanta, Romania; Koper, Slovenia; Záhony, Hungary; Zilina, Slovakia; and Riga, Latvia.

Opportunities also exist to improve the operational efficiency of freight trains by increasing the utilization of returning freight wagons, since the actual number running empty is around 40 per cent. This will require the identification of new potential customers in appropriate geographical locations, more effective operational planning and reconfigured rolling stock fleets.

Threats

The key threat to passenger transport is the investment in roads, since social pressure to use private cars as the primary means of transport is high. The key factor is to retain existing customers. The danger of a lack of coordination between public transport modes is that each operator may run its services inefficiently and then lose market share against individual forms of motorized transport.

The key threat to the freight business is from the roads, where unequal infrastructure access charges can distort competition. Road freight is still an increasing threat to non-bulk rail freight transport. The market share of road transport will continue to increase in the absence of client-driven rail transport. One possible answer would be to integrate the rail freight operators into global complex service providers by means of privatizations or mergers.

The Pan-European Corridors (see below) were defined on the basis of East-West transport needs, although a Central-European North-South connection is still missing. In fact, the traditional logistical route from northern Europe to the Balkans goes through Germany, whereas a link between the Polish ports and southern Europe could shorten the distance and ease pressure on the existing, highly congested route.

Institutional Background

The main institutional developments can again be divided into the two periods already mentioned above, following the initial political change.

Before Political Change

Prior to political change in the region, the railways were part of the state administration in each country. All responsibilities (including design, authorization, operation and investigation) were concentrated in a single organization. Staff were considered state servants with a range of privileges in terms of salary, welfare, healthcare, transportation services and pension system.

Changes during the Cutbacks Period

The railway market in this period was still reserved for national railway companies, and structural changes were limited to rationalizing the operation of these organizations. As a first step, the railways were separated from the state administration as an independent legal entity, but still concentrating infrastructure and transportation functions. Non-core activities such as track construction, rolling stock overhaul and IT services were outsourced. Among the new subsidiaries created, the most attractive were privatized, for instance the wagon factories in Arad, Romania and Poprad, Slovakia, and the passenger coach refurbishment factory in Dunakeszi, Hungary; others, however, still

remained under the control of the railway company.

Changes during the Revitalization Period

During the accession process, each country had to adopt European legislation in its national regulatory framework. Implementation measures and conformity with EU legal requirements was controlled even more strictly than in the existing Member States.

In each country, the Ministry of Transport kept overall responsibility for the railway services and transport, whereas the regulatory function was transferred to a rail authority. Even in these countries where this authority already existed (for example, Hungary), its responsibility was modified to fulfil the requirements defined for National Safety Authorities (NSA) in Directive 49/2004/EC. The typical tasks of the NSA include, among others:

- ♦ licences for train operating companies (TOCs) to provide railway transportation;
- ♦ operation controls of TOCs with licences issued in other EU Member States;
- ♦ authorization and technical inspection of railway vehicles;
- ♦ control and licensing of staff in areas relevant to safety.

Management of infrastructure was split from transport services and organized in a separated subsidized entity. However, the owner of the infrastructure company and train operating company remained the state; the holding structure implemented in almost all new Member States ensures some control over the whole sector. These operators have kept the dominant position in each country. The only one exception is Hungary where, in accordance with an initial decision, the form of integrated company was retained. To ensure the independent procedure, a capacity allocation body (VPE) was established in

2005. In the meantime, the freight transport division of the state railway company (MAV) was separated (January 2006) and privatized (December 2007), while the passenger transport division was also separated (July 2007).

Infrastructure

The railway network is still very dense in the central European region, especially in Slovakia, Hungary, the Czech Republic, Slovenia and southern Poland. This not only means high railway density (km line per square km), but a considerable number of stations, junctions and industrial connections.

Recent trends in transportation demand, changes in the composition of goods transported, developments in logistics and railway technology have indicated the need to rationalize this infrastructure, yet operators and infrastructure managers are in a dilemma. On the one hand it is hard to identify, and reach a compromise with different actors, as to which elements are unnecessary. In a typical conflict situation, the costs and the benefits are allocated to different entities: examples range from in-house discussion to country-wide political

Table 2. Railway line density (2004).

<i>Country</i>	<i>Length of lines/area m/km²</i>
Czech Republic	122
Hungary	85
Slovakia	75
Poland	65
Slovenia	61
<i>EU-25</i>	<i>50</i>
Romania	46
Bulgaria	38
Latvia	35
Lithuania	27
Estonia	21

Note: EU-25 – Average of the EU Member States in 2004.

Source: EU energy and transport in figures – Statistical pocketbook 2006.

conflict. The most discussed subject is the operation of branch lines. Some countries, like Poland, managed to optimize its network, but other countries, like Romania, are still operating lines with a daily frequency of 1 or 2 trains. On the other hand, dismantling lines and land restoration need a significant investment, taking away resources from real development. When resources are limited, such activities are usually ranked at the end of the project wish-list. Yet if the infrastructure managers continue to operate all these obsolete elements, it significantly increases their operation costs and leads to an economically inefficient situation.

Physical Indicators

As figure 3 shows, the length of railway lines has not changed significantly over the last 20 years, with the exception of Poland,

which has managed gradually to reduce its inefficient branch lines.

Development

Since 1990 the main priority for intra-European infrastructure development has been the Pan-European Corridors. The Pan European Transport Conference in 1994 defined the so-called Crete priority corridors, a concept which was slightly adjusted in Helsinki in 1997. As the first development, each east European country has improved its connection to western Europe, with the most important upgrades in Period I comprising the Warsaw-Berlin, Prague-Dresden and Budapest-Vienna corridors.

The financial support of the EU was essential in this development. It has to be noted that this approach significantly limited the possibility of achieving a level playing field

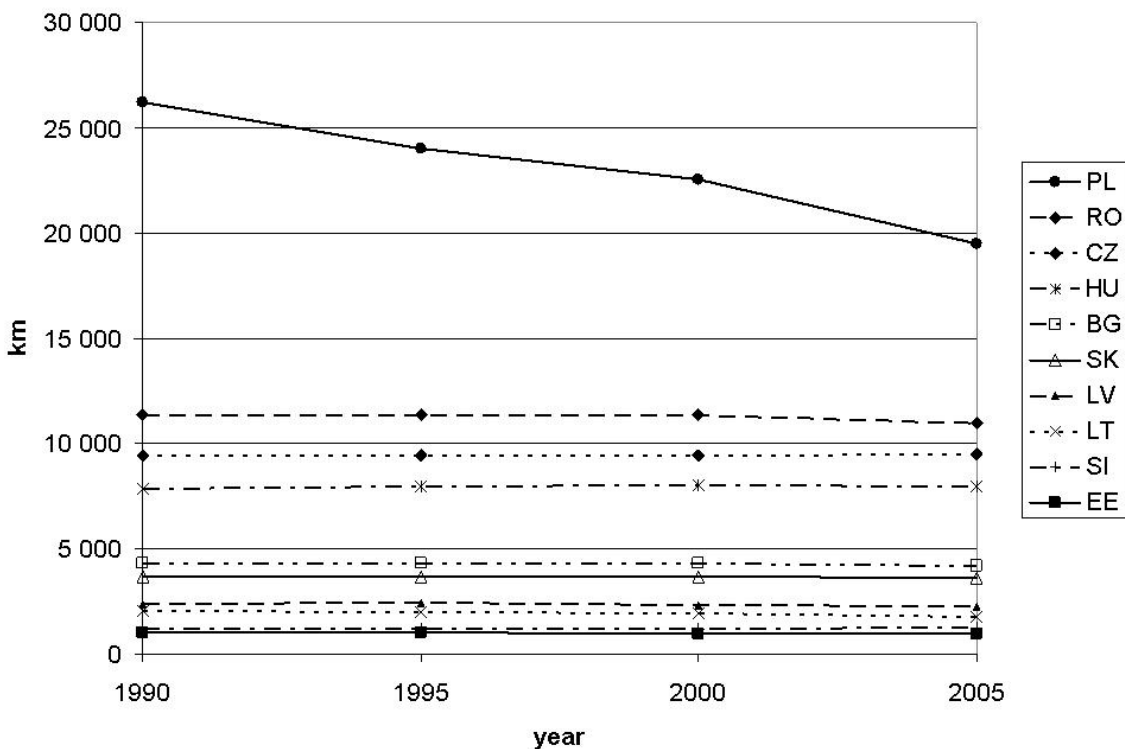


Figure 3. Length of lines. (Source: EU energy and transport figures – Statistical pocketbook 2007–2008)

in the area of transport policy, since the small national investment budget was needed as a national contribution of TEN developments. The EU co-financing rate and the total committed budget increased gradually during the accession process. However, the real effect of the EU contribution can be observed after project realization, as the amount of payments describes the situation better than the sum of commitments. In general, there is on average a two-year difference between a commitment decision and the realization of a project, and a strict procedure exists for de-commitment in case the project is not finished in time. Figure 4 presents the effective payments for all transport projects and shows the spectacular increase in EU support after the accession period. EU contribution has covered 30–50 per cent of the total project cost from pre-accession funds while after accession, structural funds are providing contributions of up to 85 per cent, depending on project viability and own revenues.

Charging

The EU Railway Directives 2001/12/EC and 2001/14/EC provided a general framework for setting rail infrastructure charges. In order to avoid discrimination of users, all operators have to pay charges for use of infrastructure. The level of charge has to cover the costs of infrastructure operation (i.e. marginal cost) as a minimum and full cost as a maximum.

However, there is a lack of clear calculation guidelines for the infrastructure cost in the rail sector, but an overview of implementing marginal cost-based rail charging systems in the Member States can be evaluated using the knowledge disseminated in the annual conferences of the Imprint net project (see <http://www.imprint-net.org/conferences/2/>).

At present, there is a wide variety of rail charging systems in place. It appears that most of these comply with Directive 2001/14, but that the different systems reflect different circumstances related to the cost

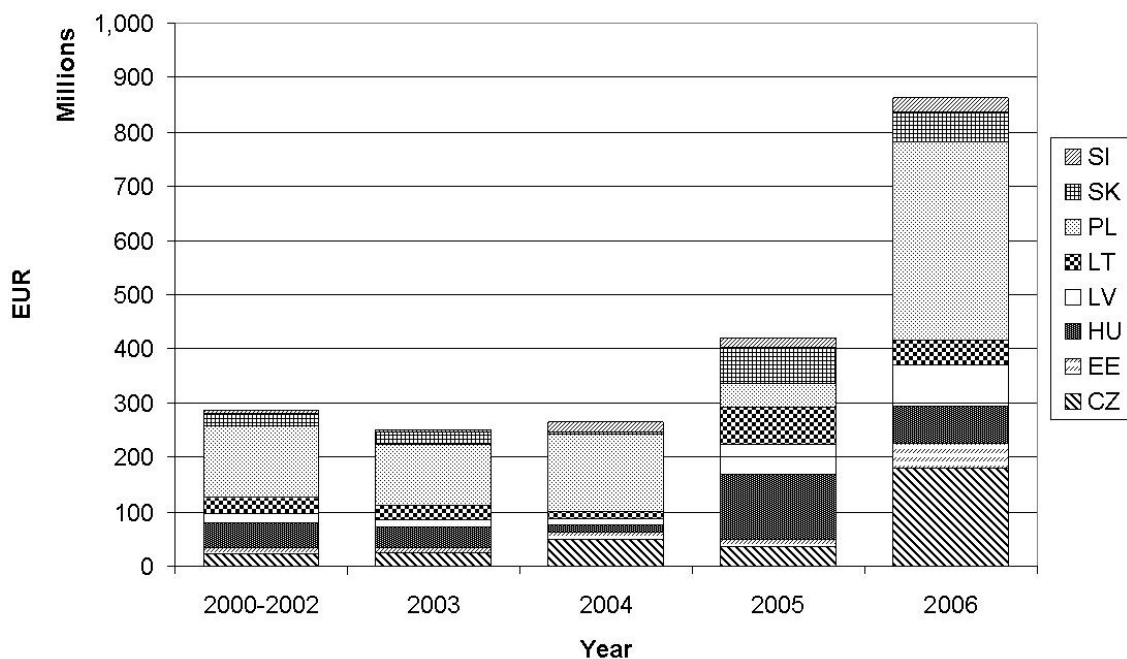


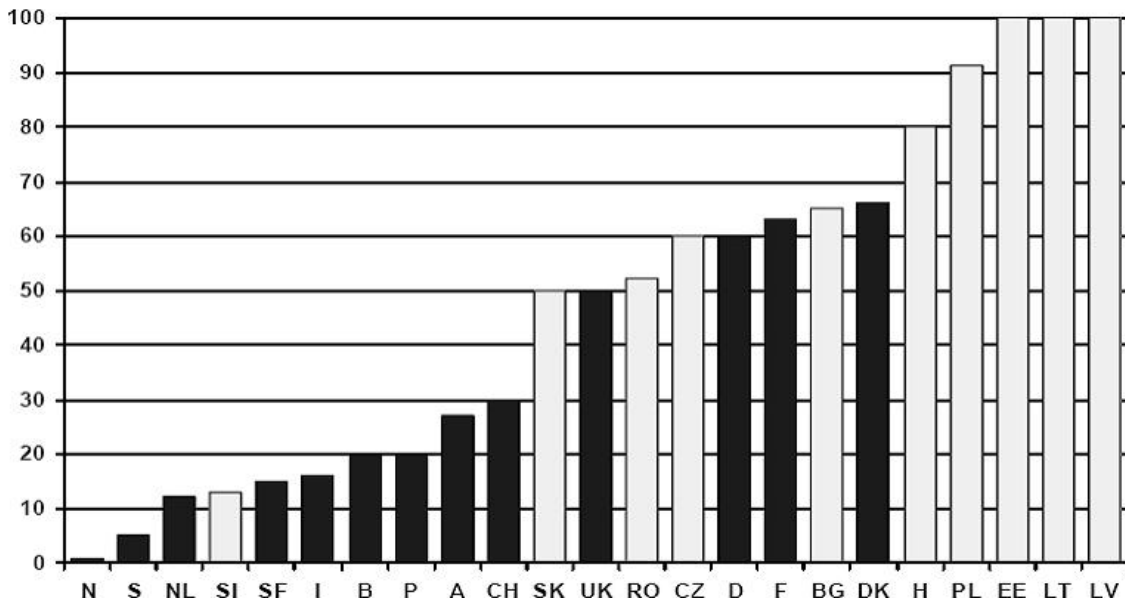
Figure 4. Payments from ISPA and Structural Funds. (Source: EU annual reports on Structural Funds, 2000–2006)

base of the network (technology, density etc.), cost-recovery requirements and different interpretations of the detail of the Directive – be that in relation to the definition or structure of the charge, the method of cost estimation and/or the method of cost accounting. Some infrastructure managers are focused on cost recovery and have little or no regard to marginal cost as they do not receive any government subsidy. At the other end of the scale, there are countries where the charges are actually below the marginal cost, and when the infrastructure manager seeks to bring them up to the level of the marginal cost, they face strong opposition from the train operators.

Consequently, there is a great variety of charge levels and serious concern that the level of charges is having a detrimental effect on traffic volumes in some countries. The effect of the high prices will be apparent with some years delay as the operators can

slowly react and find alternative routes. The latest actions show that a number of eastern European infrastructure managers have increased freight charges still further and reduced passenger charges. High freight charge levels in central European transit countries are likely to have a significant impact on international freight movements. Even in the Baltic region, where freight charges at present are not so important in relation to international flows as traffic on these lines will be at the end of a long haul, high charges may still have significant consequences for domestic freight, and their significance at an international level may increase if the overall pattern of east-west freight leads to a greater role for the region.

An expert group engaged by the European Commission found that there was less concern about the differences in structure as compared with differences in overall charge levels. It was noted that Railnet



Key: Grey bars – New Member States, black bars – western European countries.
 (Cost recovery = Revenues from charges as a proportion of total expenditure on the network of operations, maintenance, renewals, interest and depreciation.)

Figure 5. Percentage of total cost covered by infrastructure charges (2005). (Source: ECMT Workshop on Rail Infrastructure Charges, Paris, 2005)

Europe through the website (www.eicis.com) provides a quick means of calculating charges for international traffic. Nevertheless, it was suggested that differences in the structure of charges could be important, for instance in its impact on smaller operators. The different structure of charges may lead to high charges for particular types of traffic – for instance charging per gross tonne km leads to high charges for heavy bulk freight compared to charges per train kilometre.

Public Services and Financing

Freight Transport

In line with European legislation, freight transport has been liberalized across the Trans-European Network. The freight business units of the former state railway companies are separated at least in terms of accounting. They do not receive any subsidies for operational expenses, although some examples exist of public support for some special intermodal services, e.g. RoLa 'piggyback' lorry shipments from Szeged, Hungary to Wels, Austria and from Lovosice, Czech Republic to Dresden, Germany.

Real competition in the rail freight business started in 2003 and has developed dynamically since then. However competition has mainly been concentrated on the bulk market. Private operators in Poland, for example, were established on the basis of the former rail divisions of mines. Operators compete mostly for coal, sand and oil products; other types of goods are not that attractive for such railway companies. In the region, the key criteria for choosing a freight forwarder is still the price, and therefore private operators keep their operational structure as simple and effective as possible. This explains why their prices are highly competitive. The former national operators, on the other hand, are still in charge of all other freight transport providing a wider range of services to a large number of customers, but less effectively as the new

private operators. Market share of private operators is under 10 per cent in each new Member State in terms of transportation performances (tkm).

Passenger Transport

Domestic long-distance (InterCity) passenger transport has a long-standing tradition in east European countries, but the decline in this segment is the most important reason behind the change in overall passenger km performance. The railways quickly recognized the public's growing quality requirements and developed services as far as tight resources allowed. Such initiatives are characterized by refurbished rolling stock, air conditioning, seat reservations, and limited guarantees of punctuality. Nevertheless, although InterCity services have proved successful, the total number of long-distance passengers has fallen on the traditional long-distance train routes, and stopping trains are therefore gradually disappearing from the timetables.

Whereas the general trend for long-distance journeys is similar across the new Member States, they have taken very different approaches to the way in which they run regional transport. The following paragraphs examine key developments in Poland, the Czech Republic, Slovakia, Hungary and Romania.

In *Poland* the regional governments are responsible for organizing passenger rail services, and have recourse to adequate funding for this task. The general service provider is PKP PR (the regional passenger transport subsidiary of the state railway company), but there is a constant problem with negotiating the extent of local government support that would allow it to carry out its mandated services. Recently, the regional governments have been interested in creating regional rail passenger operators in cooperation with PKP PR. Following the general basis of this cooperation, PKP

provides the assets, while the local governments provide the financial resources. The first operator created along these lines was the Mazovia Railway, and others have since also followed suit.

In the *Czech Republic*, the public transport authority (PTA) has three subdivisions, which are responsible for (i) the provision of long-distance transport services, (ii) regional basic transport services and (iii) other local transport services.

Responsibility for providing 'regional basic services' belongs to the districts (*kraje*), represented via district offices (*Krajské úřady*). Transport contracts for the provision of regional basic services exist between the district office and České dráhy a. s. (the national railway company), and in some cases also private operators. The basic duration of the transport contracts currently in force is one year (minimum duration according to the Railway Act) – with an exception of two tendered services with a duration of four and five years.

The political debate in *Slovakia* seems to have reached a compromise. The transfer of transport coordination responsibility to the regions will be completed in three steps. First, a public service contract will be concluded between ZSSK (national railway company) and the Ministry of Transport with nine specific annexes (eight for individual regions and one for inter-regional and long distance services). The regional authorities will be involved in the process of creating and approving the train timetable. As a second step, regional authorities will order regional transport services themselves, nine public service contracts (one between ZSSK and the Ministry of Transport for inter-regional and long-distance services, 8 between each regional authority and ZSSK for regional transport). The Ministry of Transport will transfer funding to regional authorities according to ordered train-km. The contract for inter-regional and long-distance transport

should be concluded for a three-year period (from 2008) and one year for regional transport during this transition period. Finally, as from 2011, all competencies, including financing, will be transferred to regional authorities. All regional services (rail and bus) can be subject to tendering upon the decision of the authorities.

In *Hungary*, the regions (NUTS 2) do not have executive power, and therefore the responsibility for public services contracts still rests with the Ministry of Transport and Economy. During the recent political debate on regional transport, the Ministry announced its intention to engage the municipalities to take over the operation of some branch lines with the aim of establishing an association of municipalities which are able to decide on the volume and modality of regional services. However, as financial support, it is only possible to use the budget supplied by the Ministry. The passenger transport subsidy of the national railway undertaking (MAV-START) has a long-term contract with the Ministry, but service levels and compensation are subject to annual negotiation.

Finally in *Romania*, as a consequence of liberalization, some private operators have already started activities in the regional public transport system, but the state-owned operator (CFR Calatori) is still the only one receiving state subsidies. However, the Ministry wants to reduce these subsidies, while new operators are claiming that they have the status of public service providers and should accordingly be entitled to public sector subsidies.

Conclusions

The EU accession accelerated the structural changes of the railway sector in central and eastern European countries. The necessary organizations were set up to ensure railway safety and regulate and control the railway market. Different activities of the railway

undertakings were split according to EU regulation. Some conflict of interest appears in the spotlight during the present 'learning phase', but legal and financial relations have been gradually consolidated. The overall development is considerably accelerated by the European contribution in numerous plans and programmes for the rehabilitation of the rail infrastructure and other railway facilities.

The presented restructuring process and performance trends proved that the railway system still represents a sustainable transport mode in the new Member States, potentials and opportunities exist for further improvement. The quality in the freight transport will soon reach the European standard level by means of Europe-wide implementation of new telematic solutions, technology and know-how transfer by co-operation or privatization. Passenger transport will follow this trend with particular regard to the liberalization of international services from 2010 and the compulsory public service contracts defined in the EU Regulation 1370/2007.

It has to be stressed that further efforts are needed in specific areas from both national and Community sides. To open the possibility of EU financial support in rolling stock fleet renewal is vital in the process of service improvement. Control over and support in preparation of EU co-financed programmes is still necessary. Individual projects should follow planning and feasibility studies which take into account the actual level of transport demand and the possible alternatives. Local

decision-makers tend to preserve existing infrastructure with over dimensioned capacity based on outdated technology. Clear national transport strategies are also needed, together with proper coordination with the road infrastructure rehabilitation and extension programmes.

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