



Railway Transformation

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1 Railway transformation – a blueprint for change

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The current economic conditions point toward future growth of railways. Railway companies will have to transform themselves into highly efficient businesses, although the rate at which this transformation occurs will differ from company to company. There will also be variation between different countries. Only a handful of companies will be fully or partially privatized. In the long term, a few internationally active players will come to dominate the market. Governments and railway companies need to identify the correct strategy for themselves and then implement it when the time is right. Otherwise, they risk missing the transformation train altogether.

1.1 Where railways come from

Railways and their roots present a varied picture around the world. In Europe and Asia they are generally owned and run by the state. In the United States, by contrast, the railroads are largely in private ownership. But this hasn't always been the case. Indeed, the construction of railways in Europe in the nineteenth and early twentieth century was mainly carried out by the private sector. It was only later that governments increased their control of the rail sector.

This historical development had a number of reasons. With road infrastructure still in an early stage of development, countries soon realized that rail networks were of critical importance to the economy. Governments also came to feel that it was their duty to ensure a functioning railway system operated in the public interest.

The result? European countries began to restrict commercialization and limit competition. This step led to loss of traffic and a noticeable deterioration in the financial position of railways. Private railways were no longer willing (or able) to invest in infrastructure and rolling stock. By 1950 nearly all the railways in Europe were state-owned and the vast majority of them still is.

The picture in the United States is very different. As early as the nineteenth century, American railroad companies were listed on the stock exchange. By 1970 all intercity railroad services – both passenger and freight – were privately owned but regulated by the government. However, passenger traffic was in decline and return on investment insufficient to maintain the track. Added to this there was tight government regulation and numerous tax and labor issues. Eventually, the pressure became too much to bear and virtually every major railroad in the North-East filed for bankruptcy.

The US Congress decided to establish a new, more balanced regulatory system that allowed railroads to act freely in terms of managing their own assets and setting prices for their services. The state-owned company Amtrak was founded to relieve freight railroads of most of their unprofitable passenger operations.

The privately owned US cargo railroads have significantly benefited from the entrepreneurial freedom and are today considered as the most efficient in the world.

In Central and Eastern Europe the process has been different. Here, the change has been one not of ownership, but of roles – from the mandates of a centrally planned economy to market forces and management decisions. The collapse of the USSR and dissolution of Yugoslavia

and Czechoslovakia led to the emergence of more than twenty new national railway companies. Some of these networks – the national railways of Russia, Kazakhstan and Ukraine, for example – are among the largest in the world. Railway companies have faced momentous changes in the scale and nature of traffic demands attending the transition to market economies, often with dire financial, employment and investment consequences.

China offers another interesting example. The high rate of economic growth in recent years has imposed freight and passenger demands on a relatively sparse network. Despite declining modal share, this has led to some of the highest average rail traffic densities in the world. The network enhancement program that has been adopted by the government presages the biggest burst of railway building activity since the nineteenth century. Its objectives include increasing capacity, extending the network to more remote areas and enhancing service quality. In parallel, China has opened its railway companies to private investors. As in other parts of the world, private investments began in the freight sector. In the year 2006, the first full transfer of a state railway company has been accomplished.

1.2 Drivers of transformation

First main driver: liberalization

One of the main drivers of railway transformation is liberalization. Governments have a number of different aims in pursuing this policy. They include encouraging innovation and quality by introducing competition, stimulating investment to create or safeguard employment, increasing efficiency and relieving the burden on the state in terms of financial support. Liberalization has a firm place on the discussion agenda in most countries with developed railway markets.

Three basic models of liberalization can be observed. In North and South America, most private railway companies vertically integrate their rail freight and passenger operations with infrastructure management. Strong demand on dedicated routes justify railroads offering parallel own networks, competing against each other. The infrastructure itself is either owned by the railway company, as in the United States, or run as a concession, as in Latin America.

A second model is found in Japan. Here, privatization occurred in the early 1990s. However, no broad liberalization occurred on the markets. Today passenger rail business is provided by vertically integrated companies with a regional focus. The state-owned rail freight operator has access to the tracks owned by passenger railway companies. Private players face a major barrier to entry as they can only enter the market by offering their own infrastructure.

Europe presents a third model. Vertically integrated incumbent railway companies run their passenger and freight operations separately from infrastructure management. At the same time, a regulator oversees access to the track. The result is that intramodal competition in the market is found in the rail freight business, with competition for the markets in the passenger sector limited to public tenders.

The liberalization of rail traffic in the European Union began with the Council Directive 91/440/EEC on the development of the Community's railways. Since then liberalization has progressed gradually. The current regulations vary from country to country depending on national legislation. One important issue is whether transportation services can be offered outside the borders

of a particular country. Here, two issues should be distinguished: first, the right to establish a railway business in a foreign country, and second, the right to access the rail infrastructure of the country in question.

Following the liberalization of rail freight traffic, the European Union plans to turn its attention to passenger transportation. The intention of the European Parliament is to open up the railway networks for cross-border passenger traffic by 2010. It also plans to improve passenger rights and introduce standard rules for engine drivers.

In line with this policy, the European Union has approved a number of „railway packages.“ Figure 1 details the contents of these packages and outlines their main objectives.

1st Railway Package	2nd Railway Package	3rd Railway Package	Main objectives
<ul style="list-style-type: none"> > All rail freight co's can access Trans-European rail freight network (TERFN) > Infrastructure separate from transport business > Track access charges based on marginal costs > Independent regulator > EU-wide licenses 	<ul style="list-style-type: none"> > Cabotage in freight transportation > Harmonization of security standards > Market access improved through interoperability > Coordination and harmonization by European rail agency 	<ul style="list-style-type: none"> > Common approach to training drivers > Codification of passengers' rights > Open access for all international services, possibly including cabotage > Quality standards for rail freight sector 	<ul style="list-style-type: none"> > Increase modal share of rail to reduce <ul style="list-style-type: none"> – CO₂ emissions – Road congestion > Stimulate competition and so raise efficiency and quality in the industry > Reduce government funding in the industry

Figure 1: European Union railway policy

Second main driver: privatization

Another driver for the liberalization of railways is the ultimate goal of privatization. The transformation from public to private ownership is a complex task for governments. The first step in the process involves the formal conversion from a public to a private legal form. This is followed by functional privatization, involving the transfer of sovereign duties to the new private company or companies.

Japan offers some interesting insights here. The national railway company Japanese National Railways (JNR) collapsed in 1987 following a period of intense investment. The level of debt had topped JPY 37 billion, which was equivalent to more than half the Japanese state budget. Privatization enabled this debt to be shared between public and private bodies, with 70% remaining with the state and 30% being taken on by private companies.

As part of the privatization process, JNR was split into the three private companies JR East, JR West and JR Central, three additional regional railway companies and a single freight operator, JR Freight, serving the entire country. The six passenger rail operators are vertically integrated and responsible for both train operations and infrastructure. JR Freight uses the infrastructure of the six passenger railway companies. Despite being propped up by a complex financial support system, JR Freight, which remains to this day 100% state-owned, is only marginally profitable.

Country	Passenger rail	Rail freight	Infrastructure	Comment
Denmark	x	✓	x	Rail freight sold to Deutsche Bahn
Estonia	(x)	(x)	(x)	66% of integrated railway operators sold; re-nationalization followed reduction of track access charges which made operator's business unviable
Germany	(✓)	(✓)	x	IPO planned but recently postponed
Great Britain	✓	✓	(x)	British Rail split into 100 companies; infrastructure re-nationalized after several major accidents caused by infrastructure failure
Hungary	x	✓	x	Rail freight sold to Rail Cargo Austria
Netherlands	x	✓	x	Rail freight sold to Deutsche Bahn

✓ Privatized (✓) Partially/soon to be privatized x Not privatized (x) Privatized then re-nationalized

Figure 2: Railway privatization in Europe

Privatization in Europe presents a complex picture (see Figure 2). Only Great Britain has completely privatized its railways. Under the Conservative government of John Major, the former national incumbent British Rail was broken up into more than 100 separate train operating companies, among them six freight companies. Following their sale to the US company American Wisconsin Central Railroad, five of these six freight companies were amalgamated to form English, Welsh and Scottish Railways (EWS). EWS was sold to Deutsche Bahn in 2007. The company remains to this day the UK's leading rail freight provider. In 2002 the infrastructure management company Railtrack was brought back under public control and renamed Network Rail.

The pattern is different in other European Union member states. In the Netherlands, Denmark and Hungary, rail freight operations were sold to incumbent railway companies from other countries. In Germany the initial public stock offering of Deutsche Bahn was scheduled for 2009, but then postponed due to the ongoing financial crisis.

China's path to privatization is different again. The rail freight sector first received investment from private capital at the end of the 1990s. The first participation in a Chinese railway company by a non-state investor took place in 2005. And in August 2006, a state railway passed for the first time into full private ownership with the acquisition of the Chunluo Railway by the privately-owned Shenzhen Zhongji Industrial Development Company. The Chunluo Railway connects the cities of Yangchun und Luoding in China's southern Guangdong Province. It was previously jointly owned by a state-run coal transportation company, which held an 84% share, and the China Railway Construction and Investment Company, with a 16% share. Experts see in the deal an important milestone in the new regulation promoting investments of non-state capital in railway construction.

The experience of New Zealand has been less happy. New Zealand has a rail network of around 4,000 km connecting almost all the main cities in the North and South Islands. The railway system is primarily geared toward freight, with passenger transportation only playing a significant role in the major conurbations of Auckland and Wellington and on a few key routes. New Zealand Rail Ltd., an integrated entity covering infrastructure, freight and passenger operations, was privatized in 1993. But in May 2008 it was announced that the privatization had been a failure and that the government would be buying back the shares, including the ferry connection between the North and South Islands. The main reason behind this renationaliza-

tion was that the government wanted to keep tight control of public investment in the rail network. Finance Minister Dr. Michael Cullen summed up the situation as follows: “The sell-off of our public rail system in the early 1990s and the running down of the asset afterward has been a painful lesson for New Zealand.”

1.3 A blueprint for transformation

Transforming a railway is a long-lasting process which comprises structural improvements, strategic realignment of network and product offering, internationalization, and efficiency improvement. There is no one-size-fits-all solution. In each case it is necessary to analyze the market and find the best solution for the country in question.

Nevertheless, it is possible to identify a number of steps that typically constitute the transformation process. We call this our “blueprint for transformation” – in the sense that it represents a roadmap for change. Thus the first step is to clarify the interface with the state and create a sustainable organization structure. The second step then involves restructuring and achieving competitiveness. The third and final step is to privatize. We discuss each of these steps in detail below.

Step 1: Clarify the interface with the state and create a sustainable organizational structure

Liberalizing the railway network means creating a structure that allows effective competition to arise. It is important to separate entrepreneurial and governmental tasks and institute a market model. Regulation is a key success factor here, as shown in Figure 3.

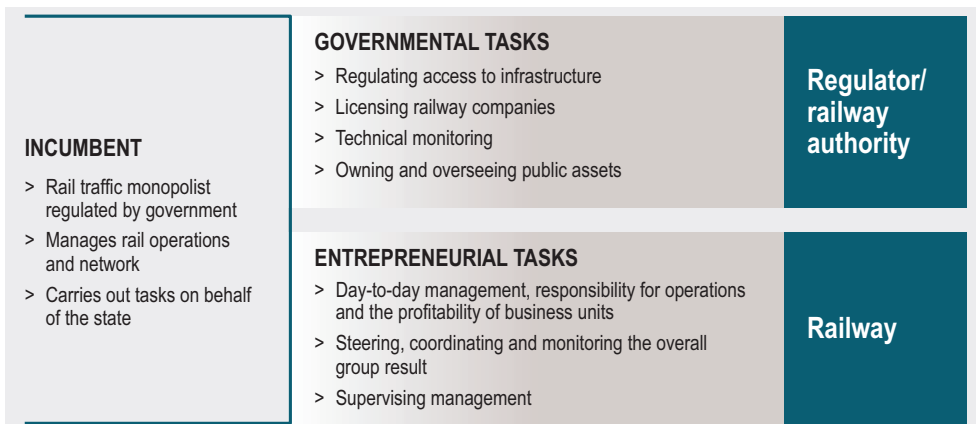


Figure 3: Separating governmental and entrepreneurial tasks

Separating entrepreneurial and governmental tasks is a job that cannot be sidestepped. It is also desirable that the railway companies be freed from their inherited liabilities, thereby increasing their chances of becoming fully competitive. The barriers to competition will differ depending on the situation, so the exact path taken in practice will vary from country to country.

Take Germany, for example. At the beginning of the rail transformation in Germany, a Federal Railway Fund was set up. One of the purposes of this fund was to take on the pre-

existing debts of the state railways and the responsibility for real estate that was no longer needed for operational purposes. However, the main objective of the Fund – even today, 15 years after its creation – is to compensate for the competitive disadvantages arising from Deutsche Bahn’s labor costs. Thus the Fund manages the civil servants formerly belonging to the Bundesbahn in West Germany and the Reichsbahn in East Germany, charging them at a market rate to Deutsche Bahn. In this way it absorbs any labor costs that are above the market rate. The Federal Railway Fund is also responsible for the pension and health insurance funds.

Step 1 in the transformation process furthermore involves creating a sustainable organizational structure. It is advisable to transform the remaining parts of the incumbent into a stock corporation, spinning off business units as necessary and creating separate businesses for

- infrastructure management,
- regional & urban passenger transportation,
- long-distance passenger transportation,
- freight,
- and other business.

To summarize, the objectives of Step 1 are as follows:

- Move the railway from state control to private control
- Introduce a free market system and modern management techniques, including state-of-the-art controlling systems
- Base compensation packages on individual performance
- Free the railway from its inherited liabilities
- Create transparency of performance and costs.

Step 2: Restructure and achieve competitiveness

Becoming competitive entails restructuring the entire railway company. The objective of this restructuring is to significantly increase efficiency and profitability, reduce the level of debt, secure organic growth and hence boost revenues. Key factors involved in this process are shown in Figure 4.

COMPANY-WIDE/ HOLDING	PASSENGER BUSINESS	FREIGHT BUSINESS	INFRASTRUCTURE
<ul style="list-style-type: none"> • Overhead reduction • Purchasing cost reduction • IT cost management • Real estate mgmt. • Outsourcing of technical functions • HR program 	<ul style="list-style-type: none"> • Increase of regional service profitability • Sales channel optimization • Passenger service market campaign • Revenue mgmt. for long-distance travel 	<ul style="list-style-type: none"> • Network realignment • Standardization • Performance improvement for intermodal services • Freight service market campaign 	<ul style="list-style-type: none"> • Control center management and modernization • Network maintenance • Station management • Prioritization of investments • Energy sourcing
	<ul style="list-style-type: none"> • Traction efficiency increase • Rolling stock maintenance 		

Figure 4: Key factors in restructuring a railway company

Strategic realignment is also essential. For this to happen, the strategic goals of the new company must first be defined. This involves a fundamental decision as to whether the railway company should concentrate on the domestic market or pursue international expansion. The strategic goals of individual parts of the company depend on this decision.

If the company decides to pursue also an international expansion, the following strategic goals are possible:

- Freight: position the company as a „neutral“ carrier or logistics service provider offering other means of transportation and services in addition to rail; expand internationally through acquisitions and partnerships.
- Local public transportation: participate in foreign tenders and acquire foreign operators where appropriate; operate bus services and buy shares in municipal transportation companies.
- Long-distance passenger transportation: expand international connections, improve products in terms of journey speed and comfort levels.
- Infrastructure management: develop railway stations into shopping malls where appropriate; expand infrastructure, linking railways to sea ports, building high-speed rail connections, etc.

Of course, while railway companies remain in state ownership they have certain advantages in terms of financing. This factor can be helpful when it comes to acquiring companies to grow – presuming the home country itself is creditworthy. In other words, the interest spread compared to an almost risk-free government loan must be relatively small, so railway companies can refinance the majority of the purchase price of acquisitions cheaply through bond issues. Consequently, the acquisition costs are lower than in the case of an isolated rating that ignores the close relationship between the company and the state. Deutsche Bahn has put this factor to good use in recent years in developing its portfolio.

We may summarize the objectives of Step 2 as follows:

- Increase productivity
- Expand modal market share
- Introduce a market-oriented and flexible organizational structure
- Run the company according to free market conditions
- Reduce the backlog of investment projects
- Establish strategic partnerships that reinforce the status of the company as an overall logistics provider.

Step 3: Privatize

Privatization may involve an initial public stock offering (IPO), the sale of parts of the corporation to strategic or financial investors, a management buyout (MBO) of specific divisions or areas of business, or some combination of the above.

A number of conditions must be met before privatization can take place. First, the company must be ready for the capital markets. To attract investors, the possibility must exist that any capital put into the company will increase in value. In other words, the return on capital employed (ROCE) must be bigger than the weighted average cost of capital (WACC).

Given a return rate which is not sufficient to justify a privatization, the key question needs to be answered, whether and how targeted profits and thus ROCE can be achieved. Figure 5 shows how a corresponding EBIT targeting may look like. EBIT improvements may be achieved through more volume and price increase. “Subsidy effects” refer to the impact of subsidies on local public transportation, for example, and are, like pricing, subject to political decisions. “Project effects” refer to the impact of efficiency-raising programs and marketing initiatives. Besides improving EBITs, it is also important to optimize the use of capital.

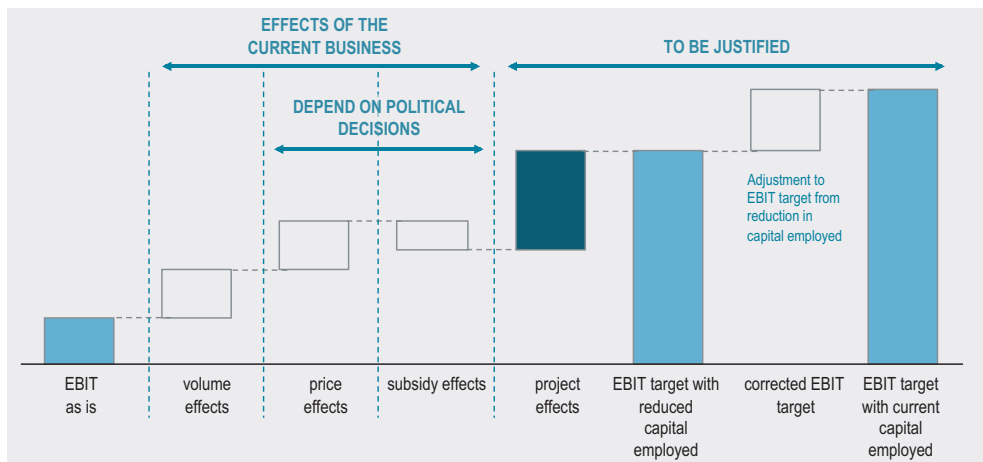


Figure 5: Logic of EBIT targeting

Privatization also needs a good equity story. With this in mind:

- the company needs to align its vision and its strategy
- the value added by the head office must be clear
- the management strategies of the different units must be checked
- key assumptions in the business plan must be validated
- the corporate structure needs to be able to support strategic development.

Railways are not in themselves exciting investments. To encourage enthusiasm on the part of investors, a number of additional elements are needed: a good restructuring story, visible potential for further growth, a strong business portfolio, good future prospects for the various divisions, a stable dividend flow and an equity kick.

1.4 Future development of railways

Main drivers for development

Railways are set to grow in importance over the coming years. The reasons for this include:

- Increasing passenger mobility in developing countries: the mobility requirement in developed countries is 10 to 20 times higher than in developing nations.
- Growing urbanization: the need for efficient, space-saving modes of transportation puts railways at a distinct advantage.

- So as to avoid carbon dioxide emissions, public authorities favor advantageous means of transport, like maritime and rail freight.
- Shrinking fossil fuel reserves: energy-efficient modes of transportation are needed. Again, this puts railways at an advantage (see Figure 6).
- Developments in the global division of labor: the global division of labor will remain largely as at present, but it will continue to develop. New industrial clusters will emerge and these need to be connected by efficient transportation axes. Growth in the number of clusters will lead to a bundling of transportation streams and a growing affinity to rail.

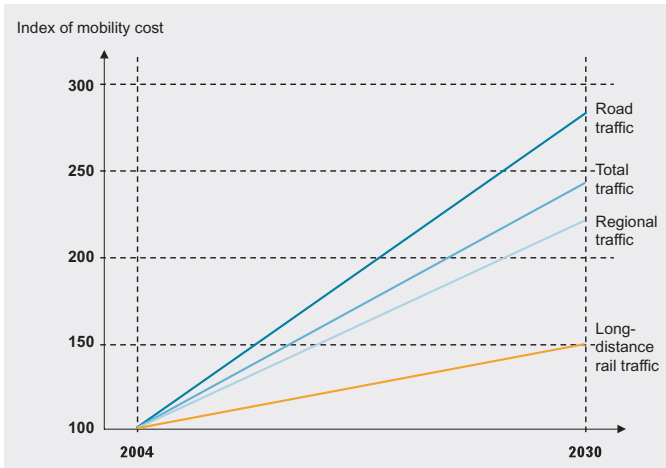


Figure 6:
The growing cost advantage of rail over road transportation

But it is not all wine and roses for the future of railways. Due to the economic crisis and steady pressure on public budgets, money is in short supply for the necessary expansion of infrastructure. Many companies are running at a loss and rely on government subsidies.

Moreover, Europe in particular is still plagued by a lack of cross-border interoperability, despite decades of efforts in this area. More than 20 train-control systems currently exist across the European Union. Each train used by a national railway company has to be equipped with at least one system to be able to run safely within that country. Sometimes more than one system is required even within a single country. For cross-border traffic to be possible, extensive integration and engineering efforts are required. This pushes up the total delivery costs of international operations. These technical barriers to international journeys limit competition and hamper the competitiveness of the European rail sector compared to road transportation. The ERTMS project aims to find a solution to this problem. ERTMS is a unique European train-control system designed to gradually replace the existing incompatible systems found in Europe. If it succeeds, the benefits for the railway sector will be substantial. Rail will become more competitive and enjoy a more level playing field with road transportation. Ultimately, this means that the environment will benefit too.

As the global economy develops over the coming years and decades, it is highly likely that the focus of the railway market will shift from Europe and North America toward Asia. China plans to expand its network of high-speed rail connections massively. According to the Chinese Ministry of Railways, the government wants to invest in excess of USD 300 billion in building 42 new routes.

In the next years, 13,000 km of new track will be laid. Eventually, the country’s provinces will be connected by four north-south and four east-west axes. Trains on the new routes will travel at speeds of up to 350 km/h and provide transportation for up to seven billion passengers a year.

Other countries with major resource deposits are also expecting strong growth in the railway market. The regions concerned include Russia, Australia, and large areas of Africa and South America.

Given the increasing need for rail transportation and the lack of public money for investment, an increasing number of infrastructure projects are likely to be funded privately or via public-private partnerships (PPPs). Overall, the level of demand for railway services will continue to grow. How far the railway companies manage to benefit from this growth depends both on their individual performance and the political frameworks in which they operate.

Future competitive environment

It remains unclear how the future competitive environment in Europe will develop. It is difficult to say at present which state-owned railways will be privatized, how consolidation will develop in the future and what progress will occur on the technical harmonization front. The impact of liberalization on modal competition is likewise hard to foresee.

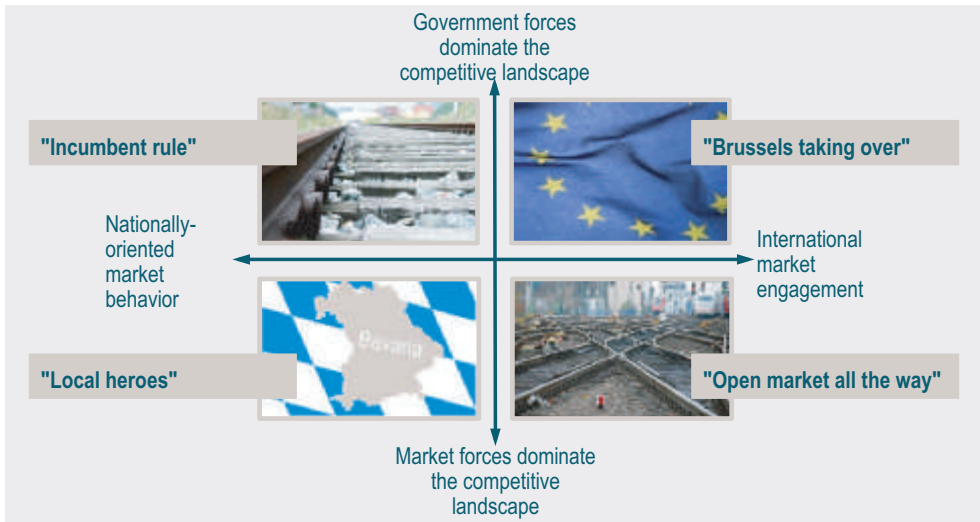


Figure 7: The future competitive landscape – basic scenarios

What is clear, however, is that access to markets and the overall competitive landscape will depend on the level of government involvement and the degree of internationalization of railways. We identify four possible scenarios, as shown in Figure 7:

Scenario 1: “Incumbent rule”

- No privatization of currently state-owned railways
- Little, if any, consolidation; players unlikely to compete fiercely (“energy market scenario”)

- Liberalization allows some competition into the market (tenders for franchises)
- Technical and operational standards retain a national focus.

Scenario 2: “Brussels taking over”

- Wide-spread privatization of state-run passenger railways unlikely
- Limited consolidation, little competition
- Liberalization allows some competition into the market (tenders for franchises)
- Cross-border harmonization of technical and operational standards driven by the European Union.

Scenario 3: “Local heroes”

- Privatization of currently state-owned railways, probably as integrated entities
- Consolidation leading to moderate competition only (“energy market scenario”)
- Liberalization allows some competition into the market (tenders for franchises)
- Technical and operational standards retain a national focus.

Scenario 4: “Open market all the way”

- Privatization of currently state-owned railways, probably after they are split up into separate operational units
- Consolidation fuelled by the emergence of new business models, fierce competition likely (“telecom market scenario”)
- Liberalization allows competition into the market
- Cross-border harmonization of technical and operational standards driven by private, transnational players.

Development of regional and urban passenger transportation

Regional and urban rail transportation around the world stands to benefit from the trend toward increasing urbanization. Where rail services are available in rural areas – often as a result of policy mistakes or misguided incentives – greater pressure on the public purse will mean that they are scaled back and partially replaced with more cost-effective bus services.

Railway companies will have to offer multi-modal solutions to compensate for this and avoid losing business volume.

Railway companies may also benefit from the development of electric cars and the e-mobility sector, as their stations network represents an ideal platform to get access to the cars and re-charge the electric cars’ batteries.

In the short to medium term, urban passenger transportation will rely on public subsidies. However, these subsidies may fall victim to the increased pressure on public budgets. National railway companies and private operators are currently competing fiercely over the transportation contracts put up for public tender. The economies of scale in regional transportation only fully kick in where resources are used in more than one region. In light of this, two developments are possible: Either the national railway company (potentially post-privatization) will retain its strong market position and a few other international operators with a regional focus will establish themselves. Or a system of tenders will emerge as in Great Britain, whereby production resources are passed on from one franchisee to the next and only the management and certain marketing functions change.

Development of long-distance passenger transportation

Long-distance passenger transportation will benefit from shorter journey times thanks to the building of infrastructure, in particular high-speed rail connections. Experience shows that journey times are a key factor in determining a modal market share, particularly for trains versus planes – see Figure 8.

Railways will also continue to improve on-board comfort. However, offering different classes of service greatly increases complexity, so it is only a factor for certain high-frequency routes in specific segments where customer requirements are divergent.

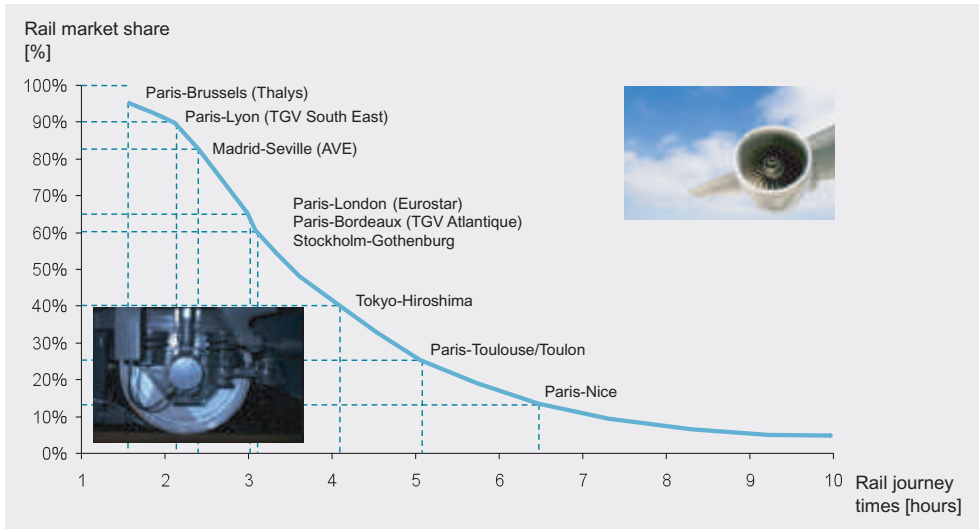


Figure 8: Market share of rail for journeys of 300-600 km (source: UIC, Highspeed Congress, March 2008)

The key challenge remains price differentiation as a way of steering utilization and leveraging customers' willingness to pay for comfort features; at the same time, booking procedures need to be simplified.

Many countries are developing their railway stations with the objective of making travel by train more attractive to potential customers. Stores at railway stations and lounges for frequent travelers subjectively reduce waiting time. Low platforms make it easier to board trains.

For long-distance passenger transportation, modal competition will only develop on highly attractive routes. This sets long-distance transportation apart from urban transportation. The main competitors for long-distance rail travel will remain road and air, as in the past.

Development of rail freight

With the formation of new industry clusters and the bundling of commodity flows, train lengths and axle loads are set to increase. Connections to sea ports and the needs-oriented develop-

Railways across the globe develop from public administrations acting as monopolies to service-oriented companies operating in liberalized markets with strong inter- and intramodal competition. Transforming a railway is a long-lasting process, which comprises structural improvements, strategic realignment of networks and product offerings, internationalization, and efficiency improvements. The book provides an outline of the major challenges in the transformation process and describes how leading companies have mastered them.

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