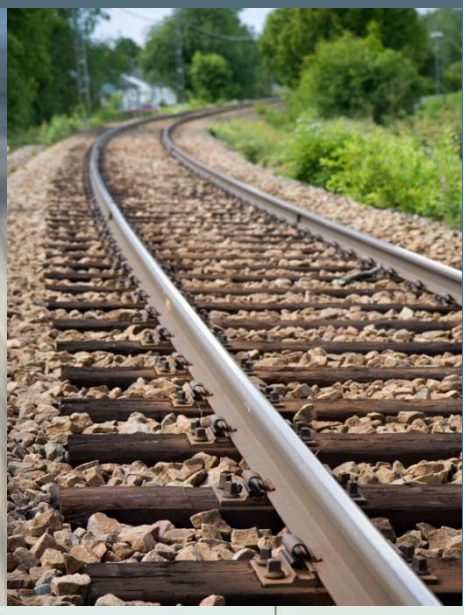
Railway Reform:

Toolkit for Improving Rail Sector Performance



Second Edition:
September 2017

PPIAF
Enabling Infrastructure Investment

SUPPORTED BY
WORLD BANK GROUP

International Bank for Reconstruction and Development / The World Bank
1818 H Street NW, Washington DC 20433
Internet: http://www.worldbank.org/transport

Foreword

Railway lending has always been a challenge for the World Bank. One notable success story is the oft-cited loan to Japanese National Railways to support construction of the first leg of the Shinkansen (Tokyo to Osaka) as part of the 1964 Tokyo Olympics investments. However, the challenge continues because, perhaps more than with any other transport mode, railways do not readily yield to a standardized reform formula. Fortunately, the tools that have emerged from the many years of experience are flexible, and can be deployed to achieve a wide range of reform objectives. This toolkit should be a constant companion to those who want their nation's railway sector to become an efficient link in a transport network that reinforces national economic growth.

In 1982, an initial comprehensive review of Bank railway lending, "The Railways Problem," concluded that railways could play an important role in the transport sector of many countries.[1] However, the report also found that during the years after World War II railways had "…become slow-moving public administrations, now requiring extensive structural change…" In most cases change had been slow, due in part to confusion about which functions should be managed by the state and which by the railways, and in part to the persistent delusion that investment alone would resolve all the problems.

In reality what was needed were changes in policies, organizational structures, and facilities (including *disinvestments* that respond to changing traffic levels). Due to the glacial pace of change, many railways remained bottlenecks to development and a drain on government finances.[2] The report concluded that governments should: (i) remove restrictions on competing modes, tax them appropriately and limit subsidies to railways; (ii) shake up existing railway staff and bring in new management and marketing skills more appropriate to commercial operations; and (iii) ensure that investment projects aim to serve customer or operating needs so as not to become white elephants. The report argued that the World Bank should lend only to railways willing to embark on a thorough process of managerial and structural transformation.

Through the 1980s, despite the declared desire to press for railways restructuring and commercialization of services, World Bank lending continued to struggle with recalcitrant railways and governments. World Bank projects remained focused on investments to repair and rehabilitate facilities that had suffered more from mismanagement than overuse. Bank loans did include more requirements for change, and focused on restructuring; but clients tended to perform better on investment components than on reform. The momentum of change in the Bank sometimes seemed barely ahead of that of its railway clients.

---

[11] "The Railways Problem," Transportation and Water Department, World Bank, January 28, 1982, reissued November 29, 1982.

[2] Ibid, summary page.

In 1994, the Bank published an updated review of railway lending, "The Evolution of the World Bank's Railway Lending."[3] This report concluded that railway lending had evolved from the earlier model of investment focus to a model that consistently tried to attack the underlying institutional weaknesses that had caused the railways (and prior railway loans) to fail. The report pointed out that rapidly accelerating global economic change, exemplified by the collapse of formerly socialist railways, was increasing focus on institutional failure as opposed to asset repair.

Supporting this analysis were two other reports aimed at defining specific actions and tools available for restructuring – "Techniques for Railway Restructuring"[4] and "Options for Reshaping the Railway."[5] "Techniques for Railway Restructuring" outlined four general steps around which the restructuring effort could be organized: (i) a Strategic Plan that relates the restructured railway enterprise to the broader political, social, and economic context within which it will function and addresses major public policy options; (ii) a Contract Plan that defines specific commitments and obligations flowing from the Strategic Plan that government and the railway enterprise formally accept as their respective responsibilities; (iii) a railway Management Plan that establishes an organizational structure, functional responsibilities, and performance measures for effective internal management control, in light of the requirements imposed by the decision to operate as a commercial enterprise; and (iv) an "Enabling Actions" Plan to list necessary legislative, legal, and administrative changes to carry out planned restructuring. "Options for Reshaping the Railway" addressed issues involved in breaking up the historically monolithic railway institution, for example by creating tenant operators that paid for access, or even for infrastructure separation—an independent infrastructure agency and all operators pay for access.

The early 1990s saw the emergence of two additional and powerful forces supporting railway change. The first, the European Commission's Directive 91/440, initiated a long process of separating railway infrastructure from operations and requiring all operators to pay non discriminatory access charges. The Commission's objective was to end the "fortresses" of the national railways and open the transport market to competition, both *in* and eventually *for* provision of rail services. Despite many years of resisting this Directive and its follow-ons, the Commission has slowly forced the European Union (EU) railways into a mold of separated infrastructure with competition in freight and long-haul passenger markets and competition for suburban and regional passenger markets. During implementation of the change, the 10 former CEE railways have joined the EU and have been subjected to the Directive's requirements: in addition, a number of railways adjacent to the EU (e.g., Russia) or influenced by EU policies (e.g., Chile) have implemented or considered their own forms of vertical separation.

The second major force was the expanding private sector role in railway services. At the beginning of the 1990s, the U.S. freight railways and the Canadian Pacific railway were the only privately owned and operated railways in the Americas. By the end of

[3] Galenson, Alice and Louis S. Thompson, "The Evolution of the World Bank's Railway Lending," World Bank Discussion Paper Number 269, 1994.

[4] "Huff, Lee W. and Louis S. Thompson, "Techniques for Reshaping the Railway," World Bank report INU-56, January, 1990.

[5] Moyer, Neil M and Louis S. Thompson, "Options for Reshaping the Railway," World Bank report WPS-926, June, 1992.

the 1990s, every significant freight railway in the Americas had been transferred to private operation, sometimes by privatization (Canadian National) but more commonly by concession (Argentina, Chile, Brazil, Mexico, Peru, Bolivia, Guatemala). In addition, the suburban railways in Argentina and in Rio de Janeiro had been concessioned, along with the Metros in Buenos Aires and Rio de Janeiro. The World Bank supported the concessioning process through lending for repair of assets that were derelict after years of neglect; more importantly, Bank lending supported labor force adaptation. A similar process was followed in many African countries, though progress has been slowed by weak and unstable governments, even civil war. The British Railways privatization initiated the infrastructure separation process and private sector privatization (freight) or franchising (passenger services) in the U.K., a process that has slowly spread to other parts of the EU.

More recently, the Bank has stressed the importance of sound governance and incentives structure to drive the railway to operate in a commercial fashion. These are “tools” that can apply in the full range of competitive and ownership options to improve the performance of the railway sector.

Taken together, these initiatives have set the stage for this toolkit. A universal railway reform solution does not exist. Nevertheless, the reform options available have expanded considerably since 1990, and the experience gained since then is immensely valuable to tailor the options to fit diverse national needs. Few countries have experienced a reversal in the reform process, and most reforming countries have benefited significantly, albeit not without some problems along the way. The toolkit is a comprehensive guide to navigating the difficult, complex, and perpetually challenging process of reforming the railways.

Acknowledgements

Acknowledgement is due to the many contributors who contributed to *Railway Reform: Toolkit for Improving Rail Sector Performance*.

Funding for this publication was provided by PPIAF. PPIAF, a multi-donor trust fund housed in the World Bank Group, provides technical assistance to governments in developing countries. PPIAF's main goal is to create enabling environments through high-impact partnerships that facilitate private investment in infrastructure. For more information, visit www.ppiaf.org. Support was also provided by the Transport Research Support Program (TRSP).

The World Bank coordinating team for the first edition was led by Martha Lawrence and included Vasile Olievschi, Jukka-Pekka Strand and Vickram Cuttaree. The World Bank coordinating team for the second edition was led by Martha Lawrence and included Fatima Arroyo Arroyo and Alicia Hernandez Muñoz.

Authors include Paul Amos, Karim-Jacques Budin, Richard Bullock, Jeremy Drew, Henri Kuitunen, Martha Lawrence, Pedzisayi Makumbe, Vasile Olievschi, Robert Phillips, Jukka-Pekka Strand, Louis Thompson, and John Winner. Case studies were adapted from studies by Menke Chen, Jakub Karnowski, Martha Lawrence, Gerald Ollivier, Dominic Patella, Joanna Moody, Siddhartha Raja, and Wenting Wei and the International Transport Forum. CPCS, for the second edition, updated a number of chapters and case studies from the first edition and prepared additional case studies.

Guidance on the first edition content was provided by an expert team from the World Bank: Michel Bellier, Pierre Pozzo di Borgo, Victoria Hilda Rigby Delmon, Benedictus Eijbergen, Ralf-Michael Kaltheier, Jorge M. Rebelo, John Carter Scales, and G. George Tharakan. Helpful input was also provided by Jean-Charles Crochet, Robin Carruthers, Henry Des Longchamps, Maria Carolina Monsalve and Reindert Westra. Anita Shrestha reviewed the financial model. Reviewers of the second edition include Paul Amos, Victor Arragones, Antoine Kunth, Airy Magnien, James Markland, Gerald Ollivier, David Robinette and Vincent Vu. Marc Juhel and Henry Kerali, World Bank Transport Sector Managers, provided overall supervision and quality control of the first edition and Almud Weitz and Michel Kerf of the second edition.

We gratefully acknowledge the cooperation and support in development and dissemination of this resource provided by the International Union of Railways (UIC), the International Transport Forum and the Community of European Railways and Infrastructure Companies (CER).

1

Railway Reform:
Toolkit for Improving Rail Sector Performance

Chapter 1:
Introduction

1 Introduction

Railway Reform:

Any change in policy, investment plans, or structure seeking to improve performance

This Railway Reform Toolkit aims to provide an easy-to-use resource on the rail industry—what it is and what it does best—and to provide an experience-based set of best practices to aid in the planning and execution of railway reforms. This toolkit is based on international experiences with railway reform under a range of railway organizational forms—state agencies, state-owned, or private enterprises. The toolkit should be particularly useful to those thinking about transitions from one organizational form to another and for those seeking to improve railway performance through investment, reorganization, or changes in government policy.

1.1 Target Audience

The toolkit will help transport professionals and practitioners—all those responsible for railway performance—by explaining railway fundamentals and how performance can be improved. Professionals and practitioners include government policy makers, legislators, regulators, railway management personnel, international financial institutions, and other stakeholders–including railway customers and employees—who seek improvements in railway financial and operational performance.

1.2 The Role of Transport in Economic Development

Efficient transport is a critical component of economic development, globally and nationally. Transport availability affects global development patterns and can be a boost or a barrier to economic growth within individual nations.[6] Transportation investments link factors of production together in a web of relationships between producers and consumers to create a more efficient division of production, leverage geographical comparative advantage, and provide the means to expand economies of scale and scope. Transport's contribution to economic development includes the following:

- Network effects—linking more locations exponentially increases the value and effectiveness of transport
- Performance improvements—reducing cost and time for existing passenger and freight movements increase transport's contribution to economic growth
- Reliability—improves time performance and reduces loss and damage, thus reducing economic drag
- Market size–access to wider markets adds to economies of scale in production, distribution, and consumption, thereby increasing economic growth
- Productivity—transport increases productivity gained from access to a larger and more diverse base of inputs such as raw materials, parts, energy, and labor, and broader markets for more diverse outputs

Transport has affected economic development from the beginning of human civilization.

Transport has affected economic development from the beginning of human civilization. Economic development focused on the confluence of transport systems –

[6] See Paul Krugman on New Trade Theory, Journal of International Economics, 1979; and New Economic Geography, Journal of Political Economy, 1991

early cities grew up on natural bays and ports, and on rivers and lakes where transport was available. Romans built roads to unify and provide access to their far-flung empire. Geographic characteristics such as proximity to oceans, seas, and waterways, plains, mountains and the location of oases defined early transport systems (*e.g.*, the "Silk Road" went from oasis to oasis, and city to city, where there were no reliable water or road routes).

The industrial revolution generated new transport demands, which required higher volumes of coal, iron ore, and other materials; this led to canal construction that extended water transport, and to early railway development.

1.3 Railway Costs and Cost of Alternatives

Railways are an efficient transport mode—concentrating people and goods and transporting them over a fixed route using one prime mover and multiple carriages and freight wagons.

Rail freight transport uses two-thirds less energy per ton-km than road transport in the US.

Rail transport is generally more fuel efficient than road transport; in the US, rail freight is on average 63 percent more fuel efficient than road transport.[7] Railways use a unique technology that has very low friction – based on steel wheels and steel rails. The most significant forces that must be overcome, besides the weight of the goods being transported, are rolling resistance and aerodynamic drag as speeds increase. Next to water transport, rail transport is the most energy efficient means of moving large volumes of goods and passengers. On average, inland water transport, using barges and a towing or pushing ship, is about 35 percent more fuel efficient than rail freight, but compared to water transport, rail is often less circuitous and thus, often as energy efficient.

Beyond energy efficiency, transport by inland water or rail can also achieve significant economies of scale in that a single vessel (barges + tow) or rail train (locomotives + wagons or carriages) can move many tons of freight or passengers at once making it operationally highly efficient when there is enough volume to use available capacity.

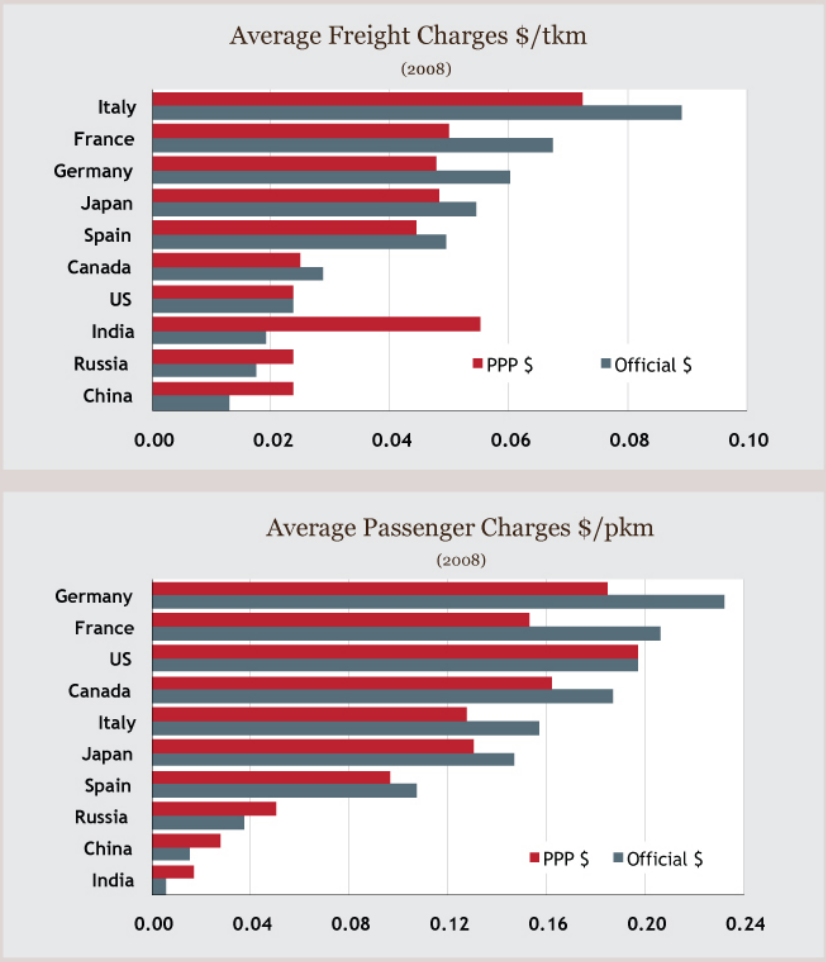
Railways are ideal to transport high volumes of bulk commodities or passengers. Rail transport costs for bulk materials are generally quite low—typically less than $0.03 per ton-kilometer; passenger transport is equally inexpensive, typically less than $0.10 per passenger-kilometer. On relatively dense freight oriented railways, rail transport can average less than $0.02 per ton-kilometer; rail passenger transport can be much less than $0.10 per passenger-kilometer, depending on how transport is subsidized and on the density of passengers.

[7] According to the US DOT, inland water transport averages about 576 ton-miles/gallon (224 tkm/liter); rail averages about 426 ton-miles/gallon (165 tkm/l); road transport about 155 ton-miles/gallon (60.3 tkm/l). Of course, energy efficiency varies greatly depending on circumstances.

Price variations arise from government policy choices, management effectiveness, design characteristics, and differences in volume, cost structures, competitive environments, commodity mixes, geography, haul lengths, among many other factors.

The two charts below show average passenger and freight charges for a sample of railways around the world.[8]

Figure 1.1 Railway Prices in Selected Countries

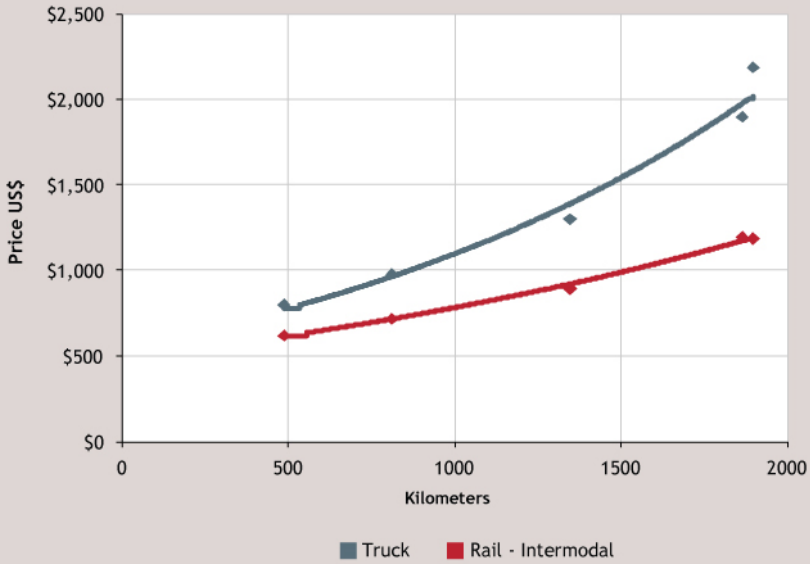


Since efficiently run railways can provide an inexpensive means of transporting high volumes of freight and passengers, low transport costs improve the competitive positions of shippers and entire economies. Many commodities are traded at world market prices and transport costs come out of producer profits, thus, low transport costs can help marginal producers be more competitive and give competitive producers a distinct advantage. Containerization of goods has expanded transport network effectiveness by reducing costs and friction between transport

[8] Figures based on 2008 World Bank data. It is interesting that on a PPP adjusted basis, India has the highest freight rates and the lowest passenger rates among the world's largest railway systems.

modes, thereby extending rail transport value beyond bulk commodities to include manufactured goods.

Figure 1.2 Truck vs Rail Intermodal Prices in the US



The chart above compares the cost of transporting containers by rail (rail-intermodal) with similar road transport movements in the United States. For distances greater than 500 kilometers, rail transport of containers costs about 20 percent less and the cost advantage continues to increase as distance increases. Local drayage adds cost, and changing modes at a terminal adds time to rail movements so rail may not have such a significant advantage for domestic movements, especially shorter movements. Cost comparisons between road and rail transport for general commodities are difficult to obtain, but the advantages of rail transport of bulk commodities such as coal, ores and grain, would be much greater than for container transport.

The cost advantages of efficient well-run rail transport can boost competitiveness among manufacturers and shippers in domestic and global markets and exert competitive pressure on road transport prices. Similarly, efficient well-run passenger transport can increase labor mobility—expanding the labor pool and economic development outward from urban centers.

1.4 Environmental and Land Use Benefits

Modern railways are a green transport alternative when their infrastructure and trains are heavily utilized. In general, they are more energy efficient,[9] have substantially lower environmental impacts[10] on water and air, and are less expensive to build than other transport modes. Modern and well run railways often offer significant environmental, land-use, and capital investment benefits – they are usually more energy

[9] Often more energy efficient than inland water transport, considering circuity factors.

[10] Ocean transport can have lower CO_2 and other emissions because circuity is rarely a factor.

efficient than road transport and much more environmentally friendly because they have lower emissions per traffic unit (passenger/kilometer or ton/kilometer) than nearly any other mode. Many of the world's railways are electrified, which can reduce emissions associated with rail transport, depending on the energy source used to generate the electricity.

Railways generally also have a much smaller land requirement for right-of-way than highway transport. Although railway freight lines generally require lower gradients and more gentle curves than road transport, which increases rail circuity in mountainous terrain, railways usually have a much smaller environmental and land use foot-print than road transport and often require substantially less investment per kilometer than water or road transport with equivalent capacity. Rail right-of-way is also environmentally friendly in other ways – it is porous and railway lines have much smaller impact on water drainage and nearby waterways than road transport.

Inefficiently managed railways, and railways with light usage may not be so environmentally (or economically) efficient. Railways with very light axle-loads can be less energy efficient than road transport for freight because rail freight wagons typically weight much more than highway vehicles. High-speed trains with low load factors can be less efficient than even automobiles or airplanes. Environmental and efficiency benefits depend upon an efficiently designed and managed railway system. Of course, this is true of other transport modes as well.

1.5 What Is Railway Reform? Why Do It?

Railway reform is any significant change in government policy, investment strategy, or management structure that seeks to improve railway performance. Railways are complex institutions with multiple measures for performance—costs, transport charges, service levels, and investment needs, among other factors. In the past, most interested parties sought industry improvements that would reduce government subsidies, introduce competition, improve capacity and reliability, and increase responsiveness to user needs to expand the client base.

Defining the goals and objectives of railway reform is a crucial first step in developing and defining a reform program. This will define the performance metrics that need to change. For example, railway reform may seek to tap private capital markets for railway investments, to alleviate the state burden for replacing state-owned rail sector assets because government has many competing budget obligations. Typical reform goals include the following:

- Reduce government expenditures and liabilities associated with providing railway services
- Improve railway financial performance and sustainability
- Attract private capital to the rail sector to alleviate government investment requirements
- Eliminate transport capacity constraints to economic growth
- Increase customer responsiveness and improve services, including through efficiency gains so transport charges can be reduced

- Adopt requirements to increase competition, provide access to strategic national infrastructure, or introduce new rail transport laws and regulations
- In the initial stages, railway reform requires a set of clear and prioritized goals that specify desired outcomes of the reforms. These goals are crucial to establish the types of reforms needed and how to implement them.

1.6 What Can Be Expected From a Reform Effort?

Rail reform outcomes are as varied as reform goals and methods.

Railways are often very powerful institutions with a long history and many employees. Reforming them usually takes a crisis.

Canada's reform and sale of the Canadian National railway (CN) gained Government over US$2.0 billion from the initial public offering (IPO) and resulted in a highly competitive and low-cost rail sector. Tariffs declined, service improved; CN rail operations now rank among the best for global railway financial performance and CN has reduced costs and improved services. Rail sector investment in Canada has increased dramatically. In the United Kingdom (UK), the success of reforms has been widely debated but results include a tremendous increase in competition among rail service providers, significant increases in private investment in the rail sector, and substantial gains in rail freight and passenger market shares.

The primary focus of reforms in Latin America and Africa has been to revitalize moribund railways while reducing government subsidy requirements. In most cases, rail reforms have revitalized important parts of the railways and substantially reduced government subsidies and investment requirements.

This toolkit includes many case studies of railway reform results. Typically, governments achieve most of their reform objectives, but the path can be long and arduous, and compromises are inevitable along the way.

1.7 How Long Will Railway Reforms Take?

The time investment is substantial—but so are the benefits. The most critical step in railway reform is when the responsible authorities agree that something must be done and they take the first step to begin the process.

Railway reform is a multi-year effort—depending on the number and complexity of the reform goals and objectives, reform can take five to ten years. Often the first set of reforms is followed by a period of adjustment, then further reforms, usually less dramatic, to refine the outcomes. For example, EU rail sector reforms have now been underway for over two decades and most stakeholders expect these efforts to continue indefinitely as the reform process is rolled out across many EU countries.

Expect railway reforms to take some time – five to ten years; if the initial reform program is successful, the process will likely continue.

Typically, it takes months and sometimes several years to reach any agreement on reform goals and objectives. Often, a strategy study is required to consider reform alternatives and their implications and prioritize objectives. Public consultations should be integral to the strategy study. When agreement is reached, governments usually need to pass legislation and may need to build new institutions for regulatory oversight—then, more time is needed to staff and equip the oversight institutions. In parallel, the railway itself must be audited and valued; its institutional

structure must be designed and implemented; its employees counted and their skills assessed. Each element can take a year or more. Even simple concession-type reforms require several years to move from recognizing that reform is needed to completing the concession deal.

Railways, especially state-owned railways, are powerful institutions; they are typically the largest single employer in a country and generally have a longstanding institutional life. Due to their size and importance, railways have considerable political clout, which is a significant factor to consider in designing reform efforts. Because railways are so powerful, successful reform efforts are often precipitated by a crisis to rally sufficient political will to surmount the inevitable difficulties involved. The larger the railway—measured by staff numbers, revenues, or share of state budgets—the more profound the crisis must be to find sufficient political support for sustained rail reform efforts. Some preliminary aspects of the reform process can be completed before a crisis is imminent, but implementation of significant sector reforms will require substantial and sustained efforts by responsible government entities and a crisis sharpens their resolve and focus.

International experience with reforms has proven that a comprehensive communications strategy is essential. The larger and more powerful the railway reform targets, the more thorough the outreach effort must be. Most successful reformers have hired professional communications firms to design and coordinate a sophisticated outreach and information dissemination program to consult the public, employees, shippers, and other stakeholders about their concerns, to explain the need for reforms and the resulting benefits, and to keep stakeholders informed of progress.

1.8 Structure of this Resource

This document and accompanying website are a comprehensive resource for those involved in railway reform, covering issues that may arise in designing, implementing and consolidating railway reforms.

The first part introduces railway reform. Chapter 1 describes the role of railways in an economy, introduces railway reform and explains why countries undertake railway reform. Chapter 2 provides information about railways markets and technology—a useful base of knowledge for understanding the later chapters.

The second part explains the elements of railway economic and financial sustainability. Chapter 3 explains the economics of railways and how this affects their market power, pricing and cost recovery. Chapter 4 discusses the elements of financial sustainability for railways. This part is supported by Annexes on financial modeling, benchmarking and costing.

The third part—Chapter 5—describes the options for the rail industry structure along the dimensions of business organization, competition and separability. It also discusses options for non core activities.

The fourth part discusses the roles of government in the railway sector. Chapter 6 provides an overview of the roles of government. Chapter 7 provides more detailed

information about how government should exercise its role as owner of the railway. Chapter 8 discusses government as the purchaser of services from the railway. Chapter 9 addresses the role of government as regulator. This part is supported by Annexes on concession and service contracts.

The fifth part discusses how to improve the railway's efficiency and market responsiveness by managing the railway in a commercial fashion, and is applicable to both government and private sector owned railway entities. Chapter 10 discusses best practices in corporate governance. Chapter 11 explains how commercial railways organization structures differ from traditional, non-commercial organization structures. Chapter 12 covers commercial management practices for strategy development, market responsive service design and pricing, investment planning and staffing.

The sixth part, in Chapter 13, discusses how to harness the private sector in railways. It is also supported by the Annexes on concession and service contracts.

The last part consists of nine case studies that illustrate various types of railway reform in railways from Africa, Asia and Europe. Each case represents a unique mix of reform choices for business organization, competition and separability. The cases range from introduction of commercial practices (Moroccan Railways) to corporatization and partial introduction of competition (Russian Railways), private competitive rail operations (Virgin), and concessioning (Camrail). Links are provided to additional case studies and other reports that provide more detailed information about the railway reform process.

2

Railway Reform:
Toolkit for Improving Rail Sector Performance

Chapter 2:
Rail Markets and Technology

2 Rail Markets and Technology

2.1 Introduction

Chapter 2 explains the fundamental building blocks of the railway and how these are organized to serve the transport market. Railway markets are discussed first followed by the technologies that railways use to serve these markets.

2.2 Transport Market Characteristics

Rail transport markets can be divided into two major segments—passenger and freight. The infrastructure for each segment is similar or even the same, but the type of transport, the equipment, and the details of the infrastructure are often different.

2.2.1 Passenger services

Typical passenger market segments are *urban*, including metros, trams, and light rail systems, *commuter* or suburban services, and *intercity*, which includes conventional and high-speed trains.

Metro

Urban railways generally serve the city center and immediate environs; within the central business district, metros usually run underground. Typical car capacity is about 100 passengers seated, or crush loads of around 160. Most metros can travel at speeds of up to 100 kph and are electrified at 750 VDC or 1,500 VDC, every second car; metro trains operate with four or six cars, which are usually automated. Metros are best for moving high passenger volumes for short distances around an urban area. Examples include the London Underground and the Paris Metro.

Tram

Trams are another type of urban rail system. Trams often mix with street traffic but some have a reserved right-of-way; they have seating for 80 passengers per car but can carry crush loads of around 120. Most trams operate at 750 VDC; although they have a top speed of 80 kph, their average speed is usually lower. Most trams operate in single or double units with a driver's station on each car. Many European cities operate tram systems and Melbourne, Australia operates one of the largest tram services in the world.

Light Rail

Light rail systems are often indistinguishable from trams, but in modern usage light rail systems are more likely to have a dedicated right-of-way and are designed to service specific routes such as airports or convention centers. Light rail car seating is similar to that of trams; light rail trains usually operate in sets of two or four cars with a driver's station at each end and trains are usually electrified at 750 VDC. Light rail services are relatively new; they have lower capacity than a metro but are generally less expensive. However, light rail systems have higher capacity than trams due to train size, acceleration, and a dedicated right-of-way.

Suburban/Co Commuter Metro

Suburban systems usually provide longer distance commuter services—seating density is lower and they offer more comfort for longer travel times. Often bi-level passenger carriages are used to increase passenger capacity and comfort. Suburban systems are typically hauled by electric or diesel-electric locomotives–the electrification is usually 25 kVAC.

Modern equipment standards blur the boundaries between light rail and suburban services; similar equipment often serves both. If suburban services operate on common infrastructure with freight services, passenger equipment crash standards are high, which is why most are locomotive hauled.

Conventional Intercity

Conventional intercity passenger services are usually locomotive-hauled using 25 kVAC electric or diesel-electric locomotives. Intercity passenger services often share right-of-way with freight services and can be hauled by the same locomotives. Maximum speeds are around 120 kph. Some intercity train services have multiple classes and sleeper cars. Seating is about 80 passengers in conventional coaches, fewer in first class, which sometimes has compartments and sleeper services.

High Speed Rail

High-speed rail (HSR) services operate at 250 kph or more. HSR trains generally operate in eight-car sets. Some have integrated locomotives; others have motors distributed throughout the train with passenger seating in what would otherwise be the 'locomotive section'. Some HSR trains have double deck passenger cars. HSR trains operate on a dedicated right-of-way so train frequencies are usually fairly high—one train per hour is a typical maximum interval. HSR trains sometimes also operate on conventional speed track to gain access to locations where dedicated track cannot be built such as inner city railway station. Trains are always electrified and 25 kVAC is typical.

Passenger trains that have traction motors distributed throughout the train in passenger car 'multiple units'; electric-powered trains are called 'EMUs' while diesel powered trains are often called 'DMUs'. Such trains usually do not have a separate locomotive, though there may be a streamlined car in front and back with drivers stations. Using this classification, metro, tram, light rail, and many high-speed trains are EMUs. All EMUs and DMUs have electric motors on many wheel-sets to provide traction. This is unlike conventional trains and locomotive-hauled suburban trains, where only the locomotive has powered wheel-sets and the rest of the rolling stock is hauled (pulled or pushed).

The figure below summarizes the principal characteristics of equipment used in each market segment.

Figure 2.1 Characteristics of Passenger Rolling Stock

Type of Service	Speed (kph)	Passengers per Car	Passengers per Train	Cars per Train	Typical Distance	Cost/ Train-US$
Tram	40	120	240	2	1-2 km	$4 m
Metro	70	160	720	6	2-4 km	$12 m
Light Rail	80	100	400	4	5-10 km	$6 m
Suburban Commuter	120	80	480	6	15-20 km	$12 m
Conventional Intercity	160	80	640	8	25-120 km	$12 m
High Speed Rail	250-350	70	560	8	250-350 km	$25 m

Rail passenger services are usually measured by passenger trips and passenger kilometers.

Typical measures of passenger services are passenger journeys or trips and passenger-kilometers. A passenger journey or trip is usually counted from the entrance to the passenger system to the exit. In urban trips that may involve several metro lines, one journey may include travel on more than one train. When train lines are under separate management structures, each segment may constitute 'one trip' for accounting purposes. Passenger-kilometers are usually measured on the basis of the rail travel distance between origin and destination multiplied by the number of passengers traveling between each origin and destination.

Passenger revenue calculations are often complex. Charges for passenger services vary by type of service, the means used to collect the fares, and the amount of subsidy provided. For example, many metro systems sell monthly passes that can be used for an unlimited number of trips or trip segments. Special categories of passengers—students, disabled, retired—are often eligible for discounted monthly passes. Other metro systems charge on a segment basis and use rechargeable 'stored value' cards to levy charges for each trip. Stored value cards can be purchased with discounts depending upon advance sales or passenger category—student, disabled, or retired. For special-purpose light-rail lines, such as airport services, a flat fee per trip is the norm.

Typically, charges for suburban services are based on distance and time of day—a surcharge may be applied during peak travel periods. If suburban and urban services are coordinated, the same ticket can be used for both segments and revenues are usually allocated between services on equitable cost-related basis such as passenger-kilometers.

Urban passenger services are operated as a public service; long distance services generally cover their operating costs.

Fares for intercity services are usually related to class of service and distance. However, many HSR systems have airline-type pricing related to advance ticket sales, class of service, time of day, and distance. In many countries with extensive HSR and conventional provincial services, ticketing is integrated to provide competitive and compensatory services between each service type. Revenue sharing between intercity and metro services is rare but occurs in some places.

Typically, urban services are operated as public services subsidized by government. Some urban systems, such as the Hong Kong MTR, and London Underground, operate at break-even for operating costs. Rarely are they expected to cover capital costs.

Rail passenger transport is particularly good for rapid movement of massive volumes of people, thus urban rail is an essential element in urban planning. Urban rail systems define population centers and dramatically affect urban development patterns. Similarly, commuter and suburban passenger services are an effective and relatively inexpensive way to connect suburban communities with the city center and one another. Urban and suburban rail systems can provide significant public benefits, including substantial savings that accrue to all levels of government and private citizens—reduced congestion and pollution, fewer accidents, and improved spatial planning. Furthermore, urban and suburban rail systems generate financial benefits from rising property values and higher quality development patterns. Some urban and suburban rail systems, notably in Japan, have tapped into property value increases successfully enough to finance their rail systems as well as generating all the above-mentioned public benefits.

Intercity passenger service revenues often cover operating costs, but few are expected to cover their capital costs. Most of SNCF's TGV services operate at a profit, including equipment costs, but its provincial or conventional services rarely do. Thus, most passenger services infrastructure costs are subsidized; sometimes government provides rolling stock.

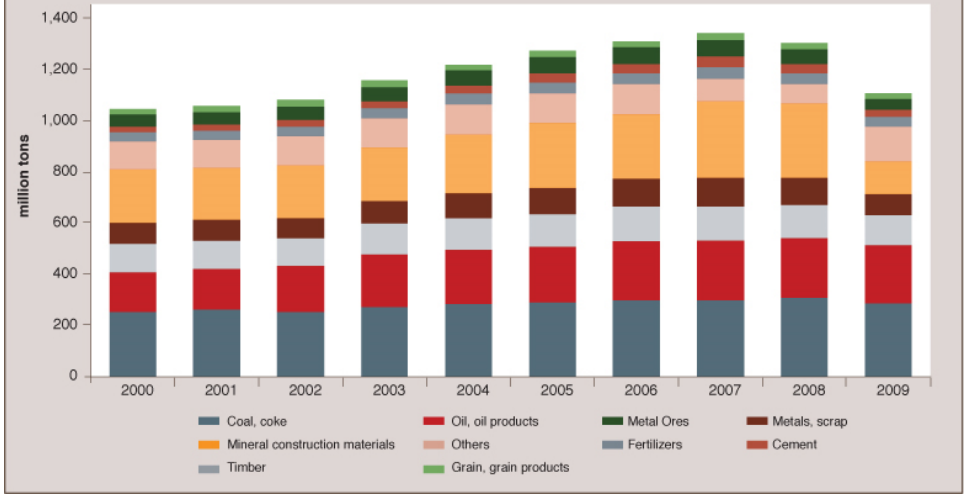
Rail passenger services generate significant public benefits in the form of rapid travel times, reduced road congestion, reduced air pollution and CO2 emissions, and reduced losses from accidents. If passenger demand is high for intercity train services, governments can avoid the cost of additional highway construction, which boosts overall energy efficiency. Sometimes rail transport is the sole means of mobility for distant populations. However, if fewer than 1,000 passengers per day are being transported, long distance bus services are typically cheaper and offer similar or better energy efficiency, depending on train frequency and load factor.

Most rail passenger services have excellent safety records; the number of accidents per passenger-kilometer is lower than most other means of passenger transport. The accidents that do occur often involve a road/rail interface at level crossings.

2.2.2 *Freight services*

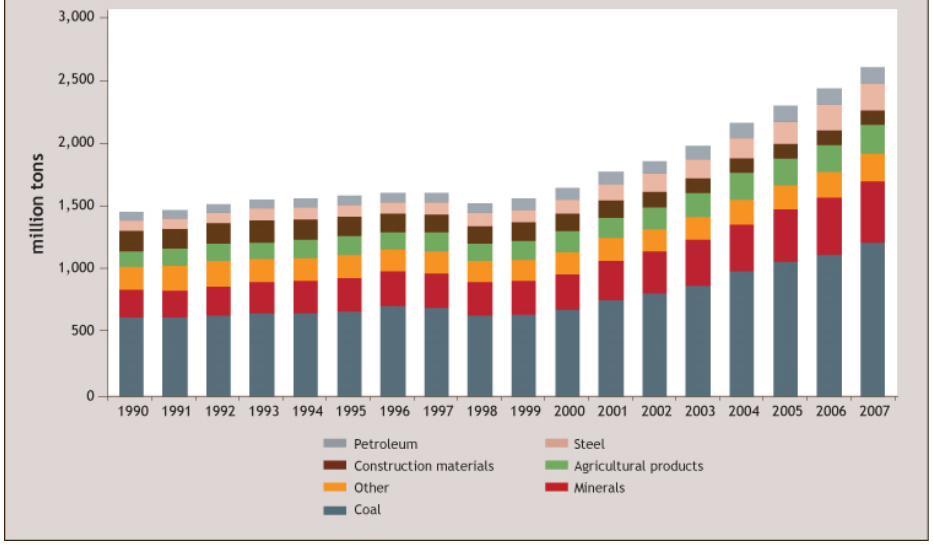
Rail freight services are important to economic growth in many countries and regions. As discussed above, rail freight services are efficient, and can move massive volumes of cargo over long distances effectively at reasonable prices. Rail freight services are dominated by bulk commodity movements—coal, iron ore, phosphates, grains and cereals, lumber, gravel, sand, and other construction materials.

Figure 2.2 Russian Railways - Tons by Commodity



Russian Railways' commodity mix, shown in the bar chart above, is typical of many large rail networks; similar data for China Rail are shown on the lower chart. In both cases, coal, mineral products, agricultural products and construction materials dominate the mix of traffic on these large networks.

Figure 2.3 China Rail – Tons by Commodity



Container Ship

Mixed Freight Train

If navigable inland waterways are unavailable, rail transport is the only effective means to move high volumes of bulk commodities. Often, bulk goods move in trains that consist entirely of one commodity—from the same origin to the same destination—from a mine to a power plant or steel mill, or from a grain elevator to a port. These trains are highly efficient since no intermediate handling occurs; however, often the freight wagons return empty.[11]

Rail transport is also an effective means of transporting general freight, automobiles, and heavy objects. Most of this freight traffic must be moved to a marshaling yard to be sorted by destination and grouped into train-load quantities for shipping. Although sorting the heavy freight wagons takes time, rail transport is still an efficient means to move mixed freight since trains can carry from 50 to 150 wagons, depending on the infrastructure.

Rail container transport is expanding. Since containerization began in 1959,[12] it has become important in shipping manufactured goods, including liquid and granular commodities, especially imports and exports associated with ocean transport movements.

Prior to containerization, the shipping industry could load and unload about 0.6 tons per person/hour; by 1976, that figure was 4,235 tons per person/hour; now it is over 8,000 tons per person/hour at a typical container port. Typically, a break-bulk ship that handles crates, barrels, and bags of miscellaneous freight, would be in port for several weeks, and in 1959, a general commercial cargo vessel could carry 10,000 tons of freight at a speed of 16 knots (29 kph). By 2009, container ships could carry 77,000 tons at 25 knots (46 kph) and would be in port for only

[11] Trains moving from a single origin to a single destination transporting one commodity are often called unit trains or circus trains, and typically use rolling stock and other mechanisms for fast loading and unloading such as loop tracks with automated loading of open-top hopper cars, rotary couplers that permit cars to be dumped without uncoupling, or automated discharge doors on hopper cars.

[12] Malcolm McLean is credited with the invention of container shipping; he shipped the first containerized freight from Newark New Jersey to Houston Texas in 1959.

Double-stack Container Train

16 hours to unload and load. Some of these same efficiencies apply to rail transport of general freight. Box wagons can hold more goods than a container and are useful for many commodities, but they can be used only by shippers located on rail lines. Other shippers must load goods into containers and use road transport to move them to a container terminal where they are transferred to a ship or train for transport over longer distances. In many markets, rail transport competes fiercely with road transport for container shipments; most time-sensitive freight moves by road transport from origin to destination. However, containerized rail transport is increasingly preferred to move general freight to and from ports and distant inland logistics centers.

Rail freight services are usually measured in tons of freight, and by net and gross ton-kilometers.

Freight traffic on any mode is typically measured in tons and ton-kilometers. A ton-kilometer = cargo weight transported X distance transported—also reported as net ton-kilometers (NTK). Another frequently reported measure is revenue ton-kilometers, which refers to revenue-producing freight tons and excludes non revenue-producing freight such as rail, ballast, or other goods transported for railway company use. For railways, an important measure of work performed is gross ton-kilometers, this measure includes rail wagons' empty weight for both empty and loaded movements. This measure of gross ton-kilometers is also called 'trailing tons' or the total tons being hauled. Sometimes gross ton-kilometer measures include the weight of locomotives used to haul freight trains.

Energy and fuel consumption in railways is closely related to gross-ton-kilometers since this is a nearly direct measure of work performed. Geography plays an important role in energy consumption as well. Whether trains must be hauled over a mountain range or rolled downhill has a direct effect on energy use of any particular railway line. But, given the geography, energy consumption is usually related to gross-ton-kilometers.

2.3 What Railways Do Best

Railways are best at moving high volumes of passengers or freight between common points.

Railways are an efficient and cost-effective means to transport large volumes of passengers and freight over various distances, particularly between originating and terminating points with large volumes. Rail transport cost effectiveness increases as volumes and distances increase. When traffic demand involves smaller passenger and freight volumes that must be distributed over a larger number of points, road transport is usually more efficient and cost effective.

For high volumes, railways deliver much more significant cost savings, environmental, energy, land use, and other social benefits than road transport, although in some cases, rail can be slower. Water transport can be more energy efficient and lower cost than rail transport, depending on waterway circuitry and availability, but typically, water transport is much slower. Rail passenger and freight transport are competitive with road and air transport at some distances.

Rail transport is generally the most effective mode of transport available for larger volumes over longer distances, for example, to transport coal or minerals from a mine or production center deep in the interior of a country to distant markets. Rail infrastructure requires relatively little land—a strip of land 100 meters across is usually more than generous and a typical rail right-of-way can be as narrow as 10

Railways moving bulk goods should be designed with low gradients. High speed passenger lines can have higher grades.

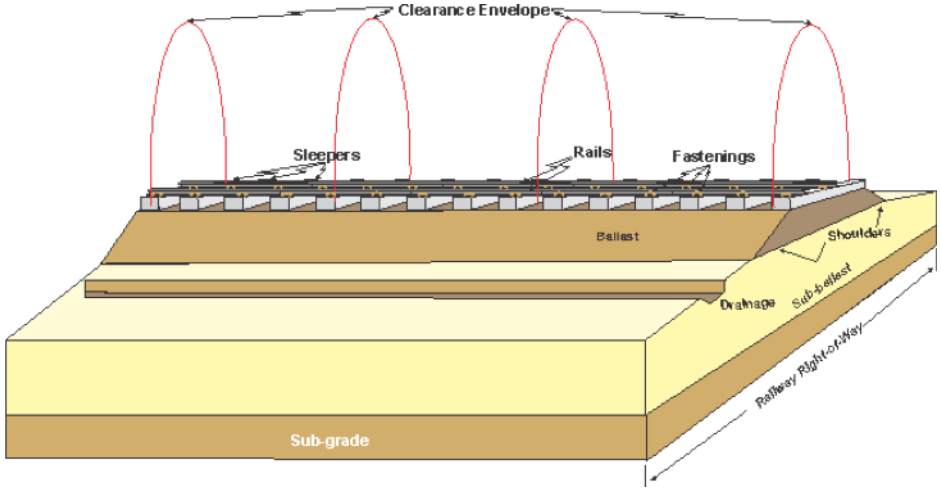
meters. However, freight railways require relatively gentle grades and curves, especially for transporting minerals—grades should not exceed 2.0 percent. By contrast, high-capacity roadways can have grades as steep as 5.0 percent or more. Therefore, railway lines between two points can be more circuitous than road transport.

2.4 Railway Technology and Terminology

When working on rail industry reforms or investment projects, it is useful to understand railway jargon and terminology and to be familiar with the rail industry technology, technical standards, and common practices. This section covers railway basics.

2.4.1 Infrastructure

Typically, railway infrastructure includes fixed physical facilities including the following principal components.



Railway Infrastructure

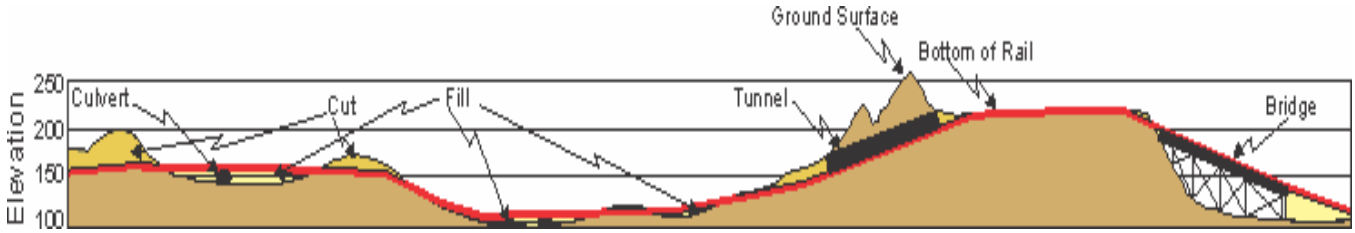
Basic railway infrastructure includes the sub-grade, sub-ballast, ballast, sleepers (also known as crossties), rail, and track fastenings that secure the rail in position relative to the sleepers and to each other.[13] These systems, the foundation for railway infrastructure, should be designed for the proposed purpose of the railway. Railways intended to carry heavy loads will require a solid sub-grade without underlying problems such as soft marshy soils, for example, and a substantial sub-ballast cross section of hard angular rock, typically granite. The ballast section must also be hard angular rock; the rock depth must be sufficient to distribute load stresses throughout the sub-ballast and the rock size must be sufficient to permit rapid water drainage into drainage structures built adjacent to the shoulders of the top ballast section.

Railways take advantage of the very low energy required to roll steel wheels over steel rails. But, because there is little friction between steel wheels and steel rail,

[13] Track fastenings include plates, spikes, bolts, clips and anchors – all devices that keep rail and sleepers together and maintain the spacing between sleepers.

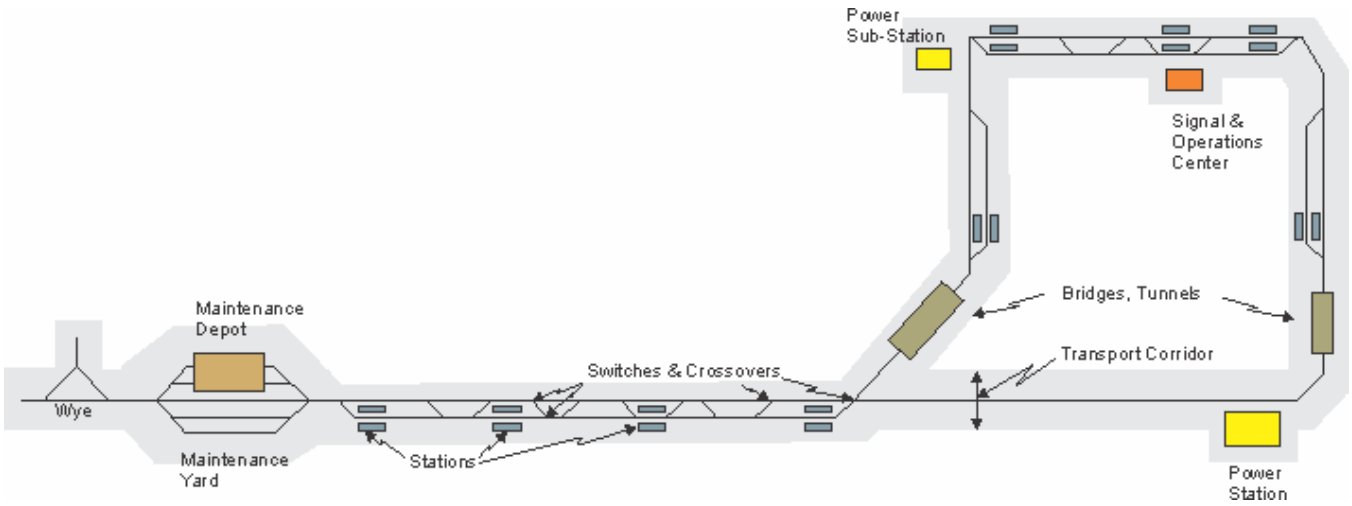
railways must have low gradients—gentle up and down slopes. As mentioned earlier, railways generally are engineered to have grades of 1.0 to 2.0 percent (10-20 meters per kilometer).[14] Railway designers use many techniques to minimize vertical grades; some are shown below in the cross section diagram. Designers use bridges and tunnels to traverse vertically challenging territory, cuts through rolling hills, and fills in low spots, often with material taken from cuts, to keep tracks as level as possible. They add drainage structures such as culverts—concrete

Track Structures for Easing Grade



pipes or box-like structures that conduct water flows under the tracks—and common ditches.

Other terminology commonly found in railway projects is shown below in the schematic of a short railway line:



Infrastructure Components

This plan includes infrastructure component structures—maintenance depots, and switches (also called turnouts) and crossovers, which allow trains to change from one track to another, and maintenance and sorting yards, where freight and passenger cars are arranged in the correct order for the outbound train. A device known as a 'Wye' is used to turn locomotives, and even whole trains, to face in the opposite direction, replacing turntables that were used in the past.

Single and double track

Many railways are built as single track lines. Trains leave a station or a yard with multiple tracks and move to the next station or yard over a single track. Only one

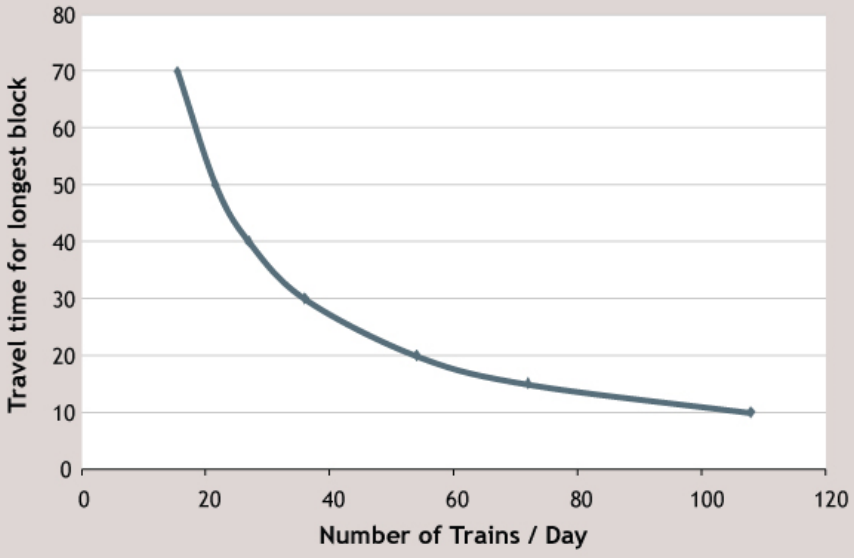
[14] Except for high-speed rail lines, which have very high power-to-weight ratios to achieve high speeds, these can be built with higher gradients of as much as 5 percent.

train can operate over single track line at the same time. Single track lines often have sidings at various points where trains moving in opposite directions can meet and pass each other (passing sidings). The capacity of a railway line is determined by the longest time for trains to move between passing sidings. As a rule of thumb, railway engineers estimate capacity in trains per day using "Scott's Formula" (Figure 2.4) which states:

N = (E x 24 x 60) / T where

N = Number of trains/day
E = Efficiency of signaling system (usually between 0.7 and 0.9)
T = longest Travel and stopping time in minutes between passing sidings on a given line

Figure 2.4 Scott's Formula for Train Capacity



Trains are usually heavy and the same thing that make them energy efficient – low friction losses – make them hard to stop. Each freight car and passenger carriage has air brakes at each wheel to slow and stop trains, but it still takes a lot of distance to stop a train – often a kilometer or more. The higher the speed of the train, and the heavier the train, the longer it takes to bring it to a stop. Similarly, it takes a long time and distance to bring a heavy train out of a passing siding and up to track speed. These factors are taken into account in determining the value of "**T**" in the equation above. For single track lines with track speeds around 100 kph, with a modern signal system and using passing sidings (passing sidings can hold a typical train) a single track line can typically handle 30 trains a day at most (assuming half are in each direction). As the number of trains increases, interference between trains increases and delays to all trains on the line tend to get larger as well. Railway engineers do many things to increase capacity – increase the speed of trains (this reduces **T** in the equation), build more sidings (also tending to reduce **T**), modernize signal systems (increasing **E**).

As the number of trains increases further, railways will connect passing sidings to provide piece of double track, permitting trains to pass while still moving and saving on the stopping and starting times. Eventually, to create more capacity, the entire line will be double tracked. Capacity can also be an issue with double track lines. Trains can follow each other no closer than the stopping distance for the slowest train; in mixed freight, some trains may be slow – either stopping at many small stations or very heavy, other trains may be fast. Large speed differences between trains tend to limit line capacity even on double track, since trains have to switch tracks to get out of each other's way. Some urban rail systems need as many as six tracks to allow the train frequencies needed in dense urban areas.

Signaling and train control

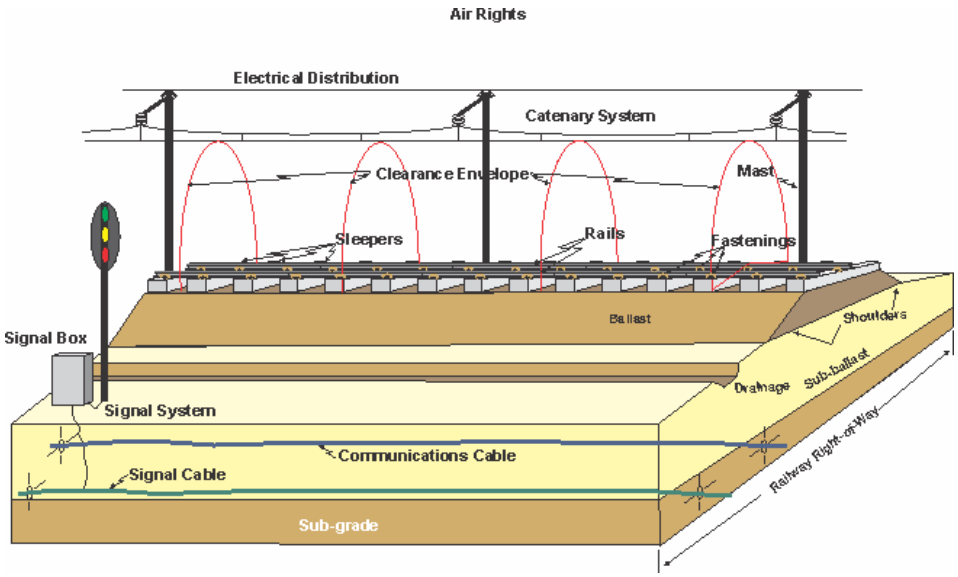
Most busy railways install signals to control train movements; these are akin to road traffic lights and they allow trains to operate in both directions on single or multiple track railways. On a single track signal systems may work only at the siding or station. Modern signal systems have train presence detection and their indications are interlocked with switch positions to prevent trains from moving onto a track if there is oncoming traffic. 'Automatic block' is a common signal term for systems that are interlocked with the current siding and with sidings ahead and behind to prevent unsafe train movements.

Train Control Center

Advanced signal systems rely on centralized systems to control a large territory. Still more advanced systems have computer controls that help dispatchers make sophisticated decisions about which trains to advance and which to delay. Modern signal systems are computerized train controls that require complex digital communication technology. These systems can enforce control indications and stop trains automatically when they detect unsafe conditions. Pictured at left is part of a modern train control system.

Electrification

High speed or very busy railways are often electrified; they use electric locomotives and draw electrical power, usually from overhead power distribution systems, but sometimes, in urban railways, via a third rail system at ground level. The diagram below shows components for the electrical distribution system and the wayside signals. Major signal system components include signal boxes, display systems (on some railways, the signal display is inside the locomotive, not along the wayside), and the signal and communications cables needed to control these systems. Electrification system components include masts or poles, and a catenary system that delivers electrical current to the locomotive. In overhead systems, such as the one shown below, locomotives have a pantograph on top to collect the electrical current. The pantograph slides along the catenary as the train rolls underneath. Several electrification standards are used to power railways; today, the most popular is 25-kVAC for main-line railways but many kilometers



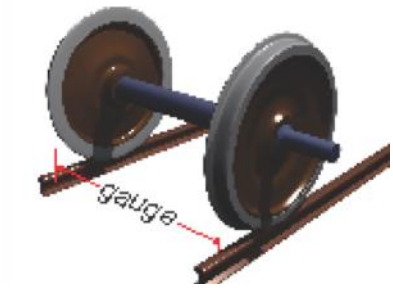
Electrification and Signaling Systems

of 3-kVDC systems, some 15-kVAC systems, and a few 1.5-kVDC systems exist. Many urban railways use 1.5-kVDC electrical power but most now use 750-VDC. Most electrification uses an overhead distribution system like that shown in the diagram, but some use third-rail systems, which are more compact, have smaller urban clearances, and use smaller tunnels; most are 600-750-VDC.

For main line passenger railways, electrification has the advantage of a high power-to-weight ratio–a lot of power (kilowatts or horsepower) available with a relatively light locomotive since locomotives do not require a diesel engine and generator. This is especially useful if trains need to move fast (faster than say 150 kph, and if a high acceleration rate is needed for station stops and departures. Electrification can be attractive in freight lines, as well, especially those with high volumes (at least 40 million gross-tons per year) ***and*** high diesel-fuel prices relative to electricity prices.

Railway electrification is expensive, typically US$3.0-5.0 million/kilometer, including sub-stations. Electrification may also require substantial modification to existing railway signal systems, bridges, and tunnels for the higher clearance required for overhead catenary systems. High initial costs and continuing maintenance costs encourage most commercial railways to carefully consider the implications of electrification. Despite this, about 25 percent of global railway lines are electrified and more than 50 percent of all rail transport is moved by electric traction, according to some reports.

Electric railways can reduce rail transport's environmental footprint, depending on the electricity source, such as low-emission power plants, and distance to the railway, since up to 30 percent of power plant output can be lost in transmission.



Railway Gauge

Railway gauge

Railway engineers often discuss railway 'loading gauge', generally defined as a combination of track gauge, physical clearance envelope, and axle load capacity. Track gauge refers to the distance between the inner surfaces of the rail, illustrated

at left. Although there are many different rail track gauges in use around the world, the most predominant gauges are shown in Figure 2.5 below.

Figure 2.5 Railway Gauges

Common Gauge Name	Metric Measure	English Measure	% of Worlds Rail lines	Example Countries Using
Standard	1,435	4' 8-1/2"	57%	US, Canada, Europe, China
CIS/Russian*	1,525	5'	18%	Russia, Ukraine, Kazakhstan
Cape	1,067	3' 6"	9%	South Africa, Indonesia, Japan
Meter	1,000	3' 3-3/8"	8%	Brazil, India, Argentina
Indian	1,676	5' 6"	6%	India, Pakistan, Argentina, Chile
Iberian	1,668	5' 5-2/3"	1%	Portugal, Spain
Irish	1,600	5' 3"	1%	Irland, Australia, Brazil

* 1,520 mm gauge is also commonly used in CIS countries and Finlandv

Many countries have railway lines built to several different gauges. Why is one gauge selected over another? There are two main reasons—heritage and cost. Many railways were built by foreign engineers who used a gauge that was common in their country of origin. The second reason is cost—narrow gauge is cheaper to build than a broader gauge because cuts and fills are smaller, less earth moving or blasting is required, tunnels can be smaller, and narrower gauges require less ballast and can use smaller, less expensive sleepers. Investors often built narrower gauge railways to keep investment costs down during the early days of railways that were built to exploit natural resources. For example, some Latin American railways built to move banana harvests are only 560 mm, a size that could be built quickly and cheaply and easily relocated.

Two things are responsible for the gauge of a railway – either heritage or cost.

What are the advantages of various size gauges? Broader track gauges are better for railways that are planned for hauling heavy tonnages; broader gauges provide stability, lower track stresses, and a longer lifespan for track components. During the mid-1980s, Vale (CVRD) built a new 1,000 kilometer broad gauge railway line in the Amazon to move massive quantities of minerals. However, lesser gauges can also effectively haul heavy freight. Vale operates another railway in Brazil, a very fine Cape gauge railway (EFVM) that hauls more than 120 million tons of iron ore concentrate from the mountains in the state of Bello Horizonte to an Atlantic port. This railway serves passengers and general freight customers, too. Cape gauge railways in South Africa efficiently haul millions of tons of coal.

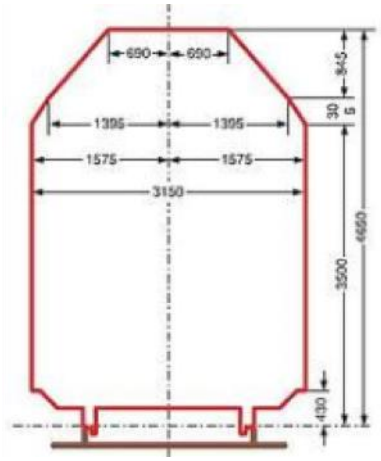
The best gauge is the one that already exists; but new standalone railways can be built to any gauge that makes sense. Standard gauge is a good compromise in most cases.

Most of the world's heavy-haul railways are standard gauge, probably due to the large base of rolling stock and many suppliers of standard gauge components, systems, and associated equipment. Standard gauge appears to be a good compromise between cheaper-to-build narrower gauges and more expensive-to-build broader gauges. Gauge may be an important consideration during design (because of construction costs), but is less important for railway operations once a rail line is built.

A new railway line should match the specifications of the predominant gauge in the region if it is to be part of a national network. However, if a new line is independent of other railway lines and has a specific purpose, gauge choice depends on

other design considerations. While there are high-speed passenger services using different gauges, a new railway line for high-speed passenger services would likely be built using standard gauge because most of the specialized rolling stock these railways require are built to (and originally designed for) standard gauge. For example, Spain's national railway is Iberian gauge—1,668 mm, but Spain used standard gauge when it built high-speed rail lines so the trains could interconnect with French and European lines.

Since most of the world's railways are standard gauge, there is a wider supply of standard gauge rolling stock, track maintenance and track building machinery. Generally, new lines should be built to standard gauge unless the new line is to be connected to a national network of a different gauge or if there is another compelling reason to select a different gauge.



Clearance Envelope

Clearance envelope or loading gauge

Railway 'loading gauge' also refers to the physical clearance envelope (shown in the diagram at left) available for rolling stock. The clearance envelope also determines the size of openings in tunnels and under bridges and the distance from the centerline of the track to station platforms, signs, signal lights, and other trackside devices. Railways with overhead electrification will require more vertical clearance but the maximum size of rolling stock still determines the loading gauge. Generally, the physical clearance envelope takes account of sharp curves and long cars and allows for the swaying or rocking motion of rolling stock. Physical clearance envelope is a critical consideration when railways want to introduce an unusual size of new rolling stock such as bi-level passenger cars or double-stack container equipment that may need clearance envelope expansion.

Axle loads

Axle load—the total permitted weight of a loaded rail wagon or a locomotive divided by the number of axles on the piece of rolling stock—is a critical measure of infrastructure physical capacity and strength. Axle loads are an important element of railway loading gauge and permitted axle loads and the weight of empty freight wagons are key determinants of rail transport efficiency and sustainability.

Many older railways were built to a standard of 16 to 18 tons/axle. India, Russia, and China used 22.5 to 23.5 tons as design limit. Heavy haul railways operate at 32.5 tons/axle (standard in North America with some lines operating at 36 tons/axle); and a new special-purpose heavy-haul railway in Australia has been designed to achieve 40 tons/axle.[15]

The weight of empty freight wagons can affect railway efficiency significantly. Early railway rolling stock design was less precise and metallurgy in steel and castings were of poorer quality, resulting in larger and heavier freight wagon components. However, modern engineering and design systems and high-strength steels and aluminum components now allow much lighter freight wagons with higher capacities.

[15] The railway will open at 32.5 metric tons to wear harden the rail and compact the subgrade and rail infrastructure and loadings will be moved to 40 tons/axle over a period of years to provide time to determine the effects of such high axle loads under sustained and frequent train movements.

Figure 2.6 Axle Load

	Lading (tons)	Empty Weight	Axle Load	Avg Haul	% Empty Haul	NTK	GTK	GTK/NTK Ratio
Light Rail Freight	45	25	17.50	1,000	30%	45,000	77,500	1.72
General Rail Freight	65	25	22.50	1,000	30%	65,000	97,500	1.50
Bulk Unit Train	75	25	25.00	1,000	100%	75,000	125,000	1.67
Heavy Haul	110	22.5	33.13	1,000	100%	110,000	155,000	1.41
Container Car-one	40	20	15.00	1,000	25%	40,000	65,000	1.63
Double Stack	80	20	25.00	1,000	25%	80,000	105,000	1.31
Light Road Transport	15	9	6.00	1,000	20%	15,000	25,800	1.72
Heavy Road Transport	33	8	8.20	1,000	30%	33,000	43,400	1.32

* These are theoretical optimum values, in practice, mistakes, repairs, re-routes and other factors increase these ratios

The figure above shows the best GTK to NTK ratios that could be achieved in the given circumstances. In practice, railways do not average such high ratios because of the normal "Brownian" motion of railway assets – they move the wrong direction, or get re-directed, move to be cleaned before the next load, and move to and from repair and inspection facilities. Typical gross to net ratios for freight railways average in the 1.8-1.9 range. Railways with light axle load limits (e.g., 17.5 tons in one of the examples) typically have a GTK to NTK ratio above 2.0. In contrast, the most efficient types of freight are heavy haul and double stack containers. For heavy haul, freight wagon design and high axle loads compensate for returning most freight wagons empty for reloading. Double stack achieves low GTK to NTK ratio due high axle loads, low empty weight, the universality of containers, and the need to return even empty containers. The values for General Rail Freight, with an axle load of 22.5 tons/axle and a 30 percent empty miles rate are typical of Russia, China, and India and in practice average around 2.0. By this measure, light road transport, perhaps for local delivery, is not particularly efficient; but heavy road transport can achieve good efficiency.

Track modulus

Typically, infrastructure strength is measured by track modulus–of the degree of stiffness or resistance to vertical deflection under loads. Higher track modulus values mean greater stiffness, generally higher axle-load capacities, and lower infrastructure wear rates. Track modulus is determined by many factors—gauge, rail weight, sleeper type and spacing, ballast type and thickness, and sub-grade quality. Sample values appear in the figure below. Higher values denote greater track stiffness and more stable infrastructure conditions.

Figure 2.7 Track Modulus

Rail	Sleeper Spacing	Ballast Type and Depth	Track Modulus[1]
R42	1,800 / km	150 mm cinder ballast on clay sub-grade	375
R42	1,800 / km	150 mm limestone on clay sub-grade	760
R42	1,800 / km	300 mm limestone on clay sub-grad	780
R42	1,800 / km	600 mm limestone on clay sub-grade	850
R50	1,800 / km	600 mm limestone on compacted clay sub-grade	2,000
R60	1,660 / km	600 mm limestone on compacted clay sub-grade	2,100
R60	1,660 / km	600 mm limestone ballast on crushed stone compactedlimestone sub-grade	3,600
R65	1,660 / km	650 mm granite ballast on crushed granite sub-grade	4.200

Railway reforms and investments that encourage increases in axle loads, acquisition of modern light-weight rolling stock, improvements in rolling stock management and operations, and strengthening of the infrastructure, all work to improve the returns and sustainability of railways.

2.4.2 Rolling stock

Railway rolling stock comes in a variety of forms. The most common types of passenger services railway rolling stock are described below.

Bombardier TRAXX Electric

GE Evolution Diesel-electric

Locomotives

The sole purpose of locomotives is to pull or push trains; they carry no passengers or freight. Locomotives are distinguished by the prime mover or energy source used to propel them. Modern locomotives are either electric or diesel-electric. Electric locomotives draw power from an overhead wire or third rail, and use electric motors to turn the wheels. The prime-mover is a transformer on the locomotive that converts the overhead electricity to the type of electricity needed in electric traction motors that turn the wheels. Instead of a transformer, diesel-electric locomotives use a diesel engine to drive an alternator and generate electricity that powers traction motors that turn the wheels.

Some diesel locomotives use a hydraulic torque converter rather than electric motors—these are referred to as diesel-hydraulic locomotives. Older generation steam locomotives, powered by coal, oil, or wood, are now used only in tourist operations or for occasional work on smaller railways or in museums.

Passenger rolling stock

Descriptions of passenger rolling stock types can be found in Section 2.2.1. “Multiple-unit” passenger rolling stock is an important category, with two basic types—electric multiple-units, called EMUs and diesel multiple-units, called DMUs. The MU equipment has no locomotive; multiple cars can be connected and operated from a single location. Some multiple-unit cars have powered axles; the cars that do not are called ‘trailer’ cars. Typically, the first car has a driver’s station and accommodates passengers. Multiple unit (MU) equipment is popular for many reasons.

EMU in Queensland

DMU in the Netherlands

Class A US Boxcar, 89'

CSX 100-ton Open Top Hopper

UP 100-ton Covered Grain Hopper

- MU trains can respond to changes in demand levels because cars can be added to or dropped from a train.
- MU trains can be driven from either end so two person crews can quickly prepare for return trip, making MUs popular for commuter services.
- MU trains offer more passenger space per track length, since they operate without a locomotive.
- MUs distribute traction and braking power throughout the train, achieving higher power-to-weight ratios, and greater acceleration and braking rates.

The MUs' flexibility and design characteristics are also ideal for high-speed train services because higher power levels are needed to overcome aerodynamic drag.[16]

Some TGV and ICE[17] trains are considered push-pull trains with power cars at each end, some with as much as 16,300 horsepower (12,200 kW). For example, the EuroStar train service has a configuration (1 power set,[18] 18 trailer cars, 1 power set) with a total of 24,400 kW (32,600 hp) that can carry 794 passengers in bi-level coach configurations.

Freight wagons

Railway freight wagons come in a variety of designs aimed at accomplishing specific freight tasks most efficiently.

Box Wagons are commonly used for many commodities such as auto-parts, canned goods, bags of cement, and even loose grains. Some box wagons offer interior loading restraints (equipped boxes), a range of door types and sizes, insulation, refrigeration, and temperature control so goods will not overheat or freeze, and a range of grades—high-grade wagons are used to ship food or other products that must avoid contamination by other commodities.

'Open-top' Hopper Wagons can be loaded in many different ways and carry commodities that will not be damaged by exposure to weather such as aggregates, coal, and mineral ores. The name derives from the 'hoppers' at the bottom of the wagons that are opened to discharge contents easily and quickly.

Covered Hopper Wagons haul commodities such as grains, cement, sand, fertilizers, flour and sugar, or chemical or powdery materials that may be damaged by exposure to weather. Some covered hopper wagons are 'unload-assist' and have vibrating sides or air injection systems to aid unloading. Covered hopper wagons are often categorized by size (cubic meters/feet) and larger wagons are used for lighter density commodities such as flour or grains; smaller wagons are used for high-density products such as cement and sand.

[16] Modern locomotives can operate in MU configurations too – many can be "MU'd" together to operate as a single locomotive unit with one driver controlling all connected locomotives.

[17] TGV, or Train à Grande Vitesse, is the French design-standard high-speed integrated train set; ICE, or Inter-City-Express, is a German design-standard high-speed integrated train set.

[18] Here a power set refers to two matched locomotives permanently coupled together.

High-sided Gondola Car

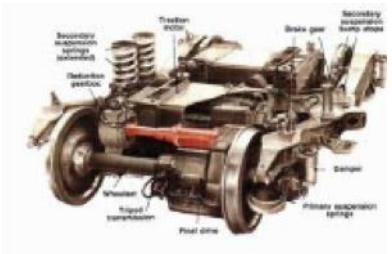
Rotary Dumper for Gondola cars

Center-beam Flat Car for Plywood

Trailers and Containers on Flat Cars

Russian Oil Tank Wagon

Freight Bogie



Passenger Bogie

Gondola Wagons have open tops but no bottom hoppers for unloading. Most gondolas are unloaded by a crane or bucket but some have drop floors; often they are unloaded using a rotary dumping device (see photo at left). High-sided gondolas are used for aggregates, coal, and other relatively low-density materials, including cement in 10-ton bags. Low-sided gondola wagons are used for heavier materials such as steel slabs, steel structural members, machinery, and other materials that can tolerate exposure to the weather.

Flat Wagons carry machinery, logs, plywood, containers, and road transport trailers. Many flat wagons include special features to extend their utility—for example, an automobile rack converts it to an automobile carrier; stakes added to the sides can contain pipes and lengths of raw timber; bulkheads can be added to transport logs, or lumber. Trucks, tanks, turbines, and other commodities are carried on flat wagons or modified flat wagons.

Tank Wagons carry liquids such as oil or oil products, chemicals, or consumables such as seed oils, milk, beer, or water. Some tank wagons carry gases in their liquid forms, such as liquefied petroleum gas or LPG, or pressurized fluids in a liquid/gaseous state, such as liquefied natural gas (LNG). Tank wagons are often specialized for the type of commodity they carry, for example, chemicals, oils, and oil products use a special tank lining, and milk or beer may be carried in a stainless steel tank. In many countries, tank wagons transporting hazardous materials are required to have safety features, such as shelf couplers that prevent wagons from detaching during a train derailment, or reinforced end shields that prevent couplers from puncturing the tank during derailment. In addition, pressurized tank wagons have pressure relief valves and special venting systems.

These basic freight wagons types have many variations; many railways collaborate with shippers and tailor freight wagons to specific needs.

Rolling stock components

Railway rolling stock includes some major common components. Most railway freight and passenger wagons sit on top of **bogies** (or 'trucks' in North America; see photo at left). Most bogies have two **wheel sets** so rollingstock can maneuver around curves while supporting heavy loads. The two **side frames** contain two wheel sets (each wheel set is two wheels and a solid axle mounted together as one piece). **Roller bearings** are used between the axles and the side frames to permit the wheel sets to turn freely. Usually, wagons bodies are not fastened to the bogies but rest on and pivot around a center support. Generally, bogies on passenger rolling stock support a **suspension system** that isolates them from the wheels and infrastructure. Bogies also support the **braking systems**. Most passenger and freight rail cars use brakes operated by air pressure. Freight braking systems use air pressure to press brake pads to each wheel tread. Some passenger systems use the same type of braking system, but most high speed trains are equipped with disk brakes attached directly to wheelset axles in addition to tread brake systems.

Couplers are designed to allow railway cars to be joined together quickly and easily while draft gears provide the mechanism to transmit the longitudinal forces that propel the train through the car body to the next car, without interfering with the workings of the bogies. Some couplers, like those shown at left, have top and bottom extensions (**shelf couplers**) to ensure that cars stay coupled even if one car

Shelf Couplers and Air Hoses

Spring Loaded Freight Car Buffers

leaves the tracks. Draft gear and coupler system strength determine the safe weight at which a train can operate on a railway. Many rail systems use **buffer pads** alongside coupler mechanisms to reduce 'slack action', the tendency of a group of wagons to elongate or contract when in motion.

3

Railway Reform:
Toolkit for Improving Rail Sector Performance

Chapter 3:
Railway Economics and Pricing

3 Railway Economics and Pricing

3.1 Economic Features of Railways

Railway transport is a subsector of the wider transport industry so it shares many key economic features with other transport modes. This chapter identifies common features, and notes characteristics that are unique to railways.

All modes of transport provide services using vehicles, vessels, or aircraft that rely on a substantial infrastructure network comprising routes, terminals, and controls for the movement of those vehicles. However, railways are unique in that the same entity often provides *both* railway services *and* network infrastructure. Most countries prefer this approach, while others prefer to separate service provision from network infrastructure. Reasons for these choices are explored in Chapter 5 of this toolkit.

For all modes of transport, neither infrastructure nor service capacity can be stored—the *unused* train path, aircraft take-off slot, or shipping berth is lost. Similarly, when trains, ships, aircraft, or trucks travel with only partial loads, the unused capacity is lost. Therefore, higher vehicle productivity is crucial to better commercial performance for transport service providers, just as higher infrastructure utilization is crucial to better commercial performance for the infrastructure provider.[19] For vertically integrated railways, the drive for higher vehicle productivity coexists in a single entity with the drive for higher infrastructure productivity.

In all modes of transport, differences arise in how much competition exists in the market for the transport infrastructure (e.g., the road) and the market for the transport service (e.g., the trucking company). Transport infrastructure investment tends to be location-specific and physically fixed or difficult to move. It is also 'lumpy" (provided in indivisible increments for a range of possible output) so it exhibits economies of density—declining marginal cost—as the intensity of use increases. These various characteristics endow most transport infrastructure, including rail networks, with elements of a natural monopoly. The opposite is true in transport services, where head-to-head competition is the norm within all modes of transport that compete with rail services for freight and passenger business—roads, airlines, barging, and international shipping. Historically, most countries have chosen policies that restrict competition between rail companies. Now, more countries (identified in Chapter 5) are choosing policies that permit competition in the rail freight sector, and more rarely, in the inter-city passenger services sector.

Competition, together with capacity that cannot be stored, points to the importance of service design, marketing strategies, and pricing policies to maintain and increase capacity utilization. Crucially, railway transport should be viewed as a service industry of differentiated products tailored to specific markets, rather than a 'utility.' Railway transport has often been considered to be a 'utility' like water, gas, or electricity supply, which has led to undesirable policy and management outcomes.

[19] For ocean shipping, the route 'network' is free and has vast capacity, but infrastructure utilization is still critical to performance for port providers.

Finally, all modes of transport have external effects on the environment. The costs of impacts such as noise, air, land and water pollution, accidents, and greenhouse gas emissions are rarely paid by the entities creating them. These impacts differ by mode, country, and circumstances and affect overall transport systems sustainability and transport policies. Well-loaded freight trains have proven to incur significantly lower external costs than road or air freight transport; and well-loaded passenger trains incur lower external costs than road transport (cars or buses) or airlines.

Railways' general and specific economic characteristics have many policy and management consequences that are explored in later sections of this toolkit. This section discusses how these characteristics drive the structure of railway costs and the principles of rail pricing; both are crucial to the financial sustainability of railways, discussed in Chapter 4.

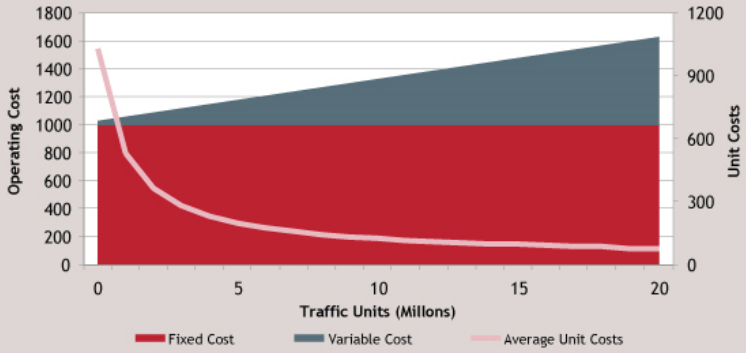
3.2 Railway Cost Structures

Generally, costs are classified into rail network infrastructure, train operations, and corporate overheads.

3.2.1 Infrastructure network costs

Most costs for the railway infrastructure network include capital and maintenance costs for track, engineering structures such as bridges and tunnels, train signaling, communications systems, power supply in electrified sections, and terminal infrastructure.

Figure 3.1 Rail Infrastructure Costs



The higher the utilization, the better the infrastructure economics.

These infrastructure costs have a component that is essentially fixed or invariant with the level of infrastructure usage[20] and a component that is variable with traffic levels over the long-term (Figure 3.1). The proportion of the 'fixed' cost component will differ by lines and traffic levels but rarely is estimated at less than 70 percent of total infrastructure costs, except on the busiest lines. The variable component,

[20] This component can vary significantly relative to other factors such as engineering standards, terrain, age, climate, and management efficiency.

should vary over the long term by traffic level, but is often 'sticky' (at least downward) in the short and medium term, which are typically used to formulate business plans.

Numerous economic studies have demonstrated that railways exhibit *economies of density*—their long-run average cost curve slopes downward. Unit costs decline as output rises on the railway line as the fixed cost of providing track is spread over more and more traffic units.[21]

These economies of density are substantial on their own. But when combined with the impossibility of storing unused train paths, they create a convincing case that railway infrastructure networks' financial sustainability depends critically on high traffic volumes. Good railway network economics requires high infrastructure utilization—the higher the utilization, the better the infrastructure economics[22].

This is true whether the infrastructure network is part of a vertically integrated railway, or provided by a separate rail infrastructure authority or company. Vertical separation of train operations from railway infrastructure is insufficient to improve railway financial sustainability, although it may facilitate other policies that help (see Chapter 5). However, a vertically separated track authority or company will face much higher fixed costs across its total business than a vertically integrated railway company. This has implications for track access pricing that is explored later in this chapter.

The infrastructure cost curve is largely fixed in relation to traffic volume, but can be shifted downwards by management actions that improve efficiency in infrastructure provision and maintenance.

A company exhibits *economies of scale* if its long run average cost curve slopes downwards as the size of the company increases. Economic studies suggest that economies of scale may exist when railways are very small; realizing further economies of scale is harder when the railways become larger perhaps because of greater management complexity and loss of corporate agility.[23]

---

[21] Caves, Christiansen, and Tretheway, "Flexible Cost Functions for Multiproduct Firm," in *Review of Economics and Statistics*, (August 1980), 477-481. Griliches, "Cost Allocation in Railroad Regulation," *Bell Journal of Economics and Management Science*, (1972, vol. 3) 26-41. Charney, Sidhu and Due, "Short Run Cost Functions for Class II Railroads," *Logistics and Transportation Review*, (1977, vol. 17), 345-359. Friedlaender and Spady, *Freight Transport Regulation: Equity, Efficiency and Competition in the Rail and Trucking Industries,* (MIT Press, 1981). Harris, "Economics of Traffic Density in the Rail Freight Industry," *Bell Journal of Economics*, (1977, vol 8) 556-564.

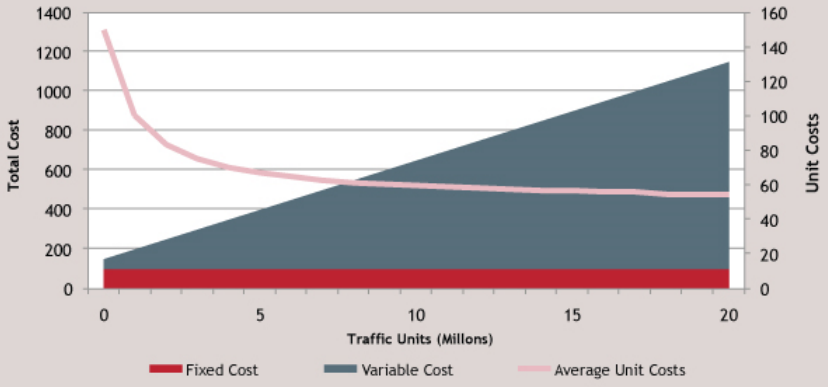
[22] Except at the point when capacity is reached and incremental traffic requires a major capacity enhancement; but once the capacity increment is made, the general rule usually again applies.

[23] Caves, Christiansen and Tretheway, "Flexible Cost Functions for Multiproduct Firm," *Review of Economics and Statistics*, (August 1980), 477-481. Griliches, "Cost Allocation in Railroad Regulation," *Bell Journal of Economics and Management Science*, (1972, vol. 3) 26-41. Charney, Sidhu and Due, "Short Run Cost Functions for Class II Railroads," *Logistics and Transportation Review*, (1977, vol. 17), 345-359. Friedlaender and Spady, *Freight Transport Regulation: Equity, Efficiency and Competition in the Rail and Trucking Industries,* (MIT Press, 1981).

3.2.2 Train operating costs

Train operating costs include: (i) diesel fuel or electrical energy; (ii) locomotive capital depreciation or leasing cost; (iii) locomotive maintenance; (iv) driving crew; (v) on-board crew for passenger trains; (vi) rolling stock wagons or railcars depreciation or leasing cost; (vii) rolling stock maintenance; and (viii) terminal operations; and (ix) commercial costs (passenger ticketing, freight booking, etc.).

Figure 3.2 Train Operating Costs



Most train operating costs vary substantially in the long run with traffic volume (Figure 3.2), although some joint costs may exist (discussed below). In general, greater traffic volume requires more trains and more operational resources. In the shorter term, this relationship is not proportional, except perhaps for fuel/electrical energy. In the medium term, say 6-12 months in a well-run railway, managers can adjust operating resources such as crew costs, locomotive and rolling stock requirements, or maintenance to match demand volumes.

Train operating costs are variable with traffic levels, but the overall operating cost/output curve can be shifted downward by management action. In particular, three variables affect how train operating strategy translates into train operating economies: higher net-to-tare ratio for freight services[24] or higher passengers-per-car; more time in commercial service per unit of equipment; and larger passenger and freight train sizes—providing the market's required minimum service frequency is met.

3.2.3 Corporate overhead costs

These include most railway headquarters functions such as Board and executive management, finance, legal, security, and personnel functions. More complex and bureaucratic railway structures that are less commercially streamlined require higher levels of costly 'corporate glue' to remain cohesive.

Over the long-term, with good management, corporate overheads can vary with the broad scale of the railway. In public sector railways, adjustments to overhead

[24] Tare is the weight of the empty wagon. Net is the weight of the load.

costs tend to occur in sporadic upheavals caused by organizational restructuring, rather than through gradual changes that adapt to the traffic task.

However, management action can reduce corporate overheads dramatically by decentralizing decision making to business units, controlling finances and budgets, seeking opportunities for competitive outsourcing of corporate services, and generally running a leaner corporate entity.

3.2.4 Summary: costs and comparative advantage

Railways cost structures are at their most highly competitive when railways can operate large trains, well-loaded with traffic, over a heavily used network, by organizations with a lean and market-oriented corporate management. Train size and payload provide train operating economies; train density plus heavy network use provide infrastructure economies; and corporate structure yields administrative overhead economies. Although this seems obvious, many countries maintain railway policies and business models that openly defy this reality.

3.3 Costing Railway Services and Traffics

A railway service is most competitive when it delivers a better price and service mix to its customers than its competitors. Costs incurred in producing these services will dictate the lowest possible prices that will sustain the overall financial sustainability of the railway entity. Therefore, cost levels are critical, and a well-run railway will devote considerable attention to measuring and controlling costs.

Railway financial accounts will reveal total costs, which are essential to analyze overall financial viability. Benchmarking total costs against other similar railways will highlight areas for seeking cost efficiencies. However, most national railways provide a range of freight and passenger services. For freight customers, services might be tailored, for example, to bulk freight customers, container forwarders, and general freight. Passenger services might include inter-city, regional and suburban services. Each broad freight or passenger group will contain multiple market segments.

In a well-run railway, commercial managers need to know costs and financial performance for each market segment, disaggregated by route and other factors, sometimes even a specific train or freight customer. In a multi-product railway, these costs cannot be derived directly from general corporate accounts. They require application of costing techniques (see Annex 3 on costing). But understanding rail business management and pricing requires a general understanding of the main costing concepts. Two of the concepts are *common costs* and *joint costs,* which can be either fixed or variable with regard to traffic levels.

3.3.1 Common costs

In the railway industry, most common costs are associated with infrastructure and corporate overhead functions that support all users and services. Lines for mixed-use railways are usually built, maintained, and controlled to standards that can

serve all types of passenger and freight trains[25]. Some design elements and some management characteristics are more specific to either passenger services or freight services, but most infrastructure network costs are common among all users on a mixed-use, multi-product railway.

If costs were variable with usage, they could be attributed to specific services that are provided with facility capacity, or to specific traffic. However, most rail infrastructure network costs are common and fixed, so a 'relative usage' formulation is technically arbitrary, not based on cost causality.

Also, many operations costs are 'technically common' such as train crews or locomotives, but over the medium term, these costs vary—more traffic equals more trains, more locomotives, more crews. Therefore, these costs can be attributed to specific services and traffic segments.

3.3.2 Joint costs

In the railways industry, joint costs are largely associated with train operations and occur when producing one good or service produces another good or service. For example, if the wagon can attract a regular load in both directions then the wagon movement cost is *joint* between the two traffics. Similarly, if a locomotive and crew is scheduled to haul a container train in one direction and return with an intercity passenger train, these costs are joint between freight and passenger services.

Joint costs cannot be attributed unambiguously to *each* beneficiary service or traffic because reverse movement is still required and costs are incurred even if one service or traffic is no longer operated. Fortunately, joint costs are becoming rare. Now, passenger services are more segmented into service types and fixed-formation trains operate services in both directions. Similarly, a much higher proportion of freight services now operate two-way trainloads of specialized wagons for coal, containers, and oil, among other cargoes. Therefore, joint costs can usually be ignored, except in unusual circumstances.[26]

Next, the three main uses of traffic costing are discussed below: *financial contribution analysis; commercial management;* and *railway pricing policy*. Each is important to the financial sustainability of railways.

3.4 Financial Contribution Analysis

This technique of railway management accounting measures service- or traffic-level financial performance. Total revenue is compared with costs for each service or traffic to establish whether the revenue from the service covers the cost.

Three main cost thresholds that are commonly measured and compared with revenue are below. These thresholds are defined in Box 3.1, which indicates their significance and primary uses.

[25] Most new high-speed passenger lines and some heavy-haul freight lines are for dedicated use.

[26] For example, unless costing is undertaken at a micro level such as a specific train, or freight customer movement.

- Short-run variable (avoidable or incremental)[27] costs
- Long-run variable (avoidable or incremental) costs
- Fully allocated costs (FAC) (sometimes referred to as 'fully distributed')

The most important of these thresholds for guiding railway commercial service- or traffic-level decisions is long-run variable cost because it includes any and all costs relevant to the decision. Long-run variable costs are the costs that *should* vary depending on the decision to be made, which may be related to time period to which that decision relates (such as the duration of a particular traffic contract).

The word *should* is significant because some variable costs are rendered invariant through institutional rigidities. For example, restrictive labor agreements may prevent management from matching human resources to demand, or management deficiencies may sustain the mismatch of resources to changing activity levels. Should-be long-term variable cost should always be included in long-run variable cost estimates to avoid the risk that any management rigidities will become self-reinforcing and distort commercial decision making.

In some state railways, the short-run variable cost threshold is the standard used in commercial decision making. This leads to a proliferation of services/traffics that make a positive contribution above short-run costs but consistently fail to recover their long-run costs. Box 3.1 spells out this warning.

The FAC threshold is a benchmark rather than an actual 'cost', as it includes an allocation without basis in cost causality. However, if all individual railway services and traffics cover *only* long-run variable costs, a revenue shortfall will still occur in total railway costs. Reviewed across all traffics, FAC indicates the overall revenue necessary for the railway service mix to recover total costs. The FAC threshold is useful in certain situations, such as to negotiate government compensation for meeting public service obligations (Chapter 8). This begs the question as to how pricing policy should actually 'allocate' these costs, a question addressed in 3.6 below.

[27] Avoidable cost is relevant to an existing service or traffic and incremental to a new service or traffic being contemplated, but the basic cost concept is otherwise the same.

Box 3.1 Railway Costing Thresholds and Their Main Uses

Costing concept	Cost description	Uses
Long-run variable (avoidable or incremental) cost	Costs that could be avoided in the long-term if a specified existing service or traffic were discontinued *or* incremental costs that would be incurred if a new specified service or traffic were added to existing operations. Includes the costs of all the capital, material, and human resources that could be saved *or* resource increments that would be incurred, allowing for a reasonable period for resource adjustment.	Long-run variable cost is for an individual service or traffic the key financial performance threshold, which, when compared to revenue, indicates whether and how much the service or traffic is making as a positive long-term financial contribution to the railway. Individual components of long run variable cost indicate to commercial management where operating efficiencies can be sought that will reduce cost of that service or traffic, thereby improving its long-term financial contribution. When the most efficient long run variable cost is attained, it is the normal floor price to be applied to a traffic or service.
Short-run variable (avoidable or incremental) costs	Costs that could be avoided in the short-term if a specified existing service or traffic were discontinued *or* incremental costs that would be incurred if a new specified service or traffic were added to existing operations. Short-run variable costs include only costs that vary in the short-term with traffic level, typically fuel/energy and materials costs.	In limited and specific circumstances, may be used as the floor price for a service or traffic that is available to the railway only for a short period; typically one that would have little or no impact on railway capital or labor resources. *Warning:* Short run variable cost should not be used for normal business planning or pricing decisions; this leads to the accretion of traffics at prices that erode long-term profitability, and sustain institutionalized management myopia.
Fully allocated (or fully distributed) costs (FAC)	Long-run avoidable or incremental costs of a specified existing service or traffic, *plus* an allocated share of those joint and common costs so the sum of the costs allocated to each service add up to total railway costs.	Useful in compensatory pricing situations, such as PSO negotiations, to indicate the average markup required to add to long-run variable costs to ensure the service or traffic contributes to railway joint and common costs.

3.5 Commercial Management Actions

Contribution analysis can improve railway financial sustainability. The long-run variable cost schedule generated by costing and financial contribution analysis can help railway managers identify areas of potential improvement in financial performance. Typically, the analysis contains three types of information:

- amount of each resource attributable over the long run to operating the service or traffic (a)
- unit costs of each resource (b)
- total cost of each resource used (a*b)

Knowing the cost structure of a service or traffic enables railway managers to identify potential cost efficiencies for improving financial performance. The analysis highlights where cost efficiency gains can be achieved by reducing the resources used (a) or reducing unit costs of those resources (b), or some combination of the two. Chapter 11 of the toolkit identifies many of the ways in which railways can seek to improve financial performance through these means.

Assuming revenue remains unchanged, management action to reduce the cost will increase the positive financial contribution of profitable services and may turn unprofitable services to profitable. Pricing policies can also influence the contribution from the revenue side.

3.6 Railway Pricing

According to pure economic theory, to maximize overall economic welfare for the whole community, the most economically efficient pricing approach would be for prices to equal the marginal social costs of railway services. As a practical matter, no railway in the world does this for the following reasons.

- In economic theory, the concept of 'margin' is a very small unit of output, such as a single passenger seat-km, or wagon-km of freight. In practice, the increments of output in which prices can realistically be set are much greater, i.e. for a class of service, a class of trains, a regular commodity movement, or a particular freight shipper;
- Railway costs that are variable, particularly in the short term, are less than total costs, so that pure marginal cost pricing will lead to financial losses. Even long-run marginal cost pricing is insufficient to recover all railway running costs when all fixed common and joint costs are included.
- In virtually all countries, railways' main transport competitors *do not* include external costs in their prices. This negates the assumption underlying the economic theory—to charge social costs *only* in the rail sector would create perverse outcomes.

Therefore, the pure economic theory has little practical application in railway management. In practice, there is no prescribed or standard form of market-based pricing for railways. Good railway managements adapt pricing practices to their markets, customers, institutional arrangements, pricing regulations, and the social and economic norms in which they operate.

Nevertheless, the economic concepts are important in guiding workable principles that can contribute to railway financial sustainability in freight and passenger markets.

3.6.1 Freight pricing

Competition should be the primary determinant of rail freight pricing strategies, not costs. As indicated in Section 3.2, most railway infrastructure costs are fixed in relation to an individual traffic movement during the currency of rail freight contracts, so any infrastructure cost allocation to individual customers is largely technically arbitrary. More than a century ago, railway economist William Acworth observed:

> *'Volumes have been written to show that railway rates ought to be based on the costs of carriage…such a basis is impossible, as no one knows, or can know, what the cost of carriage is. Cost of carriage of a particular item may mean the additional cost of carrying that item; this is normally so small as to be negligible. It may mean the additional cost plus a fair share of the standing costs of the organization… an arbitrarily estimated proportion of a sum that can only be ascertained very roughly.'*[28]

Basic principles of commercially efficient rail freight tariff setting are well established and have been used by competent railway managers since the nineteenth century. The rate set should be the highest that the market will bear, taking account of prices charged by actual or potential competitors, except under special circumstances, such as the need to nurture a new service. This rate should at least cover a price-floor of the long-run variable costs of carrying specific traffic for the duration anticipated.[29]

The economic formulation of this practical and already established approach to railway pricing was provided in 1927 by mathematician Frank Ramsey. [30] To paraphrase, *the railway should mark up its long run variable costs to individual customers in inverse proportion to their price elasticity of demand.*[31] So customers with a low elasticity of demand (such as coal producers) will be charged a higher markup than the customers with high elasticity of demand (such as container shippers).

Railway marketing managers cannot know the precise elasticity of demand for each customer, but railway marketing staff should have sufficient information on customers and competition to *estimate* the effect of prices on customer volumes.

---

[28] W. Acworth, *The Elements of Railway Economics*, (Oxford University Press, 1905).

[29] Avoidable cost for an existing traffic, incremental cost for a new traffic.

[30] F. P. Ramsey F.P., "A Contribution to the Theory of Taxation," *Economic Journal*, (Vol. 37, No 145, 1927) 47–61.

[31] Elasticity of demand is measured as the percent change in the quantity of demand divided by the percent change in the price. A customer that is sensitive to the price and will reduce the quantity demanded by more than the change in price has an elasticity of demand greater than 1. A customer that will reduce the quantity demanded by less than the change in price has an elasticity of demand less than 1.

The general principle of commercial pricing is to establish a price that will maximize the service's contribution to railway fixed costs; the corollary is that the railway should not price below long-run variable costs.

By contrast, 'average cost pricing'[32] in rail freight distributes fixed common and joint costs over all traffic. However, average cost pricing can depress demand in some traffic segments, thereby reducing overall traffic and creating higher fixed cost burdens for remaining traffic. In (exceptional) cases, where the railway does have significant market power, the 'market' may be a regulatory body. The railway freight provider's general market-based pricing philosophy should still prevail. Typically, the railway will attempt to allocate as many costs as possible, but ultimately, the regulatory body decides on which costs the user industries will bear.

3.6.2 Passenger service pricing

The so-called 'Ramsey pricing' matched to individual customers or commodity groups has practical application in most freight markets, which comprise an identifiable and limited number of customers. However, in passenger markets, railway market pricing aggregates customers by pricing options based on individual features such as service class, travel times, or ticket purchase restrictions, and passengers select for the cheapest prices that fit their traveling needs. Railways can set price offerings by considering load factors for each train and station pair—sometimes using airline-style yield management software—and conducting extensive market research to respond to customer demand levels with desirable ticketing packages that maximize revenues from seat sales. Thus, most passenger pricing is highly centralized by the service provider and service offerings are analyzed intensely to determine overall revenue and ridership impacts.

However, underlying this very pragmatic system of continuous adjustment, the economic concepts that support financial sustainability in passenger services remain the same: pricing above long run variable costs should be inversely related to demand elasticity, and price-service packages should be tailored to meet customer needs more effectively than competing alternatives. Therefore, railway passenger marketing managers must fully understand the competitive environment and the demand elasticity of passenger sub-markets within market segments. Tariff structures should be designed to maximize overall revenue yield from the seat capacity on offer.

Typically, railway passenger services can be divided into major segments for service planning and management—inter-city, regional (sometimes segmented by sub-region) and suburban services (sometimes segmented by city). Each segment may have a different tariff structure, and within each segment, individual trains may carry passengers travelling at first class premium fares and those travelling in more basic accommodation or with less flexible ticket types at discount or concession fares. To be financially sustainable, the schedule of services for major service segment should aim to recover their long-run variable costs, and collectively, all the segments must recover overall fixed costs allocated to the passenger sector.

[32] Also known as fully distributed or fully allocated cost pricing.

If this were always feasible, it would be convenient. However, railway passenger financial modelling indicates that it is rare for passenger train services to operate without long-term budgetary support, even at efficient input-cost levels and with optimal pricing circumstances.[33] Inter-city railway passenger services often fail to recover their long-run variable costs (a negative financial contribution) and rarely cover their FAC from the fare-box alone, except on the densest inter-city rail corridors. The cost-recovery challenge is even greater for heavily 'peaked' suburban services or less heavily utilized regional services. In many countries, it is impossible for a single passenger railway route to make a positive contribution above long-run variable costs and many barely cover short-run costs.

As a result, for most passenger and mixed-use railways in the world, financial sustainability depends on receiving some budgetary support. Chapter 8 of this toolkit discusses effective implementation of government support that is justified or politically necessary for social or other reasons.

3.6.3 Infrastructure network access pricing

If the railway network owner is separate from the train operator, the railway-pricing paradigm alters somewhat. The paradigm alters even more if competition exists among freight train operators because train operating companies have less opportunity to distribute access charges among customers according to their ability to pay. Competition eliminates the operating company's ability to mark up the track access charge if customers have a choice of train operating companies, or the ability to run their own trains. Therefore, the economic challenge of recovering railway fixed costs rests entirely on the infrastructure company, for whom most costs are fixed.[34]

Infrastructure charges differ by country, but the system is most well developed in the EU where charges are a legal requirement. Multiple approaches share common components: (i) capacity-utilization based on train path use; (ii) gross-tonnage over the track to reflect infrastructure wear and tear; and (iii) ancillary charges for infrastructure company services such as power supply, stabling, or rescue. Charges usually differ by train type and route standards, generally reflecting cost and market considerations that are difficult to disaggregate.

In Germany, for example, passenger and freight train track access is subject to a common basic tariff framework; pricing 'factors' result in different tariff rates. DB Netz terms and conditions for network access are published in the German Federal

[33] Amos and Bullock, *The financial performance of non-urban passenger rail services*, (World Bank, 2007). http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/03/24/000333038_20080324074100/Rendered/PDF/430250NWP0Pass10Box327344B01PUBLIC1.pdf

[34] So-called 'network access price' is a misnomer if the network and train operations are separated but under common public ownership without real competition in train operations. The 'price' is often simply a politically determined budgetary allocation of the infrastructure company's costs between freight and passenger sectors; the level and pattern of services provided bears no relation to the 'price' of access; and if the sectors cannot afford to pay their allocation, it is paid by the government to the companies, or picked up as an infrastructure company deficit by the government.

gazette and on the Internet, and include a detailed list of tariffs for train paths and for the other facilities and installations.[35]

German track access charging policy aims to recover a high proportion of railway infrastructure costs from train operating companies. The train-path tariff system has a three-part modular design:

a. *Basic price for route category and utilization level:* 12 route categories are grouped by infrastructure performance standard and transport importance. Basic prices are increased by a 20 percent premium on routes with very high utilization.
b. *Train path products (product factor):* the 'basic' price may be multiplied by other factors that depend on whether the company is operating freight or passenger train service or seeking to purchase other service features or levels (that differ for passenger and freight services).
c. *Special factors:* a series of multiplicative, additive, or regional factors such as those for steam trains, extra heavy freight trains, or tilting passenger train technology.

The tariff system imposed by DB Netz and approved by regulatory authorities is designed to reflect the costs of providing and maintaining infrastructure, train path standards for performance levels, degree of utilization, and market differences between passenger and freight trains' ability to pay. Using the tariff tables above, tariff calculations are straightforward for any train operating company track access for a specific train type or service on a particular route.

The Australian Rail Track Corporation (ARTC) publishes a list of reference tariffs for track access on each of its routes. The reference tariffs are based on a fixed component (referred to as a 'flagfall') per train for each route, plus a variable element that depends on the gross ton-km of the train. Since the fixed element reflects route length, it is distance-related rather than a true 'flagfall'. As in Germany, this distance-based component is affected by train speed. The fixed component is for a reserved train path and is payable by the customer regardless of whether they use the train path.

The reference tariffs relate to a specified service performance standard. Individual customers can negotiate for specific needs or service characteristics that vary from the reference assumptions on axle loads, speed, train length, origin/destination, stops, and operating timetables. However, ARTC has committed to the Australian Competition and Consumer Commission that it will not charge different prices to different clients for similar service characteristics; or if applicants operate within the same end-market. ARTC agrees not to discriminate pricing between privately owned or government owned train operators. All negotiated tariffs are published.

While there are many models to choose from, this toolkit generally supports the simplest system that is compatible with a country's aims and circumstances. Some fundamental questions are: how much to collect from railway users and how much from budgetary support; how much of the fixed infrastructure cost burden should

[35] http://www.db.de/site/bahn/en/business/infrastructure__energy/track__infrastructure/prices/prices.html

be borne by the freight sector as opposed to the passenger sector without creating an effective tax on one sector to support the other; whether the parts of the network being priced are operating at or near capacity; how far to impose 'take-or-pay' on train paths that are reserved but not used; and how to design charges for international train movements so that each country involved obtains a fair share of the overall access charge and avoid creating incentives for each country to maximize its position and so collectively to discourage international traffic.[36]

In theory, the economic benefits of Ramsey pricing apply to a separated rail infrastructure company as much as to a vertically integrated railway. But, the practicality of Ramsey pricing is greatly reduced with a separate infrastructure company. Infrastructure companies deal with train operating companies *not* freight customers, and are remote from the detailed market information that would allow managers to price to market.

Moreover, Ramsey pricing may also now be less acceptable. Most separated railway infrastructure companies do not apply Ramsey pricing in any substantive form. In other words, a freight train hauling same number of gross tons of coal or general freight on a given train path often pays *exactly the same,* even though demand elasticity with regard to track access prices is likely to be much lower for coal than for container trains.

Indeed, since marginal cost to the infrastructure company is so similar, it is unclear whether regulatory authorities would permit differentiated charges.[37] Furthermore, using Ramsey pricing, the price-to-cost ratio in less elastic markets would be much greater for infrastructure than in an integrated company because track-access charges are a fraction of total freight charges. Where economists may see justifiable price differentiation, regulators may see price discrimination.

Therefore, the venerable principle of Ramsey pricing may be weakened by placing its full burden on rail infrastructure charges rather than the total freight rate. If so, and other things being equal, vertical separation may have made it more difficult to maximize infrastructure utilization and to recover infrastructure fixed costs. Countries that pursued vertical separation are hoping that separation allied to greater competition in rail service will generate greater use and revenue for the railway network. Will potential economic benefits from competition in services outweigh the dilution of economic benefits from Ramsey price differentiation and the transaction costs of separation? This remains to be seen.

[36] These issues are explored more fully in Louis S Thompson, *Railway Access Charges in the EU: Current Status and Development since 2004*. http://www.international-transportforum.org/Pub/pdf/08RailCharges.pdf

[37] In the UK, track access charges for freight reflect cost differentials by axle-load, wagon type etc but the variations are not that large, except for coal, and in any case are cost-based not market-based variations.

Railway Reform:

Toolkit for Improving Rail Sector Performance

Chapter 4:

Financial Sustainability for Railways

4 Financial Sustainability for Railways

A railway achieves financial sustainability when it has sufficient longer term financial resources to cover operational costs, to invest, and to meet debt service and other financing requirements.

4.1 Introduction

This chapter will explain the fundamental drivers of railway financial sustainability and the tools used to analyze it. A railway achieves *financial sustainability* when it has sufficient longer-term financial resources to cover operational costs, to invest, and to meet debt service and other financing requirements.

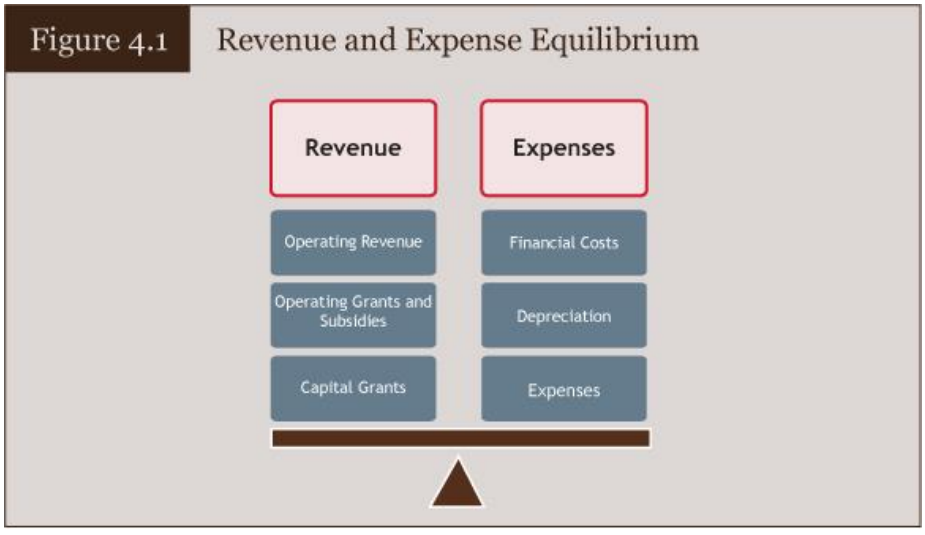
The concepts of financial sustainability explained here apply to all types of railway operations. Where appropriate, the particular features of passenger, freight, infrastructure on integrated railway operations are discussed. Section 4.2 explains the main forces that drive financial sustainability, organized around the topics of revenue structure, cost structure, investment needs, and capital structure. Section 4.3 explains how these factors interact and how financial sustainability is determined and measured. Section 4.4 explains financial analysis tools—financial modeling, benchmarking, and cost analysis. Annexes 1-3 provide more information on these tools.

4.1.1 Policy choices affecting financial sustainability

Financial sustainability depends on multiple factors—some internal, some external to the railways. As a result, there is no single set of general rules that would guarantee overall financial sustainability. The analysis described in this chapter, however, will identify factors undermining financial sustainability and possible remedies.

A general revenue and expenses equilibrium can be conceptualized as shown in Figure 4.1.

Figure 4.1 Revenue and Expense Equilibrium



Some factors that affect financial sustainability are market-specific but often government policies also influence the situation. For example, a policy that creates an

extensive highway network that can be used free-of-charge makes railways less attractive to freight companies. Also, a railways policy that favors passenger services over freight transport will make the system less profitable.

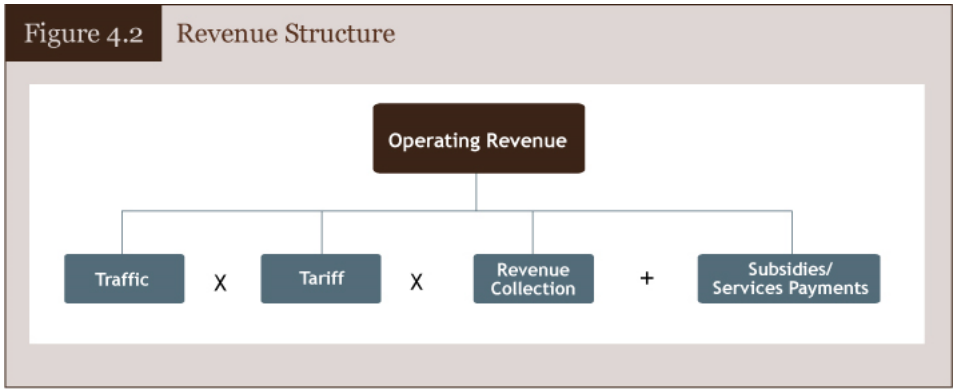
4.2 Drivers of Financial Sustainability

The four main elements of railway financial sustainability are *revenue structure*, *cost structure, investment requirements*, and *capital structure*. To evaluate the longer-term financial viability of a railway system and identify risks, it is essential to explore the underlying political and economic forces that shape these four elements. This includes identifying potential barriers to sustainability and suggesting possible solutions.

4.2.1 Revenue structure

The important components of revenue structure are traffic, pricing, revenue collection, subsidies and service payments (Figure 4.2).

Figure 4.2 Revenue Structure



Traffic

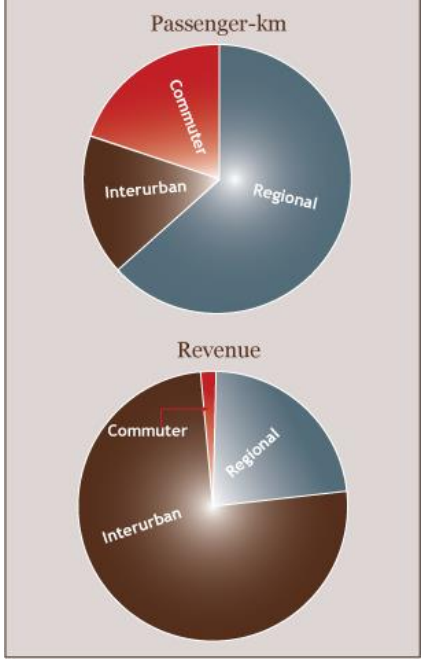
Demand for transport is derived from the *underlying demand*—either for the goods transported or for the outputs of industries supported by goods transported, such as electricity supply produced by burning coal. The demand for passenger services is derived from human desire to work or play in another location.[38] For rail infrastructure providers, demand is derived from passengers' and freight shippers' demands to use the infrastructure. Because demand is derived, railways have little influence over demand volume.

By contrast, railways have considerable influence over their *share* of transport demand, and therefore volume of traffic they carry. If the railway provides timely, reliable, high value service, the railway can increase its market share. For example, U.S. railways improved their services for transporting finished automobiles, thereby increasing their market share from near zero to 70 percent and gaining US$3.0 billion in annual revenues. Since railways typically have high fixed costs, increasing traffic through improved service can enhance the railway's financial sustainability.

[38] An exception might be an excursion train, where the value of the service is the trip itself.

There are several steps to analyzing railway traffic. First, identify the main customer and product segments. For example, for a freight carrier, the main product segments could be coal, grain, or intermodal. For a passenger carrier, the product segments could be commuter, regional and interurban (Figure 4.3). Traffic segments are usually a country-specific mix of freight and passengers—no standard optimum composition exists. The second step in analyzing railway traffic is to identify the rail market share of the main traffic segments and assess the competition. This involves examining trends in volume, market share, and traffic mix to understand market characteristics and the services the railways need to offer to be competitive. A final step might be to examine the market for *other* transport modes such as highways, waterways, or air transport to find out if railways could compete with some of their services.

Figure 4.3 Passenger Traffic Segments



Pricing

A second component of railway revenue is pricing, which is governed by three main factors—costs, competition, and regulation. Often, the railway must attempt to manage all three because prices need to cover costs, but revenues may be limited by both the regulator and the market. Nevertheless, railways should price to maximize the contributions of the traffic.[39] This requires the railway to understand how to price its services competitively—low enough to retain customers but high enough to maximize revenues. Also, the railway must understand demand elasticity to know when lowering the price will yield more revenues because traffic volume will increase more than price decreased. Finally, the railway must accurately calculate its variable costs for providing services to ensure that prices are above costs, and to enable it to select the price most likely to maximize contributions above variable costs.

Typically, a regulator sets railway prices or the upper price limits for infrastructure providers, and often, for freight and passenger providers too. Therefore, knowledge of the regulatory process and the political forces that influence it are prerequisite to understanding railways' revenue structure and revenue risks. Sometimes, prices are set in the context of service agreements—governments pay railways to provide specified services at an agreed price. Therefore, it is critical to understand the variables that influence the price that government is willing to pay for these services.

Revenue collection

Prices established, services provided, the railway must then collect payments. This is not always straightforward, because sometimes clients stop paying. The railway should monitor revenue collection and withhold services from clients that are in arrears. However, governments often intervene in railway service provision, forcing railways to continue providing services in spite of arrears to support sectors that are experiencing economic difficulties. Revenue collection problems will be reflected in the railway's provision for uncollectable accounts (bad debt expense) or in its accounts receivable (Figure 4.4). The proportion of uncollectable accounts

[39] Contribution = Revenue - Variable Costs

relative to overall revenues will indicate the magnitude of the railways' revenue collection problem.

Figure 4.4 Working Capital Assumptions

	Average
Days in accounts receivable	45
Days in inventory	37
Days in other receivables	51
Days in accounts payable	34
Days in other payables	58

Government subsidies/service payments

Governments compensate railways for providing socially important but commercially unprofitable railway services. Revenue analysis should include these important sources of revenue, their payment structure, and any associated risks and variability.

Examples of public service contracts (PSCs) might include passenger operations to remote and sparsely populated areas, or discounted travel privileges for eligible passenger categories such as students, military, and pensioners. The railways' financial sustainability can be impaired by PSC payments that fail to cover total costs, so it is crucial that the railway ensures adequate compensation for PSC services. Typically, compensation levels rise with the frequency of operations and the extent of the network covered by the PSC.

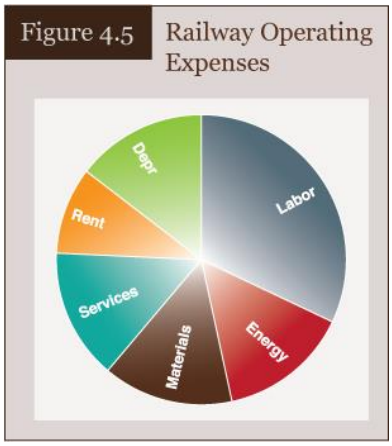
Ratios

Ratios that are often used to analyze revenues are shown below.

Box 4.1 Financial Ratios for Revenue		
Ratio	**Calculation**	**Use**
Revenue/traffic unit	Revenue/traffic unit (Traffic unit: ton or ton-km for freight; passenger trip or passenger-km for passenger; gross ton-km or train-km for infrastructure. Revenue and traffic unit should be traffic-segment specific)	Compare rates among traffic segments; benchmark rates against other railways; compare to unit costs
Collection ratio	(Accounts receivable / Revenue)*365	Determine number of days to collect outstanding invoices (typically 30-60); smaller ratio indicates more efficient collections; compared to number of days used to pay suppliers (average payment period)
Subsidy/traffic unit	Government subsidy (operational + capital)/traffic unit	Determine extent of public support for operations; compare ratios against other railways; compare to unit revenue
Subsidy as percent of GDP	Government subsidy (operational + capital)/GDP	Establish burden on government from supporting railways; benchmark ratio against other modes of transport within country and other railways outside country

4.2.2 Cost structure

Figure 4.5 Railway Operating Expenses



Operating expenses

A railway's operating expenses include all recurrent costs associated with producing the railway service. The six main components of operating costs are *labor, energy, materials, services, rental, and depreciation* (Figure 4.5).[40]

Labor - all costs for railway staff salaries, pensions, and benefits such as medical insurance.

Energy - costs of electricity and diesel fuel. For freight and passenger entities, most energy costs are associated with traction, but some costs may include electricity for facilities. Some railways classify diesel fuel as 'materials' and electricity as 'services'.

Materials - costs of track materials such as rails, sleepers, and ballast, spare parts, and other consumables for rail operations and maintenance (but not for capital investments).

[40] Interest and taxes may also be a significant part of the railway's cost structure, but they are not operating expenses.

Services - all externally purchased services such as maintenance on rolling stock and infrastructure, computer support, and passenger train catering.

Rental - payments for use of any asset or facility; typically, this includes lease payments for rolling stock, which can be substantial. Also, railways pay rental 'per diem' when they interchange traffic and use neighboring railways' rolling stock. Often, per diem payments and receipts balance, so the net effect is insignificant. But per diem payments *can* be a significant expense if a railway receives or terminates more traffic using other railways' wagon than it originates or forwards with its own wagons.

Depreciation is a non cash expense that refers to the investment cost of assets spread over their useful life; it also represents the annual investment the railway should make to renew its assets. However, depreciation is based on the *historical* cost of assets, so during periods of high inflation, railways need to restate assets value and depreciation rates, which will be less than the amount needed to renew them.

Relative proportions of these six cost groups may vary, depending on the type of services railways provide. For example, the share of labor costs for passenger services is higher than for freight services. A higher share of services may be traded off for lower shares of labor and materials. If low depreciation reflects limited investment, costs for materials may rise because older assets are more costly to maintain.

The tradeoffs possible among cost groups mean that an 'ideal mix' of operating costs does not exist. However, when analyzing cost structure, if any cost category in the mix is disproportionately large or small, the reasons for this should be investigated. Also, to identify cost 'outliers', the cost mix and costs per unit of output can be benchmarked against railways with similar traffic and operating characteristics (Figure 4.6).

An issue that impairs the financial sustainability of many railways is overstaffing, which can result when government owns the railway and maintains a policy of high employment. Overstaffing also occurs often after a decline in traffic. Downsizing staff is always a politically difficult and prolonged process. As a general rule, labor costs should not exceed one-third of total operating costs, although cases vary for many reasons and each must be evaluated on its merits.

Figure 4.6 Staff Costs and Productivity

Timely payment

If railways are experiencing financial difficulties, they may attempt to manage cash flows by extending payment periods for their bills. The size of accounts payable relative to operating costs will indicate the magnitude of the problem of timely payments.

Ratios

Ratios commonly used to analyze costs are shown in the table below. Financial ratios for costs are most useful when paired with measures of physical productivity and benchmarked against railways with similar traffic and operating characteristics.

Box 4.2 Financial Ratios for Operating Costs

Ratio	Calculation	Use
Operating cost/traffic unit	Operating expenses/traffic unit (Costs and traffic units should be for comparable entity.[41])	Benchmark costs against other railways; compare to unit revenue
Labor cost/traffic unit	Labor expenses/traffic units	Benchmark labor costs against other railways; compare to unit revenue
Labor productivity	Traffic units/number of staff	Benchmark labor productivity against other railways
Traffic density	Traffic units/track-km	Benchmark infrastructure productivity against other railways
Average payment period	[Accounts payable/(operating expenses-depreciation)]*365	Measures days of operating expenses represented by accounts payable. Compare to normal payment period, e.g. 60 days.

4.2.3 Investment

Railways are capital intensive businesses. This means that, in most years, a high proportion of the railway's cash flow should be spent on investment. Financing activities (borrowing and raising capital) allow the railway to invest more than its annual cash flow during years that big investments are needed. Capital grants from government are also a source of financing in some countries.

Railways can function for years without investment because railway assets have long life spans. Without regular investment, the trains can continue to run, but costs rise for materials and maintenance, and service quality and asset values decline. A railway that is not regularly investing, however, is "eating" its assets. Over the longer term, the railway becomes unsustainable. This is acceptable in markets the railway is planning to exit.

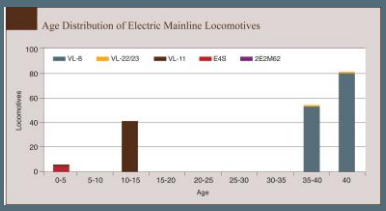
In fact, a critical measure of financial sustainability is whether the railway can manage sufficient investment over time to ensure safety, renew assets and serve new markets. Insufficient investment over time risks massive and potentially unmanageable future investment requirements. The adequacy of investment is not easily measured by a set of financial ratios, but a first check would reveal if depreciation is higher than investment, indicating the railway is likely under investing.[42]

[41] If entity includes both freight and passenger activity, the usual traffic unit is passenger-km + ton-km. This definition should be used with care; See Annex 2 for discussion of traffic units.

[42] If railway assets are undervalued, this check is not valid.

Azerbaijan Railway

An analysis of Azerbaijan Railway's electric locomotive fleet showed that the railway had not been investing. Within five years, the age of most of its locomotives would be over 40 years.



The railway needed about 120 locomotives in good condition for regular operations. This number could be reduced to 100 if improved operating practices were adopted, which depended in part on more reliable locomotives. Thus urgent replacement of over half the fleet of electric locomotives was needed.

Financial analysis of investment levels is most meaningful when paired with some analysis of physical factors. For rolling stock, an age-distribution exercise will reveal whether the railway has been investing regularly, or whether large portions of the fleet are at the end of their useful life and will need replacing soon. This is illustrated by Azerbaijan Railway (see above left). The age distribution of electric locomotives revealed that 80 percent of the fleet was older than 35 years, and there were insufficient numbers of newer locomotives to meet railway needs. For railway track, typical physical measures are the share of track needing renewal and the share subject to speed restrictions.

Analysis of asset productivity is also warranted. Since the railway is such an asset intensive business, much of its financial resources are consumed in capital expenditure on and maintenance of assets. For example, for track, the amount of traffic produced per km of track could be measured and benchmarked against other railways (Figure 4.7). If the track productivity is low, the railway network should be analyzed to determine how it could be optimized to reduce capital and maintenance costs. Similarly, if rolling stock productivity is low, its management and utilization should be investigated for opportunities to reduce cost. See Chapter 12.

Figure 4.7 Track Productivity

Box 4.3 Ratios for Determining Investment Backlog for Track

Ratio	Calculation	Use
Share of track in need of renewal	Track-km needing renewal/total track-km	Indicates share of track that needs investment
Share of track with speed restrictions	Track-km with permanent speed restrictions/total track-km	Indicates share of track that needs investment

4.2.4 Capital structure

Railway capital structure comprises long term liabilities plus equity. Long-term liabilities may include debt, staff pensions, and other railway obligations that must be considered when assessing railway financial viability.[43] Liabilities oblige railways to make specified payments for loan and bond interest and principal, financial leases, and employee benefits.

The railway may also have various forms of equity in its capital structure. If the railway is private, the investors that provided the capital will expect dividend payments. However, investors are paid only *after* debt holders are paid, therefore capital holders have more risk and require a higher rate of return than is paid on debt. If government holds the equity, dividend payments may or may not be expected.

A railway with a high debt to equity ratio is more leveraged and risky in its capital structure. Financial ratios used to monitor debt levels are referred to as debt service coverage ratio and gearing ratio. It is not uncommon to see railways borrowing beyond a sustainable level. A high share of revenues is directed to service debt payment, which diminishes the railway's capacity to reinvest its profits.

The borrowing terms of individual loans affect overall sustainability. Many railways lack access to long-term affordable financing without sovereign guarantees or support from international financial institutions. Short maturities and high interest rates mean high debt servicing, which is not a good fit for the extended life of railway investment. Before assuming additional debt, the railway needs to ensure that the higher total debt service can be managed with available revenues, after paying operating expenses and other costs.

[43] If the railway receives capital subsidies, these would be recorded as deferred income (a long-term liability) that amortize at the same rate as the asset for which they were given. Such liabilities do not confer a repayment obligation or an ownership interest, only the obligation to purchase and use the assets for which the grant was provided.

Box 4.4 Financial Ratios for Debt

Ratio	Calculation	Use
Debt service coverage ratio	Cash available for debt service/Debt service = (Net income + depreciation(and amortization) + other non cash items)/(annual principal and interest payments on debt)	Assess financial strength of railway through ability to meet debt service payments; a ratio above 1 means that the entity generates sufficient cash flow to pay debt obligations
Gearing ratio	Total debt/total equity	Compares level of external financing to entity's own equity capital to assess leverage in capital structure; a high gearing ratio indicates higher leverage and lower financial strength, which increases riskiness of entity; appropriate level can be determined by comparing to other railways; higher gearing can increase potential gains to equity holders

Some railways reach a point where payment obligations associated with historical debt can no longer be managed, rendering the railway financially unviable. Returning these railways to financial viability requires restructuring their debt, among other measures. The European Union acquis communautaire calls on Member States to "set up appropriate mechanisms to help reduce the indebtedness" of existing publicly owned or controlled railway undertakings "to help reduce the indebtedness of such undertakings to a level which does not impede sound financial management, and to improve their financial situation."[44]

4.3 Determining Financial Sustainability

Railway financial sustainability is determined by revenues and expenses. Do railway operations make or lose money? Do they generate sufficient funds to finance investment, and service debt and equity?

4.3.1 Operating profitability

Do railway operations make or lose money? The answer is provided by looking at railway earnings before interest, taxes, and depreciation (EBITDA) and earnings before interest and taxes (EBIT or operating profit). The EBITDA indicates whether revenues cover expenses, netting any funds for investment, debt or taxes. The working ratio monitors this relationship, with values below 1 indicating that funds are generated. Operating profit indicates whether revenues cover expenses including an allocation for investment (depreciation). The operating ratio monitors this relationship, with values below 1 indicating that operating expenses, including deprecation, are covered by revenue.

[44] Council Directive 91/440/EEC of 29 July 1991, Article 9.

Box 4.5 Financial Ratios of Operational Sustainability

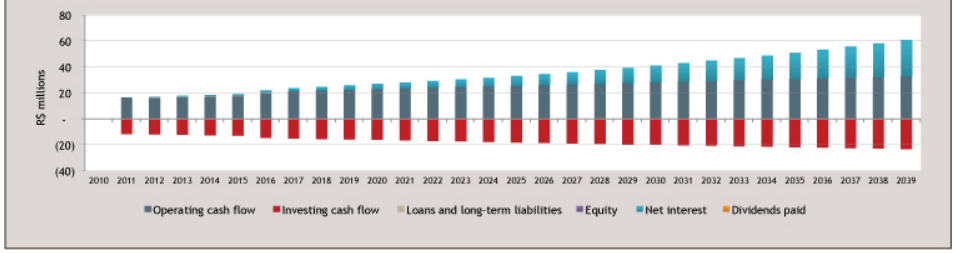
Ratio	Calculation	Use
Working ratio	(Operating expenses—depreciation)/Revenue	Measures entity's ability to recover operating expenses, excluding depreciation, from annual revenue; a ratio below 1 indicates entity's ability to recover operating expenses, excluding depreciation
Operating ratio	Operating expenses/Revenue	Measures entity's ability to recover operating expenses from annual revenue; a ratio below 1 indicates entity's ability to recover operating expenses

If possible, operating profitability analysis should be carried out for each business line. For many railways, profitable freight operations cross-subsidize loss-making passenger operations, and may also cross-subsidize unprofitable freight operations. Analyzing profitability by unit can help identify sources of financial unsustainability and develop remedial actions.

4.3.2 Cash flow

A sound cash flow forecast is the best measure of railway financial viability. The cash flow statement shows relationships among funds (i) generated by operations, (ii) generated by financing, (iii) used for debt service, and (iv) used for investment (Figure 4.8). This forecast should incorporate realistic estimates of funds generated from operations, and all debt-service obligations. It should include projected capital expenditures for returning all railways assets to sound service condition and maintaining them there. If the forecast cash balance remains positive under these conditions, then the railway is financially viable.

Figure 4.8 Cash Flow Breakdown



4.4 Data Availability and Quality

Accurate financial data are the foundation of high-quality financial analysis. Every railway is strongly encouraged to adopt International Financial Reporting Standards (IFRS), and use IFRS-qualified external auditors. In any railway reform program, improving the accuracy of financial data should be high priority. If audited IFRS data are not available, the following areas can be examined for commonly occurring problems.

Accounts receivable. Under national accounting standards, it is rare for railways to write off uncollectable accounts in a timely fashion. This leaves a significant portion of accounts receivable on the books that may not be collectible.

Property, plant and equipment. Periods of high inflation significantly reduce the historical value of property, plant, and equipment. Values may have been increased through indexing, but still bear little resemblance to accurate values.

Hidden liabilities. Examples of liabilities that may not be disclosed in financial statements include staff pensions and environmental clean-up.

It may be possible to overcome some data limitations, for example, by estimating total uncollectable accounts. However, even if this is not possible, knowing the data limitations allows the user to avoid drawing conclusions that rely on the problem data.

4.5 Financial Analysis Tools

Financial analysis tools can help assess railway financial viability, suggest measures to improve it, and help quantify the impact of these measures. Three types of financial analysis tools are commonly used by railways: *financial modeling, benchmarking*, and *cost analysis*.

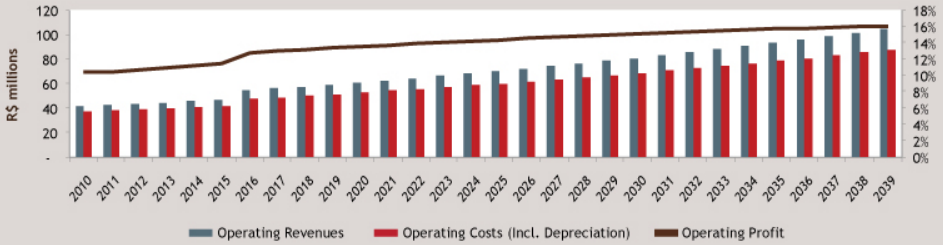
4.5.1 Financial modeling

A financial model is a forecasting tool that uses traffic, operational and financial data to model railway finances and forecast balance sheets, income statements, and cash-flow statements to test the impact of various policy and investment scenarios. A typical financial model will include forecasts for the following elements:

- Traffic, and then, revenue from the traffic
- Operating subsidies, if any
- Operating costs, based on costs structure and forecast traffic
- Capital investments, based on analysis of the railway's assets and requirements of the forecast traffic
- Debt, and debt service and other liability payments
- Projected financing, based on railways financing needs and available sources.

If these elements are out of balance, financial model iterations can identify ways to balance them (Figure 4.9).

Figure 4.9 Operating Profit



Financial models are used to assess railway financial viability, for example, by highlighting misalignments between debt sizes relative to earning capacity. Models can be used to analyze the financial effects on the railway of changes in traffic, or operations, among others. Also, models can reveal whether there is potential for private sector investors. Annex 1 contains more information about financial modeling and a financial model.

Figure 4.10 Benchmarking Locomotive Operating Costs

4.5.2 Benchmarking

Benchmarking is a process that compares statistics for one entity to the same statistics for other entities. Railway benchmarking identifies problem areas and opportunities for improvements. It may compare financial measures such as operating ratio or revenue per ton-km, or productivity measures such as traffic units per employee, or traffic units per track-km. Often, a high-level comparison is carried out first to identify high-potential areas, followed by detailed analysis of those areas (see Figure 4.10 at left).

Benchmarking is most useful when carried out for railways that are similar because this controls for factors beyond management or government influence, and focuses on analyzing factors with potential for change. Thus, to the degree possible, the benchmark railways should have similar (i) size; (ii) traffic volume; (iii) traffic mix, and; (iv) traffic density. More benchmarking information is in Annex 2.

4.5.3 Costing

Cost analysis attempts to understand the structure of railway costs. Which costs are fixed? Which are variable? What are the contributing factors? In the railway industry, cost analysis has four main uses.

Pricing. The railway should price services at market-competitive levels that are greater than the variable costs of the service and maximize the traffic's contribution to fixed costs. To establish prices, railways must know the variable costs of providing the service.

Profit Measurement. Cost analysis allows the railway to evaluate service profitability by matching cost attributed and allocated to the service with revenues generated by the service. Profitability information can help railways prioritize use of scarce resources, including investment funds.

Budgeting. Cost analysis yields information to help railways establish flexible budgets.

Financial modeling. Cost analysis provides the basis for accurate financial forecasts, including costs and investment analysis.

Many railways maintain a Service Costing and Profit Measurement system that costs and measures traffic profitability. More information on these systems is in Annex 3.

4.6 Economic Analysis

Economic analysis[45] of railways expands on financial analysis by incorporating non-financial externalities and impacts on a broader range of affected entities. Financial analysis is fundamental as it determines the financial revenue and cost streams to the railway entity. Economic analysis considers financial and also non-financial benefits and costs accruing to all stakeholders, including as the government, railway customers and other citizens. Economic analysis seeks to establish whether a project or a policy intervention is worthwhile from an overall social perspective. The analysis is a comparison between alternative states of the world—between "with project" and "without project". The latter scenario should be a realistic base case against which the project/policy options are tested. Both the base case and project need to be clearly defined in terms of project scope, period and impacts.

4.6.1 Project scope and stakeholders

The first step in economic analysis is to describe the project, define its geographical and economic area of influence, and determine the period of analysis. Stakeholders, i.e. agents affected by the project, also need to be identified and typically include some of the following: railway operator, infrastructure owner, the government, freight customers, passengers, other transport modes and society as a whole. Project impacts need to be identified for each stakeholder. Ideally, all impacts should be included, no matter how small they are, but in practice data collection is made less cumbersome by excluding minor impacts. Impacts may include investment costs, maintenance and system operating costs, vehicle operating costs, journey time savings, safety benefits, environmental impacts (pollution, noise), and wider effects on the economy and government.

4.6.2 Traffic forecast

A traffic forecast should be prepared for "with project" and "without" scenarios to quantify generated traffic in the project area of influence and diverted traffic from other transport modes for both freight customers and passengers. Adequate data collection for the period of analysis is crucial to preparing a reliable traffic forecast. Traffic forecast is essential to determining any time savings or other benefits that may accrue to users from speed or reliability improvements.

4.6.3 Project benefits

Railway customers experience project benefits through travel time savings, greater reliability and improved comfort. In economic terms, there is a positive change in

[45] There are different interpretations of economic analysis but here it refers to cost-benefit analysis.

consumer surplus, i.e. willingness to pay more than the cost of a trip, when the project improves railway service. The value of time can be quantified through savings in foregone income per hour during working time and willingness to pay for greater comfort when traveling by rail vs. road. The value of reliability can be quantified as the cost of extra inventory held to guard against unreliable shipment time. Railway operators and infrastructure managers derive direct benefits through higher revenue and/or lower operating or maintenance costs[46]. Indirect benefits can result from creation of productive economic activities and increased mobility, if, for example, transportation delays and costs are reduced for businesses within the project area of influence. Avoided infrastructure costs for alternative transport modes and avoided higher fuel costs also count as benefits. External benefits can refer to safety (lower accident costs) and environmental benefits which increase social welfare.

4.6.4 Project costs

Identification of project costs is typically more straight-forward than defining benefits. Normally financial costs for investment, maintenance and operation are converted into economic costs by eliminating physical and price contingencies, VAT, and other taxes and duties. External and non-financial costs arise from pollution, global warming, noise, involuntary settlement of people and safety risks. Quantification of such costs is challenging due to measurement difficulties and the need for context-specific assumptions. It is noteworthy that the "without project" scenario may include investment costs in other transport modes, such as road rehabilitation or expansion, if the railway project is not undertaken.

4.6.5 Results and sensitivity analysis

When all costs and benefits have been identified and quantified, net economic benefit can determined by calculating the project's net present value, internal rate of return and benefit-cost ratio. The discount rate should be determined specifically for each project. The World Bank uses 12 percent as a standard discount rate in economic analysis over a 20-30 year forecast period. As project costs and benefits are typically uncertain, sensitivity analysis should be performed on the results by testing the relative impact of project variables. For example, "switching analysis" determines the changes in variables which yield a net present value of zero. Monte Carlo simulation can determine the probability distribution of project results given changes in key variables.

4.6.6 Additional resources

The World Bank has produced with the UK Department for International Development 22 economic evaluation notes which detail the different stages in transport project evaluation. The series of Transport Notes (TRN-5 to TRN-26) is available on

[46] If the reduction in operating and maintenance costs entails staff reductions, the economic price of labor should be used in benefit calculation instead of money wages and benefits (financial price of labor). Economic price of labor, or labor supply price, can be estimated using the shadow wage rate which depends on skills, location, economic sector, and even season.

worldbank.org/transport > Research and Analysis > Transport Notes Series[47]. A good example of the World Bank's railway economic analysis can be found in the Project Appraisal Document for Egypt National Railways Restructuring Project (P101103)[48].

[47] http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTTRANSPORT/0,,contentMDK:20457194~menuPK:1323557~pagePK:210058~piPK:210062~theSitePK:337116,00.html

[48] See Annex 9 of Project Appraisal Document on http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=51351213&theSitePK=40941&entityID=000334955_20090224045050&searchMenuPK=51351213&theSitePK=40941

5

Railway Reform:
Toolkit for Improving Rail Sector Performance

Chapter 5:
Creating the Industry Structure

5 Creating the Industry Structure

5.1 Introduction

This Chapter explores the main alternatives for railway industry structure, including the roles of the public and private sectors. Sections-5.1-5.5 discuss structuring core railway functions—the railway infrastructure network and passenger and freight transport services. Next, Section 5.6 addresses the many non core activities that have accrued to railways over time. Finally, Section 5.7 introduces case studies to illustrate examples and features of the structures discussed.

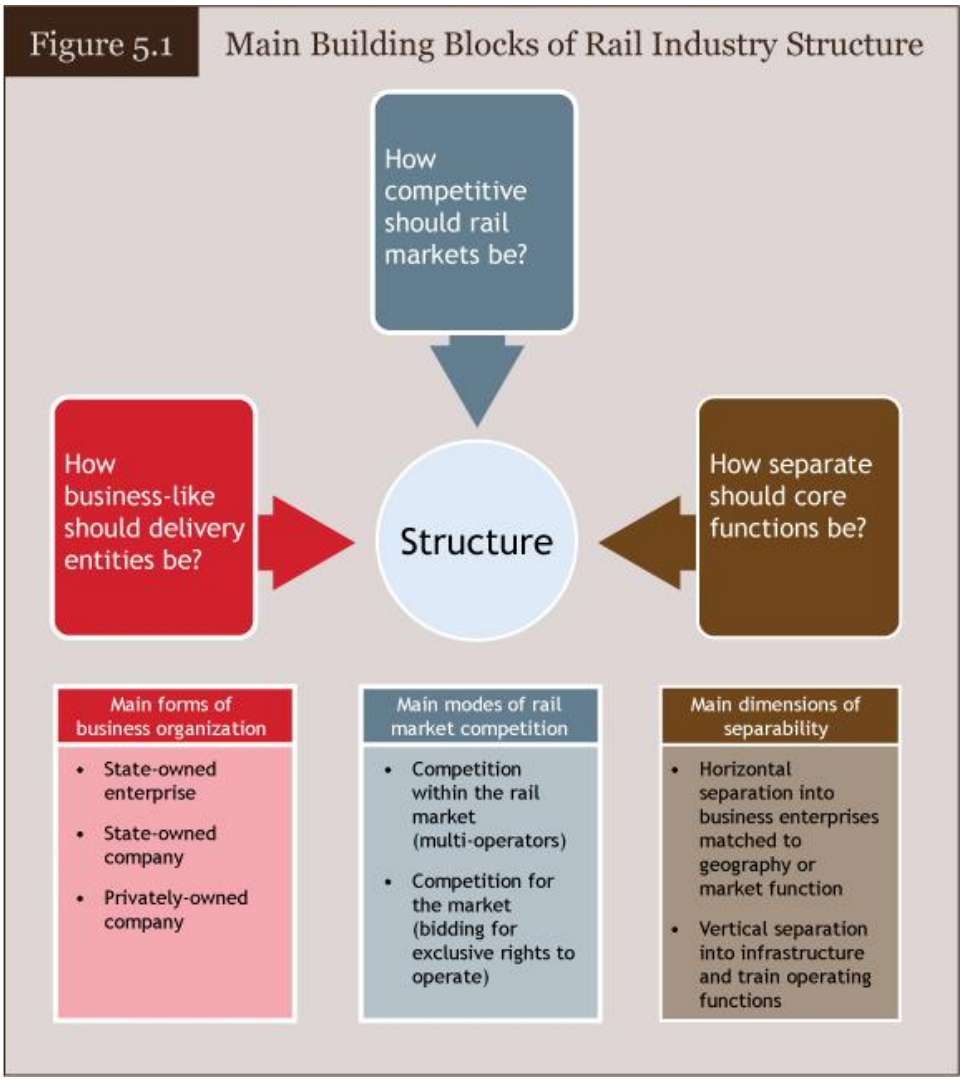
Chapter 5 begins with a generic industry model or railway archetype that includes all of the features and alternatives embodied by most of the world's national state-owned railways up to the 1970s: (i) it is under full public ownership; (ii) it operates as department of a ministry, or a public entity with an administrative reporting relationship to that ministry; (iii) it offers passenger and freight transport services; (iv) it is vertically integrated in managing railway infrastructure and train operations; and (v) it undertakes a range of non core railway activities.[49]

Experience shows an alternative to the archetypal railway can be formed from three main policy building blocks:

- *Business organization*- the degree to which its delivery institutions are to be structured in a business-like or commercial manner including the option of private sector ownership or operation of core railway functions;
- *Market competition*- the degree to which the railway transport services it produces are to be competitive, as between different rail service providers;
- *Separability*- the degree to which its monolithic nature should be broken down and some of its sub-businesses be separated and decentralized.

Figure 5.1 summarizes these building blocks and the main options within each. Naturally, the three elements are interrelated and how they are combined differentiates industry structure. But for convenience, this Chapter will describe each building block separately and the options within it (Sections 5.2-5.4). Next, these elements will be combined to generate structural options that progressively increase the extent of private participation, the degree of railway service competition, and the extent of separability, compared to an archetypal railway.

[49] Some railways in the World Bank regions of operation still resemble this description, particularly in Eastern Europe and Central Asia (ECA) Region, in East Asia and Pacific Region (EAP) and in the Middle East and North Africa region (MNA). In Latin America and Caribbean (LAC), and sub-Saharan Africa (SSA) most railways are now run by the private sector under long-term concessions. However, the biggest sub-Saharan African railway, which is in South Africa, still broadly fits the archetype, although as a subsidiary of an even bigger state-owned multi-modal transport monolith.



5.2 The First Building Block: Business Organization

Most government authorities trying to operate in a commercial environment share the dilemma posed by government management incentive structures—a built-in bias for bureaucratic objectives, political goals, and public services rather than market advantage, resource efficiency and commercial gain.[50] Railways share this dilemma. If they are run as and by public departments and authorities they are ill-equipped to compete in a tough external business environment.

Archetypal railways have always been captive to bureaucratic pressures, which can undermine their commitment to serving customers. Multiple constraints include: (i) accountability measured-by-process ('box-ticking') rather than results; (ii) vulnerability to short-term national budgeting processes that destabilize longer-term business and investment planning; (iii) public service employment norms and procedures that impede commercial operations; (iv) political patronage or seniority as a basis for selecting board and senior management, rather than merit; and other

[50] Good bureaucracy is essential to government administration and accountability; and bureaucrats have an immediate responsibility to support the policies of political leadership.

constraints. Many examples of these influences exist among state-owned railways of both developed and developing countries.

Many governments suffer from fuzzy thinking about railway industries. Some view railways as a conduit for social values, but then invariably want state-owned railways to operate efficiently enough to compete successfully against other transport modes. Examples abound of political pressures that have undermined commercial outcomes when railways must comply with government directives to offer discount freight rates to strategic industries, maintain artificially cheap fares for passengers, continue to run trains on lines where passenger demand can hardly fill a single coach, reallocate investment to areas of greatest political visibility, and avoid any labor force reductions that might erupt into an industry-wide disruption.

By comparison, the road passenger and freight transport industries are intensely competitive and mainly privately-owned. Most political pressures are visible and transparent and road transport is not an implicit conduit for transmitting social benefits to the industrial sector or labor unions, or scoring political points for re-election.

There are three main corporate forms that can help improve the performance of the archetypal railway organization by reducing bureaucratic demands and political pressures: a state-owned enterprise operating under a specific railways law or state-owned enterprise law; a state-owned company under companies law; or a privately-owned company under companies law. There can of course be more than one entity in any industry structure (industry separability is addressed in section 5.4). In any particular country different legal challenges might be faced with the different structures regarding asset holding, accounting methods, taxation and transfer of staff to new entities. The choice of corporate form is therefore complex and what follows focuses on generic features.

5.2.1 State-owned enterprise

A state-owned enterprise (SOE) is constituted under structures established by a specific railway law or under a general SOE law designed to accommodate a range of government businesses. The law specifies enterprise commercial orientation, objects and freedoms, and channels for political influence.

Unfortunately, merely creating a new structural form is insufficient to improve performance. This building block needs shoring up with the following: (i) a professional and independent board of directors; (ii) merit-based management selection; (iii) management accountability based on short- and medium-term business planning targets; (iv) creating business management structures geared to markets and focusing on core functions; (v) greater pricing freedom; (vi) use of internationally recognized commercial accounting and auditing standards; (vii) and contractual agreements between enterprises and government for reimbursement of public service obligations imposed by governments.

Experience shows that SOE-type railways are an improvement on departmental structures, but far from a panacea. If a government is committed to pursuing political objectives through the channels laid out in the foundation law, and attentive to the complementary measures, SOEs can be a more business-like structure.

However, if none of the above conditions are fulfilled this structure can still be undermined and commercial performance is unlikely to be achieved.

5.2.2 State-owned company

A state-owned company (SOC) may be set up if a government wants an 'arm's-length' relationship, similar to but more rigorous than an SOE. This alternative utilizes the general framework of national corporate law, rather than railway law or state-owned enterprise law.

Governments can establish and register a company using a formal company constitution drawn up according to corporate law,[51] using a corporate form that is tried and tested daily by the private sector. In a joint-stock company, the board of directors' role is to establish and monitor the company's direction and strategy to enhance profitability or otherwise ensure a return on shareholders' funds; some jurisdictions also consider the position of creditors and employees.

Shareholders select the board of directors. Arm's length distance from government can be achieved by vesting all or part of the shareholding in another ministry, such as Ministry of Public Enterprises or Ministry of Economy because they are interested in the company's commercial performance without line-ministry political accountability, therefore, they are less-likely to succumb to political pressure or avoid unpopular decisions. By contrast, the policy ministry, normally the Ministry of Transport, could be conflicted by the short-term political consequences of board commercial decisions. Arm's length independence requires that the majority of directors on the board are selected for their business skills and industry experience, plus independence from the policy ministry.

These actions require positive sector and corporate governance; company law is insufficient to prevent a determined government from exerting intrusive shareholder rights, stacking the Board with ministerial placeholders, embedding a compliant CEO through political patronage, or adopting minimum reporting standards. Ultimately, an SOC is only as effective as government allows, similar to an SOE.

Corporate law is rigorous, but it can also be rigid. For example, during periods of corporate financial difficulty, would the government allow the company to fail—to declare bankruptcy and carry out a business wind-up procedure? Insolvency laws are designed to benefit company creditors. Although most governments would not be unhappy if a railway administrator dissolved a failing board and dismissed management, bureaucratic equanimity might evaporate at deeply discounted liquidation of publicly-owned assets such as railway land, rights-of-way, or the passenger rolling stock necessary to run future services. A solution is to franchise or concession to use state assets. The state could vest all company assets in a bankruptcy-remote vehicle and the state-owned trading company, which can fail and be replaced, could have the franchise or concession.

Box 5.1 summarizes and compares state-owned enterprises and state-owned companies. Successful transformation from an archetypal railway depends less on the

[51] Such as, in Common Law jurisdictions, the Memorandum and Articles of Association.

choice between an SOE or SOC, and more on whether governments build in the reinforcing mechanisms described earlier, whether they then respect the mechanisms they create, and whether they adopt a robust contractual system for any budgetary support.

Box 5.1 State-owned Enterprise vs. State-owned Company

Why choose a state-owned enterprise (SOE)?	Why choose a state-owned company (SOC)?
• Because an SOE can be constituted with bespoke objectives, structures, and accountability • Because SOEs have worked well in other sectors in the country	• Because an SOC is more rigorously constituted at 'arm's length' from government with more commercial objectives, structures, and accountability • Because an SOC relies on the provisions of the Companies Act and does not require custom design
What are the most favorable circumstances?	
• National SOE legal framework and law are well-developed • Government has strong capacity and willingness to meet its obligations and exert its rights *only* within the SOE framework • The SOE has explicit contractual mechanisms for any government budgetary support	• A well-developed framework of company law has worked well when applied to government businesses • Government has strong capacity and willingness to meet its obligations and exert its rights *only* within the framework of company law and according to the company constitution. • The SOC has explicit contractual mechanisms for government budgetary support. • When the company's ability to fail is clear and a politically acceptable framework for the fate of public assets can be put in place.
What are the least favorable circumstances?	
• National SOE legislation or experience is weak. • The railway is highly politicized and public governance capacity weak so that an SOE structure cannot prevail against day-to-day intervention. • Budgetary support is necessary but unstructured and unpredictable.	• National corporate legislation is weak. • The railway is highly politicized and public governance capacity is weak so that a SOC structure cannot prevail against day-to-day intervention. • Budgetary support is necessary but unstructured and unpredictable. • Consequences of company failure are unclear.

5.2.3 Privately-owned company

A joint-stock company owned by private shareholders is the most commercial structure for delivery of rail transport services in competitive markets. Private companies have much stronger incentives to improve commercial performance than SOEs or SOCs, and much stronger alignment between managers and shareholders on improving the bottom line.

Conversely, though private companies will deliver social benefits if they happen to coincide with their commercial goals, they have no inherent interest in using rail transport to achieve social outcomes, except as a public relations strategy. Therefore if governments wish to capitalize on the strengths of privatized railway entities *and* protect or pursue other public interests, they must adopt contractual and/or

regulatory mechanisms that specifically align company interests with targeted public interests.

Globally, public ownership (in various corporate forms) is the dominant model in national railways in terms of total traffic carried,[52] though this result is influenced by the huge traffic flows of the three mega-public railways of China, India and Russia. About 63 percent of all rail freight ton-kms on national networks[53] and nearly 90 percent of passenger-kms are carried by state-owned entities, including public authorities, SOEs, and SOCs. Nevertheless, there are over 500 private rail-freight companies internationally, concentrated in North America, South America, sub-Saharan Africa, and Australia, but an increasing number are operating in Europe. Private inter-city passenger rail services are concentrated in Japan and the UK; privatized passenger concessions for urban and regional rail services are common throughout the EU, particularly in Germany, Sweden and the UK. Some freight rail concession operators in Latin America and Africa also run residual passenger services as a concession condition, sometimes with government financial compensation.

Almost all private operation of previously state-owned railway services has improved market and commercial performance, particularly freight railways. Private rail freight companies have been better able to compete in the arduous, low-margin business of moving goods. Success often depends upon cutting operating costs to the bone, and outmaneuvering a highly decentralized and entrepreneurial road haulage industry that faces relatively few constraints on entry, movement, management, or pricing.

Railway network privatization or concessions have proven more daunting and less attractive as a public policy choice in countries where national railways have a strong passenger base. In nearly all cases of freight privatization referred to above, rail infrastructure was taken under private management (after remaining under public ownership through long-term concession structures). But in Canada (Canadian National), Great Britain, New Zealand, and parts of Australia, some or all main-line railway infrastructure was transferred to full private ownership. Since then, Britain and New Zealand have essentially brought railway infrastructure back into public ownership, although train operations are still in the hands of private companies.

Public policy on railway network ownership and control has a critical influence on restructuring options. Many governments are as uncomfortable with the notion of full private ownership or free-market operation of railway networks as they are with full private ownership of other transport networks—roads, inland waterways, shipping lanes, or air traffic routes.

Governments cite several issues: (i) the inherent monopoly in railway infrastructure; (ii) the difficulty of full cost recovery for rail infrastructure from user charges; (iii) the 'lumpy,' long-term, immovable and therefore risky nature of transport in-

[52] Paul Amos and Lou Thompson, *Railways in Development: Global Round-up 1996-2005, World Bank Transport Note TRN-36,* (World Bank, 2007).

[53] Excluding own-account mineral railways and industrial railways.

frastructure that can render it unattractive to private investors; and (iv) the concept that 'common user' transport infrastructure is inherently public patrimony that should be run for the public good rather than private profit.

A government policy position opposed to railway network private ownership or management through concession limits available structural choices, but does not rule out separability options, greater competition, and private participation in train operations.

Box 5.2 summarizes the merits of a private company as corporate form.

Box 5.2 Benefits of a Private Company

Why might a private company be preferred?

- Private shareholders provide the greatest incentives for business-like decision making.
- Railway service meets private (i.e. market or commercial) as opposed to social needs.
- Rail transport is no longer seen as a core government business.
- Other forms of SOE or SOC have been unsuccessful.

What are the most favorable circumstances?

- The company is capable of profitable operation and government is willing to accept market forces to establish the balance of price and services offered, whatever that may be.
- Government accepts the verdict of market forces but remains willing to exert influence through explicit compensation for meeting public service obligations, and through other transparent mechanisms such as contributions to capital upgrading.
- Government specifies the services to be delivered and is willing to contract a private company, using a concession or franchise, to deliver services at market or regulated prices.

What are the least favorable circumstances?

- Political expectations and private company interests are seriously misaligned.
- Government lacks sufficient administrative capacity to regulate or provide contractual support to achieve public interest goals.

5.3 The Second Building Block: Market Competition

The second building block of railway industry structure is the degree of competition among suppliers of railway services. Historically, freedom to compete in supplying rail services has been weak or absent from national rail industry structures in most countries, unlike other transport sub-sectors. Road haulage, long-distance coaches, coastal shipping, inland waterway barging, airline passenger and freight—all modes of transport that compete with national railways display higher levels of competition among service suppliers.

No systematic empirical worldwide review of the benefits of competition within the railway sector has been carried out. However, Canadian, American, and Mexican rail freight sectors have substantial parallel competition between railways, reinforced by negotiated and mandatory track access arrangements. These operating conditions are widely accepted among policymakers as factors that contribute to making these railways amongst the most technically efficient and innovative in the world. European countries such as Germany and the UK opened their rail freight markets to competition earliest and furthest and experienced the highest growth

in rail freight. In Australia, competition among rail freight providers yielded service and tariff benefits for bulk and intermodal freight shippers. Most countries that have competitively tendered contracts to operate urban or regional passenger rail services also claim significant improvement in value for money. In all cases it is difficult to separate the impacts of competition from the impacts of private participation. However, ample evidence from other service industries and all other modes of transport services suggests that competition, or even the threat of competition, creates incentives that result in higher efficiency and quality services than when there is a single, protected supplier.[54] Therefore, advocates of rail services monopolies must accept the burden of proof to demonstrate how this serves the public interest.

Worldwide, most railways would claim to operate in 'competitive' transport markets because their customers can opt for other transport modes, or alter supply chain sources or destinations to avoid relying on one rail route. Often, archetypal national railway managements raise this point to justify exclusive rights to provide railway service. However, the same argument from the road transport sector—that a national trucking monopoly is justified because it 'competes' with rail transport—would be considered absurd by national governments.

Nevertheless, there are countries and circumstances in which exclusive rights to operate rail services may be justified (see Section 5.3.2 below). Moreover, discouraging day-to-day competition does not preclude contestability through competitive bidding for exclusive rights. Two main forms of contestability in rail services are competition in the market, and competition for the market.

5.3.1 Competition in the rail market

Competition creates incentives for managers to meet market needs at the lowest cost and encourages service innovations to gain market advantage. The strongest case for competition in the market is for rail freight services. Even in some small railway markets in individual European countries and Australian states, competition in rail freight transport is significant and effective. Among the mega-railways of the USA, China, India, and Russia, rail freight markets are large enough to bear competition, and American freight railways do compete. The international road transport industry is a formidable competitor to railways partly because it is not structured as a state-owned monopoly and is intensely competitive between its participants.

It is sometimes argued that on-rail competition would threaten railway economies of scale but railway infrastructure economies are not materially affected by whether track traffic volume is carried by a single operator or several. In practice most so-called economies of scale ascribed to railways are actually 'economies of density', arising from declining average unit costs of additional traffic over a fixed railway infrastructure (until capacity is reached). See 3.2.1.Whoever provides the traffic, the more there is, the lower the unit infrastructure cost.

[54] Economic theories of market contestability suggest that the threat of competition can be effective in encouraging consumer-friendly price setting and service behavior of an incumbent supplier, even if the actual level of competition in the industry is relatively low.

On-rail freight services competition occurs in some thirty countries worldwide, under three main institutional frameworks:

- Competition among operators of vertically integrated railway routes together with negotiated rights-of-track access at specific locations under private agreements among railway entities (e.g. USA);
- Mandated but limited rights-of-access to competing operators defined under national laws; access rights confined to defined routes and/or circumstances exist in Canada, Brazil, Mexico, and the Russian Federation;
- General rights-of-access are mandated based on a policy of broadening access to public infrastructure networks such as in the European Union, and Australia.

These three models provide a range of effective tools for allowing independent private freight train operators to use national railway networks, and manage the operational interfaces of a multi-operator regime.

By contrast, competition among rail passenger service providers is rare and occurs mainly in EU member countries under three scenarios: (i) between a long-distance national operator and a regional service provider on selected routes (e.g., German Railways Inter-City Express (ICE) Service or regional route concessionaires); (ii) between two operators on parallel or overlapping routes (e.g., perhaps 10-20 percent of the UK market); and (iii) using third-party track access rights (a few UK services; a service planned between Cologne and Hamburg in competition with German National Railways). This toolkit acknowledges potential for direct competition for passenger services on some of the world's busier routes, but experience suggests that conditions favoring exclusivity are widespread (see 5.3.2) and that pursuing competition in rail freight markets is an easier place to start.

5.3.2 Competition for the rail market

Three circumstances militate against competition in rail transport services delivery.

1. ***Micro markets*.** Railways are a niche transport mode and railways are most competitive where they can achieve high-level capital utilization——infrastructure that carries substantial flows of well-loaded trains and well-utilized locomotives, coaches, and/or wagons. But many railways in developing and transition countries have inherently low freight and passenger flows, which means that railway managers face the unenviable choice of running longer cost-efficient trains at an unappealingly low frequency, or offering more attractive service frequency for shorter, high-cost trains. Hence, it is often said that rail services that succeed in thin markets do so because they run on 'the smell of an oily rag'; introducing competition—a second operator—would mean running on the smell of *half* an oily rag.

2. ***Subsidized passenger rail services*.** Most rail passenger services in most countries are subsidized by taxpayers because fares are inadequate to cover operating costs. Introducing competition would reduce the fares, thereby undermining the operators and increasing the drain on the public purse.

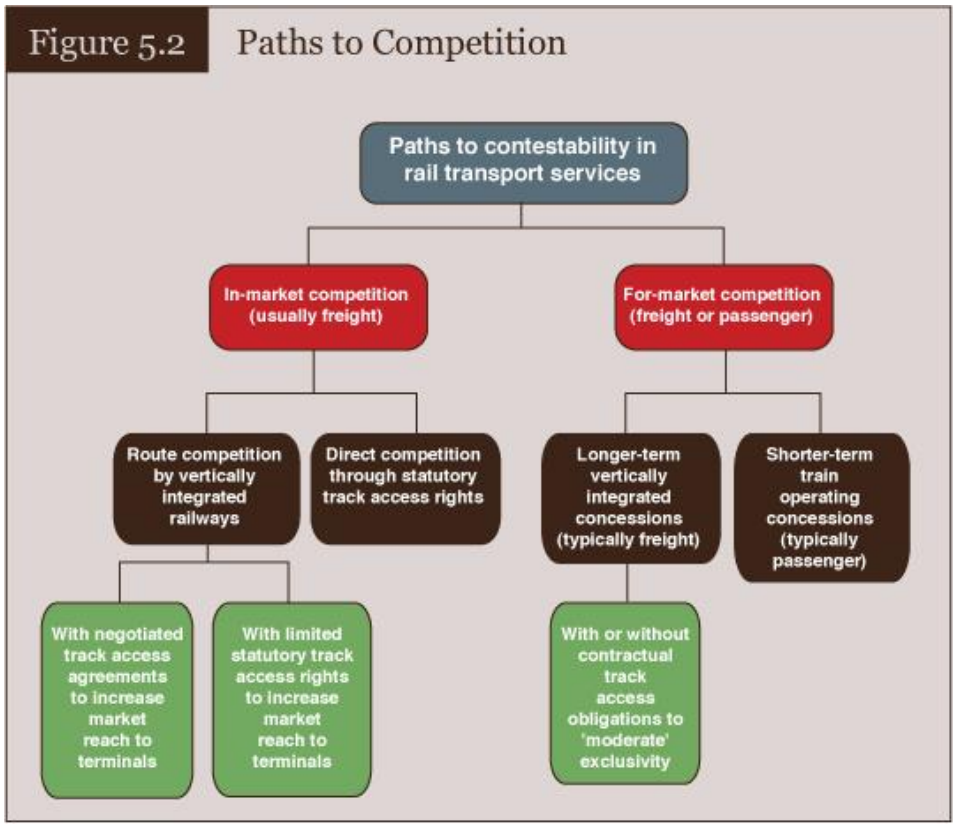
3. ***Long-term investment in public railway infrastructure.*** Sometimes governments offer exclusive concessions as incentives for railway services providers to make long-term investments in infrastructure. African railway concessions, in particular, are based on this justification.

Exclusivity is not incompatible with contestability. In the three circumstances described above, governments can adopt a transparent and competitive bidding process for granting exclusive rights, and for any associated public funding.

5.3.3 Alternative paths to competition

The main policy alternatives are summarized in Figure 5.2 below. The assumption is that if governments favor greater competition in segments of core railway services, they will accept private sector delivery, therefore, competition in the market or for the market would include at least one private participant.

Figure 5.2 Paths to Competition



In some countries, two railways owned by the same government (or owned by a state and a local government) compete for traffic, but competition is nearly always at the margin of operations as a by-product of other policies, rarely the central policy intent. There are good reasons for this.

First, national governments may fear that two commonly-owned competitors will lapse into a comfortable duopoly with stable market shares, thereby neutering competition. However, the opposite scenario is equally undesirable—each state-owned competitor might attempt to pursue an aggressive price-cutting strategy at

the expense of the public purse (whether in the guise of lower shareholder value or higher budgetary support).[55]

5.4 The Third Building Block: Separability

How the railway industry structure is divided, referred to as 'separability', comprises two primary dimensions, horizontal and vertical. Horizontal separations are sometimes justified by creating better-managed, decentralized, and market-focused units from a monolithic national company. Vertical separation into companies for operations and for infrastructure can help expand private sector participation and competition in train services.

5.4.1 Horizontal separability

The archetypal railway is managed at the national level; usually, larger countries also have regional administrative units of the national railway.

Horizontal separation works best when there are clearly separable business units with discrete geographic focus. For example, larger countries have multiple railway markets—heavy-haul freight in a mining region, major urban centers, and regional networks—each can be owned, managed and financed separately, compete over different routes, perhaps with access to tracks in other regions. Specialist businesses, such as a container rail company, may need to be vertically separated from infrastructure in order to be independently constituted.

Horizontal separation can sharpen market focus and management accountability, and allow for specialized operations to be devolved, divested, or compete with one another. All of these objectives can be met while maintaining the integrity of a coherent general-purpose national railway system providing long-distance services. Box 5.3 summarizes horizontal separability.

Box 5.3 Horizontal Separation

Why separate the railway horizontally?

- to create more manageable business units from a monolithic structure
- to improve transparency in financial performance
- to sharpen market focus with specialized business units
- to devolve responsibility to sub-national governments
- to divest selected units to the private sector by sale or concession
- to allow efficiency to be compared through benchmarking

What are the most favorable circumstances?

- large railways with separable regional freight and/or passenger markets
- generally separable regional freight operations
- separable and specialist freight businesses
- generally separable regional passenger networks
- suburban passenger networks

What are the least favorable circumstances?

- Horizontal fragmentation of small national railways because these lack offsetting benefits from devolution or divestment, although units can still be usefully run as individual profit centers.

[55] This is to be distinguished from the situation such as in the EU where state-owned railways of different countries compete for traffic on some routes.

5.4.2 Vertical separation

A railway can also be divided into one or more entities that own and manage railway infrastructure ('IMCs') and one or more entities that operate train operating companies offering transport services 'TOCs').[56] Or it can choose to allow vertically separated 'tenant' train operating companies to use the infrastructure of a vertically integrated dominant or host railway.

Typically, governments undertake full separation to maintain ownership and control of the railway network while trying to encourage more contestability and private sector participation in train services. However, this option creates complexity and adds transaction costs and regulatory burdens. The challenge is to clarify allocations of responsibility and accountability between railway infrastructure managers and train services operators at the interfaces of railway technology, operations, safety, and economic concerns. Amongst countries that have introduced it there have been positive and negative experiences (as is also the case with integrated railways). Some governments have considered separation but rejected it as too complex or as putting at risk some of the possible benefits of integration such as single point performance responsibility, keeping infrastructure managers 'closer' to final customers, co-ordination of interdependent infrastructure and rolling stock investment decisions; and a unitary command and control structure to meet emergency situations (such as severe winter conditions).

For now, full separation is confined to some EU countries, and some of Australia's interstate network. Nevertheless, many EU railways (including the largest, in Germany) are not institutionally separated; and in Australia, far more freight is carried on integrated railways than on vertically separated infrastructure.[57]. Indeed, about 98 percent of global railway traffic is carried on vertically integrated railways, including railways that compete through access by statutory right or commercial contract on lines controlled by a vertically integrated company. In the USA, more rail freight is carried under track access agreements on tracks of vertically integrated railways, than in the rest of the world put together. And the US national passenger train operator Amtrak is the world's largest predominantly vertically separated passenger train operator.

In presenting restructuring frameworks below, it is assumed that governments would seek full vertical separation of infrastructure from rail operations only if they wanted to introduce private sector participation and competition into train operations. Independent research has so far failed to find any benefits to separating railway infrastructure from train operations without reforms in one or both. [58] Box 5.4 summarizes this option.

[56] Internal separation of an infrastructure division from train operating divisions within a railway company, or as companies within a holding structure, is not vertical separation but a means of managing vertical integration.

[57] Countries with a vertically separated railway infrastructure manager are Finland, France, Spain, Denmark, Netherlands, Portugal, Sweden and Great Britain.

[58] See for example G. Friebel, et al, *Railway Deregulation: A European Efficiency Comparison* (University of Toulouse, 2003).

Box 5.4 Vertical Separation
Why separate railways vertically?
• to promote competition in or for the rail transport market, and encourage private sector participation in rail transport operations while maintaining state ownership and control of the railway network • to increase transparency in use of government subsidies (more apparent than real as track access charges may still transfer subsidies between IMCs and TOCs)
What are the most favorable circumstances?
• larger railways with multiple and separable types of TOCs that can operate as viable entities, within markets that are large enough to be viably competitive • countries aspiring to join the European Union (although institutional vertical separation is not an EU requirement) • countries with strong implementation, administrative and regulatory capacity
What are the least favorable circumstances?
• Vertical fragmentation of small national rail markets that are unable to support competition or have no intention of seeking private participation in TOCs

5.5 Assembling the Building Blocks: Options for Industry Structure

The three building blocks—business organization, market competition, and separability—must be assembled to develop industry structures that improve on the archetypal railway. This toolkit presents policy options that exist within one of two alternative frameworks that emerge from the archetypal railway. Each framework is distinguished by its policy on public ownership and control of the railway infrastructure network.

- *Public infrastructure framework*. This option retains public sector ownership and management of the railway infrastructure network. The framework assumes a mix of passengers and freight but the passenger role is substantial because experience shows that under these circumstances, governments are most committed to network ownership.
- *Private infrastructure framework*. This option privatizes the national railway network and train services or offers the opportunity of concessions. The framework also assumes mixed passenger and freight but freight services predominate over more marginal passenger services because experience is shows that under these circumstances governments have been willing to privatize their public rail network[59].

***Both public* and *private* frameworks can yield solutions that involve private sector participation, contestability, and business separation.**

5.5.1 The public infrastructure framework

Box 5.5 summarizes the main structural options for reforming a public railway within the public framework. The options in Box 5.5 are sequenced in order of increased industry diversification, contestability, and private sector participation,

[59] The only exception in the last thirty years was Great Britain, which has a passenger dominated railway network that was nevertheless privatized, though this was later reversed.

but the sequence and option variants presented can be modified to suit country circumstances;

- **Option 1:** commercialize an existing departmental railway by separating it from the government policy and regulatory functions and establishing it as a state-owned enterprise (SOE) or a state-owned company (SOC). This key step toward reform within the public framework is insufficient unless bolstered by far-reaching substantive actions such as: (i) creating a professional and independent board of directors; (ii) selecting management on merit; (iii) boosting management accountability with short-and medium-term business planning targets; (iv) creating business management structures geared to markets and focusing on core functions; (v) allowing greater freedom of pricing; (vi) using internationally recognized commercial accounting and auditing standards; and (vii) formalizing agreements between enterprises and government for reimbursement of any government-imposed public service obligations.
- **Option 2:** create horizontal separation to facilitate policy decentralization and devolve to sub-national government authorities (LGAs) the funding responsibility for any separable regional or suburban rail operations. Option 2 devolves responsibility and accountability to communities with the greatest stake in providing services and finding the resources to sustain them. Several variants on this option include: (i) the national company can operate services under contract to the local transport authority; (ii) train services can be divested to the local authority and run on the centrally-owned network under network access agreements; or (iii) both the local network (if it is reasonably separable) and the train services can be devolved to the local authority. Obviously, Option 2 works only if sub-national governments have the financial and administrative capacity to fulfill the functions.
- **Option 3:** the local authority offers a concession or franchise through competitive bidding for delivery of regional or suburban services. The national government might assume responsibility for concessions if sub-national governments lack financial and administrative capacity[60]. In principle, the national public company might compete with private train operators for the concession, which could include local rail infrastructure. Box 5.5 presumes a model of a private train operating a concession under a network access contract on a joint-user network administered by the national railway company. This type of train operating concession should be re-bid periodically to ensure competition.
- **Option 4:** government adopts a policy of separating rail freight services into an independent commercial public company. Freight services are split from passenger service, staff and freight train operating assets are transferred into a new incorporated structure with separate accounts, board of directors, and shareholders—independent of other parts of railway business. The company would operate under a network access contract with the main public passenger company. This separation recognizes differences between freight and passenger transport customers, service needs, and economic drivers, not to mention

[60] Examples of different approaches include, for example, passenger rail concessions in Buenos Aires offered in concession by the national government (including the Metro) and the Rio de Janeiro metro and suburban rail services offered by the State government.

different political profiles that typically result in higher resource allocations for passenger services when both freight and passenger transport are under the same corporation.[61]

- **Option 5:** the state privatizes the separated rail-freight company, partially or wholly; privatization variants include an initial public offering (IPO), trade sale, or concession. If national capacity is sufficient to offer and regulate access to the public rail network, privatization of rail freight is entirely consistent with continued state ownership and control of the railway network. Privatizing the public rail-freight operator on an exclusive basis may be justified (variant in Box 5.5) if the market is insufficient to support on-rail competition. But if freight-rail competition is favored, a case can be made for a period of exclusivity before implementing a policy of track access rights, which would allow enough time for a company accustomed to public sector constraints to prepare for the rigors of competition.

- **Option 6:** introduce a degree of competition in the rail-freight market through specific or general track access rights for qualified private freight train operating companies. This option offers direct market competition if justified by the scale of the freight market, but it can result in uneconomic market fragmentation in countries with lower freight density. In principle, third-party access rights can coexist with continuing public sector rail freight operation; EU countries are an example. But, new private operators can cherry pick the most profitable public operations, leaving the public rail-freight operator with a financially unsustainable traffic mix, in part because a public operator is less commercially agile and has more institutional constraints. Instead, a more commercially rational reform strategy is to first privatize the state rail company (option 5) and then introduce rail-freight competition (option 6). This would allow the state to sell its 'cherries' before other operators are encouraged to pick them.

- **Option 7:** cause a vertical separation of national railway infrastructure from all the entities offering train services. Box 5.5 presumes prior separation of local passenger services and rail freight, and would require corporate separation of inter-city passenger services into one or more inter-city train operating companies. Horizontal separation of inter-city passenger companies under public ownership may provide more commercial independence and market focus. Also, establishing a free-standing rail network company may provide a more independent and neutral framework to administrate a fair and transparent track access regime, although it is certainly not essential to implementing track access arrangements.

[61] Option 4 presumes that the archetypal railway has a substantial passenger role, that the freight company should be separated, and that the network and passenger services remain corporately connected. However, if rail-freight services predominate, and passenger services are marginal, horizontal separation to constitute passenger services as a separate train operating company would leave a vertically integrated freight company as the core public railway, offering network access under contract to the passenger company.

Box 5.5 Illustrative Structural Options within the Public Infrastructure Framework (assumes mixed-use railway with a substantial passenger role)

<table>
<tr><td></td><td colspan="5">Main Railway Functions</td></tr>
<tr><td>Main policy options</td><td>National main-line railway network</td><td>Local railway net-works</td><td>Intercity passenger train services</td><td>Freight train services</td><td>Local passenger train services</td></tr>
<tr><td>Archetypal railway system</td><td colspan="5">National public railway department or authority</td></tr>
<tr><td>1. Re-constitute as SOE/ SOC plus commercialization measures</td><td colspan="5">National public railway company (or SOE)</td></tr>
<tr><td>2. Decentralize regional/ subur-ban train operations to local authorities</td><td colspan="4" rowspan="2">National public railway company (or SOE)</td><td>National or a local public TOC operating under LGA contract</td></tr>
<tr><td>3. Concession regional and subur-ban passenger operations to private sector</td><td rowspan="6">Private passenger TOC concessionaire(s) operat-ing under service contract to central or local govern-ment authorities</td></tr>
<tr><td>4. Horizontal separation of public rail freight train operating company</td><td colspan="3" rowspan="3">National public railway company (or SOE)</td><td>Exclusive national public rail-freight TOC</td></tr>
<tr><td>5. Privatize freight train services on an exclusive basis</td><td>Exclusive national private rail-freight TOC</td></tr>
<tr><td>6. Privatize freight plus 3rd party access rights</td><td rowspan="3">Competing private rail-freight TOCS</td></tr>
<tr><td>7. Vertical separation of public infrastructure and operations</td><td colspan="2">National public railway network company (or SOE)</td><td>Exclusive inter-city passenger public TOC (s)</td></tr>
<tr><td>8. Concession intercity passenger operations</td><td colspan="2">National public railway network company (or SOE)</td><td>Competitive bidding for inter-city private passenger TOC concession (s)</td></tr>
</table>

TOC: Train Operating Company **SOE:** State-owned Enterprise **SOC:** State-owned Company **LGA:** Local Government Authority

- **Option 8:** maximize the diversification of the public framework with competition and private participation. Privatize inter-city passenger train operations through franchise or concession—as a single operation, by region, or by corridor.

Box 5.5 shows that public ownership and railway network control are compatible with a diverse, market-oriented, competitive industry structure that has substantial private participation. Box 5.5 shows that a coherent reform program can be built from re-sequencing priorities and creating variants.

The case studies in this toolkit will provide international examples of these options and variants and the industries and companies that have thereby emerged. Typically, options increase in complexity from Option 1 to Option 8, therefore, each country must evaluate its capacity to implement and administer the structure selected.

5.5.2 The private infrastructure framework

Box 5.6 summarizes the main structural options for reforming a public railway when government is willing to privatize the railway network—through sale or concession. Options presented assume a mixed passenger and freight railway; rail-freight is predominant and passenger services are subordinate. Features of each option, and possible variants, are described below:

- **Options 1, 2, and 3:** Essentially, these are the same in the public framework above. Under Option 1, central government converts a public department or authority into a state-owned enterprise or company. Under Option 2, central government separates and devolves responsibility to local government for running any local passenger services, and Option 3 is a concession for passenger services.
- **Option 4:** government creates a vertically integrated freight railway as the core railway entity. This implies separating any inter-city train operating services into an independent state-owned enterprise or company that would then operate on the predominantly freight network under a network access contract.
- **Option 5:** the state partially or wholly privatizes the vertically integrated rail-freight company through the variants of initial public offering (IPO), trade sale, or concession. In larger countries the national freight company could be divided into smaller regional freight concessions as in Brazil, Argentina and Mexico.
- **Option 6:** the state offers concessions to private operators for inter-city passenger train operations; the private passenger operators pay track access charges to private freight operators. A more common alternative is that the state offers or requires the private freight company to assume responsibility for managing the inter-city passenger services under a government contract, accompanied by contractual compensation payments to cover any losses.

Box 5.6 Main Structural Options within the Private Infrastructure Framework (assumes mixed-use railway but with a marginal passenger role)

<table>
<tr><td></td><td colspan="5">Main railway business functions</td></tr>
<tr><td>Main policy options</td><td>National main-line railway network</td><td>Local railway net-works</td><td>Freight train services</td><td>Intercity passenger train services</td><td>Local passenger train services</td></tr>
<tr><td>Archetypal railway system</td><td colspan="5">National public railway department</td></tr>
<tr><td>1. Reconstitute as SOE/ SOC plus commercialization measures</td><td colspan="5">National public railway company (or SOE)</td></tr>
<tr><td>2. Decentralize regional/ subur-ban train operations to local authorities</td><td colspan="4">National public railway company (or SOE)</td><td>National or a local pub-lic TOC operating under LGA contract</td></tr>
<tr><td>3. Concession regional and subur-ban passenger operations to private sector</td><td colspan="4">National public railway company (or SOE)</td><td rowspan="4">Private passenger TOC concessionaire(s) oper-ating under service con-tract to central or local government authorities</td></tr>
<tr><td>4. Horizontal separation of public inter-city train operating com-pany</td><td colspan="3">National public rail-freight company (or SOE)</td><td>National inter-city passen-ger TOC</td></tr>
<tr><td>5. Privatize freight railway as a vertically integrated entity(ies)</td><td colspan="3" rowspan="2">Privatized national rail-freight company (ies) (single or multiple regional concessions)</td><td rowspan="2"></td></tr>
<tr><td>6. Concession or contract inter-city passenger services to the private sector</td><td>Inter-city passenger TOC under government contract: private concession or pri-vate rail freight company (ies)</td></tr>
</table>

TOC: Train Operating Company **SOE:** State-owned enterprise **SOC:** State-owned company **LGA:** Local Government Authority

- **Option 7:** introduce a degree of competition in the rail-freight market through specific or general track access rights for qualified private freight train operating companies.

5.5.3 Reform motives and reform choices

In either infrastructure framework—public or private—not all options are relevant for all countries, and option variants can be tailored to national circumstances. Restructuring is a pragmatic search for a model that works in specific markets and in which railway management objectives are reasonably aligned with national policy objectives for railways, not an exploration of 'ideal' models or theoretical elegance. Railways need to be continually changing to adapt to changes in markets and technology. The case studies in the book illustrate many useful alternative approaches.

Clearly, market structure affects model choice. Private infrastructure framework options have been adopted by governments in countries heavily dominated by rail freight markets, where long-distance passenger rail services were marginal in the overall transport system. These governments view meeting freight transport demand as a role for the private sector in a market environment so that government need not be directly involved. If passenger demand and service dominates the national rail network, most governments have discerned a much stronger public interest or political benefit in state involvement and been unwilling to privatize the railways network, except for Japan and the UK, but subsequently reversed in the latter case.

Markets also matter within each framework. Options for horizontal separation of regional or urban passenger services make sense only if there are significant subnetworks of these services. Options for multiple freight operators make sense only if overall freight markets are strong enough to sustain multiple operations.

The frameworks and their variants imply a measured, progressive, rational program to rebalance the public and private sectors, redefine competition and regulation, and reset boundaries between industry sectors. Such a program will transform an archetypal and monolithic railway into a diverse, decentralized, pluralistic industry that is transport market-focused and responsive. Ideally, this type of providential program would emerge by stages in a country that has well-developed policy and implementation skills, sufficient transaction resources, and a meticulously designed program prior to implementation. However, in reality, many governments are rudely awakened by the alarm bells of necessity for railway restructuring only when time and money have run out.

Reformed structures will boost management incentives to improve efficiency, offer more control over public expenditure, and create better value for public money than the traditional monolithic railway. Some options can also reduce public budgetary support for rail systems, but that is a separate objective and typically requires a separate policy decision. However, only radical downsizing of the network, services, and/or employees will reduce a large public subsidy quickly in a publicly-owned railway, and if the market can bear it, increasing tariffs. If these are the imperatives of the situation then the quest for a new long-term industry structure may need to take second place to more immediate surgery on the existing structure.

Although crisis responses are sometimes inevitable, well-considered policies consistently applied over the long term are more successful in supporting public interests than 'slash and burn' solutions that may result in a demoralized workforce operating a poor service with underinvested assets. Even emergency surgery will make more sense in the context of a longer-term structural strategy to create a competitive railway that is affordable to users and taxpayers.

The Case Studies contain descriptions of many railway industry structures and individual rail entities that illustrate structures described in this toolkit. Individual case studies illustrate variants of core railway structures. Collectively, the case studies illustrate the diverse solutions to organizing a national railway industry.

5.6 Dealing with Non Core Activities

In much earlier times, archetypal railways needed to be highly self-sufficient. Often, they manufactured at least some of their own rolling stock and/or constructed their own infrastructure according to the specifications of their own design offices, in which they employed engineering staff who had been trained in their own educational institutes. Railways also printed their own tickets, timetables, and manuals, employed their own security force, and sometimes accrued other businesses such as hotels, ferries, ports, haulage companies, and so on.

Few railways now retain such a wide range of activities. This section explains the historical reasons behind archetypal railways initiating so many non core activities, why most railways now find it necessary and desirable to reject this strategy, and business processes for dealing with these non core activities.

What is 'core' business? 'Core' is generally interpreted to mean the market focus of organizational activities—a focus that differentiates a business from its competitors, or from activities of other sorts of businesses.[62] For railways the core business is delivering competitive transport services through efficient use of railway technology. Constructing railway lines, manufacturing rolling stock, or printing tickets and timetables are non core activities—not only unnecessary for a railway to do itself to be successful, but also responsible for diverting resources from the core business.

Four main groups of activities associated with archetypal railways can be considered, prima facie, outside the 'core' railway business. These are social and recreational services for employees; materials supply and manufacturing companies; business support services; and 'extended' businesses that are ancillary, diversified, or involve real estate holdings. Box 5.7 gives examples of such activities.

[62] An influential management text by Peters and Waterman (1982) identified poor results among companies that diversified beyond their fields of real competence, and concluded that an organization's core business consists of activities delineated by its core competencies.

Box 5.7 Examples of Non Core Activities in Railways

Social & recreational employee services*	Railway materials & manufacturing	Business support services	'Extended' businesses
Schools Universities & institutes Clinics Hospitals Nursing homes Staff housing Social clubs Sporting clubs Staff holiday resorts	Quarries (ballast) Forests (timber ties) Concrete ties Mines (steaming coal) Power stations Railway sleepers Maintenance tools Locomotives Coaches and wagons Rail motors and units Wheels & brake shoes Track circuits & relays Telephonic equipment Office furniture	Occupational health Occupational training Engineering design Architectural design Construction services Heavy repairs Vehicle cleaning Printing & publishing Police & security Railway banks	Car parking Hotels & restaurants Train catering Road haulage Passenger road coaches ICT & logistics parks Freight & pass ferries Forwarding & logistics Travel agencies Rolling stock leasing Property development Advertising

* Occupational health and training should be treated as a railway business support service

Modern, competitive railways must concentrate on sourcing and procuring those necessary but non core services in the way that will best support the core transport business. They must pose a number of questions. Is the activity necessary at all? If so, what are the alternative sources of supply? Which alternative delivers the activity at the most efficient cost?

Each group of activities shown in Box 5.7 has a different origin and rationale, therefore each requires a somewhat different assessment.

5.6.1 Social and recreational services to employees

During the mid-nineteenth century, large companies in industrializing economies, including private and public railways, began to extend social benefits to employees and their families to attract and retain workers and minimize absenteeism. In the railway industry, pressures to provide employee benefits such as health care, education, and employee housing emerged as railways expanded their territories into more remote locations. At that time, most central governments provided no such services or benefits for its citizens.

Healthcare

Early railways work was hazardous and many employees were killed or seriously injured in the line of duty, particularly at railway construction sites, marshalling and heavy repair yards, and often in remote locations. The railway industry had to make its own response and in the USA, for example, private railway companies began to employ their own medical specialists. U.S. railway medical services expanded to an array of health services including routine check-ups, vision and hearing tests, obstetrical care and advice to railway managers on workplace safety and sanitation. By 1896, American railways employed over 6,000 railway doctors and operated 25 hospitals that treated over 165,000 patients annually.

Education

Early railway companies provided education services to impart specialist railway knowledge and skills that were unavailable in trade schools or universities. Later, education services expanded to include basic education for workers' children in remote railway communities. In countries such as Australia, Canada and Russia, railway communities were often the first settlements to be established and railway-provided schools were often the only viable means of obtaining an education.

Housing

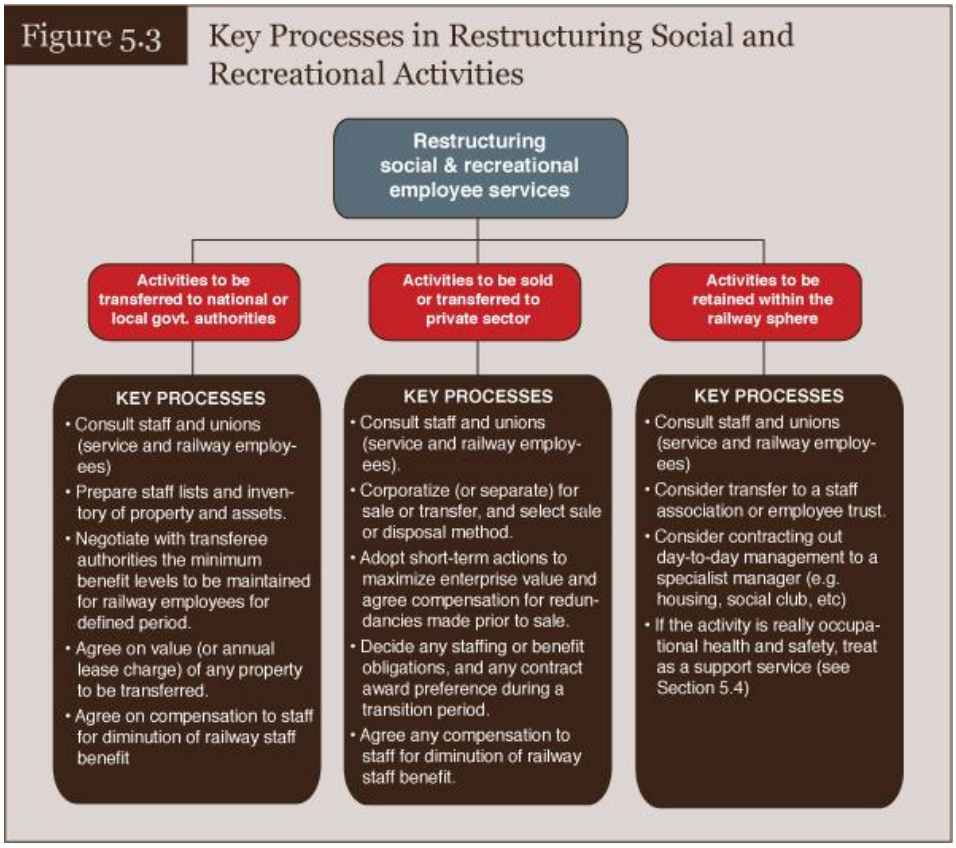
Since railway communities were often the first settlements in remote areas, railways provided housing for new railway workers and later found it convenient to own houses or flats to facilitate staff mobility, for example, among station masters and superintendents.

During the twentieth century, railway-provided social services expanded in many socialist countries as governments decreed state-owned enterprises a main channel for social services delivery. Soviet railways provided their workers with a full range of health, education, and housing benefits from cradle to grave. In addition to health, education, and housing, the paternalistic age of railway companies provided or supported many other staff benefits such as libraries, annual social events, and social and sports clubs.[63]

Today, few railways provide social services. Demand has declined because many trade unions and employees now prefer to rely on national schemes rather than company benefits. Insurance products are available to protect against adversity, and labor markets are more mobile. On the supply side, central and local governments now provide social services, which have expanded rapidly throughout the world, replacing services once provided by companies and state-owned entities. Moreover, railway companies could sustain these services *only* because they had enjoyed a virtual monopoly in long-distance land transport. After WWII, rail modal share declined, as did absolute traffic levels in some countries, which demanded financial stringency and market focus. Railways could no longer afford to divert increasingly scarce resources into activities better provided by other branches of government, and could no longer guarantee employment security and 'cradle-to-grave' benefits. Now many railways explore other supply options for non core activities. For example, even occupational health and safety training, which supports railway core competencies, can be contracted out.[64]

[63] Amongst many famous football clubs that began as railway teams are Manchester United, Locomotive Leipzig, and Moscow Dynamo.

[64] A website for a medical services firm in Europe highlights services to railway management, which includes fitness-for-work assessments; drug and alcohol screening; medication advice for safety-critical workers' absence management; heath surveillance; and trauma advice and counselling.



Dealing with the issue of social services remains a key first step in the process of streamlining railways to meet market competition. Most railways in developed countries, in the former Soviet Union and Eastern European transition countries, and in China, have successfully withdrawn from providing many social services.

Railways that retain a significant range of social activities, but seek to lessen their burden, should consult Figure 5.3 for a basic division into three types: (i) can be transferred to more appropriate public providers such as central or local government departments; (ii) can be sold or transferred to a private provider; (iii) cannot be readily transferred to a more appropriate provider, and supply important benefits to maintain staff morale.

Key tools, or business processes, to handle these three categories appear in Figure 5.3. (Occupational health and safety functions are carved out of these categories and treated as a business support service).

Experience suggests that most social and recreational activities can be restructured within such a framework. Activities must be discontinued if they fail to demonstrate significant value to staff morale and productivity, and cannot be transferred to a more appropriate provider, using fair procedures to deal with any retraining or redundancy.

However, adjusting long-established worker benefits requires utmost caution and respect, because employee resentment can easily spill over and impair other aspects of railway reform. For this reason, the proposed process includes the highest requirement for staff communication and consultation. Ultimately, if some em-

ployee benefits are cost-effective, not easily transferred to a more suitable provider, and demonstrate high value in terms of staff morale, it is often best to retain and improve them.

5.6.2 Railway materials and manufacturing enterprises

Historical reasons abound for railways annexing materials supply and manufacturing. Industrial development and international economic competitiveness drove railway construction in nearly all countries. Typically, these railways adopted national or imperial-based technical and engineering standards. National (or imperial) supply industries were often protected by import restrictions, tariffs, and local purchasing policies, and larger countries manufactured their own locomotives, rolling stock, signaling systems, and other infrastructure components.[65]

Many early railway manufacturing and materials companies were privately owned and independent from the core railway. But the mutual dependence of 'large buyer/large seller' led some railways to develop their own manufacturing capability. Moreover, in China, Great Britain, India, and the Russian Federation, railway nationalization and integration led to co-locating ministerial or departmental structures with responsibility for both railway system and manufacture of capital assets.

When supply chains were less efficient or competitive, some railways sought to control their own supply of strategic materials. As a result, it was not uncommon for railways to own mines for high-quality steaming coal for locomotives, quarries for ballast, and forests for wooden sleepers. Later, some railways even built their power stations to avoid dependence on monopoly suppliers, or to ensure power in areas of low availability or reliability.

Supporters of integrating railways with manufacturing and materials supply pointed to the benefits of controlling specifications and prices, and the manufacturing units enjoyed secure and predictable demand levels. In planned economies, political support was attracted to the theoretically higher savings from the 'efficiency' of joint planning of supply and demand for enterprise outputs.

Today, most countries have dismantled these structures in all industries, not just railways, because experience has proven that the exclusive relationships of co-owned public industries reduced incentives for efficiency and innovation for both. In the railway transport industry it produced technologically outmoded locomotives, rolling stock, and other equipment. In railway manufacturing industries, it undermined their potential to be internationally competitive.

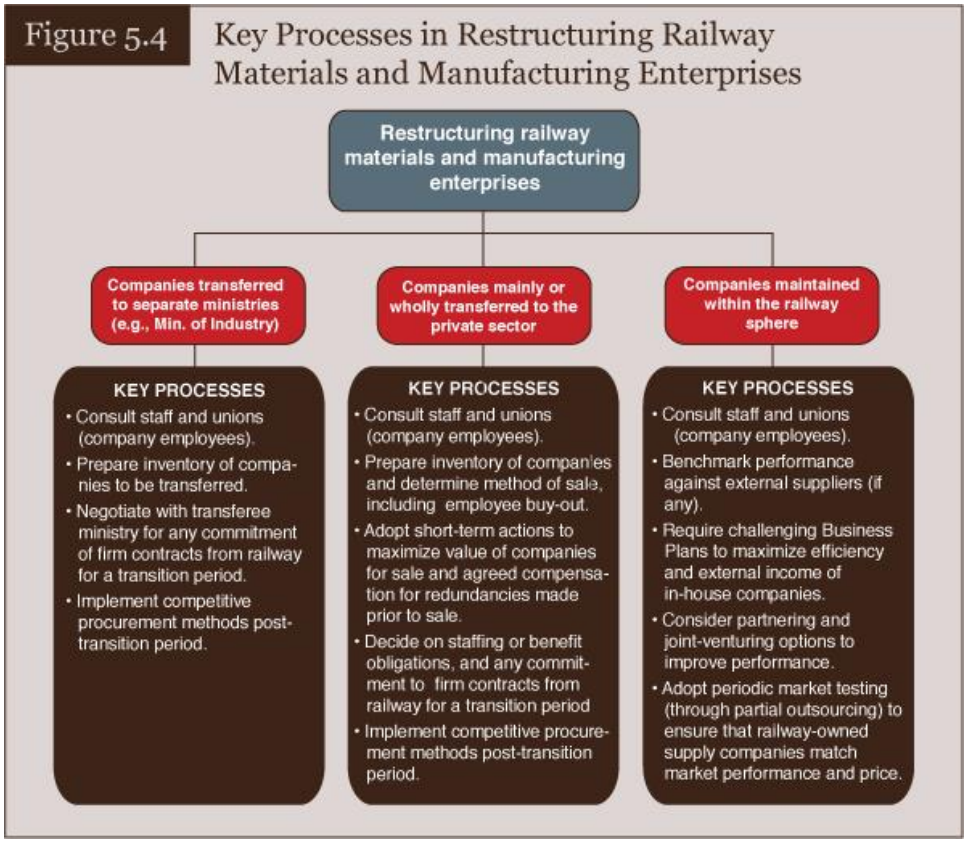
Today, the railway supply industry is diverse, global, and competitive. Nearly all capital equipment and materials for railway infrastructure or operations can be

[65] The most striking impacts of such policies survive in Europe in a patchwork of sub-systems that include four main track gauges, eight main signalling systems (and twelve others), six main electrification systems and sundry other differences in loading gauge, pantograph headroom, maximum axle-loads, direction of running, safety systems and others.

procured competitively using domestic or international tendering. Technical ability to specify and monitor railway equipment performance is a core railway competence, particularly for assets that provide competitive advantage in the transport market. However, preserving significant manufacturing capability within a railway transport organization is difficult to justify because the required competencies do not serve the core business of passenger and freight transport. Some railways might try to make a business case for manufacturing if they require spare parts with non standard specifications to run their inherited bespoke system, but it is nearly always possible to source parts through franchising or contracting with an outside company.

Retaining manufacturing capability undermines railways competiveness but the social and industrial consequences of withdrawal may be significant, although they can be mitigated. Railways must establish a process that provides sufficient time for developing an effective procurement strategy, and for divesting manufacturing and materials plants in a way that maximizes ownership value and increases the probability of success as an independent entity. In lower-wage economies, international manufacturers typically create alliances or joint-ventures with local plants.

Figure 5.4 suggests a division of railway materials and manufacturing suppliers into three types of companies: (i) industries or public enterprises supervised by a separate ministry to reduce procurement conflicts of interest; (ii) companies with full or majority private ownership; and (iii) companies maintained within the railway sphere because they provide critical materials or parts unavailable through normal competitive means, and/or that have no private sector markets.



These processes are based on pursuit of long-term interests of the core railway and the enterprises. During these processes, it is possible to discover that some materials and manufacturing activities have no value—for the railway or other parties—even with incentives, such as a commitment to purchase outputs for a specified transition period. The only sensible commercial decision is to close them down.

5.6.3 Business support services

Most railways developed a wide range of in-house business support capabilities as shown in Box 5.7. Railway management, often delegated to regional administrations, viewed the railway industry's specialized needs as core competencies because private suppliers might be unavailable locally or too distant to be reliable.

The regulatory environment also favored large national railways supplying their own services. For example, policing the railways required statutory rights and duties, such as the power to perform arrests. Government was more comfortable bestowing these rights on a national railway than a private supplier. Similarly, national management positions such as Chief Civil Engineer or Chief Mechanical Engineer sometimes carried statutory legal responsibility for the safety of assets under their management, which inclined them to preserve direct personal control over the organizations and plants that maintained the assets.

Bureaucratic incentives have shored up large in-house service structures well past their useful lifespan. The archetypal railway management structures encouraged empire building rather than profit making—greater staff numbers and bigger budgets were key to increased corporate influence and rewards, so each region and department would build up their own business support service units in addition to their core units.

Today, thanks to improvements to supply chains and the electronic communications needed to source and manage them, a wider range of private suppliers offers access to many of the services that most railways need. Some railways buy services in volumes sufficient to influence the shape of the supply industry in a way favorable to those railways.

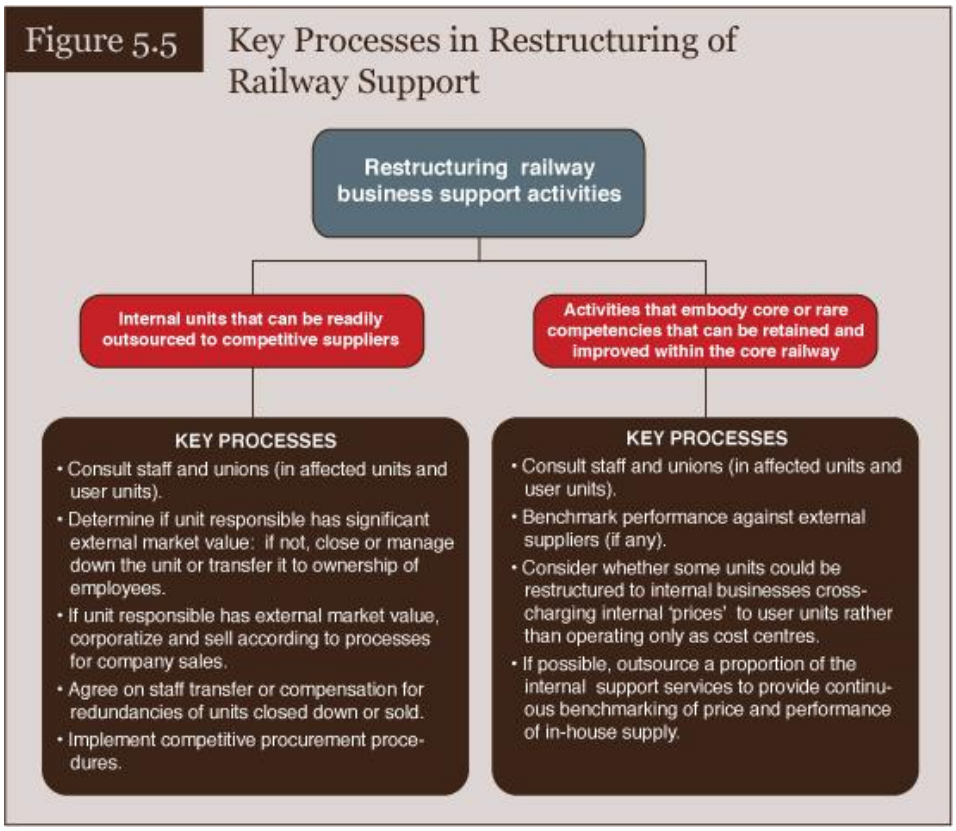
Similar to other industries, railways must decide which support services to retain in-house and which to outsource, based on business justifications for each compared with the alternative of contracting out. This will differ from railway to railway, and service to service. Some service activities embody core skills or competencies, which if divested entirely to outside contractors, could increase critical risks, or reduce organizational ability to assess or control those risks. For other services, the external market may be too thin or poorly developed to justify competitive outsourcing. But, modern railways have found that many non core services can be reliably outsourced, sometimes improving the quality of service and almost always providing long-term cost savings that improves competitive advantage in the core transport activity.

The strategy for rationalizing internal business support activities has important social and industrial dimensions that must be sensitively handled, and will require

complementary changes to procurement strategies, similar to the strategy for divesting materials and manufacturing. Figure 5.5 suggests processes for restructuring: (i) activities that can be readily outsourced to competitive suppliers; or (ii) activities that embody core or rare competencies that can be retained and improved within the core railway.

Retained activities require further evaluation and upgrading. All large organizations find it difficult to maintain pressures and incentives for high performance in units shielded from daily contact with external customers or competing suppliers. Figure 5.5 suggests strategies to strengthen incentives, including 'internal pricing' and external benchmarking through partial external procurement.

Figure 5.5 Key Processes in Restructuring of Railway Support



5.6.4 Extended businesses

The final category of non core activities includes three types of businesses that extend railways services beyond passenger travel or freight transport. Here they are treated, prima facie, as non core but sometimes they are not, as discussed below.

Ancillary passenger businesses

Ancillary businesses widen the range of passenger services to include station car parks, railway hotels and bars, train catering, and left luggage offices, among others. On-board services are restricted to rail travelers but the other businesses developed as an adjunct to passenger marketing or an opportunistic commercial venture, supported by regular passenger flows that provide customer turnover.

The general value of these activities is undisputed. However, many railways have found that the best way to maximize the performance and value of such activities

to the core railway business is to sell, lease, or franchise them to businesses with the greatest competencies in the activities, thereby generating the highest net revenues. These include specialist car park operators, hotel chains, fast-food franchises, and so on. This enables railway managements to concentrate on their core business *and* get the best value from extended businesses through revenues from sales, leases, or franchise payments.

Property utilization businesses

Some business activities utilize railway assets in ventures only tenuously connected with transport, if at all. These include telecommunications companies that use railway rights-of-way, train stations redeveloped as retail or offices, advertising hoardings, and commercial car parks, among others.

Strategies that unlock revenues from railway property and other assets are to be applauded, but rarely do railway companies have specialized expertise in property development to maximize asset value. Therefore, the best strategy may be to monetize unused land, and sell or lease access or air rights to the highest bidder, depending on core railway capital needs. If projects require longer-term cooperation between railway and property developer, the railway could choose to share longer-term risks and rewards through a joint-venture in special-purpose companies, tapping into specialist partners' skills and expertise as needed.

Supply chain diversification businesses

Some business activities increase railway market reach through diversification into the supply chain, mainly in freight, but also in passenger services. Examples include companies that handle road haulage, bus services, ports, ferries, logistics, travel agencies, wagon leasing, and shipping among others. Some of these are complementary to rail services, such as truck or bus rail-feeder services, but some railways have also invested in competing long-distance transport operators.

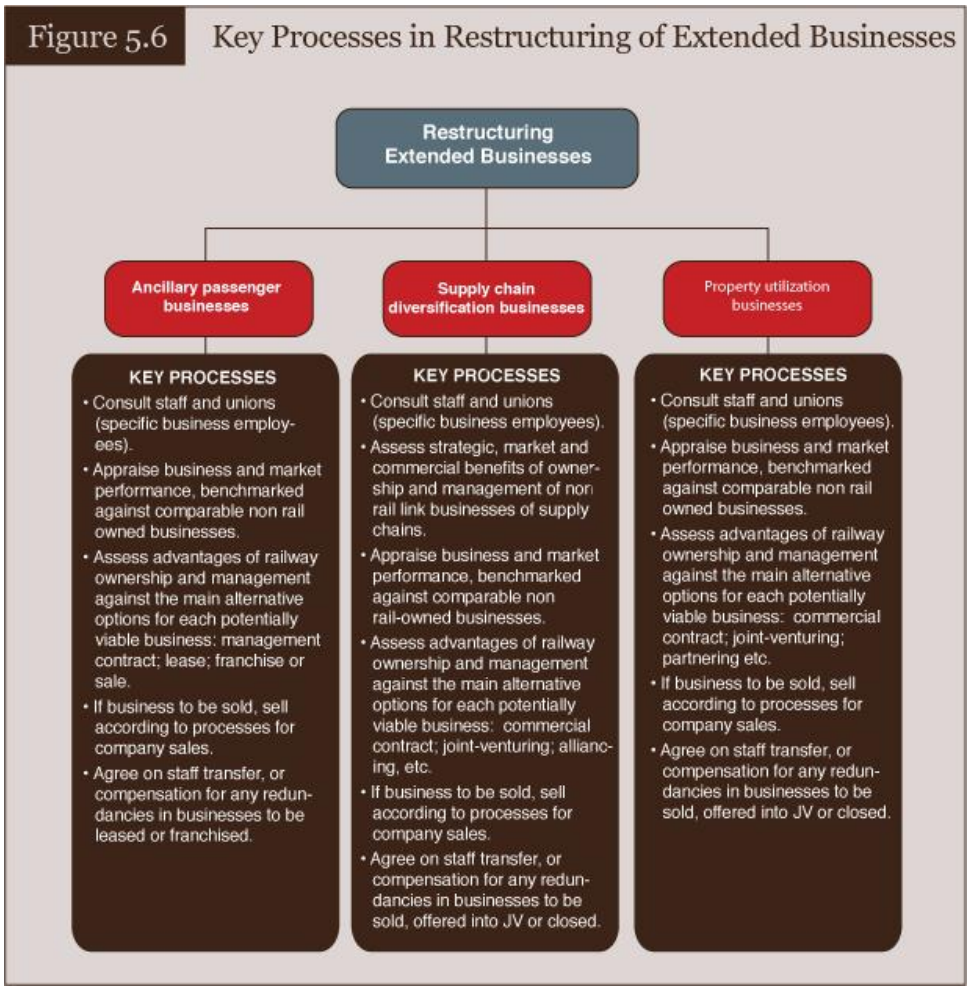
In the most persuasive cases, these businesses were acquired to expand core rail operations beyond just running trains into the larger world of freight transport and logistics or, in the case of passenger-related services, into travel and tourism. Through acquiring or developing extended businesses, railway management can access competencies neither found nor retained in a traditional railway enterprise. However, most railways have substantial investment needs but limited capital. They should therefore also consider contracting, joint-ventures, or partnering with specialist organizations to extend their business or integrate other services.

Diversification decisions must be supported by thoroughly researched market potential and commercial viability, or valuation of potential synergies from co-ownership of core and extended business. Instead, some unsuccessful examples of diversification have resulted from a 'copy-cat' response to another railway that has successfully diversified but in a different market environment. The reasons for other diversifications have been superseded by changes in market demands and endure only through inertia.

Generally, this toolkit advocates against diversification and in favor of management focus on improving core railway business, particularly when the core business faces capital constraints or requires on-going budgetary support. However, a

well-supported business case would justify exceptions. Railways contemplating restructuring should review all extended businesses and select the most efficient business strategy. Figure 5.6 presents a process for reviewing and for any restructuring activities in the three groups described.

Figure 5.6 Key Processes in Restructuring of Extended Businesses



5.6.5 Use of professional advisers

The complex process of analyzing and restructuring non core railway activities involves appraising large numbers of diverse activities, in diverse corporate forms, involving distinct skills, operating in distinct internal and external markets. No transport ministry and few railway organizations have all the skills to develop and implement a strategy to rationalize non core activities.

Also, the process of implementing reforms is industrially sensitive—always in the affected units and often in the core-railway itself—and if prolonged, liable to depress worker morale and performance and guaranteed to encounter opposition. Neutrality and deep expertise is required to separate legitimate commercial issues from entrenched vested interests.

For these reasons, external business consultants are the best choice. They can supply the requisite range of competencies and independence to undertake business appraisals, identify the best alternatives, and assist in implementing the recommendations.

6

Railway Reform:
Toolkit for Improving Rail Sector Performance

Chapter 6:
The Roles of Government

6 The Roles of Government

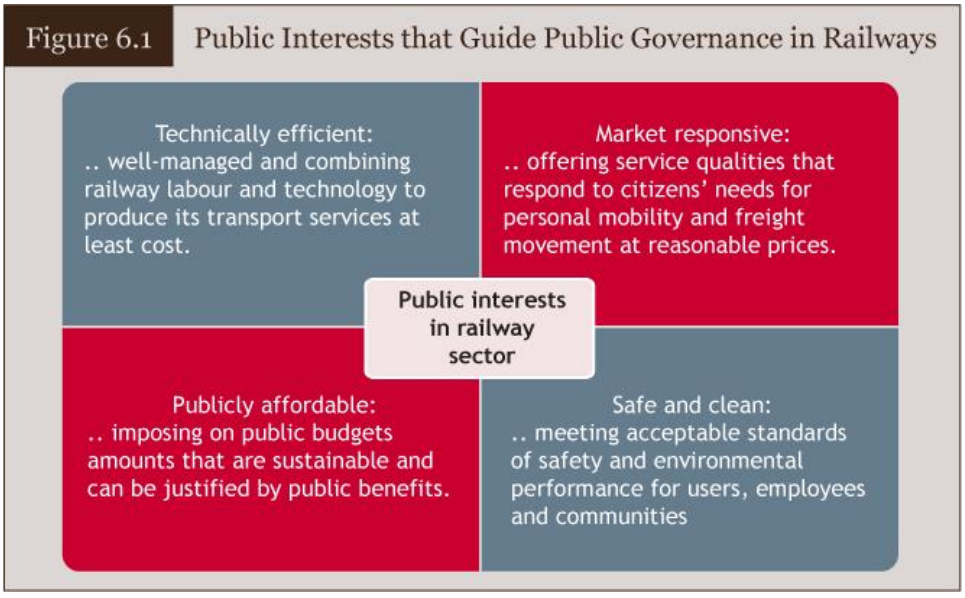
6.1 Government, Railways, and the Public Interest

Chapter 6, 7 and 8 address the roles of government in the railway sector. Collectively, the execution of these roles is referred to as sector governance, to distinguish it from corporate governance (the governance of the individual railway entities themselves).

Essentially, this toolkit promotes greater market focus and commercial orientation in the railway sector, so it may seem surprising that the role of government is given such prominence. But experience shows that government actions are always influential and often decisive in helping or hindering a successful railway industry. Rail sector governance affects who may be industry participants and the terms on which they compete, environmental and safety standards, the extent of public financial support, long-term infrastructure development, among many other factors. All of these are matters of public interest—hence also of government interest.

What are these public interests for railways? This toolkit defines public interests as the following: the railway industry should be efficient; railway service levels and quality should respond to market demands while maintaining affordability for the public purse; and rail services should maintain national—and increasingly international—safety and environmental standards (Figure 6.1).

Figure 6.1 Public Interests that Guide Public Governance in Railways



The seven main roles in which governments pursue these public interests are summarized in Figure 6.2.

Figure 6.2 Main Roles of Government in the Transport Sector

1. Setting a national transport strategy	The overall policy aims and framework that govern how railways and other modes of transport will be developed and operated.
2. Creating railway sector structures	Primary industry institutions, balance of public and private sector roles, and the competitive framework for railways.
3. Purchasing transport services	Methods by which governments specify and purchase railway services or special fare concessions on behalf of the community.
4. Regulating the industry	Institutional and methods of administering economic, technical, environmental and safety regulations.
5. Facilitating international railway integration	Inter-governmental frameworks that promote interoperability and seamless service across borer.
6. Establishing the administrative apparatus	The organization of ministries to perform the above roles generally, including supervision of entities in the railway sector.
7. Ownership*	How the government exercises governance over railway entities it owns.

* Outside North America, Government typically owns the railway infrastructure, and often also owns the railway opera-tor(s).

While overlap exists among these government roles, it is useful to consider them individually, not least because the success of each role requires unique skills and tools. The remainder of this chapter provides a discussion of each role. More details are presented elsewhere in this toolkit.

6.2 National Transport Strategy

The railway industry is subject to the overall umbrella of government policies and actions for the transport sector as a whole. Transport strategy specifies sector-wide objectives and then adopts consistent principles and establishes priorities for using public resources, including the railway sector, to attain the sector objectives.

Many countries lack an explicit or documented national transport strategy. Nevertheless, an overall umbrella exists, whether it is strategically coherent or not, and the nature and consistency of the fabric of the umbrella will influence the fortunes of those who shelter beneath it.

National transport strategies may differ between countries, but broad government policy aims and principles for transport within a country should be coherent when applied to the sector as a whole, i.e. independent of mode. Similarly, public policy instruments should minimize obvious conflict between modes. This, however, can be difficult to achieve in practice because policies (for public infrastructure investment, infrastructure cost recovery, transport taxation, and environmental and safety regulation, among others) often are formulated by different groups of people, pursuing different objectives, in different modal departments, using different economic principles and tools.

In most countries, transport demand is highly market-driven[66], but transport supply depends heavily on government policies for funding public infrastructure. In most countries outside of North America, including developing countries and Europe, rail passenger and freight traffic moves on publicly-owned networks, while most road freight, road coach services, and private vehicles travel on publicly-owned roads. However, public funding for developing and maintaining each modal network (and other public networks such as airways or inland waterways) is not always aligned with an overall national transport strategy via a multi-modal assessment. Similarly, infrastructure regulation and infrastructure pricing policies are often established independently. Both factors influence the relative fortunes and potential of industries that use this publicly funded infrastructure.

In most countries, governments consider the road system to be a 'public good'—government is responsible for planning and funding highway network enhancement, expansion and maintenance, except for a few toll roads. Government responsibility for the highway network is presumed, and large national permanent administrations exist in almost every country to plan, finance, and manage road networks. Full cost recovery is neither possible nor expected for national road networks, other than for trunk routes.

By contrast, railway network development is often presumed to be an internal matter for the industry, rather than national policy issue, although there are some notable exceptions, such as French high speed railway (See the case study on SNCF Réseau). Government funding or investment in railways, other than for prestige projects, is considered to be a temporary aberration, which could be avoided if the rail industry was restructured or privatized. In reality, substantial public funding underwrites national railways, but this funding tends to be sporadic rather than systematic, handed over in amounts that fluctuate arbitrarily and unpredictably. As a result of this erratic flow of funds, financial management of many public rail systems flounders, seeking to achieve both short- and long-term stability based on a combination of deficit support, fare subsidy, maintenance back-log, and system enhancement. In fact, international experience has demonstrated that full infrastructure cost-recovery directly from railway users is infeasible in most countries, particularly for newly constructed lines[67].

The issue is not about providing public spending parity. Rather, it is about ensuring that public investment in each mode makes economic sense in light of overall transport policy. A rational and economically justifiable balance between modes can emerge only from a national transport strategy that applies common policy

[66] This is evident in countries such as Poland and Russia, where the shift from a centrally managed economy to a market-oriented one following the collapse of the USSR led to a massive shift of both passenger and freight traffic on the railway to the road sector. This is discussed in the case studies on the restructuring of Polish Railways (PKP) and Russian Railways (RZD).

[67] Full cost recovery would include total capital costs of building, renewing, or expanding railway infrastructure networks. Even in countries with relatively high average traffic density, traffic on the high-density rail corridors typically cross-subsidizes infrastructure costs in the less densely trafficked parts of the rail network.

aims and consistent benchmarks to planning and evaluation of public transport investment performance.

Similarly, if safety and environmental standards[68] and compliance regulations differ between transport modes, national safety and environmental regulations can affect modal operating costs, thereby affecting customer choices. The 2015 OECD guidelines[69] emphasize the importance of avoiding using differential standards or regulations as an indirect mechanism to shift traffic between modes.

Achieving inter-modal consistency within a national transport strategy is not easy. Common accounting and cost allocation methodologies, and costing principles need to be developed and implemented, to minimize pricing distortions between modes.

National transport strategies should help establish broad policy principles and settings. These cover a range of issues, including sector governance, public and private sector roles, the extent of competition, the types of interventions necessary to attain coordination and integration between modes, the nature of regulation, and consistent pricing principles across modes. They may also include integrating global warming policies with transport policies, ensuring meeting the transport needs of disadvantaged and remote populations, integrating transport infrastructure planning with land use planning, encouraging private participation in both provision of infrastructure and provision of services, and applying consistent safety and security standards. The role of government in establishing a level playing field for transport modes is thus complex, but it is better done imperfectly than not considered at all.

6.3 Railway Industry Structure

Focusing on the railway sector, the second role of government is to create or modify rail industry structure by determining which institutions will deliver rail transport services and developing the policy environment in which they will operate.

Every national government inherits an existing railway industry structure, and most continue to administer it extant, either because railway performance is judged adequate, or because the perceived difficulties and political risks of change outweigh expected benefits. International development bank experiences in the sector have shown that a national appetite for radical reform occurs only in the face of chronic deterioration in railway operating performance, a rail industry financial crisis, a major shift in political ideology, or some combination of these[70]. Moreover, experience shows that conditions for achieving reforms include sufficient public support to counteract the losses of vested interest groups when reforms are enacted, and a cadre of professional administrators or advisers sufficiently motivated

[68] Regulations include market-entry licensing, standards for driver or operator training, vehicle environmental compliance, load limits, hours of operation, hazardous cargo movements, and so on.
[69] OECD, Guidelines on Corporate Governance of State-Owned Enterprises, 2015 Edition.
[70] Examples of the range of combinations of these 'triggers' are provided by the Case Studies included as part of this Toolkit, such as the Polish Railways, Camrail (Cameroon) and Mexican Railways.

and skilled to guide the reform process. The confluence of these factors is rare enough that radical structural reforms in national railway industries are relatively uncommon. Nevertheless, government remains responsible for railway industry structure—maintaining a sinking railway industry with scarce public funds is, by default, a policy decision.

Recognizing this, governments cannot avoid structural decisions. This is most obvious in countries with publicly-owned railway delivery institutions, but also true in countries with railways that are predominantly privately-owned. For example, merger proposals for private American railways invariably trigger government investigations into the competitive risks and potential benefits of such mergers. Whether private or public, the industry structure should permit it to respond to market forces. Government has a critical role in industry governance, but providing sector or corporate governance should not mean micromanaging individual institutions. For a corporatized railway, whether legally organized as a public entity or as a private corporate enterprise with 100% State ownership, government has an ongoing oversight role as sole shareholder, and there is a natural temptation to extend that role in order to encourage the SOE to meet other policy goals[71].

The previous chapter addressed industry structure, including three main building blocks—business organization, market competition, and separability. Business organization is the railway's degree of commercial orientation, including the presence or potential extent of private sector ownership or participation. Market competition is the degree to which railway transport services are contestable through either competition in the market or for the market. Separability is the degree to which the archetypal railway's monolithic industry structure can be split into sub-businesses with decentralized management. The strategic nature and significance of these choices and alternatives were addressed in detail in Chapter 5.

6.4 Purchase of Transport Services

Most governments influence the passenger services that railways provide and the tariffs charged for those services. They do so for a variety of reasons.

If transport policy aims for equity, basic transport services are considered similar to health or education—a service that government should ensure is accessible and affordable for all citizens, including disadvantaged, low-income, or remote populations. If an environmentally-oriented transport policy aims to encourage the use of railways, subsidized services and prices for services make rail an attractive alternative to private vehicle use. If policy is based on the precepts of welfare economic theory, then it may favor charging only marginal costs for use of services, leaving government to pay for the fixed costs of infrastructure.

Budgetary support of passenger transport services is a common and legitimate public policy choice. However, budgetary support should not imply simply picking up the bill for whatever losses occur. Unsustainably high passenger rail subsidies, exacerbated by political pressure to avoid fare increases, create long-term funding instability, underinvestment, and unreliable low-quality services. Instead, budget

[71] This is discussed in more detail in Chapter 10 below.

support should be targeted to those it is intended to serve. Operators should receive incentives to improve efficiency and revenues. The budgeting process should be open and transparent, to underpin long-term affordability and ensure that the policy choices are visible to stakeholders.

Central or local governments can achieve these aims by purchasing railway services through a contractual mechanism such as a Public Service Obligation (PSO) contract or Passenger Services Contract (PSC). These purchasing models are described in Chapter 8, along with a discussion of opportunities for arranging competitive bidding for those contracts, seeking the best value for public money through competition for the market.

Although the purchasing models in Chapter 8 are most directly relevant to passenger rail, a few legitimate government-imposed obligations exist in specific freight markets, such as hauling relief supplies to areas suffering natural disasters, or moving emergency military or civilian resources to respond to emergency situations (earthquakes or floods, for example). However, governments that own shares in mining operations, oil production and refining, steelworks, or similar industries sometimes pressure rail freight managers to keep tariffs artificially low to support so-called 'strategic' industries.[72] Because this type of intervention is difficult to justify with economic arguments, this toolkit recommends avoiding such interventions.

6.5 Industry Regulation

The fourth role of government in the railways industry is to establish regulatory systems to protect or advance the public interest. Government is responsible for developing the regulatory framework, administering some of the regulations, and delegating the rest to specialist administrative bodies.

This toolkit addresses economic, safety, environmental and technical regulation (Figure 6.3). Regulatory systems must be designed to suit industry policies and structures. For example, where there is a high degree of competition between railways and other transport modes, or between different railway operators, economic regulations may be minimal or aimed merely at sustaining that competition, particularly in cases where the railway has a natural monopoly or quasi-monopoly. Similarly, granting of infrastructure access rights to competing users requires a national system to regulate infrastructure access.

The ideal requirements of any regulatory system are: independence of the regulator from the organizations and/or agreements it is regulating; open and transparent deliberations; accountability of regulators for their decisions; and regulatory principles that are clearly enunciated and consistently applied. Regulatory models that aspire to these principles are described in Chapter 9.

[72] 'Strategic' in this context may mean little more than industries with more political influence than the rail freight industry.

Figure 6.3 Main Areas of Regulation

1.Economic	May include industry entry, service standards, and pricing orf rail services,and/or access to infrastructure.
2. Safety	Includes processes for protecting passengers, employees and communities, compliance and incident investigation.
3. Environment	Includes the impact of rail transport on rail corridor communities and wider impacts such as carbon emissions.
4. Technical	Includes technical norms and standards to ensure an integated, safe and environmentally acceptable rail infrastructure and services network.

6.6 Transnational Railway Agreements and Treaties

The fifth role of government is, as facilitator of international rail integration, increasingly important to the railway industry in many regions. Most railway networks now are owned and operated within national borders, resulting in multiple barriers for railways, particularly rail freight services[73]. This may have been acceptable before globalization, but international transport, because of its cost effectiveness over longer distances, now represents a large, fast-growing and potentially profitable market for railways. Inward-looking policies impede international rail corridor development, creating the following problems.

- **Absence of transit management:** International freight train transits are not necessarily actively managed to achieve a specific origin-destination train path. Instead, some national railways simply move trains from border to border according to their own methods of working. After border processing is completed, trains are allocated to whichever train paths are available. Therefore, unpredictable border processing times creates unpredictable train path assignments. Prior to the EU initiatives of 1991, this was generally the case in Western Europe. It remains an issue in both the operation of the existing narrow gauge network linking Kenya and Uganda and the development of a new standard gauge network in East Africa[74]. Moreover, international trains do not always obtain priority in train path allocation, locomotive assignments, me-

[73] In Southern and East Africa, network development in fact preceded national boundaries. The Cape Gauge network linking South Africa, Namibia, Botswana, Zimbabwe, Zambia, and the copper-belt region of DRC was developed as a single privately financed and owned system, and was later broken up to align with national boundaries. The Meter Gauge networks of Tanzania, Kenya and Uganda were developed piecemeal in the early 20th century but were operated as an integrated network between 1948 and 1977, when the first East African Community (EAC) was dissolved. It is currently operated as three separate national systems.

[74] Construction from the Port of Mombasa (Kenya) to Nairobi was substantially complete as of early 2017, and commercial operation is expected to begin in 2017. Planning is underway for extension of the network to the Kenya-Uganda border and then to Kampala. Extension to South Sudan, DRC, and Rwanda is under active discussion. The EAC is assisting with the development of a multi-country framework for ensuring communality of technical and regulatory standards.

chanical repairs, or management attention. Border delays occur in remote locations at inconvenient times, and local decision-makers may prioritize their national trains over international trains.

- **Unnecessary or incompatible train inspections:** Receiving railways carry out mechanical inspections of trains to reject wagons in poor condition that might cause safety problems or require repair. If a wagon is rejected, it must be shunted out of the train, and the train must be re-marshaled, creating delays. However, because national inspection standards are inconsistent, a wagon authorized to proceed in one country may be rejected in another country.
- **Locomotive and driver changes:** Locomotives and drivers may be changed at each border, which does not take long if fully-crewed locomotives are ready and waiting at the changeover yard. However this is not always the case, particularly if schedules are unpredictable. For example, a domestic train that supplies locomotives for an international train may be delayed, or the local train dispatcher may allocate waiting locomotives to a waiting domestic train if the international train appears to be delayed. When a new train is marshaled, the train brakes must be tested for continuity, which also adds delay.
- **Bunching and queuing:** High variability in border processing times combined with inevitable perturbations in train running performance can result in bunched trains and longer waits at borders for processing. These problems are self-amplifying—unpredictable processing time at borders is itself a major cause of schedule disruptions.
- **Information flow:** Sometimes the wagon or train manifest is not sent to borders in advance but arrives with the train, affording no opportunity for advanced processing by customs or other border agencies.
- **Customs and other border procedures:** Border procedures are also unpredictable, due to variations in railway operations and the activities of Customs and other inspection agencies active at borders. However, border services delays are accentuated when train bunching occurs. If Customs insists on full inspection of a freight train wagon, the railway faces a difficult choice—whether to detach the wagon and allow the train to proceed, or accept inspection while the train-consist remains whole. Detaching keeps the train moving, but the detached cargo is likely to experience a major delay, particularly if trains are typically dispatched at or near maximum allowable length and trailing weight.

'Seamless' international rail freight corridors thus require close and coordinated political and managerial attention across borders, not only within and between national railways but also involving Customs, health and phytosanitary inspection, and all other national entities active at border points along the corridors[75].

[75] In East Africa, for example, national leaders created two multinational entities to improve corridor performance along the 'Northern Corridor'. The Northern Corridor Transit and Transport Coordination Authority (NCTTCA), whose members consist of Kenya, Uganda, Burundi, Rwanda, DRC, and South Sudan, is a permanent multinational agency that monitors performance on an ongoing basis and identifies technical issues restricting movement along the corridor, while the Northern Corridor Integration Project (NCIP)

In large countries such as China, India, Russia, or the United States, the ratio of international to domestic traffic is relatively low. But in parts of the world with smaller contiguous national railway networks, particularly the expanding European Union, parts of the former USSR, and southern Africa, developing successful long-distance railway corridors is vital to the operation of transnational train services that can compete with trucks. These international relationships are plagued by national incentives for each railway to maximize its own return from transit traffic or through-trains. Thus, inter-governmental agreements are essential to the provision of coherent frameworks for railway management co-operation, the streamlining of national border controls, and the avoidance of the highly variable delays that are the norm at many international rail borders.

Political and managerial boundaries can magnify technological boundaries. For example, the European rail network currently comprises a patchwork of inherited national systems with diverse technical standards—four main track gauges, eight main signaling systems plus twelve others, six main electrification systems, differences in loading gauge, pantograph headroom, maximum axle-loads, left or right train running tracks, safety systems, and others. These technical differences constrain cross-border operation and limit the ability of railway equipment suppliers to exploit scale economies. Other regions such as Sub-Saharan Africa and Southeast Asia have aspirations for creating regional networks. They will face similar problems with the integration of networks and services, in the absence of prior agreements on technical standards. In all regions, government engagement at a multi-country level is thus essential, in order to provide the enabling international frameworks needed to encourage solutions among national railway management and border agencies, allowing international rail corridors to compete successfully with other transport modes.

A related problem is inconsistent freight pricing or inconsistent access pricing across international borders. Without overarching political accords, local financial incentives may lead each railway to try to maximize their portion of the total movement revenue, thereby inflating the through rate, to the detriment of overall traffic prospects.

6.7 Administrative Apparatus

The sixth role of government is to create and use the state apparatus to perform all the other roles described above. The state apparatus must suit the industry structure adopted, which can differ by country. Some dimensions include: (i) distribution of responsibilities among ministries; (ii) delegation of decision making between national and local governments; (iii) preference for departmental or agency-type institutions; and (iv) preference for single-mode or multi-modal functional divisions within the Ministry.

A key requirement is to avoid conflicts of interest by separating the sector policy and regulatory functions from the commercial operation. When policy/regulatory advisory functions and the day-to-day responsibility for a government railway are

Summit, in which Kenya, Uganda, Rwanda, and South Sudan participate, meets regularly at the highest political level to set short-term performance targets and monitor achievement of those targets.

located within the same entity, government railway administrators risk persuading themselves that the interests of the public railway coincide with their perception of the public interest in railways. A critical element of the conversion of a State railway entity to a commercially-oriented enterprise is thus the creation of an independent regulator to replace 'self-regulation'.

Combining development of railway policy, regulation, and corporate oversight of railway operations makes it difficult to pursue policy options, such as increasing the degree of competition, because that adds risk to the railway's financial position. Obtaining private finance for rail projects can be difficult, because potential investors in a new rail venture may perceive that their risks are too high when the (state) partner maintains single stakeholder control over entry to the playing field, determines the rules of the game, and selects the referees. Finally, safety and environmental regulations that protect the public interests (as shown in Figure 6.1) seem unlikely to emerge from administrators of the organizations affected by the regulations, when those regulations may inhibit commercial performance of the rail sector.

After railway policy and regulatory roles are separated from commercial management, governments must decide how best to shape governmental entities to execute those roles. These options are explored in Chapter 7. Issues of 'corporate governance' of railway entities—integral to the role and operation of railways rather than governments—are in Chapter 10 of this Toolkit.

6.8 Ownership

The final role of Government is ownership (and in many cases operation) of the railway network within national boundaries, as touched upon in Section 6.3 above. In summary, the state as an owner should:

(i) Ensure that state-owned railway governance is transparent and accountable;
(ii) Establish a clear and consistent ownership policy;
(iii) Act as an informed and active owner; and
(iv) Clarify and prioritize its objectives.

Further discussions about Government's role as the owner of railways are provided in Chapter 7.

Railway Reform:

Toolkit for Improving Rail Sector Performance

Chapter 7:

Overseeing the Railway:

The State as Owner

7 Overseeing the Railway

7.1 Introduction

In many countries, railway transport activities have been organized as part of the state administration. Public transport services to provide for passengers and industries' transport needs (whether state-owned or private) are politically sensitive. This led to establishing state railway departments, and historically, many governments have been deeply involved in managing the daily activities of railway entities.

Transport markets have changed dramatically. The relationship between the state and the railway must be adapted to reflect a new reality. The best way to do this is by allowing the railway to function as a commercial entity.

However, in recent decades, transport markets have been transformed by road transport deregulation, urbanization, containerization, and the evolution of new global trading patterns. These have forever changed rail transport entities' role and competitive positions. The relationship between the state and the railway must be adapted to reflect this new reality. Today, allowing a railway to function as a commercial entity is generally accepted as "best practice" for organizing railway activities. As a result, state railway administrations are evolving into state-owned enterprises (SOEs)[76], private enterprises operating under concession agreements, or partial private/public corporations. This section analyzes options to segregate decision-making and oversight duties between government and state-owned railway enterprises.

State-owned railway performance depends on a complex set of interactions among company management, board of directors, various ownership entities, national government ministries and regulatory bodies, local government bodies, shipper organizations, and other stakeholders. Not surprisingly, accountability for railway entities' performance can be difficult to assign precisely. Because of this, developing a structure that will ensure both efficient decision-making and good corporate governance is challenging.

7.2 New Relationships between the State and Railways

7.2.1 Adapting to new market conditions

New market conditions have created a strongly competitive transport environment. This has in many cases reduced railways' significance in the transport marketplace. Since 1950, the efficiency of both road and water transport has grown exponentially, mirrored by changes in ownership and financial structures. Railways are now competing primarily with nimble private companies that can adapt rapidly to market requirements using any combination of trucks, ships, cars, buses, and aircraft. As economies develop, the structure of the economy may change to require less transport. Over the last sixty years, governments have invested heavily

[76] OECD Guidelines on Corporate Governance of State-Owned Enterprises (2015 Edition, p.14) defines an SOE as follows: "…any corporate entity recognised by national law as an enterprise, and in which the state exercises ownership, should be considered as an SOE. This includes joint stock companies, limited liability companies and partnerships limited by shares. Moreover statutory corporations, with their legal personality established through specific legislation, should be considered as SOEs if their purpose and activities, or parts of their activities, are of a largely economic nature."

in developing roads and highways, creating railways' strongest and most successful competitor. In many developing countries, road users pay user charges that do not fully recover the cost of damage to the road infrastructure from heavy vehicles. In some cases, railways pay fuel taxes that are earmarked for road development. All of this puts railways in a difficult competitive position. As a result, rail market share is declining, exerting downward pressure on volume and revenues.

Tough competition and declining market share should trigger changes in railway administration and management—cutting costs, adapting services to customer shipping requirements, and improving service quality. But these responses have historically been rare because railways were managed as government departments, not as business units, and therefore, were managed according to political priorities. This practice has relegated many of the world's railways to a serious state of decline. Common practices in using the railways to accomplish political outcomes that led to this decline include:

- Providing a large-scale source of jobs to help government reduce national unemployment;
- Creating a captive clientele for poor-quality products and services supplied by other government enterprises;
- Providing below-cost transport services as a public good (passenger services) or to subsidize production of other government enterprises;
- Providing high-level jobs for political appointees, who frequently lacked railway experience or business qualifications;
- Garnering political support from trade unions in exchange for railways adopting compensation schedules and conditions unrelated to employee performance, and financially unaffordable for railways; and
- Allowing railway investment decisions to be made at the political level by those motivated by acquiring political capital, rather than railway performance or financial sustainability.

7.2.2 Governance principles for state-owned railways

Railways are state-owned entities in many countries. As part of state administration they are subject to government decision making and budget processes. The organizational model selected for state-owned railways affects:

- The degree of government decision-making power;
- Railway organizational independence; and
- The distribution of responsibilities between government and the railway entity.

Countries that are reforming the corporate governance of state-owned enterprises agree that this complex undertaking should address two major challenges:

- The state should actively exercise ownership functions, such as nominating and electing the board of directors, but refrain from political interference in company management;

- The state should ensure that markets not only permit, but actively encourage, competition between private sector companies and state-owned enterprises, and ensure that governments do not use their regulatory or supervisory powers to distort a competitive transport market involving both private and public entities.

Problems frequently arise from the practice of converting railways to state-owned companies but failing to deal with essential governance and independence issues. Governance of state-owned railway companies faces all the challenges described above and should address the following three major institutional issues:

- Developing a new state/railway relationship;
- Developing a new railway/shareholder rapport; and
- Building a new commercial culture within the railway organization.

Implementing these changes can be very challenging. Few examples exist of state-owned railways fully compliant with the governance principles described in the most recent *OECD Guidelines on Corporate Governance of SOE's (2015)*. Even fewer state-owned railways are compliant with the more stringent *G20/OECD Principles of Corporate Governance (2015),* which are intended to be applicable to both private and public enterprises.

Even in developing countries, formerly state-owned railways are now mostly organized as separate, publicly owned corporations. However they are seldom completely at arm's length from politics. As long as public money is involved, the risk of political interference in company management exists. For this reason, the implementation of the role of the state as an owner according to the principles presented in the current chapter requires strong political will. Thus one of the key OECD organizational recommendations is that SOEs shares should be held by an "ownership entity", which will elect board members as the "owner".

Railways should act as transport service providers with the same rights and obligations in the market as any other similar state-owned or private entity.

7.3 Implementing New Governance Principles

7.3.1 Segregation of duties

The most important governance principle is to separate the functions of government bodies and railway enterprises. Railways should act as transport service providers, with the same rights and obligations in the market as any other similar state-owned or private entity. Government must continue to play multiple roles as follows, without being involved in daily railway management:

- *Government policymaker* for the transport sector;
- *Regulator* for safety standards, infrastructure access, and sometimes prices;
- *Owner* of some railway assets (permanent way, perhaps rolling stock, stations, freight and passenger facilities); and
- *Client* for contracted social *transport* services.

When the functions of the state and the railways are separate and clearly specified, the following rules should be observed:

- Interaction should occur on a strictly contractual basis, or within a clear regulatory framework.
- The state should exercise ownership rights in terms of setting broad policy, without playing any role in ongoing day-to-day management of the railway business.
- Railway management should maintain independence in railway business decisions, but remain accountable to shareholders for overall business results. The designated holder of state shares may consider a broad range of socio-economic policy concerns in providing guidance, but it is important to maintain a single "policy window", thus avoiding a structure where multiple representatives of the state "owner" provide conflicting guidance[77].

7.3.2 Setting up the legal and regulatory framework

The new legal and regulatory framework must create and protect a market environment, in which state-owned and private railway operators can compete on equal terms, avoiding market distortions. The most recent *OECD Guidelines on Governance of SOEs* define and describe the main pillars and principles of a market environment as follows:[78]

A. There should be a clear separation between the state's ownership function and other state functions that may influence the conditions for SOEs, particularly market regulation.

B. Stakeholders and other interested parties, including creditors and competitors, should have access to efficient mechanisms for dealing with complaints or conflicts, through unbiased arbitration or judicial processes.

C. Where SOEs combine economic activities and public policy objectives, they should maintain high standards of transparency and disclosure about their cost and revenue structures.

D. Costs related to public policy objectives should be funded by the state and disclosed.

E. SOEs undertaking economic activities should not be exempt from the application of general laws, tax codes and regulations simply because they are owned by the state. That is, laws and regulations should be applied equally to SOEs and to their market competitors. For example, a railway that is an SOE should allow creditors to press their claims, including claims to compensation in the event that the railway ceases to provide a service or even to do business.

F. SOEs' economic activities should face the same market conditions as private competitors. In particular:

    - SOEs' relations with both financial institutions and non-financial SOEs' should be purely commercial;

[77] This, however, should not undermine the independence of the regulator.
[78] OECD, Guidelines on Corporate Governance of State-Owned Enterprises, 2015 Edition

- SOEs' economic activities should not benefit from any indirect financial support that might give the SOEs an advantage over their private competitors, such as preferential financing, tax arrears or preferential trade credits from other SOEs. SOEs' economic activities should not receive inputs (such as energy, water, or land) at prices or conditions more favorable than those available to private competitors.

G. When SOEs engage in public procurement, whether as bidder or procurer, the procedures involved should be competitive, non-discriminatory and transparent.

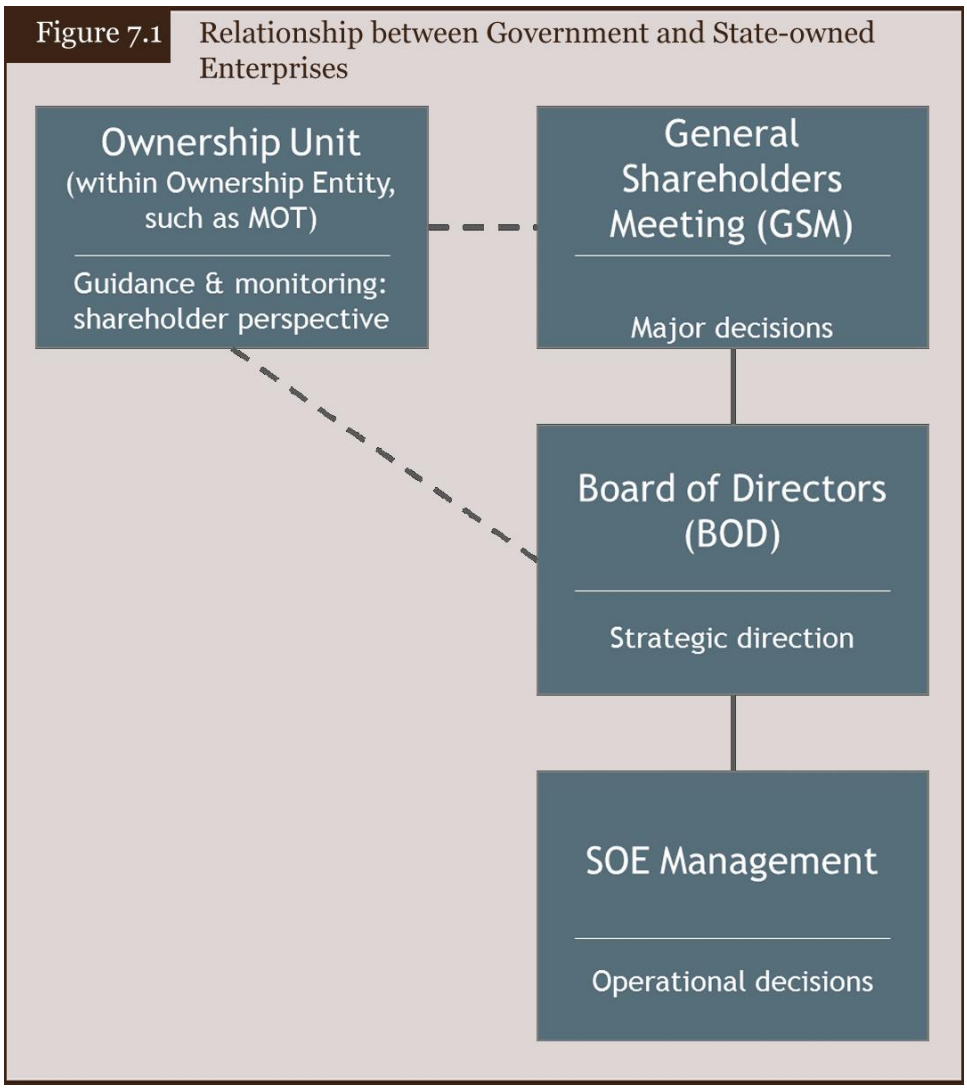
7.3.3 Contractual relationships between government and railways

Relations among state entities (Government owner, Ministry of Transport, Ministry of Finance, etc.) and the railway corporation must be governed by publicly available written documents to ensure long-term business sustainability. A railway law should establish these relationships and long-term agreements, to shield the railway from day-to-day political changes that would undermine its inherent need for long-term planning. Typically, other legal agreements between state and railway enterprises relating to railway infrastructure administration and railway enterprise social responsibilities are multi-annual contracts. These include both financing of infrastructure maintenance and public service contracts to establish terms and conditions for managing these obligations. All written agreements should follow standard business practices.

The structure presented in Figure 7.1 below provides an example of a governance structure that clearly separates the policy role of Government, represented by the Ministry of Transport (MOT) for the railway, from day-to-day management and decision-making. This structure is designed to assist SOEs in the transition from a Government entity with a broad range of often-conflicting goals to a commercially-oriented SOE that must meet broad goals set by Government while operating as an independent commercially-oriented entity.

The legal bodies that provide governance to state enterprises are, typically, the General Shareholders Meeting (GSM), the Board of Directors, and the company management. The ownership entity, for example, the Ministry of Transport or Ministry of Finance (or similar) depending on the country's SOE ownership structure, would be represented in its role as a shareholder (initially as the sole shareholder) by a unit located within the ownership entity.

Figure 7.1 Relationship between Government and State-owned Enterprises



The GSM is responsible for making major decisions such as appointment of directors and approval of their plan (the Statement of Corporate Intent) and approval of major transactions.

The Board of Directors is responsible for providing strategic direction to the enterprise (Administrative Plan or Statement of Corporate Intent) and ensuring effective management of the enterprise. It appoints the SOE management and approves their plan (Management Plan or Business Plan).

The SOE Management provides day-to-day guidance to the enterprise and takes operational decisions.

The unit established within the owner Ministry to represent the owner acts on behalf of the Ministry as the shareholder of the SOE. As such, it provides general guidelines for the SOE on performance indicators, remuneration, conflict of interest, dividends and disclosure. It works through the GSM and SOE boards to ensure compliance with relevant corporate governance codes and principles. The ownership unit monitors both compliance and overall performance of the SOE. The ownership unit reports to the public on the performance of the SOE portfolio.

7.4 The State as Owner

7.4.1 The ownership role

As owner, the state should:

(i) Ensure that state-owned railway governance is transparent and accountable;
(ii) Establish a clear and consistent ownership policy;
(iii) Act as an informed and active owner; and
(iv) Clarify and prioritize the railway's objectives.

State ownership policy and overall objectives should remain broad, clear, and consistent over the longer term, providing the railway, the market, and the public with predictability and a clear understanding of railways' long-term commitments. Objectives should be developed through public consultation. The ownership policy and objectives should be described in publicly available documents, widely circulated among relevant ministries, agencies, railway boards, management, and parliament. As an owner, the state should decide what is required from the state-owned railway and how the company should be administered to best meet those goals.

The state should not be involved in daily management. Instead, it should allow the railway full operational autonomy to achieve agreed business objectives. Similarly, the state should respect the board of directors' independence, except for exercising the state roles as owner, regulator, and contractor for services provided to citizens and customers. All objectives, policies, regulations, and contracts should be fully disclosed in publicly available documents.

The state generally exercises its power as owner in the shareholders' meeting, where a board is elected to be legally and financially responsible for the railway company. "Management independence" does not mean that managers of state-owned railway can set objectives that contradict the objectives of the state as owner, nor can management define the limits of public services. If serious differences arise, the state as owner retains the right to replace board members, including the chairman when necessary, to align overall railway business objectives with those set by the government for the railway.

This organizational model is based on typical powers of the state as railway owner and typical uses of ownership powers and responsibilities. The state as owner is responsible for making this model work, but the model will fail if government allows politics to influence decisions that should be made by the railway company. Another risk to the effectiveness of this model is political interference in recruitment, which can undermine the process of hiring competent and professional railway management. Therefore, governance structures for the state and the railway enterprise must be comprehensive, precise, and clear to all participants and to the public.

Three basic forms of SOE ownership exist: centralized ownership, where one government entity owns all SOEs in the country; decentralized ownership, where different SOEs are owned by different government entities; and dual ownership, where certain ownership functions are performed by one government entity (such as the Ministry of Finance) for all SOEs while other ownership functions are performed by other government entities (such as Ministry of Transport for state-owned railways). While there is a trend toward centralized ownership, there remain debates on the advantages/disadvantages of different ownership models.

Regardless of which ownership structure is selected, the ownership must be established under law and the ownership entity should act in accordance with a publicly disclosed ownership policy. State ownership functions should be strictly separated from both regulatory functions in the railway sector and the setting of transport policy[79].

The state as owner acts through the ownership entity, in a manner similar to any major shareholder, to protect and optimize its ownership interests. As defined by the *OECD Principles of Corporate Governance*, basic shareholder rights include:

(i) Participation and voting in shareholder meetings;
(ii) Obtaining adequate information on the corporation on a timely and regular basis;
(iii) Electing and removing members of the board; and
(iv) Approving extraordinary transactions.

When an SOE's shareholding structure changes from single state owner to multiple shareholders, it becomes essential to protect fully the rights of minority shareholders. That is, the state needs to understand that the rights it has over the SOE through shareholding are in in general no greater than the rights of other shareholders, except for cases where special rights are clearly defined in the enabling statutes. OECD therefore recommends that from the beginning even SOEs wholly owned by Government should follow all applicable elements of the more general OECD guidance on corporate governance, to minimize potential difficulties later in the transition process when shareholding is broadened.

Ownership unit responsibilities related to government and parliament

The ownership unit, within the ownership entity, fulfills the following obligations on behalf of the ownership entity of the railways:

- Elaborating and defining ownership policy, owner objectives, and long-term state commitments;
- Conducting consultations on policy issues with the public, ministries, agencies, the railway board of directors, and parliament;
- Maintaining accountability to government and parliament for implementing ownership policy;

[79] This is most effectively accomplished by appointing different state entities to address ownership, policy and regulation.

- Maintaining defined relationship and continuous dialogue with external auditors and state control organs within limits of existing legal framework; support state audit institution tasks and take measures to respond to audit findings;
- Publicly disclosing reliable quantitative performance reports on exercising state ownership, and achieving state objectives in the interests of the owners through administering state-owned railways (ad-hoc or permanent commissions could maintain dialogue with Parliament)[80].

Ownership unit tasks relative to state-owned railways

The ownership entity, through the ownership unit, will exercise state ownership rights in overseeing the railway according to legal and institutional frameworks, In many countries, Ministry of Transport has the authority over the country's railway and has the legal responsibilities, including:

- Coordinating oversight of the SOE;
- Exercising the functions of the shareholder on behalf of the state; and
- Coordinating the exercise of shareholder functions.

The specific responsibilities are to:

- Appointing the representatives of the state to the board;
- Proposing candidates for the management board and supervisory board in compliance with requirements of the relevant corporate governance ordinance on SOEs;
- Monitoring the management board directly for autonomy and through the GSM for commercial companies to ensure that the SOE is operating under principles of efficiency and financial sustainability; and
- Ensuring the transparency of the state in its oversight.

The ownership unit within MOT is responsible for carrying out the responsibilities of MOT as the owner for the transport SOEs. Based on the legal requirements and good practice examples, MOT should assign the following seven responsibilities to its ownership unit.

- Overseeing the board member selection process;
- Establishing and monitoring performance objectives;
- Monitoring the implementation of the remuneration guidelines;
- Monitoring conflicts of interest and approval of related party transactions;
- Monitoring other corporate governance practices in the SOEs;
- Developing a general dividend guideline; and
- Ensuring transparency with respect to the state's governance of SOEs.

[80] Accountability requirements for the ownership entity should not restrict its autonomy in fulfilling responsibilities. Cases in which the ownership entity needs to obtain ex-ante parliamentary approval should be limited to significant changes in overall ownership policy, the size of the state sector, or major transactions.

The ownership entity should have skilled staffed professionals with legal, financial, economic and management expertise that are experienced in carrying out fiduciary responsibilities.

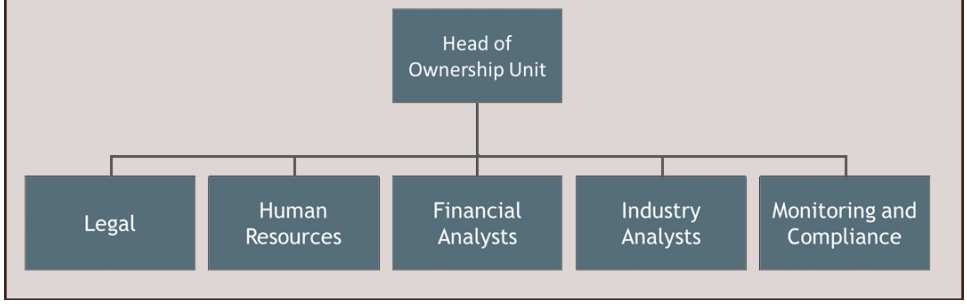
7.4.2 Staffing the SOE ownership unit

The ownership unit, which is to exercise the responsibilities of the ownership entity, needs professionals skilled in law, finance, economics, and business management. These professionals should provide experience in strategic thinking and in carrying out fiduciary responsibilities. They must also have a good overall understanding of entrepreneurship and their roles and responsibilities as civil servants with respect to state-owned railways. However, detailed knowledge of railway operations is not required in this unit.

The ownership unit requires a degree of budgetary autonomy. It must be able to contract for external advice from independent specialists and to carry out evaluations or monitor railways results in specific domains. Thus, it must have sufficient flexibility in staff recruitment, remuneration, and retention, including from the private sector.

The ownership unit should be staffed with people having the skills needed to properly execute its assigned functions. A schematic structure for an ownership unit, which illustrates basic functions, is shown in Figure 7.2.

Figure 7.2 Staffing the Ownership Unit



- **Head of the ownership unit.** The head of the ownership unit should have a broad knowledge of corporate governance principles and their application, and be able to apply them to the work of the ownership entity. S/he is responsible for creating and leading an effective team to manage the implementation of better governance practices within the SOE.
- **Legal.** The position should have a strong grounding in the country's corporate law and strong knowledge of corporate governance principles and their application. S/he contributes knowledge of law and regulation and will be responsible for compliance aspects of the ownership unit's oversight of board activities, including identifying and dealing with conflicts of interest and transactions with related parties
- **Human Resources.** The position should have experience with corporate recruiting and compensation. S/he contributes to the oversight of board member recruitment, and compensation including the establishment of broad limits on board member and executive compensation.
- **Financial Analysis.** The position requires experience conducting financial analysis of commercial companies. S/he will be responsible for financial monitoring of the portfolio. Together with the industry analyst, s/he monitors the

SOE performance and risk, including the development of the basic dividend guidelines.

- **Industry Analysis.** The position requires experience with investment analysis of transport stocks. S/he will be evaluating and commenting on the SOE's strategy and performance objectives set by ministers, the board and management in the context of the annual planning process.
- **Monitoring and Compliance.** The position requires strong information management and organization skills. S/he will be responsible for monitoring that the SOE boards are implementing the ownership unit's guidance on governance practices according to the currently accepted national practice.

In practice, a number of the desired functions can be combined in a single individual. All members of the team need to have a basic understanding of good governance practices. They should be comfortable working in a team environment and have the capacity to communicate and interact well with high-level individuals within government, in boards and within the SOE. The team needs to have the capacity to act proactively and be an effective advocate for better governance practices.

8

Railway Reform:

Toolkit for Improving Rail Sector Performance

Chapter 8:

Buying Services from Railways

8 Buying Services from Railways

8.1 Introduction

Most governments want to retain influence over railway passenger services and fares. Chapter 6 argued that the best way to do this is by using a model in which governments use a contract to purchase the services and fare concessions they want, which this chapter will discuss in detail. First, it will introduce the public service obligation (PSO) concept, underlying the two primary contracts—PSO contracts (Section 8.3) and public services contracts (PSC) (Section 8.4). Second, the chapter will explore the possibility of introducing competitive bidding for such contracts (Section 8.5) and introduce (in Section 8.6) examples, which are also described in the Annexes.

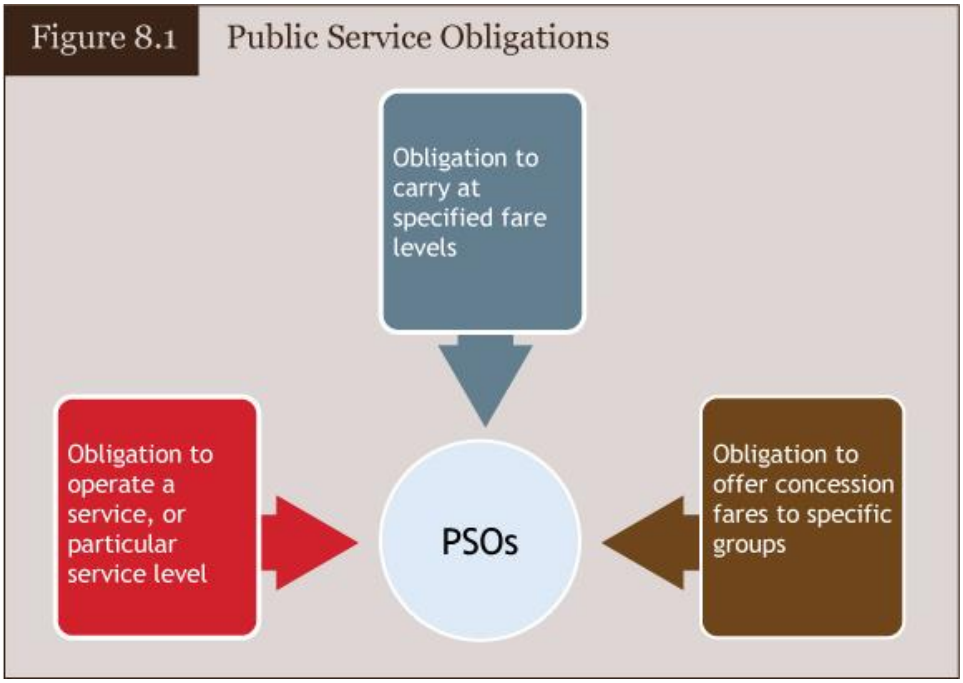
8.2 Public Service Obligations

A Public Service Obligation is a requirement defined by government, which the railway would not assume if it were considering its own commercial interests.

A good working definition of public service obligations (PSOs) was developed by the European Commission for use in the European Union and is adapted here for more general application: "a requirement defined or determined by government, which the transport undertaking in question, if it were considering its own commercial interests, would not assume or would not assume to the same extent or under the same conditions, without reward.'

Government in this context refers to either the central or local government authority. Three main types of PSO apply to passenger railways. (Figure 8.1.)

Figure 8.1 Public Service Obligations



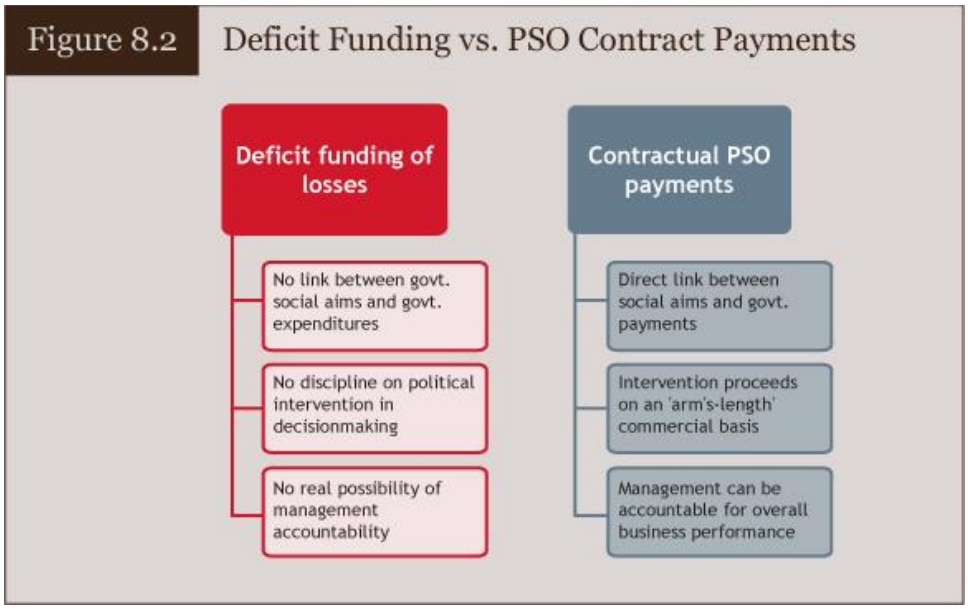
Public service obligations could include: (i) a specified service or group of services such as those on low-density branch lines, commuter services, or off-peak services at night or on Sundays, regardless of demand levels; (ii) a regulated non-commercial fare structure or restriction of fare increases below those recommended by railway management or at a lower rate than cost increases; (iii) offering concession

fares to specified groups such as students, pensioners, military personnel, civil servants, the disabled, and so on.

Around the world, many passenger railways face explicit service obligations established by government or imposed through regulatory intervention, but rarely reimbursed directly. In other cases, railway managers face similar *unstated* obligations that, if ignored, might prove career-limiting for them. Whether explicit or implicit, unfunded service obligations undermine railway management's pursuit of commercial performance and their own commercial accountability. Typically, managers continue to fulfill the obligations and then try to recoup the costs at the end of the year from government by bundling service obligation costs with railways' total annual losses, which are then covered by government. Unfunded obligations undermine government spending efficiency and effectiveness because there are no links between government objectives, actions, outcomes, and budget impacts. Instead, the costs of unfunded obligations are buried somewhere in the bottom line of deficit funding for the whole service package.

By contrast, contracting for PSOs establishes a funding framework that reveals the costs of government-imposed obligations and allows the railway to treat both commercial activities and PSOs, on a commercial basis. A comparison of deficit funding of losses and PSO contractual arrangements is shown in Figure 8.2

Figure 8.2 Deficit Funding vs. PSO Contract Payments



8.3 Public Service Obligations Contracts

Preparing a PSO contract requires identifying the public services obligations and then determining the principles of compensation.

The PSOs that arise from explicit government direction should be the easiest to define. However, if obligations are not explicit, the railway must analyze its activities in detail to select the services and fares it would offer under circumstances of commercial freedom. Then it can present to government a list of services and fare differentials between actual and commercial cases. This gives government the opportunity to balance social aims and affordability by selecting which obligations the railway will be asked to continue. These obligations become the PSOs.

Ideally, compensation for PSOs should be the full commercial net cost of provision. For a service PSO, cost estimates should equal the efficient cost of supply, including return on capital, less revenue from services.[81] For a pricing PSO, cost estimates should equal net revenue lost through adopting the pricing obligation, allowing also for the increase in cost from providing capacity to meet any increase in demand. These levels of compensation should form the basis of the PSO contract with governments. However, if governments are reticent about funding the non cash costs of depreciation and return on capital (that it may anyway have funded as a grant) the minimum level of compensation should leave the railway no worse off on a cash basis from meeting the PSOs. But in this case, capital renewal for PSO activities would have to be compensated through a future grant from government to the railway.

Under a PSO contract system, the reporting lines of the government purchaser and the reporting lines of railway provider must be clearly separated, as described in Section 6.4, to ensure that the purchaser can be objective in assessing railway performance in meeting its obligations.

In principle, PSO contracts can provide greater transparency and accountability in public governance and organizational performance, which can lead to improvements in both. However, in practice, in the passenger railway sector, PSO contracts are not straightforward for reasons that are conceptual, budgetary, technical, and political.

Conceptual

A PSO contract system is suited to an industry with a core set of potentially profitable activities, and at the margins, another set of obligations that can be disaggregated, separately costed, and charged to government. However, financial modelling has indicated that passenger train services cannot operate without long-term budgetary support, even at efficient input-cost levels, except under very limited circumstances, such as dense inter-city rail corridors.[82] Most railway passenger services fall far short of recovering their full 'efficient' costs of operations and infrastructure. The challenges of attaining full commercial viability are even greater for heavily 'peaked' suburban services or less heavily utilized regional services. In many countries, hardly a single passenger railway route would or could be profitable in a full commercial sense. In these circumstances, a list of individually priced PSOs would fill the whole timetable, representing an unwieldy and impractical decision tool.

Budgetary

In principle, PSO contracts are equally applicable to profitable and unprofitable railways. But when national railways are profitable[83], government budget planners

[81] The railway obligation is not only to meet the PSO but also to provide it efficiently, and the government obligation is to fund the PSO to a level that an efficient provider would charge.

[82] Amos and Bullock, *The Financial Performance of Non-Urban passenger rail services,* (World Bank, 2007). http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/03/24/000333038_20080324074100/Rendered/PDF/430250NWP0Pass10Box327344B01PUBLIC1.pdf

[83] Profitable usually due to the recovery of infrastructure costs from heavy freight flows.

tend to resist the PSO contract model. Instead they usually prefer the railway to meet the obligations by internal cross subsidy. This argument is not convincing in terms of economic efficiency as it implicitly supports the idea of an internal tax on some customers to support others. But it is nevertheless persuasive to cash-strapped governments making hard budget choices; they may observe from a practical viewpoint many other network industries such as postal services, telephone networks, broadband networks, broadcasting, electricity supply, water supply and others often contain significant elements of internal cross-subsidy between customer groups.

Technical

Applying PSO contracts to railways poses the challenge of making credible net cost assessments for specified services, which is a complex process. Railway operations include joint and common costs, so some costs will be assigned on the basis of professional judgment. Therefore, strong professional capacity in railway management accounting methodologies is essential to derive estimates that can satisfy skeptical finance ministries, which must verify charges.

Political

Finally, the economic rationality of the PSO contract model is not well matched to political rationality. The presumption is that governments will be willing to intervene in the transport services or fares of one portion of the community, or set of electors, while leaving those of all others to the commercial disciplines of the market. Experience suggests that the political interests of most governments are not so readily divisible.

For all of these reasons, PSO contracts are not easy to implement. Moreover, even after they are agreed, there are examples in Latin America and Africa of governments eventually defaulting under pressure from hard-pressed finance ministries.

It takes a healthy dose of pragmatism to craft PSOs suitable for each country and railway. A PSO contract works best when the railway industry's internal structure nearly mirrors its commercial and non-commercial roles, providing a more transparent and separable financial structure. For example, separating suburban networks or regional services will facilitate targeted PSO payments to those units. This argument for horizontal separability was discussed in Chapter 5.

Restructuring tariffs should always be considered *before* committing to long-term PSO contracts. If the railway operates in an environment of regulated tariffs, PSO losses are partly linked to tariff policy so tariff rationalization may address part of the revenue shortfall. In many cases, a revised tariff policy is a simpler instrument to accommodate the social issue of subsidizing special categories of customers than using a PSO and service subsidies; it also performs better in terms of efficiency and equity.

8.4 Public Services Contracts

Public services contracts (PSCs) are also based on the concept of public service obligations (PSOs) but PSCs overcome some conceptual and practical difficulties of deriving and agreeing on a schedule of individually priced obligations. Rather than

try to divide a specific service network into commercial and non-commercial services, a PSC can specify minimum service and fare obligations for the whole service or large parts of it, and compensate the provider at an agreed amount or to an agreed formula, for the contract period.

This toolkit presents the PSC as a generic tool for managing public funding of railway passenger obligations. But it is also useful to consider the specific application of PSCs in the EU where the concept has been subject to considerable legal and regulatory development in the context of urban bus, tram and railway services, and has supplanted PSO contracts as the accepted method of meeting public interest objectives in these areas.

The EU regulations promulgated by the European Commission[84] recognize that many passenger transport systems serving general economic interests cannot operate on a commercial basis; therefore, EU Member States must act to ensure provision of 'safe, efficient, attractive and high-quality' passenger transport services. Under EU legislation, Member States can award exclusive rights to public service operators, grant them financial compensation, and impose general public transport rules on all operators.

The regulations acknowledging that financial compensation may be necessary to apply to national and international public passenger transport services—track-based modes such as trains and trams, and road-based modes such as bus services—and to both public and private service operators. Whilst contracts for road and light rail services must follow public tendering procedures, exemptions may be made for heavy rail for which member states may decide on how to award contracts.

Under the EU regulations, the central or local government authority must conclude a PSC with any passenger transport operator granted an exclusive right of operation, or compensation for public service obligations, or both. Obligations that aim to establish maximum tariffs require compensation for the net positive or negative financial impact occasioned by compliance with the pricing obligations.

The European Union PSCs, and their general rules, define, inter alia: operator obligations; parameters for calculating compensation; the nature and scope of all exclusive rights granted; cost distribution linked to service supply (staff costs, energy, infrastructure, maintenance, etc.); and transport ticket revenue distribution between public service operator and public authority.

This transparent contract agreement is critical to avoiding an open-ended deficit-funding commitment. If the PSC is not tendered, as many EU railway services are not, compensation should not exceed the net financial effect of contractual obligations on the costs and revenue of the public service operator. These effects are assessed by comparing the costs of the contractor meeting the public service obligation, with the situation which would have existed if the obligation had not been met.

The regulations offer guidance on calculating the net financial effect, which is summarized below.

[84] Regulation (EC) No 1370/2007.

- **costs** incurred in relation to a PSO or a bundle of PSOs;
- **minus** any positive financial effects generated within the network operated under the PSO(s) in question;
- **minus** receipts from tariff or other revenue generated under the PSO(s);
- **plus** a reasonable profit.

Public services accounts must be ring-fenced to increase transparency and avoid cross subsidies being paid to any public service operator that is engaging in other activities while supplying compensated services under public transport service obligations.

Public service contract periods are limited. In the EU, they must not exceed ten years for bus and coach services, and fifteen years for rail or other track-based modes. This period may be extended by up to 50 percent under certain conditions, particularly to allow amortization of investments. The longest periods apply to railway contracts, acknowledging the long-term nature of rail system capital investments.

However, if PSC contract agreements with an incumbent public railway are awarded without competition, the operator will have no incentive to optimize performance. First, unless the PSC price is based on input cost or targets, such as improved rolling stock utilization or labor productivity targets, it lacks incentives for efficiency improvements. Second, if the PSC covers the difference between revenue and cost, even for efficiency-enhanced cost targets, the contract lacks incentives to optimize fare structures or collect all the fares charged. This would obligate the contracting authority to set marketing and revenue collection parameters, which would add complexity to contracts and their administration. Instead, if PSCs are contestable though tendering, these difficulties are avoided because bidders have clear incentives to plan their bid on the basis of efficient costs and fare collection systems, and if successful in their bid, to implement them. A Guide for preparing a Passenger Service Contract is in Annex 5.

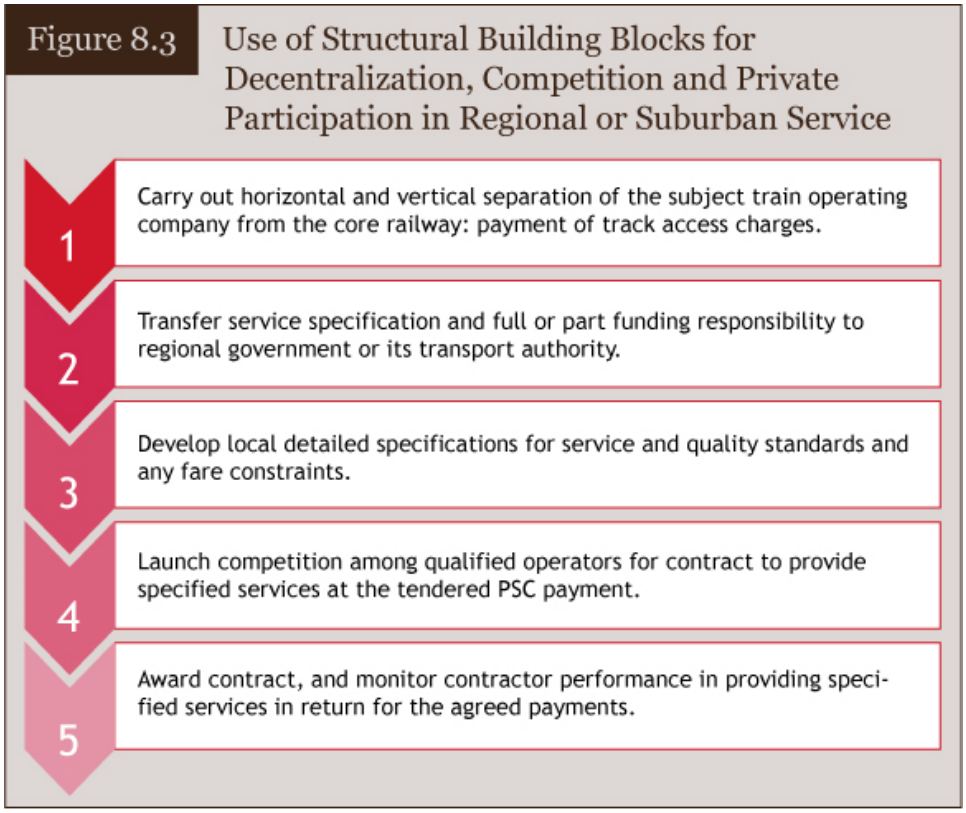
8.5 Competing for PSC Contracts

Under some structural options presented in Chapter 5, PSC contracts can be made contestable. First, groups of services, such as a suburban rail network, or a set of regional train operating services can be separated into new companies; then the required PSC, including performance standards such as punctuality and reliability, and rewards and penalties, can be drawn up; company operation can be concessioned through a bidding process; and finally, a special oversight unit of national or local government can monitor performance and make payments.

Figure 8.3 summarizes an example of how this could be staged for a separable regional or suburban train operation. Transferring responsibility for service specification and partial funding to lower-level government, as shown in Figure 8.3, is an attractive add-on where it has capacity and resources to perform this role but not

essential for this approach. Competitive tendering of PSO contracts has been successful in many applications in Europe, though not without important hurdles to be overcome[85].

Figure 8.3 Use of Structural Building Blocks for Decentralization, Competition and Private Participation in Regional or Suburban Service



8.6 Case Studies

The use of contractual forms to fund passenger public service obligations is illustrated in some of the case studies presented in Annexes including examples from both private and public frameworks. Such contracts exist to ensure continuation of passenger services on many privately run freight concessions in Latin America and Africa; they also form the basis of the long-distance passenger services operated by the state-owned Via Rail on the Canadian National and Canadian Pacific private networks. In the public framework, competitively tendered PSCs are used to procure specific rail passenger services in regional markets in Germany, Finland and Sweden. The corporate case study of Virgin Rail shows how one private company has responded to being awarded what is essentially a PSC (in UK).

[85] Louis S. Thompson, *Competitive Tendering in Railways: What is Experience Telling Us?* Paris, (ECMT, November 2006). http://www.internationaltransport-forum.org/Pub/pdf/07TenderingRail.pdf

9

Railway Reform:

Toolkit for Improving Rail Sector Performance

Chapter 9:

Setting the Regulatory Framework

9 Setting the Regulatory Framework

9.1 Introduction

The railway industry has always had high public sector involvement. In many countries, railways are owned and managed by the public sector. However, both publicly *and* privately owned railways have usually been subject to some government control—pricing, market entry and exit (obligations to keep lines open and services operating), financial structure, accounting methods, vertical relations such as those between infrastructure and train operations, and operating rules.[86]

Increasingly over the past 30 years, experts have questioned the heavy burden of economic regulation. Regulations that once protected national monopolies have been replaced in some countries by regulations that open access to infrastructure for third parties. These opposing trends are most apparent in the European Union (EU) where rail market liberalization has been accompanied by extensive regulation to establish a non discriminatory market.

In principle, the best regulator is the market.

In principle, the best regulator *is* the market, which means that economic regulation should be used *only* to correct for market failures, for example, if competition is absent. Regulation should be used cautiously, as it can inflict unintended consequences on those it was designed to protect. For example, in many countries, regulated prices are set below cost. In the short term this appears to benefit customers but over the longer term railway assets and services will deteriorate because prices that are set at below cost-recovery will discourage or even prevent railway companies from making longer-term investments, and could even cause bankruptcies. Therefore, regulations that work against railways' long-term financial sustainability will also eventually hurt customers.

Railway reform may involve changes to railway ownership or management, institutional and organizational structures, and governance systems. These changes may require changes in the form of economic regulation. For example, the introduction of third-party access creates the need to regulate the conduct of infrastructure supply organizations. Economic regulation may also include the difficult task of maintaining and developing competition in the sector.

Although this chapter focuses on economic regulation, the discussion will also include regulations needed for railway safety, environmental protection, and harmonization of technical standards.[87]

This chapter also covers the institutional and organizational aspects of regulation. In many countries, the ministry responsible for transport has been replaced as regulator by a body that is independent of government. Regulation is then separated from the government, which retains administrative oversight and its roles as policymaker, owner, and financier. In countries that have not yet managed to establish

[86] I. Kessides and R Willig, *Restructuring regulation of the rail industry in the public interest*, Policy Research Working Paper, (World Bank, 1995).

[87] A broad range of information on regulation, with a glossary available in six languages, is available at http://www.regulationbodyofknowledge.org/

independent regulation, other solutions may be required, at least in the shorter term, until obstacles can be overcome.

9.2 The Public Interest

Regulatory intervention is required if the public interest is expected to differ materially from the commercial interests of service providers—usually private companies. This situation is often referred to as 'market failure.'

The public interest is compromised if the market fails to deliver on government objectives, such as national security, national cohesion or social policy objectives. It is then up to the government to set out what it requires the railways to do and to pay for the cost of doing so. These are essentially public sector obligations (PSOs). Administering public sector obligations *is* a form of regulation, but since this is discussed in Chapter 8, it will not be repeated in this chapter. Instead, this chapter focuses on regulating railways' monopoly power and developing competition, safety and environmental regulations, and establishing technical standards.

Aspects of public interest that must be considered in designing rail sector regulatory systems are discussed in the following sections.

9.2.1 Economic issues

Most economic regulation in the railway sector is designed to address two issues: (i) monopoly, particularly natural monopoly; and (ii) managing industry interfaces, usually at the point of separation between the natural monopoly and the rest of the industry.

Monopoly

The most common form of market failure in railways arises from monopoly power. Railway companies may dominate certain markets and usually have a natural monopoly, at least for infrastructure.[88] In the rail sector, it is rarely possible to create competition in infrastructure provision due to the economies of density required to sustain the business—average cost declines as corridor volumes rise (see Chapter 3). Also, when inter-modal competition and intra-modal competition between railway undertakings are weak, regulation may be needed to protect the final customer and perhaps to ensure that all competitors or potential competitors have fair access to facilities owned by incumbents. Economic regulation should be designed to replicate a competitive environment to the extent possible.

[88] A natural monopoly is an entity whose average costs decline with output.

Figure 9.1 Range of Solutions to the Infrastructure Monopoly Problem

When a monopoly exists, price and service quality can be determined in several ways.[89] Gomez-Ibanez suggests an array of options along a continuum (Figure 9.1) ranging from total dependence on markets to public provision of the service.[90] At one end of the continuum—the market extreme—customers contract directly with the monopoly service provider. The next option is concession contracts, which, like private contracts, use the courts to settle disputes but are more suited to railways with many customers. Further along the continuum, government would create a specialist body to carry out discretionary regulation, including the power to set prices and services standards. The regulator would operate within a clear and transparent framework set by legislation but broad enough to allow the regulator to exercise substantial discretion. At the political extreme of the continuum are the public enterprise options.

In practice, these options are more complex. Discretionary regulation can be combined with concession contracts (discussed below) and public enterprises. For example, in Europe, many state-owned infrastructure providers are subject to discretionary regulation, irrespective of whether they are part of holding companies or completely independent of any operator. Markets may have more or less influence. State-owned infrastructure providers, for example, rarely depend entirely on private markets to raise capital.

[89] Rail's natural monopoly element is its infrastructure. This is true for both vertically integrated and vertically separated railways. Vertical separation reduces the scope of the natural monopoly—rail operators have no choice, while end customers sometimes do.

[90] J. A. Gomez-Ibanez, *Regulating Infrastructure: Monopoly, Contracts and Discretion*, (Cambridge, Mass. Harvard University Press, 2003).

Managing interfaces within a reformed industry

If there is third-party access to infrastructure, regulation is needed to ensure equitable access among railway undertakings seeking to use the infrastructure, in particular to ensure that access rules and charges are not discriminatory.

If there is third party access *without* vertical separation of infrastructure and operations, particularly strong regulations are needed to ensure that the vertically integrated railway does not discriminate against new entrants.

Because vertical separation prevents the infrastructure supplier from having direct contact with customers, regulation may be needed to ensure that investments made by the infrastructure supplier reflect customer and government needs. Also, under vertical separation, infrastructure and train operations should be well coordinated and regulation can play a role in this.

9.2.2 Safety and the environment

Typically, the railway industry does not bear the full costs of accidents or environmental damage, so regulation is required to protect the public, employees, and the environment, as in other economic sectors. Otherwise, rail companies may neglect safety and environmental concerns, either for commercial reasons or simply because they lack awareness or competence in these areas.

9.2.3 The need for common technical standards

Railways have an incentive to develop and agree upon common technical standards because this facilitates interoperability among railway systems. Even railways that are not connected to other railways are interested in developing common technical standards so they can benefit from economies of scale in manufacturing. As a result, standards have been developed by the International Union of Railways (UIC), the Association of American Railroads (AAR), the Organization for Cooperation of Railways (OSJD)[91] and others.

Despite this, individual railway companies can lack incentives to develop and apply common technical standards; regulation can ensure that standards are established and met.

To uphold the public interest, competitiveness should be taken into account when developing regulations for the rail sector.

9.2.4 Impact on competing modes

Competing modes of transport such as roads usually entail much higher safety and environmental costs than rail. Railway regulations should not be so harsh that they stifle railways' ability to compete because this would tend to encourage customers to select other modes, creating overall deterioration in safety and environmental performance across the entire transport sector. Therefore, to uphold the public interest, competitiveness should be taken into account when developing regulations for the rail sector.

[91] For Eastern Europe, the Former Soviet Union, China, North Korea, Mongolia and Vietnam.

9.3 Forms of Regulation

9.3.1 Links among forms of regulation

The different forms of regulations are linked. Safety and environmental requirements affect technical standards and all of these shape requirements for economic regulation because they influence competition in rail services and the commercial aspects of railway performance. Also, competition can affect the implementation of safety, environmental, and technical regulations. For example, in the EU, introducing open access has led to requirements for each country to establish a national safety authority and an accident investigation body (European Parliament and Council, 2004), and Technical Requirements for Interoperability.

9.3.2 Economic regulation

Regulation and structure – international experience

Regulations must be designed to take account of industry structure, since this determines *what* needs be regulated: the interfaces within the railway industry, such as ensuring fair competition among operators and appropriate access charges or the price to the end-consumers of services.

International experience illustrates the link between structure and regulation. Most railways worldwide are vertically integrated and many have no automatic requirement to provide third-party access to other operators. The United States approach (see Box 9.1), which has competing vertically integrated railways allows for light regulation of prices to end users. This approach may be replicable in Russia, China, and India, which are large enough for competing vertically integrated railways. However in smaller countries competing vertically integrated railways would be uneconomic. Introducing competition within the smaller rail system would require third-party access, which would require more intrusive regulation than the regulation in the United States.

Box 9.1 Regulation of Vertically Integrated United States Railroads

The American experience in reducing regulation illustrates the effectiveness of a light touch, especially if there are competing vertically integrated railways. Vertically integrated freight railways compete in most markets with road and in some markets, with parallel rail lines.

Most railways are owned by the private sector in the United States and for many years were subjected to detailed control by the Interstate Commerce Commission (ICC). Railways could not close lines or merge, and were subject to strict regulation of tariffs and other aspects of service. Contracted (negotiated) rates with shippers were not allowed, only common carrier tariffs.

These restrictions prevented commercial initiative and created railway organizations that resembled the public sector. This led to inadequate or even nega-

tive financial returns and a consequent lack of investment. Eventually, it culminated with the bankruptcy of several railways (20 percent of the industry) in the 1970s.

In 1980, the regulatory regime was changed to achieve a better balance between the financial viability of the railways and the interests of shippers. The new approach depends on competition between railways and competition between railways and roads to 'regulate' the market. Railways were permitted to negotiate prices and services with customers. The Regulator agency intervenes only on prices, only in response to complaints, and only if the ratio of revenue to variable cost for the traffic is greater than 180 percent. The Regulator also reviews mergers to preserve competition.

Since 1980, all performance measures of the railways have improved and financial returns have been adequate but not excessive. Average rail rates have fallen 55 percent, rail traffic volume has nearly doubled, and the railways have reinvested more than $460 billion into their systems.

Typically, formerly planned economies have vertically integrated railways with one dominant operator. Most aspects of price and quality are regulated through direct control—railways are run as ministries or as state administrations (see Box 9.2), which puts them under direct political control. This results in conflicting interests—as a regulator, the ministry may want lower tariffs, but as an operator, it might want higher tariffs. Therefore, railways are fettered in their ability to operate as a business.

Box 9.2 Formerly Planned Economies

Typically, formerly planned economies (including India) regulated most aspects of railway price and quality through direct control, either by running railways as ministries or as state administrations. In China and India, for example, the ministry is policymaker, regulator (economic and safety), owner and dominant (vertically integrated) train operator. However, Russia has corporatized its railways, separated management from government functions and allowed private wagon owners to become operators, although they must usually use Russian Railways' locomotives.[92] When Russian Railways (RZD) has finished creating subsidiaries to own all its wagons, tariff regulation will be limited to infrastructure and locomotives. The RZD tariffs are regulated by the Federal Service for Tariffs[93], a body responsible for tariffs in all network industries in Russia.

The EU and Australia (see Box 9.3) allow competing railway operators access to the railway infrastructure. Their experience is relevant to countries that have or are considering open access or limited third-party access. Open access allows competition to regulate the final market. Its disadvantage is that regulation is still required to ensure

[92] Russia follows EU terminology: carriers provide traction, operators do not.

[93] http://www.fstrf.ru/eng. More details on Russia may be found in the Case Study and in the relevant chapter of *Reforming Railways*, http://www.cer.be/publications/books/2099-new-reforming-railways-learning-from-experience

fair access to infrastructure and encourage competition among operators. Regulation of access charges is important in open access situations.[94]

Box 9.3 'Open Access' in Europe and Australia

Traditionally, most European countries regulated entry into the rail market, allowing only the state-owned vertically integrated railways to operate train services. Recently, however, the European Union and Australia, competition has been introduced in the rail sector by removing barriers to entry and allowing third party access to monopoly railway infrastructure.

Because railway undertakings are now operating in a competitive market, the focus of regulation must change from controlling the behavior of the vertically integrated railways to controlling the behavior of the natural monopoly infrastructure provider and promoting competition among operators. New forms of regulation are therefore required. The key principles for the EU are contained in Article 30 of EU Directive 2001/14:

- The creation of national regulatory bodies (RBs) is required, independent from any infrastructure manager (IM), allocation or charging body or applicant (railway undertaking seeking railway capacity);
- The applicant must have a right of appeal against unfair discrimination;
- RBs must decide on any complaints and take remedial action;
- RBs must ensure the charges for access to infrastructure are non-discriminatory and are set by the IM at a level that allows them to cover the direct cost of operating the service,[95] including scarcity and environmental costs, with mark-ups allowed where the market can bear it;
- RBs must ensure that IMs are able to balance income and expenditure;

Member states must ensure RBs have the powers to obtain information that allows them to carry out their duties.

The EU rules were established before Central and Eastern European countries joined the EU in 2004 and 2007. In some CEE countries, the incumbent railways and rail modal share have suffered from opening up their markets. As a result, despite apparent broad agreement on the principles of liberalization, the context must be carefully considered to avoid unintended outcomes.

Duties of the economic regulator

No single model is best for economic regulation of all railways. Regulation must be designed to achieve national transport sector objectives and take account of other aspects of railway reform, particularly industry structure and government policy on private sector participation. Also, regulation must consider the railway market—which could range from a single user mineral railway to a network serving

[94] More details on the Australian approach may be found in the Case Study on the Australian Rail Track Corporation.

[95] This is generally interpreted to mean marginal cost.

many freight customers and passengers—whether competition exists, whether a new line will be built, and railway ownership. These considerations shape the objectives that discretionary regulation should be designed to achieve and these objectives become the duties of the regulator.

Other practical considerations include any experience of regulation in the country, the existing political culture, and the potential to recruit staff with the skills and abilities needed to run the regulatory body.

The broad duties of the economic regulator or regulators should be enshrined in legislation. They may cover the following issues:

- Regulating tariffs and services, if there is little or no competition
- Developing competition
- Ensuring non-discriminatory access
- Determining access charges
- Ensuring infrastructure investment

Once competition is adequate, tariffs and services should be deregulated.

Regulating tariffs and services

Regulation of rail tariffs and services should be considered if there is little or no competition, whether from other rail operators, other transport modes, or competing sources. In this case, the standards of price regulation should be objective and transparent. Historically, governments have regulated transport tariffs and quality and many governments still do so. However, once competition is adequate, tariffs and services should be deregulated.

Developing competition

Competition is more efficient than regulation. Therefore an important task for the regulator is to help establish competitive markets, which will remove the need to regulate tariffs. However, in developing competition, the regulator must consider whether railway entities already face competition from other transport modes. Therefore, the regulatory body must monitor the development of competition and may intervene actively to promote competition, sometimes in cooperation with the competition authority if it has relevant experience.

If third-party access to railway infrastructure is allowed, competition among railway undertakings should lead to lower prices, increased innovation, and the development of new markets. However, incumbent railways, usually state-owned, have complained that new market entrants 'cherry pick'—that they enter or compete in only the most profitable markets, leaving the incumbent to serve the least profitable markets, which it may be under an obligation to serve. Another possibility with passenger railways is that new entrants may schedule their services just before the incumbent's. The consequent reduction in profitability can lead to reduced invest-

ment, thus leading to increased need for government support—for example, to replace cross subsidies from profitable block trains[96] to single wagonload services—and the closure of loss-making services.[97]

The regulator can help prevent cherry picking and ensure that competition is fair among industry players and of benefit to customers. Experience suggests that it may be more difficult to develop competition for passenger services than for freight. This may explain why regulations often differ between freight-dominated railways and passenger-dominated railways, which often rely on franchising.

Ensuring nondiscriminatory access

Healthy competition with third-party access requires the incumbent and new market entrants to share a level playing field. All licensed undertakings must have equitable access rights to track, under specified conditions. The regulator may be required to arbitrate complaints about discrimination in access provision.

Competition can sometimes be encouraged by developing multi-party access to the so-called 'last-mile' facilities—stations, depots, and connections to rail networks for which shared facilities make more economic sense than duplicate facilities. [98] If it is expensive to duplicate essential facilities; ideally, the owner *should* provide access to competing companies. However, to require this could discourage investment as companies do not want to invest to benefit their competitors.

The distinction between essential and non-essential facilities is illustrated by Annex II of the European Union's Directive 2001/14 (European Parliament and Council, 2001)[99] (see Box 9.4). The Directive includes lists of services that may be supplied to railway undertakings. Group 1, the minimum access package, and Group 2, track access to services facilities and supply of services, refer to services that would be costly to replicate and to which access must be provided (see Article 5). Group 3, additional services, *may* be offered; if they are, the infrastructure manager must supply them upon request. Finally Group 4, ancillary services, *may* be supplied but the infrastructure provider is under no obligation to do so.

[96] Block trains are trains that run from origin to destination without passing through marshalling yards where wagons are reorganized into new trains.

[97] *Railway Reform – Regulation of Freight Transport Markets,* (European Conference of Ministers of Transport, 2001).

[98] If access requirements do not discourage investment because the investor is obligated to provide access to the facility that will give advantage to competitors.

[99] http://ec.europa.eu/transport/rail/packages/2001_en.htm

Box 9.4 ANNEX II of EU Directive 2001/14 - Services to Be Supplied to Railway Undertakings

1. The minimum access package shall comprise:
   a) handling requests for infrastructure capacity
   b) the right to utilize the capacity that is granted
   c) use of running track points and junctions
   d) train control including signaling, regulating, dispatching, communication, and providing information on train movement
   e) all other information required to implement or operate the service for which capacity has been granted

2. Track access to services facilities and supply of services shall comprise:
   a) use of electrical supply equipment for traction current, where available
   b) refueling facilities
   c) passenger stations, their buildings, and other facilities
   d) freight terminals
   e) marshalling yards
   f) train formation facilities
   g) storage sidings
   h) maintenance and other technical facilities

3. Additional services may comprise:
   a) traction current
   b) pre-heating of passenger trains
   c) supply of fuel, shunting, and all other services provided at the access services facilities mentioned above
   d) tailor-made contracts for:
      - control of transport of dangerous goods
      - assistance in running abnormal trains

4. Ancillary services may comprise:
   a) access to telecommunication network
   b) provision of supplementary information
   c) technical inspection of rolling stock

Developing access charges

The charging system for access is one of the most complex issues of third-party access. First, to be able to calculate the cost of providing infrastructure services, accounts for infrastructure must be separated from accounts for rail operations.

Second, a decision must be made about the principles on which charges should be determined. Two broad options are marginal cost pricing and full cost recovery. Most economists favor marginal cost pricing, which charges for costs incurred for each service. However, the marginal cost of infrastructure is normally much less

than average cost,[100] so under marginal cost pricing, the railways will recover only a small proportion of total costs.

Another option is referred to by economists as a 'second-best' solution. The second-best solution adopted by the EU (EU Directive 2001/14) is to allow mark-ups above marginal cost to permit differentiated charges and improve cost recovery. Although it does not mention Ramsey Pricing, the EU Directive proposals are consistent with this approach.[101] So far, this approach has had limited success because many infrastructure managers measure direct costs inaccurately and lack market segment data on the sensitivity of traffic volumes to changes in access charges. In part, this is because, unlike integrated operators, infrastructure managers have no direct contact with customers. Chapter 3 noted that putting the full burden of Ramsey Pricing on access charges would create highly differentiated charges that could trigger regulatory objections or legal challenges.

Another way to recover fixed costs from customers is to impose a two-part tariff with a fixed charge to reflect fixed costs, including the longer-run costs of providing capacity. However, fixed charges are difficult to establish in a competitive market with open access because they affect competition between the larger incumbent railway undertaking and smaller new entrants to the market that have very different abilities to pay fixed charges.

Western European nations often resort to government funding to fill the gap between revenue and expenditure because of the difficulty of finding a second-best solution that allows full cost recovery from charges. However, in Central Europe, government budgets are more tightly constrained so high uniform-access charges are often imposed on all traffic. This reduces traffic levels and therefore reduces contributions to fixed costs.

Ensuring infrastructure investment

Ensuring the right amount and type of investment in rail infrastructure is complex and difficult in railways, because of the lumpiness of investment in railway infrastructure (large investments are needed all at once), because railway assets have long lives, because of the importance of sunk costs since rail infrastructure rarely has alternate uses and cannot be moved, and because of the large number of ultimate beneficiaries of investment. In most years, even in North America's deregulated and highly efficient railways, capital returns have failed to meet standards set by the regulator.

As a result of these difficulties, government may require the regulator to create a framework that encourages infrastructure investment. The key choices here are between rate-of-return (or cost-of-service regulation) and incentive (or price-cap) regulation.

---

[100] An exception is where there is congestion or scarcity of capacity, and marginal costs exceed average costs. This could be a real issue in countries with high capacity utilization. In these cases, the solution is to improve the design of access charges.

[101] Ramsey pricing is an approach whereby charges are raised above variable costs in inverse proportion to the elasticity of demand for a particular market segment. In other words the higher the elasticity of demand, the lower the charge.

Rate-of-return regulation was developed in the United States for setting utility rates. Prices are based on an efficient firm's costs for providing service, including a return on capital. The standard of an efficient firm is used because basing tariffs on all capital invested encourages wasteful investments, and basing it on all operating costs provides little incentive to reduce these costs.

Price-cap or incentive regulation is common among utilities in Europe, but for railway infrastructure, it exists only in Britain where it was introduced when railways were privatized in 1996. The Office of Rail Regulation applies a five-year price cap to infrastructure supplier's charges (Network Rail) and the infrastructure supplier retains any efficiency gains for the five-year period.

A weakness shared by both approaches is the difficulty of assessing efficient firm costs. Also, "there is no transparent method of comparing the cost and efficiency with which infrastructure is being maintained and thus there is no effective incentive for infrastructure providers to be efficient."[102] Finding benchmark railway companies is difficult, since generally each country has only one infrastructure provider. Thus, in-country benchmarking is difficult, and for international railways and other industries benchmarking is complex.[103]

Regulatory incentives appear to have little influence on efficiency gains by state-owned companies, perhaps because it is assumed the state will cover any losses. Governments usually regulate infrastructure suppliers through governance arrangements and annual budgeting, including an allowance for a return on capital. In mainland Europe, Ministries set annual budgets for state-owned infrastructure suppliers; this means the supplier retains any efficiency gains for only one year. However, several European countries have introduced multi-year contracts between the state and infrastructure suppliers as an alternative to regulation. To enlarge the planning horizon and to encourage efficiency gains, the EU is considering a requirement for member states to offer infrastructure managers multi-year contracts or to enact regulations to improve budgeting certainty and provide incentives to infrastructure managers to improve their efficiency.

Economic regulation across borders

Railways are the most competitive transport mode for moving freight over long distances; hence, cross-border railways are of growing economic importance. Consequently, regulatory frameworks need to meet national requirements and be sufficiently flexible to achieve compatibility across borders to operate or build new systems. In Europe, railways have developed along national lines so key concerns are interoperability and access, including access charges (Box 9.5), problems that are common to cross-border movements around the world.

[102] *Railway Reform and Charges for the Use of Infrastructure* (European Conference of Ministers of Transport, 2005).

[103] Comparing costs has been less problematic in the U.S.A. due to multiple rail companies and the regulator STB, which has created standard cost definitions, cost reporting requirements and a URCS (uniform rail costing system).

Box 9.5 Access Charges for Cross-Border Movements in the EU

In the EU, access charges for cross-borders movements have been debated extensively. National levels and structures of access charges vary widely among countries resulting in customer charges that are complex and unpredictable, and creating incentives for each country to act in its own interest by maximizing its revenue share from these services. Instead, some have argued that both the structure[104] and level of access charges should be harmonized across Europe. However, this is impractical due to wide variations in national levels of state support for infrastructure.

In the former Soviet Union, railways were unified until 1990 and they continue to adhere to the same technical and safety standards. Although transit tariffs vary, a satisfactory international agreement is in place. In Africa, a few international railways were built in colonial times, which predated today's national boundaries; therefore, interoperability is not a problem, unless countries change technical standards, such as gauge. The key regulatory issue is access arrangements for transit services from landlocked countries to ports.

In developing countries, the solution to the sharing of revenue for cross-border movements should be more straightforward. Governments should negotiate an international treaty, mirrored in an agreement among national railways that includes financial arrangements. The Southern Africa Development Community (SADC), for example, agreed on a "Protocol on Transport, Communications and Meteorology."[105] The chapter on rail included a requirement for "the establishment of regional railway costing principles, and a regional system for account settlement that provides for simplified payment procedures and account settlement procedures." At the time of writing, this system had not yet been implemented, but it is consistent with the principle that revenue sharing should be based on cost.

9.3.3 Safety regulation

The regulator should set the safety standards and the railway companies the system for implementing the rules.

Rail industry incentives are inadequate to improve safety because railways do not bear all of the costs of accidents. Consequently, safety cannot be left entirely to the industry, particularly if the railways carry passengers.

Safety regulations should not be too burdensome, so safety rules should be more relaxed on railway lines with little traffic or low speeds. Regulators should establish safety standards and railway companies should establish systems for implementing the standards. Regulators should then review, approve, and audit the system to ensure adherence. Appropriate regulations are more likely than inappropriate and illogical ones to be accepted by the industry and to be implemented without too much supervision. Safety regulation should not be intrusive and the regulator's

[104] If one country charges by train-km whereas a bordering country charges by gross ton-km, the train makeup will not be optimized for either.

[105] *Protocol on Transport, Communications and Meteorology*, Chapter 7 on railways, (Southern Africa Development Community, 2008). http://www.sadc.int/index/browse/page/162.

primary focus should be to ensure adequate processes are established to meet standards. See Box 9.6 for examples from the EU and South Africa.

Safety regulation could be 'privatized' through insurance requirements. For example, insurance company surveyors could conduct annual inspections, which would be a condition to obtain insurance, and insurance would be a condition to obtain a license to operate.

Box 9.6 Examples of Safety Regulation in the EU and South Africa

In the EU, Safety Directive (2004/49)[106] requires railway operators to maintain a safety management system (SMS) and hold a safety certificate or authorization indicating the safety regulator accepts the SMS. This directive is more detailed than earlier legislation as it now takes account of market opening and interoperability. The principles include: (i) railway companies are responsible for the safety of their portion of system; (ii) safety regulators are responsible for managing, regulating, and enforcing safety rules; and, (iii) national accident investigation bodies must be established and can be part of the safety regulator.

South Africa adopted a similar approach. The Railway Safety Regulator (RSR), under the Department of Transport, oversees and promotes safe railway operations by supporting, monitoring and enforcing within an enabling regulatory framework.[107] The RSR oversees railway safety in South Africa; train, station, and railway line operators remain responsible for implementation.

9.3.4 Environmental regulation

Most railway environmental regulation is based on cross-sector national legislation for environmental protection. Typically, rail-specific regulations cover three broad areas:

- Soil pollution, for example from engine lubricants, oil leakage from wagons, sewage from passenger trains, pesticides, and creosote from wooden sleepers;
- Noise from rolling stock, which can be a major concern in urban areas;
- Local air pollution from diesel trains; pollution from freight (e.g., coal dust).

The environmental regulation body may also undertake environmental impact assessments for new projects. Assessments could cover a range of issues, including the impact on human settlements, wildlife, and water resources.

Environmental regulations are often standardized internationally. For example, a recent EU Directive (2004/26) aligns diesel locomotive emission limits with U.S. standards to help create a competitive global market for rolling stock.

[106] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:220:0016:0039:EN:PDF

[107] Source: RSR's website - http://www.rsr.org.za/

In the United States, the Federal Railroad Administration (FRA) is responsible for environmental regulation and environmental impact assessments. In contrast, in the EU, most countries assign environmental regulation to their environmental agencies, not a sector regulator.

9.3.5 Technical regulation

Technical regulations may be required to meet safety, environmental, or operational standards. A key form of technical regulation aims to ensure that track and wheels are compatible with each other on all lines. For example, EU directives on interoperability use provide a degree of technical harmonization and procedural standardization. Soviet standards, which still apply in former Soviet Union countries, have the same function.

Often, technical regulation standards are set too high, which makes them uneconomic. Regulations should not be overly prescriptive—national standards should not be misused to protect national industries, and all regulations should be evaluated for cost effectiveness, a task better performed by industry associations than by regulators.

- For example, in the U.S., the safety regulator, FRA, implemented legislation that forced the industry to adopt 'positive train control', a system designed to improve train safety. The regulator is convinced of operational advantages but the railroad industry disagrees and claims that the small benefits are far outweighed by high system costs.

- Similarly, the EU is convinced that a cab-based signaling system—European Railway Traffic Management System (ERTMS)—is essential to create a seamless European system and increase rail transport competitiveness. However, some parts of the industry will incur major costs from ERTMS, which could actually *reduce* rail's competitiveness.

These examples demonstrate the risk of unintended outcomes when governments or super-national agencies determine technical regulations and set standards without understanding the industry's pragmatic cost-effective requirements. Regulators should avoid imposing standards, implementation methods, or timescales that are unrealistic or unaffordable.

Often, industry associations develop voluntary standards, which reduces industry costs because effective design and standardization facilitates greater competition among suppliers. Voluntary standards developed by major industry associations are most effective when rail-specific national rules and standards align with international standards.

9.4 Regulatory Instruments

9.4.1 Legislation and regulatory instruments

Regulatory instruments are tools to carry out regulation. Their mandate must be provided for in primary legislation, which should set out a general framework that includes overall policy objectives, criteria, and procedures for applying the instruments. Legislation should enable all desirable regulatory interventions.

The simplest and most common regulatory instrument is rule-based regulation, such as tariff control. In contrast, contracts have been introduced as railways have been commercialized and privatized. The most important of these are licenses and concessions or franchises. Licensing is a type of discretionary regulation that may cover economic, safety, and environmental issues. Concessions or franchises cover only economic issues. These contractual instruments are discussed below.

9.4.2 Licensing

An operating license is essentially a contract between the regulator and the company; a regulator may exercise discretion in using its powers. As a contract, a license specifies obligations, risk allocation, and enforcement procedures. In particular, it specifies the rights and obligations of the licensee and gives it the right to operate. A licensed operator must comply with license conditions that indicate its suitability to operate the assets, taking account of its financial and management capacity, and agreed approaches to safety, environmental concerns, customer service obligations and information provision. The regulator and the railway company negotiate a license agreement that stipulates these license conditions. An example of such conditions for Network Rail, covering a wide range of regulatory issues, is on the website for the British Office of Rail Regulation.[108]

A license is a *negotiated* contract, which means that under most circumstances, changes can be introduced *only* by mutual agreement. However, regulators should have the authority to impose changes on any operators that disagree with the regulator's proposals, and operators should have the right to appeal or refer to the competition body or other appeals bodies, requesting an investigation.

Licensing could also be used with concessioning (or franchising) although the concessionaire may be exempt from certain license conditions if compliance with licensing conditions has been verified by the concessioning authority. Ideally, the license should be issued by an existing independent licensing body (possibly the regulator), not the concessioning authority. Concessionaires that fail to get a license for any reason normally should not be allowed to operate. A concession should be granted only after the regulator has issued a license, except if operations cannot start until new facilities are built. In that case, a concession agreement would be needed earlier than an operating license.

However, using *both* licensing and concessioning has disadvantages because more than one governing body is needed, and many countries lack resources for this.

[108] http://www.rail-reg.gov.uk/server/show/nav.2159.

The simplest solution may be to have a concession and compensate for gaps in the concession contract by making provision for dispute resolution.

9.4.3 Concessions

Key elements of concessioning

Concessioning differs from outright sale of the entire business and is commonly used to introduce competition for the right to serve the market, not competition within the market.[109] Normally, government retains infrastructure ownership and the concessionaire has the rights of use for the contract duration.[110] Concessioning is a form of regulation, but additional discretionary regulation may be required.

Concession design depends on the rights that are being contracted for, which could range from the right to operate a few services, to the right to construct and operate an entire national or international railway. The concession could be:

- A negative concession (usually for loss-making passenger services) where tariffs and services are normally regulated and the government pays the concessionaire;
- A commercial concession-operators pay government for operating rights, usually for freight, without rates or services regulations;
- A combination of these two.

A guide to a commercial concession contract is set out in Annex 4.

Regulation under concessioning

Under concessioning, regulation can be as simple as contract enforcement.[111] Alternatively, regulatory responsibilities can be divided between the concession-monitoring body (either government or a government agency) and an independent regulator. The independent regulator may give the private investor more confidence by providing a check on government, or preventing a concession-monitoring agency from terminating a contract before the concessionaire has an opportunity to rectify any problems. This arrangement should command better concession prices from bidders because it lowers their perceived regulatory risks. Box 9.7 describes experience with rail concessioning and regulation in Argentina.

[109] J. A. Gomez-Ibanez, *Regulating Infrastructure: Monopoly, Contracts and Discretion*, (Cambridge, Mass. Harvard University Press, 2003).

[110] In the case of new infrastructure, ownership can either revert to the government at the end of the concession or can be transferred to government on commissioning with the concessionaire having permission to use the facilities.

[111] Estache and de Rus, *Privatizing and Regulation of Transport Infrastructure*, (World Bank Institute Development Studies, 2000).

Box 9.7 Rail Freight Concessions and Regulation in Argentina

Argentine railways were concessioned in the early 1990s. Government established a transport regulator, also responsible for trucks and buses, which reported to the Secretary of Transportation. The regulator lacked discretion to modify concession contracts and most problems resulted from contracts that were incomplete and rendered obsolete when freight traffic fell short of contracted levels, and growing competition forced a tariff reduction. As a result, concessionaires paid government less and invested less than stipulated by their contracts. Government opted to renegotiate the contracts, rather than terminate them and authorized the Secretary of Transportation to renegotiate, rather than the regulator. This resulted in establishing a system of 'regulation by renegotiation', rather than 'regulation by contract'. Both sides took the contracts less seriously and this reduced their effectiveness.[112]

Regulators may arbitrate if investors exhibit opportunistic behaviors such as contract renegotiation demands, or contract non compliance. This is a common occurrence among African concessions[113] but no African country has an effective rail regulator to arbitrate or enforce agreements. Box 9.8 summarizes the experience with rail concessions in Africa.

Concessioning has some limitations compared to discretionary regulation. Since many circumstances are unforeseen when a concession contract is signed, contracts are incomplete and contract rules inadequate to deal with all eventualities. Regulatory processes are a low-cost replacement or supplement for incomplete contracts.

Many failed concessions could have been reinforced to make them more effective if discretionary regulation had been used.[114] Concession-monitoring bodies, which are government entities or dependent on government, should not deal with customer complaints or safety concerns because government has a vested interest in protecting the concessionaire's interests. Regulators should be independent of government and the railway industry so they can consider appeals against decisions without resorting to the courts. An independent economic regulator may act as arbiter in concession contract disputes or non compliance.

In principle, under a concession, economic regulation should be passive, which means the regulator should *respond* to complaints rather than *initiate investigations*, and use a light touch, especially because there is often intense competition from road services. However, the regulator may need to do the following:

- Monitor market domination if the concessionaire achieves high levels of rail market share; and monitor measures to deal with abuse of monopoly power

[112] J. A. Gomez-Ibanez, *Regulating Infrastructure: Monopoly, Contracts and Discretion*, (Cambridge, Mass. Harvard University Press, 2003).

[113] R. Bullock, V. Foster and C. Briceno, C., *Africa's Infrastructure, A Time for Transition*, (World Bank, 2010). http://www.infrastructureafrica.org/aicd/flagship-report.

[114] J. A. Gomez-Ibanez, *Regulating Infrastructure: Monopoly, Contracts and Discretion*, (Cambridge, Mass. Harvard University Press, 2003).

- Hear and investigate complaints on access and discriminatory practices
- Assess discrimination among shippers
- Ensure fair access to infrastructure for new operators, if appropriate
- Provide advice to the minister if, for example, the concessionaire wishes to withdraw services

Also, the minister may have authority, either under law or the concession agreement, to require the regulator to review the reasonableness of proposed tariff increases in the context of the concession agreement, if the concession monitoring body lacks the expertise.

Box 9.8 Rail Freight Concessions in Africa[115]

Since 1993, many African countries have granted concessions to operate railways, a move that has generally improved efficiency and traffic despite weaknesses in concession contracts and institutional arrangements for enforcement. Fears that private concession operators would develop undue market power have proven unfounded but this has meant that tariffs could not be as high as assumed at concessioning. Low tariffs and traffic which fell short of forecasts reduced profitability. High concession fees and unsustainable debt levels have consequently left operators unable or unwilling to invest adequately. Therefore, governments have had to make up most of the investment, using loans from international financial institutions (IFIs), to address renewal and maintenance backlogs. Concession contract regulation has been ineffective, especially on information disclosure, due to shortage of qualified staff and lack of political support for concession authorities. Contracts have not been subjected to independent audits, and concessionaires have suffered unpredictable and arbitrary changes, such as requirements to run unfunded passenger services, or imposed salary increases. An independent regulator or oversight committee might have prevented these irregularities.[116]

Most Latin American and African countries have chosen to use concessions rather than licensing because they lack a history of independent regulation. However, once the transaction is completed, the concessionaire has considerable leverage, which can become a problem.[117] In practice, both concessionaire and government often fail to deliver on their obligations.

Specific regulatory issues in concession contracts

In Latin American and African concessions, most economic regulation is limited to subsidized passenger tariffs, and the potential to abolish concession agreement

[115] R. Bullock, *Review of Selected Railway Concessions in Sub-Saharan Africa*, (World Bank, 2006). http://www4.worldbank.org/afr/ssatp/Resources/WorldBank-WorkingPapers/ESW-RailwayConcessions.pdf and R. Bullock, *Results of railway privatization in Africa*, (World Bank,2005). http://siteresources.worldbank.org/INTTRANSPORT/Resources/336291-1227561426235/5611053-1229359963828/tp-8_africa_rail_concessions_web.pdf

[116] Ibid.

[117] R. Sharp, *Results of Railway Privatization in Latin America*, (World Bank, 2005). http://siteresources.worldbank.org/INTTRANSPORT/Resources/336291-1227561426235/5611053-1229359963828/TP-6_LAC_Railways_Concessions_web.pdf.

exclusivity if there is abuse of monopoly power. However, exclusivity is rarely removed as volumes are rarely sufficient to support more than one operator. Furthermore, some concession contracts are silent on the issue of exclusivity; therefore, concessionaires assume it exists and governments assume it does not. In general, Latin American and African concession contract design and regulation need strengthening; an independent regulator with appropriate powers would support this.

Construction of new lines

Concessionaires may sometimes want to ensure that no new lines are built that may compete with the line they have concessioned. The concession agreement could state that the government will not subsidize (or even approve) the construction of such lines for a stated period.

Mineral lines

In many countries, railway lines to export coal or minerals, usually purpose-built and owned by mining companies or their subsidiaries, are commonly concessioned. Sometimes government decides the public interest would be better served if the concessionaire were required to provide capacity for third-party access by other mining companies or others. For example, recently in Pilbara, the Australian Competition Tribunal required the mining companies that owned a rail line to provide access to other mining companies. However, since line owners have incentives to sell spare line capacity, it begs the question of whether regulatory intervention is even necessary or desirable for such lines.

Competition

Competition among rail operators is feasible if lines serve the same markets, but only if sufficient economies of density exist. Otherwise, it is seldom economic to have more than one line serving a corridor. For example, in Mexico, the railway concessioning competition was designed to connect industries through one jointly owned line to more than one railway systems, each serving a separate port.

Duration of concession contract

Long contracts encourage assets investment, market development, and good management practices. Since most railway assets have a long lifespan and railway infrastructure is immobile, the concessions should have commensurate duration. In Africa, for example, concessions are typically 15-30 years.[118] However, it is a good idea to design in some review dates to assess progress.

Rail passenger franchises are a form of concession but normally they do not include responsibility for rail infrastructure. In Britain, franchise duration is typically 7-10 years, although there are plans to increase this, and elsewhere in Europe, franchise durations are even shorter. Short franchises increase competition 'for the market' and make it easier for the public sector to capture efficiencies. However,

[118] R. Bullock, V. Foster and C. Briceno, C., *Africa's Infrastructure, A Time for Transition*, (World Bank, 2010). http://www.infrastructureafrica.org/aicd/flagship-report.

short franchises discourage concessionaires from investing in assets or staff training and development, or introducing permanent cost-saving measures. This can shift responsibility for investment to the public sector.

9.5 Institutional Issues

9.5.1 Principles for sound regulation

Key principles for determining how to regulate railways are as follows:

- The regulator is independent of industry and government
- The regulator has clear legal authority and can extract industry information required to carry out its specified duties
- Transparency and openness prevail
- The regulator is accountable for action, inaction, and related costs
- Regulatory decisions are consistent and predictable
- Simple regulatory design clarifies roles and responsibilities, which can help avoid misunderstandings and legal disputes.

All aspects of regulatory activity should reflect these principles.

Independent regulators

Independence from industry and government is desirable for any regulator. This is because the decisions of an independent regulator are more likely to be, and be perceived to be, free from vested interests and consequently less liable to controversy and legal challenges. Independence reduces the scope for 'regulatory capture'—when a regulator champions special interests, such as short-term industry objectives or political outcomes—rather than upholding the public interest. A clear delineation of tasks is needed between the government as policy maker, the regulator as referee, and industry players as infrastructure and service providers.

Economic regulation should be independent of any railways industry player; this is even more critical after introducing competition, to maintain a level playing field and the perception of fairness.

Ministers should have no authority to influence regulatory decisions. If the industry is regulated by a ministry with financial interests in the railways, or ministry policy objectives conflict with commercial objectives, the private sector will walk away and the goal of developing market competition will be unrealized. Independence should also ensure consistent and predictable decision-making as decisions are separated to some extent from the political process.

Before investing, the private sector will be concerned that regulations and rules may be introduced or changed which may undermine the profitability of their investments, or even worse, renders their assets vulnerable to expropriation. Independent regulation provides greater certainty than if decisions depended entirely on government. Regulators often oversee complex and contentious situations, and should be allowed to seek professional advice and find apolitical solutions.

However, even though regulation should function outside the political process, regulator authority and scope of responsibility are established through government legislation, and members of the regulatory body should be appointed by government.

How can countries establish regulation that is genuinely independent? Many countries lack experience of independent regulation or the financial and human resources to regulate effectively. Consequently, some national governments opt to regulate using concessions. However, without some independent regulation, concessions can be problematic.

To achieve genuine independence, the regulator must be adequately resourced, typically from a dedicated funding source that emanates from the industry it is regulating—through fees for licenses or concessions. Independent funding insulates the regulator from government budgets and reinforces independence from government. Parliament should establish the regulator's budget, separate from that of the ministry responsible for railways, to ensure budgetary accountability and independence. Genuine independence is also reinforced through stringent processes to appoint and dismiss the regulatory board and senior staff (see section on staff below).

In practice, countries may be unable to implement all elements of regulatory independence immediately. A small fledgling regulator could benefit from established government administrative procedures, and financial independence from public subsidy is unlikely given the substantial start-up costs to set up the regulator. However, the long-term goal should be regulatory independence.

Clear legal authority and duties

The powers of the regulatory authority should be fully articulated in legislation, avoiding the need for the regulator to seek ministerial approvals. The legislation should specify the regulator's legal authority and scope of responsibility. In particular:

- The roles of the regulator and other bodies should be clarified to avoid overlapping responsibilities.
- The regulator's authority must be sufficient to execute specified responsibilities; for example, the regulator must be able to access industry information.
- All aspects of regulatory processes should be transparent, including all decisions and the justifications for them.
- The regulator should be legally accountable for procedures and decisions through an appeals procedure, which provides a reputational incentive for the regulator to base decisions on evidence and sound reasoning.
- Permanent consultative arrangements should be established with key sector stakeholders, including ministries, ports (where appropriate) and major customers.

For example, the duties of the British rail regulator are in Section 4 of the 1993 Railways Act.[119]

Transparent and open processes for making and publishing decisions reinforce the independence of the regulator.

Transparency and openness

Transparent and open decision-making processes conducted through formal channels reinforce regulatory independence and provide market confidence that there has been no undue influence from government or industry. This includes opening regulatory processes and procedures to public scrutiny and disclosing all decisions, procedures, appointments, financial information, and means of appeal. Communication channels should include annual reports, a continually updated website, and perhaps a telephone call-in facility.

Accountability

The regulator must be accountable to the public it serves, to the industry it regulates, and to parliament, which authorizes its operation. Therefore regulatory reporting procedures and access to information for consumers and other stakeholders must be open and transparent. The regulator must demonstrate accountability in staffing procedures, lines of authority, and decision-making. Also, accountability requires a coherent, robust, and open appeals process for industry to challenge regulator decisions.

Of course, independent regulators are capable of exceeding their mandates and increasing their internal costs to unjustifiably high levels. Therefore, checks and balances must be established through governance structures, mandatory public information disclosure, independently audited accounts, and judicial reviews and investigations of regulator decisions. Regulators should submit an annual report to parliament disclosing finances, planning, achievements and failures, and a parliamentary body, such as a public accounts committee, should oversee this.

Consistency and predictability

Regulators need enough flexibility to improve the regulatory regime by adapting processes and decisions to reflect lessons learned in carrying out their work. However, inconsistent or unpredictable shifts in regulatory requirements increase risk for the private sector, generating suspicion and reducing credibility about regulatory independence, thereby raising the cost of capital and discouraging investment in the industry.

Complexity should be minimized

Minimizing the cost and complexity of regulation is a key objective in regulatory design. Complexity increases costs for the regulator and the industry, uses scarce human resources, and can stifle commercial activity. Regulation must strive to avoid reducing rail industry competiveness, particularly since most governments want to shift transport traffic to rail from less environmentally friendly modes. Regulatory design should be aimed at limiting regulation to the absolutely essential, and streamlining regulatory structures and processes, leaving as much as possible to the market and the industry.

[119] http://www.railwaysarchive.co.uk/documents/HMG_Act001.pdf.

A clear delineation of tasks between government, as policy maker and the regulator, and as referee should be made.

9.5.2 Institutional arrangements and staffing

Within the context of the principles set out above, several inter-related options exist for regulatory institutional arrangements.

- Should economic and safety regulations be combined in a single body?
- Should rail have its own regulator or share a regulator with other sectors?
- Should the regulator be designated as an agency or an authority (implying more independence)?

There are also staffing options, which are discussed below.

Combine economic and safety regulation?

A single body can carry out economic and safety/technical regulation, or tasks can be shared by separate bodies. Some countries have opted for separate bodies, such as the United States, and initially, Great Britain. Later, Britain decided that safety and economic regulation should be combined, which would help to ensure that safety regulation took more account of the commercial implications of decisions. This creates some potential for safety to be compromised by a greater focus on commercial outcomes, but combining economic and safety regulation offers the advantage of sharing staff, especially technical staff. It addresses the important issue in designing regulatory frameworks of ensuring smooth coordination between those responsible for different aspects of regulation.

Single sector or multi-sector regulator?

The legislation setting up the rail regulator should take account of other regulators whose authority may take precedence or whose mandate may overlap with that of the rail regulator. For example, would it make more sense for existing regulators to add rail regulation to their responsibilities? Or is a dedicated rail regulator a better option? This relates to the broader issue of whether a single rail regulator or a multi-sector regulator (MSR) should be responsible. Box 9.9 offers examples.

Box 9.9 Examples of Single and Multi-Sector Regulators

In the United States, economic regulation for railways is carried out by the independent Surface Transportation Board (STB), responsible for all surface transport modes; railway safety is regulated by the Federal Railroad Administration (FRA) within the Department of Transportation. Similarly, in Germany, an MSR, the Federal Network Agency (BNA), monitors competition and ensures non discriminatory access to infrastructure in all network industries, including railways; the Federal Railway Authority (EBA) supervises and issues railway licenses.

In Russia, there are two economic regulators (MSRs) for natural monopolies: the Federal Service for Tariffs (FST), which deals only with tariffs and the Federal Anti-Monopoly Service (FAS), which deals with broader competition and regulatory issues. A similar arrangement has been adopted in Kazakhstan.

In other large EU countries (Britain, France, Italy), economic regulators for rail are responsible *only* for the railway industry, but this is not the case in smaller EU countries.

Few transitional or developing countries have sufficient resources to establish a single regulator for the rail sector, or even for the transport sector, so most developing countries have established rail regulation within multi-sector regulators. For example, in Tanzania, the Surface and Marine Transport Regulatory Authority (SUMATRA) regulates economic, safety, and environmental aspects for all transport sectors, except air. Useful synergies can result when a single body regulates multiple sectors.

- Lessons learned from regulating one sector can be applied to other sectors.
- Specialist staff (e.g., lawyers) can be utilized across sectors, creating full work programs and more effective and efficient regulation.
- Utility and transport sectors share the need to plan and finance long-term capital investment, to determine tariffs, and the need for licensing.
- An MSR should facilitate regulatory policy that is more consistent and transparent across sectors.
- An MSR may be less likely to succumb to 'regulatory capture' than a single sector regulator, because an MSR has more status and authority, and works across multiple industries and ministries.

MSRs have some potential disadvantages:

- Because of MSR power and influence, leaders can abuse their position. Specialist technical knowledge for individual sectors may be insufficient; this risk can be reduced if each sector is represented at board level, and if sector-specific technical groups are retained at operational level.
- An MSR's size and relative complexity may present more challenges to establish and manage.
- A larger bureaucracy could delay decisions.

Authority or agency?

The regulator should be set up as an independent authority not a government agency, which would lack the necessary independence. A regulatory authority, operating within a framework defined by government in legislation, will ensure that decisions are consistent and sufficiently predictable to assure investors, rather than based on short-term political gains such as elections, or financial constraints.

Staffing

Many countries have little or no experience of independent regulation so building regulatory capacity is a key issue.[120] The challenge is to recruit and retain experienced qualified staff that can perform the unique and difficult roles required by the regulator.

[120] R. Bullock, V. Foster and C. Briceno, C., *Africa's Infrastructure, A Time for Transition*, (World Bank, 2010). http://www.infrastructureafrica.org/aicd/flagship-report.

Regulation should be designed so that its benefits exceed its costs.

Regulators should not depend on a government department for their staffing. To increase independence, appointments should be made independently of government or the minister, possibly through an independent appointments board. Board members and senior staff should have tenures of four or five years to ensure their allegiance is to the regulator and not to their former assignment, typically the industry or the ministry. Board members or senior staff should be exempt from dismissal except under extreme circumstances of moral turpitude or gross incompetence. This precaution insulates decision makers from external pressures, thereby upholding regulator independence. Grounds for termination should be specified in law and termination procedures should incorporate strong checks and balances, such as a requirement for parliamentary ratification.

An effective regulator must have sufficient numbers of competent staff, which could encompass skills in law, economics, accounting, and engineering, depending on the duties of the regulator. Also, railway technical skills will be required for safety regulation, and possibly for economic regulation, to ensure that decisions take account of rail industry realities. Since the regulator should be a catalyst for change and take a fresh look at railways, staffing should not be dominated by former railway employees who may also be overly intrusive and attempt to direct the running of the railway.

9.6 Conclusions

It is difficult to regulate well. Consequently, regulation should be limited to essentials, using the simplest and least intrusive regime possible.[121] Economic regulation of railways is required only if there is market power; it may be unnecessary if there is strong competition from road transport. The regulator should contribute to developing and sustaining competition so that less regulation is needed. If the industry structure allows third-party or open access—creating competition among rail operators—regulation should focus on the remaining natural monopoly, which is usually limited to infrastructure provision.

Regulation should be designed to ensure that its benefits exceed its costs. Economic regulation may be an appropriate response to market failure, but it is more efficient to develop a functioning market than to regulate. Although several forms of market failure exist for railways, monopoly is the form that requires the most regulation. However, by allowing competition in train services, regulation can be limited to infrastructure, particularly investment, and controlling and pricing access. Both access and investment objectives are more easily achieved using commercial incentives than using regulation.

No single best model for economic regulation of railways exists. Instead, regulation should be custom designed to achieve government objectives for the whole transport sector, taking account of other aspects of railway reform. These considerations determine the public interest objectives that regulation should be designed to achieve and these should determine the duties of the regulator that should be enshrined in legislation.

[121] J. A. Gomez-Ibanez, *Regulating Infrastructure: Monopoly, Contracts and Discretion*, (Cambridge, Mass. Harvard University Press, 2003).

Experience suggests that it is more difficult to develop competition for rail passenger services than for freight services, implying that passenger-dominated railways may need more regulation than freight-dominated railways.

A regulatory regime should be flexible enough to respond to the unexpected, particularly when traffic fails to meet projections. Flexibility is easier to achieve through discretionary regulation than through a concession contract, although sometimes a combination may be the best solution.

External safety and environmental regulation is essential for railways but technical standards are often best left to the industry.

Institutional arrangements for rail regulation are important. Ideally, economic regulation should be carried out independent of government *and* industry; if this cannot be achieved immediately, it should be an eventual goal.

10

Railway Reform:
Toolkit for Improving Rail Sector Performance

Chapter 10:
Corporate Governance for a State-owned Railway Enterprise

10 Corporate Governance for a State-owned Railway Enterprise

10.1 Introduction

Transparency – presenting accurate information on governance and performance to the public – is one of the most important sources of accountability for both SOEs and their state owners

Corporate governance of a state-owned railway enterprise provides the framework for ensuring that the railway is well managed, implementing shareholder-set policy, conducting business lawfully, and performing in accordance with owner's expectations. It includes creating: (i) a transparent and healthy relationship between the government and the entity; (ii) a structure for strategic guidance and oversight of the railway; and (iii) a structure for appointing an appropriately qualified and motivated management team.

Most formerly state-owned railways are now organized either as state-owned enterprises (SOEs) or as private corporate enterprises with state ownership of part or all of the shares[122]. This chapter describes good practice for how corporate governance processes should work for state-owned railways.

Sources of good practice

This chapter draws on good practice guidance from the "Guidelines on the Governance of State-owned Enterprises" and the "Principles of Corporate Governance" prepared by the Organization for Economic Co-operation and Development (OECD)[123], as well as the experience of the World Bank in the rail sector. The Guidelines on the Governance of State-owned Enterprises (the OECD Guidelines) provide the only international body of guidance specific to the governance of SOEs. The two sets of OECD Guidelines are a unique and valuable resource for governments and ministries. They provide recommendations and extensive annotations. The OECD recommends that where possible SOEs should adhere to the broader 'Principles', which are intended to apply to both privately and publically owned enterprises. The World Bank's SOE Toolkit, "Corporate Governance of State-Owned Enterprises: A Toolkit" provides useful guidance[124].

A selected set of sample documents for carrying out the corporate governance functions prepared by the World Bank are provided in Annexes.[125]

---

[122] An SOE is normally established under a special law applicable only to state entities, i.e. no provision for private shareholders. A private corporate enterprise with 100 percent state ownership is legally a private corporation, but all of the shares are (at least initially) held by the state. The latter has all the legal status of any privately-held corporation, thus it is easier to add non-public shareholders later without making major changes to the corporate charter.

[123] OECD (2015), *OECD Guidelines on Corporate Governance of State-Owned Enterprises*, 2015 Edition,
OECD Publishing, Paris; and OECD (2015), *G20/OECD Principles of Corporate Governance*, OECD Publishing, Paris.

[124] World Bank Group. 2014. *Corporate Governance of State-Owned Enterprises: A Toolkit*. Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/20390 License: CC BY 3.0 IGO.

[125] Includes: Board Charter (Annex 6); Ethics Code (Annex 7); Terms of Reference for an Executive Committee (i.e. Management Board or the Management) (Annex 8); Definition of Independence (Annex 9); Guidelines on Related Party Transactions (Annex 10); and Statement of Corporate Intent (Annex 11).

10.2 Structure of State-owned Enterprise Governance

One of the two typical enterprise governance structures is usually employed for railway enterprises; namely, the one-tier board system (unitary board system) most common in North America and in Australia; and the two-tier board system (dual board system) used in some of the countries in Europe (including emerging economics such as Poland), as well as in China[126]. Although the dual and the unitary board structures have shown some convergence in recent years, there remain notable differences. Under the unitary board system, the CEO is usually a member of the board of directors (or sometimes chair of the board, which is not a good practice from the corporate governance perspective), while under the dual board system, overlap in membership between the supervisory board and the management board is often not permitted.[127] By statute, the membership of the (European) supervisory board under the dual board system includes employee representation, which is seldom seen in North America. Under the dual board system, the supervisory board usually appoints the entire management team (management board), while under the unitary board system, the board of directors typically appoints the CEO, who then appoints the balance of the management team.

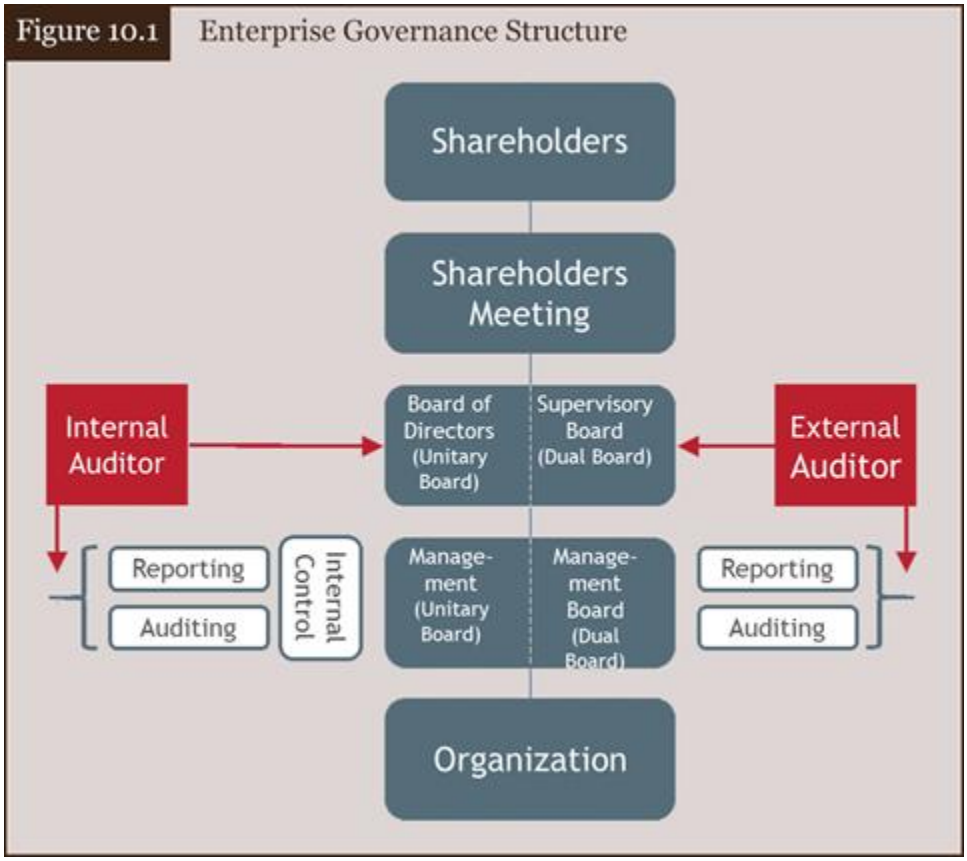
Legislation and regulations within each country will determine the details of the legal roles and responsibilities of the elements of the organization and their designation. For example, the articles of incorporation or corporate charter[128] for setting up the enterprise will determine many functional rights and responsibilities of shareholders and the board of directors. In addition, local company law and the enterprise charter often specify shareholder voting issues, how shareholders exercise voting rights, how they access enterprise information, and how minority shareholders are protected. Local law also determines the liabilities of the board of directors.

[126] In the European Union, unitary board system is recommended by the respective corporate governance code in eight countries, while a dual board system is recommended in ten countries. The remaining nine countries use a hybrid system or both (companies can chose unitary or dual board system). Source: European Commission, "National Factsheet: Gender Balance in Boards: Country Sweden." January 2013. http://ec.europa.eu/justice/gender-equality/files/womenonboards/womenonboards-factsheet-se_en.pdf

[127] In countries such as Germany and France, the CEO is not a member of the Supervisory Board, but in countries such as the UK and Australia, the CEO is often a member of the Supervisory Board although s/he is not the chair.

[128] A corporate charter is a set of legal documents, often including Articles of Incorporation, filed with a government licensing agency that defines the purpose of the enterprise and how it will be structured (open or closed stock company, limited liability). The definition of the company in charter documents provides the legal basis for determining what laws and regulations apply to the enterprise and identify the legal address and structure of the enterprise. While it is important for a charter to be broadly consistent with international best practice, it is also essential that corporate documents for SOEs be fully consistent with national corporate law, including stock market regulations.

Figure 10.1 Enterprise Governance Structure



For the remainder of this chapter, "board" refers to the "corporate body charged with the functions of governing the enterprise and monitoring management", as defined by the OECD "Guidelines on the Governance of State-owned Enterprises", i.e. the board of directors of the one-tier board system or the supervisory board of the two-tier system.[129] "Management" refers to the group of senior employees responsible for day-to-day management of the enterprise, headed by the CEO, whether or not they are constituted as a board or other formally designated body.

It is important to understand that corporate governance policies have an important role to play in sustaining non-government investor confidence. Good corporate governance that is credible and supported by effective supervision and enforcement mechanisms reassures shareholders and other stakeholders that their rights are being protected on an ongoing basis. This not only facilitates corporate access to the capital market but reduces business risk, decreasing the cost of capital for the enterprise.

The most important characteristic of the corporate governance structure is that the board of directors is independent from enterprise management. Local legislation

[129] In some countries, SOEs are required by government regulations to have a supervisory board or a board of supervisors *in addition to* a board of directors. This supervisory board consolidates state shareholder views and nominates and removes board members.

and the articles of incorporation or corporate charter[130] for setting up the enterprise determine many functional rights and responsibilities. For example, local company law and the enterprise charter often specify shareholder voting issues, how shareholders exercise voting rights, how they access enterprise information, and how minority shareholders are protected. Local law also determines the board of directors' liabilities—generally, the board has fiduciary responsibility to shareholders and is legally liable for enterprise conduct.[131] The enterprise compensates board members and expects them to spend significant time on company business.

Other important structures shown in the governance diagram and features specific to a railway enterprise are discussed in detail below.

10.3 Statement of Corporate Intent

In case of a public entity such as a railway SOE, there is often a formal commitment put in place between the railway SOE (via the company board) and the government entity that owns and oversees the enterprise, which may be called a Statement of Corporate Intent (SCI). The SCI (or similar) guides the activity of the railway corporation and allows the performance of the company to be evaluated. The SCI's exact content vary by the railway but typically includes the following[132] (also see Annex 11 for a Model Statement of Corporate Intent Template):

- The corporate vision;
- The overview of the company and its business;
- The company's strategic objectives;
- High-level business strategy;
- Key initiatives;
- Review of the previous year's performance, including the financial results, and the performance targets for the coming years.

The relationship between the board and state owners can be complicated. Because the state is a shareholder (and often the only shareholder), state-appointed directors may feel conflicted about their responsibility to the state as against the railway SOE. For example, the board may include present or former government ministers or ministry officials, who report to government ministries. These directors may face a conflict between their responsibility to the state (or the state entity) and their

[130] A Corporate Charter is a set of legal documents, often including Articles of Incorporation, filed with a government licensing agency that defines the purpose of the enterprise and how it will be structured (open or closed stock company, limited liability). The definition of the company in Charter documents provides the legal basis to determine what laws and regulations apply to the enterprise and identify the legal address and structure of the enterprise.

[131] A fiduciary responsibility is a responsibility based on trust. In this case, it refers to a group, business, or person (the board members in this case) who may act for another (the shareholders) with total trust, good faith, and honesty.

[132] Some rail SOEs' SCIs can be found at: http://www.artc.com.au/uploads/Final-ARTC-2016-17-Statement-of-Corporate-Intent.pdf (ARTC); https://www.parliament.nz/resource/en-NZ/51DBHOH_PAP66038_1/fd716313690a7bd5d1cdf5b4e1ee2ac3c5af5d6c (KiwiRail); and https://www.tasrail.com.au/client-assets/downloads/sci/2015%20-%202016%20Statement%20of%20Corporate%20Intent.pdf (TasRail).

responsibility to the enterprise as the board member. This situation has obvious conflicts; board members have fiduciary responsibilities to enterprise, thus board members are obligated to exercise their judgment to the benefit of the enterprise; but they also represent a state entity, whose interests may conflict with those of the enterprise. The SCI, clearly setting the enterprise objectives and performance targets as commitments to the government, enables the board and the government maintain a relationship that is transparent and arms-length. More information on the SCI and the process for creating it may be found in World Bank's SOE Toolkit, "Corporate Governance of State-Owned Enterprises: A Toolkit"[133].

10.4 General Shareholders Meeting

The transparency of the railway company's performance should follow normal rules of business as determined for a publicly listed company, including holding an annual general shareholders meeting (GSM) and having continuous and regular communication to the owner on matters that might affect the value of the railway company as a whole. If an SOE has an annual GSM, and if there are private shareholders, the private shareholders should also be able to vote at GSM.

One of the most important functions of the GSM is to select and approve board members. In addition, at GSMs, shareholders vote their shares to approve major annual items, including the company's financial statements and other major decisions/transactions, if any, as shown below.

Box 10.1 Typical Voting Items at SOE General Shareholders Meeting

Annual Decisions	
Board	• Appoint board members at the recommendation of the board or shareholder • Approve board member mandate contracts • Approve the remuneration of the board • Monitor activity of board to ensure that principles of economy and efficiency are being observed
Accounts	• Approve annual financial statements • Appoint and dismiss the independent external auditor
Dividends	• Approve the dividend proposal by the board of directors
SCI	• Approve the Statement of Corporate Intent and any amendments to it
Extraordinary Decisions	
Governing Documents	• Approve any amendment to the articles of incorporation or other governing documents of the SOE • Propose changes in board structure (unitary or two tiered)
Changes in Capital	• Authorize issuance of additional shares
Business Combinations	• Approve merger, split or divestiture of the SOE
Extraordinary Transactions	• Approve transactions involving 25% or more of the SOE's assets • Cancel related party transactions that prejudice the interests of the SOE

[133] World Bank Group. 2014. *Corporate Governance of State-Owned Enterprises: A Toolkit*. Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/20390 License: CC BY 3.0 IGO.

10.5 The Board

10.5.1 Functions of the board

Shareholders influence management through the board members they nominate. The board is legally and financially accountable for the company, responsible for the following functions, among others:

- Nominate and dismiss the CEO and in some cases key corporate officers, and set their compensation levels;
- Establish the enterprise organization;
- Establish company values and mission;
- Set the enterprise's strategic direction;
- Supervise management and monitor company performance against the performance objectives set in the SCI and the enterprise business plan;
- Monitor company financial performance and manage financial risks;
- Approve all important investments and strategic issues; and
- Develop company succession plans.

The duties and powers of the board, as well as board composition (discussed more in Section 10.5.3), terms, and chair selection, board committees, and relations with shareholders, are defined in the board charter (see Annex 6 for a Model Board Charter). The board draws on a range of resources to fulfill its duties to shareholders.

The board has a fiduciary responsibility to shareholders to act in the best interest of the enterprise. A fiduciary responsibility is a responsibility based on trust – those who act for shareholders have the duty to act with total trust, in good faith, and with honesty. For railway SOEs, the fiduciary responsibility of the board of directors means that they must act in the interest of the railway company. Conflicts between the interest of the company and the interest of government should be addressed through the SCI and other tools of government such as PSO/PSC contracts and regulation, so that the board can act fully in the interest of the SOE.

Boards typically organize internal committees to help manage responsibilities and may hire specialist consulting firms to help conduct governance, oversight, and strategic responsibilities.

Box 10.2 Key Principles for the Boards of SOEs

The boards of SOEs should have the necessary authority, competencies and objectivity to carry out the function of strategic guidance and monitoring of management. They should act with integrity and be held accountable for their actions.

- Boards should have a clear mandate and ultimate responsibility for the company's performance, be fully accountable to the owners, act in the best interest of the company and treat all shareholders equitably.
- Boards should carry out their functions (monitoring management and strategic guidance) subject to the objectives set by the government and the ownership entity. The Board should have the sole power to appoint and remove the CEO.
- Boards should be composed so that they can exercise objective and independent judgment. Good practice calls for the Chair to be separate from the CEO.
- If employee representation on the board is mandated, mechanisms should be developed to guarantee that this representation is exercised effectively and contributes to the enhancement of the board's skills, information and independence.
- Boards should set up specialized committees that support the full board in performing its functions, particularly with respect to audit, risk management, and remuneration.
- Boards should carry out an annual evaluation to appraise their performance.

Note: The above is a summary of key responsibilities of the board from OECD Guidelines on Corporate Governance of State-Owned Enterprises (2015 edition). Accessed at: http://www.oecd.org/corporate/guidelines-corporate-governance-SOEs.htm

10.5.2 Other key responsibilities of the board

Setting performance targets for management

Performance targets for SOEs should be set as part of the development of the company business plan and SCI. The board should establish performance objectives for the team of top executives linked to performance indicators found in the SCI and the business plan. These objectives are then negotiated with and agreed by executives.

Setting dividends for shareholder(s)

When the enterprise is expected to be commercially viable, the government entity that oversees the railway corporation should prepare dividend guidelines for the company that specify how much dividends are expected to be paid out and the process by which the dividends are approved and paid.

The guidelines on dividend amount should follow the following principles:

- The proposed dividend payment should take into account both the current and future financing needs of the railways and shareholder expectations;
- Dividend payments should be in line with dividends paid by a peer group of listed companies;

- Dividends should be predictable and show a degree of consistency across years, although this does not preclude the possibility of a one-time dividend in unique circumstances (sale of major assets, for example).

Protecting minority shareholders

The government overseeing entity, the board and the SOE all should play a role in ensuring that minority shareholder rights are respected and that shareholders are treated fairly. Minority shareholdings may occur when SOEs have partial listing on a local or international stock exchange, or they may result from the presence of strategic owners in SOEs or joint ventures. Irrespective of their origin, SOEs supervised by the responsible government entity should comply with both legal requirements and good practices in equitable treatment of shareholders, assuring the following minority shareholder rights are protected:

- Obtain relevant and material information on a timely and regular basis;
- Participate and vote in general shareholders meetings;
- Elect and remove board members; and
- Share the profits of the organization.

Related party transactions

A conflict of interest is a set of circumstances in which an individual or organization has multiple interests, one of which could unduly influence the professional judgment or actions regarding the other. A related party transaction (RPT) is a transaction in which a party with influence over the transaction has a conflict of interest. Conflicts of interest can arise when board members, executives or their families have secondary interests that could influence the board member or executive's judgment. Each enterprise board must adopt appropriate guidelines and put in place the necessary monitoring and disclosure systems, to ensure that no RPT that is prejudicial to the interest of the enterprise is approved by the board. Also see Annex 10 for Guidelines on Related Party Transactions.

10.5.3 Board composition

The board composition and number of members must be matched to the duties and responsibilities it is expected to carry out effectively and efficiently. Board members have fiduciary responsibilities to enterprise, and are obligated to exercise their judgment to the benefit of the enterprise. On average, the board of a large corporation has 7 to 12 members[134]. A substantially larger board should be avoided as unwieldy[135]. It is usually recommended that there be an odd number of board members to avoid tied votes.

---

[134] According to de Andres, P., Azofra, V., and Lopez, F. "Corporate Boards in OECD Countries: Size, Composition, Functioning and Effectiveness", *Corporate Boards In OECD Countries*, Volume 13, Number 2, March 2005, the average board size of large non-financial companies sampled (450 samples from Belgium, Canada, Switzerland, Germany, Spain, France, UK, Italy, Netherlands, and USA) was 11.67, with the smallest average size of 6.84 in Netherlands and the largest average size of 15.06 in Germany. According to one of the OECD reports in 2011, the average board size of large companies in Japan was less than 10, Portugal, 9-10, Sweden 10-11, and UK 10-11.

[135] In India, for example, the national legislation defines the supervisory board as having 7-12 members, based on expert international advice. In Germany, as discussed in the

Board members commonly serve staggered multi-year terms. This provides stability and continuity, since members will not all be replaced simultaneously. Shareholders can remove and replace board members at any time, and boards have committees in place to nominate new board members.

Shareholders must carefully consider railway company business maturity and business direction when nominating board members for an enterprise that has substantial financial, operational, market, and technological complexity. Because of this complexity, it is useful to have board members with broad expertise in finance, operations and logistics, technology, human resources, and law and government, in addition to general attributes required for board members, such as analytical ability, integrity and accountability, interpersonal skills, common sense, financial literacy, and being "fit and proper" (see Box 10.3). Members who are specialists in law and government are essential, since railways are usually heavily regulated. Some boards also include employee representative(s) from one or more of the powerful unions representing railway workers. Both the corporate charter and local laws may restrict eligibility to serve on the board, especially for SOEs.

Box 10.3 Fit and Proper

A board member is not fit and proper if s/he has been:

- Subject to an adverse finding in civil proceedings related to commercial or professional matters;
- Found guilty of any criminal violation related to commercial or professional matters or that would raise doubts on their character as a potential board member;
- Subject to disciplinary actions by regulatory authorities, professional bodies, or agencies;
- Refused the right to carry on a trade, business or profession requiring a license
- A major shareholder or officer of a company gone into insolvency, liquidation or administration in the last five years;
- Disqualified from acting as a board member or from acting in a managerial capacity.

Source: Based upon the Fit and Proper Test for Approved Persons from the UK Financial Services Authority Handbook. http://www.fsa.gov.uk/pubs/hb-releases/rel27/rel27fit.pdf

Even for railway SOEs, the majority of board members should be independent of the main owner(s) (see Annex 9 for Definition of Independence). As discussed above, the SCI is one of the mechanisms to maintain transparent and arms-length relationship between the board and the government owner. Sufficient number of independent, non-executive board members capable of exercising independent judgements where there might be potential conflict of interest will help strengthen

box below describing the structure of Deutsche Bahn (DB, German Railways), the Supervisory Board includes union representatives and is somewhat larger.

the integrity and independence of the board. In most countries, boards must consider gender distribution, and sometimes they should also consider race, ethnicity, or regional identity.

Prospective board nominees must be capable, available for the time needed to fulfill their roles and responsibilities, and free of any bias that would encumber their decision making. The enterprise compensates board members and expects them to spend significant time on company business. Ensuring that all of these criteria are met is not only the responsibility of shareholders but also of prospective board members themselves. The issue of independence and resources should be assessed on an ongoing basis, at least annually, not only at the time of nomination.

The board chair must be selected based on both qualifications and ability to allocate time necessary for the role. The chair should not be the railway CEO or a past CEO[136]. Large railways may require board chairs to be available for a substantial amount of time, since they may serve on committees, advise the CEO, and are often the political figurehead and spokesperson.

Board committees

A large railway SOE typically has several special board committees, such as:

- Compensation/remuneration committee, responsible for compensation policy for the board members and overseeing the remuneration of executives and staff, including salary, benefits and variable performance-based compensation;
- Audit committee, responsible for monitoring: the financial reporting and financial position of the SOE; the system of internal controls and risk management; the internal audit; the external audit; and informing shareholders on the status of the SOE; and
- Nominations committee, responsible for recommending board members in accordance with the proper nomination procedures.

Depending on the railway and the needs, more committees may be established, such as planning and strategy, finance, and executive search committees. Each committee should be headed by an independent board member with specialized professional experience in the specific issues that the committee is assigned to handle, and include other board members including independent members.

[136] For example, the President and CEO of Amtrak, publicly-owned and the most important passenger rail transport company in the USA, is by law precluded from being Chairman of the Board. The President of VIA Rail Canada, Canadian equivalent to Amtrak, is a member of the Board but is not necessarily the Chair, although it is not expressly forbidden.

Box 10.4 Corporate Governance Principles at Australian Rail Track Corporation (ARTC)

Statement of Corporate Intent (SCI)

ARTC, as a Government Business Enterprise (GBE), has specific reporting and disclosure requirements set out in Australian legislation. The company is required to prepare a corporate plan, and the Board is responsible for ensuring that such plan is prepared. The plan has to be submitted to the responsible Minister and the Finance Minister and has to be published on the ARTC website. The published corporate plans that have been redacted can take the form of a SCI or a Corporate Plan.

Board of Directors and Its Composition

The Board of Directors provide strategic guidance for the company and effective oversight of Management at ARTC. The Board comprises six members, of which five are independent non-executive directors. The only executive director on the Board is the CEO. The Chairman of the Supervisory Board is a different person than the CEO of ARTC.

Board Committees

ARTC currently has the following four committees:

- Audit and Compliance;
- People, Policy and Remuneration;
- Environment, Health and Safety; and
- Risk.

Each committee is chaired by a non-executive director and comprises in majority non-executive directors. Each committee is governed by its own charter, detailing the Committee's role, membership requirements and duties.

Management Structure

The Management Team manages the company. The ARTC Management Team currently consists of nine members: (i) CEO, who is also member of the Board; (ii) Chief Financial Officer (CFO); (iii) General Counsel and Company Secretary; and (iv) five Executive General Managers.

ARTC Corporate Governance Principles

ARTC's system of corporate governance reflects the eight principles:

1. Lay solid foundations for management and oversight
2. Structure the Board to add value
3. Promote ethical and responsible decision-making
4. Safeguard integrity in financial reporting
5. Make timely and balanced disclosure
6. Respect the rights of security holders
7. Recognize and manage risk

8. Remunerate fairly and responsibly

The ARTC Annual Reports provides report on the above every year as part of the company's Corporate Governance Statement. This includes a description of roles and composition of the Board, Code of Conduct, risk management, internal and external audits, and shareholder communications.

Source: ARTC Annual Reports

10.6 The Enterprise Management

10.6.1 Functions of management

The CEO and his/her management team make daily business decisions and play a central role in preparing and presenting materials on strategic issues and may recommend board actions on those issues (see Annex 8 for a Model Terms of Reference for an Executive Committee (i.e. Management Board or Management).

10.6.2 Management structure

The management organization, headed by the CEO and approved by the board, manages the company. The management structure is an essential component of corporate governance, so the management organization and managers' duties and responsibilities must be completely transparent and publicly disclosed.

The primary duty of the management team is to assist the CEO in implementing operational decisions in the following categories. (This is a partial or representative list. Depending on circumstances, the list can vary, as can the management team structure.)

- Finance and Risk Management: accounting, finance, ICT, insurance, and other investment preparations, calculations, risks, and 'going–concern' evaluations
- Human Resources Management: policies, pensions, remuneration, and safety issues that affect workers
- Legal Affairs: competition policy, compliance, corporate governance systems, internal control, board and management team agenda, and patents
- Communications: external and internal communication strategies and plans, corporate social responsibility, internet presence, branding, and media relations
- Operations, Technical and Engineering: usually the largest functional group in a railway company; includes operations, transportation functions, rolling stock, and infrastructure design, engineering, construction supervision, and maintenance
- Commercial and Market Management: commercial issues, relationships with passenger representatives and shippers; includes market research, marketing, and pricing issues; includes development of retail channels and the development of contracts; uses cost accounting data to develop pricing tools

The CEO is responsible for delegating these duties to the members of the management team, supervising their implementation, and evaluating the results.

The CEO

The board selects the company CEO, provides general instructions and guidelines on managing railway operations, and reviews the results. The CEO and the management team prepare strategy and strategic decisions and present them to the board, which has overall responsibility for these areas. The CEO ensures railway compliance with rules and regulations and well-managed company assets, and can initiate unusual or long-term actions *only* with board authorization.

The board should clearly distinguish areas of responsibility and decision making between the CEO and the board chair to avoid confusion or conflicts between the two. Since the board supervises the chair, the CEO should not be the board chair. The CEO's terms of reference should be established in a written agreement, and approved by the full board.

The CEO is typically responsible for the following:

- Leading the executive directors and the senior executive team in the day to day running of the group's business, including chairing the Executive Committee and communicating its decisions/ recommendations to the board.
- Ensuring effective implementation of board decisions.
- Regularly reviewing the operational performance and strategic direction of the group's business.
- Regularly reviewing the group's organizational structure and recommending changes as appropriate.
- Formalizing the roles and responsibilities of the senior executive team, including clear delegation of authorities.
- Supervising the activities of subsidiary companies' most senior executives.
- Developing senior teams within subsidiaries and ensuring succession planning.
- Developing the policies for board approval and then implementing them. These include, but not limited to:
    - Codes of ethics (see Annex 7 for a Model Ethics Code) and business practice;
    - Share dealing code;
    - Health and safety policy, risks and procedures;
    - Communications policy (including procedures for the release of price sensitive information);
    - Investor relations policy;
    - Corporate social responsibility policy (including environmental, employee communications and employee disability).

- Ensuring that all group policies and procedures are followed and conform to the highest standards.
- Together with the chairman, providing coherent leadership of the company, including representing the company to customers, suppliers, government, shareholders, financial institutions, employees, the media, the community and the public.
- Keeping the board chairman informed on all important matters.

Senior management

The CEO of an SOE typically determines his/her own top management team[137], and while the board can facilitate nomination and recruitment and provide advice, the CEO is ultimately responsible for recruiting and retaining a competent, high quality, cohesive management team. The board defers to the CEO in team selection and development, although board approval may be required for key management team positions.

10.7 Incentive Structures

Most enterprises provide incentives for management and staff, to align compensation with company strategy. A properly functioning incentive system is crucial to motivating the CEO and railway staff to act for the benefit of the company and its shareholders. Railways following good governance practice thus develop enterprise-specific performance indicators, which drive incentive compensation schemes. The incentive system should take into account shareholder objectives and goals (that is, government objectives for state-owned railways). Therefore, the incentive system can be a key driver for changing company culture to promote innovation, commercial behavior, and staff loyalty.

Most incentive structures are based on performance indicators–typically each business unit department or function has a specialized set of indicators that measure the performance of the unit or function as it contributes to the railway enterprise strategy.

To motivate employees to achieve the objectives, incentive compensation system targets and goals must be achievable only with above-average efforts. Incentives should be developed and adapted annually, setting new targets aligned with company strategy. Each employee participating in the incentive scheme should be assigned multiple performance indicators, but not so many that the system becomes too complex to manage and adjust.

10.7.1 Setting incentive structure for management

In general, the principle in building incentive programs is to weight them in favor of longer-term goals, i.e. the incentive structure must ensure to balance short-term goals such as financial returns with longer-term goals such as maintaining assets in good condition.

[137] If the organization has a dual board, the supervisory board may appoint the entire management board.

Typically, top management has long- and short-term goals, key operational personnel have shorter-term goals, and for staff below that, the incentive structure is based on a number of performance criteria depending on the company, which can include overall corporate performance and divisional/departmental performance, considering the annual (short-term) KPIs.

Long-term incentives are paid to top management and to managers who can influence long-term railway development. Typically, incentives measures are key performance indicators for longer-term (more than one year) corporate performance and strategic development.

Box 10.5 Good Practice for Setting Executive Remunerations

The executive/senior management's remuneration schemes should:

- Support the long-term interests of the company;
- Are fair relative to a peer group of companies, considering both performance and compensation level;
- Align incentive compensation with individual performance objectives;
- Ensure that the cost of variable compensation plans is understood under different performance scenarios to ensure that unusual payouts do not occur under unexpected conditions;
- Avoid distortions in incentives that can result from the choice of weightings and/or performance measures and avoids incentivizing wrong behaviors;
- Reduce discretion in incentive plans and, to the extent possible, link to objectively measurable results, while ensuring that formula-based plans do not generate unexpected or unfair payouts; and
- Balance positive and negative impacts of incentive compensation plans on morale.

Short-term incentives reward operations results and are normally paid to key staff in a position to make a measurable impact on company performance. Indicators can differ among positions, but results must be measurable, and have an observable impact on daily operations. Typically, these short-term KPIs for a railway organization could measure profit, turnover, growth, punctuality, safety, market development or other outcomes. The individual incentives can vary from 10 to 40 percent of a staff member's annual compensation.

11

Railway Reform:

Toolkit for Improving Rail Sector Performance

Chapter 11:

Creating Commercial Railway Structures

11 Creating Commercial Railway Structures

11.1 Introduction

This section discusses what is meant by commercial railway operations, why railways operate commercially, and how commercial railways are organized. Railways are often considered a natural monopoly and in many cases have been owned and operated by government units (or, where privately owned, have been heavily regulated). State-owned and heavily regulated railways tend to pay attention to government units, not to customers—railway management is evaluated on its attention to political concerns. Meanwhile rail services for customers stagnate or decline. In response, many governments have reorganized state-owned railways to operate as commercial entities.

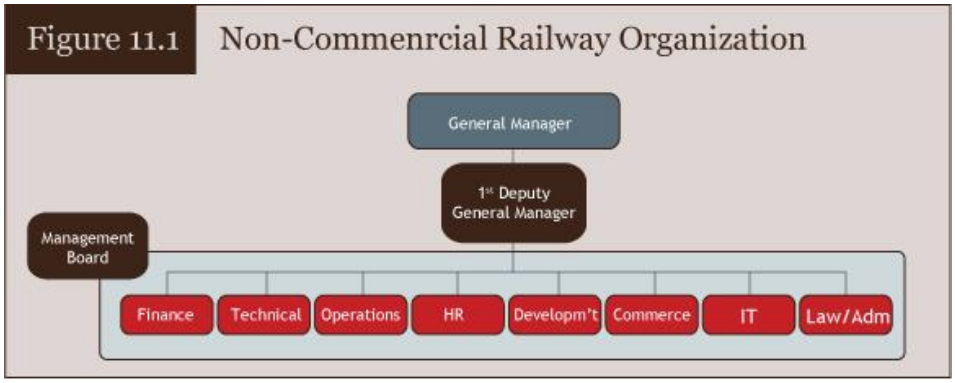
State-owned or private railways that operate commercially compete for customers and revenue with other transport modes and services. Commercial railways enter into mutually beneficial contracts and pursue at least break-even financial performance in their operations. Government may provide some or all of the capital needed to build new railway lines or even renew existing lines, but most commercially oriented railways operate both government-owned and railway provided assets *for profit*. This requires greater focus on customers.

Commercial railways contract with government for services that government wants to provide. Government contracts, sometimes called public service obligations (PSOs) or public service contracts (PSCs) may provide minimum service levels or deeply discounted or low-price passenger services for eligible travelers, such as the disabled, students, or seniors. Public contracts can also be used to provide below-cost freight services for specific commodities such as grain, or fertilizer; or services on light density railway lines that might otherwise be closed. Commercial railways try to price each service to cover its costs and earn a return on asset investments. In the case of PSOs or PSCs, the government is a customer like any other, and pays commercial market rates for contracted services. Hence, commercial railway operations minimize or eliminate the need for railways to cross-subsidize loss-making state services by overcharging for other services, usually freight. (See Section 8: Buying Services from Railways)

This chapter focuses on commercial railway organization, and how it differs from a typical government railway department. An o*rganizational structure* is designed to focus the attention of management on the principal driving force behind organizational outputs—usually either sources of revenue or of political power.

11.2 Non-Commercial Structures

Most railways organized as government departments focus on politicians, other government departments, or internal functions designed to meet internal needs or the needs of other government units. The figure below shows the organizational structure of a typical government railway department, and often a typical government railway enterprise.



Many government-owned railways have a management board, responsible for company planning and investment programs. This type of management board of directors is internal and usually chaired by the general manager (GM). Usually, the Ministry of Finance or Ministry of Economy supplies the GM with budget allocation information; the Ministry of Transport directs railways policy and development; and another ministry or entity, independent of the railway, regulates prices. In this organizational structure, most staff are in the technical division, which includes engineering, design, (sometimes depots and drivers) and operations, which includes dispatchers, on-board staff, and station staff. Typically, the commerce unit handles waybilling, and some station staff. Only much farther down in the railway structure are major market segments seen. In fact, many organizational units have some role in dealing with each market segment. Customers interface with the railway at passenger or freight stations, or through intermediaries such as freight forwarders.

This typical government-based organization structure has two main features that distinguish it from a commercial operation. First, the organization is designed to respond to government—not customers. Second, below the GM and maybe the management board, no organizational unit is responsible for profit and loss, service versus cost trade-offs, service levels, or revenue.[138] No department is responsible for investment trade-offs or return on investments.

11.3 Commercial Railway Structures

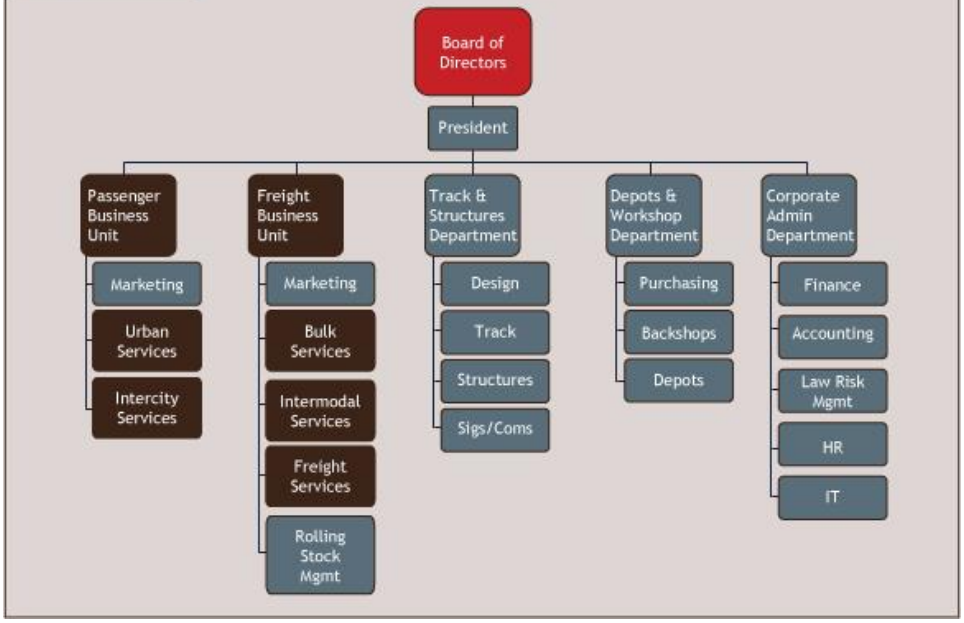
Commercial railway organization requires a structure that focuses most railway activities on markets and customers. To achieve this alignment, many commercial railways use a 'line-of-business' structure based on divisions by principal markets. In a line-of-business organization, common railway resources may be managed from a single organizational unit, but the principal focus is on major markets, and sometimes, major customers (Figure 11.2).

11.3.1 Profit centers and cost centers

Key elements of this structure are that the two business units—passenger and freight—are profit centers; each has ***revenue*** *and* ***expense*** responsibility for services it provides and each is managed on a profit and loss (P&L) basis.

[138] Arguably, the commerce department is responsible for revenue–but usually it is responsible only for revenue accounting.

Figure 11.2 Commercial Railway Organization



Any segments of the main business lines that can be uniquely segregated (for example, a specific set of customers with similar service needs, specialized or identifiable equipment, or even a particular geography) can be organized as discrete profit centers. In the diagram above, under passenger services, urban and intercity services are discrete business units—each uses separate rolling stock, some different stations, and each has different operating requirements. Similarly, under freight services, bulk and intermodal services could be managed as business segments, each with its own P&L. Each business unit and P&L-based sub-unit is responsible for preparing and justifying its own investment plans related directly to its own primary activities.

Other units, shown above as 'departments', are cost centers. The departments have budget responsibility for any costs under their control but are not responsible for generating revenue. Each department may have an investment program; some investments may support several business units or sub-units. For example, investing in track upgrades to increase train speeds may support a passenger business unit strategy *and* provide service improvement benefits for the freight business intermodal services group strategy.

Sometimes transport law will require that other train operating companies be able to provide railway services over the infrastructure. In these cases, the track unit will be formed as a business unit. It will develop a charging scheme for infrastructure access. Infrastructure costs may be subsidized by the government, reducing necessary access charges. Train service companies can compete with railway business units, providing some competitive pressures in the rail transport market. For example, operators for suburban services could be hired in a bidding process by a local government; or a mining company might run its own coal trains to a utility customer. These operators would need to buy or lease equipment, hire qualified employees, receive a license to operate, and contract with the railways infrastructure business unit for access to the infrastructure. Other possible structures and

railway functional arrangements include equipment leasing companies that own and provide rolling stock, or private companies that perform rolling stock maintenance.

Some railways are dominated by passenger traffic, others by freight traffic, and the infrastructure unit is sometimes consolidated into the dominant business unit forming what is called a vertically integrated business unit. This is most typical in mining railways that may provide some incidental passenger services. In such cases, other railway operating units and private operators would pay an infrastructure access fee to use the tracks. Access rights are normally set by the railway law; access prices are set by railway management under a regulatory process established under the railway law. (see Chapter 9).

Governments and railways have developed many different commercial structures and organizational forms for railways. CN (Canada), Conrail (US), QR (Australia), NZR (New Zealand) are among the many railways that were privatized after a great deal of thought and planning on the part of their respective governments. In the UK, the British Government tried a number of organizational reforms for British Rail (BR), including a complex sector management structure.[139] The sector management structure presaged in many ways the eventual equally complex strategy used by the UK government in the breakup and privatization of BR.

The EU has required open access to EU member networks and while the implementation has been slow in some ways, the reforms have had a significant impact on the management structures of the formerly vertically and horizontally integrated railways. Over the last 15 years the EU rail sector has been undergoing reforms with many new private operators (of both freight and passenger services) flowing into the market. The result has been a significant increase in private investment in the sector, especially in rolling stock.

Reforms in Russia have been different but have also resulted in a flood of new private investment into the rail sector. In Russia, the Russian Railway (RZD) has been restructured from a cabinet level Ministry to a state-owned enterprise. Over time, RZD has relinquished customer contacts and most direct marketing services to "operators" who are like freight forwarders with rolling stock. RZD provides infrastructure, dispatching, drivers, locomotives, and even shunting services while the operators take over customer relationships, freight car ownership, loading and unloading duties, and car management activities. Private owners are responsible for freight car maintenances and use RZD maintenance depots and a newly privatized network of RZD depots to obtain those services. RZD has moved its freight car fleet into two new enterprises (Freight One and Freight Two), the largest operators on the network. However, over the past eight years of this reform process, private owners have replaced about 40% of the freight car fleet (many of these acquisitions financed by IFC and other development banks specializing in private sector financing). In addition to growth in private operators, there are now a number of equipment leasing companies active in the Russian market. Passenger services have been similarly restructured with the "operators" in

[139] Louis S. Thompson, *Privatizing British Railways: Are There Lessons for the World Bank and Its Borrowers?* (World Bank,2004). http://siteresources.worldbank.org/INTTRANSPORT/214578-1099319223335/20273748/Final%20Version%20for%20Publication.pdf

these cases being local transport authorities, often in joint ventures with RZD's passenger business unit.

Each country develops an individual style of private sector participation that is suited to its legal structures and political abilities. In each case, the major focuses of reform efforts have been to increase the commercial sensitivity of rail enterprises to customer needs (both passenger and freight) and to structure the sector to attract private investment. In these areas, the more "radical" restructuring done in the UK, Russia, Canada, and Australia have resulted in significant inflows of private capital into the rail sector.

11.3.2 Purpose of commercial management structures

Commercial management structures introduce *accountability* for revenue, expenses, and investments to discrete railway business units or cost centers. They also distribute performance accountability downward in the organization and much closer to customers. P&L results, rather than production or output, can be used to evaluate railway business unit managers. Commercial orientation fundamentally changes how management performance is measured, because costs and revenues can be attributed directly to discrete business lines, thus permitting managers to recalibrate P&L components. Commercial organization structures also facilitate the introduction of incentive systems to reward improved financial performance.

By contrast, in a traditional government departmental organization, performance is harder to measure—loss-making services are mixed with profitable services, making it difficult to isolate actions that will improve financial results. Often, financial results are the responsibility of the finance department, and results are reported months after transport services are delivered.

A commercial structure can boost business unit performance by providing incentives for managers to reduce or reform loss-making services, and focusing management attention on improving customer services, increasing revenue, and reducing costs.

A commercial management organization must have an accurate and detailed management cost accounting system that can prepare monthly P&L statements for each business unit.

A commercial railway structure will be led by a non-executive board of directors. The board's primary objective is to represent shareholder interest, therefore, the board should include no more than one member of the railway executive. Typically, this would be the general director, president, or the chief executive officer. The board must maintain independent oversight on railway management; therefore, no other railway officers should be voting members of the board. However, other management team members may attend board meetings, to provide specialized advice, for example, the chief legal counsel or company secretary. Railway law or government ownership regulations may determine board member eligibility for ministry representatives from Transport or Finance. If possible, the board should include representatives from other commercial entities such as local business leaders. Many private commercial railways have at least one member who is a railway shipper or customer. Railway governance structures are discussed more fully in Chapter 10.

12

Railway Reform:

Toolkit for Improving Rail Sector Performance

Chapter 12:

Commercial Management Practices and Strategy Development

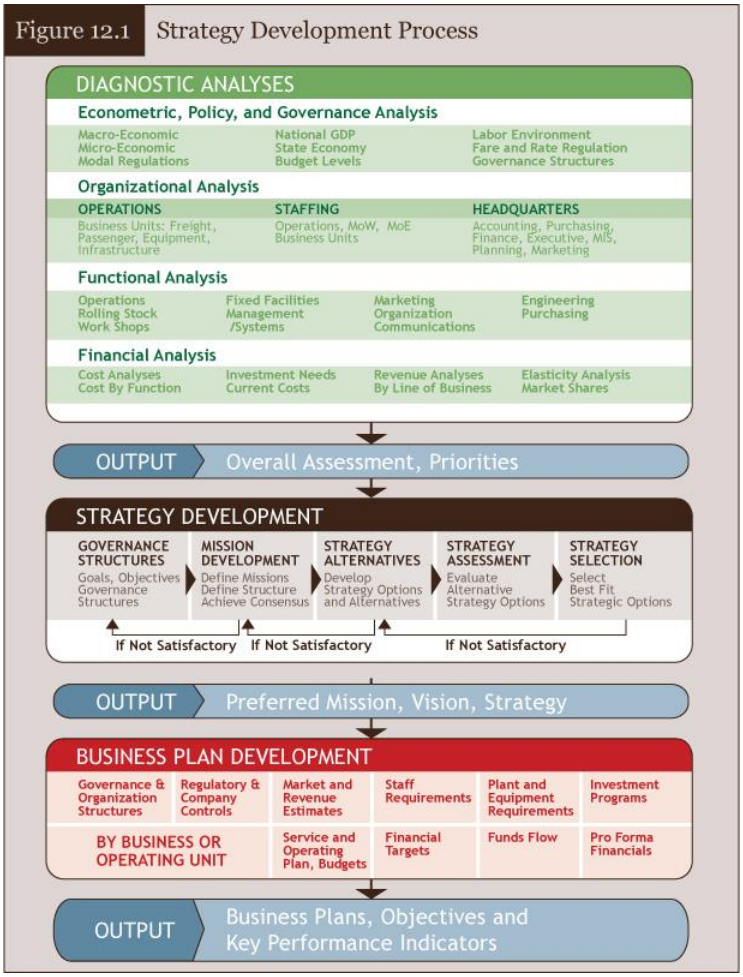
12 Commercial Management Practices and Strategy Development

This chapter introduces basic concepts and techniques in commercial railway management that improve railway performance, including developing a business strategy and management plans for investment, financial performance, marketing, and human resources. Managing railways requires a sound business strategy based on all of these elements.

12.1 Strategy Development

Developing a business strategy requires analyzing the basic purpose of the railway, assessing its competitive and financial position, coming to agreement with shareholders on the railways' mission and objectives, and then developing a long-term strategy to achieve those objectives (figure 12.1). Successful railways focus their efforts on a few critical areas determined during the strategy analysis. Strategy establishes a general direction that must be backed up by a detailed plan and set of performance measures. The strategy will include market, cost structure, investment, human resources, and finance components. Generally, these elements must be addressed iteratively, using a range of potential alternatives to develop a final strategy that will be reviewed with shareholders.

Figure 12.1 Strategy Development Process



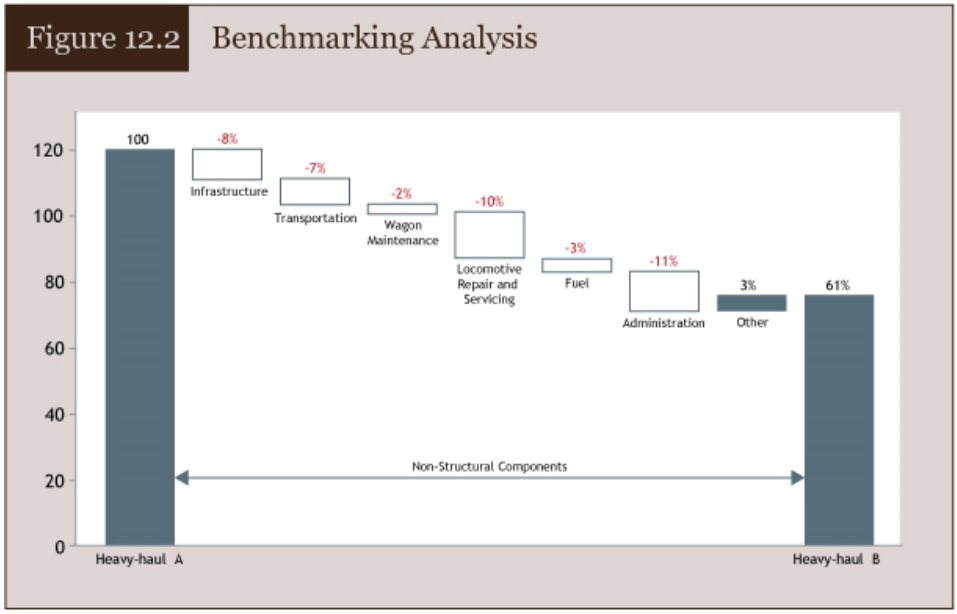
12.1.1 Diagnostic analysis

To develop a strategy, most commercial railways follow a process like that shown in the diagram above. First-time strategists, or newly commercialized railways and their boards of directors must establish a baseline, and then typically, the process begins with a diagnostic analysis that documents the existing state of knowledge about macro and micro-economic factors, the regulatory environment, labor environment, modal competitive conditions, and other external factors. At the same time, an internal analysis of the railway organization should be conducted and include a status report on the quality of operations, infrastructure, rolling stock and other assets, and financial condition. Some internal reviews include a benchmarking analysis.

Benchmarking

Railways are data-driven organizations that generate substantial amounts of quantitative information. The World Bank has an international database of railway statistics; data are available from world railway organizations (UIC, AAR, and OSJD for the CIS) and from numerous industry reports. A preliminary benchmarking analysis can be completed using these data to compare a railway with other railways that have similar characteristics—gauge, geography, and so forth. This type of analysis is useful for simple ranking, size, and scale comparisons that reveal railway aspects that require more complex examination (Figure 12.2). Analysts should avoid drawing premature conclusions from size and scale benchmarking studies. Multiple factors affect railway performance and a thorough analysis is needed to draw detailed conclusions. See Annex 2 on Benchmarking in this toolkit.

Figure 12.2 Benchmarking Analysis



A full benchmarking analysis can be useful in later stages of strategy development. After completing initial assessments, directed analysis can be performed on the railway (e.g., Why are costs per ton-mile or passenger-mile three times the cost of best-performing similar railways?). Benchmarking analysis reveals the potential for changes that would improve railway performance.

SWOT analysis

Another technique used in a diagnostic review is a strengths-weaknesses-opportunities-threats analysis (SWOT). The SWOT analysis is a time-honored and useful tool to capture a snapshot of a newly commercialized railway. A SWOT analysis is often represented in a matrix (below). An *internal* analysis will reveal *Strengths* which might include control of capacity and resources available for improving performance and other factors representing a competitive advantage. For example, strengths might include cost advantages, excess capacity, or strong brand recognition. *Weaknesses* are internal factors that can be changed or improved such as poor reputation among customers, slow service, or high costs due to excess capacity. An *external* environment review typically reveals opportunities that could enhance business value. *Opportunities* might include changing regulations, ability to contract, or trends such as rising demand. Changes in the external environment may threaten the success of the railway. *Threats* include substantial government investments in highway capacity, more stringent government regulations, or rising energy prices (which could also be an opportunity).

Figure 12.3 SWOT Analysis

Strengths: Positive internal factors within control of the organization	**Weaknesses:** Negative internal factors within the control of the organization
Opportunities: Positive external factors the organization might seek to capitalize	**Threats:** Negative external factors the organization might seek to minimize

Financial analysis

An important element of the assessment process is to develop a high-level understanding of enterprise financial structure, including a basic model of revenue, expenses, investment, debt structure and capacity, subsidy requirements, and subsidy availability. If data are available, a financial time series should be elaborated to reveal trends and take them into account. Is revenue declining? Are expenses increasing faster than inflation? How long can the company continue to access markets for debt? Eventually, this information will be used in the financial analysis and modeling that was described in Chapters 3 and 4.

CSX

Our Mission is to be the safest, most progressive North American Railroad, relentless in the pursuit of customer and employee excellence.

Swaziland Railway

Our Vision is to provide an efficient transport system that offers total logistics to our Clients.

Canadian National

Our Mission is to meet customers' transportation and distribution needs by being the best at moving their goods on time, safely, and damage free.

Vision, mission, core values

Diagnostic analyses define key parameters around which a strategy can be developed. The analyses provide insights on major risk factors and opportunities for improvements, available options, and major constraints.

In developing a commercial strategy, it is common to distill a description of the organization into vision and mission statements. A *mission statement* describes what the organization does; a *vision statement* describes what the organization aspires to be. Examples of mission and vision statements are shown at left and many more can be found on company websites.

Although mission and vision statements can appear to be little more than advertising slogans, or vague expressions of good intentions, they perform the very useful function of conveying core values and future direction to internal and external audiences. They explain the values the organization thinks it will take to succeed. Mission and vision statements also provide a point of reference for strategy development—"Will this strategy help achieve our mission? Will it move us towards our vision?"

Some organizations also state their *core values*. A core value statement includes organizational ambitions and ideals about teamwork, individuality, safety, stewardship, and employee behaviors with one another and customers. Core values become employee evaluation criteria and are often included in job descriptions.

Collectively, mission, vision, and core value statements help define corporate culture aspirations and guide strategy development. To transition from a government department to a commercially oriented organization, many railways must replace an existing inward-looking, risk-averse corporate culture with a more outward-looking, risk-taking culture. Typically, the board of directors prepares the mission, vision, and core value statements and sets the fundamental direction of a commercial organization. Universal objectives, key success factors, and success drivers such as safety, cost control, profitability, and so forth, define *what* an organization must do to survive but not *how* to do it. Combined, these statements explain the essence of why an organization exists.

12.1.2 Strategy development

Developing a commercial strategy for a commercial railway is the responsibility of the executive management team. Strategy development requires an understanding of customers, the competitive environment, and market requirements, combined with detailed knowledge of all railway assets including employees, organizational structures, and physical assets. After a basic diagnostic is completed, the executive management team will assemble and study all the components required to build a strategy—financial analysis, mission, vision, and core values statements, strategic alternatives, market and pricing strategies, opportunities and threats. Then, they can begin to evaluate cost reduction and investment strategies.

The executive management team should guide the strategy development process, taking direction from the board and reporting back to them. The board of directors may have a dedicated strategy and operations committee. The management team

"Competitive strategy is about being different. It means deliberately choosing a different set of activities to deliver a unique mix of value."

Michael Porter

manages assumptions, builds scenarios and alternatives for consideration, and then finalizes the overall commercial strategy.

Financial models

For commercially oriented properties, the ultimate 'scoring' for strategy evaluation is done in a financial model, although evaluating strategic alternatives is based in part on company mission and vision statements. A realistic financial model is crucial for managing a commercial railway, developing a strategy, building a business plan, supporting discussions with government on investment and subsidy needs, and discussing debt financing options with banks and investors. The financial analysis conducted during the diagnostic phase of strategy development usually provides the basis for the development of a railway-specific financial model. Analyzing financial results from earlier years can help develop the relationships needed to build and refine a financial model for the railway.

The financial model should align with international accounting standards and the railways' organizational structure. In a commercial railway, each business unit should prepare its own revenue and expense projections, or at least prepare the inputs for the projections. Each cost center or department should prepare expense projections. Financial models were discussed in Chapter 4 of this toolkit and a sample financial model is described in Annex 1 (and included in the web version of the toolkit).

Establish framework and baseline assumptions

To begin, most strategy developments define basic outlines for the time frame under consideration—typically five years, but for railways, since assets have a longer lifespan, a 10–year time frame might be needed. The first few years should be modeled in some detail but a lower level of detail can be used for the latter periods of the model. For example, some commercial railways develop monthly financials for the first year of the projection.

Next, a consistent set of baseline assumptions should be established for all departments to use in developing their inputs or portions of financial projections. These baseline assumptions are macro- and micro-economic factors that relate directly to major drivers of railway demand and costs. For example, baseline assumptions for passenger services would include projections for gross domestic product (GDP), population and employment growth, personal income growth, and inflation. For freight traffic, baseline assumptions would include GDP projections, perhaps industrial production projections, and inflation. Energy and labor cost projections might be treated separately, as might other major assumptions such as steel prices, or world prices for major commodities that affect the railway. Typically, business units and departments prepare more detailed assumptions, and the executive management strategy team provides baseline assumptions and oversight. For example, the executive management team may provide assumptions for world steel prices while the infrastructure unit may develop projections for the price of rail and scrap steel they expect to see.

Baseline ridership and tonnage projections are usually based on their relationship to one or more of macro-economic factors. If sufficient historic data are available,

regression analysis can reveal past relationships between key macro-economic factors and key railway parameters. For example, passenger numbers usually correlate with worker population; freight tons usually correlate with GDP. Then, these relationships are used to project passengers and freight tons through the forecast period. Typically, passenger revenue is projected using trends in average travel distance and number of passengers to generate passenger-kilometers; and revenue is computed from average revenue per passenger-kilometer. For freight, the tons projection is translated into ton-kilometers using average haul length, allowing for any increases in distance over time. Freight revenue is based on revenue per ton-kilometer by major commodity. Usually, both projections are supplemented with known developments–for example, opening of a new passenger station, or a major shipper locating a new factory for rail shipment.

Baseline assumptions are used to develop company financial projections, assuming no major strategy initiatives and using the baseline projections. Results from financial model analysis provide further inputs to strategies, and may suggest where strategic investments are needed to contribute to the strategy development process.

During the process, it is useful to test how robust each strategy remains if basic assumptions change. What happens if GDP growth rises? What happens if personal incomes fall? Optimistic and pessimistic scenarios are developed to test various strategies, and scenarios can be further elaborated using specific inputs from the business units and departments about external conditions. For example, will an automotive manufacturing plant or several new mines open on schedule? Or will there be major delays?

The strategy development process considers a range of alternatives regarding markets, railway investments, technology initiatives, and human resource measures. Some strategic initiatives might involve changes in capital structure—changes in debt levels, equity injections from government, or alternatives for financing important investments 'off balance sheet,' such as customers buying rolling stock. Each strategic initiative undergoes an iterative analysis that is then compared to the baseline projection to establish which initiatives would move the organization closest to its mission and vision statements.

12.2 Market Responsive Service Design and Pricing

On many state-owned railways, railway marketing is an oxymoron –the two concepts (railways and marketing) do not make sense together.

Since most state-owned railway organizations are complex, insular, and hyper-focused on internal business details, customers have found dealing with railways notoriously difficult. For many state-owned railways, 'railway marketing' is an oxymoron–an internal contradiction in terms. In contrast, for commercial railways, marketing is integral to achieving strategic objectives. Business units tend to drive development of more robust marketing departments that focus on customer needs and integrate pricing with customer relationship development.

12.2.1 Customer interaction

When railways are organized into business unit structures, customer needs gain importance. Business units should set up marketing and pricing departments to focus the development of a better understanding of railway customers. Depart-

ment managers should use surveys to interact directly with customers, and conduct frequent face-to-face meetings with the largest customers or representative groups such as travel departments and agencies.

For *passenger business*, customer surveys are among the best ways to understand passenger needs, preferences, and desired improvements; most detailed business planning processes include survey results. Well-designed survey instruments can reveal price sensitivities and differentiate among transport services features to discover which are more valued by customers. Trends and principal findings from surveys should influence business unit strategy and investment plans. For example, "Does this route need a night train? Are station improvements needed?"

For *freight business*, railway officers should have regular meetings with major customers—although such meetings are rare enough that this will likely startle the customers the first time it happens. When railway marketing managers meet with major customers, the managers need to expand the discussion beyond the number of freight cars customers will require to include broader shipping needs. Marketing managers should observe loading and unloading operations and discuss railway services that can reduce customer transport costs and increase their shipping volumes, such as wagon preferences, or new pickup or delivery times, or train service schedules that maximize transport value to customers. In addition, discussions should explore: (i) how railways might modify services or equipment to increase customer loadings; (ii) how railways could help customers develop longer-term plans for improved services; and (iii) how rail service and pricing affects major customers' competitive position in their industries.

12.2.2 Service plans and service design

Typically, railways have focused on running trains, but paid little attention to customer needs or changing schedules or services to better meet customer requirements.

Passenger surveys, discussions with passenger representative organizations, and meetings with metropolitan authorities can reveal needs for different passenger service patterns—more frequent afternoon trains, daytime intercity trains, more passenger space on night trains, and later or earlier departure times.

Direct discussions with freight customers can lower costs for shipper logistics, shift investment requirements; and for the railways, these discussions can increase volumes and reduce costs. Engaging with customers enables railways to predict and adapt to marketplace changes, for example coming up with new service designs—complex service and investment arrangements that tie customers more closely to the railways, increase profitability and reduce customer transport costs.

For example, many railways/shipper conflicts arise from demurrage charges for delayed freight car loading. Instead, the railway could provide customers with sufficient freight cars for a full trainload and extend their loading times. The railway would service the customer less frequently but transit times would improve, since a full-loaded train can move directly and without delays from loading site to destination such as a port or a power utility. Also, this option improves equipment utilization as equipment can return directly and reload.

Close contact with shippers enables railways to suggest specialized equipment that will increase load size, ease loading and unloading, or create some other specialized advantage for shipper goods—internal bracing systems or flat cars equipped with metal racks for logs or lumber. Often, shippers agree to pay for special equipment or purchase specialized freight cars, which not only ties that shipper to the railways but also avoids damage and depreciation of railway assets.

Customer requirements vary over time so commercial railways must constantly revise service designs—train schedules, service patterns and work performed—to meet evolving customer needs as revealed in customer surveys and interactions.

12.3 Railway Investment Planning

Railways are said to be both capital and labor intensive–involving massive physical assets and a large labor force to produce transport outputs. Most physical assets have a long but finite lifespan. Usually, the lifespan of each asset class is reflected in its depreciation rate, or in a design lifespan that railway engineers can estimate with reasonable accuracy.

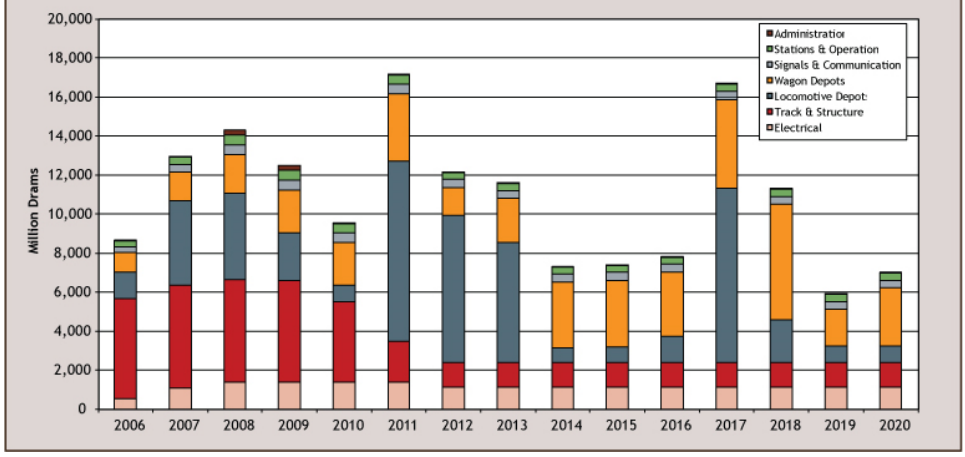
12.3.1 Bedrock investment program

The first step in investment planning is to develop an asset register, a list of railway assets with dates of acquisition or construction, estimated lifespan, and typical renewal or replacement pattern (this need not be a detailed database with thousands of records, it can be a relatively simple register of principal assets with details about date of acquisition, estimated life by class and renewal costs). Each asset class has a projected expiration date. For example, rail is an asset with a lifespan measured by gross weight passing over it, which typically varies from 500 to 1,500 million gross tons. Rail lifespan is shorter through mountainous territory and longer if the terrain is flat. The typical design life of passenger cars is 30-35 years, which can be extended through a substantial overhaul. This is also the case for other rolling stock—locomotives and freight cars. For most railways, infrastructure, rolling stock, and locomotives represent 95 percent of all replaceable assets. As a part of a baseline study, railway asset replacement needs can be projected, based on its original acquisition date, the amount of its useful life that has been consumed, and an assumption of no significant changes in traffic patterns or usage rates.

This initial capital estimate is the baseline investment requirement, which must be dealt with in the strategy and in proposed investment plans. Figure 12.4 depicts the results of analysis carried out for Armenian Railways.[140] The analysis shows only baseline investment requirements for physical asset replacement, including infrastructure components such as electrification, rail, bridges, rolling stock, computer systems, and other physical assets. The Armenian study used a 15-year time frame.

[140] Published study data from the Armenian Railway public concessioning in 2007.

Figure 12.4 Railway Investment Program



Baseline financial model projections might reveal that the railway cannot afford the investment replacement program. Eventually, a commercial railway strategy must deal with these projections by developing methods to prolong asset life, or designing specific investment strategies (which may include private investment, for example, by equipment leasing companies or by shippers) to address replacement needs.

12.3.2 Prioritizing investments

Baseline analysis and a bedrock investment program develop a list of assets that must be replaced over time, but investments must be prioritized—this is a task for railway management. The highest priority is investment required by law to meet regulatory or safety requirements; however, some mandatory investments may be eliminated if the railways' strategic direction is changing. For example, a strategic initiative to rationalize the railway network may propose closing a line that now includes an unsafe bridge, thereby eliminating the necessity of bridge replacement. Another example is a regulatory requirement to reduce air pollution, which would force the railway to replace older locomotives that fail current emission standards. Instead, the railway might choose to invest in electrification. Nevertheless, the highest priority investments are always those required by law or safety needs.

The second priority investments are those required to stay in business, which includes asset renewal. Worn rail is not a safety hazard if railways compensate by reducing speeds or taking other mitigating actions, but worn rail and slower speeds could substantially erode competitiveness. Therefore, second priority investments should be selected for greatest impact on maintaining a competitive market position, such as repairing track to restore operating speeds, or replacing worn locomotives to ensure continuous and reliable services.

After these two priorities, investment projects should be selected based on estimated risk adjusted financial returns (or IRR). Some investments maybe proposed to enter new markets –specialized rolling stock, or building a new siding or line to a customer. Other investments will reduce operating costs—new locomotives may lower overall fuel consumption, improve reliability, reduce maintenance, and in-

crease train sizes resulting in higher efficiency and a smaller locomotive fleet. Major optional investments should be analyzed to assess the risks and estimate the financial returns using a risk adjusted discounted cash flow analysis. Optional project investments should be consistent with the strategy of the railway and prioritized based on the highest risk-adjusted returns.

12.3.3 Investing for fundamental change

Investments linked to fundamental changes in railway capacity are more complex and difficult to resolve. Often, when railways need to adapt to rising traffic volumes and new requirements for rail services, substantial revision of existing railway technology is required, which may take many years to fully implement and many more years to fully realize benefits. That is because, based on their original fundamental design parameters—capacity, budget, services—most railways were carefully designed and engineered to maximize utility *as a system*. Consequently, it is not possible to change only one engineering parameter because railways are a tightly integrated system of engineering solutions.

Changing gauge

Some railways believe they are constrained by gauge, normally, too narrow rather than too wide. Changing railway gauge sometimes makes sense. For example, if branch line gauges differ from most of the network, if significant interchanges occur between the main and branch lines, and if branch lines have substantial growth potential, they should be connected to the main network and converted to the main-line gauge. In Australia, several state railways were built with a different gauge but recently, segments of narrow gauge were converted to standard gauge to provide a continent-wide standard-gauge railway line. Some grain branches were converted to standard gauge, but a network of narrow gauge mineral lines remained narrow gauge.

India has three gauges—most of the main line is built to Indian broad gauge, and some branches are standard or narrow gauge. Over time, Indian Railway has converted some narrow and standard gauge lines to broad gauge.

There is rarely a good reason to change gauge on an active railway because changing an entire system is an extremely expensive option that must be justified by a business case. Not only must railway tracks be replaced between stations, and through marshaling yards, sidings, storage, workshops, and depots, but also all rolling stock must be replaced to match the new gauge. Changing gauge can be considered for branch lines, for a railway that is completely worn out, or for a railway that has closed and is to be repurposed.

A common misconception is that narrow gauge railways must adopt a wider gauge to increase capacity. But narrow gauge railways can increase axle loads, carry heavy traffic volumes, or even handle moderately high-speed services. Narrow and Cape gauge railways in Argentina, Brazil, and South Africa demonstrate that massive volumes of bulk commodities can be moved on narrower gauge railways. In Australia, a high-speed tilting train commonly operates passenger lines at 160 kph over Queensland Railways' Cape gauge. In Japan too, mini-Shinkansens operate at higher-speeds on Cape gauge track to connect with main Shinkansen services.

New special-purpose high-speed or heavy-haul railway lines dedicated to moving output from a mine to a port can be built using a gauge that differs from the national railways. The best alternative for high-speed and heavy-haul rail services is standard gauge, commonly used by most railways worldwide, so competitive bidding will likely yield a lower price.

Automatic Coupler

Coupler type and strength

Some railways rely on old coupling technology to assemble a train. Older coupling systems use hooks and chains, links and pins, or buffers and chains, so coupling freight and passenger equipment must be done by hand, each car individually. Old coupling technology is also weaker, limiting train size to quite short or quite light trains. Modern railways replaced old systems with stronger automatic couplers (photo at left) that are more efficient and much stronger. Even though couplings can be made automatically, brake system air hoses still require manual connection between each rail car before trains can depart.

Changing to stronger automatic couplers can significantly increase financial performance. Higher safety and operational flexibility mean that railways can run fewer trains with heavier loads, thereby increasing capacity without building a new line or double tracking an existing railway line. Modern technology is also more reliable and less expensive to maintain.

Usually, coupling systems are changed incrementally to avoid wasting useful capacity from existing rolling stock. Rolling stock used in unit-train type services can be changed first—train sets that carry containers, coal or ore, or passenger equipment—to avoid changing all rolling stock coupling systems at once. Typically, this requires converting some locomotives to haul trains with new coupling technology, and retaining some locomotives for use with old coupling systems. Incremental change will necessarily introduce some temporary inefficiency in equipment utilization since rolling stock fleets must be segregated into different pools. The best time to change coupling systems is when new bulk or passenger train-sets are purchased for specific services.

When modern coupling systems are introduced, new infrastructure investment may be required to accommodate changes in train size and weight. Since new coupling systems allow longer and heavier trains, longer sidings and wider signal spacing may be required. In addition, marshaling yards, customer sidings, and other infrastructure must be adapted and railways may need new locomotives to fully exploit the potential of increased train weight permitted by new coupler systems. All these investments must be part of a strategy and investment plan.

Axle loads

Many railways were built to accommodate set axle loads for freight cars and locomotives, calculated as tons per axle; raising this limit is an effective way to increase rail system capacity.

However, despite adequate infrastructure, many railways are reluctant to operate at the higher end of axle load technical capacity for several reasons: rail wears out

faster; accidents can be more damaging; and many bridges and culverts were designed for lower load limits. Sometimes rolling stock needs subtle changes in bogie suspension systems (different spring rates) to minimize impacts from higher axle loads.

Technical factors that limit axle loads include type, size, and spacing of sleepers or crossties; rail weight or size (usually measured in kilograms per meter); thickness of roadbed sections; rail metallurgy; and bridge and culvert designs—changing axle loads can require significant investment.

Some railways have low axle load limits of 12.5-tons/axle. Typical heavy-duty railways have at least 25-tons/axle limits; North American railways have 32.5-tons/axle limits (metric measure), a level common to heavy-haul railways in many countries. Recently, an Australian company built a specialized mineral railway designed for 40-tons/axle loads, which is currently the upper load limit for railways due to rail metallurgy limitations. Initially, the railway will operate at 32.5-ton/axle load limits to permit rails to become work-hardened and infrastructure to settle before increasing to full design capacity.

Railways around the world with similar rail and sleeper specifications have axle load limits ranging from 22.5 to 32.5 tons/axle. For example, in Russia, most main rail lines use R65 rail (65 kg/m; 131 lbs/yd), large concrete sleepers on good spacing (1,660 sleepers/kilometer), but axle loads were limited to 22.5-tons/axle. Recently, Russian railways began allowing 25-tons/axle equipment on some lines and later plans to gradually move to 27.5-tons/axle.

1896 Bridge, Armenia

India is similar, with relatively heavy rail, closely spaced modern concrete sleepers, and a 22.5-ton axle load. Recently, without substantial infrastructure changes, India began allowing 25-tons/axle equipment on some lines.

Most railways can increase axle load limits by introducing only small changes to infrastructure. For example, many railways have discovered that only small investments are needed to strengthen bridge abutments and span members, or that minor speed restrictions will allow heavier axle loads to pass over bridges. In other cases, raising axle load limits may require substantial investment to strengthen or replace old structures, such as the 1896 Armenian cast-iron bridge (shown above). Exceptionally large structures engineered for design load limits at the time and limited by construction costs may need more extensive investments. The 3.7 km Dona Ana Bridge over the Zambezi River at Sena, Mozambique (at left) needed substantial strengthening.

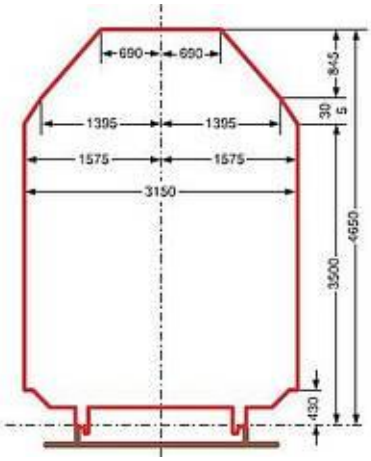
Sena River Bridge, Mozambique

Increasing axle loads significantly boosts railway capacity because higher axle loads increase freight car carrying capacity almost directly, without increasing the weight of the freight cars very much, if at all. For example, increasing axle load limits from 22.5 to 25 tons (about 10%) increases the carrying capacity of a fully loaded freight car from about 68-tons to 78-tons (a 15 percent increase). Second, increasing locomotive axle loads contributes directly to increased hauling power, which is directly related to locomotive weight, assuming no change in locomotive horsepower or in wheel/rail friction control systems. Increased locomotive weight results in the ability to haul longer and heavier trains.

Axle load increases can result in heavier trains of the same length, which means that railways do not have to invest in longer sidings and new signal systems to achieve substantial capacity increases.

Loading gauge

Loading gauge defines maximum vehicle size the railway line can accommodate. Loading gauge is determined by the size of tunnel openings, bridges, and passenger platforms or loading docks adjacent to the track. Increasing loading gauge can permit the use of larger freight and passenger cars significantly increasing capacity and reducing the number of trains needed to move the same amount of traffic.



Loading Gauge

Today, most loading gauge increases are to introduce bi-level passenger cars and double stack container trains. Commonly, loading gauge increases are designed is needed to replace through-truss bridges, to lower tracks in tunnels, and increase vertical clearances for highway and pedestrian overpasses. Bi-level passenger equipment and double-stack container equipment can reduce the number of trains needed to move the same number of traffic units, thus increasing capacity. Increases in permitted height can accommodate larger/taller box cars, and multi-level auto carrier equipment, which opens a new market for some railways and increases the freight traffic volume that can be carried, thus increasing railway capacity.

Often, railways combine increases in axle load *and* loading gauge to modernize and substantially increase capacity.

Double track

Originally, most railway lines were built using a single track. Trains moving in opposite directions on a single track railway line meet at stations or at passing sidings or loops. Usually, less time-sensitive train waits in the passing siding or station track for the other higher-priority train moving in the opposite direction to pass. This process time and energy – the waiting train must first slow down to move into the siding, come to a complete stop, wait until the superior train passes, then accelerate until it attains track speed.

Typically, line capacity is measured by the maximum number of trains (or train pairs – one in each direction) that can operate over a line each day. On single track lines, line capacity is limited by the number of available passing loops, train composition, train control and signaling systems, train speeds, and the structure of train schedules. Thus, on a single track line, more trains typically mean more train delays. Eventually, all passing loops are filled and no more trains can enter the line until trains on the line exit.

As the number of trains increase, more passing loops must be added to increase line capacity. Some passing loops can be lengthened to become sections of double track so the inferior train (the one taking the siding) can move along the extended siding without having to come to a complete halt. Usually, signal systems are upgraded as a part of capacity improvement investments to fully exploit the passing loops. Railways can further increase capacity by increasing train speeds, or by raising the number of traffic units on each train with higher axle loads and/or loading

gauge. When all these measures have been taken, any additional capacity will require double tracking.

Double tracking is usually the option of last resort to increase capacity since it essentially doubles infrastructure investment and maintenance costs. Often, railways will double track only the rail line sections that are cheapest to build and leave the expensive sections as single track, especially bridges, tunnels, and large cuts.

Signal and train control systems

Railway signaling is a critical element of infrastructure safety and capacity. Signals indicate when trains should slow down, stop, or go. Most trains travel at the posted track speed limit and since railway trains weigh 1,000 to 20,000 tons, they require considerable time to slow and stop. Most railway signal systems are meant to regulate traffic flows, not indicate travel speeds. Train control systems work with signal systems to shift trains from one track to another. The most basic systems issue written orders to departing trains on how to navigate the track ahead. For example:

> *"Proceed to the passing siding at kilometer 10.5; wait on the main line to meet train number XYZ which will take the siding. When clear, proceed to the passing siding at kilometer 35.7, take the siding and wait for train number ABC to pass on the main. When clear, proceed to destination."*

In such rudimentary train control systems, train meets can take a long time. The train crew may have to stop the train, manually throw track switches to enter the siding, and then, when clear, throw them back, and repeat this procedure on departure from the siding.

Semaphore Signal in Indonesia

In somewhat more advanced systems, switches are controlled remotely (either mechanically or electrically). Station staff throw the switch to the siding, which changes wayside signals in advance of the siding to indicate to the advancing train that it will enter the siding. The signals indicate to drivers that they need to slow to approach speed and prepare to stop. The signal indicates to the train in the opposite direction that it can proceed. Semaphore systems are examples of this type signal system. These systems are faster than train order systems but have little flexibility; they can only affect train speed and control at staffed stations.

Central Dispatcher Control Panel, Georgia

In more advanced systems, often called 'automatic block signal' system (or ABS) electrical circuits are embedded in the track to detect trains. The system automatically aligns passing loop switches and signals to correctly signal trains in both directions. Signals controlling sidings must be connected to one another because train departures from a station are not permitted if a train is in the block of track ahead. For distant passing sidings, intermediate signals are used to permit trains to operate at track speed until the approach distance to the next controlled siding

An ABS signaling system does not prioritize trains—the first train to arrive at the siding where trains will meet is directed to take the siding. To exercise greater control over train movements, railways developed centralized train control systems (CTCs). These systems allow a centralized dispatcher (now sometimes a computer

control program) to allow faster trains to pass slower trains moving in the same direction, to allow trains to stay on the main line if they exceed the siding length, or to allow higher priority trains to keep to the main lines with as few stops as possible.

The ABS and CTC systems provide several safety advantages. They use electrical track circuits to detect trains and train speeds. These track circuits also detect broken rails or wash-outs and stop trains before passing the danger area. The electronic controls are fail-safe and interlocked so a switch cannot be thrown under a train or allow two train paths to cross. If any part of the system fails, signals automatically protect trains from running into each other.

Double track segments are usually directional (*up* trains on one track, *down* trains on the other). CTC systems can be designed for reverse running so that trains can use either track to move in either direction, increasing flexibility and capacity, and allowing work crews to perform maintenance on one track while trains move along the other. The CTC systems permit fast trains to pass slow trains, and allow some trains to stop or serve customers on the main line while trains move along the opposite track.

In traditional ABS and CTC systems, the railway line is segmented into signal control blocks. Block length is determined by calculating the stopping distance of the heaviest or fastest train—the longest stopping distance—and then fixed by track circuit design. The systems permit trains to occupy a block, and at least one empty block is kept between trains. The number of blocks between trains is determined by how many aspects are used in the signal system. Typically, there are three aspects (for example, red, yellow, green) but systems in the busiest lines can have four or more, which facilitate finer control of speed and allow overlapping blocks so that trains can follow at shorter distances.

The latest and most advanced signal systems dispense with wayside signals and discrete signal aspects. Instead, they provide digitally controlled train speed, and base train spacing on the physical characteristics of the infrastructure and particular train, adjusting train speeds to maintain stopping distances between trains. More advanced signal systems provide train 'pacing' or speed information that permits the minimum amount of slowing when trains meet, thus reducing energy consumption and maximizing line capacity.

Successive advancements in signal and train control systems increase line capacity, safety, and train speeds, and reduce energy consumption. Of course, as systems become more sophisticated, they also become more expensive.

Electrification

Originally, railway trains were hauled by steam locomotives, fueled with wood, coal, or oil.[141] Diesel-electric and diesel-hydraulic locomotives were developed in response to steam locomotive shortcomings, such as the need for frequent stops to

[141] There were some early horse-pulled railways. Other early railways were pulled by cables.

refuel and take on water. As engineering improved, diesel engine technology developed higher horsepower locomotives. Thanks to improvements in wheel-slip controls and computer control systems, modern diesel-electric locomotives are highly productive and energy-efficient.

3kV-DC Overhead Catenary, Georgia

To reduce dependence on diesel fuel and provide higher capacity operations, railways turned to electrification, usually using overhead catenary systems to deliver electricity. Electric locomotives can have higher power density—more horsepower or kilowatts per ton of locomotive—which can haul trains at higher speeds and up steeper grades than diesel locomotives. Generally, electric locomotives require fewer maintenance inputs and were once considered more reliable. Modern diesel-electric locomotives are now as reliable as electrics and can provide the similar levels of tractive effort – for high speeds, electric locomotives are advantaged.

Electrification is essential for high-speed train operations of more than 160-kph or 100-mph. Electrification is useful in high-density operations where train acceleration is important, such as commuter passenger systems; and where diesel fuel is too expensive or scarce.

Electrification is expensive; it requires substations and overhead catenary structures along the railway, and infrastructure maintenance costs are higher. Thus, electrification is rarely financially feasible unless traffic densities are at least 40 million gross tons per year, or for high-speed and commuter services.

Electric railways are substantially more environmentally friendly and have fewer carbon emissions than diesel-electric railways if the electricity is generated by renewable energy or nuclear power. If the electricity is generated in a coal-fired plant, electric railways have about the same environmental impact as diesel-electric powered railways.

Information systems

Information systems are among the most important investments for commercial railways, particularly for revenue, cost accounting, and general ledger systems that have a level of detail that facilitates accurate tracking of railway costs and revenues. Railways must be able to analyze complex data on costs, production statistics, and revenue along several dimensions. Some examples: for passenger services, railways must analyze *revenue* by ticket type, origin, destination, and time of day; and *costs* by carriage type, route, time-of-day, and day-of- week; for *productivity,* railways must analyze number of passengers, passenger kilometers, train kilometers, carriage kilometers. Freight data are equally complex and must include tons, ton-kilometers, disaggregated by commodity, customer, type of freight car, tariff type, origin and destination, and so on. This kind of analysis requires computers and dedicated systems.

Pre-computer-era railway systems may keep some of these data, but usually highly aggregated, manually maintained, and unavailable on a timely basis. Without modern costing systems, cost data are not available in the detail needed to determine costs of specific services, or even entire lines of business, without resorting to large-scale allocation using highly aggregated data.

Commercial railways must analyze traffic, revenue, and costs across many dimensions and must be able to develop detailed income and profit and loss statements, at least for major lines of business. Railway asset holdings, lifespan, cost, and condition must be tracked, usually in asset registers or other types of systems that inform balance sheets.

These capabilities are now readily available in off-the-shelf packages that can be customized by language and input type. Most railways need new location-, function-, and responsibility-based cost accounting systems that track detailed costs. Railways need revenue accounting systems such as ticketing systems that collect data with sufficient detail to provide revenue by class of service and by train number and date. For freight traffic, railways need waybilling systems that track revenue by customer, commodity, car type, origin and destination, and contract agreement. Revenue accounting systems can often be call-center based, eliminating many station agents and local clerical staff.

All of these systems inform railway management and allow operations personnel to manage costs and services more effectively. Railways need other operational management systems to monitor and schedule rolling stock maintenance by unit number, record repairs made under warranty, analyze infrastructure degradation to optimize maintenance scheduling, program train drivers to better manage duty times, and a myriad of other operational and management activities.

Usually, required information systems rely on high-quality communications systems to transmit data across the railway network. Often, communications systems are commercially available but many railways have installed fiber optic systems along their lines, using some capacity themselves and selling the balance to other businesses or to national telecommunications companies, including cell phone operators.

Generally, information systems and communications investments yield high returns and facilitate intelligent implementation of reform programs using adequate management information.

12.3.4 Eliminating unneeded assets

Many older railways have excess assets that could be monetized. For example, railways may have extra depots because modern rolling stock requires fewer maintenance inputs, hence fewer but more sophisticated workshops and depots. Many railways have inventories of old rolling stock that should be scrapped. At 2010 prices, scrap steel yields about US$400/ton, so an average freight car at 22 tons is worth nearly US$8,000, and an average locomotive, at nearly 100 tons, US$40,000.

Asset disposal by state-owned railways is often difficult. In many cases, railway assets are state property and come under the authority of a state property agency – in such cases the railway may not receive the proceeds from selling excess assets and the disposal must pass through an additional bureaucracy. When restructuring a state-owned railway into an enterprise, it is important to value railway assets

and give the new state-owned enterprise title to them. The railway enterprise should be able to dispose of assets and to retain the proceeds from any such sale.

In the past, many railways comprised multiple self-contained small industries to service railway needs in outlying locations. Modern computer and communications systems have reduced the need for local offices and staff. Introducing modern technologies has reduced the number of facilities needed for track maintenance, rolling stock repair, and for machinery, which mean these assets are no longer needed. Railway restructuring should include a major effort to reduce or eliminate unneeded assets.

12.4 Human Resources

Railways are labor intensive. The railway business is complex and requires a wide range of technical skills and crafts–welding, machinery repair, civil engineering, drivers, electrical and mechanical engineering, and medical personnel, to name a few. Plus, most railways operate 24 hours per day/ 365 days per year. Railways must pay enough to attract high-quality skilled staff and railways must develop safety programs and ensure that all employees are scheduled, properly trained, vetted, and observing safety protocols at all times.

Human resource management at railways is an important and multi-faceted function that requires detailed information systems and methods for managing training, safety protocols, and skills. In reform and restructuring efforts, human resources management must cope with several specific tasks, described below.

12.4.1 Right-sizing staff

Throughout the history of railway reform, productivity rises with advancements in technology, new investments, commercial management practices, and reform processes. As a result, even with substantial increases in traffic, most railways discover that they have too many employees.

During reforms, human resources managers must decide how many staff are needed for each function, and develop a rational schedule to shed excess staff or fill staff shortages. Several methods exist for determining rational staffing numbers—for example, gross comparisons with similar railways or detailed benchmarking studies. Data to conduct gross comparisons are available from UIC, AAR, and World Bank sources. More refined benchmarking studies can be conducted with the help of consulting firms specializing in such analyses.

Managing excess staff and developing right-sizing plans is a major task in the reform process. When there is excess staff, it is difficult to restructure or entrench a culture of increased productivity and improved performance. Consequently, as management systems and new technologies are introduced, staff numbers must be cut back. Staff cuts can be introduced though a hiring freeze, or through redundancy programs that offer incentives for staff to leave.

Right-sizing efforts should include a system to rationalize pay scales by defining the necessary skills and abilities for staff positions and benchmarking wages against the local market. Often, older railway staff lack skills needed to operate or

maintain new technologies that the railway may acquire during a restructuring and reform program—new passenger rolling stock with air conditioning systems, new computer-controlled locomotives, advanced signal and train control systems, communications and computer systems. Hence, staff skills must be upgraded and new skills acquired.

Buyouts

One of the most effective ways to shed excess staff is through buyouts. Redundant employees can be invited to volunteer or be asked to leave. However, the risk with a voluntary scheme is that the better staff will take the buyout because they have more options in the job market. Designing employee buyout programs is an art. Buyout programs must reflect the age profile of the enterprise, and must be designed so that the railway maintains critical skills. Some buyout programs can target recent hires and provide a modest incentive for separation. Other buyout programs can be designed to shed soon-to-retire staff by topping off pension plans and providing incentives for early retirement.

The costs for shedding employees can run high, and like any other investment, must be weighed against the return, based on saved labor costs. Recognizing the long-term value of right-sizing the workforce, development banks have provided financing for employee reduction and retraining programs. The World Bank has produced a Labor Redundancy Toolkit which can be referenced for this purpose.[142]

Retraining programs

A civilized way to cope with overstaffing is to provide redundant staff with retraining and employment services, including computer and software instruction, and job-search, resume-writing, and interview skills. Retained staff can also undertake retraining to increase their skills.

Often, development bank grants and loans can be used to finance retraining programs, because retraining is part of right-sizing and overall reform efforts.

12.4.2 Finding qualified staff

Railway reform efforts often include investments in new technology. Most modern equipment requires employees with higher education to accommodate the new organization structures and functions, and new skills—computer and electrical, hydraulics, mechanics, operational; and business skills such as marketing, management, market research, and pricing, among others needed to operate a modern business enterprise.

Implementing railway reforms and restructuring requires new organizational structures, which should be accompanied by job descriptions that specify responsibilities, outputs, and the required skills and educational levels. Often, during re-

[142] The WB toolkit can be referenced at:
http://rru.worldbank.org/documents/toolkits/labor/toolkit/module1/resources.html
The UK's Pay and Employment Rights Service (PERS) has also produced a Redundancy toolkit (http://www.pers.org.uk/Publications/redundancytoolkit.pdf); while this applies particularly in the UK, the general concepts may be applicable to railway reforms.

structuring, external recruitment will be necessary to fill many new jobs that require new skills in marketing, market research, and management. However, before looking outside, internal recruitment may turn up staff capable of satisfying the new job requirements, or willing to undergo training to develop the necessary skills.

12.4.3 Incentive structures

New commercially oriented organizational structures require matching remuneration systems. A complete human resources management program for designing and implementing railway reforms includes right-sizing, benchmarking, buyouts, retraining, and developing new pay structures.

New pay structures usually include incentive pay schemes, which should be designed to elicit desired behaviors or skills. Effective pay incentives are large enough to be meaningful but should not represent more than 15 percent of overall compensation for any one employee. Higher incentive levels tend to be counterproductive because employees can develop tunnel vision about the incentive-driven behavior, which can erode or eradicate most of the other skills needed to effectively fulfill the position.

13

Railway Reform:
Toolkit for Improving Rail Sector Performance

Chapter 13:
Encouraging Private Sector Participation

13 Encouraging Private Sector Participation

13.1 Introduction

Most reform and restructuring efforts aim to increase railways commercial orientation and reduce government direction and support of the sector. Governments worldwide have reformed state railway departments and agencies in an effort to reduce costs, improve services, and realize more effective investments. Revitalizing rail transport takes fresh approaches and often requires large capital infusions. Encouraging private sector participation is a dual-purpose strategy that seeks not only investors but also private sector operators, whose experience and skills can sharpen the commercial focus of railway enterprises. Private sector capital is typically more expensive than government financing, but the commercial discipline and expertise that comes with private sector participation can lead to increased railway productivity and efficiencies, ultimately leading to reduced financial risk and costs to the government.

The private sector has much to offer railway reform efforts—capital is more abundant in the private sector and investors recognize that railways can often offer opportunities for good returns. Private enterprises are driven by commercially oriented managers focusing on factors that affect profit and loss—marketing, customer service, and controlling costs. These factors are not necessarily the focus of state managers.

Private sector participation is not a panacea for reforming government-run railways. Governments with an ineffective and costly rail sector have to decide whether to: a) fix the railway first (corporatize, downsize staff, and make key investments); or b) let the private sector carry out the fixes. Even before reform efforts begin, governments need to be prepared, by doing the following:

1. *Clarify their objectives*, which might include the need to: (i) reduce or eliminate subsidies (reduce cost burden on treasury); (ii) seek relief from ongoing and deferred investment needs; and (iii) provide more and better services.
2. *Understand how these objectives might be achieved*, for example: (i) improve productivity and efficiency; (ii) reduce services and close branches; and/or (iii) draw in private sector participation.
3. *Understand the political implications of required actions*, which can include: (i) making large reductions in the workforce; (ii) reducing the scope of loss-making services hurting users of those services; (iii) introducing greater pricing flexibility; and (iv) restructuring within individual units.

Whatever the approach, having a clear and well defined set of objectives– the *Why* of reforms - is a critical first step as it will guide strategic options for moving forward with private sector participation.

13.2 Typical Forms of Private Sector Participation

Private sector participation in railways can take many forms, as outlined below.

13.2.1 Contracting and outsourcing

Enterprise rationalization through increased contracting and outsourcing should be part of most reform efforts, unless the reform is limited to a concession or full privatization. All railways, even state-owned vertically integrated railways, commonly contract with the private sector for a range of services, from purchasing supplies (such as fuel or materials) to contracting for services (such as audit, accounting or overhauling traction motors). Reforms that expand contracting for services and materials can expand private sector participation and stimulate increased private investment.

Many railway activities that were once considered 'core' to the railway entity can be outsourced to the private sector, depending upon the size of the economy and the railway. For example, railways may choose to outsource maintenance activities:

- To gain economies of scale for specialized activities such as ballast production;
- When a railway is not large enough to engage full-time specialized equipment such services can be provided by a private supplier to more than one railway;
- When the activity is highly specialized and requires expertise not normally employed by a single railway, such as rail flaw detection (RFD), verification of track geometry, and bridge rating;
- When the maintenance activity is not core to the business of railway maintenance, such as station/building/depot maintenance and automotive maintenance of road vehicles.
- When the cost of outsourcing maintenance activity is lower than the cost of providing this function internally.

Other railway activities that can be outsourced includes simple activities like building repair, cleaning, catering, repairs to bridges and structures, workshop functions, and track renewals[143]. Some railways have also outsourced on-board passenger services and ticket collection, in order to control fraud, improve services, and reduce the need for non-core investments.

Many government-owned and operated railways have historically included subsidiary entities that produce everything from ballast and sleepers to advertising and printing. Often these subsidiaries can be sold, raising capital needed for critical 'core' investments. Costs typically decline when services and materials are purchased through competitive bidding. During railway reform implementation, a crucial task is thus to identify true 'core' functions, and then to shed as many of the "non-core" activities as possible. This reduces both annual maintenance cost and the capital requirements associated with the non-core functions, while expanding private sector participation.

[143] For example, India Railways outsourced catering.

When railways expand the share of non-core functions that they outsource, they need to both strengthen their procurement capacity and upgrade contracting and bidding practices. This may necessitate staff retraining programs. Railways sometimes balk at contracting out, citing 'safety issues' as an impediment and claiming that cost savings from contracting out will be cancelled out by increased supervision costs. However, global evidence confirms that when an appropriate Safety Management System is in place, it is safe *and* cost-effective to contract many functions to private sector enterprises—from signal maintenance to on-board catering—despite the need for increased staff to supervise contractors.

Both rationalization of non-core activities undertaken by subsidiary enterprises and increased contracting and outsourcing of core activities such as the running of trains should thus be considered as elements of railway reform.

13.2.2 Service management contracts

Frustrated with the cost and difficulty of reforming their state-owned railway, governments frequently seek to solve the problem by outsourcing railway management to a private sector operator. This can be effective, but is fraught with difficulty. One of the greatest challenges has been designing contract incentives that reward attaining the performance the government wants to achieve, while ensuring that the condition of the physical assets improves.

Governments may choose contract management because they cannot or are not able to face the difficult staffing and investment choices associated with greater private sector involvement. However, service management contracts often limit redundancies, prohibit significant reductions in service, or commit the government to renewal investments as part of the contract. Such contracts are typically short term. As a result, they do not involve significant private investment, becoming in effect "cost-plus" management contracts. A sample contract is included in Annex 5.

Private sector management can go some way to help achieve efficient railway operations, but most service contracts limit management' ability to make significant long-term improvements. A more fundamental way to involve private sector operators and private capital is through longer-term concession or franchising contracts.

13.2.3 Rail concessions and franchises

Rail concessions and franchises are effective ways of increasing private sector participation. Concessions and franchises are simply contracts between a government owner and private parties for the provision of specified rail-related services. The contracts can be for infrastructure, operations, or both. The terms "concession" and "franchise" are often used interchangeably, but may be interpreted differently in different jurisdictions. Here, concessions and franchises are distinguished by the length of the contract – a concession typically lasts longer than a franchise and requires a more significant investment commitment from the private sector.

Concession contracts

In most cases, concessions involve a contract for vertically integrated train services. Under a typical concession contract, the state maintains ownership of the

land under the railway and the "below the rail' infrastructure, while transferring most other infrastructure along with rolling stock assets and the right to operate rail services to a private company for a period fixed in the contract. Concessions are usually longer-term arrangements, in order to take advantage of private sector investment and commercial management practices. Railway concessioning can encompass the whole enterprise or be limited to specific enterprise components – freight operations, commuter services, or long-distance passenger services. Railway concessioning has been used in Europe, Latin America, Africa, and in many other parts of the world. While a number of African concessions have been terminated early[144], those that have continued have had generally positive results.[145] At a minimum, concessioning has generally reduced the financial burden of the railway on Government, and in almost all cases rail traffic has increased, sometimes dramatically following the concession.

However, as was the case initially in many parts of the former Soviet Union, concessions in Africa did not deal effectively with a number of underlying issues[146]:

- The fundamental misunderstanding by Government about what concessions meant. Concessions do not mean for concessionaires to manage the railways on behalf of Government. Rather, concessionaires are to take over the railways and operate it profitably (subject to concession contract terms).
- Failure to agree on the financing mechanism for public service obligations (PSOs), particularly passenger transport. A number of concessions required the operator to continue to cross-subsidize loss-making suburban and long-haul passenger traffic from freight revenue for a number of years. This drained available cash (the difference between revenue and direct operating costs), leading to under-maintenance of track and thus to declining running speeds and service levels and eventually to a declining capacity to move freight. In most cases, these passenger service requirements were eventually converted to directly subsidized PSOs to be provided by the concessionaire.
- Failure to establish a corporate structure that was sustainable in an environment where the interests of the operator and the owner were not always fully aligned.

---

[144] The 20-year concession of Zambian Railways (ZR), signed in 2003, was revoked by the Zambian Government in 2012. The 25-year concession of Tanzania Railways (TRC), signed in 2007, was terminated in 2011. The 25-year concession of the Kenyan and Ugandan railways to Rift Valley Railways (RVR) signed in 2005 remains in place, although the membership of the consortium has changed a number of times since the 25-year agreement was signed.

[145] For a discussion on concessioning, see Section 9.4.3 the toolkit case studies. A pro-forma concession contract is included in Annex 4.

[146] This section is drawn in part from recent surveys of African rail concession performance, including: Joan Miquel Vilardell, *Railway Concession in Africa: Lessons Learned*, prepared for AfDB Transport Forum, 2015; Larry Phipps, *Review of the Effectiveness of Rail concessions in the SADC Region,* prepared for USAID Southern Africa, 2009; Richard Bullock, *Results of Railway Privatization in Africa*, World Bank, 2005; Mark Pearson & Bo Giersing, *Revamping the Regional Railway Systems in Eastern and Southern Africa*, Trademark Southern Africa, 2012; CPCS, SSATP Transport Policy Review study conducted for the World Bank, 2013.

- Failure of the owner and the concessionaire to agree on reasonable traffic forecasts, and to align these with infrastructure upgrading proposals. Most agreements forecast a rapid increase in rail traffic, regarded as being constrained initially primarily by track and rolling stock condition. The agreements did not adequately consider the 'chicken and egg' question of how to finance the initial infrastructure improvements needed to handle additional traffic before traffic and revenue increased, or indeed how to convince potential customers to be the first to switch back to the not-yet-improved railway. In some cases, traffic volumes were simply not sufficient to support the infrastructure costs, setting unrealistic expectations. Failure to set up an appropriate mechanism to oversee the commercial agreement between the Government-owned railway and a private operator. In most cases, this task was left to the railway entity, creating a clear conflict of interest between the railway as regulator and the railway as owner and a party to the concession agreement.[147]
- Failure to agree on appropriate mechanisms to facilitate cross-border movement of cargo by rail. With notable exceptions (Abidjan-Ouagadougou in West Africa, and Mombasa-Nairobi-Kampala in East Africa), African railways concentrate on national markets and do not cross borders. When they do cross borders, they can attract traffic with a longer average haul, but only if they can provide service comparable to that provided by through truck movement.
- Failure of Government to implement (or pay for) some of the rehabilitation costs in accordance with the concession contract.

Concession contracts that include upgrading of rail infrastructure are typically for a period of 25 to 40 years, to allow the concession operator to obtain a return on investment in long-term assets. A concession contract can also include government commitment to invest in assets, such as infrastructure or passenger rolling stock. Infrastructure concessions are generally exclusive – the concession operator has the exclusive right to invest, maintain, and operate the infrastructure and to run trains, although they can require the concession operator to provide access to other train operators providing specific transport services (passenger, freight, or both).

Typically, state-owners are financially responsible for resolving existing workforce redundancies and environmental issues prior to concessioning. The State may include one or more service contracts with the concession operator for loss-making services (usually for provision of specific number of passenger services).

A difficult and often contentious part of concession agreements involves terminal valuations—how the value of private investments will be calculated at the end of the concession. If assets simply revert to government ownership at the end of the concession, operators often seek to dis-invest during the final years of the contract, effectively using up their earlier investments. This can leave the government with railway assets that are no better than when they were transferred to the operator at the beginning of the concession, or in some cases assets that have degenerated beyond their initial condition. Another option is for the government to pay the operator for the asset value that remains at the end of the concession. This requires

[147] For example, the debate about appropriate structure continues – In 2016, 10 years into a 25-year agreement, Kenya Railway Corporation and the Ministry of Transport retained a consultant to advise on a more appropriate regulatory mechanism for the balance of the concession agreement between KRC and RVR.

contractual agreement from the beginning on a method to value the assets at the end of the concession. Often, concession contracts have a renewal period, to try to avoid this end-of-contract dilemma. In such contracts, a 30-year concession may be renewed for an additional period of 5-10 years after year 20, thereby providing the private investor with an incentive to continue to invest. This avoids reaching the 'final years' of the concession, unless there has been a decision by one party to terminate rather than to renew.

Concessions involve competitive tendering, engage private investment and management directly, and can transform a state-owned enterprise. Some countries have emphasized the use of concessioning both to promote competition within the rail sector and to seek private sector investment and management. Larger national rail networks, such as Brazil, Argentina, and Mexico, were concessioned into self-contained viable sub-networks – each constituting a natural geographic monopoly. In some concessions, the government has required new private operators to allow other licensed railway operators access to the concessioned network. In Mexico, the national railway was disaggregated into competing networks plus a jointly owned concession serving Mexico City. Network segments with lighter traffic density were separately concessioned as short-line railways. These concessions have created competitive rail services, attracting large private sector investments and new commercially focused railway management teams. Rail traffic in Mexico has grown dramatically, the need for subsidy and government investment has declined dramatically, and the condition of assets – infrastructure as well as rolling stock fleets – has improved greatly. In Cameroon, while the results are less dramatic, there have been significant investments by both the government and the operator, traffic has grown steadily, and the 20-year term of the original agreement, signed in 1990, has already been extended to 30 years. (Refer to Mexico and Cameroon Case Studies provided in this Toolkit for more details.)

Franchises

A franchise is a form of concession. Rail reforms in the UK mostly involve discussions of rail franchises (see Case Study: Virgin Trains), involving a contract to provide an exclusive right to operate defined train services for a period of between 7 and 15 years (some franchise contracts are now being written for longer periods). Of note, UK rail franchises were limited to rail services ('above the rail'). These were not vertically integrated rail operations, as was the case in most of the concessions noted in the previous subsection. Consequently, the franchise period could be shorter as these did not entail capital investment in track and signaling (which typically have a longer term payback period.

A franchise contract can also be used to provide infrastructure. Franchises are usually auctioned or put out to competitive tendering to provide competition for the market for rail services.

Since the term of a franchise is usually shorter than the life of most rail assets, the existence of a local equipment leasing market or some other mechanism to provide for longer-term asset investment is usually a pre-requisite for franchises to work effectively.

13.2.4 Private railways

Railways are privately owned and operated in many countries. Outright privatization of a national rail network that was publically owned is uncommon, but several examples indicate that such sales can be effective in introducing private investment and management skills to the freight rail sector. In Canada, the formerly government-owned Canadian National Railways (CNR) was created in 1918-23 through the merger of a number of bankrupt private railways that had been taken over by the Government. It was privatized in 1995 through a stock offering and has since become an example of commercial efficiency and effectiveness.

In the United States, most railways had been privately owned. However, after a series of bankruptcies of large eastern railways, the federal government developed a mechanism to acquire and rehabilitate these railways. The newly government-owned railways were merged into Consolidated Rail Corporation (Conrail), which operated as a state-owned railway between 1976 and 1987. During that time, the government invested in improving the main line infrastructure, restructured operations, shed passenger services, sold non-core holdings, and reduced employment. Eventually, Conrail became financially healthy enough to be privatized. It was sold through an initial public offering (IPO) in 1987.[148] Privately owned US freight railroads today are among the most efficient and profitable in the world.

In 2001, Polish State Railways, Polskie Koleje Panstwowe's (PKP), reorganized to create a holding company with passenger, freight, infrastructure subsidiaries. After considerable effort to turn around its operations, PKP was able to sell shares in PKP Cargo in an initial public offering (IPO) on October 30, 2013. The company was valued at US$1.16 billion, and its share price closed 19 percent higher than the offer. The shares continue to be traded on the Warsaw Stock Exchange today. The successful privatization of four of the PKP subsidiaries since 2013 has realized US$1.2 billion transaction revenue. The revenue from these transactions was used to repay PKP's historical debt. (Also see "Polish Railways" case study provided in this Toolkit.)

Some countries, including Australia and Canada, permit and even encourage private railway development, in many cases to exploit mineral deposits. If a state-owned railway network exists, private railways are often prohibited from competing directly with it. Thus, some private railways are permitted to serve only their parent mining companies. In other cases, when private railways are built in remote locations, they are not prohibited from providing rail services to other customers although they have no 'common carrier' obligations. In Brazil, Vale (formerly CVRD) built and continues to operate a number of private railways that not only serve their own major mining operations but also provide public rail services under a common carrier obligation. Since 2008, Vale has developed the Moatize Corridor in Southern Africa, linking coal mines at Moatize (Mozambique) with the deep-water port at Nacala (Mozambique) via a rail corridor of more than 650 km that passes through Malawi. In Western Australia, several mining companies built pri-

[148] See World Bank study by Eric Beshers on the bankruptcy, government takeover and eventual sale of several railways in the eastern US: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2000/03/23/000178830_9810190215474/Rendered/PDF/multi_page.pdf

vate railways to serve mines in remote locations. Under Australian law, these railways generally must allow other rail operators access to their infrastructure based on a regulated track access charge.

13.2.5 Other forms of private participation

Several other forms of private participation in the rail sector are common. Generally these require an existing rail market within which private investors can operate. If there is only a single customer—for example, the national railway—private investment is less likely, *except* on a contract basis. There are a number of possible forms of such private participation, including equipment ownership and leasing, infrastructure construction and maintenance, and private operation of trains (see the Case Study on HSR financing in France included in this toolkit for a number of approaches to private financing)

Equipment ownership and leasing

Reforms that permit or encourage private investors to purchase railway equipment and lease it to users can bring substantial private investment to the railway sector.

In many markets, third-party rolling stock companies own, maintain and lease equipment to railways. This is the case with much of the petroleum tank car fleet in North America. Another example is TTX, a rail wagon pooling company owned by a group of North American railways. (Also see the case study, "TTX Company—Rail Wagon Pooling" in this Toolkit). GATX, founded in 1898 and now the world's largest railway car leasing company not owned by a railway, owns more than 125,000 wagons and 600 locomotives serving the North American market. GATX also operates in Europe and in India. In the UK, leasing of rolling stock is common for all of the passenger train operating companies.

Rolling stock leasing bring to the sector the following benefits:

- Provides both railways and shippers flexibility in their management of wagons fleets;
- Reduce the capital requirements of operators who pay for use of over time; and
- Frees up the railway operator's balance sheet, which can facilitate financing of other capital needs.

To grow and flourish, leasing requires a market ecosystem. Usually, railways offer discounts on tariffs or transport charges for shippers that invest in rolling stock. Private owner-investors must be able to spread equipment ownership risk across multiple potential customers—shippers, rail operators or forwarders, or other railways – not just the state-owned railway.

Privately owned equipment usually has higher utilization, because the owner ensures that the wagon is returned quickly for reloading. Moreover, the equipment may be newer and more reliable, and provide a better net tare ratio and suitability for specific shipper needs than railway-provided equipment, which is likely more generic.

For a market to develop, however, there must be sufficient numbers of potential leasing customers. In the UK, several passenger operators use similar equipment

so an equipment investor has potential to lease to a successor operator on a concession, or to other passenger concession operators.

Given a sufficient number of shippers or operators to provide a risk pool, it is in the railways' interest to provide sufficient tariff reductions for private rolling stock to attract private investors. This frees scarce railway capital for use in other areas, such as infrastructure improvement, where it may be harder to attract private investors.

Infrastructure construction and maintenance

Historically, many vertically integrated railways have constructed new lines with their own labor force, and many railways use employees to carry out renewals and infrastructure maintenance. However, construction and infrastructure maintenance activities can be contracted out, which can create a market in leasing specialized and expensive railway-specific maintenance equipment. Even with a single infrastructure entity, a sufficient number of specialized track maintenance contractors can become a sustainable market for equipment leasing, especially if other railways of similar gauge are nearby and also seek to contract construction and infrastructure maintenance services. Examples of this specialized and highly productive equipment include rail-grinding trains, tunnel boring machines, and high-productivity track tamping machines. Track renewal work is successfully contracted out in this way in Latin America, the US, Europe, and Australia, where there are multiple railways or railway concessions.

Private operators of trains

Many governments' railway reform efforts include trying to increase competition between rail services. Within the European Union, regulations now require infrastructure accounts to be separated from transportation services accounts. Multiple rail operators are licensed to provide services over the same multinational rail network. Private operators negotiate for network space ('train paths') and provide shippers with loading, unloading, train assembly, and transport services on a 'for-hire' basis. Private operators invest in locomotives and rolling stock and sell services to shippers or local communities for suburban and commuter passenger services.

Governments often forbid differential pricing for infrastructure access (all operators pay according to the same access charge formula, although this sometimes allows for differential pricing for different service bundles. In a market that includes private operators, this restriction on the extent of Ramsey pricing[149] permitted for rail services potentially reduces the total volume of rail transport. In addition, many state-owned railways continue to view the railway as an integrated monopoly and thus distrust the idea of separation of infrastructure from operations and the introduction of private operators.

[149] Ramsey pricing means charging shippers according to their sensitivity to transport prices – those who are less sensitive pay more, those who are more sensitive to transport prices are charged less. Like modern airline pricing, these pricing methods tend to enlarge rail transport markets, so restricting their use effectively constrains market growth.

In Russia (and in some other CIS countries), reforms have opened the market to private rail operators who compete with state-owned operators for freight markets. Private operators own or lease rolling stock that they manage for their customers, but in Russia they do not presently operate trains. The national railways provide train crews, dispatching, and infrastructure services (train paths) based on agreements negotiated with operators. Russian Railways assert that this 'retained monopoly' in infrastructure and haulage is "more efficient in the Russian context". Russian Railways provide 15-20 percent tariff discounts for private wagon ownership. Equipment operators earn a return from leasing their rolling stock and providing an interface between the railway and shippers for billing and record keeping. Equipment operators manage their equipment carefully and target specific customers in order to achieve higher equipment utilization and lower empty hauls. This would be impossible to achieve in the general pool of railway equipment. Russian equipment operators thus combine the functions of freight forwarders and equipment leasing companies, adding value through risk mitigation, better equipment condition, and better customer service. The growth in private equipment operators has resulted in the development of a pure equipment-leasing market in Russia, leasing rolling stock to both shippers and equipment operators.

Using this market opening, private equipment operators in Russia have invested over US$20 billion in railway freight equipment. As a result, the Russian railway did not have to finance these investments, old rolling stock has been replaced, and new equipment technologies have been introduced, reducing maintenance costs and out-of-service time. Globaltrans, regarded as Russia's leading private freight rail operator, was created in 2004. As of mid-2016, Globaltrans owns and operates more than 66,000 wagons and 75 locomotives. Discussion continues in Russia about whether private equipment companies will be able to buy and supply their own locomotives, leaving the railways to supply qualified drivers, dispatching, and infrastructure services. The Russian Railways case study in this Toolkit provides more details.

13.3 Public Private Partnership

A public-private partnership (often referred to as PPP, P3, or 3P) in railways is a contractual arrangement between government and private investors to provide public rail infrastructure and/or services and to share the risks associated with those investments and/or operations in some way. Such arrangements include private ownership and/or operation of trains, but typically include financing and management of infrastructure and services.

PPP arrangements differ from simple construction and service contracts in that PPP for railway transactions typically involve a contractually defined division of risk for provision of rail infrastructure or other investment for a public service. Government may participate in several ways: (i) transfer existing assets; (ii) provide land; (iii) finance part or all of initial investment in infrastructure; or (iii) provide a revenue guarantee through a long-term contract. At the end of the contract, assets are transferred to government at a pre-determined price. This toolkit provides case studies illustrating two possibilities for division of risks in development of high speed rail services, based on recent French experience (See "France: HSR Public-Private Partnership" in this toolkit).

Government support for a PPP may include not only asset transfers, initial investment, and long-term contracts for services, but often also forms of tax relief or tax-related benefits. A typical PPP railway transaction would be the construction and operation of a rail extension or urban rail services to an airport. Government may provide land; a private operator would build the line and operate the service for the duration of the PPP arrangement, and assume related risks. Revenue risks associated with passenger services could be mitigated by revenue available from land development rights for the private builders, or through some direct revenue support from the government under specific conditions specified in the contract. This is typically required when the operation on its own is not commercially viable.

When government contracts for private construction, operation, and eventual transfer with a long-term contract to operate the facility, without regard to usage or without revenue risk, the arrangement might be better referred to as a private finance initiative rather than a PPP.

13.3.1 Land rights

Often, the public sector contribution to PPP is access to land for development. For example, the government may provide land and a private company may finance, build, and operate a railway line in exchange for land development rights along the railway (See, for example, "Hong Kong Rail Plus Property Program" in this toolkit). Alternatively, the municipal railway may provide passenger services under a long-term lease with the private developer, who then profits from developing land near stations. Depending on the attractiveness of a region's real estate market, a municipality could potentially get a rail line and service without incurring the related full costs and the private developer pays upfront to build the rail link in exchange for development rights to land in the passenger service corridor, particularly adjacent to or over stations.

Land rights have been used to finance and develop railways for more than 100 years. In the United States and Canada, land grants were used to finance nineteenth century railway construction. In Japan, commuter rail services have been financed by land and development rights—private railways in Japan are in effect both development companies *and* railways. Some Japanese railway companies own office buildings, apartments, and sports stadiums and operate services that transport customers to these facilities. Their most profitable line of business is land development, although without railways to provide access the land would be less valuable.

Land combined with property development rights can contribute to developing and financing an urban railway system. However, land values are notoriously difficult to estimate prior to development, and the value of access to land may be insufficient to offset all of the costs and risks associated with a major rail investment.

13.4 Paying for Projects and Services That Have a Funding "Gap"

The financial dynamics of railway projects and services can range from fully private and commercial to public service type operations that are not viable without government financial support.

Fully private and commercially operated railways, such as North American Class I freight railroads, have a number of available sources of money to pay for rail projects (such as a new line to a mine) or increased services (such increased service frequency). These include cash generated from profits (U.S. Class I freight railroads generated $13.4 billion in profits in 2013), or a range of financing mechanisms including debt and equity raised in capital markets. They often use other financing instruments to defer payments, such as equipment capital leases – paying for use over time, rather than making a large capital outlay to purchase equipment outright.

Rail projects and/or services that cannot generate sufficient revenue over their lifecycle to cover capital and operating costs – in other words, projects and/or services that are not commercially viable – are said to have a "funding gap". Simply put, a funding gap is the delta between the sources of money available to pay for the project and/or service and all the costs associated with realizing the project and/or service.

There are two ways of reducing a project and/or services funding gap:

- **Increasing funding** (e.g. through government capital grants, subsidies or other sources); and/or
- **Reducing costs** of the project and/or service (e.g. scaling down the project's design characteristics, offering a lower level of service, etc.).

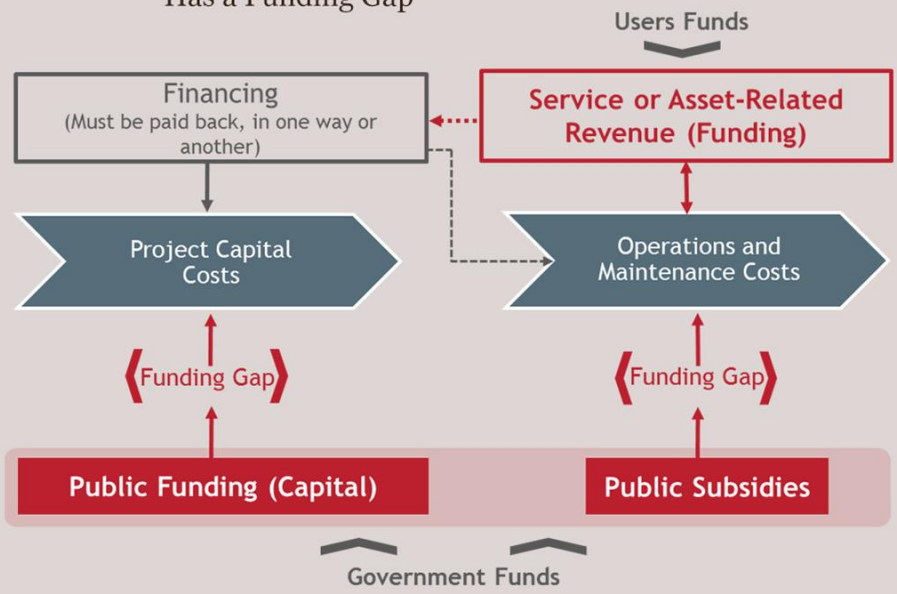
Of particular note, private financing (e.g. debt, equity, or other financial contributions from the private sector – as may be part of a PPP, for example) are generally not available to projects that have a funding gap, unless a government can pledge other future funding to repay the financing (e.g. service the debt). ***Financing* cannot solve a *funding* problem**.

Box 13.1 Funding versus Financing

Funding refers to the sources of revenue that can be used to pay for a project or service. Sources of funding include, but are not limited to, future revenue streams from the delivery of rail transportations services (whether freight or passenger services), ancillary revenues, and non-repayable government grants and subsidies.

Financing refers to the financial mechanisms or tools used to access money to pay for a project or service (including various forms of debt, equity, and capital leases), generally before the project generates the necessary revenue to pay for the investments. For instance, financing mechanisms can be used to raise the capital needed for the construction phase of a project, before revenues associated with the project start to flow.

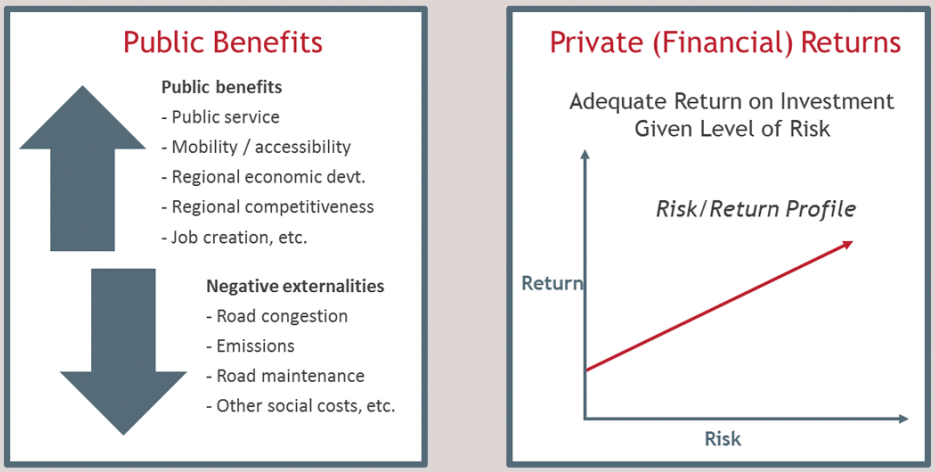
Figure 13.1 Typical Financial Dynamics When a Railway Project Has a Funding Gap



Explanatory notes: There are primarily two categories of railway costs: project capital costs, and operating and maintenance costs. Typically for new railway projects, capital costs must be incurred up front (e.g. during construction and equipment purchasing), before revenues flow from the operation itself. Financing tools can be used to access money to pay for up front project capital costs (provided the project is expected to be profitable, failing which public funding is requirement to fill the funding gap). Once the railway is in operations, revenue from the service or asset can help pay for operating and maintenance costs and financing servicing costs (e.g. principal repayment and interest). If service or asset-related revenues are insufficient, an operating subsidy is required.
Source: CPCS, from Transportation Research Board, Alternative Funding and Financing Mechanisms for Passenger and Freight Rail Projects, (2015)

Rail projects and/or services that have a funding gap may have merit. But there is a critical distinction between a public policy rationale for a project (e.g. the economic benefits of a project or services, relating to increased mobility, safety, reduced emissions) and its commercial rationale. Public benefits are generally measured in economic or public terms rather than financial terms and accrue to society at large, rather than to private investors.

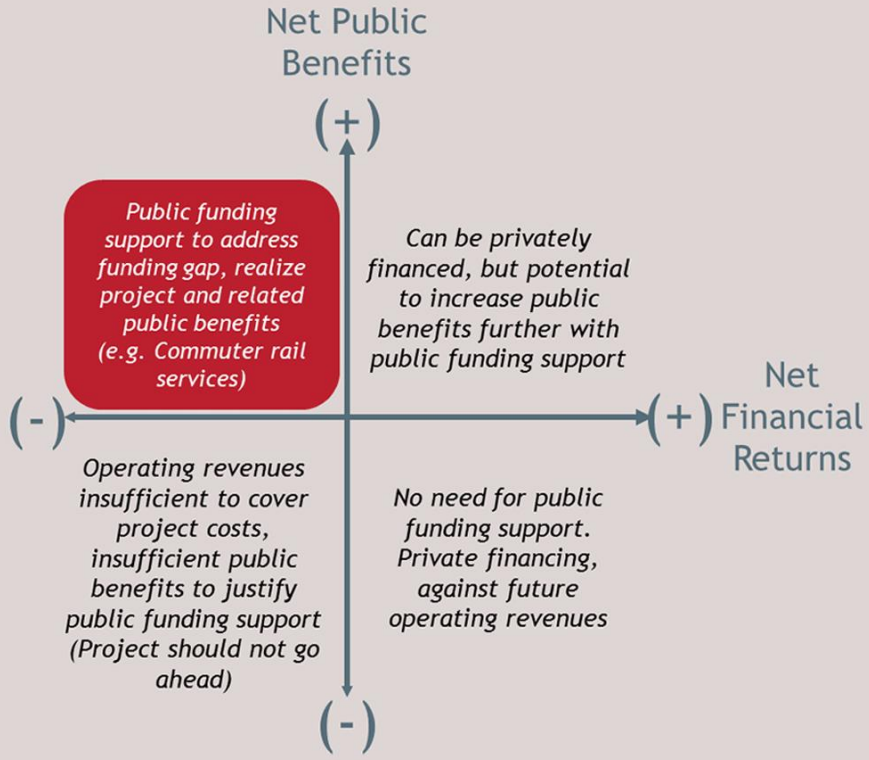
Figure 13.2 Public versus Private Sector Return Expectations Differ



Source: CPCS, from Transportation Research Board, Alternative Funding and Financing Mechanisms for Passenger and Freight Rail Projects, (2015)

This distinction has important implications. Fundamentally, if a rail project and/or service has a funding gap, the public sector must decide whether the public policy rationale and economic benefits case warrants public support (capital investment or operating subsidy). The private sector will not invest in such projects unless government can pledge financial resources to eliminate the funding gap, and provide an opportunity for profit. Projects or service with neither public benefits nor financial returns are bad projects that should not go ahead.

Figure 13.3 Basic Framework to Determine the Use of Rail Funding and Financing Mechanisms



Source: CPCS, from Transportation Research Board, Alternative Funding and Financing Mechanisms for Passenger and Freight Rail Projects, (2015)

13.5 Private Investor Perspectives

Private investors are looking to secure long-term returns on their invested capital and are willing to take risks, but will expect commensurate returns. Some returns from railway infrastructure investments are equivalent to a virtual government guarantee. If government uses a PPP structure with a long-term operating contract that limits the private sector risks to construction risk, the private company will expect returns similar to those of utility companies. If construction cost risks are shared with Government, the project may look more like a government guaranteed investment, with lower risk and commensurate lower returns.

If the private sector accepts fundamental risks, but the markets are not fully developed, private investors will be looking for returns similar to those of land developers or others who invest equivalent sums in risky commercial ventures. If private investors' potential returns from the venture can be expanded through land development rights or other profitable opportunities, they may accept lower returns or

assume more investment risk. For private investors, government-guaranteed financing or development bank-structured financing can shift a potential project from 'too risky' to 'possible'.

In short, private sector return expectations must be commensurate with the risk of the rail project and/or service.

13.6 Government Perspectives

Government must determine the degree of restructuring and private sector participation appropriate to a restructured railway by assessing national goals and objectives. Only a government is in a position to predict the extent of reform and restructuring that is politically feasible. Government then has to develop a roadmap for the required changes, which will include some of the following.

- Identify essential public services that must be retained;
- Identify a desired industry structure and a preliminary plan to achieve it;
- Determine what extent of private control is permitted in infrastructure;
- Develop required legal and regulatory environment;
- Develop criteria for resolving labor issues;
- Develop a road map to restructure the sector—functions, timing, investment needs, potential investors, and so forth.

Simple outsourcing of services—catering, construction, building maintenance, and so forth—yields modest private sector participation. The highest level of participation emerges from complete sector-wide restructuring. Full privatization offers the potential for the widest range of private sector specialist companies to develop. Many countries now have a vibrant rail sector comprising multiple private enterprises that supply manufacturing, maintenance, operating, retail, and other services to private businesses operating in the sector.

The case studies presented in this toolkit, as well as other resources of the World Bank and other development banks, can provide examples. It should be kept in mind that opening part or the entire railway sector to the private sector is likely to limit the ability of government to use the railway (or railway tariffs) as a tool to achieve other regional or sector development goals. While this issue can be dealt with in contract negotiations with the private sector partners to some extent, there remain risks, since government development priorities may change over a time horizon that is shorter than the 20-30 year term of a typical concession agreement. Many governments work with development banks to hire consulting firms that will help them work through a rail reform roadmap.

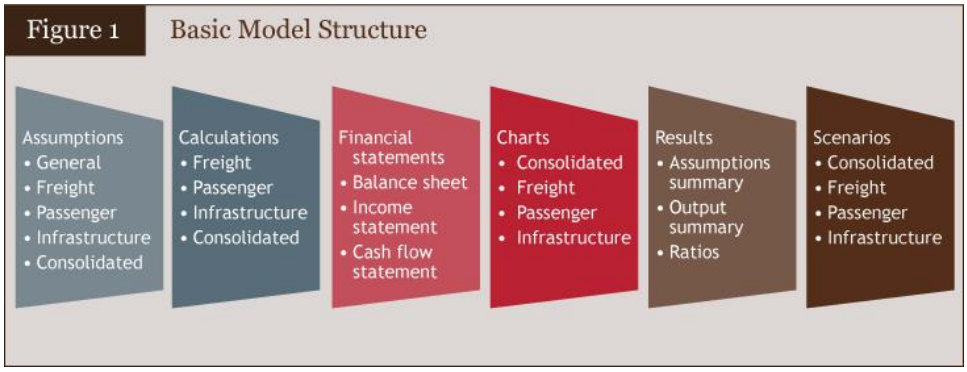
Annex 1
Financial Model—Guidance for Users

1 Introduction

Purpose

The financial model presented in *Railway Reform – Toolkit for Improving Rail Sector Performance*[150] demonstrates some key assumptions in developing financial modeling for railway operations and how financial and operational results could be presented (Figure 1). The target audience includes railway professionals in public and private entities, government agencies, and international organizations. The approach selected here is one of many potential variations of financial modeling; it is neither superior nor universal, just a point of departure for learning.

Figure 1 Basic Model Structure



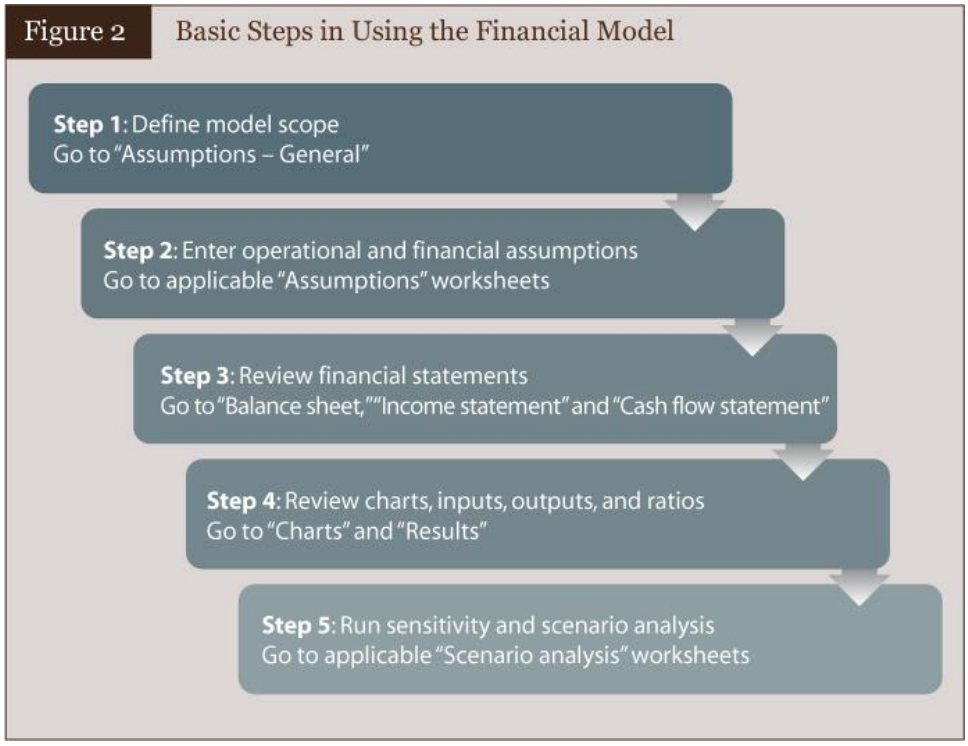
User requirements

Model users should be proficient in Microsoft Excel and financial analysis of railway operations. More experienced financial modelers can calibrate the model to their specific needs, and with practice, even novice users can learn model structure and logic.

Basic steps

This model includes no default values or data from an existing railway entity; instead, model users are expected to have access to recent financial and operational data for the entity they are examining. To begin, model users define the railway entity and enter all available historical financial and operational data, plus assumptions (Figure 2). The model will then generate a set of results, including forecast financial statements, charts, and ratio analysis. Also, the model includes a tool for model users to test a range of scenarios by changing key variables.

[150] The Excel model is available through the web version of the toolkit.



2 General Assumptions

Model scope

To define model scope, users select the railway type and range of operations. Integrated railways produce a single set of financial statements for any combination of passenger, freight, and infrastructure operations. Typically, separated railways consist of distinct legal entities for passenger, freight, and infrastructure, so each has a separate set of financial statements. On the 'Assumptions – General' worksheet, users select 'integrated' or 'separated' railways, then select operations that are included.

Each selection runs a macro that displays only those assumptions and results relevant to the user. Users should enter assumptions only for selected entities. The scenario needs to be run only once for the selected railway type. After this has been done, the model can be saved in a macro-free Excel file format.

> *Note: By default, the model displays assumptions and results for freight, passenger and infrastructure entities producing separate financial statements.*

Labeling

Users should enter the label selected for each railway entity—only one time—because labels remain constant for all relevant assumptions and results worksheets.

Period

Model users can freely select any starting and ending dates within a 30-year period. It is recommended that the first modeling year is past and data are available. For example, if model users want to generate a forecast for 2011-2039, they should

enter a 1/1/2010 starting date and a 12/31/2039 ending date, assuming data exist for year 2010.

> *Note: Results will be generated only for the first 30 years, even if a longer period is entered, due to the difficulty of accurate forecasting many decades ahead.*

Macroeconomic assumptions

Users enter the primary accounting currency to be used throughout the model, plus inflation and benchmark interest rates for that currency. If debt financing is anticipated from multiple currency sources, up to two additional currencies can be entered. If debt financing involves a fourth currency, loan terms should be converted to one of the model's three available currencies.

Data entry

Users enter data in orange or blue cells. Orange cells indicate entry points for historical data; blue cells indicate assumptions. Column D to the left of assumptions describes the form of required input—text, ratio, percentage, or something else. Inputs are entered in Columns E-AH. Data cells with white background indicate *results* of calculations; these should not be edited.

> *Note: Assumptions must be entered separately for all entities selected unless they are integrated; for example, fixed asset assumptions must be entered for each selected, and separate, entity.*

3 Specific Assumptions

General

Separate assumptions worksheets exist for each railway entity. When defining model scope, the automatic macro will limit assumptions worksheets to those relevant for the selected combination. If two or more entities are selected and they are integrated, users enter some assumption only once (Figure 3). In these cases, users can enter additional assumptions under 'Assumptions – Consolidated' for any additional costs associated with a headquarters or coordinating authority.

Figure 3 Integration of Entities

General Principles Of Integration	• Enter separate revenue, subsidy, and cost assumptions for each entity. • Results are shown only in a consolidated form.
All Entities Integrated	• Enter fixed asset and financing assumptions (including debt, equity, working capital, taxes, dividends and other long-term assets and liabilities) **only once under the freight entity only.**
Freight And Passenger Integrated	• Enter fixed asset and financing assumptions (including debt, equity, working capital, taxes, dividends and other long-term assets and liabilities) **only once under the freight entity.**
Freight And Infrastructure Integrated	• Enter fixed asset and financing assumptions (including debt, equity, working capital, taxes, dividends and other long-term assets and liabilities) **only once under the freight entity.**
Passenger And Infrastructure Integrated	• Enter fixed asset and financing assumptions (including debt, equity, working capital, taxes, dividends and other long-term assets and liabilities) **only once under the infrastructure entity.**

Network and operational

Users enter assumptions about network length, staffing levels, first-year traffic volumes in gross ton-kilometers (GTK), and traffic distribution between electric and diesel. Users can adjust these assumptions over the entire forecast period by changing values in the blue cells. For example, shares of electric traction may change for each modeling year if the railway is expanding network electrification. Also, users can enter operational benchmarks and key productivity ratios; these benchmark ratios will appear alongside entity results on the 'Charts' worksheet.

Fixed assets

Fixed assets can be divided into as many as six asset classes, which can be labeled according to model users' needs. If the entity has more than six asset classes, these should be summarized into six classes for using the model. Next, users enter net asset values and total depreciation at the end of the first modeling year, and forecast annual capital expenditure and asset sales for each asset class. If asset sales over the forecast period exceed the starting total net asset values, the model will display a warning. Users can enter depreciation figures by hand, or the model can calculate depreciation using straight-line depreciation after users enter average remaining life of existing assets and average life of new assets for each asset class. During manual entry, if any figures are missing for required assumptions, the model will display a warning. Existing land assets are an exception because they are not expected to depreciate. If users want to add depreciation for existing land, they can only do so manually. New land assets can be depreciated using the model or manual entry. For integrated entities, users should combine any coordinating authority fixed assets, such as headquarters buildings, with assets of the largest entity—freight, passenger, or infrastructure—because these additional assets cannot be entered separately.

Note: For integrated railways with two or more entities, fixed asset assumptions should be entered only in one place. If a freight entity is combined with a passenger or infrastructure entity, users enter fixed asset assumptions for the whole integrated railway under the freight entity ("Assumptions – Freight" worksheet). If an infrastructure entity is integrated with a passenger entity, users enter fixed asset assumptions under the infrastructure entity ("Assumptions – Infrastructure" worksheet).

Other long-term assets

Users can enter the aggregate value of any other long-term assets (not property, plant, or equipment) that deviate from standard depreciation schedules. Any depreciation, amortization, or impairment should be calculated outside the model and net asset values entered for each year in the period.

Note: For integrated entities, assumptions for other long-term assets should be entered for freight only if it is combined with passenger or infrastructure. For infrastructure integrated with passenger, users enter shared assumptions for other long-term assets for the infrastructure entity only.

Traffic

Traffic is a critical assumption that can be entered for up to 10 freight commodities and three passenger services. Data entry starts by selecting units of available data. The model uses average length of cargo haul/trip and net weight of train load, together with the GTK information given earlier, to convert original data to other units of traffic volume. The model converts to GTK because some operating costs, such as energy consumption, are forecast proportionally to GTK volume. Users have the option of adjusting the gross to net ton-km ratio for any forecast year by entering a "change in GTK/NTK ratio".

Traffic for the infrastructure entity includes any freight and passenger traffic entered for freight and passenger entities, *plus* additional traffic generated by external infrastructure clients. An example is private passenger service operators that pay track access charges to the infrastructure entity. External traffic volumes are entered *by client* rather than by commodity/service type.

Tariff assumptions

Each traffic flow defined above is associated with a tariff (freight) or a fare (passenger). First, users determine if tariffs and fares rise with inflation. If they do, the proportion of the rise can be set separately for each traffic flow. For example, a 50 percent inflation indexation means that the annual tariff/fare increases half of annual inflation through the forecast period. An additional tariff/fare change, post inflation adjustment, can also be entered for each year.

Note: Resulting tariffs/fares can also be shown for each traffic flow by clicking on 'Show/hide results'. These results feed from the Calculations worksheet and allow the user to see the outcome of selected tariff/fare assumptions.

Other operating revenue

Any revenue generated outside tariffs and fares can be entered here. Outside revenues from multiple sources should be aggregated for the one line item provided in the model.

Non-operating revenue

Users can enter tax credits, foreign exchange gains, or other revenue that is independent of operations volumes; revenues can be adjusted for inflation and for any annual changes during the forecast period. Annual changes can be applied to the quantity of a revenue stream or its 'unit price'. If a revenue stream is difficult to separate into price and quantity components, any annual change can be entered to *either* quantity or price. Quantity multiplied by price yields annual revenue.

Public subsidies

Some railways receive public subsidies under public service agreements or as compensation for discounted fares provided for special groups such as retirees, students, or veterans. Usually, governments provide operational subsidies to cover operating costs and these are shown in the income statement as part of operating revenue. Also, capital subsidies are provided for capital investments; these appear in the cash flow statement and in the capital subsidy equity account on the balance sheet. The model automatically amortizes annual capital subsidies, linking them to new assets' depreciation because some new assets are likely acquired with the capital subsidy. Similar to accounting treatment for deferred revenue, amortization means that part of the capital subsidy is recognized each year as revenue as the corresponding acquired asset is used. Asset use can be approximated by the corresponding depreciation amount each year. Users must enter the corresponding capital investment on the assumptions sheet by hand since no automatic link exists between capital subsidy and investment.

If subsidies are available, users enter the first-year amount, decide whether to link the subsidy level to inflation, and, if so, to what proportion. An additional annual change can also be entered. Alternatively, users enter the subsidy for each year by hand. For passenger operations, users can link the subsidy to traffic levels to reflect a potentially higher need for subsidies with higher traffic volumes in subsidized categories.

> *Note: For integrated entities, assumptions for capital subsidies need to be entered for freight only if it is combined with passenger or infrastructure. If infrastructure is integrated with passenger, users enter the shared assumptions for capital subsidies for the infrastructure entity only.*

Track access charge

The infrastructure company's main revenue source is track access charges, calculated using traffic volume measured in GTK and train-kilometers. Each traffic flow is charged for track access based on GTK and train-kilometers, therefore, freight and passenger entities will record these under their operating costs. Users enter two average charges for freight and two average charges for passenger, which are applied to all traffic flows. Like tariffs, access charges can be indexed to inflation. An additional annual change can also be entered.

Note: As part of consolidation, the revenue charged by the infrastructure entity to the freight and passenger company is removed to avoid double counting revenue. Only track access charge revenue from external clients, and other revenue, will be included in the consolidated income statement. Correspondingly, track access charges are removed from consolidated entity operating costs because the infrastructure company is considered as an internal cost center.

Operating costs

Some operating costs are fixed; other operating costs vary with traffic and/or inflation. All costs are calculated as quantity multiplied by price—a physical cost driver and a price. For staff cost, the number of staff (or staff count) defines the quantity, and salary, benefits and overhead form the 'price' (or 'staff member cost'). Cost driver and price variability can be defined. For example, if variability of staff count relative to staff cost is 100 percent, total staff costs increase in 1-to-1 relationship with staff count. If variability is 50 percent, total staff costs increase by only 50 percent of staff count, i.e., half of the total cost driven by quantity is fixed. For staff cost, users can alter the number of staff in the top part of each assumption sheet under "Network and operational assumptions". For example, a change can be entered to conduct sensitivity analysis.

Price or unit cost can vary with inflation to the extent defined by users. Users can also increase the price above or below inflation by entering an 'additional annual change'. The additional change will apply until the end of the forecast period, unless undone by the user through a reverse additional change. Other operating costs are defined by the same logic but with other physical cost drivers. Materials costs are driven by total traffic, measured in GTK, and costs for diesel fuel depend on diesel traffic and costs for electricity depend on electric traction traffic volumes.

External services and other operating expenses are not linked to staff or traffic for the physical cost driver. Instead, users define the initial quantity and can change it in any year. The point is to capture the percentage change in quantity, so the physical cost driver could also be a simple index that starts with 100 and changes as defined by users. As above, users can define the variability of these costs in relation to changes in quantity. Users can define the degree of price variability with inflation, and whether price is impacted by additional changes.

For the consolidated entity, the model assumes that the only additional costs arise from coordinating activities in headquarters, which can be captured by additional staff cost and other operating expenses. Users should enter any additional operating costs under these two categories.

Note: Users can ignore the section on 'scenario analysis' when entering values for the base case. Scenario analysis is relevant only when the base case is complete and the model is ready for sensitivity testing with different variables.

Non-operating costs

Users can freely label non operating costs and define the variability of physical and price cost drivers because they are independent of any operational variables. The

logic behind non operating cost calculations remains similar to that of other operating costs.

Taxes and dividends

Users enter the corporate income tax applicable during the modeling period and set the amount of annual dividend. The model excludes the impact of value-added taxes. Users also enter the debt service coverage ratio before a dividend can be paid, which is sometimes a financial covenant requested by lenders. If the entity's debt service coverage ratio (DSCR) for a given year is lower than the requirement, no dividend is paid. If actual DSCR exceeds the requirement, a dividend will be paid from cash flow available for dividends, as determined on the Calculations worksheet. Users set the 'annual dividend after DSCR' as a percentage share of the cash available for dividends.

> *Note: For integrated entities, assumptions for taxes/dividends need to be entered for freight only if it is combined with passenger or infrastructure. If infrastructure is integrated with passenger, users enter the shared assumptions for taxes/dividends for the infrastructure entity only. Consolidated financial statements will use dividend assumptions entered on 'Assumptions – Consolidated' worksheet. Freight entity tax assumptions are used for consolidated financial statements if freight is selected. If freight is not selected, consolidated financial statements will use the tax assumptions entered for infrastructure.*

Working capital

First-year values are important in defining working capital (current assets minus current liabilities). The model converts each working capital item into the number of days of underlying revenue or underlying cost that each account represents. For example, days in accounts receivable indicate the amount of recognized operating revenue waiting to be paid; 50 days in accounts receivable is the total operating revenue typically recognized over a 50-day period. Inventory consists of stored materials and diesel fuel for use; other receivables are linked to other revenues.

On the liability side, accounts payable refer to total operating costs that are due but unpaid; other payables are defined by non operating cost amounts waiting to be paid. If revenue collections become more/less efficient and invoice payments faster/slower, users can adjust after the first, historical year, the number of days outstanding in each working capital account. Finally, users can define how much interest is earned on cash balances, if any. It would not be unusual for interest to be below the benchmark interest for a low-risk cash account or short-term money market investment.

> *Note: In consolidation, working capital accounts for freight, passenger and infrastructure entities are aggregated, excluding accounts receivable and payable arising from intra-company track access charges. The consolidated entity needs additional working capital for headquarters staff costs, other operating costs and non operating costs.*

Debt financing

Assumptions for financing are divided into existing debt, new debt, and equity. Existing debt consists of three loans that the user defines according to source, currency, outstanding balance, repayment schedule, and interest rate. Users must ensure that the outstanding balance in the first modeling year is repaid in full by entering sufficient annual repayments in the schedule. If any amount remains outstanding, the model displays a warning.

New debt assumptions can be entered for up to four loans. First, users must name the funding source, indicate the first disbursement year (any number from 1-30) and enter the loan currency. As mentioned earlier, if debt financing involves a fourth currency, loan terms should be converted to one of three available currencies. Users must enter the disbursement schedule for the new loans by hand since, by definition, new debt is undisbursed at the time of modeling. Users select the loan term, which includes the grace period, and can select a repayment profile—bullet, equal installment, or fixed annuity.

A bullet loan is paid off in a single principal repayment at the end of the loan term and interest is paid annually on the whole principal; equal installments divide the loan into equal principal repayments with interest charged on the outstanding balance; fixed annuity repayment maintains an annual fixed amount of combined principal and interest. Users can enter a front-end fee due in the first year of loan disbursement and/or a commitment fee assessed during loan disbursement on committed but undisbursed capital (principal amount minus disbursements).

> *Note: For integrated entities, financing assumptions need to be entered for freight only if it is combined with passenger or infrastructure. If infrastructure is integrated with passenger, users enter shared financing assumptions for the infrastructure entity only.*

Other long-term liabilities

Users can group and enter any other long-term liabilities.

> *Note: For integrated entities, assumptions for other long-term liabilities need to be entered for freight only if it is combined with passenger or infrastructure. If infrastructure is integrated with passenger, users enter shared assumptions for other long-term liabilities for the infrastructure entity only.*

Equity

Equity assumptions are straightforward. Users enter the combined ending paid-in capital in the first modeling year, together with retained earnings. Changes to paid-capital, in case of new equity injection, can be entered by hand for any year in the forecast period.

> *Note: For integrated entities, equity assumptions need to be entered for freight only if it is combined with passenger or infrastructure. If infrastructure is integrated with passenger, users enter shared equity assumptions for the infrastructure entity only.*

4 Calculations

On this worksheet, assumptions are converted through calculations into a form required for financial statements and numerical and graphical results. Users need not enter assumptions or data because the model will automatically feed any required inputs from the Assumptions sheet or Scenario analysis, if enabled. The Calculations sheet can be used to check calculation methodology or to assist an experienced financial modeler in troubleshooting and model calibration.

5 Financial Statements

Balance sheet

As users are entering assumptions, the model is generating financial statements, including a balance sheet, for each selected entity. For financial statements that are complete and accurate, all assumptions must be entered. Users must pay particular attention to initial historical data because they must balance assets with liabilities and equity in the first modeling year; then the model will balance following years through income and cash flow statements. The consolidated balance sheet combines individual balance sheets of selected entities and removes intra-company transactions, such as the impact of internal track access charges on receivables and payables.

> *Note: The Ratios worksheet contains checks to ensure that the balance sheet is correctly presented. Always confirm that the answer to each check is 'Yes'.*

Income statement

Assumptions entered for traffic, tariffs, subsidies and track access charges define income statement revenues for the selected entities. Subsidy amortization is non cash revenue and included in other revenue. The main costs comprise operating costs and track access charges for freight and passenger. Depreciation, a non cash operating cost, is presented separately from cash-based operating costs to distinguish between earnings before interest, tax, depreciation and amortization (EBITDA) and earnings before interest and tax (EBIT). Net finance expenses are the balance between debt service and interest income. Net income is the final result after income tax and net finance expenses have been deducted.

> *Note: An infrastructure entity derives most revenues from track access charges, paid by freight and passenger entities and recorded by them as operating expenses. However, in consolidation, these track access charges are considered 'internal transfers' and are removed for selected entities. Only track access revenue derived from external clients and the unselected freight or passenger entity is shown on the consolidated income statement.*

Cash flow statement

The indirect method is used to construct cash flow statements; first, net income is adjusted for non cash revenues and costs to determine net cash from operating activities. Investing activities present the combined capital expenditure and sale of assets across all asset categories. Financing activities detail changes in debt and

equity balances and amount of interest paid. Dividend calculation is based on user assumptions and cash flow available for dividends.

6 Input and Output Summaries

Charts

On this worksheet, key operational and financial results are presented as dynamic charts that automatically adjust for changes in the forecast period, currency, or input units. Productivity charts include user-defined benchmarks on the 'Assumptions' worksheets. Users are encouraged to study the charts to visually validate assumptions and modeling results, and make it easier to detect inadvertent omissions or errors.

Results

This includes summaries of assumptions and outputs and a list of key operating and financial ratios. The input summary changes in response to changed assumptions or to enabling the 'scenario analysis' function. Users cannot enter inputs on this sheet or adjust assumptions because the summary feeds from the 'Assumptions', 'Calculation' and 'Charts' sheets. The output summary contains key financial and operational results with charts adapted from 'Charts' sheet. Results are expressed as numbers and charts, and will change if assumptions are changed or if 'scenario analysis' is enabled. The output summary is intended to present a results snapshot under assumptions selected.

Finally, some common financial ratios are presented under 'Results' with minimum, maximum, and average values and their dates of occurrence. Similar to other results sheets, these ratios change if assumptions are changed or if scenario analysis is enabled. This worksheet includes checks to validate the balance sheet and cash balances.

> *Note: Users cannot introduce changes directly to results or charts in the above worksheets, only to the assumptions or scenario analysis sheets.*

7 Scenario and Sensitivity Testing

This worksheet can be used after all assumptions have been entered and the financial statements and results have been validated to form a solid base case. The user can use the Scenario analysis sheet for sensitivity testing of key variables and model calibration. Each railway entity has a scenario analysis that has to be switched on when performing sensitivity testing.

After an entity scenario analysis has been switched on, the variable to be tested must also be switched on; the value entered for the variable will supersede the value entered on the Assumptions sheet and feed into all results and charts, including charts on the Scenario analysis sheet. When the variable is switched off, the original assumption, results, and charts are restored.

If several scenario analyses are switched on at the same time for the same variables, the model will first consider variables entered for the consolidated entity,

then the infrastructure entity for traffic variables, before considering variables entered for freight and passenger entities.

Before beginning sensitivity testing, i.e., when all switches are off, users can copy-paste base-case values shown in 'Results' to the space provided for base-case results. Results shown *above* base-case values change as different assumptions are tested.

If any tested scenarios produce a low-equity return, low DSCR, or negative cash balance warnings will be displayed to alert users to potential financially unsustainable scenarios.

> *Note: If users want to test more variables than are available in scenario analysis, they can return to assumptions and make changes. Sensitivity analysis should extend beyond the few variables presented here.*

Annex 2
Benchmarking

1 Introduction

Benchmarking is the process of comparing performance of one entity (the subject railway) to the performance of other entities (the benchmark companies) to identify best practices and opportunities for improvement. Often, benchmarking begins with a high-level comparison to identify areas of greatest potential, followed by detailed analysis of these high-potential areas. In the railway industry, benchmarking may compare financial measures such as operating ratio and revenue per ton-km, or productivity measures such as traffic units per employee, and traffic units per track-km.

During benchmarking, after comparison of statistics identifies the high opportunity areas, the business processes of the subject and benchmark railways are compared to identify changes necessary to close the performance gap. Next, an implementation plan is developed for the subject railway to adopt improved business processes. For example, the high-level analysis may identify a gap in locomotive operating costs. The detailed analysis might reveal that the subject railway's locomotives work fewer hours per day than the benchmark railways and that the subject railway's staff have lower productivity, which is partially offset by lower wages (Figure 1). The business process analysis would reveal a difference in locomotive assignment practices—the subject railway restructure changes the locomotives every 150 km, while the benchmark railways change every 2,500 km—which affects staff and locomotive productivity. A performance improvement plan would be implemented to change locomotive assignment practices and adjust staffing. This

Figure 1 Benchmarking Locomotive Operating Costs

would subsequently be evaluated by whether costs and locomotive productivity had improved.

Benchmarking against both railways and companies outside the railway industry can be useful. Railway comparisons are more useful for operational issues. External comparisons are useful to examine how competing transport providers and logistics companies handle their markets, corporate culture, and strategic issues. This annex focuses on benchmarking using statistical comparisons between railways. It explains the steps for statistical analysis, provides definitions, highlights data issues, and explains the typical ratios used.

The statistical analysis for benchmarking starts with selecting benchmark railways and indicators.[151] Next, data are collected and adjusted to improve comparability. Then indicators are calculated. Finally, results are interpreted.

2 Selecting Benchmark Railways

Benchmarking is most usefully carried out using high performing railways with fairly similar characteristics and operating conditions. This controls for factors that management or government cannot influence and focuses analyses on factors that can be changed. Thus, to the degree possible, benchmark railways should be similar in the following characteristics: (i) size; (ii) traffic volume and type; (iii) traffic mix and journey types, such as passenger vs. freight, and originated vs. transit journeys; and (iv) traffic density. Other factors, such as having a similar technology level, may be considered.

3 Selecting Indicators

Indicator choices depend on the benchmarking objective. If benchmarking aims for a general review of railway operations, the process would likely begin with key financial indicators and an overall productivity measure for each primary railway resource—labor, track, locomotives, wagons, and coaches—followed by detailed statistical analysis of any areas with large gaps. Typical indicators appear in the table below.

Box 1 Railway Benchmarks

Name	Definition	Interpretation
Financial Measures		
Average tariff	Freight revenue/ton-km	A measure of the railway's ability to generate revenue from freight traffic. Most tariff level variations are due to competition, commodity, and haul length. But low tariff levels may indicate a tariff policy issue.
Average fare	Passenger revenue/passenger-km May be calculated by type of service (e.g., commuter vs. intercity)	A measure of the railway's ability to generate revenue from passenger traffic. Most fare level variations are due to competition, type of service, and average distance traveled. But low fares may indicate a fare policy issue.

[151] The annex draws heavily on the World Bank Railways Database Update 2007, *Users Guide*.

Box 1 (cont.) Railway Benchmarks

Name	Definition	Interpretation
Average passenger subsidy	Passenger subsidy/passenger-km	A measure of railway ability to obtain compensatory revenue from government in exchange for providing loss-making passenger services.
Ratio of passenger fares to freight rates	(passenger revenue/ passenger-km)/ (freight revenue/ton-km)	Rough measure of the degree to which railway revenue structure depends on freight services to cover fixed costs and/or to cross-subsidize passenger services. This indicator must be used with great caution when comparing railways because either freight or passenger yield can be heavily influenced by traffic mix in each market.
Operating ratio	Operating costs/operating revenue May be calculated with and without operating subsidies	A measure of railway ability to cover its costs and generate investment funds. Operating ratios for reasonably profitable US Class I railroads range from 80-85 percent. Limited data available on operating ratio including operating subsidies for EU railways typically show ratios around 95 to 100 percent, indicating inability to cover all costs, even after receiving government PSO payments.
Labor share of revenue	Total wages/total revenue	A measure of the share of revenue from customers that is paid to workers. It excludes subsidies to focus on the direct relationship between wages and revenues. Typically, profitable US freight railways have a ratio of about 0.30 (China is even lower). Many EU railways have ratios approaching 1.00 or higher.
Productivity Measures		
Track density	(passenger-km + ton-km)/ track-km	A measure of the volume of traffic produced with railway infrastructure. Railways are capital intensive and infrastructure is a substantial proportion of total assets. Railways with high utilization of this expensive asset such as those in China, U.S., and Russia, have an advantage in reaching economic viability.
Locomotive productivity	(passenger-km + ton-km)/ locomotives Passenger-km/passenger locomotives Passenger-km in multiple unit(MU) service/MU powered coaches Ton-km/freight locomotives	A measure of the volume of traffic produced with railway locomotives. High utilization of this expensive asset gives the railway an advantage in reaching economic viability. If data permit, the locomotive fleet should be separated into passenger, freight, and shunting services to calculate separate productivity measures. If a substantial proportion of passenger service is provided with MU equipment, the figures should be adjusted to reflect this.
Wagon productivity	Ton-km/wagon	A measure of how much freight traffic is produced with the railway wagon fleet. High utilization of this expensive asset gives the railway an advantage in reaching economic viability. This measure should be used with caution because wagon ownership practices can differ. In some countries, customers own a substantial proportion of the wagon fleet. In others, the railway may handle substantial traffic moved in wagons owned by other railways.

Box 1 (cont.) Railway Benchmarks

Name	Definition	Interpretation
Coach productivity	Passenger-km/coach	A measure of how much passenger traffic is produced with the railway coach fleet. High utilization of this expensive asset gives the railway an advantage in reaching economic viability. If the railway operates both coaches and MU equipment, MU coaches should be added to the coach total. Higher figures are usually associated with high-speed rail or commuter services; lower numbers indicate longer-haul services with lower-density seating, and significant coach space allocated to dining or sleeping. Thus it is important to benchmark against railways with similar types of passenger services.
Employee productivity	(passenger-km + ton-km)/ employee	A measure of how much traffic is produced with the railway labor force. Labor is the largest single-cost item for nearly all railways, so output per employee is fundamental to financial and economic viability.
Other Measures		
Locomotive availability	Locomotives available/total locomotives in the fleet Units may be number of locomotives or locomotive hours	A measure of the technical capacity of the railway to maintain its locomotives and to provide funding for spare parts. U.S. Class I railroads expect a diesel locomotive availability ratio of 90-95 percent. In the developing world, good performance would be 70-90 percent. A ratio below 70 percent or a ratio that is deteriorating over time indicates a management problem.
Locomotive-km/ day	Locomotive-km/locomotives/365	A measure of the work performed by railway locomotives.
Wagon availability	Wagons available/total wagons in fleet Units may be number of wagons or wagon hours	A measure of the technical capacity of the railway to maintain its wagons and to provide funding for spare parts.
Wagon-km/day	Wagon-km/wagons/365	A measure of the work performed by railway wagons. A low figure implies low use—that wagons linger in shunting yards, or that the wagon fleet is too large.
Wagon cycle time	(wagons*365)/loads May be independently measured in railway's operation system.	A measure of wagon use intensity. A high figure may indicate too much time in shunting yards, inefficient redistribution of empty wagons, or unused wagons spending a lot of time in storage because the fleet is too large.
Load-to-empty ratio	Loaded wagon-km/empty wagon-km	A measure of how much of wagon movement is revenue generating. A low ratio of loaded to empty may indicate inefficient redistribution of empty wagons. Unit train movements have a load-to-empty ratio of approximately 1, so the measure is strongly affected by the nature of traffic.

Box 1 (cont.) Railway Benchmarks		
Name	**Definition**	**Interpretation**
Coach availability	Coaches available/total coaches in the fleet Units may be number of coaches or coach hours	A measure of railway technical capacity to maintain its coaches and provide funding for spare parts.
Coach-km per day	Coach-km/coaches/365	A measure of work performed by railway coaches, which is strongly affected by the nature of railway traffic. A railway with long-distance service will have higher coach-km per day than a railway with commuter service.
MU availability	MU trains available /total MU trains in fleet 'Units' may be number of MU trains or MU train hours	A measure of railway technical capacity to maintain its MUs and to provide funding for spare parts.

4 Collecting the Data

Sources for benchmarking data include the following:

- **World Bank Railways Database** (updated in 2007), provides a set of indicators for the railway transport that includes size, scale and productivity measures over a sufficient time frame for adequate cross-sectional and time series performance evaluations, including financial and physical measures. http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTTRANSPORT/EXTRAILWAYS/0,,contentMDK:22614614~menuPK:7260743~pagePK:210058~piPK:210062~theSitePK:515245~isCURL:Y,00.html

- **UIC** maintains the **Railisa** database with railway physical indicators, including all UIC railways over many decades, allowing cross-sectional and time-series evaluations. http://www.uic.org/spip.php?article1352

- **Other Rail Industry Associations** may compile member statistics. For example, the Association of American Railroads produces several statistical publications on the North American railway industry. http://www.aar.org/StatisticsAndPublications.aspx

- Railway **websites** offer selected physical indicators and/or railways financial reports. For example, Turkish State Railways publishes statistics on its website (http://www.tcdd.gov.tr/home/detail/?id=305) Deutsche Bahn publishes its financial statements on its website. http://www.deutschebahn.com/ecm2-db-en/ir/financial_reports/reports_2010_2009.html)

- **Government Statistical Agencies** usually collect statistics on railway traffic and infrastructure size. For example, the Ukrainian Statistics Agency provides traffic volumes by commodity, track length, and electrification (http://www.ukrstat.gov.ua/)

- **Regulatory Agencies** often require railways to provide detailed statistical reports. For example, the U.S. Surface Transportation Board requires large railways to file R-1 reports with detailed operational and financial statistics. (http://www.stb.dot.gov/stb/industry/econ_reports.html

Comparing statistics from multiple data sources requires great care to ensure consistency. Definitions, pitfalls, and interpretation issues are discussed below.

Infrastructure

Typically, infrastructure statistics such as line-km, track-km, km of electrified line, km of double track line, are accurate. Definitions to note are the following:

- Track-km. Track length in kilometers, counting every track. 100 km of double track = 200 track-km. Track-km may be disaggregated by gauge, electrification, main lines, secondary lines, or station track.

- Route-km. Railway line length, regardless of single or multiple tracks. 100 km of double track = 100 route-km. Route-km may be disaggregated by gauge or electrification. Route-km is often referred to as line-km.

- Track gauge. Distance between the rails, disaggregated into four categories: (i) narrow gauge (NG) is less than one meter; (ii) meter gauge (MG) includes both true meter—1000 mm, and "Cape Gauge" —1067 mm; (iii) standard gauge (SG) is 1435 mm; and (iv) broad gauge (BG) includes all gauges greater than standard. Broad gauge is found in former Soviet countries and the Baltic Republics (1520 mm), and India (1676 mm).

Rolling stock fleets

Some railways report only locomotives, coaches, or wagons that are serviceable; others report their entire fleet and distinguish between 'total' fleet and 'serviceable' fleet. The difference, referred to as the availability ratio, can be significant. Some railways record three categories of rolling stock: in service, inoperable but repairable, and beyond repair. In some railways, equipment beyond repair is still included in the fleet, distorting the apparent size of the fleet, availability ratio, and measures of rolling stock productivity.

Locomotives

Often, locomotive fleets are reported by type of power—steam, diesel or electric—and purpose—main line or shunting. Each railway has its own definition of 'main line', so this term covers a range of locomotive sizes. The lightweight locomotives used by smaller railways as main line would be used only for marshalling (switching) on larger railways with heavier flows.

In former Soviet countries, railways often permanently coupled two locomotives, and counted the two units as one locomotive. A single locomotive used for lighter

work (e.g., passenger) would *also* be counted as one locomotive. Therefore, when comparing locomotive productivity statistics, analysts must adjust figures so that multiple-unit locomotives are counted in a consistent way.

Multiple units

The rolling stock that is most difficult to measure is multiple unit (MU) passenger equipment. This equipment forms passenger trains that are not hauled by a locomotive. Instead, some or all of the coaches include power units. The ratio of powered coaches to un-powered trailer coaches can range from 1:1 to as high as 1:3. Published statistics do not always clarify whether MU equipment consists of individual coaches or sets of MU trains. If a railway has substantial MU operations, the number of coaches may be unclear. The use of MUs must be considered when compiling statistics, because MUs may substitute for locomotives and coaches and may be responsible for some or all of the production of passenger service.

Passenger coaches

Passenger coaches vary in seating density—more seats per car for shorter distances, fewer for longer distances—and in the numbers of sleeping or dining coaches. Counting multiple unit (MU) coaches is often complex in countries with significant commuter services.

Freight wagons

Wagons vary by size and type, and one freight wagon might carry up to four times the gross weight of another wagon. For example, some railways, operate economically obsolete, two-axle wagons with maximum axle loadings as low as 15 metric tons (30 ton maximum gross weight), whereas a few state-of-the-art heavy haul freight railways uniformly use four-axle wagons with axle loadings as high as 35 or even 40 ton (140 to 160 tons maximum gross weight). Also, in many countries, customers own a substantial part of the fleet. Thus, in calculating productivity statistics, care must be taken to match output (ton-km) and production (wagon-km) with the wagons that produced it.

Passenger traffic

Accuracy of passenger counts is improving due to advances in ticketing systems. However, inaccurate figures are common if high numbers of seasonal or multi-ride tickets are sold. This is particularly an issue for railways with substantial suburban passenger traffic, and in countries such as Russia, where many passengers have social privileges and therefore ride without being ticketed. Also, railways with multiple passenger interchanges, for example between long-haul and short-haul trains, often record two trips rather than one trip, thus inflating passenger numbers. For example, every day Indian Railways in Mumbai transports more than five million commuters using seasonal or multi-ride tickets. Passenger sampling yields estimates of actual ridership and trip length, but sampling must be designed and executed to yield accurate estimates.

Freight traffic

Statistics for railway freight tonnage are usually reliable because tariff revenues are based on tonnage. Major sources of inaccuracy are (i) weighing, because shippers have incentives to report lower weight and (ii) traffic interchanged between rail-

ways, where tonnages can inadvertently be double counted. Generally, ton-km reports are accurate, but errors can occur if multiple routes are available because shippers insist on being billed for the tariff route, but for operational reasons the railway may use a longer route. As with passenger traffic, on larger and more modern railways, computers and automated shipping documents have improved the accuracy of freight reporting.

During a benchmarking exercise, when comparing across regions, the units of measurement should be checked to ensure they are the same. American railways measure outputs in 'short' tons and miles, not metric tons and kilometers. Conversion rates: one short ton = 0.907 metric tons and one mile = 1.609 kilometers.

Traffic units

Productivity is measured by the ratio of outputs to the resources used to produce the output. For example, freight wagon productivity can be calculated by dividing ton-km by the number of wagons. However, when track and locomotives are shared by passenger and freight services, resource productivity must be calculated using an output measure that combines figures for passenger and freight traffic.

Calculating a combined measure is problematic, but the most common measure used is Traffic Units (TU). TU is the sum of ton-km and passenger-km, using a 1:1 weighting of passenger and freight-km. Most specialists would agree that the resources used to produce a passenger-km and a freight ton-km are not equal, but no agreement exists on what a more accurate weighting should be. Earlier World Bank research indicated that labor inputs associated with a passenger-km are at least twice that of a ton-km. Outputs per freight locomotive tend to be higher than for passenger locomotives. Lighter passenger trains may generate less wear on infrastructure than heavy freight trains, but passenger trains' higher speed may consume more capacity than freight trains. Since an ideal weighting is undefined, benchmarking should involve railways with relatively similar passenger-freight mix.

Financial measures

Benchmarking using monetary figures or financial reporting requires great caution due to wide differences in accounting standards. Financial statements prepared according to International Financial Reporting Standards (IFRS) and audited by qualified external auditors will have consistent definitions across entities, clear descriptions of accounting policies followed, and footnotes that provide details about the figures provided. Ratios that include depreciation or amortization, such as the operating ratio, can be problematic because asset valuation varies widely, especially in countries with high inflation. When IFRS financial reports are unavailable, financial data should be used cautiously.

Financial comparisons between countries require a common currency. Typically, local currencies are converted at the official exchange rate to a common international currency such as the U.S. dollar or Euro; or, currencies are converted using purchasing power parity (PPP). Using international currency at the official exchange rate has the merit of familiarity but can seriously misrepresent local resource use. Instead, PPP dollar conversion offers more accurate estimates of the activity being valued in terms of local resource consumption, within the limits of the calculation of PPP values. However, both methods are imperfect since railway

services use a mix of local resources, such as labor, and international resources, such as locomotives.

Some monetary measures, such as the ratios of wages/revenues and average passenger fare/average freight tariff (this is revenue/passenger-km divided by revenue/ton-km), are relatively robust regardless of currency value because numerator and denominator are affected equally by conversion. Use of time series can reveal useful trends, even if absolute value is questionable due to differing definitions.

Average fare and freight yields

Traffic mix and average distance affect comparisons of passenger fares and freight tariffs. Typically, railways charge lower tariffs for some low-value bulk commodities, such as coal, and higher tariffs for higher-value goods that require higher service levels, such as assembled automobiles. For this reason, two fully comparable railways could report vastly different average freight tariffs if one hauls mostly coal, and the other mostly assembled automobiles. A similar market-mix phenomenon occurs in passenger services—commuter travel has high passenger volume, low prices, and simple coaches. Longer-haul journeys have lower passenger volume, higher ticket prices, and can require more complex coaches including sleeping and dining cars.

Average distance per journey can raise or lower unit price because railways incur costs not only during hauling freight or passengers, but also at the start and the end of each journey. Thus, average freight tariffs and passenger fares are lower in large countries such as China, Russia, and the U.S.A. where starting and ending costs are a smaller proportion of much longer average journeys than, for example, in smaller countries such as Belgium. Without complete data on tariffs and fare schedules for both subject and benchmark railways, adjusting for this type of unit price differential is impossible. Nonetheless, it should be kept in mind.

5 Analyzing Results

Benchmark calculations will identify areas of performance differences—better and worse—between the subject railway and the benchmark railways. Further statistical analysis is then made of the areas in which the benchmark railways are superior to the subject railway. For example, the preliminary analysis may show that the subject railway has lower wagon productivity. Next, additional benchmarking analysis might be done on wagon-km per day, wagon fleet availability, and wagon cycle time.

Using these benchmarks as guides, subject railway operational practices would be compared to those of the benchmark railways to identify differences that account for different results. For example, the benchmark railways may use computer models to distribute empty wagons and the subject railway does not. Or, the benchmark railways may allow customers a single day to load and unload but the subject railway allows customers three days. Or, the benchmark railways may have efficient shunting operations but the subject railway's marshalling yards average 36 hours dwell time.

The analysis aims to identify which of the benchmark railways' good practices are responsible for better performance, and then implement these practices in the subject railway.

Annex 3

Service Costing and Profit Measurement Systems

1 Use of Service Costing and Profit Measurement Systems

Service Costing and Profit Measurement Systems (SCPM) provide detailed cost and profitability information for railways service provision. Typically, railways fixed costs are substantial and shared broadly by all traffic groups. So most SCPMs calculate variable costs, and measure service profitability by how much the service contributes to the railway's fixed costs (e.g., contribution = revenue - variable costs).

Railways use SCPMs to provide information for the following activities:

- Commercial pricing
- Prioritizing use of scarce resources
- Identifying opportunities for cost reduction
- Investment analysis

The primary purpose of any SCPM system is to *support commercial pricing decisions*. The general principle of commercial pricing is to maximize profit (the services' contribution to the railway's fixed costs), knowing both the costs and the market. This principle is sometimes expressed as "price to the market, not to costs....but price above costs."

Box 1 You Cannot Make It Up On Volume

In 1980, during an economic recession, railway pricing in the US was deregulated. Railways were eager to use their new pricing freedom to attract as much traffic as possible to their lines. One railway management decided that their marketing department should *not* know the service provision costs because, "We want them to price to the market. Even if we lose money on individual movements, we can make it up on volume." Development of a SCPM model for this railway disproved this approach and provided the marketing staff with tools they needed for market-based pricing decisions to improve the railway's finances.

To make the best pricing decisions, railway marketing staff must know both their customers and their competition—whether, for example, a small price reduction is

likely to cement existing client loyalty and perhaps lure clients from competitors. The SCPM role is to ensure that marketing staff know the price level that is viable in the face of the railway's variable costs of providing the service. At prices below variable costs, the railway would lose money.

SCPM system information is used prospectively for pricing and retrospectively for evaluating marketing department staff performance. The system's costing methodology must be applied consistently for both purposes.

Commercial railways use SCPM systems to *allocate scarce resources*. For example, during a period of locomotive shortage, a U.S. freight railway used its SCPM system to determine the profitability of each traffic type and prioritized locomotive allocation to trains hauling the most profitable traffic. Similarly, commercial railways use SCPM's profitability measurement to allocate capacity on crowded railway lines. When capacity is oversubscribed, the railway may increase the contributions required from all traffic. This prices the least profitable traffic off the railway, freeing up capacity for the more profitable traffic.

The SCPM system also provides *information for cost reduction* by relating railway activities to costs. The system provides a structured view of costs, allowing the railway to benchmark service cost components and identify those that are too high. The SCPM also specifies cost variability, thus identifying costs that are too inflexible, leading to efforts to rectify this. For example, during the 1990s, the U.S. railways transformed most labor costs from fixed to variable, a major effort that required renegotiating crew contracts, modifying train planning, and altering management practices.

Finally, the SCPM provides information for *investment analysis* by providing baseline ("before investment") costs to compare with the after-investment scenario. When railways management is considering line upgrades, sales, or closure, they can use data from the SCPM to analyze revenues and costs for all traffic handled on the line segment. If management is considering a new service, they can use SCPM information for projecting costs, based on data from similar services.

To satisfy all these uses, the SCPM system must have the following characteristics:

- *Timely:* Data must be available immediately when needed.
- *Accurate:* Results depend on accurate underlying data, without which cost calculations will seem unreasonable to users, who will then ignore system results.
- *Specific:* The value of the system is providing costs specific to services provided.
- *Unbiased:* Users must view the system as impartial since it may be used to evaluate staff performance, allocate resources, and make investment decisions.
- *Multi-dimensional:* The system must provide short-, medium-, and long-term costing for decisions with multiple time horizons.
- *Easy and flexible:* Being user-friendly will facilitate broad use.

2 Costing Concept

The SCPM system costing component relates railway costs to services by applying variability and causality.

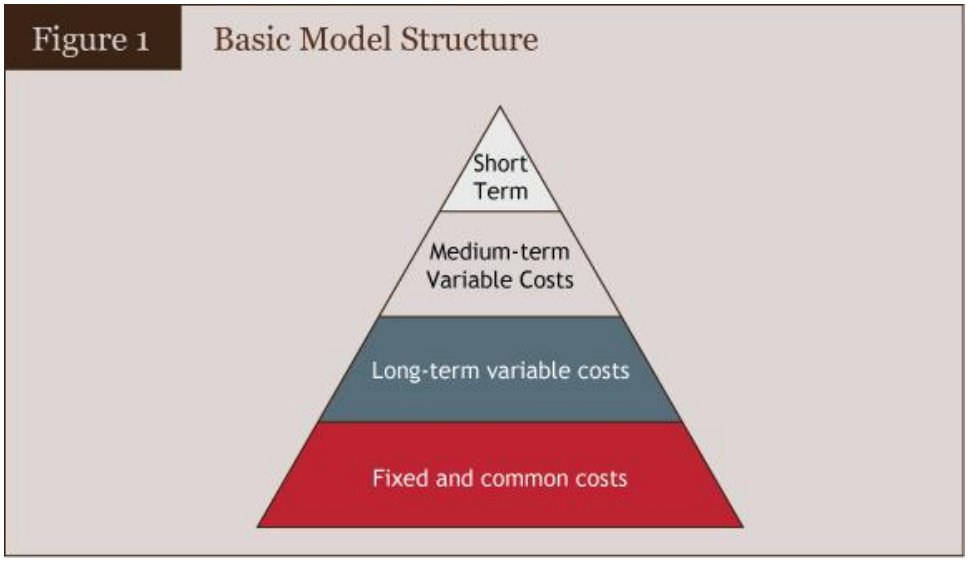
2.1 Variability

Railway costs vary with traffic volume—it costs more to carry 100 million tons than 1.0 million tons of freight. Figure 1 below shows that, some costs vary with traffic volume right away, while others take a longer time to vary with traffic volume. For example, a railway cannot change its locomotive fleet costs on a daily basis to respond to changes in traffic volume. However, in the longer term the railway *can* change locomotive costs to traffic level changes: More traffic will cause railways to lease or buy locomotives; less traffic might cause them to sell locomotives or allow leases to expire. In the very long term, every railway cost is variable.

Short-term variable costs refer to costs that vary with traffic volume over a time frame of one year or less. Examples include diesel fuel and electric energy for traction. Short-term variable costs would govern short-term pricing decisions that use surplus resources.

Medium-term variable costs are costs that vary with traffic over a time frame of one to three years. Examples are wagon maintenance, train crews, and leasing of wagons or locomotives. If railways are negotiating medium-term service contracts, the negotiated price should cover at least medium-term variable costs of providing services.

Figure 1 Basic Model Structure



Long-term variable costs vary with traffic volume over a timeframe of three years or more. Examples include capital costs of rolling stock[152] and infrastructure maintenance. This is the cost level that should be used for most pricing and other

[152] Rolling stock ownership is considered variable in the medium term because railways can increase or decrease rolling stock through purchases, sales, and leases. Thus, most SCPM systems calculate an annual capital cost for rolling stock and consider this cost variable in the medium term.

decisions—in normal circumstances, a negotiated price should cover at least long-term variable costs of providing services.

The remaining costs do not vary with the volume of traffic. An example would be some headquarters expenses such as the cost of the financial audit. These costs are referred to as 'fixed' because they do not vary with traffic level and 'common' because they cannot be attributed to specific traffic. In this case, 'fixed' does not equate to 'unchangeable.' Railways can and do alter the size of their headquarters staff or make changes to their track capacity. Often these changes are related broadly to very long-term changes in business level—variable costs in the very long term.

Fully allocated costs include all short-, medium-, and long–term variable costs, plus allocated fixed and common costs. Fully allocated costs are used as a benchmark—if all railway traffic covered fully allocated costs, the railway would be profitable. Normally, some traffic will pay less than fully allocated costs and some will pay more. If each traffic segment pays at least its long-term variable cost, no traffic subsidizes other traffic. The railway is profitable if the sum of the contributions above long-term variable costs cover the fixed and common costs.[153]

Often, railway SCPM systems calculate several cost levels for each service, corresponding to short-, medium-, long–term, and fully allocated costs, as discussed above. This allows users flexibility to use the cost appropriate to the timeframe and decision to be taken.

2.2 Cost Causality

In the SCPM, railway costs are associated with specific traffic movements. Relationships can be established through direct attribution, known cost, expert judgment, or allocation.

Direct attribution

The most accurate way to associate costs with service is to collect the cost separately for each service. The European Union's acquis communautaire[154], for example, requires at least accounting separation between passenger, freight and infrastructure entities so that their costs are accurately. For example, maintenance costs could be collected by locomotive type, which would allow the SCPM system to accurately attribute costs to the services provided by each locomotive type. Detailed information on major cost elements should be collected and used in the SCPM system, wherever possible.

Engineering relationships

Relationships between costs and services can be established based on engineering or statistical analysis. For example, fuel costs are often related to services based on gross ton-kilometers, especially if train speeds and other operating parameters vary little. Another example is track wear, where significant engineering research has been conducted on the relation between costs and use.

---

[153] Through a modal policy promoting a level playing field with road transport, governments sometimes subsidize railway infrastructure costs, reducing the need to cover fixed and common costs through margins over variable cost.

[154] Aggregate body of European Union law.

Expert judgment

For cost relationships that cannot be calculated with precision, expert judgment is acceptable. For example, locomotive maintenance experts may evaluate locomotive maintenance as 50 percent variable in the medium term, and the relationship to services is half caused by train km and half by gross tkm. Developing a new costing system may require many expert judgments. Over time, these expert judgments should be tested and revised, and updated to reflect changes in the cost structure.

Allocation of common costs

When full cost information is required, fixed and common costs must be allocated between services, a process that is purely arbitrary. Since there is no right or wrong method, railways use various methods of allocation, including by tons, by ton-km, and as a markup of variable costs. This process is essentially arbitrary.

Cost causality relationships will be defined in terms of physical characteristics, which can be collected for each traffic movement. Examples are shown in Figure 2 below; physical characteristics used to relate costs to traffic are referred to as 'cost drivers.'

Figure 2 Examples of Cost Drivers and Variability

Cost	Physical Movement Characteristic	Short Term Variable Cost %	Medium Term Variable Cost %	Long Term Variable Cost %	Fully Allocated Cost %
Diesel fuel	Gross ton-km	100	100	100	100
Wagon maintenance	Wagon-km (costs separated by wagon type)	30	100	100	100
Wagon ownership	Wagon-hours (costs separated by wagon type)	0	60	100	100
Track maintenance	Gross ton-km	10	50	100	100

3 Structure of a Service Costing and Profit Measurement System

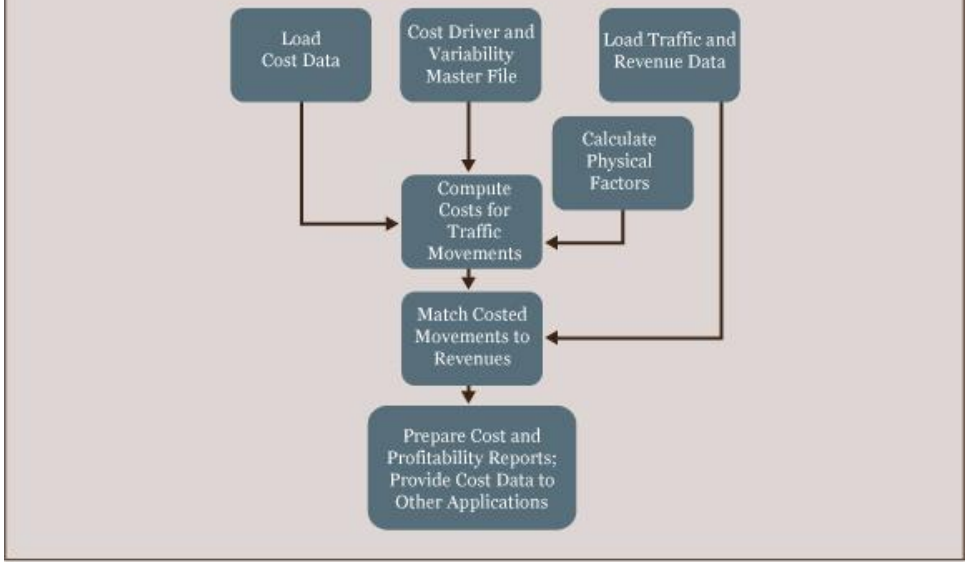
Typically, the SCPM system combines traffic, revenue, physical, and cost data from many railway systems. This includes waybilling or ticketing, revenue accounting, cost accounting, and various operational systems. The basic process is shown in Figure 3.

Traffic movement information comes from railway operating systems that record and track traffic, such as the waybilling system for freight, and the ticketing system for passengers. These systems provide basic movement characteristics—origin, destination, weight, wagon type, and freight commodity, or origin, destination, and service class for passenger traffic. The movement can be matched to operational databases to find the physical characteristics of the movement that correspond to the railway's cost drivers. Examples of such physical factors are the freight movement ton-km, equipment type, and shipment time.

Cost information comes from the railway's cost accounting system (or systems). The quality of the SCPM system output is constrained by quality and detail of cost data available. In a high quality accounting system, a number of descriptors are recorded together with the amount of each expenditure:

- *Functional expense.* For which function was the expense incurred? Examples are train operations, track maintenance, and station operations.
- *Natural expense.* What type of good or service was purchased? Examples include diesel fuel, electricity, rail, ballast, and track labor.
- *Service/profit center.* For which service or profit center was the expense used? Examples are intercity passenger service, merchandise freight, intermodal.

Figure 3 Typical Process for Service Costing and Profit Measurement System



- *Geographic location.* Where was the expenditure used? Geographic location may be defined by routes or line segments (Astana to Karaganda), administrative regions (Northern Division), or specific location (Almaty), depending on the location breakouts of interest to the railway. Often the most specific location identifier is used, and can then be aggregated into broader location groups according to the railway's preferred system.
- *Cost center.* Which organizational unit has budget responsibility for the purchase? Examples are Track Department, Northern Division, Baku Locomotive Workshop, or Accounting Department. In the case of multiple layers of budget responsibility, the most specific identifier is used and can then be aggregated into broader groups.
- *Capital project budget.* Which project? Examples are rebuilding a bridge, or double tracking a line.
- *Customer/Special Service.* Is the expenditure for a single customer? Which one? The customer would be tracked only if significant recurrent expenditures

are made. Examples are unit train service for a coal company, intermodal trains for sea/land services, or special unloading services for a chemical company.

A variability master file is created that defines the physical factor—cost driver—with cost varies and the proportion of the cost that varies at the defined cost level. Costs are associated with traffic by applying the relationships in the variability master file to the physical factors associated with the traffic. This process often contains many layers of decision rules.

Revenue information from the railway accounting system is matched to movement information and costs, using a movement identifier such as the waybill number in both sets of data.

The result is a detailed database that includes traffic information, revenues and costs. This database can be used to generate cost and profitability reports by service type, customer, commodity, line segments and other classifications. The database may also feed other analytical tools, such as tools for estimating costs for prospective movements, based on their physical characteristics.

Annex 4
Concession Contract Guide

1 Introduction

The aim of a Concession Agreement is to create the best value for money in the provision of railway services. The Agreement seeks to balance the contributions of the public and private sectors so that public service obligations are met as economically as possible while maintaining acceptable service levels; these tasks are sometimes best undertaken by the private sector, with some government support. Drafting the contractual arrangement known as the Concession Agreement should be preceded by conducting a comprehensive feasibility study that includes legal due diligence and risk review, which can differ from country to country.

In contractual arrangements, a key difference between civil law and common law jurisdictions is judicial interpretation of agreements. Generally, in common law countries, the law assumes that parties have set out the specifics of their agreement in the contract. Therefore, under law, the contract means what it says. By contrast, civil code countries rely more on the provisions in the civil code, hence, contracts tend to be shorter because they do not need to repeat what is in the code. In addition they are interpreted on a purposive basis, namely, "What was the intent of each party?"

To a degree, if project finance is used, international lenders tend to demand comprehensive documentation rather than rely on judicial interpretation, or failing that, the results of arbitration. However, if lenders can rely on being fully paid out by the state in the event that an agreement is terminated, they may be less concerned but the state is considerably more exposed to residuary risk.

The public sector would be well advised to consider the following: (i) Should it recapture some benefit from refinancing arrangements that improve the equity return? (ii) Should it rely on a financial model to make adjustments under the Concession Agreement? (iii) How should it calculate compensation upon termination if a corporate finance structure is adopted instead of a project finance structure? Concession Agreements would then reflect the outcome of these decisions.

1.1 Purpose of Concession Agreement

The three main objectives of a Concession Agreement are the following:

- Promote an understanding of the main responsibilities and risks that are to be undertaken by the parties to the agreement;

- Specify service levels to be delivered by the private sector and the flow of payments between the parties without extended negotiations; and

- Establish a consistent approach and pricing among bidders during any competitive tendering procedure that follows the introduction of reforms.

1.2 Key Factors

This Guide does not purport to set out draft clauses, instead it seeks to point out many of the issues that will need to be considered when developing concession-type arrangements. As indicated in the Introduction, in Civil Law Jurisdiction, some of these issues may be addressed within the Civil Code and therefore would not need to be repeated in the Agreement, or where permitted, the Agreement may seek to deviate from the Civil Code and the wording should reflect that. Therefore the Guide addresses not only general issues that may arise in relation to concessions but also factors and situations that are particular to railways, and their potential impact on a Concession Agreement. Although some of these factors and situations are neither mandatory nor essential, they illustrate issues that ought to be considered in concession-type arrangements.

- Will the private sector party be a special-purpose vehicle? Initially, this might mean that the party uses its own contractors and their subcontractors to supply services on its behalf. Usually, a special-purpose vehicle is a company set up for a single purpose. After operations and maintenance costs are met, company revenues are used to pay off debt, pay interest on the debt, and pay a dividend on equity. The company may apply revenues towards increasing and/or improving assets used in connection with the concession, but would not be expected to acquire assets for any other purpose.

- Does the public sector intend to create both a Concessionaire and the executed Concession Agreement, followed by a competition to divest the concession company to the private sector (namely with the benefit of the Concession Agreement)?

- Will the public sector contracting party be a Ministry, a government agency, or a state-owned company, such as a railway holding company? If it is a Ministry, state guarantees will not be needed as they would be if the contracting party were a state-owned entity.

- Will the assets to be used for the concession be transferred to the Concessionaire or will the transfer include only the rights to use the assets? As a corollary, where only the rights to use are transferred, will any new assets developed by the Concessionaire be transferred immediately to the Authority, with a continuing right for the Concessionaire to use them?

- Will the concessioned railway assets be a subset of the host country's railway system? Will the railway, subject of the Concession Agreement, be used primarily for freight, or must the Concessionaire allow infrastructure access to rail passenger traffic?

- Will the Concession Agreement require some infrastructure development or refurbishment and some new equipment (New Upgrades) followed by a full operational phase during which the Full Service is provided?

- Will operational obligations start as soon as the concession term commences?

- Should any land development associated with the concession occur through an associated Property Development Agreement? The agreement would benefit the public sector through a share of the proceeds from development because, in most economies, commercial and other property markets significantly deviate from the infrastructure development cycle. A Property Development Agreement avoids the risk of failure to realize the full market value of development rights.

- Should the Ministry retain the right to revoke air rights or rescind access to land that is not essential to railways operation, without compensating the Concessionaire? If the Ministry retained this right, the Concessionaire could not exploit its monopoly position in lineal infrastructure, for example, in relation to creating crossings over or under the infrastructure.

- Will the New Upgrades be wholly or partly financed by limited-recourse debt, or leasing arrangements?

- Should Future Upgrade costs be covered by retentions from the Concessionaire's revenue stream, except and to the extent provided for in the Concession Agreement? When the Agreement is executed, Future Upgrades may be as yet unidentified and emerge only as the host country economy grows.

- Should any tariff increases be permitted before the New Upgrades have been completed?

- Should the Concession Agreement permit derogation in standards to reflect the existing state of infrastructure and equipment until the New Upgrades are completed?

- The Concession Agreement should set out a safety regime if state law does not provide a safety regime for railways. This regime may be superseded when a statutory regime is adopted in the host country. If state law does require a safety regime, is there a regulator or other independent party to supervise the regime? Investors and Lenders may be nervous if the regime is applied by the entity entering into the Concession Agreement. As indicated in the Toolkit, the eventual objective should be economic regulation if market forces prove an insufficient economic incentive, and safety regulation through an independent regulator. There is some advantage to a strong link between economic and safety regulation to ensure that the safety regulation does not stand in the way of 'the good' by enacting a safety requirement for 'the best', which might be commercially infeasible. For the purposes of the Guide, and illustrative purposes only, it is assumed that there is a Railway Safety Board within the host country's Transport Regulatory Commission.

- Will international third-party access be required as soon as the State has signed cross-border agreements with governments of adjacent countries?

- If there is to be third-party international access, would it be useful to adopt the working assumption for the Concessionaire that the treaty rules will follow a precedent? Would COTIF (Convention Internationale sur le Transport International Ferroviaire) be useful as a guideline to identify a future access regime?

- If Border Crossing Points must be expanded and updated as a Future Upgrade but are as yet unknown because they will depend upon treaties with adjacent states, should the state pay capital costs of Border Crossing Points?

- When will an environmental audit be carried out? Both public and private sectors should understand the status of pre-existing environmental conditions *before* the tendering process commences. The worst scenario would be if the environmental audit is carried out after concession rights are already granted and in effect.

The answers to these questions will be reflected in the Concession Agreement but any particular solution does not imply that a given structure, including a financial structure, is inherently preferable. The suitability of various structures, including trade-offs between cost, complexity, and risk, should contribute to overall public sector appraisal of any reform proposals and, if a concession option is adopted, any subsequent bidder's proposal. However the nature of the Concession Agreement is such that documentation will be reasonably comprehensive; if a simpler transaction is adopted then the approach can be simplified. This Guide aims to encourage users to consider all of the issues; it is not meant to be prescriptive.

The award of the Concession may arise from an unsolicited bid (although an unsolicited bid may not achieve the best outcome), or from competitive tendering. As indicated in Chapter 13, the process for tendering needs to be carefully considered to achieve the best value for money while encouraging private sector initiative. On simple projects it may be possible to send out a form of contract that is to be signed by each of the bidders; the winning bid is then countersigned by the public sector, which becomes the contract. For more complex matters greater flexibility will be required but negotiations should be avoided after final offers are received.

The Guide it is intended to provide users with a conceptual framework within which to consider the various issues, many of which are inter-related. Therefore, the conceptual framework includes the concession of infrastructure with a right to operate rail freight services. Passenger transport services are assumed to be permitted over the rail infrastructure, but the rail passenger service franchise would be dealt with separately (for the Railway Passenger Service Guide see Annex 5). However third-party access is required over the rail infrastructure. For examples of Railway Concession Agreements please refer to the PPP in Infrastructure Resource Center.[155]

[155]http://web.worldbank.org/external/default/main?menuPK=4704603&pagePK=64861910&piPK=64861909&theSitePK=4817374

2 The Guide

2.1 Parties

In this Guide the public sector entity granting concession rights is referred to as the 'Authority' and its counterpart as the 'Concessionaire', with the overall scheme referred to as the 'Scheme'. The agreement entered into between the Authority and the Concessionaire is referred to as the 'Agreement'. All those with a financial stake in the Project, other than trade creditors and providers of equity, are referred to as 'Funders'. Accordingly, the term 'funding' refers to all types of financial interest in the Project, other than equity and trade creditors.

Note, in some jurisdictions the bidder may be a consortium and the concession company may be created immediately before or after the Concession Agreement is signed. If the concession company was created immediately after, then the Concession Agreement should provide for itself to be assigned or novated to the new company before the concession term becomes effective.

2.2 Recitals/purpose

The document format will, to a degree, reflect what is customary in the host country. These provisions will describe the Authority and its mandate, the proposed concession, and may include a brief description of the bidding procedure and outcome, namely the appointment of the Concessionaire.

2.3 Definitions

In some jurisdictions, legislation provides for definitions in and interpretation of contracts and other legal documents. To the extent that this is not provided for, the interpretation of expressions and the meaning of defined terms should be set out.

Definitions for Railway Guide

Affected Party means the Party adversely affected by a Force Majeure Event.

Agreement means the Concession Agreement between the Authority and the Concessionaire.

Authority means the public sector entity that entered into the Agreement.

Authority's Default means an Event of Default for which the Authority is responsible.

Authority's Variation means a Variation requested or sought by the Authority.

Back Stop Date means, subject to adjustment in accordance with the Agreement, the last date by which the Concessionaire must complete the New Upgrades, failing which the Authority may proceed immediately to termination under the Agreement.

Below Rail Infrastructure means all infrastructures including the rail required for the delivery of a service to allow freight, and if relevant, passenger services to

use that infrastructure, details of which would be set out in a schedule to the Agreement.

Change in Circumstances has the meaning contemplated within section 2.18 of the Guide.

Change in Land Use means any use of land constituting all or part of the Site for which consent is required either at law or under the Agreement that departs from existing Land Use.

Change in Land Use Consents means the consents required either at law or under the Agreement to permit a Change in Land Use.

Compensation Event has the meaning described in section 2.16 of the Guide.

Concessionaire means the legal entity authorized to exercise the rights and perform the obligations set out in the Agreement and the counterparty to the Authority in the Agreement.

Concessionaire's Default means an Event of Default for which the Concessionaire is responsible.

Concessionaire's Variation means a Variation requested or sought by the Concessionaire.

Concessioned Assets means those assets that have been transferred to the Concessionaire, or the rights to use those assets have been transferred, as the same may be replaced, enhanced, or augmented by the Concessionaire pursuant to the Agreement.

Conditions Precedent means those obligations to be carried out by the parties in order that the Agreement may become fully effective, examples of which are referred to in section 2.4 of the Guide.

Confidential Information means that information that is to be kept confidential by the parties other than specific exceptions, examples of which are set out in section 2.21 of the Guide.

Date of Termination means the date on which the Term or the Agreement terminates; the concepts behind the two approaches are set out in section 2.24 of the Guide.

Direct Agreement usually means the agreement between the Authority, the Concessionaire, and the Funders or their representatives, which allows the Funders to receive notice of a Concessionaire's Event of Default and to exercise a remedy to take control of the concession to improve performance under the Agreement. Traditionally, a Direct Agreement allowed the Funders to appoint another legal entity to assume Concessionaire responsibilities under the Agreement, but in many jurisdictions, because of the laws on insolvency of companies, other remedies need to be exercised.

The expression is sometimes used in connection with agreements between the Authority and the principal contractors of the Concessionaire to allow the Authority to assume the role of the Concessionaire under those contracts in the event of a Termination under the Agreement.

Dispute Resolution Procedure is the process of resolving disputes between the parties arising under or in connection with the Agreement referred to in section 2.30 of the Guide.

Effective Date means the date on which all Conditions Precedent have been met, or compliance with Conditions Precedent has been waived under the terms of the Agreement, rendering the Agreement fully effective.

EPC means Engineering, Procurement, and Construction and the term EPC Contract has the consequential meaning.

Event of Default means either an Authority's Event of Default or a Concessionaire's Event of Default.

Financial Model means a mathematical representation of key financial and operational relationships. Comprising one or several sets of equations, the Financial Model is used to analyze how the business of the Concessionaire is due to operate. The Financial Model may include analysis of how key variables will respond to a range of economic situations or events; the model generally includes forecasts of capital expenditure revenues, operational expenditures and income estimates. Generally, a Financial Model is incorporated in computer software that includes cash flow projections, depreciation schedules, debt service, inventory levels, rate of inflation, and the like. Sometimes the model is represented in the form of spreadsheets; if the model is to be used for the purposes of the Agreement, it may be kept in electronic form and copies of the model held by a custodian for safe keeping.

Force Majeure means an occurrence outside the control of the parties and Force Majeure Events has the meaning discussed in section 2.16 of the Guide.

Funders in this document refers to the parties advancing funds to the Project and may include bondholders, but will exclude equity providers or those supplying equity-type finance through subordinated debt.

Future Upgrades refers to improvements to the Concessioned Assets that are likely to be required as the concession develops, but are not specifically required at the outset.

Independent Designer means the person or other legal entity who may be appointed by the Concessionaire, but more likely the EPC contractor of the Concessionaire, in circumstances outlined in section 2.9 of the Guide.

Independent Engineer means the person nominated by the Authority to monitor implementation of, among other things, the New Upgrades as discussed in section 2.5 of the Guide.

Insurance Certificate means the certificate issued by the relevant insurers evidencing the taking out of insurance by or on behalf of the Concessionaire.

Intervening Event has the meaning described in section 2.16 of the Guide.

Hand Back refers to the process of surrendering by the Concessionaire, to the Authority or its nominee, the rights of the Concessionaire in the Concessioned Assets and other assets as may be prescribed by the Agreement upon the expiry or earlier termination of the Term or the Agreement.

Hand Back Assets means those assets prescribed by the Agreement to be surrendered by the Concessionaire to the Authority.

Hand Back Date means the date upon which the Hand Back Assets are surrendered to the Authority.

Hand Back Failure is a failure by the Concessionaire to surrender the Hand Back Assets to the Authority in accordance with the Agreement.

Hand Back Procedures is the protocol or other written requirement attached to the Agreement setting out the steps to be taken in relation to surrendering the Hand Back Assets to the Authority.

Land Use means the use of land constituting the Site as permitted under the relevant legislation.

New Upgrades are improvements and additions to the Concessioned Assets, details of which appear in the Agreement, that are to be undertaken by the Concessionaire immediately following the Effective Date.

Non Defaulting Party means the party to the Agreement that has neither committed nor permitted the relevant Event of Default.

Notice of Intent to Terminate means the notice given by the Non Defaulting Party when the relevant Event of Default is capable of being remedied, notifying the other party that unless the situation is remedied within a specified time then the Non Defaulting Party will serve a Termination Notice. Sometimes the parties will endeavor to agree to a remediation schedule or program, in which case, the notice will relate to a failure to reach agreement on the program for remedial action.

Party means either the Authority or the Concessionaire; parties means both Authority and Concessionaire.

Permitted Release means circumstances under which Confidential Information may be disclosed to third parties.

Political Force Majeure Events means those exceptions to the rule on Force Majeure for which the Authority agrees to compensate the Concessionaire upon their occurrence, examples of which appear in section 2.16 of the Guide.

Rail Freight Operator means an operator responsible for freight train services that uses the Below Rail Infrastructure and who will be a Track Access Holder.

Railway Safety Board is a term of convenience in the Guide to refer to the legal entity responsible for safety regulation on the railways. The exact nature of the entity will depend upon host country law; if there is no person or entity legally responsible for rail safety, then safety would become contractually regulated under the Agreement until regulation was introduced through legislation.

Site means the area or areas of land made available to the Concessionaire for the purposes of fulfilling its duties and exercising its rights under the Agreement.

Senior Lenders means Funders that have made loans available to the Concessionaire and rank above all other creditors, unless a mixture of bond financing and senior debt is used, when the Senior Lenders will usually rank pari passu.

Specified Period means a period of time, typically measured in years, within the Term that is identified, and during which specified outcomes are to be achieved.

Guide refers to this explanation of components of an Agreement. The Guide will address major issues, although many detailed issues must also be considered. Just as "beauty is in the eye of the beholder", opinions will differ on which details should be included here.

Term means the period granted by the Authority to the Concessionaire for the latter to exercise its rights under the Agreement. The Term should be sufficient to allow the Concessionaire to repay all the capital advanced by Funders and otherwise service those debts and to pay a dividend to equity providers commensurate with risks borne by them.

Termination Notice is the notice given by one Party to the other specifying the date in accordance with the Agreement on which the Term and where appropriate, the Agreement, will end prior to the full period of the Term.

Third-party Liability means the duty of care or absolute duty arising at general law or under specific legislation not to damage the interests of third parties owed by a legal entity towards another legal entity including a person and the claims that may arise consequent upon a failure to meet that duty.

Track Access Applicant is a train operator that applies for passage of its rolling stock over the Below Rail Infrastructure for specified times and durations, often referred to as 'train paths'.

Track Access Holder means a train operator with an existing right to utilize specified train paths. If a Track Access Holder applies for additional train paths, for the purposes of the application, it will be designated as a Track Access Applicant.

Transport Regulatory Commission is the term used for convenience in the Guide; it is the legal entity responsible for either or both economic and quality of service regulation on the railways. The exact nature of the entity will depend upon

host country law; if no person or entity is legally responsible for such regulation, it would become contractually regulated under the Agreement until regulation was introduced through legislation.

Variations means a change requested by the Concessionaire or by the Authority regarding the Concessioned Assets or the services to be delivered under the Agreement that differ from those planned or executed as New Upgrades or Future Upgrades.

2.4 Conditions Precedent to the Effective Date

Most Agreement provisions will not come into effect until specified key requirements have been met; this provision specifies the key requirements (Conditions Precedent).

Some key requirements are more technical, such as each party obtaining all necessary authorizations to be bound by the Agreement, and legal opinions that the authorizations have been properly obtained.

Other key requirements are more substantial, such as the Concessionaire executing binding funding agreements with funders.

If the Concessionaire is to procure the issue of a performance bond or similar, the timing for its issue should be dealt with under conditions precedent, although the provisions for obtaining bonds may be set out elsewhere (see Bonds post).

Provision will be required for a cut-off date to achieve the conditions, or receive a waiver if feasible and for the consequences of failure by either party. In the case of Concessionaire failure, if the tender documents have so provided, it might be appropriate for the Authority to call the bid bond.

2.5 Conditions Precedent to the Start of the Term

On the assumption that the operational phase and the construction phase for New Upgrades will start on commencement of the Term, specific steps must be achieved in order for the Concessionaire to start undertaking its obligations.

- The Concessionaire may require a license to operate; separate licenses may be required for infrastructure operation and train operation;

- Where New Upgrades require a change in Land Use and this is to be obtained by the Authority, it should have been obtained;

- Where New Upgrades are substantial, it may be prudent to appoint a third party (the Independent Engineer) to ascertain that the design and construction are carried out in accordance with quality control procedures. If so, the Independent Engineer should have been appointed;

- Relevant insurances should have been obtained such as contractors' all-risk, property insurance, employer's liability insurance and, from a state perspective—the more important, third-party liability coverage;

- Conditions precedent to first draw down under the funding agreements should have been met, other than that requiring the commencement of the Term;

- If a direct agreement between the Funders and the Authority is required to allow time for the Funders to arrange new management of the existing Concessionaire or a replacement Concessionaire, or both (satisfactory to the Authority), then that agreement should have been executed;

- Any capital payment to be made by the Concessionaire as a concession fee or similar should have been paid, or in the case of installments, the first installment should have been paid;

- Approval of the safety regime (possibly through a safety case) should have been obtained from the Railway Safety Board; this may require separate clearances for the infrastructure operation and rolling stock operation;

- Employees should be ready to transfer from the state to the Concessionaire;

- Third-party access terms should have been agreed with the Transport Regulatory Commission, as should pricing under the charging regime—or in accordance with whatever regime applies in the host country;

- Where the Transport Regulatory Commission or other authority has approval of tariffs for freight charges, approval should have been obtained; and

- A renewals and maintenance regime for the first Specified Period, perhaps five years, has been agreed with the relevant body or bodies.

A cut-off period for achieving these conditions should be provided for and the consequences of not achieving them should be set out.

2.6 Term

The Agreement must specify the length of the Term or its duration. The duration should reflect all relevant matters; see below.

The Authority will wish to specify a duration that is expected to result in the best value-for-money solution for the reform. Factors to be taken into account when deciding on the duration of the Agreement will include the following:

- Any service requirements imposed by the Authority under the Agreement;

- The possibility of further reforms, which might require significant changes to the approach to the rail system;

- Affordability of services for users and for the Authority, taking into account the expected useful economic life of the underlying assets. Longer duration may be preferred, from an affordability perspective, if assets involved in delivering services have a longer economic life—bridges and other major structures;

- Need for and timing of major refurbishment or asset renewal programs during the Term;

- Likely Senior Debt term, and potential for refinancing the concession over a longer debt service period, which could increase the duration; and

- Potential for an option to extend the term of the Agreement by entering into a further contract period with the initial Concessionaire.

Both Authority and Concessionaire should be cognizant of inevitable rapid pace of technological change. Also, as the economy grows, the diverse requirements for transport will rise along with the risk of an increasing share of freight haulage by road. Furthermore, rising affluence increases the desire for personal vehicle ownership, particularly automobiles, and increases competition from low-cost airlines. Accordingly, the Authority's requirements are likely to change during the period of the Term. The Authority should be able to ensure that the regimes under the Agreement are sufficiently flexible to allow changes to the service over time. If, however, the Authority is concerned that changes will be sufficiently radical that the concession in its existing form may become redundant, the Authority may wish to retain flexibility through shorter contract periods, consistent with an affordable financing plan.

The impact of intervening events on the duration of the Agreement is dealt with in the item on Intervening Events in section 2.16 below.

Subsequent Guide provisions will address circumstances upon expiry of the Term and termination. The host country law and practice will determine whether termination prior to Term expiry should be that of the Term, or of the Agreement. There may be some advantage in terminating the Term, and dealing with consequences of termination whilst the Agreement continues to exist.

2.7 Concession

It is highly unlikely that all the assets to be used by the Concessionaire will have been identified by the time the Term commences, let alone by the time the Concession Agreement is executed. Examples exist of sets of wagons found on larger systems some time after the private sector has taken over the Concession. Therefore, the grant of rights should be sufficiently generic to include all the assets that the Concessionaire might reasonably need. However, if there are interfaces with other systems that are not intended for inclusion in the concession, it may be sensible to specify a transition period during which it might be ascertained that certain assets would be more appropriately kept within another system, and a transfer can occur to or from the concession.

The right granted also needs to be considered. Funders will want to know whether the use of the Concessioned Assets is exclusive to the Concessionaire and cannot be claimed by third parties or used by others, except as specifically envisaged within the terms of the Agreement. The public sector will want to know that the assets will be available to meet any public service obligation in the event of a serious Concessionaire default. Thus, the concession rights might be an exclusive right

to operate and the assets will remain vested in the state; any assets the Concessionaire develops in the future will become vested in the state as soon as such assets are put into use. In some jurisdictions, the state will lease real and moveable property to the Concessionaire, but this would not be an option if the law offers protection from lease termination, particularly if a company becomes insolvent.

Other considerations include whether the state wishes to allow the Concessionaire to claim capital expenditure against profits (capital allowances) and what interest in the assets the Concessionaire must hold to obtain those allowances.

If assets are vested and are to be vested in the state, a mechanism is needed to allow temporary removal of assets that are in need of repair and renewal, or when assets are removed for replacement, a transfer to the state of replacement assets.

To the extent possible, the Authority should offer no warranties and should exclude all liability in relation to asset condition. If the Concessionaire adopts previous designs of New Upgrades prepared by or on behalf of the state, liability for those designs should be excluded on the basis that all bidders will have had time to validate the designs.

If an inventory of spare parts exists for the overall system, not just the concessioned railway, then a split of the inventory should be carried out and allocated as appropriate among the Concessionaire and others.

Emergency access points to rail infrastructure may be required, and rights granted to the Concessionaire to pass over adjacent lands to access rail infrastructure. Similar arrangements may be necessary to carry out repairs and renewals and to access watercourses, if required by drainage arrangements.

The nature of the concession needs to be set out:

- Is it a right and obligation to renew, maintain, and operate the Below Rail Infrastructure for freight?
- Is it a right to operate freight services?
- Is it a right and obligation to renew, maintain, and operate the Below Rail Infrastructure for rail passenger services?
- Is there an obligation to provide third-party access to the Below Rail Infrastructure and does the access include international services, domestic services, freight and/or passenger services?
- What property rights are included? Can property or property rights be removed from the concession if such removal is for public good?
- Is the Concessionaire allowed to exploit the track area, e.g., through telecoms cables or cell-net masts? If so, is the revenue received considered regulated or unregulated income?

The nature of the rights granted needs to be considered. In the case of Below Rail Infrastructure, is it an exclusive right for a geographic area? What happens if a private company wishes to construct a dedicated private line, e.g., between a mine or quarry and a manufacturing process? What happens if a private company wishes to construct a spur line? Instead of granting an exclusive right for a geographic area, it is suggested that the Authority should agree not to subsidize competing lines.

The scope of the concession requires careful analysis, particularly the boundaries with other infrastructure.

- Initially, many traffic crossings will be at grade but where there are tunnels and bridges, responsibility for upkeep needs to be established and if not clearly reflected in statute law, should be set out in the Agreement.

- If equipment is to be supplied, the supply of emergency equipment such as heavy lifting gear needs to be addressed. Should it be made available for other users? In addition, if the Concessionaire is to purchase new equipment such as a track geometry vehicle, is this to be made available for use in other areas?

- If stations and other facilities are to be shared, it is advantageous to establish the lines of demarcation and an operating regime in an effort to avoid future conflicts between affected parties on interface issues.

2.8 Independent Engineer

If New Upgrades are scheduled, it may be sensible to establish a neutral specialist to monitor quality assurance and to confirm that Upgrades are ready, without compromising the overall Concessionaire responsibility. To a degree, safety aspects will normally have to be reviewed by, e.g., the Railway Safety Board. Therefore, the Independent Engineer should review design and construction procedures against an agreed quality assurance regime, *not* carry out the detailed and involved role of a site engineer. If procedures are to be developed during the Term, the Independent Engineer should check that those procedures were developed according to then-ruling control documents.

Notwithstanding the role of the Independent Engineer, the Concessionaire must remain responsible for the design and works.

Usually the Authority appoints the Independent Engineer, but developing appointment terms and identifying the appointee is usually carried in consultation with the Concessionaire. Typically, the minimum requirement is that the appointee has an international reputation within the relevant fields of expertise.

Provision should be made for circumstances in which the Independent Engineer is unwilling or unable to act, or there is a performance failure that leads to appointee replacement, after consultation between the Authority and the Concessionaire.

2.9 Commencement of New Upgrades

After the Term commences in which there are to be New Upgrades, a development phase follows during which the Concessionaire finalizes design, carries out construction, procurement, and testing of, and commissions New Upgrades. New Upgrades specifications set out in the Agreement typically specify outputs. The Concessionaire is completely responsible for all design, construction, integration, installation, testing, commissioning, and ultimate performance of any asset procured or developed for the purposes of meeting the requirements of output specifications. A bidding procedure requirement may have been that bidders were asked to supply details of their proposals to meet the output specifications, and the Concessionaire's proposals will become part of the Agreement. A careful review of host country laws on liability should be conducted. Any Authority or Independent Engineer review of design or construction should not allow risk for design and construction to migrate from the Concessionaire to the Authority. In some jurisdictions, better protection against risk is afforded by adopting a no-objection procedure, rather than an approvals procedure. In any case, clarity should be established so that no review by the Authority or the Independent Engineer will relieve the Concessionaire of responsibility and liability with respect to design and construction.

If New Upgrades require major structural works such as tunnel or bridges, or the work is to be carried out on a site where there has been previous but indeterminate works such as mines, responsibility for site condition might be unclear. Generally, the Concessionaire should take responsibility for site conditions, but during the bid period on a linear project it may be difficult for a bidder to obtain reliable information on soil and subsoil conditions. One solution might be for the Authority to obtain site survey reports, and to assign the report and its underlying contract to the Concessionaire after the Agreement is signed. If this is not feasible, the issue of site risk may have to be carefully considered in each circumstance. However, if adverse site conditions pose too great a potential downside to be borne by the Concessionaire (meaning, exceeding the Funders' risk tolerance) then some cost-sharing mechanism will need to be included.

The Authority should take no responsibility for construction and procurement risk, unless exceptional circumstances are present. Therefore, the Concessionaire should be allowed the freedom to manage its own activities without Authority interference. The Concessionaire is completely responsible for satisfying service requirements under the Agreement; therefore, it accepts any risks associated with implementing the design and development, and establishing operational procedures. The Authority should not agree to any role before or following commencement of the Term that involves assuming any part of Concessionaire risk, unless under exceptional circumstances, for example, anything that would give rise to the Authority stepping in and arranging temporary operations for all or part of the facilities. In this context, the issues referred to in section 2.9 are important.

The deadline for the Concessionaire to complete the New Upgrades should be explicitly stated. Incentives may be better than penalties to encourage the Concessionaire to complete the Upgrades on time, for example by preventing increases in tariff or service payments until specified degrees of completion are achieved, rather than claiming damages for failure to complete on time.

If the scheme must meet a public service obligation, the Authority bears a residual risk if the scheme should get into difficulty. Therefore, it is advantageous if the Authority has mechanisms to verify Concessionaire progress. One such method is to audit the application of a quality control program and for that purpose the Concessionaire should develop a quality assurance procedure in accordance with its proposals submitted at the time of tender. These procedures may be signed off on a no objection basis by the Independent Engineer. It might be prudent for the Authority to require that the Concessionaire procure the services of an Independent Designer to monitor or review the design and construction. The Independent Designer is appointed by either the Concessionaire or more likely by the Concessionaire's construction contractor. The Independent Designer should have an international reputation and should sign off on all key designs for important structures. For other designs, a less onerous signing-off regime could be developed. The Independent Designer could issue certificates to confirm that design and construction were prepared or carried out according to the requirements of the Agreement, or according to the lighter regime, and present these to the Independent Engineer along with the relevant design. This can be done electronically if the Independent Engineer and the Authority have 'read-only' access to the Concessionaire or contractor design databases.

If the Concessionaire is to provide key equipment, the supplier(s) should be identified in the Agreement, or a list of agreed prospective suppliers could be set out in the Agreement, leaving the Concessionaire to negotiate the best value with those listed.

A regime for testing during works implementation, and for testing and commissioning to achieve completion should appear in the Agreement. The Concessionaire should develop a completion schedule specifying tests, sequencing, and timing. The completion schedule should include provisions relating to periods for notification of testing, implementation of commissioning procedures, attendance of the Independent Engineer and the Authority, and protocols for retesting in the event of failure. The Authority would benefit from including some tolerance to allow financial adjustment if specified standards are not achieved.

Should the Agreement include a right to terminate the Contract if a core standard level is not met? That depends upon the particular New Upgrade, but if a right to terminate is included, the Concessionaire should be given a reasonable amount of time to overcome the default but with a final cut-off date.

The Independent Engineer and the Authority should be given access to the place of manufacture and the site of the New Upgrades; the Concessionaire should be required to ensure that contracts with its contractors and between its contractors and their sub-contractors allow for this.

For larger-scale New Upgrades, the Authority may wish to review the Design/ Construction/ EPC Contract. The aim of this review is to avoid problems that might otherwise arise in case of mismatch between Agreement provisions and Concessionaire procurement, not an opportunity for the Authority to interfere in the relationships between the Concessionaire and its contractors. Normally, if there is project finance, Funders prefer works to be carried out under a unified 'design-

build' contract to avoid the risk of a dispute between separately engaged designers and construction contractors because otherwise this would leave a residual construction liability with the Concessionaire.

If there is third-party access over existing infrastructure, the Agreement should include a mechanism to deal with Track Access Holders' rights, if possessing portions of the track is required during construction or commissioning or both. Initially, freight traffic is unlikely to be as time sensitive as passenger traffic, however, as rail use is promoted, supply chain arrangement for just-in-time collection and delivery may be developed. The regime should differentiate between scheduled possessions and over-runs. Sometimes it is more efficient to allow longer-term possessions of all the tracks in a relevant area (blockades).

2.10 Role and Obligations of the Authority

Usually, prior to signing the Agreement, the role of the Authority includes the following:

- Defining output requirements and any constraints within which the output requirements must be achieved;
- Reviewing and evaluating Concessionaire proposals to achieve outputs in terms of approach, methods, resources, timetable, management, and organization, including maintenance and operational procedures; and
- Negotiating and agreeing on all contractual terms with the Concessionaire.

In accordance to these principles, the Authority should not confirm with the Concessionaire that its proposals will meet the service requirement. In practice, however, the Authority should be confident before signing the Agreement that once fully developed and implemented, Concessionaire proposals can deliver the service.

The Authority's role after contract signature and prior to the Term commencing may include the following.

- Appointing the Independent Engineer;
- Obtaining any necessary Change in Land Use Consents;
- Assisting in obtaining temporary and permanent import licenses for material and for equipment, and immigration consents for key personnel;
- Working with the Concessionaire to identify staff to be transferred to the Concessionaire and dealing with issues arising from staff not to be transferred;
- Transferring to the Concessionaire the necessary rights in the Concessioned Assets both in their entirety and punctually; and
- Where appropriate, entering into an intercreditor agreement referred to in section 2.11 and a Direct Agreement with the Concessionaire and Senior Lenders.

The role of the Authority after Term commencement, and to a degree before, may include the following:

- Paying any service payments or other payments to be made under the Concession Agreement whether of a capital or revenue nature and allowing adjustments in accordance with the Agreement for inflation and, where relevant, currency fluctuations;

- Reviewing and commenting on any changes (Variations) to Concessionaire designs and construction proposals as they are developed; this should not be confused with the continuing role of the Independent Engineer;

- Reviewing and commenting on Concessionaire maintenance, renewal, and operational procedures, to the extent these are not addressed within the role of the Rail Safety Board and the Transport Regulatory Commission;

- Viewing and observing tests of any equipment being developed;

- Administering the agreed process for the Concessionaire or Authority to propose and implement changes to output requirements, constraints on inputs, or Concessionaire proposals, to the extent these are not addressed within the role of the Rail Safety Board and the Transport Regulatory Commission;

- Accessing management information to ensure the delivery timetable is on track and any overriding safety issues are being satisfactorily addressed, depending on the scope of Authority exposure to the scheme. This may include access to the site and places of manufacture; rights of access that should extend to the Independent Engineer.

Principles outlined in this section 2.10 reflect an intention to ensure appropriate risk transfer during the period leading up to the commissioning of the New Upgrades and beyond.

2.11 Concession Fees

Should the Concessionaire make a capital payment for using concession assets in addition to the obligation to supply New Upgrades? This will depend upon how robust the business case is, which in turn depends upon whether the Authority wishes the users to include within the payments to the Concessionaire, a portion towards the return of, and return on, that capital payment. Bidders will evaluate all the risks and any up-front capital payment will be fixed with those risks in mind. Where the amount of the capital payment forms part of its bid rather than being fixed by the public sector there is likelihood that bidders will be more conservative in relation to any up-front payment.

If a capital payment is to be made, it could be paid immediately before the Term commences, by installments, or partly through a capital payment and partly through a debt to the Authority, which is subordinated to the senior debt from Funders but ranks ahead of equity. This does not mean that Concessionaire share-

holders will receive no return until the subordinated debt is paid, but if the concession gets into difficulties the subordinated debt will rank ahead of shareholders. Thus the business case would have to be robust before shareholders would accept greater risk to their investment.

If subordinated debt is used, this would be reflected in separate loan documentation including a form of inter-creditor agreement between Government and Senior Lenders.

In addition to or instead of a payment of capital monies, the Concessionaire may be required to pay annually an amount fixed by reference to turnover or other amount, perhaps based on the idea that after achieving an annual turnover target, any surplus should be shared. Issues to consider include whether the target is fixed before or after discounting for inflation, and whether any regulator rules conflict with this approach. If a lease is used, the payment may be made under the lease; however, it is preferable that all operative provisions of the agreement between the Concessionaire and the Authority should appear in one place, leaving the lease document in a simple form.

2.12 Bonds

The Concessionaire will add the cost of any surety bond(s) to its total costs, which it will then wish to recover from users and, if the Authority makes a payment to the Concessionaire, then within that payment. Thus, bonds should be used only if a strong cost/ benefit case can be made. In most cases, if the Concessionaire fails, an immediate cost accrues to the Authority; therefore it is recommended that all bonds issued be callable on demand.

The different types of procurement procedures are addressed in Chapter 13. It should be borne in mind that the use of a bid bond within the context of a negotiated bid is not without difficulty. The bond merely supports bidder commitment to enter into a contract based upon its bid. If there are negotiations, the original bid will be superseded by subsequent negotiations; therefore, an argument can be made that the bond is no longer enforceable. Another option would be to negotiate with more than one bidder and to request that they submit their 'best and final offers,' each supported by a bid bond. Yet another option is to have discussions at prequalification or pre-bid stage, and request bids with bid bonds, based on the winning bid being countersigned by the Authority to make the Agreement. Regardless of the option selected, the bid bond should be extended to cover the achievement of Conditions Precedent to the Agreement becoming effective.

As indicated, a performance bond that lasts the life of the Term is unlikely to be cost-effective. The considerable expense that the winning bidder has incurred to reach that stage creates an incentive to proceed. However, it may be prudent to have a performance bond—specified by either time period, or expenditure level. Shareholder investment, for example in New Upgrades, coupled with Funder loans puts real risk money at stake, some or all of the benefits of which will accrue to the Authority, although the benefit will be less if there is a full payout to the Funders regardless of the reason for termination. A considerable amount is at stake; thus, a performance bond provision should not only stipulate a financial institution with a high credit rating, specifying the credit agency and rating, but also allow the bond

to be returned to the issuer at a point specified by either time period, or expenditure level.

The interval just before the Term expires is the next period when the Authority is most exposed to risk. Usually, there will be a requirement that on expiration of the Term, assets should be of a standard commensurate with rail system operation (see Hand Back post). At a suitable point in time before expiration, concession assets should be inspected. To the extent work is required to reach that standard, the Concessionaire should lock up dividends and other payments in an escrow account sufficient to meet the requisite expenditure; or the Concessionaire should procure a bond issued (by an issuer of the same financial strength as for the issue of the performance bond). The escrow account or the bond should exist until the requisite work is complete and the final inspection, which would ordinarily take place after Hand Back has been satisfactorily carried out.

2.13 Obligations of the Concessionaire

To the extent economically and commercially sustainable, Concessionaire rights and obligations pursuant to the Agreement should be at Concessionaire cost and risk, without recourse to Authority credit or guarantees. If the Authority intends financial support, whether actual or contingent, the basis should be specified in the Agreement.

Unless the Agreement includes contrary provisions (for examples, see the concept contained in section 2.20 (Preservation of Concessioned Assets) it may be appropriate for the Concessionaire to have unrestricted authority to negotiate terms and conditions of all necessary contracts with all suppliers, commercial service providers, and users in respect of the concession and its obligations under the Agreement. If Authority financial support is involved, Concessionaire procurement rules and procedures and the extent of their application should be agreed in advance between the Authority and the Concessionaire.

To the extent viable under the circumstances pertaining to the scheme, the Concessionaire should agree to raise the required finance to complete the New Upgrades in accordance with Agreement terms and conditions. If loans and credits are sought to be arranged based on Authority guarantees or backstopping such loans in favor of the Funders, then more of the scheme's risks will fall on the Authority, actually or contingently. In economic terms, this may mean that the Authority will assume some construction and operation risk through required payments to the Funders, without the Authority receiving a compensatory amount from any other source, particularly when facilities are not operating properly. The Authority should avoid to the fullest extent practicable becoming a direct party to any finance commitments with Funders, other than under the inter-creditor agreement between various Funders and the Authority, where the Authority has agreed to a subordinated debt arrangement, or any Direct Agreement. Funders should be able and encouraged to proactively support the scheme in the event that the Concessionaire has difficulty meeting obligations under either or both the Concession Agreement and the Funding Agreements. Provided that any Direct Agreement imposes no greater liabilities on the Authority than under the Concession Agreement, then it is in the interests of the host country to allow the Funders to take control of the scheme and the Concessionaire to rescue the scheme. How the Funders can

effect the rescue depends upon the insolvency law and practice of the host country and the Direct Agreement will reflect that.

The Concessionaire should be permitted to provide certain assets as security to the Funders. The extent of the security that may be given will to a degree reflect the concession rights granted.

In addition to the New Upgrades, the Concessionaire should ensure that the Below Rail and other Infrastructure is renewed and maintained to a level that enables sufficient capacity to handle the potential freight and other traffic on offer. With this in mind, it is probable that potential demand should be reviewed periodically and review results implemented.

As indicated earlier, a full list of assets is unlikely, much less, an asset condition register. If the Concessionaire is delivering either or both New Upgrades and renewals, it would be advantageous for an asset condition register to be prepared and subsequently maintained. The extent of the register would depend upon a cost/benefit analysis carried out during the study for reforms. Since the register is likely to be maintained electronically, the Authority should be given 'read-only' access to the database.

At a minimum, the Concessionaire should negotiate in good faith with intent to agree with the Authority on terms and conditions for Future Upgrades of any lines, if existing Below Rail and other Infrastructure would constrain planned increases in demand that arise from the review, in order to handle additional freight traffic and technical standards. The Agreement should address setting aside funds to finance Future Upgrades if this issue does not fall within the arrangements between the Concessionaire and the Transport Competition Board.

Of necessity, contractual regulation under the Agreement must govern regulatory matters and will require one or more schedules. If regulation exists under legislation, the Transport Competition Board (referred to in the Introduction) will have a significant role as regulator to allow an adjustment in tariffs and track access charges if there is an issue as to whether Future Upgrades will be commercially viable, as opposed to economically viable, the Authority may need to make available capital grant or other funds to cover the whole or partial cost of Future Upgrades.

Host country law will determine whether to include a provision that requires the Concessionaire to carry out its obligations in accordance with the law, including the law on safety. If Concessionaire failure to observe the law might cause loss to the Authority, it may be appropriate to require the Concessionaire to observe the law. Otherwise relevant government enforcing arms would be responsible to enforce the law if the Concessionaire were in breach. Nevertheless, the Agreement should include provision for the Concessionaire to perform in accordance with Good Industry Practice, which might be defined as, "in respect of any undertaking in any circumstances, the exercise of that degree of care, foresight, prudence, and skill that would reasonably and ordinarily be expected from a competent, skilled and experienced person in the same type of undertaking in the same or similar circumstances."

The issue of rail passenger traffic depends upon the structure chosen. If the Concessionaire is to supply infrastructure services, it may be an option for the Concessionaire to supply infrastructure to a service level suitable for passenger traffic. This could be addressed under a separate services contract, particularly where the potential exists under the Agreement, for the Authority to have power, on notice, to remove certain of the Below Rail Infrastructure from the category of Concessioned Assets and place them with another services provider if the parties fail to agree on changes to the pricing structure or scope of the services. If the Authority does wish to include passenger transport services within the Agreement then it will need to include provisions relating to such matters as fare and service levels, stations/other stops, and passenger claims and complaints.

The level of detail for third-party access and charging regimes in the concession will depend upon how comprehensive legislation is in the host country—the less detail in legislation, the more the detail required in the Agreement. Similar issues relate to a Track Access Applicant's requests for access, and a Track Access Holder's requests for increased access. Analogous issues arise in relation to regimes for failure to give access, failure to give access to agreed paths, delays in journey time, and the like.

The risk of an arbitrary regulator decision will be of particular concern to the Concessionaire where, in cases regarding terms of access, there could be either or both an increase in the Concessionaire costs and tariffs, which could reduce Concessionaire income. These issues, which concern both Concessionaire and Funders, might be addressed under Compensation Events. Although achieving a balance is difficult—the role of the regulator is to ensure that Concessionaire revenues are sufficient to meet its obligations, but not to the extent that ensures compensation for poor Concessionaire management decisions.

Should access be given to infrastructure other than track? For example, should access be given to maintenance or rail freight depots? Should passenger train operators be given access to stations? Similar to situations discussed earlier, the detail required in the Agreement depends on whether host country legislation is comprehensive.

Another issue is international third party access. This does not affect 'islanded' systems with no cross-border link or no plans to link in the near or medium future. If cross-border rail traffic is likely, consideration should be given to incorporate Concessionaire obligations to allow for this. Even if the host country is not a COTIF signatory, COTIF provisions could be a useful benchmark to indicate potential considerations for bidders, until details of arrangements between the host country and its neighbors emerge.

The Concessionaire should also meet all safety requirements, and this is another case of looking at how comprehensive host country legislation is in this respect. If the Concessionaire must approve safety arrangements, e.g., safety case of Track Access Holders, or Track Access Applicants, the Agreement should address the processes to the extent they are omitted from host country legislation.

A disaster recovery plan should be linked to safety issues and agreed between the Authority and the Concessionaire. The disaster recovery plan should set out reporting lines (see also section 2.23), and make provision for changes, based on emerging experiences from incidents or accidents, to be agreed or otherwise addressed.

2.14 Insurances

The Concessionaire should be expected to take out common insurances typically acquired by any prudent business. Some insurances may be required by law, e.g., worker compensation, but other insurances are more important from Authority perspective, particularly if assets remain or become vested in the state during the Term, including the following:

- Contractor's All-Risk insurances during construction; cover during freighting of equipment or materials, should be considered, particularly if the state is advancing capital to pay for some of the New Upgrades;

- Insurance on the Below Rail and other Infrastructure;

- Third-party liability cover; and

- Business interruption cover to compensate for lost revenue, which may be caused on the occurrence of an insured peril. Similar cover should be taken out in respect of losses that may occur as a consequence of delayed completion of New Upgrades. It is not unusual under a specific obligation in concession-type agreements for the private sector party to take out this cover as it adds to the robustness of the structure being created.

The period and amount of specific covers should be stated and the Authority should be a named insured.

The Concessionaire should provide an insurance broker's letter to confirm that the broker will notify the Authority if, prior to renewal, there is an indication that cover will not be renewed or that conditions of renewal will be onerous.

Current Insurance Certificates should be produced to the Authority; if the Concessionaire fails to take out key insurances then the Authority should be able to take out the insurance and recover the premia from the Concessionaire.

If insurance cover is unavailable in the market or available only at a commercial premium (unless this was due to Concessionaire acts or neglect) then the Authority should, at the time of non availability, be able to allow the concession to continue or could terminate the concession as though the non availability was a Force Majeure Event. If the Authority wishes the Agreement to continue then, in effect, the Authority itself would assume the risk for so long as cover is unavailable. For the Authority the key issue is to assess the level of risk incurred if it allows the circumstance of no cover. There is the common risk of claims by third parties if there is third party liability without insurance cover—the Authority will be seen to have deeper pockets than the Concessionaire. There is a risk to the economy if

there is major property damage and the Concessionaire has no funds to put right the damage, thereby delaying freight transport and possibly, passenger transport.

To protect the Authority, it is recommended to establish a requirement that the insurance policy must include a cross liability clause such that the insurance shall apply to the Authority, even if the Concessionaire made a material misstatement in the application for insurance cover. There should be waivers of rights of subrogation as against the Authority so as to reduce likelihood of a claim against the Authority where it is a named insured.

To avoid the Concessionaire taking the money and walking away from the scheme, the Concessionaire should be required to apply or procure the application of the proceeds of any claims in a manner specified in the Agreement.

2.15 Liability and Indemnities

The Concessionaire should assume all liability as regards the Authority in relation to the operations under the concession, other than, and to the extent that the Authority or those for which it is responsible, caused the loss or damage.

If there is damage to third parties, which may include passengers or their property, the Concessionaire should indemnify the Authority against claims by those third parties, other than and to the extent that the Authority, or those for which it is responsible, caused the loss or damage. The Agreement should also specify how the legal and other processes arising from such claims should be handled.

Environmental and other conditions

The Concessionaire has no responsibility for any events or conditions prior to the grant of the concession. Therefore, it is reasonable that the state should remain liable for any pre-existing hazardous waste and, if removal is required by law, the Authority should bear the cost of remediation. All subsequent environmental impacts should be at the risk of the Concessionaire. Although it is unlikely that a full-site survey has been carried out, it is highly desirable to carry out an environmental audit *before* final bids have been received to create a reasonable understanding between parties as to what environmental conditions may be expected. If there is a history of environmental pollution, prior to the grant of the concession it may be helpful to appoint an environmental expert to deal with any disputes that may arise during the initial years of the concession.

The host country law should preclude third-party claims arising from the usual noise and vibration emanating from the railway as a result of its usage in accordance with Good Industry Practice. The Concessionaire should remain liable for excessive noise and vibration, i.e., if Good Industry Practice was not applied and the cause of the problem is that the Below Rail Infrastructure and/or equipment have not been properly maintained (allowing that early in the Term, the Concessionaire will need time to put the infrastructure and equipment into good working order).

If the host country law does not cover chance finds of antiquities then the concession should set out the rules governing their discovery. If the law allows any chance finds to become the property of the finder then the Agreement should provide that

chance finds belong to the Authority and should be dealt with either by the Authority or under its instruction. The impact of discovery can be dealt with under either or both Force Majeure Events and Compensation Events (see post) although larger objects may require time to allow experts to carry out excavations and investigation.

Linked to the issue of site conditions is the issue of latent defects. To a degree this turns upon the scope of the maintenance and renewals envisaged under the concession and the timing of implementing that work. The main issue will be critical structures. If major works are not envisaged for identified bridges, tunnels, and buildings, then it is arguable that the Authority has accepted this. Therefore, if it later emerges that major work is required, reasonable cost for that work should be borne by the Authority. If, however, it is envisaged that major work will be carried out at some future date, this may be an issue of timing; thus, if the Concessionaire has had insufficient time to generate a sinking fund for these works but has otherwise behaved prudently, the Authority might consider advancing funds on a subordinated basis to meet the gap between actual expenditure and the expected date of expenditure at the time the Agreement was executed.

2.16 Intervening Events

These are incidents that affect the ability of one party to the Agreement to perform its obligations or receive benefits due under the Agreement. There are many ways to identify and specify consequences of Intervening Events. This Guide includes Compensation Events, Force Majeure Events, and Political Force Majeure Events.

Compensation events

Compensation Events are designed to cater for incidents that arise at the Authority's risk, resulting in a loss of income or increased costs to the Concessionaire. Such events are more appropriately dealt with by compensation methods rather than through Authority Default. Termination should be a last resort in every circumstance, although if an event renders the parties' contractual relationship untenable, the Authority may choose to exercise its voluntary termination rights.

Examples are:

- Authority breach of an obligation, including any breach occasioned by third parties for whom the Authority is responsible;
- Authority Changes or certain Future Upgrades; and
- Discriminatory or specific changes in law.

The Authority should bear the effects of certain Changes in Law and it may, after careful consideration in certain schemes, be appropriate to add other (or railway sector) specific events.

The Authority may face a request from the Concessionaire or its Funders to consider additional items as Compensation Events. If the obligation is to make payment by a due date, additional compensation is not required, as nonpayment is addressed through provisions dealing with interest on late payment

If a Compensation Event occurs during the execution of New Upgrades, the planned completion date may have to be postponed; usually by the length of any delay caused (any long-stop date will be similarly put back). If revenue or increase in revenue commences only when construction is complete, a practical consequence is that the start date of the Concessionaire's revenue stream or the start date of increase in the revenue stream is also delayed and additional costs are incurred. As a result, the Concessionaire may suffer significant additional expense through finance charges and additional costs.

Therefore, prior to contract signature, it must be decided how to compensate the Concessionaire for any delays in completing the New Upgrades that are the direct result of a Compensation Event. One option is to retain the original Expiry Date for the Term and compensate the Concessionaire for its loss; as an alternative, the Concessionaire may agree to extend the Term.

If the Agreement includes provisions for liquidated damages, then the Concessionaire's liability for liquidated damages will also require relief for the period of delay caused by the Compensation Event. Otherwise, the liquidated damages provision risks failing completely, particularly if there has been a failure by the Authority. The Concessionaire should also be relieved of any other liability for Authority losses in respect of the Compensation Event. This relief should be taken into account in determining consequences for the Authority of a Compensation Event. The main advantages of not extending the Term are first, simplicity, and second, Funders prefer this option because it preserves the senior debt loan life cover ratio and equity return. Also, this approach offers the better incentive to the Authority to manage its rights and obligations during the construction phase in a way that avoids delay.

The Concessionaire should be obliged to exercise reasonable efforts to mitigate its losses and costs, for example, by rescheduling the works timetable or redeploying staff, which in the case of New Upgrades, could avoid delays to the planned completion date, although mitigation may incur extra costs.

A common way to deal with Compensation Events is to rely on the Financial Model prepared at the time of tendering. By using the model, the parties calculate how and when compensation should be paid. Typically this would require the Authority to agree that the senior debt loan life cover ratio and equity return are to remain unchanged. However, if changes have occurred in assumptions used in preparing the Financial Model between the Agreement execution date and the circumstances giving rise to the claim, then the use of this mechanism could risk over rewarding or under rewarding the Concessionaire. Sometimes, changes in factors can be imported into the Financial Model. Nevertheless the Agreement should be drafted so that Compensation Events require as simple an approach as possible and the sole concern is to ensure fair compensation for a limited number of events, which can be calculated in a straightforward manner.

Force majeure events

Force Majeure Events are incidents that prevent the Concessionaire from performing its obligations at any time, for which the Concessionaire bears the financial risk in terms of increased costs and reduced revenue, but for which it is allowed relief

from termination for failure to meet its obligations under the Agreement to the extent that the Force Majeure Event caused that failure. Examples listed below may be outside Concessionaire control. However, 'outside Concessionaire control' is not the appropriate measure of whether an event should appear on the list to be contained in the Agreement. Many events 'outside Concessionaire control' at the time they occur could in fact have been prevented by proper precautions (e.g., fire). Therefore, the real question is whether the risk of specific events occurring, or the consequences of those events, ought to be borne by the Concessionaire since it is better positioned than the Authority to mitigate and manage the consequences through risk management and planning, which will also take into account insurance cover and the ability to work around events or the consequence of events.

Force Majeure Events may include the following:

- Fire, explosion, lightning, storm, tempest, flood, bursting or overflowing of water tanks, apparatus or pipes, ionizing radiation (to the extent it does not constitute a Force Majeure Event), earthquakes, riot and civil disturbances;

- Failure by any, utility company, local or regional authority, or other similar body to carry out works or provide services;

- Any accidental loss or damage to the Concessioned Assets;

- Any failure or shortage of power, fuel, or transport;

- Any blockade or embargo that does not constitute a Political Force Majeure Event; and

- Any labor disruptions, including the following:
  - official or unofficial strike;
  - lockout;
  - go-slow; or
  - other dispute,

However the Agreement should specify that 'Force Majeure' should not extend to events that arise directly or indirectly as a result of any default or act of the Concessionaire, any of its contractors or their sub-contractors.

It is not unusual for the Concessionaire to bear the financial effects of delays caused by Force Majeure Events, so the Authority would not compensate for the occurrence of such delays. If a Force Majeure Event occurs prior to the date for completion of the New Upgrades then any long-stop termination date will be put back by a period equal to the relevant delay caused by the Force Majeure Event. In most cases, the relief given will be limited to relief from termination and the payment of compensation to the Authority for delay, where this is provided for in the Agreement.

Typically, there should be no extension to the Term owing to a Force Majeure Event. However, consequences to the Concessionaire are that it must bear all losses that arise without recourse to others, except and to the extent that it can recover

under insurance, which may increase the losses because the Concessionaire's insurance premia are likely to rise in subsequent years.

The Agreement should provide that when a Force Majeure Event has occurred and the Authority has been informed, the parties should consult to discuss relevant issues, such as the likely duration of the Force Majeure Event and actions to be taken to mitigate the effects.

In some jurisdictions, courts can intervene and change contract provisions to adjust the economic equilibrium, or because the Concessionaire is meeting a public service obligation, to realign Concessionaire position with what it would have been without the event. Thus, in those jurisdictions where the Agreement seeks to allocate risk in the occurrence of a Force Majeure Event, the courts might override Agreement provisions.

Political force majeure events

Political Force Majeure provisions aim to protect the Concessionaire from the occurrence of the event on the basis that the event is out of Concessionaire control, and if the event exceeds a specified period, to afford the parties an opportunity to terminate either or both the Term and the Agreement. Political Force Majeure Events may include:

- War, civil war, armed conflict, or terrorism; or
- Nuclear, chemical or biological contamination, unless the source or cause of contamination is [the result of actions of the Contractor]; or
- Pressure waves caused by devices travelling at supersonic speeds.

Relief for Political Force Majeure Events would normally apply only to the extent that the Concessionaire or the Authority is unable to comply with all or a material part of its obligations under the Agreement and the parties cannot agree within a specified number of months how to restart the scheme in full.

The Authority should not be automatically obliged to pay the Concessionaire any sums simply to service Concessionaire loan obligations in whole or in part. The parties should recognize that the Concessionaire is likely to require some financial support as there is unlikely to be insurance cover available to cover these risks. The Authority may wish to bear in mind that in the event of Termination, the Authority would pay as a minimum, the outstanding Senior Debt, which would result in the loss of any outstanding subordinated debt to the Authority. Thus, both parties benefit if the full scheme can be reinstated through some temporary financial support from the Authority.

On the occurrence of a Political Force Majeure Event, the parties should consult to seek ways to continue the concession, for example, reaching agreement on how assets, if destroyed, can be reinstated; although neither party will be obliged to do this. The solution will depend on the nature of the event and its effects, but may involve altering Concessionaire obligations, adjusting or creating payment mechanisms, or extending the Term.

As indicated in section 2.14 above, the Concessionaire may be obliged to take out insurance for advance loss of profit or business interruption against Force Majeure Events so as to provide a replacement revenue stream for Funders and others whilst the income stream under, or by virtue of the scheme is impaired. Those insurances will not come into force until a stipulated number of days has passed so occurrence of any such event may still involve the Concessionaire in otherwise unrecovered losses. In addition, business interruption cover will not extend to all Force Majeure Events, and is usually parasitic in so far as there will need to be physical damage to the Concessioned Assets.

An alternative is to categorize intervening events as Insurable or Non insurable Events; however, there is an argument against this approach. The primary factor in allocating risk is deciding which party is best placed to manage the risk and its consequences and, in the case of Force Majeure Events, this is the Concessionaire. Therefore, the Concessionaire must decide how to manage the risk of the event and its consequences. The problem with this argument arises when Force Majeure Events are considered outside of an OECD economy. In countries where a risk is uninsurable in the market at commercially viable rates, other than through the act or neglect of the Concessionaire, the Authority may have to accept some financial risk for an uninsurable event that has occurred through no fault of the Concessionaire or its contractors and their sub-contractors, particularly where the service required under the concession meets a public service obligation, and the host country economy would be adversely affected if those services cease to be available either in whole or in a substantial part.

2.17 Change in Relevant Taxes

It is reasonable for the Authority to acknowledge that the concession and the Concessionaire's performance of its obligations are based upon assumptions concerning application and rates of Relevant Taxes to be borne by the Concessionaire.

If, after the date of execution of the Agreement, as a result of any application of Relevant Taxes (arrived at by reference to the host country tax regime) the Concessionaire was to become obliged to pay, or commences indirectly to bear any Relevant Taxes that did not exist or were not applicable to the Concessionaire at the date of the Agreement, or if the Concessionaire were to incur any increase in cost because the rate subsequently increased of any Relevant Taxes that the Concessionaire would be obliged to pay, or to indirectly bear, and if the Concessionaire is unable to obtain a compensating adjustment to any tariffs fixed by the Transport Regulatory Board, then the Concessionaire should provide the Authority with full details of any Change in Relevant Taxes as soon as practicable after it becomes aware of it, including the amount of tax and due dates for any payments.

The method of dealing with the Change in Relevant Taxes will depend upon host country tax law. The Concessionaire could be exempted by an extra statutory exemption, provided that it is legally binding on the tax authorities. Otherwise the Authority should hold the Concessionaire harmless, including by making compensatory payments.

In some case, these types of provisions require the effect of a Relevant Change in tax to reach a particular financial threshold before the compensation regime locks

in; in other cases, the provisions in the Agreement will allow a tax reduction to benefit the Authority.

2.18 Change in Circumstances

For the purposes of this Guide, a Change in Circumstances is defined as a significant change in the assumptions and conditions upon which the parties based their decision to enter into the Agreement, that is, either unforeseeable circumstances, or circumstances whose consequences were unforeseeable at the date of execution of the Agreement. The change can be further defined as one that was not caused by, or contributed to by, any act or default of any party, and in respect of which, had the parties been aware prior to the execution of the Agreement that such Change in Circumstances would arise, they would not have entered into the Agreement. The basis for that being that such Change in Circumstances would have adversely affected the relevant party's ability to carry out its obligations and duties under the Agreement, or would have adversely affected the financial equilibrium under the concession. Preferably, Change in Circumstances should include only those events similar to the following for which the Authority is responsible, such as Change in Law, acts of expropriation, compulsory acquisition, and nationalization.

In some jurisdictions the civil code will incorporate protections against these kinds of changes. For instance to be considered within a Change in Law, the change may be required to be material and satisfy the following criteria:

- It is generally inapplicable to commercial and industrial undertakings in the host country in which there is private investment or ownership.

- It imposes costs on the Concessionaire that exceed the value of any benefits to the Concessionaire; the change carries a discounted present cost to the Concessionaire over the remainder of the Term that exceeds a specified sum.

One solution to a Change in Circumstances is for the parties, at their own cost, to take all steps reasonably required to restore their ability to perform their obligations under this Agreement that are affected by a Change in Circumstances, and to continue to perform their respective obligations under the Agreement insofar as they are not so affected.

The Agreement may provide that within an agreed period following the occurrence of a Change in Circumstances, the parties should meet and should, following an agreed period for consultation, take adequate measures to restore the following:

- Ability of the relevant party to carry out its obligations and duties affected by the Change in Circumstances; and

- Financial Balance of the Concessionaire, keeping in mind the caution expressed earlier regarding the use of a financial model.

In the event that the parties fail to reach an agreement within the stated period, the Agreement might provide for submission to the Disputes Resolution Procedure (see section 2.30). However if the following conditions emerge:

- The occurrence of a Change in Circumstances continues for a specified period, or

- A series of related Changes in Circumstances continue in the aggregate for that specified period during any year,

…the Agreement might then provide that the Concessionaire can opt to terminate the Term when the specified period expires by delivering a Termination Notice to the Authority. Upon such termination, provisions relating to termination should apply (see section 2.24).

2.19 Variations

The structure of the Agreement risks rigidity if it does not allow for Variations, which would normally fall into two categories. In the first category, the Concessionaire wishes to change the Concessioned Assets or a New Upgrade or Future Upgrade during the period of construction or fabrication; the second category include variations by which the Authority is seeking a change.

In either case, the Agreement should include provisions for giving notices, and counter-notices. In a Variation proposed by the Authority, the Concessionaire should be able to reject a request for a change if the Variation would affect safety or operability. The Authority may be concerned if the Variation could impose additional financial costs, e.g., increase compensation amounts payable on expiry of the Term (or earlier termination) or might reduce the benefits of services to be rendered under the Agreement.

The costs of a Variation should, by and large, be borne by the party requesting the change. If extra costs can be recovered through additional Track Access Charges or similar, the main issue will be securing funds to cover the initial costs.

2.20 Preservation of the Concessioned Assets

Typically, common business provisions include the following:

- In most cases, the railway will be run as a going concern, which will require arrangements with third parties that transcend the Expiry Date of the Term. Any third-party contract that requires the third party to make payments to the Concessionaire should be structured so that the Authority will receive the same benefits pro rata as the Concessionaire. Thus, contracts should not seek front-loaded payments, nor should they seek to impose any back-loaded obligations that might place the Authority at a disadvantage. In addition, no contract should be let that conflicts with the Expiry Date within a specified period of that date without the consent of the Authority.

- As the Expiry Date approaches, the Authority's interest will heighten in the maintenance of any concessioned asset. The Agreement should specify the condition of the Concessioned Assets both during the Term and on Hand Back and set out the Concessionaire's obligations in that respect. The Agreement should also provide that the Authority will inform the Concessionaire of its handover requirements not less than a specified number of months prior to

the Expiry Date. The Authority's interest will increase when it has to pay compensation to the Concessionaire on expiry of the Term, whether under the terms of the Agreement, under the terms of a further agreement to that effect in relation to Future Upgrades, or under the law of the host country.

- If the Authority receives the Concessioned Assets at the end of the Term, which is the common scenario, any maintenance obligations will need to be monitored, and a mechanism established to accomplish this in a manner that is as non intrusive as possible.

- If the Authority reasonably believes that the Concessionaire is in breach of renewal and maintenance obligations under the Agreement, then the Authority should be permitted to carry out, or procure, a survey of the Concessioned Assets to evaluate whether the Concessionaire has been and is renewing and maintaining the assets in accordance with its Agreement obligations. This right may be restricted to being exercised not more than once during a specified number of years.

- Where the Authority wishes to carry out a survey, it should notify the Concessionaire in writing an agreed minimum number of days in advance of the date on which it wishes to carry out the survey. The Authority should consider any reasonable Concessionaire request for the survey to be carried out on a different date. When carrying out any survey, the Authority should exercise or procure the exercise of reasonable efforts to minimize any disruption caused to the Concessionaire. Survey costs should be borne by the Authority, except where the survey results reveal Concessionaire failure, in which case, the Concessionaire should bear survey costs; or unless the surveys are related to Hand Back. The Concessionaire should be required to give the Authority, without charge, any reasonable assistance required by the Authority during the conduct of any survey.

- If the survey reveals that the Concessionaire has not complied with its renewal and maintenance obligations, the Authority is likely to require the powers to do the following:

  – Notify the Concessionaire of required standards for the condition of the Concessioned Assets to comply with Agreement obligations; and

  – Specify a reasonable period within which the Concessionaire must achieve compliance through rectification and/or maintenance work.

- The Concessionaire should be required to carry out such rectification and/or maintenance work within the period specified, and bear fully any costs incurred in rectification and/or maintenance work.

- For Hand-Back surveys, it is reasonable for survey costs to be borne jointly; if the Concessionaire so requires, surveys should be carried out by an independent expert agreed between the parties. In case of failure to agree, the Agreement should name a nominating body to appoint the independent expert. If the survey finds that renewal and maintenance work is needed to bring the

Concessioned Assets up to the standard required under the Agreement, the Concessionaire should issue a bond according to section 2.12, or establish an escrow account and deposit an amount equal to the estimated cost of carrying out the renewal and maintenance work.

In case of a failure to deliver a service as part of the concession, particularly if the service is to meet a public service obligation, the Authority may require a temporary right to procure the operation of all or part of the Concessioned Assets. The Agreement provision should include protocols for serving 'notice of intent' to assume operations, assignments of responsibility for costs incurred, and allocations of risk, particularly in relation to any damage incurred to Concessioned Assets during operation, and the withdrawal of the Authority, or its nominee, at the end of the emergency period.

2.21 Confidential Information

It is better to start with the concept of transparency and to require the Concessionaire to divulge information that might reasonably be required for informing the public of the progress or otherwise in improving services. The scope of such disclosure can be dealt with under section 2.23 (Reporting and Records). That said, in many agreements, 'Confidential Information' refers to any information, data or other matter ('information') disclosed to a party by, or on behalf of, another party under the following conditions:

- Disclosure of the information by the recipient might be reasonably expected to affect the commercial affairs of the owner of the Confidential Information; or

- Information is marked 'confidential' by a party when disclosed, and provided further that information will cease to be Confidential Information if the information has ceased to retain its confidential nature, for example:
  - Information disclosed by the recipient would no longer be reasonably expected to affect the commercial affairs of the information owner;

  - Information is now in the public domain through means other than a breach of the confidentiality provisions in the agreement;

  - Information reached the recipient independently, from a third party free to disclose the information.

Unless host country law specifically provides, consideration should be given to provisions that extend confidentiality to Track Access Holders and Track Access Applicants. The definition of Confidential Information would include information or data collected by the Concessionaire or a Track Access Holder in the performance of an Access Agreement as in the following circumstances.

- If the collector discloses information that might be reasonably expected to affect the commercial affairs of the other party to the Access Agreement;

- That the other party shall be deemed to be the owner of such Confidential Information.

The parties would agree to maintain confidentiality except in respect of Permitted Release referred to below, and the Concessionaire would be required to enter into confidentiality undertakings with Track Access Holders and Track Access Applicants.

Permitted Release could include the following examples:

- Disclosure is required or compelled by any law;
- Disclosure is necessary for the conduct of any legal proceedings, including any dispute resolution process under the Agreement or the Track Access Agreement;
- Disclosure is required under any stock exchange listing requirement or rule;
- Disclosure is to the Rail Safety Board;
- Disclosure is to the recipient's lawyers, or accountants under a duty of confidentiality;
- Disclosure is to the recipient's banker or other financial institution, to the extent required for the purpose of raising funds or maintaining compliance with credit arrangements, if such banker or financial institution has executed a legally enforceable confidentiality deed in favor of the owner of the Confidential Information;
- Disclosure is for the purpose of facilitating train control directions where the disclosure of information is by the Concessionaire in the usual course of undertaking train control;
- Disclosure is by any person involved in clearing an incident or emergency that is preventing the operation of Train Services on the Rail Infrastructure;
- Disclosure is to an infrastructure provider or operator for infrastructure forming part of the system in respect of which Access forms a part.

A particular issue arises where the Concessionaire operates the Below Rail Infrastructure and is a Rail Freight Operator. If Concessionaire employees transfer from infrastructure operations to freight operations, it is important to ensure that they do not use the Confidential Information obtained about Track Access Holders and Track Access Applicants in their new position, and that the Concessionaire gives specific undertakings in that respect.

2.22 Employees

If real reform of the railways is to be achieved then this is likely to require a comprehensive change to the terms and conditions on which railway employees are employed and the manner in which they carry out their duties including the removal of restrictive practices. If existing personnel are to be transferred to the Concessionaire, one option is for the Concessionaire to stipulate the number of trans-

ferred personnel in its bid documents, and under the Agreement the Concessionaire agrees to employ that number. Before the commencement of the Term, the Concessionaire should select and identify employees to the Authority.

It would be reasonable to include a provision to encourage the Concessionaire to use local personnel and to require that selection of local staff should give preference to existing rail employees, subject to suitability, qualifications, and availability. If the Concessionaire demonstrates that existing rail employees are unsuitable or insufficiently qualified, then the Concessionaire should be free to recruit employees with specific skills from other sources.

Each transferring employee would enter into an employment contract with the Concessionaire. Issues such as accrued pension rights and other employee benefits will need to be addressed; the extent to which it would be economically sensible or feasible to maintain conditions that are at least equal to the terms and conditions enjoyed with the former rail employer prior to the commencement of the Term will depend upon what those terms were.

The Authority may require the Concessionaire to employ or procure the employment of competent local labor, to the extent available, to construct the New Upgrades and to operate, renew, and maintain the Concessioned Assets.

2.23 Reporting and Records

If the Authority grants a subordinated loan, any subordinated loan documentation will entitle the Authority to receive comprehensive financial and management information but that entitlement will end when the debt is discharged.

Thus it is suggested that the Authority should set out its rights to information in the Agreement. Where the Authority is to repay loans to Funders, no matter the grounds for termination, the Authority is likely to require more information to enable it to monitor its exposure. Further, where the Authority or the state makes temporary funds available due to disturbance in the lending market, the Authority may require a greater influence over the choice of management in the event that the concession gets into difficulty.

Prior to the commencement of the Term, the Authority and the Concessionaire should agree on the format for quarterly reports. By a date certain in the third month after the commencement of the Term and every three (3) months thereinafter, the Concessionaire should submit to the Authority, a report in the agreed form. The report might reasonably cover progress in the development, financing, construction, and commissioning of the New Upgrades and the renewal, maintenance and operation of the Below Rail Infrastructure. Similarly, the report might provide details of main railway activities during the period—volume of traffic, changes in traffic or activity from the previous period, and for the same period during the preceding year, fees, revenues, expenditures, and other key metrics data.

The Concessionaire could reasonably be required to carry on its business and affairs with due diligence and efficiency, in accordance with sound international financial and commercial standards and practices, and fully account for all aspects of its business as follows:

- The Concessionaire should prepare and submit to the Authority within a specified number of months of the end of each financial year a copy of the Concessionaire's audited financial statements that have been or are to be submitted to state tax authorities and that have been drawn up by an internationally recognized accounting/auditor firm registered in the host country in accordance with international accounting standards and host country laws. Financial statements would include balance sheet, profit and loss account, and cash flow statement, together with any explanatory notes or variations from international accounting standards used to comply with host country law.

- In addition to financial statements, the annual reporting to the Authority might include the following information and metrics.

  – Freight tons, ton-km, passengers and passenger-km carried;

  – Locomotive-km for passenger and freight service;

  – Freight ton-km per employee and passenger-km per employee;

  – Revenue and costs by service or activity;

  – Actual vs. planned maintenance and details of asset breakdowns that have affected services;

  – Summary of events and causes of cancellations and late running, together with complaints received and actions taken and summaries of user satisfaction surveys;

  – Summary of accidents and incidents, causation and consequences (serious accidents should have been reported to the relevant Ministry as soon as they occurred and would be an issue for the Safety Board);

  – Details of human resources programs including personnel employed and training provided;

  – Rolling stock utilization statistics for both Concessionaire and other Track Access Holders.

- The Authority may wish, at its own expense, to appoint an independent auditor registered in the host country to verify Concessionaire statements and information. The Concessionaire should provide all reasonable assistance to the appointed auditor.

The Agreement should also specify any other reports and records that the Authority may require.

The Agreement should identify required periods for retaining categories of records, and expectations for these at the time of Hand Back.

2.24 Termination

Termination by authority for concessionaire's default

Funders and investors will need certainty about circumstances under which the Term or the Agreement (depending upon the approach adopted) may be terminated. This is even more critical if termination due to a Concessionaire's Default would lead to loss of equity investment and a loss of all or part of the debt. Therefore, the Agreement should set out a list of potential events of Concessionaire Default that could give rise to Termination if such events remained unremedied, or for which no remedy exists. Of course, there are 'Intervening Events', for which the Concessionaire is relieved of liability, where termination for default would not arise, nor would it arise if the Default was caused by an act or neglect of the Authority. Examples of events of Default may include:

- Failure of Concessionaire to complete the New Upgrades by the Back Stop Date;
- Abandonment by Concessionaire of performance of its obligations;
- Failure to comply with agreed levels of service under the Agreement;
- Failure to pay Concession Fees to the Authority as they fall due;
- Insolvency and other similar events;
- Acts of corruption: However, the Concessionaire should be given an opportunity to dismiss personnel or contractors involved in the corrupt practices if the Concessionaire's management were unaware of the acts;
- Save as may be permitted by the Agreement, the assignment or transfer of any of Concessionaire rights or obligations in relation to the Agreement;
- Any material breach by the Concessionaire of any its obligations under the Agreement;

Termination by concessionaire for authority's default

The Authority will need to appreciate that the Agreement will impose obligations on it and the Concessionaire will rely upon the performance by the Authority of those obligations. Common breaches by Authorities have included failure to make concession support payments, failure to release assets when contracted to do so and the like. Further, where either or both receivables are to be adjusted for inflation and funding is expressed in currency other than that of the host country and receivables are to be adjusted for currency fluctuations then any interventions by the Authority to prevent this from happening will have a serious adverse effect.

Therefore, the Agreement should also list the events that should constitute 'Authority Default, on a basis similar to that relating to the Concessionaire. The list may include the following:

- Expropriation, compulsory acquisition, or nationalization by the Authority of the Concessionaire or the rights of the Concessionaire under the Agreement;
- Removal of a consent required for the Concessionaire to perform under the Agreement ;and
- Any material breach by the Authority of any of its obligations under the Agreement, after notice from the Concessionaire, giving reasonable details of the breach and demanding remedy thereof.

Termination for non default

The Agreement should provide for termination in the event of prolonged Force Majeure or where the parties are unable to reach an agreement on the occurrence of an event of Political Force Majeure. (As indicated earlier, in some jurisdictions, courts may, through legislation, impose a solution on the parties.

Termination procedure

The party seeking termination should serve Notice of Intent to Terminate and set out the grounds on which it seeks to terminate. If grounds are based on an event of default that can be remedied, then the defaulting party should be given an opportunity to do so, or to put forward a program to do so. Specific time periods for each step should be set out in the Agreement.

Following the delivery of a Notice of Intent to Terminate, if the default has not been remedied or a program for remedy agreed upon, then the Non Defaulting Party that served the notice should be permitted to serve a Termination Notice

Effectiveness of a termination notice

The Agreement should state the minimum time period between service of the Termination Notice and the Date of Termination.

Other remedies

The exercise of the right of a Non Defaulting Party to terminate the Agreement should not preclude that Party from exercising other remedies provided under the Agreement. However, the Agreement will often include an 'exclusive remedies' clause that will limit the right of either party to remedies under the Agreement, rather than generally at law, and there may well be exclusions for what are sometimes loosely referred to as 'consequential losses' but might better be referred to as 'indirect losses', including opportunity costs.

Rights and obligations on termination

There are two approaches to termination. First, termination can occur under the Agreement, in which case those provisions that are to remain in effect, such as Confidentiality, Dispute Resolution, and provisions relating to post termination financial adjustment, such as compensation payments must be listed. Second, ter-

mination can occur because the Term under the Agreement expires or is prematurely reached. In this case, the obligations of the parties are abolished in relation to the concession, but remaining obligations stay in force. The approach will in part be impacted by host country law.

Post termination

The Concessionaire should release control of Concessioned Assets in accordance with the Hand Back procedure, unless and to the extent that it is intended, that the Concessionaire may keep certain assets. Whether the Concessionaire should receive compensation, in what circumstances and how much, will depend on what the market will accept at the time of bidding for the concession, and the law of the host country.

In essence if termination is due to Authority Default, compensation should be sufficient to repay Funders, including all unwinding costs, repay equity capital, pay the unwinding costs of then-existing contracts, the costs of demobilization and a payment towards future dividends on shares lost as a consequence of early termination.

Where the Concessionaire is in default, a practical measure would be to offer the residue of the concession on the same terms as the original concession and, after payment of the Authority's expenses, to pay the balance to the Funders of the Concessionaire. This works only where there is a liquid market—a sufficient number of companies willing to bid for the replacement concession and sufficient Funders prepared to lend money. The worst position for the Authority is that it must pay off Funders in full, plus part of the equity or share capital. A midway position is possible in jurisdictions that allow an entitlement to compensation if the concession relates to a public service. The courts will establish compensation if it was not agreed between the parties, although this will not reassure Funders, because the process of resolving disputes on value at law is typically prolonged.

On the occurrence of an event of Political Force Majeure the Concessionaire would expect repayment of Funders, return of equity, and costs of demobilization.

On Force Majeure, the Concessionaire would argue, as a minimum, for repayment of debt although it does not succeed in all jurisdictions. See issue of power of the courts in section 2.16 under the reference to Force Majeure.

Expiry of term

On Expiry of Term, the Concessionaire should surrender the concession, release control of the Concessioned Assets to the Authority, and at the option of the Authority, sell to the Authority other of the Concessionaire's assets.

2.25 Hand Back

There are various methods of effecting Hand Back; some of these reflect the nature of the concession granted, such as whether ownership transfer occurs at the end of the Term or when Concessioned Assets are created. Hand Back is greatly influenced by host country insolvency law and whether, if the Concessionaire were to be insolvent, the assets can be retained or obtained to carry on meeting the public service obligation, if such obligation exists. Whatever the legal mechanism

adopted, it is suggested that within a stated period or other time period agreed by the parties, of the inspection carried out under section 2.20, the parties should meet and agree on the processes based upon the Hand Back Procedure. The headings for these items should appear as a schedule to the Agreement, and might comprise the following.

- Works to be carried out to ensure that Concessioned Assets comply with requirements on the Hand Back Date;
- Subsisting contracts and whether they are to be cancelled or assigned to the Authority;
- Inventory of items included in the scope of Hand Back Assets;
- All the Concessionaire's assets and details on whether such assets are to be removed or transferred to the Authority, and the terms of such transfer in accordance with the respective terms and conditions of terminations under the Agreement;
- Employment, transfer or redundancy of employees;
- Training and testing procedures for personnel designated by the Authority to ensure the independent operation of the Concessioned Assets by the Authority;
- Concessionaire's rights and obligations that expressly survive termination or expiration of the Term;
- Any other details and procedures in respect of the scope of Hand Back.

Scope of hand back

On the Hand Back Date, in accordance with the Hand Back Procedure, the Concessionaire should release or transfer to the Authority the following:

- All of the Concessionaire's rights, title and interest in the Hand Back Assets, free and clear of encumbrances and claims of whatever kind or nature;
- All Concessionaire rights to use, possess, or access Concessioned Assets;
- All operation and maintenance manuals, design drawings, and other information as may be reasonably necessary, or as may be reasonably requested by the Authority to enable it or its designee to continue operation of the Concessioned Assets;
- All unexpired guarantees and warranties from sub-contractors and suppliers, and all insurance policies including claims, awards, and adjustments;
- Individual and collective employment agreements, medical and pension schemes, and other labor relations obligations;

- All technology and know-how related to operation and maintenance of the Concessioned Assets as may be necessary to enable the Authority or its designee to continue to operate Concessioned Assets.

Other hand back issues

The Concessionaire should cancel or assign to the Authority, as set out in the Hand Back Procedure, any operation and maintenance, equipment, supply or service agreements and any other agreements held by the Concessionaire and subsisting at the time of the Hand Back Date.

The Authority ought not to be liable for any cancellation costs arising thereby, and therefore should be indemnified and held harmless by the Concessionaire in respect of the same.

The Concessionaire, at its own cost and within a specified number of days after the Hand Back Date, might reasonably be required to remove, or take reasonable steps to remove, all those assets non transferrable to the Authority.

Remedy of defects after the hand back date

If, within a specified number of days of the Hand Back Date, the Concessionaire fails to comply with or complete any item of the Hand Back Procedure, then within a further specified number of days of the Hand Back Date, the Authority will require a remedy and therefore should be entitled to give notice detailing the Hand Back Failure, and requiring the Concessionaire to remedy the failure within a reasonable specified time. The Concessionaire should at its own cost, remedy the Hand Back Failures.

If the Concessionaire refuses or otherwise fails to remedy the Hand Back Failure within the specified time, the Authority itself should be entitled to remedy the Hand Back Failure, and to recover costs and expenses from the Concessionaire, whether under the bond or otherwise.

Due diligence as part of the performance studies will reveal the incidence of transfer fees and charges including stamp duty, registration fees, transfer tax, and the like. The Agreement should stipulate who should bear these.

2.26 Assignment and Other Dealings

Over the course of a long-term contract, the identity of the Authority, the Concessionaire, or the Funders may change to some extent. The shares in the Concessionaire may be bought and sold, loans may be refinanced, or Funders may syndicate, sub-participate, or create derivatives out of existing loans. Each of these steps may impact upon the other parties and change the commercial and other pressures that might be assumed to have existed at commencement of the Term. This should be recognized at the time of negotiating the Agreement, and an appropriate balance struck that allows some flexibility for any appropriate changes, but provides the parties with sufficient comfort about the identity and/or creditworthiness of their counterparties.

Restrictions on the concessionaire

The Agreement should not allow the Concessionaire to assign, novate, or transfer its rights under the Agreement, except as part of the Senior Lenders' security package. If a replacement Concessionaire is appointed by the Senior Lenders, where they have such rights under a direct agreement between the Authority, the Funders, or the Funders' agent and the Concessionaire, then the Agreement should permit the original Concessionaire's rights and obligations to be transferred. Further, restrictions may exist to shareholders' rights to dispose of shares or any economic interest in shares; such restrictions may stipulate a period of time, or stipulate conditions that might bring about a change in control. Where it is appropriate to include such a provision in the Agreement, then the wording and thus the restriction must extend to any beneficial or other economic interest in those shares, and may need to embrace ultimate or intermediate holding companies and subsidiaries of the Concessionaire, particularly where the subsidiaries are carrying out a major function in relation to the concession.

Restrictions on the authority

Bearing in mind the importance of Authority financial strength, it is reasonable for the Agreement to disallow the Authority to assign or transfer its rights or obligations under the Agreement without Concessionaire consent, except if transfer takes place under legislation or is required to facilitate public sector reorganization. However the creditworthiness of the public sector party must not be damaged as a consequence.

Changes in financing

It may be that if the Concessionaire can refinance at lower rates, the potential gain in profitability will be counterbalanced by the Transport Regulatory Commission, which could reduce the tariffs otherwise payable to the Concessionaire. If the host country's law renders this unlikely, then the Authority should consider whether it should share benefits of refinancing gains. Very careful drafting will be required if issues become more complex, for example, that refinancing gains could be taken at a higher level, e.g., at a holding company level.

In addition, if the Authority is commercially, as opposed to contractually, relying upon Senior Lenders to act as a controlling influence on the Concessionaire, because Senior Lenders will be paid only to the extent that the Concessionaire performs, then the whole issue of syndication, sub-participation, and particularly the creation of derivatives, needs to be considered.

2.27 Intellectual Property Rights

To be able to operate the Concessioned Assets under emergency circumstances, or on expiry or termination of the Term, the Concessionaire should grant to the Authority an irrevocable license or sub-license to use the intellectual property rights relating to the renewal, maintenance, or operation of those assets. The Authority should itself be permitted to grant sub-licenses to subsequent Concessionaires or operators.

If the Concessionaire is also a train operator, the Authority may require licenses to use processes for operational systems used in the delivery of freight services. If this is proprietary software, then following expiry or termination of the Term, it is likely

for those processes to be required until a new Concessionaire or operator has been appointed, and has had an opportunity to introduce its own systems.

2.28 Payments

Provision should be made for payments and timing of payments, such as when they would otherwise fall due on a public or banking holiday.

In the event of a failure to make payment by the due date, compensation should be paid. The Concessionaire will be borrowing funds; any interest payable to the Concessionaire should represent its costs for lack of punctual payment. However, the rate of compensation should not be such that the Concessionaire has an incentive to delay paying the Authority because compensation represents a cheaper alternative under the Agreement than borrowing. Thus the rate of interest for late payment should be linked to fluctuating costs for funds.

2.29 Proper Law and Language

In most Host Countries it is accepted that the law controlling the Agreement will be the law of the host country.

As to the language, the costs of international bidders and their Funders will be substantially reduced if translations are not required; therefore English, French or Spanish have advantages; typically, English is the most universal. However there may be political or cultural reasons that this is unacceptable.

2.30 Dispute Resolution

Except and to the extent that economic, standard-of-service, or safety issues may be dealt with under law by a regulator, in effect, there are three main ways of resolving disputes arising under the Agreement, namely expert determination, arbitration, and litigation. Whether two out of three ought to be used depends upon host country law. In some jurisdictions, no mechanisms exist to recognize an expert determination as final, binding, and enforceable. In other jurisdictions, the courts will intervene in arbitration, or when registering an award for enforcement the courts will accept a rehearing of the issues. In some jurisdictions, concessions will fall within administrative law; therefore, disputes arising under or in connection with the Agreement would have to be referred to the Administrative Courts.

Among reasons *not* to use the courts is the caliber of the judiciary. Concessions are complex, as are the agreements relating to granting them. There is a risk that the judiciary will not fully understand commercial and other issues involved; or there could be corruption within the court system, delays in processes and hearings, and the risk of numerous appeals. Another key issue is how long it may take to go through levels of the courts to reach a final decision.

The Concessionaire and its Funders will want to determine whether potential exists in the host country for the Concessionaire to apply for a judicial review in circumstances where the regulator makes a decision that would adversely affect the Concessionaire, and the decision is deemed unreasonable.

International investors and Funders will be influenced by the potential for satisfactory dispute resolution through arbitration. Therefore whether the host country is a signatory to the New York Convention on the Enforcement of Foreign Arbitral Awards, ICSID (International Center for Settlement of Investment Disputes) or other regional conventions becomes important.

As a condition precedent to launching any dispute proceedings, it may be useful to require a meeting between the Authority senior administrator and the Concessionaire chief executive officer who should be given a short period of time to resolve the issue. At a minimum, the requirement to meet ensures that senior officers must seek to understand the issues and the approach of their counterparts before embarking on an expensive dispute. As a corollary to this requirement, pre-reform process training within the Authority needs to emphasize that administrators should take decisions proactively rather than hiding behind the pretext that the decision was forced upon the Authority because of a finding under the Disputes Resolution Procedure.

Expert determination, where this is an option, can be valuable in settling technical disputes, e.g., if the dispute relates to construction or operational issues. In some cases, a permanent disputes resolution panel has been established for the construction phase to expedite resolution of technical disputes during construction. In other cases, financial disputes have been referred to a panel of financial experts.

From the Authority's perspective, any disputes are strictly between itself and the Concessionaire, not involving third parties. From the Concessionaire's perspective, involving third parties such as its own contractors is advantageous, particularly if it seeks to pass its liabilities down to those contractors. However, if dispute resolution involves a three-person arbitration panel comprising one appointee from the Authority, one from the Concessionaire, and an umpire, a joiner of proceedings is impractical because contractors would not have a representative arbitrator. Therefore, if dispute resolution deals with more than two parties, a single arbitrator is the best solution.

2.31 Boilerplate

The Agreement will require several standard terms to address issues such as the service of notices, whether the Agreement represents the entire agreement or if there are a series of contracts, and a provision to preserve the Agreement in the event that a provision is found to be illegal, and the like.

Annex 5
Passenger Service Contract Guide

1 Introduction

Before drafting a Transport Services Contract, some form of gateway procedure should have been adopted that would include a thorough feasibility study, a review of options, and a continuing assessment of value for money at particular stages of the procurement process, including before the process commences and immediately prior to execution of the Transport Services Contract, as is indicated in the body of the Toolkit.

A key difference of approach between civil law and common law jurisdictions is the interpretation by the judiciary of Transport Services Contracts between what was written and what was intended. Under civil law, Transport Services Contracts need not set out what is already included under the civil code. These points were also highlighted in Annex 4, Introduction to the Guide for a Concession Transport Services Contract.

1.1 Purpose

The three main objectives of a Transport Services Contract are the following:

- Promote understanding of the main responsibilities and risks undertaken by parties to the Transport Services Contract;
- Specify service levels to be delivered by the private sector and the flow of payments from the Passenger Transport Authority (PTA) to the Contractor without extended negotiations;
- Establish consistent approach and pricing among bidders in any competitive tendering procedure following the introduction of the reforms.

1.2 Key Factors

This Guide was developed for application to passenger transport services and assumes that the contract will be let by a Passenger Transport Authority (PTA), which could be a government ministry or a separate national or regional entity. This may give rise to the need for a government guarantee if the PTA is not an arm of government and if the PTA payment flows in favor of the Contractor are likely to be substantial.

The simplest form of Transport Services Contract (TSC) would be based on the Contractor operating and carrying out light maintenance on public sector-provided assets. Contractual matters become more complex if some or all of the assets are supplied by other private sector entities (see Annex 4, Concession Guide) or

state or municipal-owned corporations or similar distinct legal entities. Mechanisms will be needed to address interfaces between the Contractor and those other entities because they are not party to the TSC. For example, the private sector might supply rolling stock on a 'finance-and-maintain' basis. Does this mean the Contractor will have access to maintenance depots to carry out cleaning services? If the private company supplying the rolling stock is contractually tied to the public sector and not to the Contractor, and carries out external cleaning under the supply contract, the Contractor could not be held responsible for key performance indicators in relation to the quality of external cleanliness because it is out of Contractor control. However, a contractual relationship between a rolling stock company and the Contractor could allow the Contractor not only to enforce its rights against a rolling stock company that fails to comply with cleanliness standards, but also recover penalties.

Punctuality is a primary passenger concern. However, if a separate legal entity supplies Below Rail Infrastructure Services to either or both the PTA and the Contractor, key performance indicators for punctuality must reflect that delay may be the result of actions unrelated to the Contractor. Issues will also arise in relation to passenger access to stations if the stations are operated by an entity other than either or both the PTA and the Contractor. In addition to punctuality, passengers are concerned about overcrowding, but to manage passenger density, the Contractor would need to have control over the assets required to address overcrowding. Also, there is a knock-on effect from overcrowding because it affects punctuality. Another consideration in relation to punctuality is passenger type; for example, if the service includes airline passengers, additional dwell time will be required—first, for handling luggage, and second, because many passengers will be unfamiliar with their surroundings.

Other issues that may need to be addressed include the following:

- Who is responsible for ticket sales? Do the tickets extend to other transport services besides those for which the Contractor is responsible?
- If the Contractor has some responsibility for revenue protection, which fare categories will be discounted? (e.g., children, military, seniors, students? Also, off-peak or weekend fares?)
- How will revenue be collected? Through stored-value cards or similar? Who is responsible for fare system administration?
- Will a specified proportion of the fare box be retained by the Contractor?
- Does the PTA specify all the services? Is the PTA purchasing a minimum service level freeing the Contractor to supply any additional services that are commercially viable?
- Who benefits from advertising revenue? Are approvals required for display advertisements?
- Will the Contractor require a train operator's license? Is there a separate safety regime?
- How does the Contractor interact with the Regulator(s) under a separate safety regime?

- Who is responsible to timetable trains? Who issues timetables to the public?
- If the state of infrastructure and rolling stock affects fuel consumption, and the Contractor has responsibility for neither, how will fuel costs be addressed?
- How will requests for changes to scope or delivery of services be addressed?
- What is the responsibility of the Contractor regarding the following?
  - Resource use optimization: optimal scheduling for rolling stock;
  - Skill-based planning: scheduling drivers and crews with regard to their skills, certifications, and knowledge of route and traction;
  - Balance assignments: reducing the number of empty trains; ensuring crews end shifts at their home depots;
  - Employee preferences support: increasing employee satisfaction, retention, and efficiency;
  - Daily operational control: ability to handle real-time disturbances and schedule changes;
  - Safety: Contractor employees may require first aid training, including defibrillator use. Dealing with issues such as suicides may depend on who is in control of the infrastructure and whether station staff are engaged by the Contractor;
  - Security: third parties such as transport or railway police may affect this;
  - Universal access: improvements to infrastructure and equipment to enable access for all, regardless of physical ability, may be the responsibility of the PTA or other third parties; and
  - Reporting and data management: collating and disseminating accurate data to improve decision-making.

Responses to these issues will be reflected in any contract but a solution does not imply that one structure is inherently preferable. Instead, the best solution will be derived from analysis carried out as part of the reform process.

2 The Guide

2.1 Parties

In this Guide the public sector party granting concession rights is referred to as the 'PTA' and its counterpart as the 'Contractor'; overall services to be delivered are referred to as 'Services'. The agreement between the PTA and the Contractor is referred to as the 'Transport Services Contract' (TSC).

In some jurisdictions, the bidder may be a consortium and the Contractor created only just before or just after the TSC is signed. If the Contractor was created just after, the TSC should provide for itself to be assigned or novated to the new company before the contract becomes fully effective.

2.2 Recitals/purpose

The document format will reflect to a degree what is customary in the Host Country. These provisions will describe the PTA and its mandate, the proposed service arrangements, and may include a brief description of the bidding procedure and outcome, namely the appointment of the Contractor.

2.3 Definitions

Some jurisdictions set out the interpretation of contracts and other legal documents in legislation. To the extent that this is not provided for, the interpretation of expressions and the meaning of defined terms should be set out in the TSC.

2.4 Conditions Precedent to the Effective Date

Most TSC provisions will not come into effect until specified requirements have been met. This provision will specify these key requirements (conditions precedent).

Some key requirements may be regulatory, such as acquiring a train operator license and safety approvals.

Others key requirements may be more technical, for example that each party must obtain all necessary authorizations to be bound by the TSC and legal opinions that the authorizations have been properly obtained.

Issues relating to transfer of personnel to the Contractor may need to be addressed, as will procuring insurances for property, employer liability, and from the state perspective, the more important third-party liability cover.

If the Contractor is to procure the issuance of a performance bond or similar, the timing for bond issue should be dealt with under Conditions Precedent; and the provisions for obtaining bonds may be set out elsewhere (see Bonds post).

Where the Contractor will enter into agreement with others, e.g., track access, station access, rolling stock supply, and the like, these agreements should be completed.

The Contractor may be required to produce specific plans to which it will have to adhere for developing passenger services or improving services; the first set of these should have been submitted and agreed.

Provision will be required for a cut-off date by which time conditions must be either achieved or waived (where feasible); including specifying consequences of failure by either party. In case of Contractor failure, if the tender documents have so provided, it might be appropriate for the PTA to call the bid bond.

2.5 Service Period

The TSC must specify the length of the Service Period or its duration. The duration should reflect all relevant matters and examples are set out below.

The PTA will wish to specify a duration that is expected to result in the best value-for-money solution. Factors to be taken into account when deciding on the duration of the Transport Services Contract will include the following:

- The mechanism for dealing with cost inflation and the balance between the advantage of competitive tendering of the contracts for Transport Services in controlling costs, against the disruption and costs incurred in tendering for a replacement contractor;
- The possibility of further reforms that might significantly change the approach to the rail system, or the delivery of transport services;
- The affordability of Transport Services for users and for the PTA;
- If the PTA or others are executing major refurbishment or asset renewal programs, how efficiencies thereby created can best be reflected (if at all) in an adjustment to the cost and payment structure under the TSC.

2.6 Transport Services

The assets to be supplied by the PTA or by others nominated by the PTA should be identified, as should the basis on which they are to be supplied. As indicated in item 1.2 above, if these assets are to be made available by third parties and the Contractor is to enter into agreements with those third parties, then the basis of those agreements should be set out and the Contractor will agree to enter into those agreements. The Contractor should also agree not to amend those agreements without the consent of the PTA.

The Contractor should have a period of time to inspect the assets and if finding them damaged or otherwise materially impaired, should give notice to the PTA, or if assets are supplied by a third party, give notice to that third party. The TSC should address timing for carrying out remedial work or replacement, and the effect on contract terms while remedial work or replacement is carried out, or the consequences of delay or failure to do so.

The routes to be taken over by the Contractor should be identified, as should the service frequency, or minimum service frequency, and the timing of the first and last service on each route, if the service is not 24/7 operations.

The Passenger Services Contract should specify who is responsible for timetabling. Even if the PTA is responsible, it would be sensible to include a mechanism for Contractor inputs to the process. For example, if a proposed change would adversely impact upon load levels, other key performance indicators, or a class of passengers, proposed changes should be subject to counter-notice and resolution. If a change is imposed upon the Contractor, then any additional costs incurred should be recoverable as a Change in Service. (See item 2.19 post.) The minimum period between setting a timetable and implementing the timetable should also be stated.

The Transport Service levels and key performance indicators should be described. If improvements to assets or services supplied to the Contractor by the PTA, or other parties nominated by the PTA, are required, provision should be included for those improvements. If improvements are not carried out, the Contractor should be relieved from any requirements to meet increased service levels or key performance indicators to the extent that the failure to do so resulted from improvements not being carried out, as envisaged under the Transport Services Contract by the PTA or other third party.

Special service regimes for specific events such as sporting fixtures, national or regional festivals, and the like should be agreed. The definition of a Special Event will depend on the expected number of people per hour travelling to or from an event and the capacity of the system, and should take into consideration that spectator departure density is typically higher than arrival density. Issues that will need to be addressed include crowd surge control, security, and health and safety. It may be sensible to create a forum involving venue management, police or other law enforcement, the local authority, and other transport providers that may be affected by the mass movement of spectators. Provisions should include agreements to extend running times (if not 24 hours) if an event is scheduled to continue past normal hours of operation, and a strategy to deal with incidents and accidents.

The Contractor will need flexibility to deal with increasing ridership. However, flexibility is directly linked to the degree of control the Contractor is able to exercise over the infrastructure and equipment. Load control will be impacted by length of stations, which, together with the kinetic (clearance) envelope, will determine maximum train length, the number of available train paths at peak periods, and the capacity of seating/standing areas in any carriage. During peak periods, if the number of passengers trying to enter a carriage exceeds the permitted number, the Contractor will need to take steps to limit passenger influx, which will depend upon the configuration of stations and platforms. Nevertheless, responsibility for load control should be placed upon the Contractor, although the measures adopted will depend upon the available facilities.

As will be seen from the above, key performance indicators must reflect both the actual ability of the Contractor to control the quality of passenger services, and the PTA transport delivery objectives. Key indicators of passenger perception of service quality are delivery punctuality, crowding, and cleanliness. A bonus and penalty regime can be developed and linked with key performance indicators, but the Contractor should be exempt from any penalties if the reason for failing to meet a key performance indicator is outside of Contractor control.

If the TSC includes maintenance and cleanliness, these can be regulated either by establishing periods within which the service must be carried out, or by specifying desired outcomes. In relation to key performance indicators for cleanliness, an interesting subset is the presence of graffiti, since the Contractor's ability to remove graffiti, and the speed of removal, will depend upon the surfaces in question.

2.7 Passengers

Key performance indicators will be linked to customer or passenger satisfaction. The Contractor should either issue or subscribe to a charter that specifies passenger rights and obligations; the charter should be publicly available. This charter would supplement any regulations that are issued periodically to govern passenger behavior, which, when breached could result in criminal prosecution, for example, riding on the outside of a carriage. The charter scope and any amendments would be agreed with the PTA.

It is desirable to establish a regime to deal with passenger illness, including defibrillators if they are installed, and this could be included in the charter. The regime should specify the number of staff with first aid qualifications that should be available, their locations, and protocols for dealing with passenger illness, including liaising with the emergency services.

The passenger charter should deal with the issue of universal access—for luggage, pushchairs/strollers, guide dogs, and passengers with physical mobility limitations, depending upon the layout of stations, platforms, and carriages. The charter should specify circumstances under which passengers may claim compensation from the Contractor, or seek ticket refunds.

The charter should set out a regime to handle passenger complaints and any appeals procedures for passengers to pursue redress for unresolved grievances.

There should be simple procedures to deal with lost/found property, and related reports and inquiries, and a single contact point for passengers seeking to recover lost property.

Passenger surveys should be considered as a means to contribute to service delivery evaluations. Who should carry them out? What results are considered satisfactory/ unsatisfactory? Who is responsible for areas of satisfaction/ dissatisfaction?

2.8 Disability and Discrimination

The Contractor should prepare and implement an agreed plan for addressing disability and discrimination issues in relation to passengers and staff, in addition to issues dealt with in the charter. At a minimum, the plan should meet current legislated requirements, but may cover any criteria identified by the PTA during the bidding procedure. During the period of the Transport Services Contract, any upgrades to standards in relation to universal access should be addressed as a Change in Services; any capital costs incurred in the change of assets or equipment should be met by the PTA, or their nominees responsible for the supply of the asset or service.

In the event of an adverse departure from the plan, the Transport Services Contract should specify sanctions to be applied against the Contractor, in addition to any criminal liability that the Contractor may have, except if the adverse departure occurred under circumstances outside Contractor control.

2.9 Disasters and Disaster Recovery

If several entities are involved in delivering railway passenger services it is sensible to have a joint disaster recovery plan that establishes duties for each entity, including the Contractor, in the event of disaster or a real and immediate threat. The plan should be reviewed regularly and exercises carried out according to an established schedule. The TSC should impose on the Contractor, obligations in relation to a disaster that are commensurate with the services that the Contractor will supply, and the obligations it will undertake pursuant to the Transport Services Contract.

2.10 Fares and Fare Box

At a minimum, the Contractor should improve Revenue Protection to reduce the number of unauthorized, non fare-paying passengers. How the Contractor achieves this depends upon the revenue collection methodology.

If the Contractor is responsible to either or both collect or protect revenue, the TSC should specify discounts to be offered. If the Contractor benefits from collected revenue then any change to the scope of discounts that would reduce Contractor revenue should be dealt with as a Change in Services.

The TSC should define whether all fares are prescribed or whether the Contractor is entitled to set any fares. The Contract should also clarify whether the Contractor is to retain any collected revenue or if all revenue should be paid into a designated account and held for distribution to one or more entities—a system often referred to as a 'locked box' because fare revenue never appears in Contractor accounts.

The TSC should define the mechanism and procedure to adjust fares. If the Contractor benefits from fares and those fares are reduced, this should be dealt with as a Change in Services, except if reductions are agreed compensation for the Contractor's default.

If a passenger commits an infringement of fare regulations, the PTA should cover the costs incurred by the Contractor for issuing summonses against fare defaulters for court appearances, plus costs related to appearing in court proceedings to recover the fares, unless the Contractor is entitled to retain a substantial part of the fare revenues.

2.11 Stations and Property

Where the Contractor is responsible for maintaining the Stations during the Service Period, the Contractor should keep clean not only the station premises but also the associated car parks and cycle storage areas, depending upon Station locations.

The scope of services in relation to stations should have been set out in the tender documents and the Contractor given an opportunity to price. Maintenance stand-

ards should then be incorporated in a schedule to the TSC; failure to maintain specified standards should be governed by the bonus and penalty regime. Further and by way of example, as a public safety issue, maximum allowable periods should be specified for restoring to service a malfunctioning light source in public areas. If standards are raised during the Service Period, changes should be dealt with as a Change in Services.

The TSC may specify the number of staff, job descriptions, and hours of availability that Station personnel must be present in any given location during the working day.

The Contractor may be required to set out a maintenance plan for stations and premises; periodically, agreement with the PTA on this plan should be renewed. The plan may be part of a wider systems maintenance plan to allow all required system renewal and maintenance plans to dovetail, including plans for Below Rail Infrastructure rolling stock, stations, and the like. Therefore, Contractor failure to meet obligations for systems maintenance plans may incur financial losses or increased costs for those responsible for other parts of the system; the bonus penalty regime should reflect the consequences of any failure. Delays to the Contractor caused by others could be dealt with under Changes in Service, or under the respective third-party contract.

The Contractor may be required to develop a quality assurance procedure in accordance with the proposals submitted by the Contractor at the time of tender. The TSC should set out the acceptance procedure to create control documents and the bonus penalty regime should specify consequences for failure to produce documentation, or failure to adhere to control documentation.

If the Contractor is to provide certain key equipment, the supplier or suppliers should be identified in the TSC, or a list of prospective suppliers could be agreed and set out in the that contract, allowing the Contractor to negotiate the best value with listed suppliers. The PTA should have the right to use key equipment upon expiry or earlier termination of the TSC, but whether the PTA should pay to acquire ownership would depend upon the nature of the equipment and whether the Contractor was fully reimbursed for its cost under the payment mechanism in the TSC.

2.12 System Contracts

The reform process should have considered whether the Contractor should be required to enter into contracts (System Contracts) with third parties who supply assets or services in connection with the Transport Services, such as rolling stock, Below Rail Infrastructure, and the like. A key issue is any potential losses that the Contractor may suffer if the terms of those agreements are breached, and whether it would represent value for money if the Contractor priced for the risk of those potential losses. Among issues to be considered is the level of financial security required by counterparties to those agreements, bearing in mind that the Contractor will have few assets, and whether it would be cost-effective for the Contractor to procure a performance bond to the requisite level.

System Contracts could be assigned or novated to the Contractor or entered into anew by the Contractor. In addition, contracts could range from an agreement to

cooperate, to a fully fledged agreement such as a track-access agreement for Below rail Infrastructure, which may require the Contractor to agree, under the TSC, not to substantially amend a Systems Contract, and not to amend if the amendment would remain in effect after the end of the Services Period, without the consent of the PTA. Further, when cost-effective to do so, the PTA may ask the Contractor for an indemnity in respect of all claims, expenses, and losses that might flow from any breach by the Contractor of obligations under the Systems Contracts.

2.13 Fees and Other Remuneration

The Contractor will require revenue commensurate with the scope of the services it supplies, and the scope of the obligations it undertakes pursuant to the Transport Services Contract and where relevant, under the System Contracts.

The TSC should define whether the Contractor keeps in its own right a substantial part of the fare box and other generated income such as from advertising (because the Contractor may have bid based on a PTA topping-up payment or subsidy) or whether PTA will supply a revenue stream sufficient to cover Contractor costs and profit (because the Contractor may have bid based on the amount of the Service Payment).

If the Contractor relies little on the fare box for revenue, it can become out of touch with passengers, so customer service standards should be securely linked to key performance indicators and bonus penalty arrangements should be elaborated in the TSC.

The Transport Services Agreement should include a provision for receivables to be adjusted in case of inflation, and should include incentives for the Contractor to seek efficiency increases in operations.

2.14 Bonds

As indicated in item 2.12 above, the Contractor will add the cost of any bond or bonds to total costs, which it will then seek to recover from the PTA or out of fares (if relevant). Using a bid bond in the context of a negotiated bid can be difficult. The bond supports only bidder commitment to enter into a contract based upon its bid. However, if there are negotiations, the original bid will be superseded by a new negotiated bid, which, arguably, renders the bond unenforceable. To avoid this, negotiations could be conducted with multiple bidders; they are asked to submit 'best and final offers' each supported by a bid bond. Another option is to hold discussions during the prequalification or pre-bid stage and ask for bids with bid bonds on the basis that the PTA will countersign the winning bid, which then becomes the Transport Services Contract. Either way, the bid bond should be extended to cover achievement of 'Conditions Precedent' to Transport Services Contract effectiveness.

Depending upon Service Period length, but assuming a relatively short time, and considering the lack of Contractor assets, it may be prudent for the performance bond to equal the life of the Service Period.

2.15 Standards

The Contractor should assume responsibility for training all staff and for meeting all accreditations that may be required, particularly among drivers and any other staff responsible for the interface with control and signaling procedures.

The Contractor should provide details of its program and procedures for staff recruitment and training, and the continuous training of existing staff, for acceptance by the PTA and any relevant Safety Regulator.

The Contractor should also meet all safety requirements. Provisions will depend upon the state of the host country's safety legislation. If the Contractor must gain approval for safety arrangements, e.g., safety case as a Track Access Holder or Track Access Applicant, this should be addressed in the relevant Systems Contract, or in the TSC to the extent that it is not covered by legislation.

2.16 Insurances

During the reform process, attention should be paid to insurance cover. Under the TSC, it may be sensible to require the Contractor to take out insurances common to any prudent business undertaking; some of these may be a legal requirement, such as workers' compensation. However, if insurance for Below Rail Infrastructure is being borne by an Infrastructure Provider, does it make sense for the Contractor to duplicate cover for the same asset? Advice should be obtained from a competent insurance broker.

Other insurances are more important from the perspective of the PTA, particularly if the PTA is paying for Contractor services. These include the following coverages:

- Contractor-occupied infrastructure ;
- Third-party liability;
- Business interruption cover is essential to a prudent Contractor to make up for a loss of revenue that may be caused upon the occurrence of an insured peril. However, if a third party insures an asset, business interruption cover, which is usually a parasitic cover, might be carefully reconsidered because the Contractor would need an insurable interest in the asset in question.

The period and amount of specific covers should be stated and the PTA should be a named insured.

The Contractor should be required to provide the PTA with an insurance broker's letter of confirmation that the broker will notify the PTA if, prior to renewal, there is any indication that cover will not be renewed, or that renewal will entail onerous conditions.

Current Insurance Certificates should be produced to the PTA; if the Contractor fails to take out key insurances, the PTA should be able to take out the insurance and recover the premia from the Contractor.

During the reform process, the question of non availability of insurance requires consideration. If insurance cover is unavailable in the market, or available only at commercial premia, except through any act or neglect of the Contractor, the PTA has several options.

- Should the PTA be able to allow the Transport Services Contract to continue at the time of the non availability, to assume the risk itself for as long as cover is unavailable? Or should the PTA terminate the TSC, treating the non availability as a Force Majeure Event?
- The PTA must focus on what is at risk by allowing there to be no cover. There is a straight forward risk of claims by third parties if there is third-party liability, because the PTA will be seen to have deeper pockets than the Contractor. There is a risk to the economy if there is major property damage and the Contractor has no funds to put it right, thereby delaying passenger movement.
- There is also the reality that the Contractor has few assets and would have difficulty meeting any substantial non insured loss or damage.

There should be a requirement that the insurance policy shall include a cross liability clause such that the insurance shall apply to the PTA and the Contractor as separate insured and waivers of rights of subrogation.

The Contractor should be required to apply or procure the application of the proceeds of any claims in a specified manner, which avoids the possibility that the Contractor might take the money and ignore the Transport Services Contract, although the existence of a performance bond should be a deterrent.

2.17 Liability and Indemnities

The Contractor should assume all liability as regards the PTA in relation to the operations under the Transport Services Contract (other than and to the extent that the PTA or those for which it is responsible caused the loss or damage).

If there is damage to third parties, which would include passengers or their property, the Contractor should indemnify the PTA against claims by third parties, other than and to the extent that the PTA or those for which it is responsible caused the loss or damage. The Transport Services Contract should also specify how to handle legal and other processes arising from such claims.

2.18 Environmental and Other Conditions

The PTA should remain liable for any pre-existing hazardous waste and, where there is a requirement under the law to remove it, then the PTA should bear the cost of remediation. All subsequent environmental pollution arising from any Contractor act, neglect, or default should be at the risk of the Contractor.

The law of the host country should preclude claims by third parties arising from the usual noise and vibration emanating from the railway as a result of its usage in accordance with Good Industry Practice. Whether the Contractor should be liable for excessive noise and vibration, i.e., if Good Industry Practice was not applied and the cause of the problem is that either or both the Below Rail Infrastructure

and equipment has not been properly maintained depends upon the scope of the Transport Services. If the Contractor is not responsible for either infrastructure or rolling stock, it should have no liability and should be entitled to an indemnity.

2.19 Intervening Events

Intervening Events are events that impact upon the ability of one party to the Transport Services Contract to perform its obligations or to receive the benefits under the Transport Services Contract. There are many ways to identify and specify the consequences of these Intervening Events. This Guide uses Changes in Service and Force Majeure Events.

Changes in Service are designed to cater for events that arise and are at PTA risk, that result in Contractor loss of income or increased costs, or both. Such events are more appropriately dealt with through compensation than by being declared a PTA Default because termination of the Transport Services Contract should be a last resort in all circumstances. Although, if an event renders the parties' contractual relationship untenable, the PTA may choose to exercise its voluntary termination rights. Increased costs or income loss can arise through the following circumstances:

- Timetable changes
- PTA breach of obligation, which includes a breach or delay occasioned by third parties for which the PTA is responsible
- PTA request for Changes in Services
- Discriminatory or specific changes in law
- Railway sector or other specific events, e.g., a Special Event or occurrence of a Disaster
- Changes in safety regime
- Changes in fares or discounts, if the Contractor receives reimbursement through the fare box
- Changes in staff training standards
- Changes in disability access
- Contractor request for a Change in Service that enhances service delivery that exceeds the level contemplated at tender, and to which the PTA agrees.

If the TSC includes provisions for bonuses and penalties, the Contractor's liability also should be relieved for the period of delay or disruption if and to the extent that it arises from the Change in Service. As to whether the PTA should be entitled to a foregone bonus is more problematical since it is difficult to demonstrate that a bonus would have been awarded had it not been for the Intervening Event. It may be possible for the Contractor to show examples that indicate that the PTA timed the Change in Service to save itself money.

The Contractor should be obliged to use reasonable efforts to mitigate its losses and costs, for example, by rescheduling its own maintenance timetable or by redeploying staff.

Force majeure events

These are events that prevent the Contractor from performing its obligations at any time, for which the Contractor bears the financial risk of increased costs and reduced revenue, but for which it is given relief from TSC termination for failure to meet its contractual obligations to the extent that the Force Majeure Event caused that failure. However, it should be borne in mind that since the Contractor is likely to earn revenue only from Transport Services; any prolonged uninsured loss is likely to result in Contractor insolvency. The circumstances listed below may be outside of Contractor control, but whether the Contractor can recoup lost income will depend upon all circumstances surrounding the railway system, revenue, and capacity, and the extent to which the full burden should fall on the Contractor. Force Majeure Events may include the following:

- Fire, explosion, lightning, storm, tempest, flood, bursting or overflowing of water tanks, apparatus or pipes, ionizing radiation (to the extent it does not constitute a Force Majeure Event), earthquakes, riots and civil unrest;
- Any failure or shortage of power, fuel, or transport;
- Any blockade or embargo;
- Any of the following labor disruptions:
  - official or unofficial strike;
  - lockout;
  - work slowdown;
  - other dispute.

However the Transport Services Contract should specify that the expression 'Force Majeure' should not extend to events that arise directly or indirectly as a result of any willful default or willful act of the Contractor, or any of its contractors or their sub-contractors.

Whether Force Majeure Events should extend to war, civil war, armed conflict or terrorism; nuclear, chemical, or biological contamination (except if the contamination source or cause is the result of the Contractor's actions), pressure waves caused by devices travelling at supersonic speeds, or whether it should be dealt with under Changes in Services, or give rise to termination depends upon the scope of the Transport Services and the expected result at the time of preparing the reform.

Consequences

Where a careful analysis shows that the financial effects of delays and disruption caused by Force Majeure Events should be borne by the Contractor, then no compensation should be paid by the PTA on the occurrence of such delay or disruption.

The TSC should provide that when a Force Majeure Event has occurred and the PTA has been informed, the parties should consult to discuss relevant issues, such as the likely duration of the Force Majeure Event and the action to be taken to mitigate its effects.

In some jurisdictions, the courts have the power to intervene and change contractual provisions to adjust the economic equilibrium, or because the Contractor is meeting a public service obligation, to adjust the Contractor position back to what it ought to have been had the event never occurred. Thus, in those jurisdictions, where the TSC allocates risks in relation to a Force Majeure Event, the courts might, nevertheless, overturn the TSC provisions.

2.20 Preservation of Railway Assets

The following are some commonly expected provisions.

The PTA will have high interest in assets maintenance throughout the Services Period. The Contractor's maintenance requirements for managing physical assets should be detailed in the TSC.

If the PTA reasonably believes that the Contractor is in breach of maintenance obligations under the TSC then the PTA should be permitted to carry out (or procure) a survey of the relevant assets to evaluate asset condition and establish whether the Contractor is maintaining the assets in accordance with contractual renewal and maintenance obligations. Exercising the right to survey the assets may be restricted to no more than once during a specified number of months.

The PTA should provide the Contractor with notification an agreed minimum number of days in advance of the date on which the PTA wishes to carry out the survey. The PTA should consider any reasonable Contractor request to reschedule the survey. When carrying out any survey, the PTA should use or procure the use of reasonable efforts to minimize any disruption to Contractor activities. The PTA should bear any costs associated with the survey, unless survey results reveal a Contractor failure, in which case, the Contractor should bear survey costs, or in the case of surveys on Hand Back be borne jointly. The Contractor should be required provide the PTA, without charge, any reasonable assistance required during the survey.

If the survey shows that the Contractor has failed to comply with maintenance obligations the following consequences could result:

- The regime for penalty points under the Transport Services Contract may come into play.
- The PTA should be authorized to notify the Contractor of required standards for assets condition to comply with TSC obligations.
- The PTA should specify a reasonable period within which the Contractor complete rectification and/or maintenance work.

The Contractor should be required to carry out rectification and/or maintenance work within the specified period and at its own expense.

If the survey is in relation to Hand Back, survey costs should be borne jointly or as otherwise set out in the Transport Services Contract. If the Contractor so requires, the survey should be carried out by an independent expert agreed between the parties. If parties are unable to agree, the Transport Services Contract should include the name of a nominating body to appoint the expert. If the survey finds that additional maintenance work is required to comply with assets standards stipulated under the Transport Services Contract, the PTA should deposit a portion of the TSC periodic payments in an escrow account until the work is completed. The Contractor may be permitted to issue a bond rather than having deductions, but the bond should be callable on demand.

2.21 Temporary Operation

If the Contractor fails to deliver a Transport Service, the PTA may temporarily require the right to procure operation of all or part of those services. The provision should deal with the service of a notice of intent to take over operation, the responsibility for costs incurred in relation to operation, and the allocation of risk, particularly in relation to damage during operation, and the withdrawal of the PTA or its nominee at the end of the emergency.

2.22 Bonus and Penalties

There are many mechanisms for bonus and penalty arrangements. One option may be to allocate points for each key performance indicator and to vary the number of points as a way to indicate the margin by which targets are met or missed, or in the case of failure, the degree of failure.

Financial bonuses or penalties would be allocated against the points according to a scale set out in a schedule.

Thresholds should be set for penalty points, either by points awarded during a specified time period, or aggregated over a series of periods, when the thresholds are reached, PTA should be entitled to increase the frequency of Contractor performance monitoring of the until the number of penalty points awarded in any period drops to a minimum.

2.23 Confidential Information

It is better to start with the concept of transparency and require the Concessionaire to divulge any information necessary to keep the public informed of the status of service improvements. The scope of such disclosure can be dealt with under item 2.25 [Reporting and records] The TSC should define ‘Confidential Information’. Confidential information should extend from System Contracts to matters arising under those contracts and under and in connection with matters arising under the Transport Services Contract. The Transport Services Contract should specify circumstances under which confidential information should be released, and to whom.

The parties should agree to keep information confidential except in respect of Permitted Release referred to below. The Contractor may be required to enter into confidentiality undertakings with counterparties to the Systems Contracts.

Permitted Release should include the following disclosure and/or uses.

- Disclosure is required or compelled by any law;
- Disclosure is necessary to conduct legal proceedings, including any dispute resolution process under the Transport Services Contract or a Systems Contract;
- Disclosure is required under any stock exchange listing requirement or rule;
- Disclosure is required in relation to Rail Safety;
- Disclosure is required for the recipient's lawyers or accountants under a duty of confidentiality;
- Disclosure is required for the recipient's banker or other financial institution, for the purpose of raising funds or maintaining compliance with credit arrangements, if such banker or financial institution has executed a legally enforceable confidentiality deed in favor of the owner of the Confidential Information;
- Disclosure is required for facilitating train control directions where the disclosure of information is by the Contractor in the usual course of undertaking train control;
- Disclosure is required by any person involved in clearing an incident or emergency that is preventing the operation of Train Services on the Rail Infrastructure.

2.24 Staffing

If real reform of the railways is to be achieved then this is likely to require a comprehensive change to the terms and conditions for railway employees, and the manner in which they carry out their duties, including the removal of restrictive labor practices. It would be reasonable to include a provision in the Transport Services Contract promoting the use of local staff and to require the Contractor, in the selection of local staff, to give preference to existing rail employees that are suitable, qualified, and available. If the Contractor can demonstrate that existing rail employees are unsuitable or insufficiently qualified for specific positions, then the Contractor should be free to recruit staff from another source.

Each transferring employee should enter into an employment contract with the Contractor. Issues such as accrued pension rights and other employee benefits will need to be addressed. However, maintaining conditions that are at least equal to the terms and conditions enjoyed under the former rail employer prior to the commencement of the service period will depend upon what those terms were and the extent to which it would be economically sensible or feasible to adopt them.

2.25 Reporting and Records

The PTA should set out its rights to information in the TSC. Prior to the commencement of the Service Period, the PTA and the Contractor should agree on the format and scope for monthly and quarterly reports, and these should be set out in the TSC. The reports should cover progress in the development and implementation of measures to be taken by the Contractor to enhance performance and other key metrics data; the quarterly reports might extend to Contractor quarterly management reports.

The Contractor should carry on its business and affairs with due diligence and efficiency and in accordance with sound international financial and commercial standards and practices and fully account for all aspects of its business as follows:

- The Contractor should prepare and submit to the PTA within three months of the end of each fiscal year, a copy of the Contractor's audited financial statements that have been submitted to the state tax authorities and drawn up by an internationally recognized accounting/auditor firm registered in the host country in accordance with international accounting standards and host country laws. The financial statements shall include the balance sheet, a profit and loss account, a statement of cash flow, and any explanatory notes, including any variations from international accounting standards that were undertaken to comply with host country's laws.
- In addition to financial statements, the annual reporting to the PTA might include the following information and metrics.
  - Passengers and passenger-km carried by service or activity;
  - Revenue and costs by service or activity;
  - Actual vs. planned maintenance and details of asset breakdowns that have affected services;
  - Summary of events and causes of cancellations and late running, together with complaints received and actions taken and summaries of user satisfaction surveys;
  - Summary of accidents and incidents, causation and consequences (serious accidents should have been reported to the relevant Ministry as soon as they occurred and would be an issue for the Safety Board);
  - Details of human resources programs including personnel employed and training provided; and
  - Rolling stock utilization statistics.

The PTA, at its own expense, may appoint an independent auditor registered in the Host Country to verify Contractor-provided statements and information. The Contractor shall provide all reasonable assistance to such auditor.

The TSC should specify any other reports that may be required and which records should be retained. Of particular concern will be information flows to the Minister in the event of a serious incident or accident or near miss.

Retention periods for records categories should be stated as what should and what will be required at the time of termination or expiry of the TSC.

2.26 Termination

Termination by PTA for contractor default

The TSC should list the events of default by the Contractor which, if they remain unremedied or they cannot be remedied, would give rise to Termination. Of course, there are Intervening Events creating circumstances under which the Contractor is relieved of liability, so termination for default would not arise nor would it if the default was caused by the act or neglect of the PTA. Examples of events of default may include the following:

- Abandonment by the Contractor of the performance of obligations;
- Failure to comply with agreed levels of service under the Transport Services Contract, resulting in an excessive number of Penalty Points;
- Failure to pay sums to the PTA as they fall due;
- Insolvency and other similar events;
- Acts of corruption. The Contractor should be given the opportunity to dismiss personnel or contractors involved in corrupt practices if the Contractor's management was unaware of the acts;
- Except as permitted by the TSC, the assignment or transfer of any of the Contractor's rights or obligations in relation to the TSC;
- Any other material breach by the Contractor of any obligations under the TSC;

Termination by contractor for default of PTA

The TSC should also list the events that would constitute a PTA default, on a similar basis to those relating to the Contractor. The list may include:

- Removal of consent required for the Contractor to perform under the Transport Services Contract; and
- Any material breach by the PTA of any of its obligations under the TSC, after notice from the Contractor, including reasonable details of the breach and demanding remedies thereof.

Termination for non default

The TSC should provide for Termination in the event of prolonged Force Majeure or where the PTA wishes to terminate early for reasons in the public interest.

Termination procedure

The party seeking to terminate should serve a notice of Intention to Terminate and set out the grounds, for example, an event of default, on which it is seeking to rely. If the event of default can be remedied then the defaulting party should be given an opportunity to do so, or to submit a program to remedy the default. If the failure created penalty points, the regime for penalty points should apply.

Following the delivery of a notice of Intention to Terminate, the party that served the notice should be permitted to serve a Termination Notice unless the Intention

to Terminate was served as a result of an event of default and the default was subsequently remedied.

Effectiveness of a termination notice

The Transport Services Contract should state the minimum required time between serving the notice of Intention to Terminate and the Date of Termination.

Other remedies

If a party exercises the right to terminate under the TSC, that party should not be precluded from the right to exercise other remedies provided for under the Contract. However the TSC often includes an 'exclusive remedies' clause that limits the rights of either party to remedies provided under the TSC, rather than generally at law, and some consequential losses may be excluded.

Rights and obligations upon termination

The TSC needs to state that certain provisions remain in effect, such as Confidentiality, Dispute Resolution, and provisions relating to post-Termination financial adjustment, such as payments due.

The Contractor should release control of the Railway Assets in accordance with a Hand Back procedure. By and large, there should be no compensation for releasing control if the Contractor has not funded the acquisition of those assets.

If Termination is due to Contractor Default, then the PTA should be able to recover those losses permitted under the TSC and to call the Performance Bond.

On Force Majeure, each Party should bear its own losses.

On PTA default or voluntary termination, the Contractor should be entitled to receive demobilization costs and some compensation for revenue foregone.

On expiry of the Service Period, the Contractor should release control of the Railway Assets to the PTA, and at the option of the PTA, sell to the PTA other Contractor assets.

2.27 Hand Back

Within a stated period of the inspection carried out under item 2.20, or another agreed time period, the parties should meet and agree on processes based on the Hand Back procedure schedule to the TSC, which shall comprise the following items:

- Works to be carried out to ensure that railway assets comply with the requirements on the Hand Back date;
- Whether any subsisting contracts are to be cancelled or assigned to the PTA;
- Inventory of items to be included in the scope of Railway Assets;
- All of the Contractor's assets and details of whether they are to be removed or transferred to the PTA;
- Employment, transfer, or redundancy of employees; and

- Other details and procedures in respect of the scope of Hand Back procedure.

On the Hand Back date, in accordance with the Hand Back procedure, the Contractor should release or transfer to the PTA the following:

- All Contractor rights, title and interest in Railway Assets, free and clear of any claims or encumbrances of whatever kind or nature;
- All rights to use, own, or have access to Railway Assets;
- All operation and maintenance manuals and other information as may reasonably be necessary, or as may be reasonably requested by the PTA to enable it or its designee to continue operation of Railway Assets;
- Individual and collective employment agreements, medical and pension schemes, and other labor relation obligations.

If, within a stated period of days of the Hand Back date, the Contractor fails to comply with or complete any item of the Hand Back procedure then the following will apply:

- Within a further stated period of days of the Hand Back date, the PTA should be entitled to give notice detailing the Hand Back failure and require the Contractor to remedy the same within a reasonable specified time and the Contractor should at its own cost, remedy the Hand Back failures; and
- if the Contractor refuses or otherwise fails to remedy the Hand Back failure within the time period specified then the PTA should be entitled to remedy the Hand Back failure itself and to recover the costs and expenses from the Contractor, whether under the Performance Bond or otherwise.

2.28 Assignment

Restrictions on the contractor

The TSC should not allow the Contractor to assign, novate, or transfer its rights under the Transport Services Contract nor to subcontract substantial parts of its obligations to a single subcontractor.

Restrictions on the PTA

The TSC should not allow the PTA to assign or transfer its rights or obligations under the TSC without Contractor consent except if the transfer takes place under legislation, or is required to facilitate public sector reorganization. However, the creditworthiness of the public sector party must not be adversely affected as a consequence.

2.29 Intellectual Property Rights

The PTA should grant or procure the grant to the Contractor of all necessary Intellectual Property Rights required by the Contractor to operate and maintain the Railway Assets. Those rights should terminate with expiry or earlier termination of the TSC.

If the Contractor has developed or acquired software in connection with delivery of Transport Services, the PTA may require licenses to use processes in respect of those operational systems. If this is proprietary software, then following expiry or earlier termination of the TSC, those processes may be required until a new contractor is appointed and has had an opportunity to introduce its own systems.

2.30 Payments

Provision should be made for payments and timing of payments such as when they would otherwise be due on a public or banking holiday.

A failure to make payment by the due date should result in compensation. The Contractor will be borrowing working capital; any interest payable should represent the Contractor's costs for late payments. However, the rate of compensation should not be such that it would provide an incentive for the Contractor to delay paying the PTA because it is a cheaper alternative than borrowing, e.g., at overdraft rates. Thus interest rates for late payments should be linked to the fluctuating cost of funds.

2.31 Proper Law and Language

In most Host Countries it is accepted that the law controlling the Agreement will be the law of the host country.

As to the language, the costs of international bidders and their Funders will be substantially reduced if translations are not required; therefore English, French or Spanish have advantages; typically, English is the most universal. However there may be political or cultural reasons that this is unacceptable.

2.32 Dispute Resolution

In effect, there are three main methods of resolving disputes, expert determination, arbitration, and litigation; their use depends upon the law of the host country. In some jurisdictions, no mechanism exists to recognize an expert determination as final, binding, and enforceable. In other jurisdictions, courts will intervene in arbitration, or when an award for enforcement is to be registered, courts will accept a rehearing of issues.

Reasons to avoid using the courts to settle disputes include the caliber of the judiciary, corruption within the court system, delays in processes and hearings, and the risk of multiple appeals.

International bidders' views on dispute resolution will depend on whether the host country is a signatory to the New York Convention on the Enforcement of Foreign Arbitral Awards, or other regional conventions.

As a condition precedent to launching proceedings, it may be helpful to require that the PTA's senior administrator and the Contractor's chief executive officer meet and be allowed a short time to attempt to resolve the issue. This requirement ensures that senior management understands the issues and the point of view of their counterparts before embarking on an expensive dispute. The corollary is that during the pre-reform process, PTA training should help administrators recognize

that they must take decisions, not hide behind the pretext that decisions were forced upon the PTA by a Disputes Resolution Procedure finding.

2.33 Boilerplate

The TSC will require several standard Service Periods addressing issues such as the service of notices, whether the TSC represents the entire agreement between the parties, or if there are a series of contracts, and a provision to preserve the TSC if any provision is found to be illegal, and so forth.

Annex 6
Model Board Charter[156]

A. Introduction

I. Complementary to Law and Articles

These provisions are complementary to the requirements regarding the board and board members contained in <<Country's>> legislation and regulations, the articles of association of the company and the provisions governing the relationship between the management and the board as contained in the charter of the management (which has been adopted by the board).

II. Charter on Website

This charter is posted on the company's website.

B. Chapter I: Composition of the Board; Positions; Committees

I. Board Profile, Size, Expertise and Independence

a. Board Profile. The board, in consultation with the nomination committee, shall prepare a profile of its size and composition, considering the nature of the business of the company and its subsidiaries and the desired expertise and background of the board members (the "Board Profile").

b. Number of Members. After consultation with the nomination committee, the board determines the number of board members. The board shall have a minimum of ____ and a maximum of ____ members.

c. General Composition. The board shall use its best efforts to ensure that the board composition is such that:

   i. Its members can act critically and independently of one another;

   ii. Each board member can assess the broad outline of the company's overall policy;

   iii. Each board member has sufficient expertise to perform his or her role as a board member within the Board Profile;

   iv. The board matches the Board Profile;

[156] From IFC Guidelines for Directors on Strengthening Corporate Governance, November 2006.

v. At least one board member is a financial expert, meaning s/he has expertise in financial administration and accounting for companies similar to the company in size and sophistication; and

vi. No less than one-third of the board members are independent as defined in Section B.I.d. below.

d. Independence. An independent director is a director who:

i. Is not, and has not been employed by the company or any of its related parties at any time during the past five years;

ii. Is not, and has not been affiliated with a company that acts as an advisor or consultant to the company or its related parties, nor is not and has not himself acted in such capacity at any time during the past five years;

iii. Is not, and has not been affiliated with any significant customer or supplier of the company or its related parties (i.e. a company that makes payments to, or receives payments from the company for property or services in an amount which, in any single fiscal year, exceeds the greater of [monetary figure] [percentage] of such other company's consolidated gross revenues) at any time during the past five years;

iv. Does not currently have, nor has s/he had any personal service contracts with the company, its related parties or its senior management at any time during the past five years;

v. Is not affiliated with any non-profit organization that receives significant funding from the company or its related parties;

vi. Does not receive, and has not received any additional remuneration from the company apart from a director's remuneration, nor participates in the company's share option or performance-related payment plans,, nor is a participant of the company's pension plan;

vii. His/her director's remuneration does not constitute a significant portion of his or her annual income;

viii. Is not employed as an executive officer of another company where any of the company's executives serve on that company's board;

ix. Is not a member of the immediate family of any individual who is, or has been at any time during the past five years, employed by the company or its related parties as an executive officer;

x. Is not, nor has been at any time during the past five years, affiliated with or employed by a present or former auditor of the company or auditor of any related party;

xi. Is not a controlling person of the company (or member of a group of individuals and/or entities that collectively exercise effective control over the company) or such person's brother, sister, parent, grandparent, child, cousin, aunt, uncle, nephew or niece, or a spouse, widow, in-law, heir, legatee and successor of any of the foregoing, (or any trust or similar arrangement of which any such persons or a combination thereof are the sole beneficiaries) or the executor, administrator or

personal representative of any person described in this paragraph who is deceased or legally incompetent; and

xii. Has not served on the board for more than ten years.

II. (Re)Appointment; Terms of Office; Resignation

a. Election by Shareholders. The general assembly elects members of the board.

b. Substance of Nominations and Recommendations. A nomination or recommendation to the general shareholders meeting for a candidate for the board shall state (i) the candidate's age, (ii) his or her profession, (iii) the amount and nature of any shares s/he holds in the company, (iv) any convictions for any crimes involving dishonesty, fraud or breach of trust, (v) the positions s/he holds or has held in the past [number] years (including memberships on any board of directors or management boards/executive committees), nominating shareholder [if applicable], and (vi) any other information relevant to assess his or her suitability as a member of the board. The recommendation or nomination for appointment or reappointment shall state the reasons for the nomination or recommendation. Any nomination or recommendation by the board for appointment or reappointment of a board member must be in accordance with Section B of this charter, including the Board Profile.

c. Reappointment. Before recommending a member of the board for reappointment, the board must carefully consider his or her past performance on the board.

d. Staggered Retirement. Board members shall retire periodically according to a rotation plan (to be drawn up by the board) to avoid many board members retiring at the same time. The board may amend the rotation plan. The rotation plan is available on written demand to the company.

III. Chairman and Vice-Chairman

a. Election. The board shall elect a chairman and a vice-chairman from among its members. The vice-chairman replaces, and assumes the powers and duties of, the chairman when the chairman is absent.

b. Duties. The chairman of the board is primarily responsible for the activities of the board and its committees. S/he shall act as the spokesman for the board and is the principal contact for the chief executive officer (CEO). The CEO and the chairman of the board shall meet regularly. The chairman of the board presides over the general assembly.

c. Responsibilities. The chairman ensures that:

i. Board members, when appointed, participate in an induction program and, as needed, additional education or training programs;

ii. The board members receive all information necessary for them to perform their duties;

iii. The board has sufficient time for consultation and decision-making;

iv. The Committees function properly;

v. The performance of the board members is evaluated at least once every two years;

vi. The board elects a Vice-chairman; and

vii. The board has proper contact with the executive committee.

d. In addition, the chairman is primarily responsible for:

i. Ensuring the board satisfies its duties;

ii. Determining the agenda of board meetings, chairing such meetings and ensuring that minutes are kept of such meetings;

iii. Consulting with external advisors appointed by the board;

iv. Addressing problems related to the performance of individual board members; and

v. Addressing internal disputes and conflicts of interest concerning individual board members and the possible resignation of such members as a result.

VI. Company Secretary

a. Company Secretary. The company secretary assists the board.

b. General Access. All board members may go to the company secretary for advice or to use his or her services.

e. Responsibilities. The company secretary sees to it that the board follows correct procedures and that the board complies with its obligations under law and the company's articles of association. The company secretary shall assist the chairman of the board in organizing the board's activities (including providing information, preparing an agenda, reporting of meetings, evaluations and training programs). The company secretary is the secretary of the board.

V. Committees

a. Establishment of Committees. The board may appoint committees from among its members to perform specific tasks. The board shall determine the members of any committee. The board shall establish an audit committee, a remuneration committee and a nomination committee. The functions of the last two may be combined into a single committee.

b. Board Responsibility for Committee Action. The board remains collectively responsible for the decisions and actions taken by any committee. A committee may only perform the tasks delegated to it by the board and may not exceed the authority or powers of the board as a whole. Decisions that, by law, must be taken by the board may not be delegated to a committee.

c. Committee Reporting. Each committee must promptly inform the board of the actions it has taken and major developments of which it becomes aware. Each board member has unrestricted access to all committee meetings and records. The board shall, as set forth in the charter of the committee concerned, receive a report from the committee describing the committee's actions and findings.

d. Committee Charters. The board shall establish (and may amend) charters for each Committee. The charters shall indicate the role and responsibilities of the Committee, its composition and how it should perform its duties. The charter of a Committee shall require that the Committee has no less than two members (or, if the Committee is composed of three or fewer members, one member) who are independent, as defined in Section B.I.d. of this charter.

e. Website Disclosure. The charters and the composition of the Committees shall be posted on the company's website.

C. Chapter II: Duties and Powers

I. General Duties and Powers

a. General Responsibilities. The board oversees the general business of the company. The entire board is responsible for such supervision and oversight.

b. The Board Acts in the Interest of the Company. The board shall act in the best interests of the company and its business, taking into consideration the interests of the company's shareholders and other stakeholders. Board members shall perform their duties independent of any particular interest in the company. Members should not support one interest without regard to the other interests involved.

c. Quality of Performance. The board is responsible for the quality of its own performance.

d. Action in Concert. As much as they can, within their individual responsibilities as members of the board, members shall act and speak in concert with respect to important affairs and matters of principle.

e. Provision on Information. The chairman and the CEO shall see to it that the management, in a timely manner, provides the board and its committees with the information they need to properly function.

f. Responsibility for Securing Information. The board and its individual members each has responsibility for obtaining all information from the management and the internal and external auditors needed to carry out their duties. If the board thinks it is necessary, it may obtain information from officers and external advisers of the company. The company shall aid the board in obtaining such information. The board may require certain officers and external advisers to attend, but never to vote at its meetings.

g. Access to Records. Each member of the board has access to the books and records of the company, if useful to perform his or her duties. Unless the charter of a committee states otherwise, board members shall consult with the chairman of the board and the company secretary before exercising their rights under this provision.

h. Use of Experts. The board may hire experts to assist or advise them. The cost of such experts shall be agreed to by the board and shall be paid by the company. A board member may rely upon the advice of a relevant expert so long as the member has no reason to question the expert’s report or conclusion.

II. Duties Regarding the Supervision of Management

a. Nature of Supervision. In supervising the management, the board shall consider: (i) achievement of the company's objectives; (ii) the strategy and risks in the company's activities; (iii) the structure and operation of the internal risk management, and audit and control systems; (iv) the financial reporting process; (v) compliance with law and regulations; and (vi) any other matters the law requires the board to consider.

b. Financial Reporting. The board supervises the company's financial reporting in accordance with Section C.V. below.

c. Annual Risk Review. At least once a year, the board shall discuss the company's strategy and business risks, the management's assessment of the internal risk management and control systems, and any significant changes to such systems.

d. Resolutions Subject to Approval. The following resolutions are subject to the approval of the board:

   i. Determining and amending the operational and financial strategic objectives of the company;

   ii. Determining and amending key performance indicators in support of the strategic objectives (including, for example, any financial ratios);

   iii. The resolutions listed in Annex 1 of the charter; and

   iv. Any other matters that the _____ [name of country] laws or regulations or the company's articles of association requires the board to approve.

III. Duties Regarding the Members and the Performance of the Board

a. Duties Regarding Board. The duties of the board (in consultation with the appropriate board committees) in relation to the members of the board include:

   i. The nomination of members of the board (the appointment is made by the general assembly) and proposals to the general assembly for the compensation of members of the board;

   ii. The determination of the number of board members, the appointment of a chairman and vice-chairman of the board, the establishment of committees and defining their role, the evaluation of the board, its individual members and its committees (including an evaluation of the of the Board Profile and the induction, education and training program); [the approval of other positions of board members to the extent required under Section E.V. of this charter]; and

   iii. Addressing any conflicts of interest issues between the company and members of the board.

b. Board Self-Assessment At least once a year, the board shall discuss its own activities and those of its individual members, the effectiveness of such activities, and the composition and competence of the board.

IV. Certain Other Duties of the Board

a. Duties Generally. The other duties of the board include:

   i. Duties regarding the external auditor as described in Section C.VI. of this board charter and the charter of the audit committee;

   ii. Other duties imposed by law, the company's articles of association, this charter and the charter of a committee.

b. Annual Report and Accounts. The board shall draw up a report describing its activities in the financial year, and containing the statements and information required by law and the company's articles of association.

V. Supervision of Financial Reporting

a. General Supervision Responsibilities. The board, in consultation with the audit committee, supervises compliance with written procedures for the preparation and publication of the annual report and accounts, the quarterly (if any) and semi-annual financial reports and any other financial information. The board, through the audit committee, also supervises the internal control and audit mechanisms for external financial reporting

b. Discussion of Financial Reports. The audit committee shall regularly, and in any event as soon as possible, provide the board with reports on the annual report and accounts, and the quarterly (if any) and semi-annual financial reports, which will then be discussed at a meeting of the board. The annual report and accounts for the year just ended shall be discussed in a meeting with the board within four months of the year end. The semi-annual and quarterly (if any) financial reports of the company for the respective period just ended shall be discussed in a meeting with the board within two months of the end of the period.

c. External Auditor. The board shall ensure that the external auditor attends the meeting of the board at which the report of the external auditor with respect to the audit of the annual accounts is discussed, and at which the board decides whether or not to approve the annual accounts. The external auditor shall receive any financial information underlying the quarterly (if any) and/or semi-annual financial reports, and other interim financial reports, and shall be given the opportunity to respond to all information.

d. Audit Committee is Principal Contact with External Auditor. The board's principal contact with the external auditor is through the chairman of the audit committee. If any irregularities in the financial reports are discovered, the first discussion regarding such irregularities should be between the audit committee and the external auditor.

e. Recommendations by External Auditor. The board shall carefully consider and, if accepted, put into effect any recommendations made by the external auditor. This will include recommendations by the external auditor on the company's internal controls, as expressed in the 'management letter'.

VI. Duties Regarding Nomination and Assessment of External Auditor

a. Appointment of External Auditor. The external auditor shall be appointed by the general assembly. The board nominates a candidate for this appointment to the general assembly based on an open, transparent and competitive selection process, and may recommend replacement of the external auditor. The audit committee shall advise the board on such matters.

b. Compensation of External Auditor. The compensation of the external auditor, and instructions to the external auditor to provide non-audit services, shall be closely reviewed and approved by the board on the recommendation of the audit committee, thus ensuring for the auditor's independence.

c. Reports to the Board. The audit committee shall report their dealings with the external auditor to the board on an annual basis, including their assessment of the external auditor's independence (for example, the desirability of rotating the responsible partners of the external auditor and the desirability of the external auditor providing both auditing and non-audit services to the company). The board shall take this into account when deciding its nomination to the general assembly for the appointment of an external auditor.

d. Assessment. At least once every three years, the audit committee shall conduct a thorough assessment of the functioning of the external auditor in the various entities and capacities in which the external auditor acts. The main conclusions of this assessment shall be communicated to the general assembly so it may assess the nomination for the appointment of the external auditor.

e. Conflicts of Interest. Conflicts of interest and potential conflicts of interest between the external auditor and the company shall be resolved in accordance with the policy laid down in Annex 2 or, to the extent not dealt with in this Annex, as determined by the board on the recommendation of the audit committee. Board members must inform the chairman of the audit committee of any matters they know of that may compromise the independence of the external auditor or that may result in a conflict of interest between the external auditor and the company.

f. Representation by External Auditor. When appointed, the external auditor shall state it is aware of (i) the company's policy set out in Section C.VI.e. and Annex 2; and (ii) other matters provided for in this charter and the charter of the audit committee and that s/he agrees to abide by and promote such policies.

VII. Compensation of Management Board Members

a. Annual Remuneration Report. The remuneration committee shall annually prepare a remuneration report setting out the compensation policies and activities of the past year and an overview of the compensation policy and planned activities for the next financial year and subsequent years. The remuneration report will differentiate between executive and non-executive remuneration.

b. Approval by the General Assembly Meeting. [The remuneration policy planned for the next financial year and subsequent years as specified in the remuneration report shall be submitted to the general assembly for its approval. Every change to the compensation policy shall also be submitted to the general assembly for its approval.] Schemes whereby executive directors and other senior managers are remunerated in the form of shares or rights to subscribe for shares, and major changes to such schemes, shall be submitted to the general assembly for its approval.

c. Remuneration Committee. The board shall determine the compensation of the executive and non-executive board members on a proposal by the remuneration committee and within the terms of the remuneration policy adopted by the general assembly.

d. Extraordinary Compensation. If a board member or former board member is paid special compensation during any financial year, an explanation of this compensation shall be included in the remuneration report. The remuneration report shall detail and explain any compensation paid or promised as severance pay to a board member.

VIII. Relations with Shareholders

a. Equal and Simultaneous Information. Where appropriate, the board shall provide all shareholders and other parties in the financial markets with equal and simultaneous information about matters that may influence the share price.

b. General Meeting; Record Date; Venue. The board shall determine the date and place of any general assembly meeting and a record date for the exercise of the voting and any other rights attached to the company's securities at such meeting. Unless there is an overriding company interest to act otherwise, the board shall use its best efforts to provide shareholders with all information necessary or requested for the shareholders to properly act at the general assembly meeting. If the board believes the company does have an overriding interest, it must state why it so believes.

c. Compliance with Law. The board shall ensure all laws are complied with, regarding the rights of the general assembly and of individual shareholders.

d. Attendance by Boards. The chairman shall ensure that (unless there are important reasons) all the members of the board shall attend the general assembly meetings.

e. Chairman of General Meetings. The general assembly meetings are presided over by the chairman of the board or, in his or her absence, the vice-chairman of the board. The board may designate someone else to preside over the assembly meeting.

f. Disclosure of Resolutions. A resolution of the general assembly may be publicly disclosed only through a statement from the chairman of the board or the company secretary.

g. Changes to Corporate Governance. Any substantial change to the corporate governance structure of the company shall be submitted to the general assembly for discussion under a separate agenda item.

h. Attendance by external auditor. The board shall ensure that the responsible partner (or certifying auditor) of the external auditor attends the general assembly and is available to address the meeting. The external auditor may be questioned by the general assembly in relation to the audit of the company's financial statements.

D. Chapter III: Board Meetings; Decision Making

I. Frequency, Notice, Agenda and Venue of Meetings

a. Frequency. The board shall meet as often as necessary, but not less that _____ [five] times a year. If possible, meetings shall be scheduled annually in advance according to an annual board calendar. The board shall meet earlier than scheduled if deemed necessary by the chairman of the board or two other members of the board.

b. Notice and Agenda.

   i. Meetings of the board are called by the chairman. Save in urgent cases, as determined by the chairman, the agenda for a meeting shall be sent to all board members at least five calendar days before the meeting. For each item on the agenda, an explanation in writing shall be provided and related documentation will be attached. The chairman shall consult with the CEO prior to convening the meeting on the content of the agenda. Each board member and the CEO has the right to request that an item be placed on the agenda for a board meeting; provided that the item is notified to the chairman at least ten days prior to the meeting.

   ii. Board members who have taken part in a meeting may not object against resolutions adopted at the meeting on grounds of an invalid notice.

c. Venue. Board meetings are generally held at the offices of the company but may also take place elsewhere. In addition, meetings of the board may be held by conference call, video conference or by any other means of communication, provided all participants can communicate with each other simultaneously.

II. Attendance of and Admittance to Meetings

a. Attendance by CEO. The CEO, even where s/he is not a member of the board, shall attend board meetings unless the board instructs him not to attend. If requested by the board, other executives shall also attend meetings of the board in whole or in part.

b. Proxies. A board member may be represented at board meetings by another board member holding a proxy in writing. The existence of such authorization must be proved satisfactorily to the chairman of the meeting.

c. Undue Absence. If a board member is frequently absent from board meetings, s/he shall be required to explain such absences to the chairman.

d. Attendance by Non-Members. The admission to a meeting of persons other than board members, the CEO, the company secretary and (if invited) other

executives shall be decided by majority vote of the board members present at the meeting.

III. Chairman of the Meeting; Reports

a. Chairman. Board meetings are presided over by the chairman of the board or, in his or her absence, the vice-chairman. If both are absent, one of the other board members, designated by majority vote of the board members present at the meeting, shall preside.

b. Report. The company secretary (or any other person designated for such purpose by the chairman of the meeting) shall prepare a report of the meeting. The report shall describe the decision-making process at the meeting. The report shall be adopted by the board at the next meeting.

IV. Decision-Making within the Board

a. Preference for Unanimity. The board members shall try to unanimously adopt resolutions. However, board members are encouraged to voice dissenting opinions and record these in the minutes when unanimity cannot be reached.

b. Individual Vote. Each board member has the right to cast one vote.

c. Majority Vote; Quorum. Where unanimity cannot be reached and the law, the company's articles of association or this charter do not prescribe a larger majority, all resolutions of the board are adopted by a majority of the votes cast. In the event of a tie, the chairman of the board has the deciding vote. At a meeting, the board may only pass resolutions if the majority of the board members are present or represented.

d. Adoption at Meeting. Resolutions of the board are adopted at a board meeting.

e. Written Consent. Board resolutions may also be adopted in writing, provided the proposal concerned is submitted to all board members and none of them objects to this form of adoption. Adoption of resolutions in writing shall be effected by statements in writing from all the board members. A statement from a board member who wishes to abstain from voting on a particular resolution which is adopted in writing must reflect the fact that s/he does not object to this form of adoption.

f. Emergency Procedures. The board may deviate from the provisions of Sections D.IV.c. (last sentence), D.IV.d. and D.IV.e. if this is deemed necessary by the chairman of the board, considering the urgent nature and other circumstances of the case, provided that all board members are allowed the opportunity to participate in the decision-making process. The chairman of the board and the company secretary shall then prepare a report on a resolution so adopted, which shall be added to the documents for the next meeting of the board.

g. Minutes. Minutes must be drawn up for every board meeting and for every resolution adopted outside a meeting. The minutes are to be signed by the chairman of the meeting and then added to the company's records. Each member of the board shall receive a copy of the minutes. Each member of the board may demand a note explaining how s/he voted or that a formal declaration by him be included in the minutes. Urgent resolutions may be drawn up and adopted immediately in the relevant meeting.

h. Certification of Resolutions. A resolution adopted by the board may be publicly disclosed only through a statement from the chairman of the board and/or the company secretary.

E. Chapter IV: Other Provisions

I. Conflicts of Interest of Board Members

a. Duty to Disclose. A board member shall immediately report to the chairman of the board any conflict of interest or potential conflict of interest and shall provide all relevant information, including information concerning his or her spouse, registered partner or other life companion, foster child and relatives by blood or marriage up to the second degree. The board member concerned shall not take part in the assessment by the board of whether a conflict of interest exists.

b. Related Party Transactions. A potential conflict of interest exists if the company intends to enter into a transaction with a related party, and the company shall develop a policy on how to ensure that the rights of shareholders are protected during such transactions. A related party includes the following:

- The board members of the Company, its parent company, affiliated or sister companies and associates.
- A parent company and any subsidiary or affiliated company that is not wholly owned.
- The CEO or General Manager, and key officers, including anyone who directly reports to the Board or the CEO.
- Any significant shareholder having the ability to control, or exercise a significant influence on, the outcome of resolutions voted on by shareholders or directors of the Company, its parent company, affiliated or associated companies.
- The father, mother, sons, daughters, husband, or wife of any of the natural persons listed in Clauses (a, b and c).
- Any business, and the directors, CEO and key officers of any business, in which the natural persons listed in paragraphs (a) to (e) own jointly or severally at least [percent] of the voting rights.
- Any person whose judgment or decisions could be influenced as a consequence of an arrangement or relationship between or involving themselves and any of the persons in paragraphs (a) to (f).

c. Abstention by Conflicted Party. A board member shall not take part in any discussion or decision-making regarding any subject or transaction in which s/he has a conflict of interest with the company.

d. Requirements to Approve Conflicts of Interest. All transactions in which there are conflicts of interest with board members shall be agreed on terms that are customary for arm's-length transactions in the company's business. Decisions to enter into transactions in which there are conflicts of interest with board members require the approval of the board.

II. Compensation of Board Members

a. Approval by General Assembly Meeting. The compensation of the board members is determined by the general assembly. The board shall submit proposals on its compensation to the general assembly.

b. Reimbursement of Costs. Apart from their compensation, board members shall be reimbursed for all reasonable costs incurred in connection with their attendance of meetings. The reasonableness of such costs shall be approved by the chairman of the board (costs incurred by the chairman of the board shall be approved by the vice-chairman). Any other expenses shall be reimbursed only if incurred with the prior consent of the chairman or the company secretary on his or her behalf (or if it concerns the chairman, the vice-chairman or the company secretary on his or her behalf).

c. Loans and Guarantees. The company and its subsidiaries do not grant personal loans, guarantees or the like to board members, save as part of its usual business operations. The company does not repay or forgive loans owed by board members.

III. Induction Program, Ongoing Training and Education

a. Induction Program. Upon his or her election, each board member shall participate in an induction program that covers the company's strategy, general financial and legal affairs, financial reporting by the company, any specific aspects unique to the company and its business activities, and the responsibilities of a board member.

b. Annual Review of Training. The board shall conduct an annual review to identify areas where the board members require further training or education.

c. Costs of Company. The costs of the induction course and any training or education shall be paid for by the company.

IV. Other Positions

a. No Excess Memberships. Members of the board shall limit their other positions so as to ensure they can perform their duties as members of the board. Outside directorships are capped at __ board seats.

b. Notice of Outside Positions. Board members must inform the chairman of the board and the company secretary of their other positions which may be of importance to the company or the performance of their duties before accepting such positions. If the chairman determines that there is a risk of a conflict of interest, the matter shall be discussed by the board in accordance with Section E.I. of this charter. The company secretary shall keep a list of the outside positions held by each board member.

V. Holding and Trading Securities [NOTE: Sections E.V.b. through E.V.d. apply only to public companies.]

a. Long-Term Investment. Any shareholding in the company by board members is for the purpose of long-term investment.

b. Trades in Company Securities. Board members are bound by the _____ [name of company] corporate governance code and/or ethics code regarding transactions in company securities, which is posted on the company's website.

c. Trades in Other Securities. With respect to the ownership of and transactions in securities other than regulated by the _____ [name of company] corporate governance code and/or ethics code, board members must at all times comply with law.

d. Reports on Change in Ownership. A board member shall notify the company secretary promptly of all changes in his or her holding of securities related to listed companies. However, such report need not be made if s/he has invested exclusively in listed investment funds or has transferred the discretionary management of his or her securities portfolio to an independent third party by means of a written agreement. If the member transferred discretionary management of the securities portfolio to an independent third party, the name and office address of the third party must be reported and a copy of the agreement with such third party must be submitted.

VI. Confidentiality

a. Duty to Keep Information Confidential. Unless required to do so by law, no board member shall, during his or her membership on the board or afterwards, disclose any information of a confidential nature regarding the business of the company and/or any companies in which it holds a stake, that came to his or her knowledge in the capacity of his or her work for the company and which s/he knows or should know to be of a confidential nature. A board member may disclose such information to fellow board members as well as to staff members of the company and companies in which the company holds a stake who, in view of their activities for the company and companies in which the company holds a stake, should be informed of the information. A board member shall not use such confidential information for his or her personal benefit.

b. Return of Confidential Information. At the end of each board member's term of office, s/he shall return all confidential documents in his or her possession to the company or guarantee their disposal in a manner that ensures confidentiality is preserved.

c. Notice of Disclosure. If a board member intends to disclose to third parties information which s/he has become aware of in his or her duties and which may be confidential, s/he must inform the chairman of his or her intent and the identity of the person who is to receive the information with sufficient notice for the chairman to assess the situation and advise the board member. This section applies to both official and personal statements and to any person attending board meetings which in terms of their content and form are clearly only intended for the board.

VII. Miscellaneous

a. Acceptance by Board Members. Anyone who is appointed as a board member must, upon assuming office, declare in writing to the company that s/he accepts and agrees to comply with the provisions of this charter. A corresponding reference to this extent is included in a director's appointment letter.

b. Occasional Non-Compliance. If permitted by law, the board may occasionally decide (by unanimous decision) at its sole discretion not to comply with the provisions of this charter.

c. Amendment. This charter may be amended by the board at its sole discretion without prior notification.

d. Interpretation. In case of uncertainty or difference of opinion on how a provision of this charter should be interpreted, the opinion of the chairman of the board shall be decisive.

e. Partial Invalidity. If one or more provisions of this charter are (or become) invalid, this shall not affect the validity of the remaining provisions. The board may replace the invalid provisions by provisions which are valid and the effect of which, given the contents and purpose of this charter is, to the greatest extent possible, similar to that of the invalid provisions.

F. Annex 1: List of Approvals Required by Board

The approval of the board is required for:

I. All material transactions between the company and natural or legal persons who hold at least [percent] of the shares in the company;

II. A resolution on the operational and financial aims of the company, the strategy designed to achieve the aims, and any parameters to be used in relation to the strategy;

III. All material transactions in which there are conflicts of interest with board members;

IV. The appointment and removal of the company secretary;

V. The remuneration policy for senior management in general and CEO in particular.

VI. The annual capital investment budget, all acquisitions and disposals of business activities whose sales exceed _____ [insert currency and amount] in the year prior to the acquisitions or disposal,

VII. All financial statements before publication, and

VIII. All other acts that require the approval by law, the company's articles of association, or this charter.

G. Annex 2: Policy Regarding Independent External Auditor

The policy set out below was adopted by the board on _____ [date], on a proposal of the audit committee.

I. Policy

The company and its subsidiaries shall use the services of the external auditor only to the extent this does not prejudice the independence of the external auditor.

II. Terms of Reference

The external auditor must be independent. These regulations are based on the principles that: (i) the external auditor must be independent from the client audited, both in mind as in appearance; and (ii) an external auditor is someone who is able, in the light of all relevant facts and circumstances, to form an objective and impartial opinion on all matters that fall within the scope of his or her assignment.

Under the _____ [insert reference to local law] an external auditor is not allowed to perform a statutory audit if s/he has financial, commercial, employment or other ties with the client that in the opinion of a reasonable and properly informed third party expert compromise the auditor's independence.

The company may require from the external auditor that s/he maintains the right balance between effectiveness and efficiency, e.g. audit costs, risk management, independence and reliability. The audit committee sees to it that the external auditor complies with the relevant provisions of the _____ [insert reference to local law] and the above terms of reference, and may request more detailed explanations and written confirmations from the external auditor that these provisions are followed.

In addition to the audit work, the external auditor of the company may also carry out non-audit work, to the extent allowed under applicable legislation and regulations and the internal procedures of the company. The non-audit work shall not jeopardize the independence of the external auditor. In no event shall the individuals performing the audit work engage in any non-audit work.

All audit and non-audit work (including fees and conditions) carried out by the external auditor for the company must be approved in advance by the board on a proposal of the audit committee. The board may, within the framework set by the board, delegate this duty to the audit committee that in turn, in exceptional circumstances only, may delegate this power to its chairman, on the understanding that a decision by the chairman of the audit committee to give his or her approval will be presented to the full audit committee at its next meeting.

III. Work

a. Audit Work

Audit work is the audit of the annual financial reports of the company, the assessment of interim financial reports that are disclosed, services that are traditionally

provided by the external auditor and that are related to filings and obligations under legislation or regulations, and services that only the external auditor can reasonably provide. The external auditor does not need to go through a tender process for each individual engagement.

b. Non-Audit Work

For non-audit work of the external auditor other than (i) services that can only be provided by the external auditor, (ii) services that are an extension of the work performed as part of the audit of the company or rely on work performed as a part of the audit such that the quality and timeliness of the services can most effectively be provided by the external auditor or (iii) services that enhance the effectiveness of the external auditor's examination of the company's financial statements, the board shall on the proposal of the audit committee set one or more financial thresholds. For non-audit work by the external auditor that is expected to exceed these thresholds, a very strong rationale must be presented to support the selection of the external auditor and alternative service providers should be considered.

For further explanation whether certain activities should be considered audit work or non-audit work and whether certain non-audit activities fall under any of the categories listed above, the head of the internal audit department should be contacted who, when in doubt, will consult the chairman of the audit committee.

IV. Rotation of Partners Responsible for Audit Work

In order to prevent the external auditor and the company becoming too close, the number of years a person may be part of the audit team of the external auditor, is capped.

Partners of the audit team of the company who are charged with essential audit tasks must be replaced at most every three year(s) after the start of their involvement. The partners of the audit team of the company charged with essential tasks who have been replaced are not allowed to work on a new assignment for the company until at least three years have expired from the date of their replacement.

The audit committee shall also supervise the risks of dependency of other members of the audit team of the company who are involved with the audit for a significant period. The audit committee shall consult the responsible partner of the external auditor regularly on safeguards set up by the external auditor to assess the risk of dependency and to reduce it to an acceptable minimum level.

V. Appointment of the External Auditor

The external auditor shall be appointed in accordance with Section C.VI. of the charter of the board. If the decision is taken to call in the services of another external auditor, the tender process approved by the audit committee shall be followed.

VI. Staff Transfer Restrictions

The company and the external auditor shall agree on a policy regarding the restriction of staff transfers from the company and its group to the organization of the external auditor and vice versa, taking into account all relevant legislation and

regulations. This policy is subject to the approval of the board. In no event, however, shall the company hire an audit partner or other senior member of the audit staff of the external auditor if such person audited, conducted a review of or prepared the company's financial statements during the previous one year, in particular as the company's CFO.

Annex 7
Model Ethics Code[157]

Preamble

The purpose of this code of ethics is to:

- Demonstrate the company's commitment to the highest standards of ethical behavior;
- Encourage proper ethical conduct and sanction misconduct within the company; and
- Develop an ethical culture based on such standards and conduct, led by the company's shareholders, directors and management, and followed by all employees.

By adopting and, following this code of ethics, together with the other guidance in this Manual, the company confirms its desire to demonstrably lead and promote good ethical behavior and corporate governance. In order to foster the confidence of its shareholders, employees, investors and the general public, this code of ethics goes beyond the legal and regulatory framework prevalent in Romania today, and embraces both national and internationally recognized principles and practices.

The company's governing bodies and employees understand this code of ethics as their obligation and set forth to ensure that its spirit and provisions are respected and acted upon throughout the company [and its subsidiaries and dependent companies] and its business partners.

This code of ethics is reviewed and updated on an annual basis and published internally in booklet form and via the company's intranet site, as well as on the company's internet site.

A. The Company's Values

In all internal and external relationships, the company demonstrates its commitment to [insert company's values[158]]:

- _____;
- _____; and

[157] From IFC Guidelines for Directors on Strengthening Corporate Governance, November 2006.

[158] Company values often focus on delivering quality products and services; leadership (in terms of innovation, and research and development); promoting shareholder value; protecting the environment; satisfying customer satisfaction; acting with honesty, integrity and respect for people; etc.

- _____.

B. The Company's Ethical Principles

The company is committed to act ethically in all aspects of its business.

The company's ethical standards are based on the following principles:

- Honesty;
- Integrity;
- Fairness; and
- Transparency.

Similarly, the company expects the same in its relationships with all those with whom it does business.

The company's ethical standards focus on the following areas: employees, customers, relations with its business partners, government, society and the wider community[159]. These ethical standards shall also apply to all business areas [for all subsidiaries and dependent companies both within and outside of Romania].

All of the company's ethical standards are based on:

- Respecting the rule of law, Romania laws and regulations, and showing respect for human rights;
- Managing the company's financial and operational performance to maximize the long-term value for its shareholders;
- Conducting business with integrity and fairness, renouncing bribery and corruption or similar unacceptable business practices, and not giving or accepting gifts and entertainment unless they fall under business custom, are immaterial and infrequent;
- Creating mutual advantage in all the company's relationships to build and foster trust; and
- Demonstrating respect for the community the company operates in, as well as for the natural environment.

The company's business plan will include specific, measurable targets for improving ethical behavior.

[159] The Company's areas of focus will depend largely on the industry and its business sector. Thus, a company in the banking sector may wish to focus on issues different than those of a company in the oil sector (e.g. financial control, insider trading and/or money laundering vs. environmental protection). Areas of focus can be structured around topics and/or relationships. Topics include health, safety and environmental concerns; bribery and corruption; legality; conflicts of interest; human rights; gifts and entertainment; control and finance; etc. Relationships can include relations with employees; customers; business partners; suppliers; joint-venture partners; etc.

C. Ethical Standards for the Company's Relationship with its Stakeholders

I. Employees and Officers

The company values its employees as the keystone to success. The company is thus committed to treating all employees with dignity, trust and respect, and to building a long-term relationship based on Romania labor law and the respect of human rights. The company will not employ child labor.

The company fosters teamwork, believing that diversity in talent, perspectives and opinions stimulate new and creative business opportunities and innovation. Similarly, the company renounces all forms of bureaucracy and excessive hierarchical structures that impede operational efficiency.

It is the company's policy to provide for and regularly improve upon a healthy, safe and secure working environment for its employees.

Conflicts of interests can, or appear to, compromise the judgment or objectivity of the company's employees and officers. Appropriate guidelines and disclosure thereof have been developed to this extent.

The company is an equal opportunity employer. Its recruitment, promotion and compensation policy is based on merit and free of discrimination. Clear and transparent policies to this extent have been developed and put into practice.

Any kind of discrimination or harassment at the workplace will not be tolerated and contrary behavior properly investigated and dealt with through the company's ethics officer [and/or the human relations manager].

Employees are recognized and rewarded for their performance, based on performance objectives, and constructive and regular feedback through face-to-face meetings. Rewards are given both at the team and individual level. The company has in place a training program, accessible to all employees, which encourages individuals to formulate personal development plans and provides for coaching, mentoring and formal skill-enhancing trainings.

The company sanctions the illegal use of confidential and insider information by all officers and employees, and has developed a detailed procedure to effectively deal with this matter.

A regular consultation process between the company's employees and managers has been put in place to effectively deal with employment conditions and other issues that affect the employees work environment.

These principles do not limit the right of the company to enforce discipline or to terminate workers in accordance with Romania legislation.

II. Customers

Customer satisfaction is tantamount to the company. Safe and quality products and services, fair pricing and appropriate after-sales service shall define the company's relations with its customers.

The company always seeks to deliver what it promises.

III. Relations with its Business Partners

The company believes that a long-term relationship with its business partners (suppliers, contractors, participants in joint ventures and _____) founded on respect, trust, honesty and fairness is vital to its success.

The company will put forth its best effort to only cooperate with those business partners that share the company's ethical standards.

The company will respect the sanctity of contracts and business relations.

- Contractual negotiations shall be conducted on the basis of mutual advantage.
- Business relations shall be based on high performance standards, delivering in a timely and qualitative manner, prompt settling of bills and _____.
- In case of a commercial dispute, the company will strive to negotiate and compromise in good faith in order to reach an amicable solution.

The company is committed to complying fully with the Romania law on anti-money laundering and only conducts business with reputable suppliers, business customers and other partners who are involved in legitimate business activities and whose funds are derived from legitimate sources.

IV. Government

The company will pay all taxes that are owed and due, fully and in a timely manner. The company abides by all federal and local regulations, including voluntary codes and guidelines, in both spirit as well as letter.

The company has also legally obtained all licenses required to do business.

The company seeks to build and manage a sound relationship with governmental authorities on an arm's length basis. No attempts to improperly influence governmental decisions shall be made, and the company will not offer, pay, solicit or accept bribes in any form or shape, either directly or indirectly, in its dealings with the government, administration or courts. Transparent procedures regarding transactions engaged in by the company with any government agency or official, or in dealings with any company owned or controlled by a government agency or official, shall be established to this end.

The company will never make political contributions whether in cash or in kind.

V. Society, environment and the wider community

The company views itself as an integral part of the community in which it operates and is committed to a sound relationship built on respect, trust, honesty and fairness.

The company is committed to creating jobs and developing local talent when this is economically sustainable.

The preservation of the environment is of the utmost importance to the company. The company thus strives to minimize any disruption to the environment arising from its activities by reducing waste, emissions and discharges, and by using energy efficiently. All operations and activities will be carried-out according to the highest standards of care and in-line with internationally recognized principles.

Company employees are encouraged to engage and commit part of their time to help the local community through a variety of charities and foundations, educational organizations and similar institutions.

Non-governmental organizations (NGOs) are a key element to any society and the company seeks to build constructive relationships with such organizations in building a better society and environment--in an economically sustainable matter. The company promise to engage and consider the specific developmental needs of communities in which it operates, through a process of regular and open dialogue.

D. Implementation

I. Means to Obtain Advice

Many business decisions involve ethical dilemmas and require complex judgments to make the right choice. In cases of uncertainty, all officers and employees are expected to act responsibly and raise the ethical dilemma with their managers. Should this not lead to a satisfactory solution, the ethical issue is to be raised with a designated officer to obtain clarification. All officers and employees have the right to make confidential reports directly to the designated officer who in turn shall decide whether to report the matter to the audit committee to recommend appropriate action against any director or employee who acts in a manner inconsistent with this code of ethics.

II. Processes and Responsibility

Each individual is responsible for his or her ethical behavior. The company has implemented a procedure for all officers and employees to regularly state that they understand and apply the provisions of this code of ethics. Adherence to this Code is further made obligatory as it is referenced in all employee contracts and linked to disciplinary procedures. A copy of this code of ethics is given to every employee on his or her first working day.

Department heads are accountable to the CEO and/or executives for implementing this code of ethics within their departments, ensuring that all officers and employees understand it, and for providing assurance on compliance. The CEO and/or executives are in turn accountable to the board.

The principles and provisions in this code of ethics have been integrated into the company's system of internal control. Rigorous and objective processes to measure performance, identify gaps and implement measures to address ethical gaps are regularly reviewed and modified.

Willful or careless breach or neglect of this code of ethics will be treated as a serious disciplinary matter and can lead to the termination of employment.

The board's audit committee periodically reviews and updates compliance with these principles, and formulates proposals for the board's approval.

III. Training Program

The company offers an introductory ethics-training course once per year for all new officers and employees. This course offers practical examples of this code of ethics in action.

Periodic and specialized training courses are further offered to the company's officers and employees, as well as to the company's other stakeholders such as suppliers and other business partners, as part of the company's continuous professional education program.

Annex 8

Model Terms of Reference for an Executive Committee[160]

1. Purpose

The purpose of the Committee is to assist the Chief Executive in the performance of their duties, including:

- The development and implementation of strategy, operational plans, policies, procedures and budgets;
- The monitoring of operating and financial performance;
- The assessment and control of risk;
- The prioritization and allocation of resources;
- Monitoring competitive forces in each area of operation.

2. Membership

The Committee shall be made up of the Chief Executive, Deputy Chief Executive, Finance Director, all other executive (main board) directors, the heads of each business division, human resources, risk, IT, strategy, operations, group legal, and the company secretary. Others may be invited by the Chief Executive (or in their absence, the Deputy Chief Executive) to attend all or part of any meeting.

3. Chair

The Chief Executive shall act as Chair of the Committee. In their absence, the [Deputy Chief Executive] [Finance Director] shall act as Chair.

4. Secretary

The company secretary or their nominee shall act as the secretary of the Committee.

5. Quorum

The quorum necessary for the transaction of business shall be [3] members of whom at least one must be either the Chief Executive or [Deputy Chief Executive]/[Finance Director]. A duly convened meeting of the Committee at which a quorum is present shall be competent to exercise all or any of the authorities, powers and discretions vested in, or exercisable, by the Committee.

---

[160] This model was adapted from the model terms of reference provided in Guidance Note 0409902 of the ICSA Chartered Secretaries.

6. Frequency of Meetings

The Committee shall meet [monthly on the first Monday of each month] [fortnightly on a Tuesday] [every Monday].

7. Notice of Meetings

Meetings of the Committee, other than those regularly scheduled as above, shall be summoned by the secretary of the Committee at the request of the Chief Executive. Unless otherwise agreed, notice of each meeting confirming the venue, time and date together with an agenda of items to be discussed and supporting papers, shall be forwarded to each member of the Committee and any other person required to attend, no later than [2] working days before the date of the meeting.

8. Conduct of Meetings

Except as outlined above, meetings of the Committee shall be conducted in accordance with the provisions of the Company's Articles of Association governing the proceedings of directors.

9. Minutes of Meetings

The secretary shall minute the proceedings and resolutions of all meetings of the Committee, including recording the names of those present and in attendance. Minutes of Committee meetings shall be circulated promptly to all members of the Committee and, once agreed, to all members of the board.

10. Duties

- Recommending objectives and strategy for the group in the development of its business, having regard to the interests of its shareholders, customers, employees and other stakeholders;
- Agreeing policy guidelines for business divisions based on approved group strategy;
- The successful execution of strategy; The presentation of the group's budgets and five year plan to the board and, following their adoption, the achievement of the budgets and plans; Developing and reviewing business division objectives and budgets to ensure that they fall within the agreed group targets; Ensuring appropriate levels of authority are delegated to senior management throughout the group; Reviewing the organizational structure of the group and making recommendations for change; Ensuring the control, co-ordination and monitoring within the group of risk and internal controls; Ensuring compliance with relevant legislation and regulations; Safeguarding the integrity of management information and financial reporting systems; Identifying and executing new business opportunities outside the current core activities, including geographic diversification; Examining all trade investments, divestments and major capital expenditure proposals and the recommendation to the group board of those which, in a group context, are material either by nature or cost;
- Approving all strategic or material alliances and partnership agreements; Optimizing the allocation and adequacy of the group's resources; Ensuring the

provision of adequate management development and succession and recommendation and implementation of appropriate remuneration structures within business divisions; Developing and implementing group policies, including:

- Codes of ethics and business practice
- Share dealing code
- Risk management policies
- Treasury policies
- Health and safety policy
- Communications policy (including procedures for the release of price sensitive information)
- Investor relations policy
- Corporate social responsibility policy (including environmental, employee communications and employee disability)
- Charitable donations policy; and
- Ensuring the active liaison, co-ordination and co-operation between business divisions.

11. Reporting Responsibilities

The Chief Executive shall report formally to the board, at each board meeting, on the proceedings of the Committee since the previous board meeting.

Annex 9

Definition of Independence[161]

The board should identify in the annual report each nonexecutive director it considers to be independent. The board should determine whether the director is independent in character and judgment and whether there are relationships or circumstances which are likely to affect, or could appear to affect, the director's judgment. The board should state its reasons if it determines that a director is independent notwithstanding the existence of relationships or circumstances which may appear relevant to its determination, including if the director:

- Has been an employee of the company or group within the last five years;
- Has, or has had within the last three years, a material business relationship with the company either directly, or as a partner, shareholder, director or senior employee of a body that has such a relationship with the company;
- Has received or receives additional remuneration from the company apart from a director's fee, participates in the company's share option or a performance-related pay scheme, or is a member of the company's pension scheme;
- Has close family ties with any of the company's advisers, directors or senior employees;
- Holds cross-directorships or has significant links with other directors through involvement in other companies or bodies;
- Represents a significant shareholder; or
- Has served on the board for more than nine years from the date of their first election.

All of the above criteria, barring that related to representing significant shareholdings, are relevant in the public sector context (with some adaptation).

[161] Adapted from Unlocking Your Board's Full Potential: Board Evaluation Questionnaire, UK National Audit Office, ICAEW Non-executive board members Group, Mazars.

Annex 10

Guidelines on Related Party Transactions[162]

A. Introduction

It is _____'s [enter company name] (hereinafter "the Company") practice that related party transactions are conducted at arm's length with any consideration paid or received by the Company or any of its subsidiaries in connection with any such transaction being on terms no less favorable than terms available to any unconnected third party under the same or similar circumstances. The purpose of these guidelines are to set out the procedures by which the Company or any of its subsidiaries may enter into a related party transaction.

B. Application of this Policy

This policy applies to the Company's directors and senior managers. Related party transactions constitute a conflict of interest. These Guidelines are not intended to conflict with any applicable laws or regulations and if any such conflict occurs the requirements of the law or regulation shall prevail.

C. Review and Approval Procedures

Directors shall disclose to the board, through the company secretary, details of all their other directorships and any shareholdings owned by them or members of their family. Any changes to these notifications must be communicated promptly to the board of directors through the company secretary.

It is the responsibility of each director and senior manager to promptly notify the board, through the company secretary, of any proposed related party transaction as soon as they become aware of it. It is the responsibility of a director or senior manager who is involved in a proposed related party transaction to inform the board, through the company secretary, and obtain approval prior to entering into the transaction.

Conflicted board members shall not participate in discussions on transactions in which they are a conflicted party and abstain from voting on such issues.

The board shall decide whether or not to approve the related party transaction involving a director in the absence of that director.

[162] From IFC Guidelines for Directors on Strengthening Corporate Governance, November 2006.

D. Identification of Related Party Transactions

For purposes of this policy, a "related party transaction" is a transaction between the Company or any of its subsidiaries and any "related party".

"Related Party" includes the following:

a. The board members of the Company, its parent company, affiliated or sister companies and associates.

b. A parent company and any subsidiary or affiliated company that is not wholly owned.

c. The CEO or General Manager, and key officers, including anyone who directly reports to the board or the CEO.

d. Any shareholder having the ability to control, or exercise a significant influence on the outcome of resolutions voted on by shareholders or directors of the Company, its parent company, affiliated or associated companies.

e. A person's parent, grandparent, child, brother, sister, aunt, uncle, cousin, nephew, niece, spouse, widow or in-law of any the persons listed in paragraphs (a) to (e).

f. Any business, and the directors, CEO and key officers of any business, in which the natural persons listed in paragraphs (a) to (e) exercise a significant influence on the outcome of resolutions voted on by shareholders or directors of the Company.

g. Any person whose judgment or decisions could be influenced as a consequence of an arrangement or relationship between or involving themselves and any of the persons in paragraphs (a) to (f).

E. Disclosure

The Company shall report to its shareholders in its annual report and accounts on all related party transactions to the extent required by applicable laws or regulations. If the law so requires, the prior approval of shareholders will be sought for any proposed related party transaction.

F. Policy Review

The audit committee shall review and assess the adequacy of this policy at least annually and recommend for approval by the board any changes it considers are needed.

Annex 11
Model Statement of Corporate Intent

1. Introduction

[Insert name of the Company] is a State Owned Enterprise that was formed in [Insert year]. The Company has since developed a strategic plan (Turnaround Plan) with the objective to build, over 10 years, a business able to meet its long run investment requirements, following an initial investment period from the State. This prioritized investment plan includes upgrading the network, rolling stock, plant, equipment, facilities and systems. The plan will be delivered by improving reliability, timeliness and providing more flexible services underpinned by the implementation of an organization-wide customer focused culture. This will attract more freight and enable yield growth.

The 2011 financial year was the first full year of implementing the Turnaround Plan (TAP). Like many businesses, the last 12 to 18 months have been remarkably challenging with a flat economy following the global financial crisis. Overall these have had a negative impact on our performance; however, we have been encouraged by many aspects of the past year including substantial support from our customers resulting in excellent growth in our domestic and import/export freight markets. We have also made strong progress on our asset investment plans. Further insights into key performance outcomes for the 2011 financial year are included in section 5 of this statement.

2. The Rail Business

The Company operates as a single entity with multiple business units. Key elements of the business are:

- Freight provides rail freight services and locomotives for passenger services. This includes:
    - The movement of bulk freight such as export coal, milk, steel, meat, horticultural products and forestry;
    - The movement of containerized freight for import and export and domestic full container load customers
    - Metro Maintenance, which provides locomotive engineers and maintains rolling stock
- Ferry operates the ferry passenger and freight services. This includes: three “roll-on, roll-off” ferries carrying rail freight, commercial vehicles, passenger vehicles and foot passengers

- Passenger provides urban passenger services in and long distance passenger rail services. This includes:
    - Long distance passenger services as well as special charter services
    - Urban passenger
- Mechanical which includes:
    - Workshops for heavy engineering maintenance and specialized manufacturing
    - Maintenance and service repairs to rolling stock (locomotives, wagons, EMUs, DMUs and carriages)
- Network
    - Maintains the rail network and controls the operation of trains on the network

3. Nature and Scope of the Business

The business activities of The Company over the next three years will be:

- To own and operate a national rail network
- To provide for the transport of bulk and consolidated freight
- To provide ferry services for rail, commercial freight, and passenger services and their vehicles
- To provide rail passenger services in metropolitan areas and long distance services for both domestic and tourist markets
- To manage and develop property holdings for rail operations and appropriate third party land use
- To develop rail and ferry services and intellectual property in expanded markets
- To undertake or participate in business activities which add value for customers and leverage the capabilities of The Company.

4. Corporate Responsibility Commitment

- To deliver to our customers what we have promised; we will listen to them and involve them in our solutions and innovations
- To be a good employer, treating our people fairly and with respect, and valuing their diversity. We are committed to creating a workplace that makes people want to join, stay and work to their full potential. Our commitment to the safety and well-being of our people is a priority
- To work with our suppliers to develop long term partnerships based on best practice procurement methods which reflect mutually agreeable codes of conduct

- To recognize the environmental, social and economic needs of the communities we work in and endeavor to be a good neighbor. We will involve relevant communities in initiatives we implement
- To help protect the environment by better understanding, managing and measuring our environmental impacts and minimizing the carbon intensity of our services. We will do this by commissioning new, more fuel efficient locomotives, increasing our focus on fuel saving behavior and opportunities to improve efficiency.

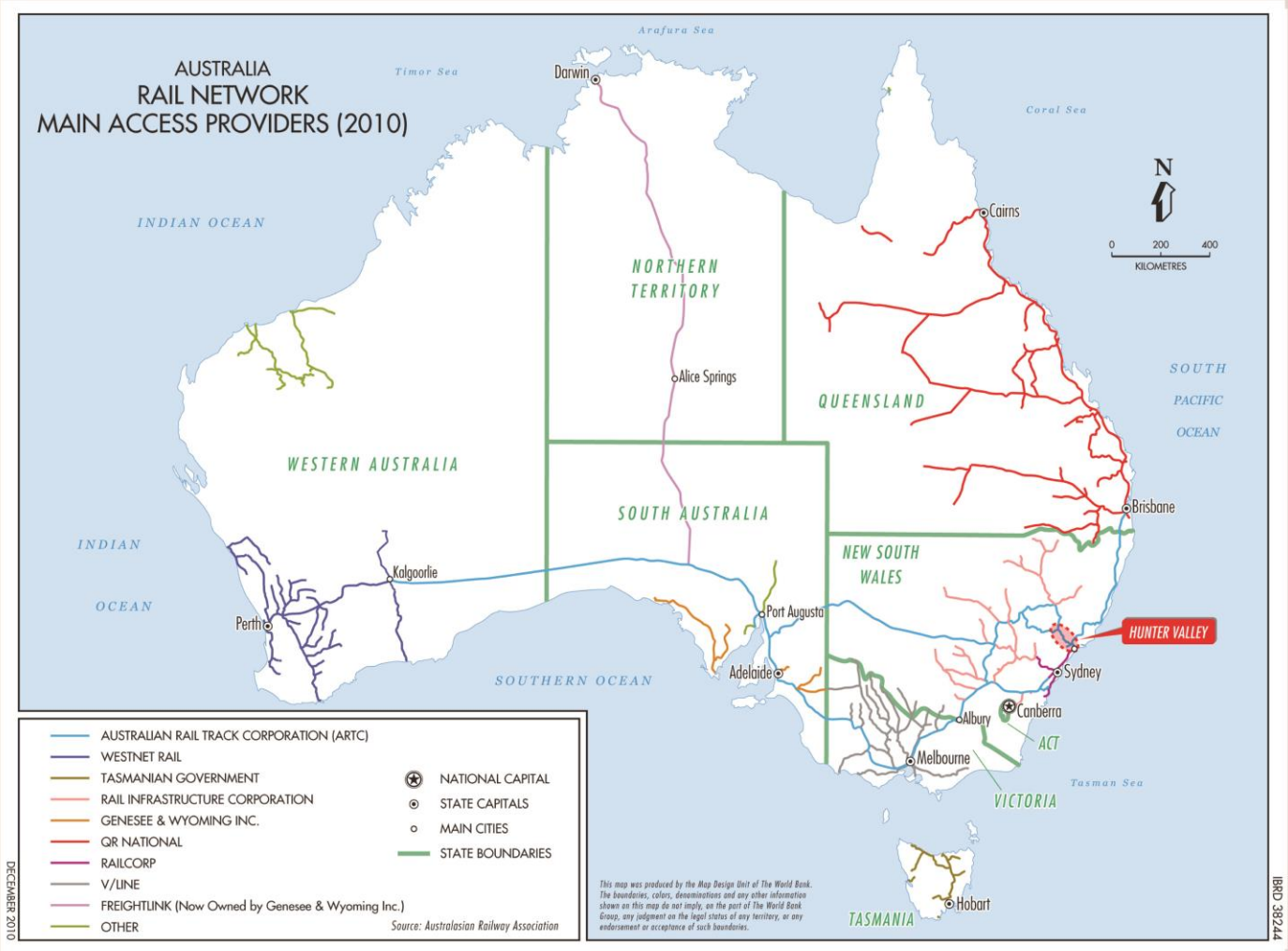
Case Study

Australian Rail Track Corporation

1 The Creation of ARTC

Originally, each of the six states in Australia constructed and operated their own public railways, with the federal government also operating two major trans-continental lines. In the 1990s, the federal and state governments undertook extensive

Figure 1 Australian Rail Network Showing Main Access Providers



(ARTC Australian Rail Track Corporation, QR Queensland Railways, BBI Babcock and Brown Infrastructure)

reform of the Australian railway industry. As part of this, they established open access to the rail network and created the Australian Rail Track Corporation (ARTC), which began operations on 1 July 1998 and represented one of the most significant steps taken during these reforms.[163] It initially managed the interstate network of the federal railway but, over time, its responsibilities have expanded to include managing much of the interstate rail network in five states, plus the Hunter Valley export coal lines (Figure 1).

Box 1 ARTC Network Growth

- July 1998, commences operations with ex-AN main lines and Victorian interstate lines
- In 2000, Tarcoola to Alice Springs line transferred on a long lease to the private company constructing Alice Springs– Darwin line
- In 2004, NSW main lines and the Hunter Valley coal network taken over, through long-term lease
- From 2004, assumed responsibility to maintain and operate NSW rural network, owned by NSW state-owned Rail Infrastructure Corporation, which collected access revenue and negotiated access.
- In 2010, took over the Queensland main line, between New South Wales border and Acacia Ridge in Brisbane, through a long-term lease.

Until 2004, the key ARTC activity was maintaining and operating the interstate main lines in Victoria, South Australia, and West Australia (as far as Kalgoorlie). In 2004, ARTC assumed control of a large part of the New South Wales (NSW) network and became responsible for major Federal Government investment in the network and maintaining, under contract, the NSW rural network. Two other adjustments occurred to the ARTC network during the last decade (see Box 1) and ARTC is now responsible for the interstate track from Kalgoorlie in the west via Melbourne and Sydney to Brisbane in Queensland, together with the Hunter Valley coal lines in New South Wales (NSW). The net result is that the original network of 4,443 route-km managed by the Australian National (AN) access unit has now increased to 7,112 route-km, of which 8 percent is multiple-track. The ARTC also maintains the regional branchline network in NSW of 2,828 route-km of operational track and a similar volume of non-operational lines.[164]

2 Corporate Objectives and Management

The corporate mission of ARTC is, *'In collaboration with our customers, through innovative and creative strategies, expand the industry, provide efficient access, and enhance the national transport logistics network'* with its vision being to *'Ensure rail is an integral, sustainable element of the nation's transport logistics network'*.

More concretely, it has four principal functions (see Box 2). First, it is the 'one-stop-shop' for track access, which was achieved rapidly in Victoria (lease) and Western Australia (through a wholesale arrangement) but not in NSW and

[163] Appendix A describes the Australian rail sector and summarizes developments that led to creating ARTC.

[164] This includes partially constructed line as well as closed lines which still require maintenance of bridges, culverts, etc.

Queensland. There was steady progress in the second function and the fourth. Unfortunately, the third function, investment, was slow to materialize. The ARTC inherited ex-Australian National (AN) infrastructure, which had received considerable investment in the preceding twenty years and was in reasonably good condition. However, much of the Victorian network was in poor condition and many of the NSW lines, especially from Sydney to Brisbane, had not been constructed to main line standards and were suffering from many years of deferred maintenance. At the same time, the NSW Hunter Valley coal lines were close to capacity and needed to be expanded. ARTC has always operated at a profit, but this has been sufficient only for minor capital works, and it could not finance the major reconstruction required to make the network competitive, particularly in NSW.

Box 2 Key ARTC Functions

- Provide access to the interstate rail network through access agreements with track owners, including those in other states—the 'one-stop-shop';
- Manage track maintenance and construction, train pathing, scheduling, timetabling and train control on track owned or controlled by the company;
- Improve the interstate rail infrastructure through better asset management, and by managing (in consultation with rail operators and track owners) a program of commercial and publicly funded investment for the interstate rail network; and
- Promote operational efficiency, by working with other track owners, and promoting uniformity of operating, technical and safety standards and practices on the interstate rail network.

Following the transfer of the NSW network, funds have been provided, primarily by the federal government, through a series of grants and equity injections. Thus, the ARTC has evolved from a track authority that primarily maintained and managed a compact network, to an entity with responsibility for managing major investment projects on its own network, and performing contract maintenance on a major rural network.

Box 3 Corporate Governance in ARTC

- Clear roles and responsibilities for Board and management defined through formal delegations
- Independent and experienced Board; there are currently five non-executive directors, all from the private sector.
- A formal Code of Conduct
- Internal and external audit supervised by the Board Audit and Compliance Committee
- Complies with governance requirements for Government Business Enterprises, including an annual Corporate Plan and Statement of Corporate Intent, and formal quarterly shareholder meetings.
- Subject to the Commonwealth Authorities and Companies legislation, and Corporations Act.
- A specific General Manager for risk and compliance
- A Board remuneration committee

Until 2004, ARTC was a slim organization with less than 100 staff. All maintenance was outsourced and the only employees were train controllers, supervising engineers, and management. When ARTC took over the NSW lines, much of the NSW maintenance workforce was seconded to ARTC; some of these have now transferred to ARTC. The total staff increased to around 1,100, but now stands at 1,000. In its early years, ARTC had a relatively simple structure but this has developed as its activities expanded. Under the Managing Director there are a Chief Financial Officer and a Chief Operating Officer. There are seven general managers, each responsible for an operational and functional area—three main operational areas (East-West, North-South and Hunter Valley); the NSW maintenance contract; commercial issues; communications and control systems; and risk and compliance.

ARTC subscribes to the same principles of corporate governance, as other major commercial companies in Australia (see Box 3 for key elements).

3 Access Pricing and Management

On the interstate network, ARTC operates under access undertakings, which are subject to approval by the national Australian competition authority (ACCC). The undertakings include provisions relating to non-discriminatory access, price-setting under the 'negotiate-arbitrate' model generally used in Australia, pricing principles adopted for deriving indicative charges, and the proposed charging structures. ARTC has developed separate undertakings for the interstate network and the Hunter Valley coal network, reflecting the very different commercial and operational characteristics of the two networks, although both follow the general principles summarized above. ARTC's access undertaking for the Hunter Valley coal network is expected to be approved by the ACCC in early 2011.

Under the 'negotiate-arbitrate' model, the access provider and access seeker aim to reach a commercially negotiated agreement on price and the non-price terms of access. If they cannot agree, a provision exists for arbitrated outcomes.

The pricing principles establish the floor and ceiling limits for negotiating and arbitrating access charges and revenue, which aims to prevent access providers from generating monopoly profits, and to ensure that users pay the cost of using the network. Generally, the ceiling price is defined as the full economic cost of service provision; the floor price equals the marginal or incremental cost, although ceiling and floor definitions vary among access providers.

The ARTC defines the floor revenue as the incremental cost of providing the service including an allocation of overheads, but excluding return on investment and return of capital. It sets the ceiling revenue at the full economic cost of providing the service including an allocation of overheads, depreciation, and a return on assets. The asset value is based on depreciated optimized replacement cost (DORC)[165] and the return on assets based on the weighted average cost of capital (WACC). However, there are few if any national network lines that recover full economic costs from access prices, except for the Hunter Valley and Queensland coal lines, and part of the West Australian network. Therefore, most prices are not based on cost-recovery. Instead they are market-based—taking account of what train operators can pay and remain competitive with road transport—and ARTC uses reference prices that reflect this on the sections of the network used primarily by general freight.

In Australia, most access charges are not related to the availability of spare capacity. Instead, passenger trains have priority path allocation; although they may incur somewhat higher charges per path and/or gross ton-km, this is not intended to ration capacity but to reflect the higher level of service they receive. Similarly, real-time path charging is not used to manage capacity or operator performance.

ARTC's access charge revenues cover recurrent expenses and allow some surplus for renewals and other works, but Government funds most major investments and upgrades. The price charged by competing road transport is the single biggest factor in setting access charges on most of ARTC routes; Government funding of major investment therefore implicitly encourages ARTC to set access charges that enable rail to compete with road transport.

The 'negotiate-arbitrate' model applies to all traffic. However, the price structure and starting point for negotiations differ between interstate lines and Hunter Valley coal.

3.1 Interstate Network Pricing

For the interstate network, ARTC publishes a schedule of reference tariffs to apply to all contracted above-rail operators (see example in Appendix B of this Case Study). This simple two-part tariff comprises a flagfall charge per train-km, plus a variable charge per gross ton-km, including freight, wagons, and locomotive weight. This formula results in a higher charge per ton-km for smaller trains, on the basis that small trains consume the same network capacity as longer heavier trains.

[165] Depreciated optimized replacement cost (DORC) valuation is a process to establish the current value of an asset based on the cost to replicate the asset in the most efficient way, from an engineering perspective, given the service capability or requirement, and existing asset age.

There are pricing categories for express passenger trains, and up to three types of regular freight services—super, express, and regular—depending on the network section. These differences reflect train operating speed and, just as importantly, are the basis for establishing train priority when crossing conflicts occur.

The flagfall charge varies by type of freight train; generally, the price is based on maximum speed and axle-load, and is charged on timetabled paths rather than actual trains, with a small allowance for cancelled trains —essentially levied on a take-or-pay basis. A fourth category, 'standard freight', provides for ad hoc operations but most long-distance traffic requires the certainty of contracted, committed train paths. The gross ton-km charges are payable on the actual ton-km operated and, on most line sectors, are common to all trains.

Both the flagfall and usage charges vary among network sectors, in an attempt to reflect cost differentials and market ability to pay to the extent that line sections correspond to markets. The interstate network price levels are constrained by the need for rail transport to remain competitive with road and, to some extent, sea transport. Essentially, current price levels are the estimated difference between what train operators can charge customers and train operators' costs, including an allowance for return on investment. The original price levels were set when vertical separation was implemented, and for many years, there was little movement in track access prices in real terms. However, ARTC has recently increased east-west access prices by about 10 percent and granted a short-term rebate on north-south prices. The changes acknowledge rail's competitive position on cost and service quality compared with road in the respective market corridors, and helps maintain rail competitiveness with road on the struggling north-south corridors. Of course, the north-south rebate will affect the market only if the cost saving is passed on in the train operators' prices.

ARTC does not apply time-of-day or day-of-week pricing on the interstate corridors even though market demands cause major peaking issues at specific times; attempts to do so have been refused by the regulator. ARTC has also been reluctant to use Ramsey pricing for individual traffics beyond the broad categories described above.

3.2 Hunter Valley Coal Network Pricing

Track access charges for the Hunter Valley coal train operators have traditionally been levied on a straight price per net ton and are mine-specific. ARTC aims to maintain equitable treatment among mines by considering their relative distance from the port, but does not apply a fixed formula to price setting. As the charges are levied for tons moved there is no 'take-or-pay' underwriting for ARTC as yet.

The current per ton tariff structure is under review as part of a broader change to contracting arrangements for track access in the Hunter Valley, as contemplated in ARTC's Hunter Valley Access Undertaking currently under review by the AC CC. ARTC is now beginning to contract directly with coal producers for path capacity rather than timetabled train paths per se. Pricing will comprise a two-part structure that commits coal producers to significant levels of fixed payments based on a take-or–pay arrangement.

4 Train Management

Much of the ARTC network is single-track. Since multiple operators compete in the same end market, train management is important in avoiding any complaints about bias or favoritism. ARTC has thus introduced formal network-management principles to establish which train will be granted priority when conflicts arise. The principles consider train categories by type and whether they are 'healthy' or 'unhealthy.'[166] So-called 'healthy' trains should normally get priority over 'unhealthy;' ones; if both trains are healthy, priority is determined by train type, which tends to reflect the size of the flagfall charges.

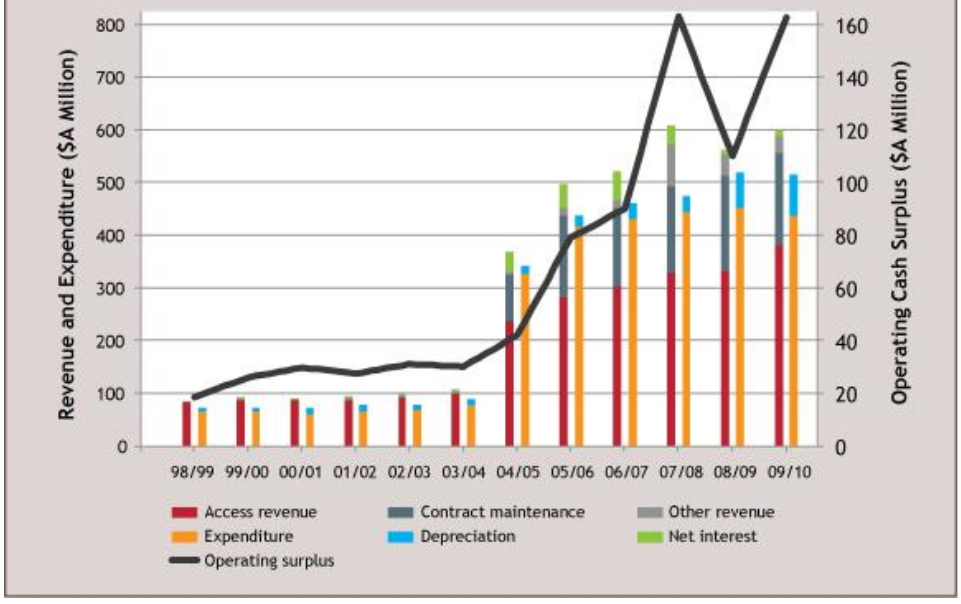
5 Accident Claims

Accidents are investigated to determine their causes, and costs are apportioned to the party at fault. However, minor accidents causing damage less than A$50,000 are not claimable by either ARTC or the train operator unless the annual aggregate of such claims between the two parties exceeds A$250,000.

6 Financial Performance

Figure 2 shows revenue, expenditure and annual cash operating surpluses since ARTC was established.[167] Until 2003-04, most of the A$100 million in annual revenue was from access charges, and cash surpluses (excluding depreciation) were A$30 million.

Figure 2 ARTC Revenue, Expenditure and Cash Operating Surplus 1998/99 – 2009/10 ($A Million)

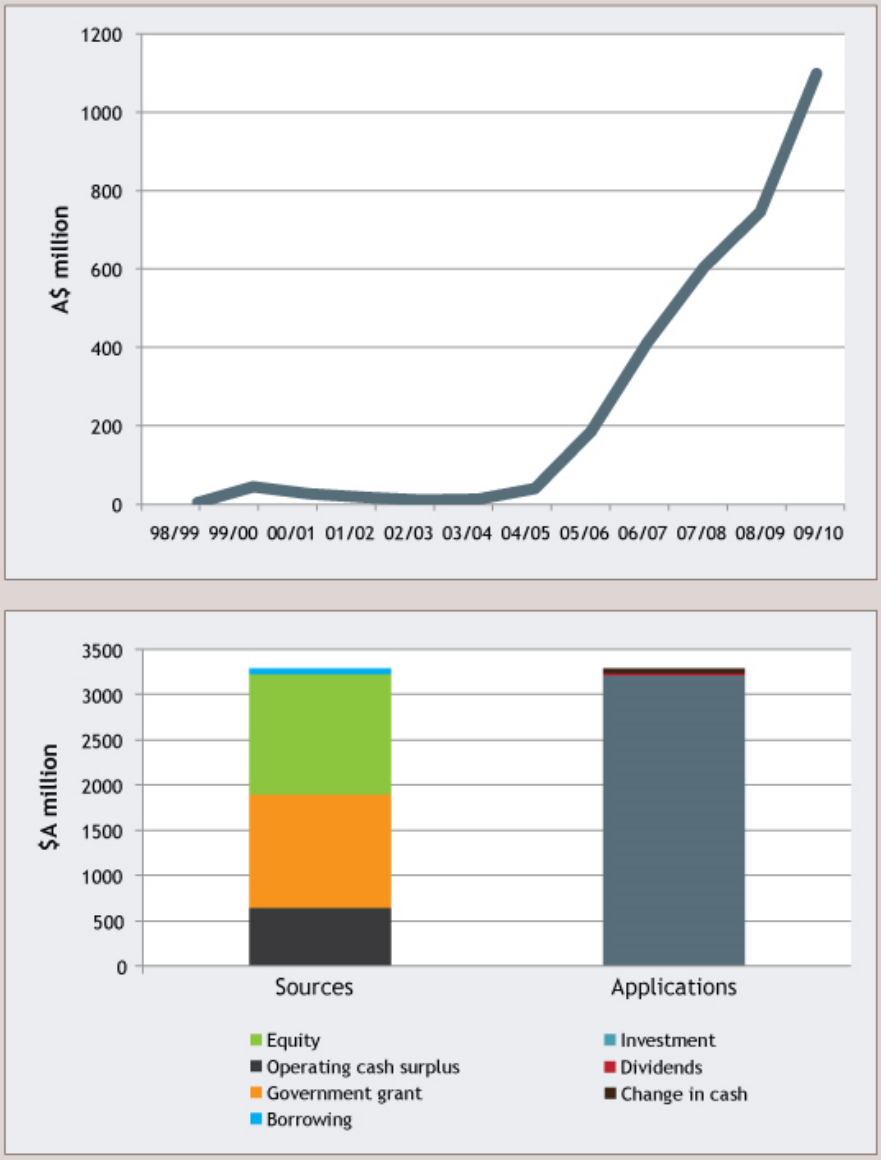


[166] Healthy trains are those that have entered the network on time and do not subsequently get delayed for reasons under the control of the operator; all others are 'unhealthy'.

[167] Some figures differ from those recorded in Annual Reports; published accounts treat much of government grant funding as revenue, and include several asset write-downs as costs. This presentation excludes those.

Since 2004, after taking over the NSW network, annual revenue has increased to around A$600 million, including access revenue of about A$380million and maintenance contract earnings of about A$180 million. During 2007-10, the cash surplus averaged over A$140 million, helped by the Hunter coal traffic.

Figure 3 Investment Levels and Sources and Applications of Funds 1998/99 – 2009/10



The investment picture is similar (Figure 3). Since 1998-99, ARTC has invested A$3.2 billion in its network. Government supplied about 80 percent, in roughly equal proportions of grants and equity.[168] The ARTC operations generated around A$600 million, thus covering 'normal' renewal investments reflected in depreciation charges during the period (around A$300 million) and generating about the

[168] Grant funds have been taxable but also have earned interest before they were spent; these related revenues and costs have been treated as 'grants' for the purposes of this case study.

same amount towards infrastructure upgrades, sufficient to address the backlog and the initial development of an advanced train control system.

7 Operational Performance

Unlike an integrated railway, a track authority has only a few direct customers—train operators who use the infrastructure. Many freight owners have no idea whether their goods are being transported by road or rail and most care little as long as their freight is delivered on time in good condition. The ARTC operates under an access undertaking that requires regular publication of two groups of Key Performance Indicators. One group measures service quality—network reliability, transit times, and track quality index; the second group measures ARTC's operational efficiency, albeit very broadly, through periodic reports of ARTC summary unit costs.[169] Network reliability is evaluated by the proportion of 'healthy' trains that leave the network on time, and 'unhealthy' trains that enter and leave the system without further deterioration. The ARTC keeps detailed records to report on this because network reliability depends not only on the quality of infrastructure, but also on matters outside ARTC control, such as locomotive failures. Track quality is measured through standard indicators such as number and length of temporary speed restrictions (TSRs) but also through a track quality index derived from track recording cars.[170]

When ARTC began operations, the ex-AN network was in reasonable condition, but the Victorian and New South Wales networks were in poor condition when handed over. ARTC immediately addressed maintenance backlogs on both networks and dramatically reduced the number of temporary TSRs, lowered transit times, and improved reliability. During 1998-99, 4 percent of the ex-AN track, and 26 percent of the ex-Victorian track were subject to speed restrictions; by 2001-02, this had been reduced to under 1 percent and has since remained below 2 percent. Again, in 2004-05, ARTC achieved 60 percent reductions in time lost to TSRs between Sydney and Brisbane; and reduced transit time by 15 percent, almost two hours, between Melbourne and Adelaide. Transit times in the north-south corridor are expected to decline by over 20 percent after ongoing capital works are complete. Service reliability during 2002-09 is summarized in Figure 4.

[169] These are infrastructure maintenance costs based on a $/train-km and $/00 gtkm, train control costs (as $/train-km) and operations costs (as $/train-km).

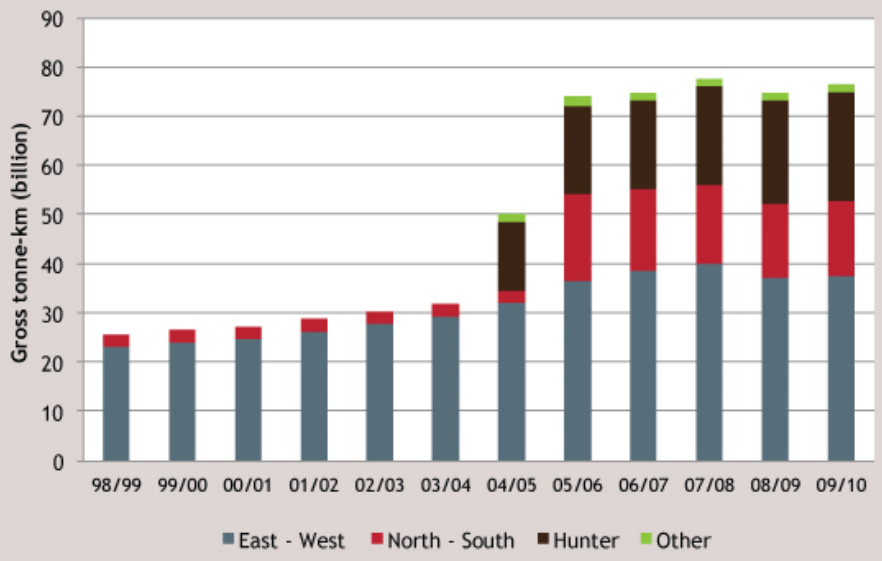
[170] The ARTC has more detailed physical condition reporting requirements for its NSW lease, but this is essentially a contractual issue rather than a regulatory requirement.

Figure 4 Service Reliability in ARTC Corridors 2002-09

Corridor/year	North-South		East-West		
	2006	2010	2002	2006	2010
% trains with on-time entry	69	86	71	70	62
% trains with on-time exit	69	74	69	50	71
% 'healthy' trains with on-time exit	92	99	97	96	99
Minutes of delay/train					
Caused by ARTC	10	17	4	17	13
Caused by operator	49	32	30	147	105
Caused by third parties	7	28	-	36	30

The average journey time over which these delays are incurred is around 30 hours for the north-south corridor and 45 hours for the east-west corridor. Thus, ARTC-caused delays are not a significant factor in current rail reliability. Some 64 percent of ARTC-related delay is due to track condition; around 25 percent is caused by signal failures and the remainder by communications breakdowns and train management.

Figure 5 ARTC Traffic By Corridor (Gross Tonne-km Billion)



Over the last decade, east-west corridor traffic has grown steadily, and so has Hunter Valley coal traffic since ARTC assumed management (Figure 5). However, north-south corridor traffic has been stable, at best, in part due to successive poor summers that reduced grain exports, an important traffic on sections of this corridor. Also, rail has clearly lost general freight market share to improved roads and more widespread use of larger vehicles. It remains to be seen how much of the north-south interstate transport market can be retrieved when network upgrading is complete.

Over the last decade, the changing rail market shares in the ARTC-controlled corridors plus the improved collective performance of infrastructure and train operators is an indication of the overall effectiveness of the vertically-separated rail model (Figure 6).[171]

Figure 6 2009 Rail Market Share By Corridor

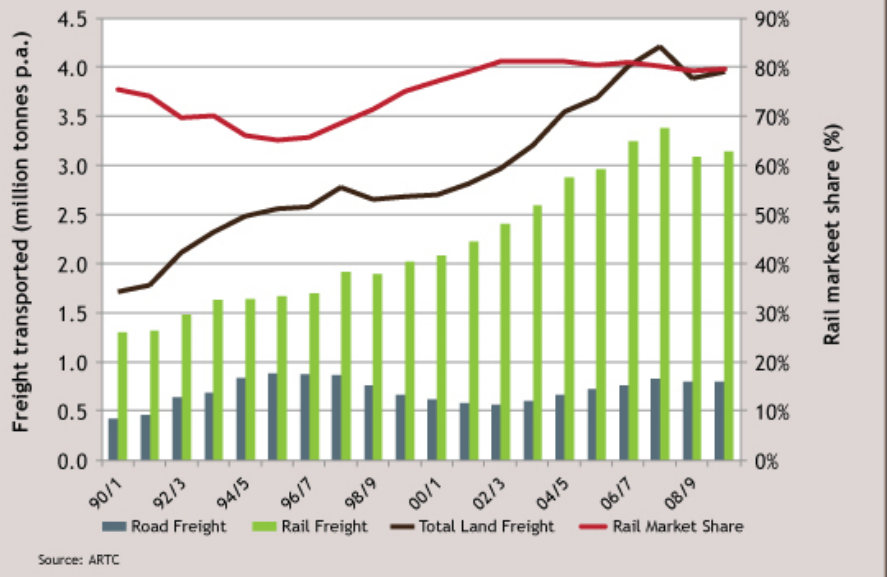
Corridor	Share % 1997	2000	2009
North South			
Melbourne-Sydney	12	11	9
Sydney-Brisbane	18	19	6
Melbourne-Brisbane	19	21	26
East West			
Melbourne-Adelaide	18	20	6
Melbourne-Perth	66	70	71
Sydney-Perth	55	65	68
Sydney-Adelaide	n.a.	n.a.	13
Brisbane-Perth	n.a.	n.a.	40
Brisbane-Adelaide	n.a.	n.a.	46
Adelaide-Perth	n.a.	n.a.	82

Source: Booz Allen Hamilton 2001, Galbraith 2009

Rail has reinforced its dominant position on long-haul east-west routes, but has performed poorly on the three shorter corridors, albeit each is around 1,000 kilometers. During 1997-00, the initial response suggests that the creation of ARTC increased market share by about 10 percent on most routes but, over the longer-term, improved road competitiveness combined with rail investment delays have dragged down shorter-distance market shares. The ARTC performance is an important enabling factor, not the critical factor.

[171] This begs many questions. What would have happened to infrastructure funding without ARTC? What has been the relative impact of open access, changes in relative fuel costs and so on? Nevertheless, it is a useful summary guide. Detailed analysis of market shares should be approached with great caution; rail volumes in these corridors are known exactly, but for most corridors, road volumes must be estimated from a range of indirect sources, so quoted market shares are indicative.

Figure 7 Rail Share of Land Freight to West Australia 1995-2010



The combined impact of open access, ARTC and before it, the AN access unit, is shown in Figure 7, which gives the market share of dominant direction westbound freight over the last decade.[172] In 1995-96, the rail share was 65 percent, by 1999 it was 72 percent, and it continued to rise to about 80 percent in 2003, where it has remained ever since. Now, most general freight on this corridor goes by rail; road carries express freight, some perishables, and out-of-gauge traffic.

8 Summary

The ARTC was probably the first stand-alone track authority in the world to deal predominantly with private-sector freight operators. As a result, ARTC had to innovate to establish commercially acceptable operating procedures and charging practices. The ARTC has enjoyed considerable success on the east-west corridor and the Hunter Valley coal network. However, although it has overseen large investments on the north-south corridor, the benefits will only begin to flow through into sustainable timetable improvements during 2011. The business has operated on a commercial basis and generated sufficient surpluses to contribute to its capital program. The strength of the underlying business model is an important element of success, although the long hauls and a strong coal market have helped. Today, little doubt exists that interstate rail freight would be in a worse state if ARTC had not been created.

In the longer-term, ARTC's capital structure and funding sources will be an emerging issue. To date, Government has supplied almost all external investment funding in the form of equity or grants. As a result, as of June 2010, ARTC had A$2.5 billion of equity, no long-term debt, but had paid no dividends since 2005. ARTC is now starting to take on debt for 'commercial' investments in the Hunter Valley and this will increase substantially over the next few years (and a bond issue for up

[172] In this case, road volumes are known exactly because West Australia maintains a road checkpoint.

to A$200 million has also been recently advertised). But the questions remain as to what is the appropriate debt:equity ratio, how much of ARTC's future investment could be debt-funded and would funders be public or private, and what dividend policy should it adopt?

Appendix A: Background

Most of the 34,000 km Australian railway network is either federal- or state- government-owned and oriented towards freight, except in the main urban areas.[173] However, all freight train operators are independent private companies, except for the main operators in Queensland. The genesis of most of the national network was the state-owned and regionally oriented networks, radiating from the state capitals and major ports to support exports and regional development. In the early 1900s, these state-based mainland rail systems were linked, albeit with three different gauges but it was not until 1995 that a single standard-gauge network linking Brisbane to Perth via Sydney, Melbourne and Adelaide was achieved.

Until the 1970s, the Australian rail industry resembled that of most countries outside North America. Six state government-owned organizations and one federally-owned railway—the 'Commonwealth Railway,' which primarily carried long-distance traffic across the Nullarbor and to Alice Springs—were responsible for operating passenger and freight services as vertically-integrated operations. Like state-owned railways elsewhere in the world, Australian railways had a large workforce and relatively low productivity; freight traffic involved various regulated monopolies—haulers could not carry traffics that competed with road services—and government-controlled tariffs.

Pressure for deregulating competing road transport was growing, and protection was steadily relaxed or withdrawn. By 1975, the two weakest state railways (South Australia and Tasmania) were handed over by state governments to the central government and absorbed into the Commonwealth Railway, which became the Australian National Railway (AN). By mid-1980s, in all states except Queensland, most passenger services had been split from freight services at least internally within the railway and in some cases services moved into a separate organization.

In 1995, the competition policy adopted by the Australian federal and state government triggered the next major change by introducing vertical separation into infrastructure in general, including railways. This opened the railway network to third parties, who could operate their own trains; railways were split internally into infrastructure providers and train operators. At the same time, state and federal governments, again except in Queensland, began to privatize their freight rail operations and the infrastructure business units became track authorities.

There are currently around half a dozen significant private freight train operators and ten major infrastructure providers, most of which are publicly owned, with little or no common ownership. Government exerts no control on rates charged by operators because on-rail competition and strong competition from the road industry are thought to be sufficient. However, access charges levied by infrastructure providers are subject to approval by state and federal competition regulators that deal with railways and other infrastructure sectors.

[173] Australia has several industrial railways, such as iron lines in the Pilbara, and cane railways in Queensland, but these carry only owners' traffic. Significant commuter rail passenger services are in state capitals: Sydney, Melbourne, Brisbane, Perth, and Adelaide, but non-urban passenger services are very limited. Most rail corridors are paralleled by high-standard highways, either partly or fully upgraded; trucks can expect to average 80 km/hr or more; most interstate road vehicles are B-doubles or larger.

Rail freight in Australia comprises two main movement groups: bulk freight, principally iron ore, coal, grain, generally moving 50-500 km from the interior to ports; and long-haul intermodal/general freight moving 1,000-4,000 km between state capitals such as Melbourne to Perth. Other than grain, export bulk traffics are confined to a relatively small and well-defined set of financially viable lines. Grain networks are relatively dense, similar to those in Canada and Argentina, but increasingly vulnerable to road competition. Almost all grain networks have lost their passenger services and most networks transport little general freight, but they remain politically significant despite their marginal financial circumstances.

Long-haul general freight includes movement of general products and manufactured goods, primarily on inter-capital hauls. Historically, rail operators have been wholesalers in this market; freight forwarding companies maintain the end-customer relationship and provide value-added services such as shipping containers, pickup/delivery, and warehousing. This sector is best considered as two markets: the east-west corridors of Brisbane/ Melbourne/ Sydney-Adelaide-Perth, in which rail is very competitive with around 70-80 percent of the market, and the north south corridors servicing Brisbane-Sydney-Melbourne, in which it is much less so.

Box 4 Road User Charges

The financial viability of interstate general freight is influenced by the level of road user charges for heavy vehicles. In Australia these are set by a national body with the overall aim of recovering the marginal costs imposed on the system by freight vehicles, in the form of an annual fixed registration charge per vehicle and a variable levy included in the diesel fuel price paid on a per liter basis. The marginal costs are based on the historic and budgeted operating costs associated with road provision, repairs and maintenance costs and land acquisition costs. Traffic control and enforcement costs are excluded, as are the cost of historically provided assets and financing costs. There is considerable debate as to whether these represent a fair contribution to road construction and maintenance costs, both in the aggregate and on specific routes, such as the long-distance arterial roads that compete directly with the main rail network.

Most rail freight moves between terminals, serving very few private sidings. Road access and egress costs to and from terminals are substantial and service availability and reliability are important factors in mode choice.[174] In eastern Australia, most interstate freight transport is overnight delivery, so cut-off times for loading and on-time arrival are critical considerations. Typically, for such time-sensitive traffics, road transport can charge a premium over rail to reflect its superior service quality.

As a result, long-distance general freight traffic was loss-making on most corridors in the 1980s and the level of service was poor. Although most state governments

[174] For example, it is commonly accepted that access and egress costs represent one-third to one-half of total door-to-door cost by rail for the 1,000 km journey between Sydney and Melbourne.

were more concerned with politically sensitive shorter-haul traffic within their own states, the federal government wanted to create a more efficient industry for long-distance general freight traffic and in 1991 established the National Rail Corporation (NRC) as a train operating company responsible for all interstate services and it began operations in April 1993. State railways were paid track usage charges.[175] Long-distance general freight traffic was a minor share of most state railway operations, but represented about 80 percent of Australian National (AN) traffic.[176] When NRC began, AN train operations therefore shrank considerably although AN was still responsible for infrastructure maintenance and train control on their network. AN responded by reorganizing internally and establishing a dedicated track access unit, the first of its kind in Australia, which developed a set of access charges for the rail operators mentioned above.

At around the same time, a major policy development, known as the Competition Policy, affected the overall framework for managing infrastructure in general. The policy emerged from the finding of the 1993 Hilmer Report, and the 1995 Competition Principles Agreement (CPA) between the federal and state governments. The agreement covered electricity, water, gas, transport, and telecommunications and laid the foundation for competition reform in these sectors. In the rail industry reform had two main phases.

- Several vertically integrated government-owned railways were separated into their 'natural monopoly' below-rail components and 'potentially competitive' above-rail components.
- Provision was made to facilitate third-party access to any below-rail facilities that were deemed nationally significant.

Next, Government decided to sell AN residual above-rail operations, which comprised passenger services and freight operations in Tasmania and rural South Australia, raising the question of what to do with track owned by AN and managed by the AN track access unit. This was part of a broader problem facing the interstate network, which now had to comply with competition policy. Five options were considered, of which the following two were the most important.

- Transfer the interstate network to NRC, which would become an integrated operator for most of its operations, but allow other operators track access.
- Create an independent authority to manage and control the interstate rail network.

The two options were compared in terms of the following broad criteria.

- Net economic benefit, which took the following into account.

[175] Initially, state railways were paid for rolling stock operation and maintenance, but most of these activities were transferred to NRC within a year or so.

[176] A further 15 percent was a stand-alone coal movement to a power station; local general freight made up the remaining 5.0 percent.

  - allocative efficiency ('doing the right thing') in encouraging market-based pricing and investment and optimizing the traffic split between road and rail
  - productive efficiency—combining technical efficiency and productivity; and optimizing maintenance and renewal policies
  - dynamic efficiency—encouraging competition through competitive neutrality, thus stimulating innovation and above-rail productivity
  - administrative efficiency—minimizing transaction costs, administrative complexity, and the need for external regulatory oversight
- Operational robustness, with operational interfaces as simple and few as possible
- Supporting a financially sustainable interstate rail freight sector, which would inevitably mean facilitating external funding

Government selected the option of an independent track authority, established as a Government-owned corporation. In November 1997, AN was sold to three separate private investors—South Australia, Tasmania, and passenger services. At the same time, the Australian Transport Council agreed to establish an Australian Rail Track Corporation (ARTC) to manage access and infrastructure development on the interstate rail network, and provide access to operators through a single organization. Subsequently, in February 1998, the AN access unit was corporatized as ARTC and became a public company, with shares wholly owned by the Australian government. The AN main line interstate track was transferred to the ARTC, which commenced operations on 1 July 1998.

Appendix B: ARTC Interstate Reference Prices

ARTC PRICING SCHEDULE
Applicable Rates - Effective from 1 July 2009

TRACK ACCESS PRICES	EAST - WEST									NORTH - SOUTH					HUNTER VALLEY & INLAND			
	PARKES JCT - BROKEN HILL	BROKEN HILL - CRYSTAL BROOK	ADELAIDE - PARKESTON	TARCOOLA - ALICE SPRINGS #	PT AUGUSTA - WHYALLA	ADELAIDE - PELICAN PT	ADELAIDE - MELBOURNE	APPLETON DOCK JCT - FOOTSCRAYED	FOOTSCRAYED - APPLETON DOCK / SWINSTON DOCK	BORDER LOOP - SLINGTON	TOTTENHAM - ALBURY	ALBURY - MILDURA/SUR	COOTAMUNDRA - PARKES JCT	MOSS VALE - UNANDERRA	MAITLAND - MUSWELLBROOK	MUSWELLBROOK - MERRYGOEN	MUSWELLBROOK - WEBBS CREEK	PARKES - WEBBS CREEK
All Freight	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
VARIABLE PRICE PER '000 GTK	3.626	3.626	2.703	5.064	4.568	3.881	3.024			3.161	2.477	2.477	3.469	3.968	3.357	2.991	3.357	2.206
FLAGFALL PRICE per TRAIN KM																		
Passenger	1.514	1.514	3.706	4.549			2.282											
Express Freight	1.021	1.021	3.508				1.834				1.044	1.044	1.044					
Regular Freight	1.054	1.054	3.495		2.351		2.129	42.840	18.350	1.716	1.053	1.053	1.374	1.014	4.098	4.806	4.094	0.534
Super Freight	0.973	0.973	3.485	4.223	2.351	2.502	1.876	42.840	18.350	0.913	0.986	0.986	0.940		0.427	0.462	0.427	0.096
Standard Freight	0.497	0.497	2.486		1.698	2.083	1.784	42.840	18.350	0.808	0.610	0.610	0.415	0.510	0.427	0.416	0.427	0.082
Heavy Freight																		
VARIABLE PRICE PER '000 GTK											4.806	4.806		6.408				
FLAGFALL PRICE per TRAIN KM																		
Heavy Freight											1.053	1.053		1.014				
Express Passenger																		
VARIABLE PRICE PER '000 GTK	3.449									3.084		2.426		3.898	3.295		3.286	2.158
FLAGFALL PRICE per TRAIN KM																		
Express Passenger	1.744									1.841	1.983	1.957		1.775	1.739		1.754	1.757

FLAGFALL APPLICATION

FLAGFALL	TRAIN TYPE AND DESCRIPTION	TRAINS
Express Passenger	Max train speed above 115kph /Max Axle Loading up to 19T	XPT, Intra Urban Passenger, Intra State Passenger
Passenger	Max train speed 115kph /Max Axle Loading up to 19T	Long Distance Passenger
Express Freight	Max train speed 115kph /Max Axle Loading up to 20T	Bi Model
Regular Freight	Max train speed 80kph / Max Axle Loading up to 23T / Length to corridor standard max	Scheduled Services including Steel, Ore, Cement, Concentrates
Heavy Freight	Max train speed 80kph / Max Axle Loading up to 25T / Length to corridor standard max	Limestone
Super Freight	Max train speed 110kph / Max Axle Loading up to 21T / Length up to corridor standard max	Intermodel, Land Bridging
Standard Freight	Max train speed 80kph / Max Axle Loading up to 23T / Length to corridor standard max	Non Scheduled services including Grain, Minerals

APT Interface

** *Rates apply to ARTC business customers only*

** *10% GST will be added to the total invoice charged based on above charges*

** *Some rounding may occur on the final invoice*

Appendix C: Key Sources

Apelbaum Consulting Group, Australian Rail Transport Facts, 2008

ARA, The Future for Freight, 2005

ARA, Australian Rail Industry Report 2007

ARTC, Annual Reports 1999-2010

ARTC, 2008-2024 Interstate and Hunter Valley Rail Infrastructure Strategy, June 2008

Booz Allen Hamilton, Interstate Rail Network Audit 2001

Bureau of Infrastructure, Transport and Regional Economics. Australian Transport Statistics Yearbook, 2009

Department of Transport and Regional Services (DOTRS), Rail Infrastructure pricing: Principles and Practice

NERA Economic Consulting, Comparative Assessment of Road and Rail Infrastructure Charging Regimes in Australia, for ARA, May 2006

National Transport Commission, Freight Rail Productivity Review Final Position Paper. August 2009

Case Study

Burlington Northern Santa Fe Railway[177]

1 Introduction

Burlington Northern Santa Fe Railway (BNSF) is a vertically integrated freight railway operating in 28 states in central and western United States and three Canadian Provinces. BNSF main lines of business are consumer products (intermodal and autos), industrial products (e.g., oil, plastics), coal and agricultural products. The company is the product of mergers and acquisitions involving nearly 390 railway lines that were built by the private sector (supported by the US government through grants of land) over a period exceeding 160 years. Until 2010, when it was fully acquired by Berkshire Hathaway (BH), BNSF was owned by private sector investors, with shares publicly traded.

Following its acquisition by BH, BNSF was able to leverage the inherent value of its assets and ongoing business by both optimizing its capital structure and improving its profitability. This allowed the company to steadily increase capital expenditures while returning US$ 20.2 billion in dividends to its owners. This case study describes BNSF's transition BH's ownership approach, the results of the transition, and conclusions and lessons drawn from BH's approach to managing BNSF.

2 BNSF's Transition

In February 2010, Berkshire Hathaway (BH), an investment company controlled by Warren Buffett, bought the outstanding shares of BNSF in a transaction valued at US$ 40 billion (including debt assumption).

BH's overall investment strategy has been to invest in long-term profitable businesses, using relatively low-cost financing generated by float from its insurance business and deferred taxes of its other businesses. The investments are selected by a team of BH staff, led by Warren Buffett, who exercise "value investing." They seek out business that: (a) are understandable; (b) have a consistent operating history and strong management; (c) have a brand or other attribute that gives them a strong market position; and (d) have solid earnings and strong growth prospects.

BNSF met these criteria: (a) its business was providing rail transport, which is understandable; (b) the railway had steady operating results, indicative of strong management; (c) BNSF has an extensive rail network that would be very costly to

[177] This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

reproduce and a 40-percent market share in rail transport in the western USA; and (d) BNSF was a profitable company that provided its shareholders with a return on equity of 13 percent and a return on assets of 4.4 percent in 2009, with good growth prospects linked to growth in the US economy. At the time of the acquisition, Warren Buffett called the acquisition an "all-in wager on the economic future of the United States."

Figure 1 BNSF Network

BNSF Railway, 2016.

2.1 The Acquisition

Prior to the transaction, BH had acquired 22.6 percent of BNSF shares on the stock market. On November 2, 2009, BNSF and BH entered into a merger agreement that called for BH to acquire the outstanding shares of BNSF common stock. Owners of BNSF were offered $100 per share or the equivalent in BH stock. The transaction required approval of holders of two-thirds of the outstanding shares (other than those already held by BH). The transaction was approved by shareholders and closed on February 12, 2010. BH paid US$ 15.9 billion in cash and $10.6 billion in BH stock for the outstanding shares of BNSF. The transaction was valued at US$ 40 billion, including assumption of outstanding debt.

3 Berkshire Hathaway's Approach

3.1 BH Management Principles

BH manages its investment portfolio using three core principles: management autonomy, value based capital allocation and a long-term perspective.

***Management autonomy*:** At BH, company managers are in charge of all operating decisions. (Although BH has over 360,000 employees, only 25 of them are at headquarters.) BH seeks out managers that "love their business, think like owners,

and exude integrity and ability[178]", and gives them autonomy to manage the business. This autonomy enabled the BNSF managers to double BNSF's profits within four years.

***Value based capital allocation*:** All excess capital generated by the companies reverts to headquarters and is invested by BH. This keeps the operating company managers focused on their business, reducing the temptation to diversify into unrelated businesses. All funds invested back into the business are subject to a simple financial test: Does the company create at least $1 in value (discounted future return) for every $1 retained in the business? BNSF has retained a robust level of cash in the railway for capital expenditures.

BH rarely sells a business, so long as it is generating some positive cash flow, and has good management and labor relations. However, capital expenditures are squeezed in such businesses. Warren Buffett says, "we react with great caution to suggestions that our poor businesses can be restored to satisfactory profitability by major capital expenditures."[179] Sales that do occur may be executed through stock sales for publically traded companies, or through negotiated agreements with investors.

***Long-term perspective*:** BH exercises a "buy and hold" strategy. It does not concentrate on the day-to-day stock price fluctuations of the companies in which it invests. It does not sell good companies, even if their market value is high. This long-term perspective was beneficial for BNSF, because railways have high fixed costs with long-term benefits, and because it insulated BNSF managers from the temptation to defer maintenance to show better short-term financial results and increase stock price.

3.2 Governance and Incentives

BNSF is governed by a 14-person Board of Directors, who have a fiduciary responsibility to guide and oversee the company. Two directors are from BH, one from BNSF management and the remaining eleven are independent. The Board has four standing committees:

- Audit
- Compensation & development
- Corporate governance
- Executive

The BNSF manager serves on the Executive Committee. All other Committees are composed of independent directors.

BH seeks to align the interests of BH and BNSF by giving the company management an ownership interest in the success of the business. At the time of the acqui-

[178] Berkshire Hathaway (2014). *Owner's Manual* 5.
[179] Berkshire Hathaway (2014). *Owner's Manual* 3.

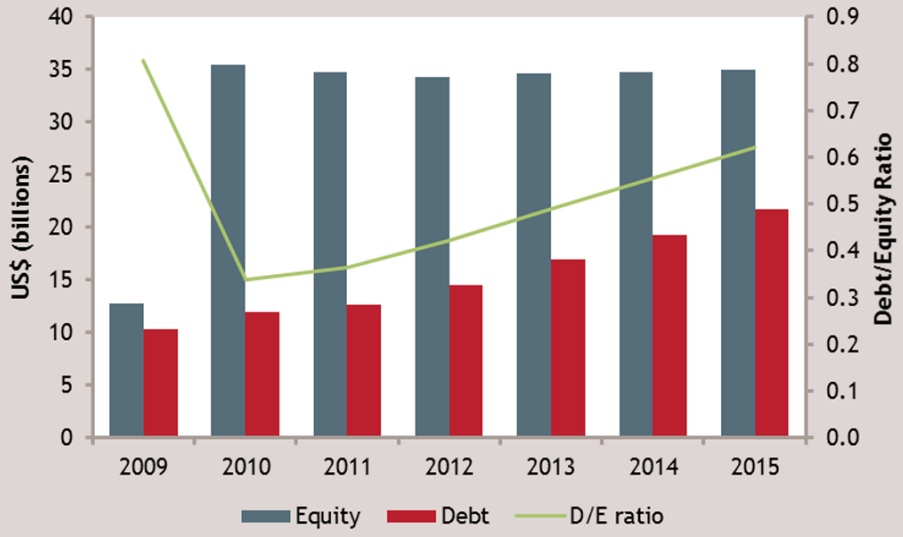
sition, BNSF managers' compensation consisted of base salary, incentive compensation linked to financial performance, asset utilization and safety. Much of the incentive compensation was paid in the form of stock and stock options.

As part of the acquisition, BNSF management's stock and stock options were converted to BH stock. After the acquisition, "to align management's interest with those of its shareholders,[180]" BH stock that vested over time was provided as incentive compensation for exceeding return on capital invested targets. As Warren Buffet says, "most of our managers are independently wealthy, and it's therefore up to us to create a climate that encourages them to work with Berkshire.[181]"

3.3 Optimizing BNSF Capital Structure

The acquisition created an opportunity to write up the assets and equity of BNSF to reflect the price that BH paid for the company. BNSF shareholder's equity was increased by more than US$ 22.7 billion. Property, plant and equipment was increased by US$ 13 billion (the asset write-up is determined by considering the current market value and the earnings potential of each asset group) and goodwill by US$ 12 billion.

Figure 2 BNSF Capital Structure



Source: SEC Form 10K Filings, Burlington Northern Santa Fe, LLC

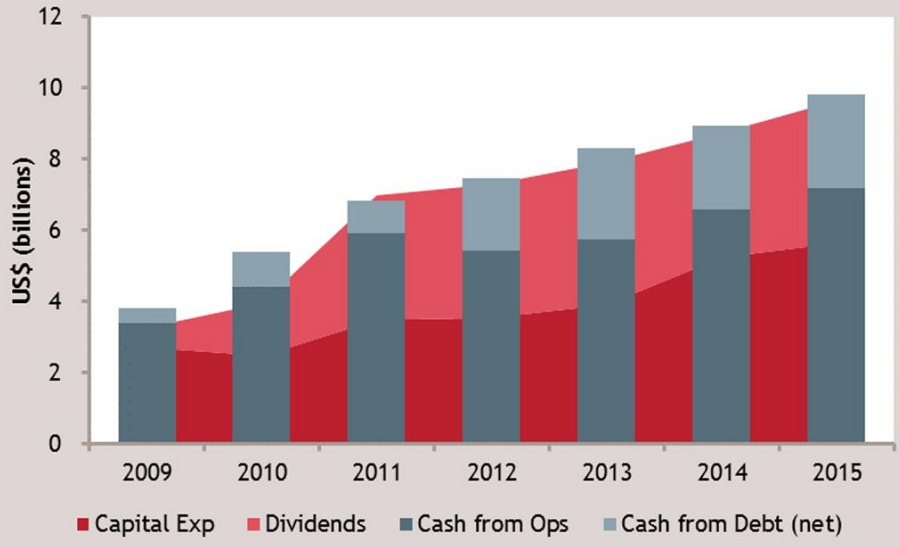
Within two years of the acquisition, BNSF profits more than doubled, and cash flow from operations increased substantially, enabling BNSF to raise more long-term debt. The recapitalization and asset revaluation in 2010 caused the company's debt/equity ratio to drop from 0.81 to 0.34. Between 2010 and 2015, BNSF increased long-term debt by US$ 10.1 billion, which gradually brought its debt/equity ratio to 0.62.

The increase in cash from operations, together with an increased amount of debt, enabled BNSF to engage in substantial capital expenditures, ranging between

[180] Burlington Northern Santa Fe Railway (2008 – 2013). *Class 1 Railroad Annual Report*.
[181] Berkshire Hathaway (2014). *Owner's Manual* 5.

US$ 2.5 and US$ 5.8 billion in each year following the acquisition. Such expenditures were maintained, while substantially increasing the shareholder's dividend from US$ 550 million in 2009 to US$ 4 billion in 2015 (see Figure 3).

Figure 3 BNSF Capital Investment and Dividends 2009-2015



Source: SEC Form 10K Filings, Burlington Northern Santa Fe, LLC

4 Results

In the five years following the acquisition (i.e. up to 2015), BNSF traffic grew steadily, slightly exceeding its 2008, pre-recession level. Revenue and profitability grew at an even greater pace, causing cash flow from operations to increase by over 110 percent.

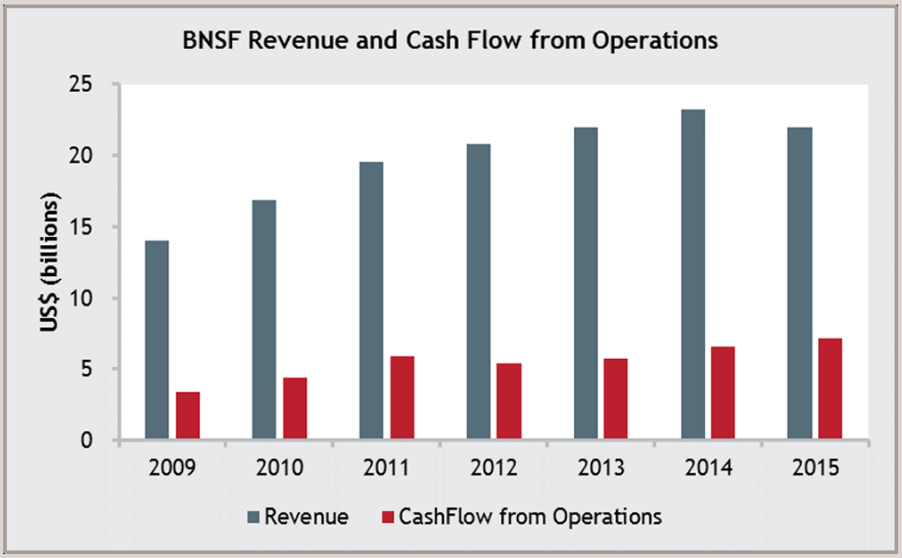
Between 2009 and 2015 BNSF revenue per ton-km increased by nearly 31 percent[182] (Figure 6 below). In part, this was due to increasing prices, but it also resulted from a change in traffic mix. Coal traffic declined by about five percent, and agricultural products grew by about ten percent. At the same time, the higher-valued consumer products and industrial traffic categories grew by 30 percent and 60 percent, respectively.

[182] Revenue declined in 2015 due to weakening customer demand in the latter half of 2015 (this primarily impacted coal, energy, and industrial product unit volumes).

Figure 4 Key Indicators for BNSF

	2009 (pre-acquisition)	*2015 (post-acquisition)*
Network	37,000 km owned right to operate on additional 14,500 km	37,000 km owned right to operate on additional 14,500 km
Freight traffic (million tons)	486	562
Passenger traffic	none	none
Employees	35,000	44,000

Source: Burlington Northern Santa Fe LLC 10-K and R-1 reports

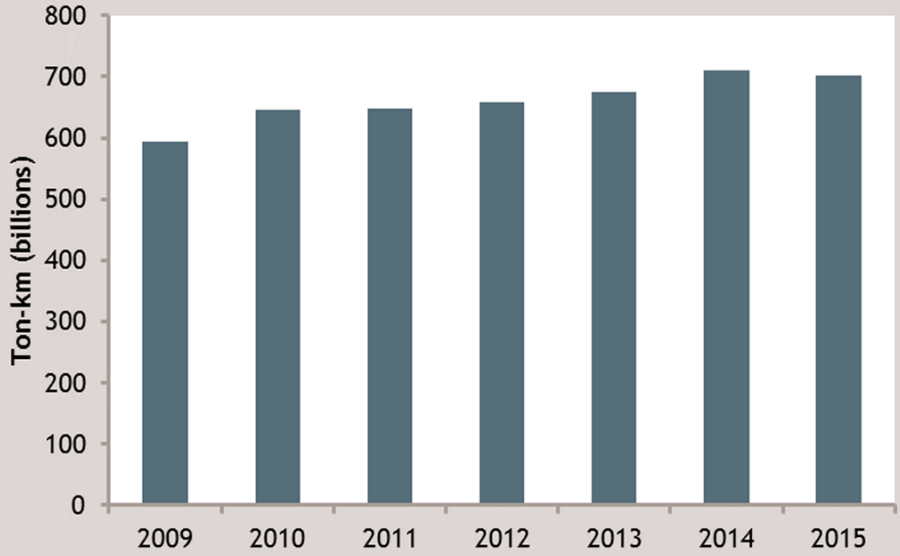


Note: Revenue declined in 2015 due to weakening customer demand in the latter half of 2015 (this primarily impacted coal, energy, and industrial product unit volumes).
Source: SEC Form 10K Filings, Burlington Northern Santa Fe, LLC

Over the same period, operating expenses per ton-km were held to a 12 percent increase. While staff costs increased at a slower pace than revenue, and materials costs increased at a greater pace, fuel and equipment rental costs actually decreased[183].

[183] Fuel efficiency increased by five percent over the period as a result of replacing old locomotives with more fuel-efficient ones and introducing improvements in operating practices.

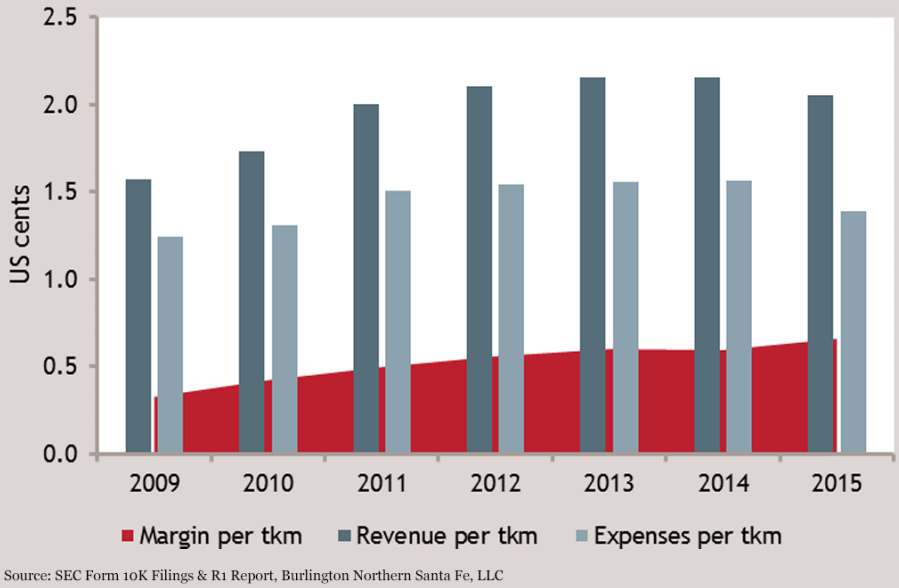
Figure 5 BNSF Traffic 2009-2015



Source: BNSF R-1 Reports

The growth in margin created by a greater increase in revenue than in expenses generated substantial growth in cash flow from operations. Figure 6 below highlights the steady growth in unit margin (revenues per ton-km less expenses per ton-km).

Figure 6 Operating Revenue and Expenses per ton-km 2009-2015



Source: SEC Form 10K Filings & R1 Report, Burlington Northern Santa Fe, LLC

4.1 Financial Impacts

The change in BNSF's ownership and its financial restructuring significantly enhanced the company's financial performance. In line with BH's portfolio principles of managerial autonomy and value-based capital allocation, BNSF's management

has made extensive capital investments while increasing both the railway's profitability and its shareholder dividend[184]. The changes in BNSF's financial situation between 2009 and 2015 are detailed in Figure 7.

It remains worth noting that the change in BNSF's ownership was not the primary factor behind the railway's traffic growth. Although traffic has grown by about 18 percent since 2009, much of this has been a recovery of pre-recession traffic levels.

Figure 7 Changes in BNSF Annual Financial Results between 2009 and 2015 (US$ Millions)

Income Statement	Change
Revenue	
Rail services	7,414
Government support	0
Other	537
Total	7,951
Operating Expenses	
Wages & benefits	1,562
Materials & energy	766
Depreciation	464
Other	697
Total	3,489
Operating Income	
Interest & other financial	328
Income before Income tax	4,134
Income tax	1,607
Net Income	2,527

Balance Sheet	Change
Assets	
Current assets	1,682
PEE* (net)	27,216
Other long term assets	14,130
Total	43,028
Liabilities	
Current liabilities	294
Deferred taxes	9,750
Long term debt	11,657
Other	-907
Total	20,794
Equity	
Share capital	13,267
Retained earnings	8,967
Total	22,234

Cash Flow	Change
Operations	3,762
Investing	
Capital investment	-2,927
Sale of assets	-492
Other	229
Total	-3,190
Financing	
Issue long term debt	2,175
Retire long term debt	58
Dividends	-3,454
Other	-42
Total	-1,263
Net Change in Cash	-691

*Property, Plant, and Equipment
SEC Form 10K Filings, Burlington Northern Santa Fe, LLC

4.2 Stakeholder Contributions and Impacts

Customers: Major BNSF customers include container shipping companies, automobile manufacturers, coal and other mining companies, oil companies and Midwest farmers. As a result of the extensive capital investments made post-acquisition, BNSF dramatically improved its service to its customers[185].

Employees: BNSF has approximately 42,000 employees, represented by a number of unions. The number of employees increased from 35,000 to 42,000 between 2009 and March, 2016.

***Local communities*:** Communities benefit from BNSF employment and from provision of transport to local communities. They experience negative impacts

[184] This was done in part through optimizing BNSF's capital structure.

[185] BNSF has significantly enhanced its reliability and service velocity through adding capacity along previously constrained parts of its network. For instance, in its November 2016 network update, average train velocity was up 13.6% in 2016 when compared to 2015. For more information, please see the Berkshire Hathaway 2015 Annual Financial Report (pg. 4) and the BNSF Railway Network Update from November 2016 available at: https://www.bnsf.com/customers/service-page/pdf/bnsf-service-deck.pdf

such as noise, blockage of level crossings, and risk of accidents. They have seen little overall change.

***Investors*:** Before acquisition by BH, BNSF was a publically traded company owned by many thousands of investors. Many of these investors now hold shares of BH.

5 Conclusion

The example of BNSF illustrates that a railway can succeed in a conglomerate of unrelated businesses, provided that:

- The railway's business is profitable;
- The railway management has decision making autonomy and responsibility for results; and
- The railway's owner exercises strict, objective, value based capital budgeting.

The lessons for conglomerates with holdings in railways amongst other unrelated businesses include the following:

- To earn a consistent high return on a diversified portfolio, every investment has to stand on its own financially, and to increase value;
- The BH portfolio principles—management autonomy, value based capital allocation, and long-term perspective—allow for a railway business to maximize cash flow and long-term value; and
- Optimizing the capital structure of a profitable investment through revaluating assets and balancing with debt can release cash for capital investment and dividends.

References

Berkshire Hathaway (2015). *Annual Report*. Retrieved from: http://www.berkshirehathaway.com/2015ar/2015ar.pdf

Berkshire Hathaway (2013). *Annual Report*. Retrieved from: http://berkshirehathaway.com/reports.html

Berkshire Hathaway (2014). *Corporate Governance Guidelines*. Retrieved from: http://berkshirehathaway.com/govern/corpgov.pdf

Berkshire Hathaway (2014). *Code of Business Ethics*. Retrieved from: http://berkshirehathaway.com/govern/ethics.pdf

Berkshire Hathaway (2014). *Owner's Manual*. Retrieved from: http://berkshirehathaway.com/ownman.pdf

Buffett, W. (1998). *The Essays of Warren Buffett: Lessons for Corporate America*.

Burlington Northern Santa Fe LLC (2008-2015). *10-K Reports*. Retrieved from http://www.bnsf.com/about-bnsf/financial-information/form-10-k-filings/

Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

Case Study

Camrail

Figure 1 Cameroon Rail Network 1994-2010

1 Background

Cameroon, on the coast of West Africa, is home to 23 million people. The country has large cultural and geographic diversity and is potentially wealthy, endowed with significant natural resources, including oil and gas, high value timber species, minerals, and agricultural products, such as coffee, cotton, cocoa, maize, and cassava.

However, in 1987, the economy went into a steep decline. By 1994, gross domestic product (GDP) had fallen by more than 25 percent, culminating in a 50 percent devaluation of its currency. Since then, economic recovery has been slow but steady, with average annual GDP growth of about 4.0 percent[186].

Before WWI, Cameroon was a German colony. During this time, two railway lines were built inland from the port at Douala: one eastward as far as Eseka; and one from Bonaberi, opposite Douala on the north side of the Wouri estuary, to Nkongsamba in the north. After the war, Cameroon became a French colony, and the Eseka line was continued to Yaounde including a short branch to Mbalmayo (which is now closed). In 1960, Cameroon became independent. Another short branch railway was opened from Mbanga to Kumba[187]. In 1974, the 626 km Trans Cameroon Railway 2 was completed from Yaounde north to Ngaoundere

[186] World Bank national accounts data: http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG

[187] The Mbanga to Nkongsamba portion of the line was closed in the mid-1990s.

with the help of European funding. The network is meter-gauge, diesel operated, and almost entirely single-track. Its maximum length was about 1,100 km, but the operational network is now about 977 km (Figure 1).

2 Performance Prior to Concessioning

Beginning in 1947, the government-owned Régie Nationale des Chemins de Fer de Cameroun ('Regifercam') operated the railway, which played a central role in the commodity-dominated economy. Railways were the preferred mode to transport large volumes of timber products and cotton for export because many main roads were in poor condition and some became impassable during the rainy season. The railway carried transit traffic between the coast and Chad and the Central African Republic, and general freight to central and northern Cameroon.

Box 1 Background to the Concession

During the 1980s, Cameroon's state-owned enterprises (SOEs) performed poorly. Management was weak; operations were not commercial; responsibilities were unclear; and accountability was lacking. Line ministries meddled in daily management, and audited accounts were rare. Financial losses, direct and indirect subsidies, and non-payment of debts were widespread.

In 1991, despite subsidies and transfers that amounted to 12 percent of GDP, only three SOEs out of over 100 avoided making losses. By 1994, the accumulated debt of the SOEs was over US$1 billion. Government introduced performance contracts that specified financial and operating targets but these proved ineffective. Restructuring proceeded slowly, largely due to lack of funds to settle SOEs' liabilities, including staff layoff compensation. Little progress was made on privatization.

In mid-1994, Government adopted a formal strategy to divest all public enterprises engaged in productive or commercial activities, through privatization or liquidation. Performance contracts were abandoned and subsidies were provided only for public service contracts, such as railway passenger services. Divestiture was planned in phases with an annual target of 10 SOEs privatized each year. In 1996, the first 15 SOEs that were privatized included REGIFERCAM, Cameroon Airlines (CAMAIR), and Cameroon Shipping Lines (CAMSHIP).

Despite railways' importance to the economy, lack of maintenance of track and rolling stock led to declining service quality and poor infrastructure condition. This was especially true on the line north of Douala, which had little freight traffic. During the 1980s, part of the southern section was upgraded, but the line faced stiff competition from road transport between Douala and Yaounde. However, poor road conditions from Yaounde to Ngaoundere, especially during the rainy season, meant that passenger and freight traffic on the aforementioned rail section were maintained at a reasonable level.

In 1999, at the time of concessioning, the railway was carrying 1.5 million metric tons of freight (about 40 percent was transiting to Chad and Central African Republic), for

an average distance of 600 km. In the same year, about 1.3 million passengers were transported for an average distance of 230 km.[188] Annual transport revenues were equivalent to €40 million, with freight accounting for €33 million and passengers, €5.0 million. Working expenses were about €35 million, but depreciation of €16 million and interest charges of €4 million contributed to average annual operating losses of about €10-15 million. These financial results were not catastrophic, but the railway was unable to fund its asset overhaul and replacement, so infrastructure and rolling stock were deteriorating steadily.

The railway required substantial repair and rehabilitation work, and a large percentage of the rail and sleepers were in poor condition. In terms of rolling stock, only half of the 61 main line locomotives were available for operations. Many of the 1,296 wagon freight fleet needed to be refurbished, and only 50 of the passenger car fleet of 73 vehicles were operational. In 1998, Regifercam had 271 derailments, with 37 occurring on the main line, creating long service disruptions. Since the 1980s, delays had almost quadrupled. The average delay was 150 minutes for passenger trains, and 280 minutes for freight trains. Unreliable rail operations and poor service was compounded by poor security and a widespread culture of petty corruption.[189]

In 1994, Regifercam reduced its workforce to 3,800 employees, down from about 6,000 in 1988. However, productivity remained low, especially given 60 percent of the network was relatively new. Regifercam suffered from the familiar problems of other Cameroon SOEs: a lack of commercial orientation and continued Government meddling in management and procurement. Poor financial performance required annual support through a performance contract and capital funds, creating a significant financial burden on the economy. Since Regifercam had major investment needs, Government designated it among the first candidates to enter a general program of privatization (see Box 1). In 1998, after a public tender, Government awarded the concession. In March 1999, Camrail began to operate the railway.

3 The Concession

At the end of the concessioning process, two groups had submitted financial offers. One group comprised two Bolloré companies (SAGA/SDV) and Systra, a subsidiary of the French Railways (SNCF); and the other was Comazar. Government awarded the concession to SAGA/SDV but requested that they use Comazar as the operator rather than Systra, which they did. Under a partnership, Bolloré and Comazar owned a controlling interest in the holding company, Société Camerounaise des Chemins de Fer (SCCF).[190] The SCCF in turn owned 85 percent of Camrail, the actual concession manager and operator, while the Government and employees owned the remainder. In April 1999, Camrail began operations as a private company incorporated in Cameroon, with the objective of transporting freight by rail, sea, or air, and providing ancillary services such as storage and maintenance.

[188] Both freight and passenger traffic volumes had remained broadly constant for the previous five years.
[189] Such as payments to make freight wagons available.
[190] Comazar is no longer involved, and Bolloré now owns 77.4 percent of SCCF.

Box 2 Bolloré

Bolloré is a long-established large diversified French-based group. In 2015, it had over 58,000 employees worldwide and a turnover of €10.8 billion. Bolloré specializes in transport and logistics, which is about two-thirds of their turnover (most of the remainder is related to fuel distribution). They operate in over 100 countries, with over 20,000 employees related to Africa, particularly West Africa.

In Africa, Bolloré is active in ports, forwarding (through SDV, Saga, Transami and NOTCO), logistics, and commodity exports. Bolloré classifies its railway interests as one of its "activities connected with transport."

In Cameroon, Bolloré is the concessionaire of the Douala International Terminal at the Port of Douala. Since 2005, the terminal has seen an increase in container traffic of over 60 percent.

Camrail was granted a 20-year rolling concession to manage railway property and operate, maintain, and improve railway infrastructure. Every five years, the concession could be extended for another five years.[191]

Government retained legal ownership of the infrastructure, including stations and track. Camrail selected the rolling stock that it then leased for eight years with an option to buy. Camrail could also buy and sell its own equipment, and Government retained the right of first refusal on any sale of any rolling stock.

Box 3 Comazar

Comazar, registered in South Africa, was involved primarily in transport services and operations. In 1998, it was 65 percent owned by Transnet, the state-owned South African transport company that included Spoornet, the main railway. Comazar was actively involved in rail concessions, including operating the railway in the Democratic Republic of Congo for a short period, and railway projects in Tanzania, Mozambique, and Brazil. Since 2000, it has undergone several changes in ownership and now is no longer involved in Camrail.

Camrail could make infrastructure investments through a Government delegation and agreed to undertake an investment program of about US$92 million over a five-year period. The program was 58 percent funded by loans from the World Bank/IDA, the French and German development agencies and the European Investment Bank; and 42 percent funded by equity injections (17 percent) and retained earnings (25 percent). Infrastructure rehabilitation, mostly north of Yaoundé, comprised about 50 percent of the program and rehabilitation of rolling stock, about 25 percent.

[191] However, Government could cancel the concession after 10 years, after giving five years notice and upon compensation payment.

Camrail had to take over 3,000 employees from Regifercam, out of the pre-concessioning total of 3,400, and reduced this number to 2,800 after the first year of operation. Retrenchment costs were borne by Government.[192] Camrail had plans to reduce staff to 2,600 employees over five years, which was achieved early in 2002.

For commercial services, Camrail was free to establish tariffs and contract with shippers and suppliers. Camrail was required to take over only two existing contracts, one for aluminum and the other linked to construction of the Chad-Cameroon pipeline. Camrail was also obliged to provide some specific noncommercial services—principally the 'omnibus' passenger services from Douala to Yaoundé that stopped at all stations (many of which were not connected to all-weather roads) and some services north of Douala for plantations—for which it was to be compensated. Rail has strong competition from trucking, and no price regulation was imposed for freight[193]. For the first five years of the concession, Camrail had an operating monopoly. After that, if the concessionaire was found to be abusing rail operating rights or discriminating against clients, other operators could be allowed in.

Concession payments consisted of the following:

- An annual fixed amount of FCFA 500 million (US$862,000), escalated according to industrial prices; and
- A variable amount of 2.25 percent of revenues in the first year, 3.0 percent in years two to five, and a negotiated amount not less than 5.0 percent from year six onwards.

3.1 The 2008 Amendment

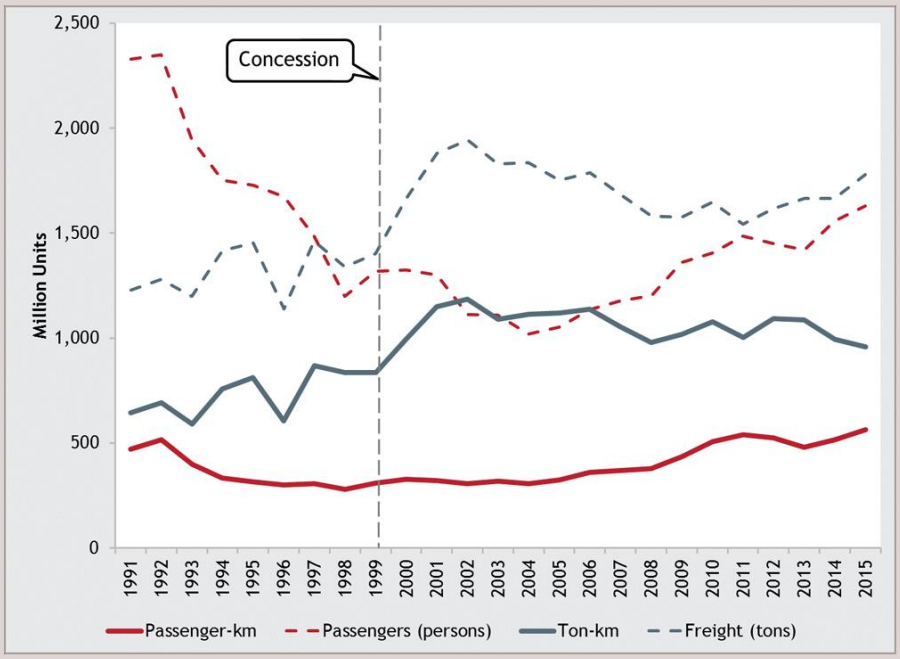
In 2008, the concession contract was amended and the following key measures were introduced: (i) the concession was increased to 30 years from 20; (ii) capital was increased by US$9.0 million; (iii) fixed and variable concession fees were capped at an annual US$4.4 million as part of a fixed concession fee; (iv) Government guaranteed financing of US$193 million for a new infrastructure renewal program through 2020, which would be partially funded through introducing a RIRIF[194] payable by the concessionaire to Government in an account managed by the concessionaire; (v) Government would finance US$27 million in passenger-only rolling stock; and (vi) the concessionaire would finance US$290 million in rolling stock and rolling stock-related investment through 2020.

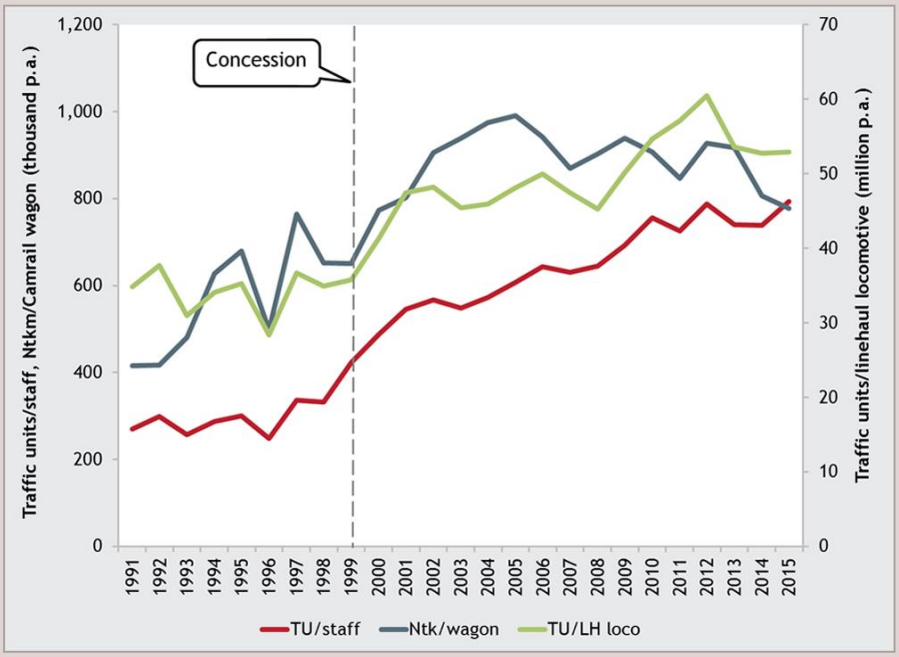
[192] The African Development Bank and European Development Bank financed severance and pension payments.
[193] In most country reports, Cameroon's roads are said to be in poor condition, e.g. in 2006, only 30 percent of the national network was reported in 'good' or 'average' condition. In 2003, estimated rail corridor market share was 60 percent for transit traffic and 22 percent for domestic traffic.
[194] Redevance d'Investissement et de Renouvellement des Investissements Ferroviaires (Rail Investment and Renewal Fee). This is calculated annually as 50 percent of net income before taxes of the previous year.

4 Concession Performance

Following the takeover, and until the mid-2000s, freight traffic quickly increased by about 40 percent in terms of ton-km. Passenger-km remained constant, although the number of passengers declined steadily, suggesting short-distance passengers moved to other modes. During the mid-2000s, freight traffic dipped, particularly after the 2008 global financial crisis. It is now recovering, albeit not at the same level of growth as the first years after the concession. Since 2005, passenger numbers have grown steadily and are now approaching the level of the early 1990s. This growth has been confirmed by an increase in passenger-km since their lowest level in 2003 (Figure 2).

Figure 2 Camrail Traffic and Productivity 1991-2015





After concessioning, Camrail labor productivity increased sharply as traffic grew and initial staff redeployments were made. Labor productivity has continued to increase, although at a slower pace. Generally, asset productivity increased as Camrail made greater use of assets that were idled or waiting for repair. Figure 2 summarizes traffic volumes and three key productivity indicators: traffic units (passenger-km plus net ton-km) per staff, an indicator of labor productivity; traffic units per locomotive; and net ton-km per Camrail wagon, during pre- and post-concession.[195]

In the years following the concession, the compensation for 'omnibus' passenger services included in the concession agreement[196] and the standard of passenger service provided by Camrail were continuing problems. For the first three years, Government paid no compensation to Camrail, then a specific business unit was created for passengers (Mobirail). In 2003, Government agreed all passenger services would be compensated, not just the 'omnibus' services. However, this did not resolve the issue, and passengers made continued protests over the quality and number of services, including blocking trains, particularly with respect to the all-stops 'omnibus' services.

Meanwhile, Camrail was investing significantly because the rail link was also a lifeline for its own activities: around 30 percent of traffic was associated with Bolloré subsidiaries and another 25 percent was timber and fuel, of which the two minor shareholders are major shippers. Between 1999 and 2007, the investment program had three main components:

- Urgent investments of €32 million made by Camrail in the first two years, from its own resources and borrowings of €8 million, subsequently refinanced by French/European agencies;
- 'Complementary' investments of €12 million made by Camrail due to delays in mobilizing funds from international agencies;
- 'Priority' investments of €64 million, of which Camrail contributed €19 million, and most of the remainder contributed by IDA and European/French agencies.

Of the total €108 million investment, Camrail contributed €55 million, after netting out the refinancing, of which €15 million was its own funds. The remainder was borrowed from banks. Nevertheless, network and rolling stock condition remained substandard. The average commercial speed was around 17 km/hr, and it was clear that the railway could not generate enough cash to renew the infrastructure as required.

Performance under the 2008 amendment

Under the 2008 amendment of the concession, a modernization program is underway to rehabilitate the rail line, which is expected to be completed in 2022. The Cameroon rail network is split into two major segments, Douala to Yaounde

[195] A consistent series is available only for railway-owned wagons; about 130 privately-owned wagons also move on the network.
[196] This represented about 10 percent of total passenger revenues; Camrail was claiming annual compensation of around €2.0 million.

(Transcam 1) and Yaounde to Ngaoundere (Transcam 2). The 263km Douala-Yaounde segment supports the highest traffic levels on the railway, yet has not benefited from a major overhaul, in some cases for as long as 35 years. Transcam 1 already makes use of an automatic, remote-controlled signaling and switch system. It is anticipated that the track improvements will lead to better reliability and availability, increased speeds and reduced travel times, and better rolling stock productivity.

As a component of the same 2009-2020 investment program, the 621km northern line from Yaounde to Ngaoundere will be modernized through financing of US$9 million from the World Bank/IDA. Upgrades will include the mechanization of the existing manual signaling and switch system (US$5-6 million), the rehabilitation of bridges (US$1.7 million), and safety interventions at two accident-prone level crossings (US$0.84 million).

Regarding passenger transport, in 2014, Camrail began a non-stop express service from Yaoundé to Douala, offering twice daily trips in each direction in 3 h 40 min. The service had been well-regarded by the general public and local authorities. However, the Yaoundé-Douala service recently suffered a devastating derailment, resulting in over 80 fatalities. Investigations into the cause of the crash are ongoing.

Under the terms of the 2008 amendment, Camrail has already invested US$56 million in rolling stock and US$42 million in infrastructure, and the Government of Cameroon US$28 million in rolling stock and US$69 million in infrastructure. Improvements in rail services have benefited both road- and rail-freight customers. Competition from rail has in fact driven down road transport prices, where rail tariffs are on average 10 percent lower than road. Between 2008 and 2012, freight tariffs (both road and rail) decreased on average by 15 percent. For example, the average cost to move a 20-foot container from Douala to N'Djamena in 2012 was approximately US$0.13 per ton-km using road and rail, compared to US$0.15 per ton-km by road only. However, when put into context, transport along this corridor is still one of the most expensive in Sub-Sahara Africa[197].

5 Financial Performance

In 1999, at the time of concessioning, financial forecasts anticipated rapid and sustained turnaround; the overall concession was expected to return 16 percent. Projections anticipated immediate revenue growth of about 10 percent, and subsequent slower growth, which was confirmed over the next 15 years. By 2003, revenue was up by 20 percent in real terms compared to the late 1990s. In subsequent years, revenue grew at a slower pace, and stabilized by 2010. Operating costs have proportionally grown more quickly. Recently, the operating margin has been as high as almost 100% (Figures 3 and 4).

[197] Average freight tariffs are US$0.06 to US$0.08 per ton-km in West African and East African corridors, and US$0.05 to US$0.06 in Southern Africa (2009 figures)

Figure 3 Camrail Key Indicators 1994-2015

	1994/5	1999/00	2005	2010	2015
Volumes					
Tonnes (000)	1,452	1,401	1,751	1,648	1,779
Ntk (000)	812	995	1,119	1,080	960
Passengers	1,728	1,320	1,053	1,406	1,631
Pax-km (000)	317	309	324	506	565
Financials (Euro million*)					
Freight	32	36	57	76	70
Passengers	5	7	8	13	14
Other	1	0	9	12	17
Total	**38**	**43**	**74**	**100**	**100**
Operating expenses	24	43	55	74	96
Total expenses	**37**	**45**	**65**	**88**	**99**
Operating margin	**37%**	**0%**	**26%**	**26%**	**4%**
Staff, Equipment, Track					
Employees	3,754	2,711	2,376	2,098	1,921
Locos (linehaul)	32	32	30	29	29
Wagons	1,194	1,287	1,130	1,190	1,234
Coaches	77	76	65	63	90
Route-km	1,016	1,016	977	977	977
Productivity					
Labor (000 TU/staff)	301	488	607	756	794
Loco (million TU/loco)	35	41	48	55	53
Wagons (000 TU/wagon)	680	773	990	907	778
Wagon turnaround (days)	n.a.	8	6	8	9
Breakdowns/100,000 loco-km					
CC2200	n.a.	9	5	-	-
CC2600	n.a.	6	13	13	16
Loco availability (linehaul) (%)	n.a.	73	77	86	83

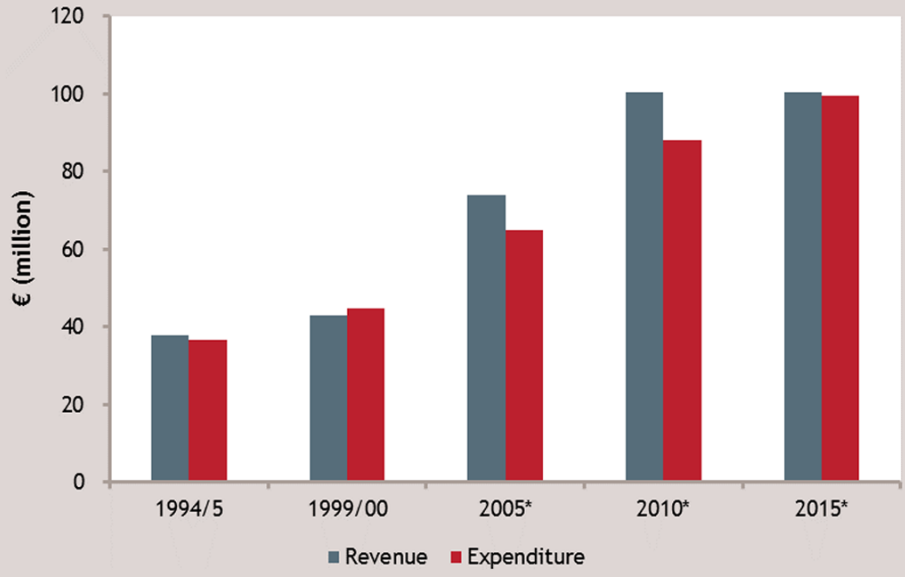
Note: 1 XOF = 0.00152 Euro

As a result, the optimistic financial projections – that long-run net profit would rise to 19 percent and operating margins would be around 25 percent – have not been achieved. Instead, the operating margin has declined, and by 2015 was 4 percent. It is worth mentioning that, given Camrail's additional investment in rolling stock and track since the concession, higher operating costs from increased maintenance spending are justifiable.

In 2015, Camrail recorded an annual turnover of US$113 million and an operating profit of US$4.8 million[198]. Since the beginning of the concession in 1999, aggregated financial flows to the Government have amounted to over US$270 million (including fixed and variable concession fees, taxes, import duties, etc.).

[198] XOF = 0.0017 USD as of December 31, 2015

Figure 4 Camrail Revenues and Expenditures 1994/5-2015



* Since the concession, passenger service compensation is included as revenue.

6 Conclusion

Carrying nearly 40 percent of all freight between Duala and Ngaoundere in the north, Cameroon's rail network plays, and will continue to play, an important role in Cameroon's economy as well as in those of its landlocked neighbors, Chad and the Central African Republic (CAR). At the start of the concession, Camrail faced substantial tasks in improving all areas, from operations to labor, management, investments, rehabilitation, security, and environmental issues. Camrail's financial performance was positive but fell short of the margins anticipated by the financial projections at concessioning. Camrail has undertaken a substantial investment program, combined with planned investment programs in signaling, and track and infrastructure improvements as part of the World Bank Multimodal Development program. These programs will help Camrail achieve its initial commercial and financial objectives by increasing the reliability of services, and therefore the capacity on the network, which has become a major constraint.

However, Camrail is a success story in terms of meeting Government objectives for privatization. Now the railway is recovering a greater share of operating costs, and it relieved Government of almost a decade of significant capital expenditures until the 2008 concession amendment. Major investments have been made, traffic volumes have increased, and the concessionaire, as a major railway user, has created a much-improved service for its own traffic. Both the Government and the operator have therefore benefitted. So have other freight shippers, as far as can be judged, with improvements in service quality, security, and reliability. Although Bolloré is a shareholder and a major railway user, there is little evidence of favoritism at the expense of other shippers.

The most significant development is that this concession was restructured to address two fundamental issues that are by no means unique to Cameroon.

First, most passenger rail services do not cover their costs and even covering routine above-rail (direct) costs is a serious challenge. Therefore, without external contribution, passenger rail services cannot be a business priority for commercially-focused concessionaires. They consequently make only cosmetic investments in these services. The Cameroon press regularly levels heavy criticism at Camrail passenger services (although service levels have recently improved between Yaounde and Douala, capacity and average fare levels remain a concern). Media criticism mostly reflects nostalgia for the old government-controlled Regifercam, and the public (and the government) expected the concession to bring significant improvement in passenger services. This was not going to happen, considering the lack of specific government contribution, particularly for the first three years when the government failed to fulfil its public service obligations (PSOs)[199]. It was easier, then, to put the blame on the concessionaire rather than address this fundamental funding issue.

Second, as a result of the passenger services continuous deficit, it fell on freight services to cover the full cost of the infrastructure maintenance and renewal. Although most functioning railways carry enough freight traffic to cover routine maintenance, low density railways like Camrail cannot generate enough surplus to pay for major periodic maintenance or upgrades. Without financial support from government, infrastructure will thus steadily deteriorate. Despite Cameroon's railway being relatively healthy in terms of financial performance, traffic levels are too low for any operator, private or public, to generate surpluses sufficient to finance replacement infrastructure to a standard that would provide high-quality freight and passenger rail services – or at least guarantee the sustainability of the network.

In addition, unlike investment in rolling stock, infrastructure investment is not portable and must be abandoned if the concession is terminated. As much as governments may wish to think that infrastructure funding problems will disappear once a railway is privatized, the problem of inadequate infrastructure investment is common to many concessions. In any concession, this fundamental issue will occur unless significant traffic volumes can be captured to generate the required revenue level and the concessionaire is committed for a long term. In the event that there is not sufficient traffic, the government needs to be committed to bringing the public contribution through direct or indirect subsidies. The concession strategy should be focused on finding new and efficient management practices, and target significant improvements and radical modernization in rail services (particularly freight) to increase reliability and capacity.

The 2008 amendment is a milestone in the development of African concessions. First, the Government established a specific program of passenger-related investment to replace the previous general commitment. Second, the original agreement required the concessionaire to fully cover infrastructure renewal, and the Government to provide only partial financing for initial rehabilitation (through IFI loans, which the concessionaire was responsible for repaying). This proved financially non-viable, and so the 2008 amendment transferred responsibility to the Government for infrastructure renewal while the concessionaire retained responsibility

[199] At the time of concessioning, Government planned to phase in all-weather road access to the villages that had only rail, which would have allowed the 'omnibus' services to be phased out. But 'omnibus' services are still being operated.

for maintenance. The concessionaire now contributes renewal costs through fees based on concessionaire profitability. Similar arrangements will need to be established in most concessions that currently (still) require the concessionaire to be responsible for passenger services *and* infrastructure renewal to ensure a long-term future for the rail system.

References

Blanc, Aymeric and Gouirand, Olivier, *La concession du chemin de fer du Cameroun: les paradoxes d'une réussite impopulaire*, Document de travail 44, Agence Française de Développement

Bullock, R., 2005, *Results of Railway Privatization in Africa*, Report for the World Bank, Washington, D.C.

Camrail Monthly Activity Reports (various).

di Borgo, Pozzo P, and others, 2006, *Review of Selected Railway Concessions in Sub-Saharan Africa*, World Bank Report, Washington, D.C.

International Union of Railways, 1990-2010, Railway statistics (annual publication)

Murdoch, Jill, 2005, *Assessing the Impact of Privatization in Africa—Case study of Camrail*

Strong, John, 2004, *The Development of Railway Concessions in West and Central Africa*, The Journal of Structured Finance, Winter 2004

Case Study
China Rail

1 Introduction

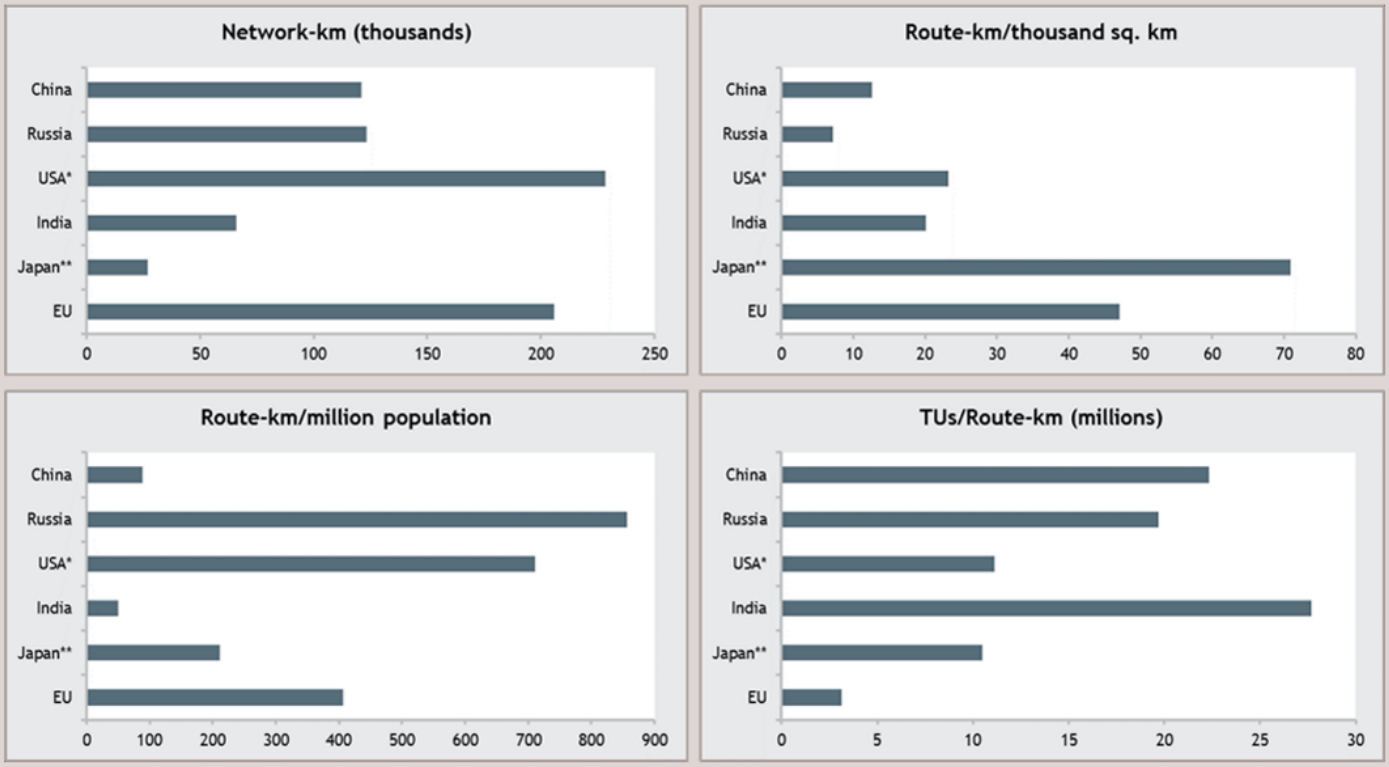
China's is unique in that it is the only country in the world that is going through a rapid rail network expansion, and the scale of the expansion and improvement over the last 30 years is striking.

The reasons are evident in its relatively small but very highly utilized network (Figure 1). In other very large countries such as Argentina, Australia, Brazil, Canada, India, Russia, and the USA, national railway systems had already been formed by the 1950s, when China started its major efforts to build its rail network. In 1949, China had only 22,000 km of poorly maintained and war-damaged railway line, of which less than 1,000 km was double-tracked and none was electrified. Since then, China's Government has expanded its rail network length by more than five-fold and totally transformed quality and capacity of its rail sector. In particular, the high-speed network has undergone extraordinary growth and now accounts for approximately half of all high-speed rail lines in the world.

Railway reform in China differs from many of the case studies presented in this toolkit in the sense that China has adhered to centralized administration and focused on largely state-financed network expansion program as the first priority. China has yet to fully embrace many of the options promoted by the World Bank, such as opening up to private sector participants and investors; allowing freight tariffs to be market-determined; and making a clear separation of regulatory functions from commercial functions. As this case study will show, China has (to various degrees) begun to introduce polices and instruments in relation to each of these best practices.

Perhaps most notably, in 2013, the State Council dissolved the Ministry of Railways (MOR), separating policy and regulatory functions from commercial functions, considered a fundamental best practice for reform. Even after this landmark event, traditional reform strategies, including private sector involvement, are used sparingly as a tool for assisting the country in meeting overall development goals. China's era of rapid development continues in freight and passenger transportation under a heavily centralized structure. However, the sector is not completely monolithic, allowing the participation of joint venture (JV) railways, industrial networks, and local railways. This case study is structured in a manner to highlight China' growth strategy and the remarkable evolution of its railway industry.

Figure 1 International Railway Network Comparisons 2015



*2010 data
**Data for multiple railway companies taken from various years (2010-2014)
Source: UIC Railway Statistics 2015; N.B.: Data from the China Statistical Yearbook (used in the remainder of this case) does not correspond with UIC Railway Statistics. UIC Data has been used in this instance in order to cross-compare country data.

Lastly, it must be kept in mind that the period since 2013 has involved contractions in China's overseas markets, and consequently within China. Further, coal demand within China has shrunk as a result of government policy to deal with pollution in the eastern provinces, negatively impacting rail freight volumes. Therefore, various indicators for China's rail sector since 2013 that may show decline should not immediately be taken as an indication of poor performance on the part of China Railway Corporation (CRC), the newly established operator. On the other hand, rail freight operations, particularly for freight, have not shown the same market growth as road and waterway traffic and should thus be monitored closely in the wake of new reform policies and initiatives.

2 Railway Industry Framework and Structure

2.1 Railway Law

The railway sector is governed by the 1991 Railway Law, which is similar to railway laws in many countries. The law has five main components: (i) sector administration; (ii) commercial arrangements for passenger and freight transport; (iii) planning, construction standards and opening arrangements; (iv) safety and protection; and (v) legal and associated matters. The Law permitted and encompassed four types of railways (Article 2):

- State railways: administered by the department responsible

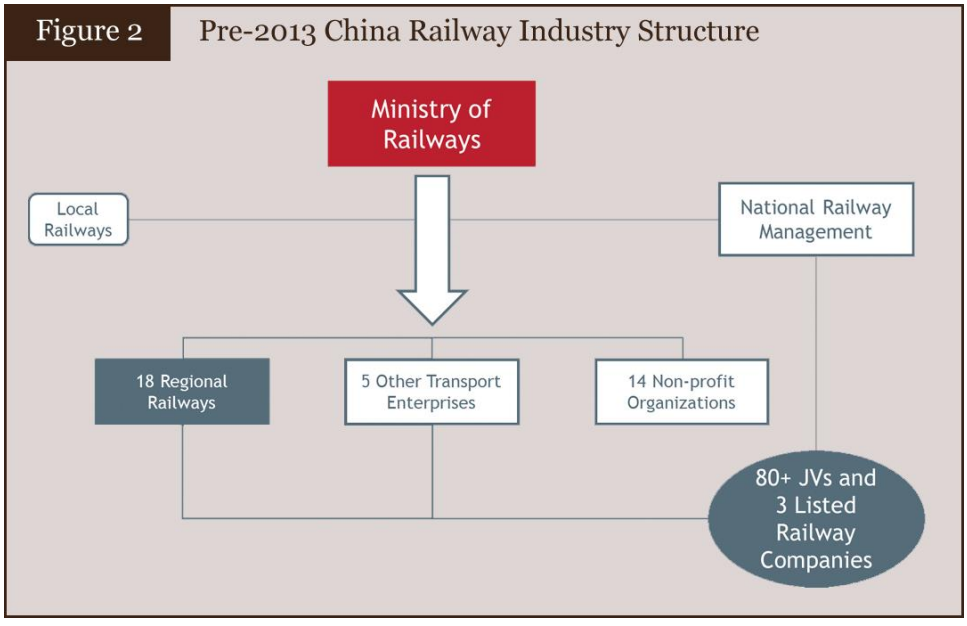
- Local railways: administered by local government authorities, which could include provincial governments or city administrations
- Industrial railways: administered by industrial enterprises or other units to provide their own rail transport services
- Private railway sidings: branch railway lines administered by enterprises or other units, connected to another railway line

Article 3 of the 1991 Railway Law requires the relevant government department (MOR to 2013, but MOT since) to implement a centralized and unified traffic control system over the State railway network, and to guide, coordinate, supervise, and assist local and industrial railways and private railway sidings. Article 4 of the Law requires MOR/MOT to develop State railways, and to aid and support local railway development. Article 24 encourages industrial railways to provide public passenger and goods transport services on a commercial basis.

2.2 Pre-2013: Ministry of Railways and China Rail

Prior to 2013, MOR supervised the sector, combining strategy, policy and regulatory functions and administering China Rail, the network of infrastructure and transport services operated by the 18 regional rail authorities (RRAs). MOR had overall control of policy, technical standards, planning and investment, finance and system-wide train and rolling stock dispatching, whereas RRAs, many of which are comparable to a large railway in another country, were responsible for daily management of railway infrastructure and delivery of rail transport services. (Figure 2)

Figure 2 Pre-2013 China Railway Industry Structure



During the 1990s, non-core activities of China Rail were separated, including construction, manufacture, telecom, design, education and social activities. Over the next fifteen years, the rail operations staff was reduced by a third, and traffic increased by 60 percent, which more than doubled railway employees' average labor productivity.

In 1999, the Asset Operation Liability System (AOLS) was implemented, and RRAs' managers became accountable for return on capital, output, profitability, and safety. Under AOLS, managers are responsible for managing and increasing assets assigned to them, and incentives are provided to those who exceed agreed performance levels. Each member of RRA management teams, right down to stationmasters, makes an 'incentive deposit' proportionate to his/her rank and must forfeit the deposit if targets and commitments are not met. If managers exceed targets, their deposit is refunded and they get a bonus – up to double the value of the deposit. When AOLS was implemented, RRAs' financial performance improved steadily, as did the overall financial performance of China Rail. In addition, safety improved significantly and accidents declined.

Prior to 2005, each RRA was divided into about five sub-administrations, each with a structure parallel to that of the RRA. In 2005, the secondary level of regional administration was abolished, a major and successful achievement in streamlining corporate management that gave RRAs a direct line of management to depots, stations, and yards, and provided a platform to improve utilization of locomotives and crews, which had often been confined within sub-administration boundaries.

2.3 Recent Structural Reform

Leading up to 2013, the National Development and Reform Commission (NDRC) set out three policy principles for the reform of the Chinese railway industry:

- Separate government administration from enterprise management;
- Introduce competition where suitable; and
- Regulate industry more effectively.

In 2013, a rail sector reform was carried out with two major goals:

- Maintain a financially sustainable railway in order to achieve the sector's overall development goals; and
- Enhance the rail operator's capability to respond to market competition for both passenger and freight services.

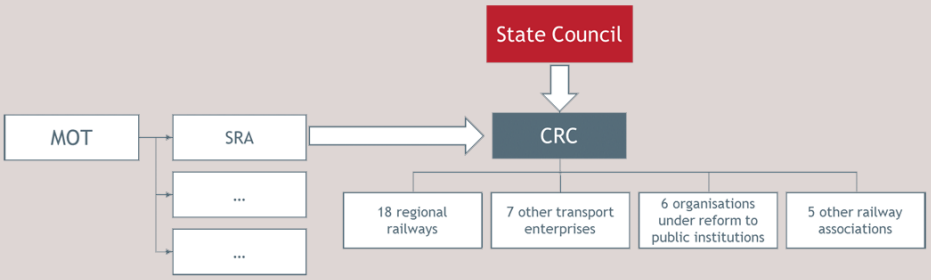
The Government undertook a dramatic restructuring of the railway sector, dissolving MOR and separating the government functions from the operation of the railway. The move confirmed the Government's strategy to separate regulatory and administrative responsibilities from commercial operations, as well as confirming the intent to keep railway assets centralized in China.

On March 14, 2013, the National People's Congress (NPC) passed a restructuring plan that separated the functions of MOR under three distinct entities:

- The Ministry of Transportation (MOT), responsible for overall transport sector planning and development policy;
- The State Railways Administration (SRA), a newly-established body under the MOT responsible for setting technical standards, setting and overseeing safety standards, and monitoring the quality of transport service and construction; and

- China Railway Corporation (CRC)[200], a newly-established state-owned enterprise responsible for commercial operation of the railway. (Figure 3)

Figure 3 Post-2013 China Railways Industry Structure



Within CRC, conventional rail network and train operations continue to be organized under the 18 RRAs. CRC also houses seven transport enterprises, such as China Railway Container Transport and Special Cargo Services Company. (Figure 3).

Box 1 China Railway Corporation

China Railway Corporation (CRC, previously known as China Rail) is the national railway operator of the People's Republic of China. CRC used to be part of the now-defunct MOR (referred to then as China Rail) and in 2013 was converted to an enterprise owned 100% by the State. CRC operates both passenger and freight services, and is responsible for managing the rail network. It is financed solely by the Ministry of Finance (MOF), and reports directly to the State Council.

Since CRC has formal responsibility for governance of the 18 RRAs, the RRAs have no boards of directors or other external supervisory bodies, and each RRA has a Head who reports to CRC. The RRA functional managers report to both the RRA Head and, less directly, to the functional heads at CRC. The RRA organizational structure is similar to and tends to mirror the functional classifications that exist at the Ministry level.

[200] The 2013 reform replaced China Rail with the state-owned enterprise, China Railways Corporation (CRC), which operates the commercial functions of the railway. The terms are in essence interchangeable. However, the reader may wish to note that the main difference (to date) is in the reporting structure. Prior to 2013, China Rail was housed under MOR, and thus reported to the Minister. By separating out the commercial functions and placing them under CRC, the operator now reports directly to the State Council, making the General Manager of CRC a de facto minister-level official. Therefore, at least on paper, the Minister of Transport and the General Manager of CRC hold the same seniority. As the newly established regulator, SRA is housed under MOT, it has yet to be seen how this chain of command will affect regulation of CRC. (http://www.railjournal.com/index.php/policy/china-implements-radical-railway-reform.html?channel=000)

2.4 Transport Operations

The now-defunct MOR was responsible for nearly all aspects of railway economic and safety regulation, while the State Council had to approve passenger fares and freight tariffs on State railways. In practice, NDRC administered economic and safety regulation; it regulated and approved China Rail tariffs, and tariffs on new lines, and regulated inter-Provincial JVs. In 2014, MOR's safety and regulatory duties were transferred to SRA under MOT, which is an executive agency of the State Council.

Although the functions of MOT and CRC are now separated, tariffs continue to be guided by NDRC, therefore limiting CRC's ability to operate as a commercially-oriented enterprise. Encouragingly, the current regulatory and institutional environment is favorable for NDRC to open up the industry to market-driven tariff setting. Publications suggest that the State Council and NDRC are indeed considering implementing market-driven freight tariffs, with NDRC at the helm of the reform[201]. However, only time will tell if this shift in policy will occur.

3 Rail Sector Growth Strategy

3.1 Network Expansion

In the past two decades, China's railway policymakers have continuously faced two immense strategic challenges:

- To increase infrastructure capacity and quality; and
- To reform the industry so it can adapt and thrive in a modern ever-changing market economy.

To meet the infrastructure challenge, China embarked upon the world's biggest program of railway construction since the nineteenth century. In January 2004, the State Council approved in principle the Mid- and Long-Term Railway Development Plan, setting out construction priorities and providing the framework for developing future five-year plans. In 2004, cost estimates for implementing the Plan were RMB 1.7 trillion through 2020 (in 2004 prices)[202]. Already by the end of 2015, the network had reached 121,000 km, with 50 percent of the network double tracked, and over 60 percent electrified. In mid-2016, NDRC released the latest five-year update to the development plan for China's railways, revising its target upward to 175,000 route-km by 2025[203].

[201] http://www.scmp.com/business/china-business/article/1402132/heavily-indebted-china-railway-corp-expected-raise-freight

[202] This was once revised upwards due to the Economic Stimulus Program Government adopted in 2008.

[203] The first update in 2008 also increased the route-km targets for the public rail network to 120,000 km by 2020 (up from 75,000 km in 2005) a figure which was surpassed in 2015.

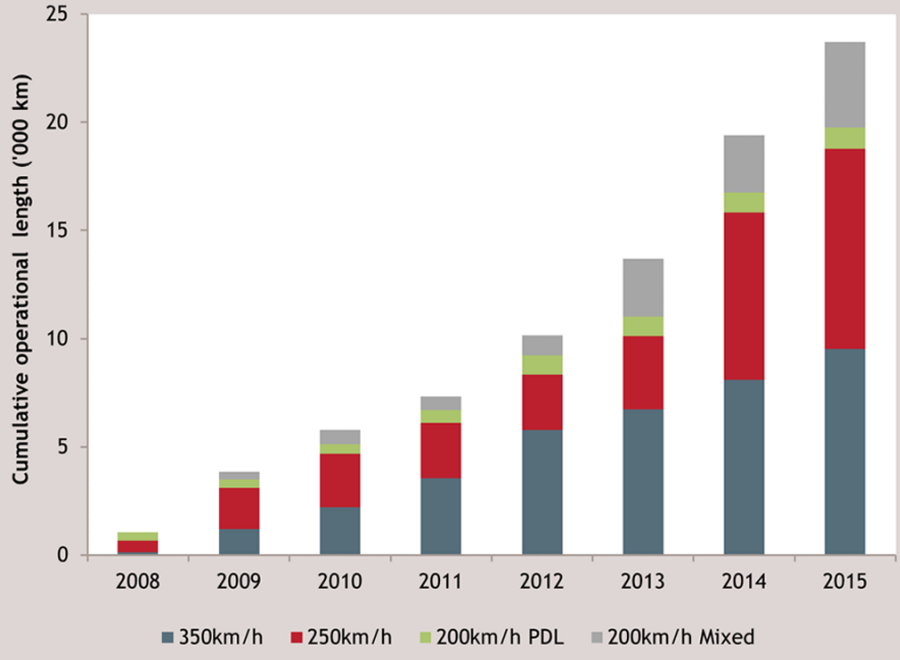
Figure 4 Chinese Rail Network Characteristics 1990-2015

	1990	1995	2000	2005	2010	2015
Route-km						
National	53,378	54,616	58,656	62,200	66,239	66,989*
Local	4,522	5,034	4,813	4,775	4,363	**
Joint Venture	N/A	2,738	5,181	8,462	20,577	**
Total	57,899	62,389	68,650	75,438	91,179	120,970
CRC Network+						
Route-km with multiple track	13,024	16,909	21,408	24,497	29,684	64,687
Electrified route-km	6,491	9,703	14,864	19,408	32,717	74,700

* 2014 data
** Data not available
+ Almost all new construction since about 2008 has been classified as joint venture rail-ways, even though these are for all practical purposes 'national railways', owned jointly by national and provincial governments. These new joint venture railways are excluded from the 'CRC Network' data in the China Statistical Yearbook (which is presented here). Since 2008, joint venture railways have increased from approximately 10,000 km to about 50,000 km, of which over 20,000 km are double-track electrified high-speed lines.
Source: China Statistical Yearbook, 2016

The program has thus far resulted in considerable growth in high speed rail, ranging from 200 km/h for mixed-use passenger and freight lines (although few freight services are using them) to 350 km/h dedicated passenger lines (Figure 5). The completed network will feature services up to 350km/h based on eight north-south and eight east-west corridors[204]. By 2016, nearly 20,000 km of high speed dedicated passenger lines were completed and most of the main corridors were nearing completion. In late 2016, an updated plan was announced to expand the high speed network to 30,000 km by 2020, which will connect 80 percent of China's major cities.

Figure 5 Growth in High Speed Rail in China 2008-2015



Source: World Bank estimate

[204] This marks a major expansion compared to the previously published 2008 strategy, which targeted four north-south and four east-west corridors.

The plan also includes 20,000 km of short-distance expansion to the conventional network by 2025. Eight regional intercity systems between major regional cities and towns are already operational. The plan will enhance connectivity within the Bohai Sea area (Tianjin, Beijing, and Qinhuangdao), the Yangtze River Delta (Shanghai, Nanjing, and Hangzhou), and the Pearl River Delta (Hong Kong, Guangzhou, and Shenzhen), as well as improving connections in China's hinterland regions[205]. Twelve new lines are also being constructed for the purpose of improving the rail connectivity of the poorest regions of China, in an effort to foster economic growth.[206]

Figure 6 China High-Speed Rail Network Map

More than ever before, a conducive environment for rail freight transport in China is emerging, although China's supply chain has persistently had low utilization of intermodal transport despite having long-haul routes that are characteristic of suc-

[205] http://www.chinahighlights.com/travelguide/transportation/china-high-speed-rail.htm
[206] http://www.railwaygazette.com/news/infrastructure/single-view/view/chinese-high-speed-network-to-double-in-latest-master-plan.html

cessful rail freight networks. It was anticipated that capacity on the existing network would be freed up by the launch of new dedicated passenger lines, which would in turn accommodate growing freight demand. However, the conventional trains still operate with strong passenger demand, limiting the desired increase in capacity for freight transport.

The separation of CRC from MOT also signals the possibility for CRC to move toward a more commercially-oriented enterprise, which would allow it to have the flexibility to customize its services to customer needs, most notably in tariff setting. Currently, however, regulatory and institutional restrictions limit CRC's ability to operate autonomously.

The ongoing revitalization plan for freight services includes high-capacity coal transport corridors, based on China's ten major coalfields, to provide annual coal transport capacity of 2.0 billion tons by 2020. The rail container industry, so far limited with the exception of some larger terminals, will be boosted through upgrading those railway lines with intensive container transport. Some major routes with heavy container traffic are being upgraded to allow double-stack container trains.

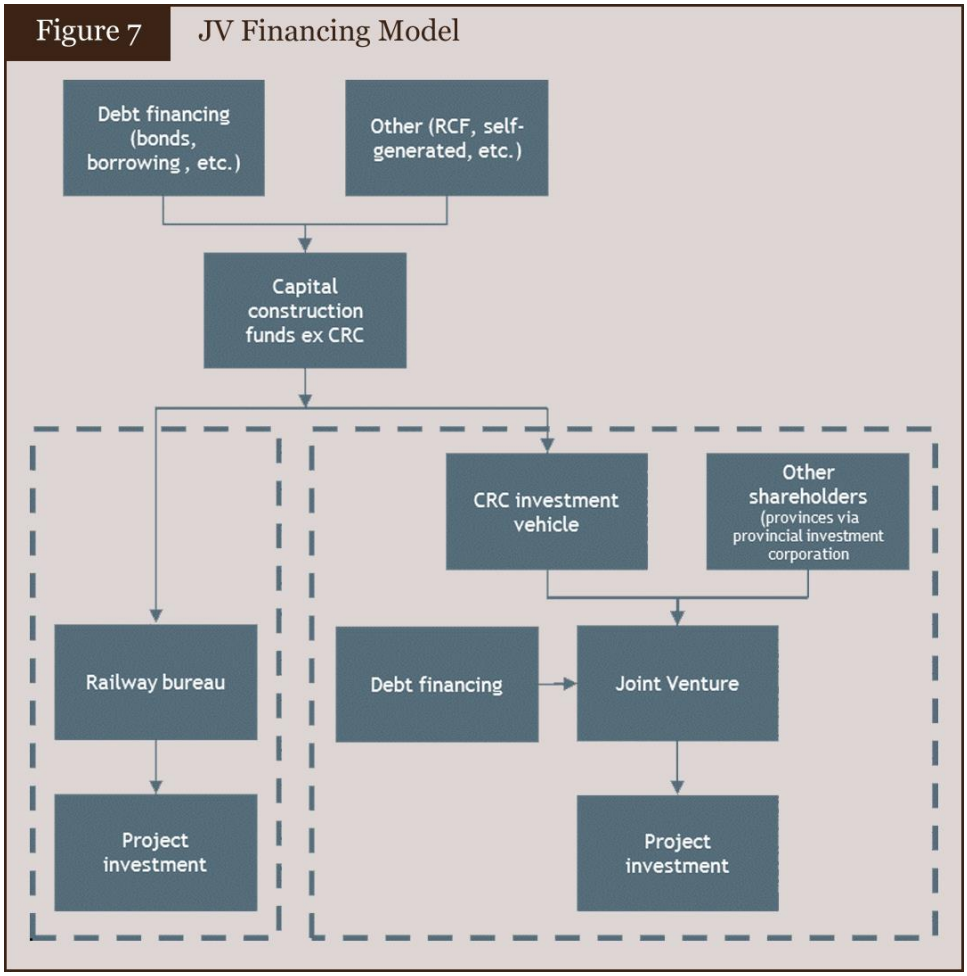
Since the early 1990s, the Government has pursued reforms to improve the organization of the railway sector and has slowly begun allowing the industry to introduce new participants. Since 2008, the policy has been that all new and upgraded lines would be done so on a JV basis. Over 80 JV railways have been established with provincial governments, enterprises, and to a minor extent, private investors. The main objective of the JV policy was to reduce the debt accruing to MOR, and the JVs were employed as a mechanism to bring local government funds into the sector. Some 19 JV railways were newly formed to support trunk corridor development. On many low-density lines, some separation and divestment to local management has occurred, with an emphasis on reducing losses.

3.2 Sector Overview

Joint venture model

In 2005, China Rail adopted the JV model, which was an important development mechanism for funding new lines. A typical 'new' JV is funded 50:50 by debt and equity. The equity comes from CRC, financed through bonds, and third parties—typically provinces and potential customers—whereas the JV raises the debt from local banks and, to a more limited extent, from International Financial Institutions (IFIs). Provincial equity is often provided in the form of cleared land (and associated resettlement costs), but provinces can also contribute funds, normally through a Provincial Rail Investment Corporation. (Figure 7).

Figure 7 JV Financing Model



Operation and maintenance of the line is typically contracted to the local railway bureau. There are two models for train operations:

- The JV takes the traffic risk, receives revenue from traffic and pays the local railway bureau to provide train service; or
- The local railway bureau takes the traffic risk, receives revenue from traffic, and pays the JV for track access.

Two successful examples of the JV model are the Daqin and Shuohuang railways. Both are dedicated coal lines, running east-west in northern China. In 1989-92, the Daqin line opened; since then, it has progressively upgraded and improved infrastructure, rolling stock, and operations. In 2006, it was listed on the Shanghai Stock Exchange and by 2007, annual capacity had reached 300 million tons, up from 100 million tons in 1988. The more recently opened JV Shuohuang railway provided a second dedicated line to the Bohai Sea ports. Most of the coal it carries is mined by the Shenhua Company, the principal member of the JV.

The JV model continues to be used for almost all new construction and upgrading projects, despite there being many question marks about how to get the right balance between railway system coordination/integration and protecting the interests of individual JV investors.

Attracting private financing

In 2014, the Government presented a new guideline on the management of a railway development fund to attract private investment into the sector. The China Railway Development Fund will be monitored by CRC, and is scheduled to last for 15 to 20 years, with an option to extend if approved by the State Council. The fund will provide railway investing and financing, and CRC will sign agreements with private investors. Preferred stock holders receive a fixed return on investment, but do not participate in the management of the fund. Seventy percent of the fund is earmarked for railway projects approved by the State Council, while the remaining 30 percent can be invested in other projects, such as land development[207].

In June 2014, the first round of fundraising for the Railway Development Fund raised RMB 8.2 billion, with investment coming from three of China's "Big Four" state-owned banks, as well as the Fujian province-based Industrial Bank. CRC contributed approximately RMB 75 billion, including approximately RMB 20 billion from the central fiscal budget. Since then, an additional round of funding was raised, and the latest estimate of its registered capital was RMB 188 billion[208].

Despite significant investment, Chinese media reports indicate that private investors are not very active in the fund. This is due to their discontent with the fact that they are restricted to being preference shareholders, and are thus not permitted to participate in the management of the fund. Further, a Chinese magazine published comments from those in the banking sector, stating that state-owned banks participated under political obligation.

A new policy is also promoting private capital investments into rail projects through public-private partnerships (PPPs). The objective is to alleviate the debt carried by local authorities. In 2016, the Zhejiang government signed the first of such PPP agreements with the Shanghai Fosun High Technology Group Co. Ltd., with an estimated project value of RMB 46.2 billion. The project will connect the cities of Hangzhou and Taizhou.[209]

Focus has also been placed on a policy that encourages development of the land around and above new stations, with generated revenues being used toward paying back railway development.

4 Performance of China’s Railway Sector

Although MOR in China has recently been dissolved – separating administrative functions (under MOT), and railway operations (under CRC, the state-owned enterprise for railways operation) – the performance of China’s railways can still be discussed rather synonymously between the former China Rail and the newly-established CRC. Given time, a comparison study between the former and current structure will be useful to evaluate the impact of separation, particularly if CRC is given the commercial freedom to be operate as a market-oriented enterprise.

[207] http://www.china.org.cn/business/2014-07/08/content_32895952.htm
[208] http://www.reuters.com/article/chinapacificinsurance-railwayfund-idUSL3N0Z007O20150614
[209] http://www.railwaypro.com/wp/china-fosun-to-invest-in-high-speed-rail-ppp-project/

4.1 Railway Transport Markets

China and its economy are well-suited to railway traffic, which can move massive volumes of people and goods over long distances. China's economy depends heavily upon coal and coke, metal ores, iron and steel, petroleum products, grain, fertilizers and other bulk products that are transported most economically by rail. The average transit distance of CRC freight in 2015 was 707 km, relatively high by world standards. China is the world's second largest freight carrier in net ton-km (after the US Class I system) and the largest passenger carrier in passenger-km. When freight and passenger traffic are taken together, CRC is now the busiest railway in the world.

In addition, China has high population density in settled areas and contains many large cities. Chinese have rising purchasing power, enabling them to travel. The result is some of the largest inter-city passenger flows in the world, creating heavy demand for travel within the larger conurbations. Since 1990, shorter-distance passenger travel has shifted to road transport, in part due to better short- and medium-distance bus services. However, it is also due to a legacy China Rail policy that actively discouraged short-distance passengers in order to free rail capacity for longer-distance travel. A reversal in this policy can be noted by the promotion of the inter-regional networks mentioned earlier, which currently average a city-to-city distance of only 134 km (taking into account operational rail lines).

Since 1990, the average passenger distance traveled has nearly doubled on the national railway system, from 275 km to 472 km in 2015[210]. However, most of the growth occurred before 2000, and the yearly average has been relatively stable over the last decade. Most long-distance travel is by air or by rail and, for trips over 500 km, rail has about two-thirds of the market, but this share has been steadily declining. Overall passenger demand on China Railway has grown at an average of 7.1 percent per year since 2010, and almost all the growth has been on the high speed rail services (CRH) (Figure 8).

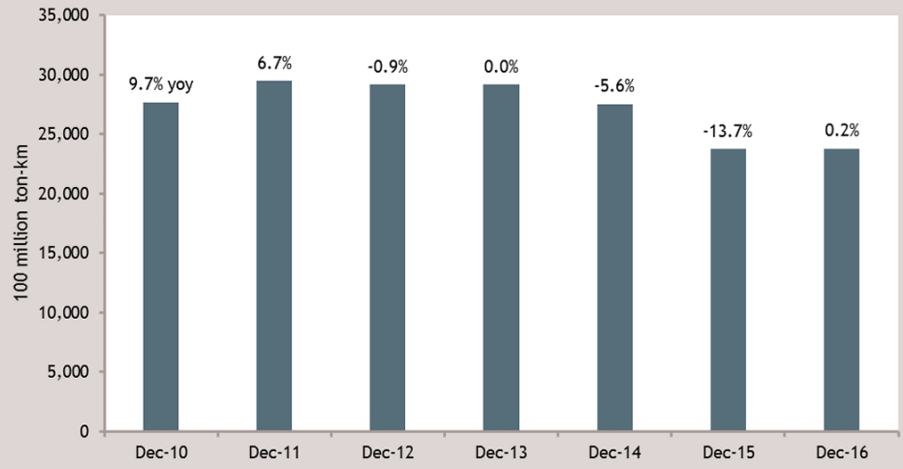
[210] China Statistical Yearbook, 2016

Figure 8 Growth in Passenger Rail Volumes 2008-2015

Source: China Statistical Yearbook, 2016

Meanwhile, freight traffic (ton-km) grew by over 100 percent between 2000 and 2011. However, annual growth then fell below zero percent in 2012. Recently, railway freight volumes have begun to recover, finishing 2016 with an annual growth of 0.2 percent[211, 212]. At the same time, road and waterway freight transport sectors have outpaced China's railway sector substantially. Despite having what should be a naturally favorable position in long-haul transport services, rail has struggled to maintain its market share compared to other modes.

Figure 9 China Railways Freight Volumes and Growth Rates 2010-2016



Source: National Bureau of Statistics of China

[211] When compared to annual cumulative freight volumes (ton-km) of 2015; National Bureau of Statistics of China

[212] Rail freight volumes experienced a year-on-year decline for 32 consecutive months prior to mid-2016. However, between August and December 2016, year-on-year monthly growth has averaged 10.2 percent.

The lackluster growth in freight rail transport can be attributed to a few major challenges. The Chinese network has been capacity-constrained for several decades, and freight traffic was limited to rail capacity minus the capacity allocated to passenger traffic. The priorities for freight transport were coal and grain, and other traffic was actively discouraged for many years.

Infrastructure planning has not necessarily prioritized the intermodal connectivity of rail for freight transport, either. Particular to container traffic, some blame can also be attributed to China's lack of necessary supply chain infrastructure (on-dock rail capabilities, warehouses, intermodal logistics services, etc.). A recent expansion of Shanghai Port, the world's busiest container terminal, was completed without the inclusion of rail access.

Strict oversight NDRC and MOT maintain on CRC's operations also has made an unfriendly market, regulating rail tariffs and thereby prohibiting CRC from tailoring its customer offerings based on willingness to pay.

Despite the above, the freight rail industry has a positive outlook: conventional rail lines have the potential to be freed up thanks to an expansion in passenger dedicated lines; the ongoing reform at CRC supported by NDRC is a big step toward enabling a competitive environment for rail; and the expansion of intermodal facilities in the country will facilitate inter-modal connectivity.

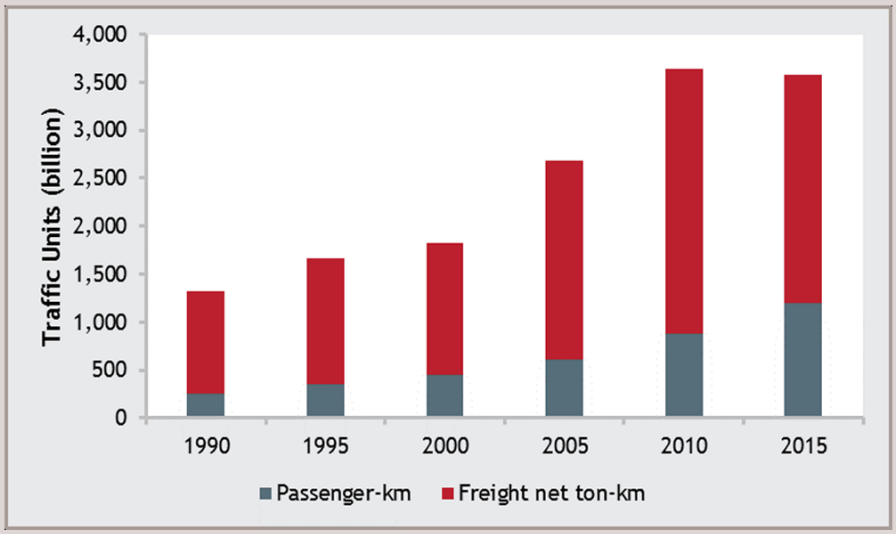
4.2 Transport Operations

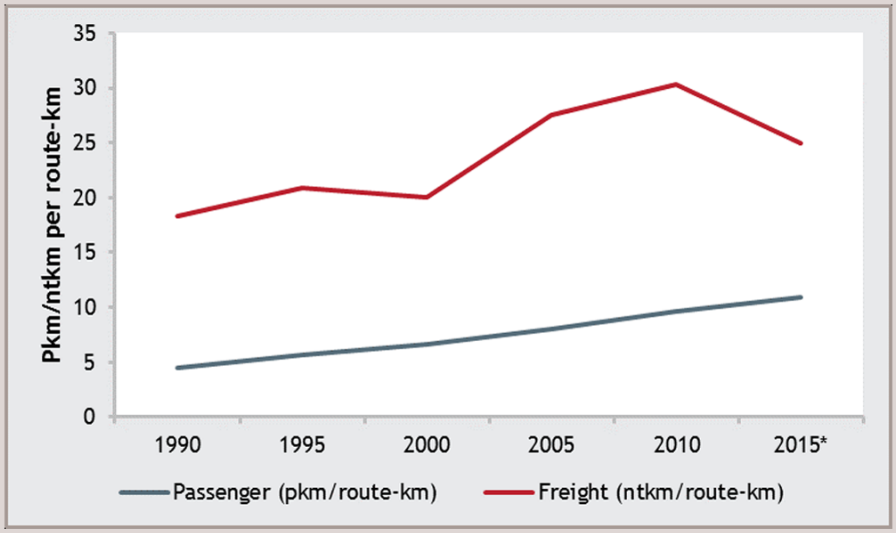
Trends in operational indices, summarized in Figures 10 and 11, are impressive. CRC equipment and labor productivity are among the highest in the world for mixed-use railways.

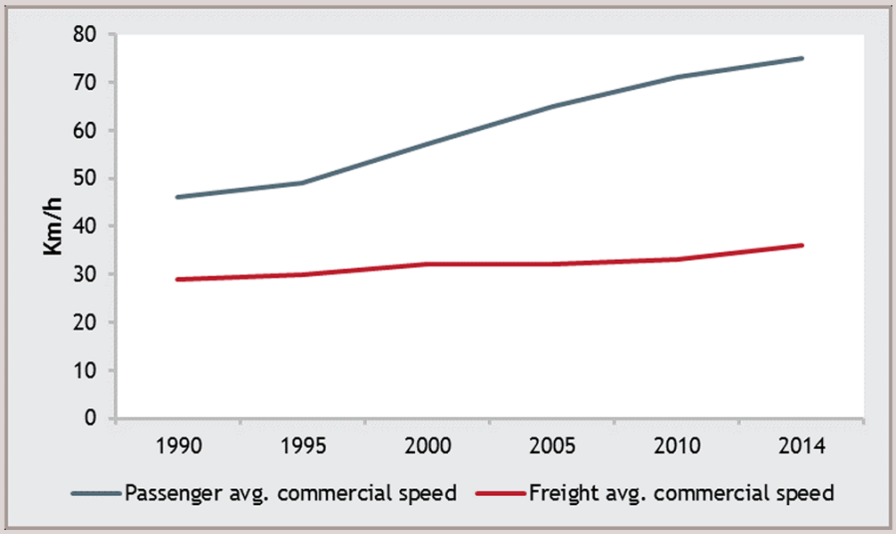
In aggregate terms, in the two decades since 1990, average passenger speeds have increased by more than 60 percent. In the freight sector, average train size increased by nearly 50 percent, and freight locomotive productivity by over 60 percent.

In 2007, Electric Multiple Unit (EMU) trains operating at 200-250 km/h were introduced on several routes. In August 2008, a 300 km/h EMU train service was inaugurated between Beijing and Tianjin. In January 2010, China's first 350km/h plus high-speed line opened between Wuhan and Guangzhou (961km). Today, over 1330 CRH services are offered daily across the county.

Figure 10 China Railways Operating Indicators 1990-2015







*Data presented for 2015 has been estimated, and may also not be directly comparable to previous years due to changes in the method for calculating traffic density in the China Statistical Yearbook since 2013.
Source: China Statistical Yearbook, 2016

Figure 11 China Railways Operating Indicators 1990-2014

	1990	1995	2000	2005	2010	2014
Traction						
Electrified track (%)	11.9	15.5	21.7	25.7	35.9	61.7*
Average technical speed (km/h)						
Passenger	57	58	69	74	81	85
Freight	44	44	46	46	48	50
Average commercial speed (km/h)						
Passenger	46	49	57	65	71	75
Freight	29	30	32	32	33	36
Average weight of freight train (gross tons)	2,414	2,597	2,676	3,038	3,467	3,535
Output/day per freight loco (000 gtkm)	860	931	994	1,106	1,350	1,434
Passenger-kms/coach/year (million)	9.6	10.9	12.3	14.5	17.3	N/A
Average freight haul (km)	705	786	771	770	759	722
Average wagon turnaround (days)	4.1	4.5	5.4	4.9	4.5	4.7
Traffic density (system-wide)						
Passenger (mln pkm/route-km)	4.5	5.6	6.6	8	9.6	10.1
Freight (mln ntkm/route-km)	18	20	20	28	30	25
Labor productivity (000 traffic units/staff)	673	749	1,155	1,712	2,298	N/A

Note: Data presented in this figure, as provided by the China Statistical Yearbook, corresponds to what is referred to as the 'National Network' and does not include statistics from the JVs between the national and provincial governments, with the exception of the data for 'Electrified Track' which includes the entire network.
* Electrified track (%) is provided for 2015 to demonstrate the recent and significant increase. In 2014, it was 33 percent.
Source: China Statistical Yearbook, 2016

Most lines in China carry a mixture of heavy freight and express passenger trains, except for new dedicated high-speed passenger lines and dedicated mineral lines. Typically, such lines operate with headways of seven or eight minutes, and routinely handle the equivalent of 120 pairs of passenger trains daily and up to 180 pairs at peak periods such as Spring Festival, which is close or equal to theoretical capacities.

On the logistics side, in 2012, CRC established a JV under the name YuZinOu with the goal of managing rail freight services between China and Europe. Under the 2013 "One Belt, One Road" program, which focuses on China-Eurasia connectivity, China now moves freight via the China-Europe Railway Express (CR Express). The railway connects China's network of container terminals to more than eight countries, including Germany and most recently the UK. By mid-2016, CRExpress saw 619 outbound trains, and 209 inbound, signaling 150% and 318% growth respectively from the previous year[213]. In 2016, China and the Intergovernmental Organization for International Carriage by Rail (ORIF) also signed a memorandum of understanding to outline areas of future cooperation, including regulations, technical standards, and to promote common CIM/SMGS consignment note for freight between Asia and Europe.

4.3 Public Service Obligations

Before the 2013 reform, China Rail had no policy or system of explicit payments for loss-making passenger public service obligations (PSOs). Unlike most national passenger railways, China Rail never built or operated suburban rail networks, which in other countries are a prime area for budgetary support. The Government explicitly views passenger services as both social service and commercial activity, and historically reallocated net revenues across RRAs to ensure financial balance

[213] UNESCAP presentation. "Rail-Based Intermodal Transport in China Current Status and Challenges." Transport Planning and Research Institute, Ministry of Transport, P. R. China. Bangkok, 30-31 August, 2016. http://www.unescap.org/sites/default/files/China_Rail-Based%20Intermodal%20Transport.pdf

in each. Meanwhile, the Ministry of Finance (MOF) provided capital contributions to railway line construction in remote regions.

The recent policy changes propose compensation to CRC for its PSOs, with improvements to the cost accounting system in order to create a reasonable compensation mechanism. In the interim, it is the responsibility of the central government to provide subsidies to CRC during the transitional period while the full cost accounting system is being developed and implemented.

4.4 Customer Satisfaction

In the passenger sector, trains are reliable and punctual, and offer superior standards of comfort in the higher service/ticket classes. China introduced a high speed rail network (branded CRH), which is the biggest planned program of passenger rail investment ever in a single country. High speed rail fares are very competitive with other transport modes within China. When looking at the sources of passenger traffic, about one-third of the pre-CRH rail volume (riders from conventional rail) transferred to CRH, which accounts for about half the high speed rail volume. Second-class fares of high speed rail vary between US$ 0.045 per km at 200-250 km/h and 0.077 at 300-350 km/h[214]. These rates are three to four times higher than conventional express trains, but conventional trains offer far lower levels of service. When compared to average fares in other countries with high speed passenger rail, fares in China are approximately a quarter of the international average.

High speed rail services also compete very effectively with air services over short distances (up to 500 km) because of lower fare, higher reliability, and more frequent services. It is a significant competitor for trips of up to 1,000 km.

However, volumes of traffic, both passenger and freight, are not necessarily an indicator of customer satisfaction. CRC does not regularly monitor customer perceptions of its services. Press reports and anecdotal evidence suggest that the freight business does not always supply enough wagons in a timely manner to meet customer demands, and that general customer responsiveness is below par.

Anecdotal accounts of passenger experiences on the new line connecting Guangzhou to Nanning[215] indicate high levels of satisfaction on several of the new high speed rail lines, making job opportunities more accessible and family trips more frequent. In 2013 and 2015, the World Bank conducted passenger profile surveys of four major lines[216]. A common finding was that respondents would travel less frequently if the high speed lines were not in operation, and that the high speed services continue to attract passengers from bus, air, and private vehicles. Rising incomes have not only spurred people to travel more but also raised demand for

[214] World Bank, "High-Speed Railways in China: A Look at Traffic". Accessed at: https://openknowledge.worldbank.org/bitstream/handle/10986/25480/932270BRI0Box30ffic020140final000EN.pdf?sequence=1&isAllowed=y

[215] World Bank, "Passengers of recently opened Wuzhou-Nanning rail line describe new opportunities", submitted by Gerald Ollivier, April 6, 2014.

[216] World Bank, "High-Speed Railways in China: An Update on Passenger Profiles" written by Nanyan Zhou, Richard Bullock, Ying Jin, Martha Lawrence and Gerald Ollivier. January 2016, and World Bank, "High-Speed Railways in China: A Look at Traffic" written by Gerald Ollivier, Richard Bullock, Ying Jin and Nanyan Zhou. December 2014.

higher standards of service and convenience. In response, new ticketing systems were implemented to improve the retailing operation, and tickets can now be purchased online. Purchased tickets can be picked up from vending machines in stations.[217]

4.5 Financial Performance

Figure 12 shows financial performance indicators[218] for the railway component of MOR-administered and supervised organizations for pre-reform years between 1990 and 2010, and then for CRC in 2015.

The revenue figures in Figure 12 include freight surcharges imposed above basic tariffs to provide capital for new construction through a dedicated railway construction fund (RCF). The surcharge revenue is ear-marked for infrastructure upgrading and not subject to tax.

Government policy, as reflected in tariff regulation, allowed MOR broadly to break even, or make a small surplus, but not to maximize profit. Thus, by design, MOR broke even on its rail operations until 2010 while the RCF was intended to provide construction capex. As high speed trains began operating in 2010, MOR wages were increased sharply: by 100 percent between 2005 and 2010 and by a further 50 percent between 2010 and 2013. Since 2009, CRC has incurred a loss on its rail operations. (Figure 12)

By 2016, CRC had accumulated a high level of a debt and liabilities (RMB 4.14 trillion on an asset base of RMB 6.4 trillion), due largely to borrowing for HSR and other projects.

In an effort to leverage the value of its assets and introduce market-oriented business models to the rail sector, CRC has recently expressed interest in exploring new equity investment mechanisms to increase cash flow from its core and non-core activities, and to consider different financing channels. The World Bank recently published a report for CRC that discussed international best practices and highlighted their relevance for China[219].

[217] Previously, it was not possible to book a return train fare; queuing to buy tickets at stations took hours and sometimes days, which sparked a secondary informal market in tickets.

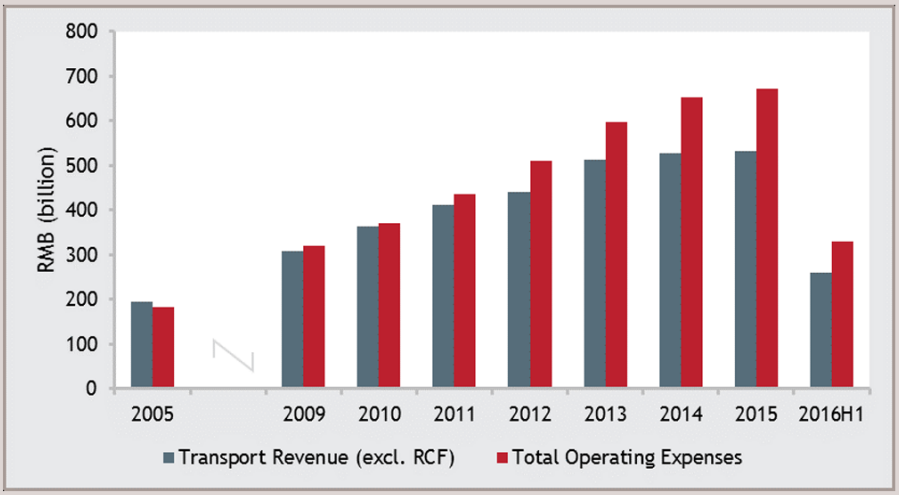
[218] Financial statements do not adhere to international accounting conventions and should be treated with caution. In the early 1990s prices were a mixture of administered and market prices and costs were calculated on a different basis prior to 1999. All figures refer to the railway transport component only of the various organizations. Various reported results for MOR in statistical yearbooks include and sometimes exclude non transport subsidiaries.

[219] See the March 2015 report, "Attracting Capital for Railway Development in China", by the World Bank. Available at: https://openknowledge.worldbank.org/handle/10986/23800

Figure 12 China Railways Corporation Rail Revenue and Expenditure 1990-2015 (Billion RMB)

	1990	1995	2000	2005	2010	2015
Revenue						
Passenger	11	20	37	62	135	251
Freight (excluding RCF)	27	36	54	110	200	231
Parcels/mail	1	2	4	5	50	56
Other	2	7	16	31	N/A	N/A
Subtotal	41	65	111	207	384	538
RCF	0	35	38	48	65	46
Total Transport Revenues	41	100	149	255	449	584
Business Taxes	2	3	6	12	21	7
Revenues (excl. RCF)	39	62	105	196	363	531
Revenues (incl. RCF)	39	96	143	243	429	577
Expenditures						
Working Expenses	21	57	85	156	299	562
Depreciation	5	7	16	26	71	110
Total Operating Expenses	25	64	101	183	370	672
Profit						
Total Profit after Tax (excl RCF)	14	-3	4	13	-6	-142
Total Profit after Tax (incl RCF)	14	32	43	61	59	-95

Note: Pre-2013 are financial statements for the commercial rail operations of MOR (China Rail); post-2013 are CRC rail operations. Figures exclude any government subsidies



Source: CRC Financial Statements

The study suggests that CRC can: (a) expand its financial sources through organizing and managing its subsidiary entities to maximize their value and the generation of cash; (b) potentially apply PPP concepts through land value capture and integrated land development; (c) capture its right-of-way value through telecommunications services; (d) raise new equity through IPO of profitable and well governed subsidiary entities; and (e) leverage financing from the railway's large fixed asset base.

5 Conclusions

5.1 Overall Sector

Centralized railway sector administration has been effective in developing China's rail transport industry. First, MOR-administered RRAs execute railway network management and train operation with consistently high discipline and efficiency. Second, for years, MOR has successfully delivered the biggest railway system development program in the world. Even after the 2013 reform, activities remained

centralized within MOR and CRC. A single point (or, more recently, two highly inter-related points) of concentrated responsibility, authority, and financial resources has been critical to managing rapid and comprehensive development of a long-term national program.

China illustrates the benefits of high traffic density for network and service economics and overall financial sustainability. Government policies have achieved some sector governance reforms recommended in this toolkit: (i) the fundamental separation of policy and regulatory functions from commercial functions; (ii) separating non-core functions and ancillary businesses; (iii) improving the commercial responsibilities and incentives for RRAs; (iv) increasing private sector participation, such as the two specialized coal transport companies (Shenhua and Daqin); and (v) creating many joint-venture railways to attract external capital. Nevertheless, to date little capital has been purely private; most came from provincial governments and state-owned enterprises. Competition between railways is not encouraged—either between existing regional railway administrations or between those administrations and new train operating companies. Little business separation has occurred within CRC; regional/functional management structures dominate.

MOT (formerly MOR) has been impressive as policymaker and regulator, embracing and encouraging value-adding railway technologies throughout the industry in construction, maintenance, operations, and management. An equally impressive network of state-sponsored railway institutes, specialist universities, testing facilities, and laboratories provide capacity to adopt international best practice and create custom-designed technologies and processes to solve operating challenges specific to China.

5.2 Notable Management Initiatives

The supply side of the industry is still heavily state-administered and regulated, but increasingly, all facets of China's transport demand are being shaped by market forces. These include freight and passenger transport types; demand volumes; geographic distribution of demand; and modal allocations of traffic. The Government has long recognized that railways must develop a market-oriented approach to customer service, become more competitive with ever-improving road and air transport, and adopt commercial management principles. In part, railway managers have responded to these pressures within the existing institutional framework. CRC managers have responded to competitive pressures by pursuing some management initiatives described elsewhere in this toolkit. The main initiatives are summarized in Figure 13.

Figure 13 Selected Examples of Management Approaches Applied in China

Principles	Examples of Application
Market segmentation	Established specialist companies to run some major coal lines and organize rail container services, express small freight and special freight
Labor restructuring	Directly increased railway labor productivity by 6-7 percent annually for last 20 years; extensive training in management and operation of new and locally-adapted rail technologies
Equipment utilization	Continuously improved asset utilization in all classes.
Traffic financial performance	Adopted Traffic Management Information System (TMIS) to provide data that facilitate detailed traffic costing (this is not yet done routinely).
Passenger market pricing	Increased the number of market-based pricing exceptions in the passenger sector, such as for high-speed rail services, though most prices remain heavily regulated.
Efficiency of train operation	Progressively increased average axle load; larger trains; specialized high-capacity wagons; block trains; double-stack container capability.

5.3 Future Challenges

The Mid- and Long-Term Railway Development Plan has successfully confronted the challenge of infrastructure development. The Plan involves risks—primarily the risk to CRC's financial sustainability, associated with the debt incurred while developing the high-speed rail network. Demand and supply conditions in China for high speed rail are very favorable. However, as it proceeds, China will need to closely monitor the level of railway debt arising from the program. Payback periods for high speed rail will necessarily be longer term for such 'lumpy' and long-lived assets. China will have to ensure that the scale of support for the high speed passenger network does not result in sacrificing other key elements of the Plan.

Government policy and regulatory functions have now been separated from the commercial functions of railway operating entities. It will be interesting to watch whether CRC is given the regulatory freedom to transition into a more commercially-oriented enterprise and to begin to fully embrace private sector involvement. Developing a more diverse and pluralist railway industry based on market principles implies a need for such institutional reforms. It may be difficult to convince external investors in new rail entities that their rights will be protected and obligations fairly administered if MOT and NDRC control entry to the playing field, set the rules, referee the game, and manage the opposing team. This issue is not straightforward, nor is it a matter just of splitting existing Ministerial functions, although the 2013 reform is certainly a big step in the right direction. In the coming years, the industry will require rigorous policy and institutional analysis that would deliver good sectorial and corporate governance of state railway entities, while maintaining implementation effectiveness for the long-term railway development program.

Case Study

Hong Kong Mass Transit Rail Corporation[220]

1 Introduction

The Mass Transit Rail (MTR) Corporation was established in 1975 as a government-owned enterprise to build, operate, and maintain a mass transit railway system for Hong Kong's public transport needs. In 2000, about 23 percent of its shares were offered to private investors on the Hong Kong Stock Exchange.

Just like many other metro projects, MTR line construction in the 1970s and 1980s was capital intensive and required substantial funding. With several lines under construction/planning, MTR Corporation had accumulated substantial debt by 1985 (HK$18.7 billion, or US$2.4 billion[221]). It was important for the government to cover and even cut some of the company's project costs without raising fares by arranging government land grants for rail and property development.

Since it became publically traded, MTR Corporation has also needed to ensure it undertakes only financially viable projects, as a profit oriented organization undertaking non-government projects. The Rail + Property (R+P) program helps MTR Corporation meet this objective.

This case study is relevant to railway companies and cities looking to generate cash flow by developing land around rail stations.

2 MTR Corporation and the R+P Program

The portfolio of MTR Corporation is divided into four parts: 1) Hong Kong Transport Operations; 2) Hong Kong Station Commercial Businesses; 3) Hong Kong Property and other Businesses; and 4) Mainland of China and International Business.

For Hong Kong Transport Operations, the merged 218.2-kilometer rail network consists of nine railway lines with 84 stations serving Hong Kong Island, Kowloon, and the New Territories, as well as a Light Rail network with 68 stops serving the local communities of Tuen Mun and Yuen Long in the New Territories. The Corporation also operates the Airport Express, a dedicated high-speed link connecting

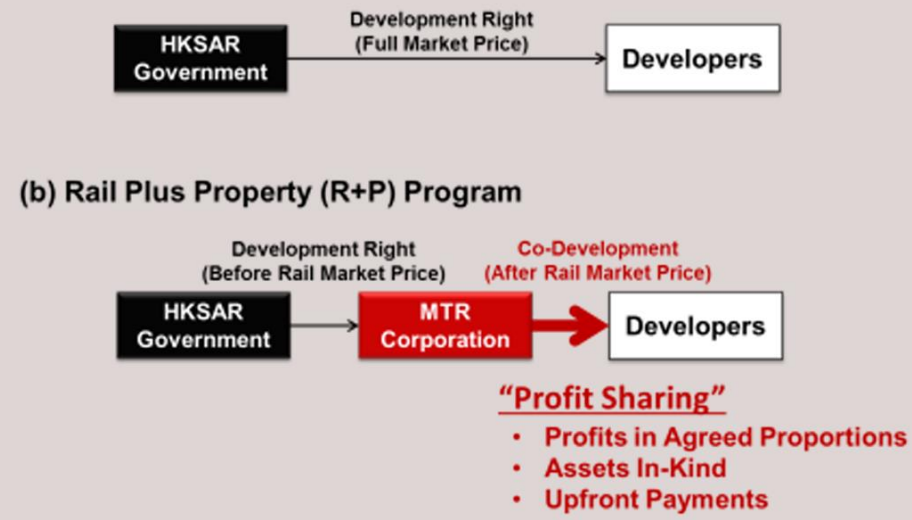
[220] This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

[221] When USD equivalent is shown for HK$ values, they are all converted by using the exchange rate of 1USD=7.75HK$ (as of 2015).

Hong Kong International Airport and the city's major exhibition and conference center, AsiaWorld-Expo. The rail system has an average weekday patronage of nearly 5.3 million passengers.

With the R+P approach, MTR Corporation has been able to fund a large part of its transport system development by: (i) creating land value through integrated urban and transport planning; and (ii) capturing such value by receiving land development rights from the government at "before rail" market prices and co-developing such land with private developers at "after-rail" market prices (Figure 1).

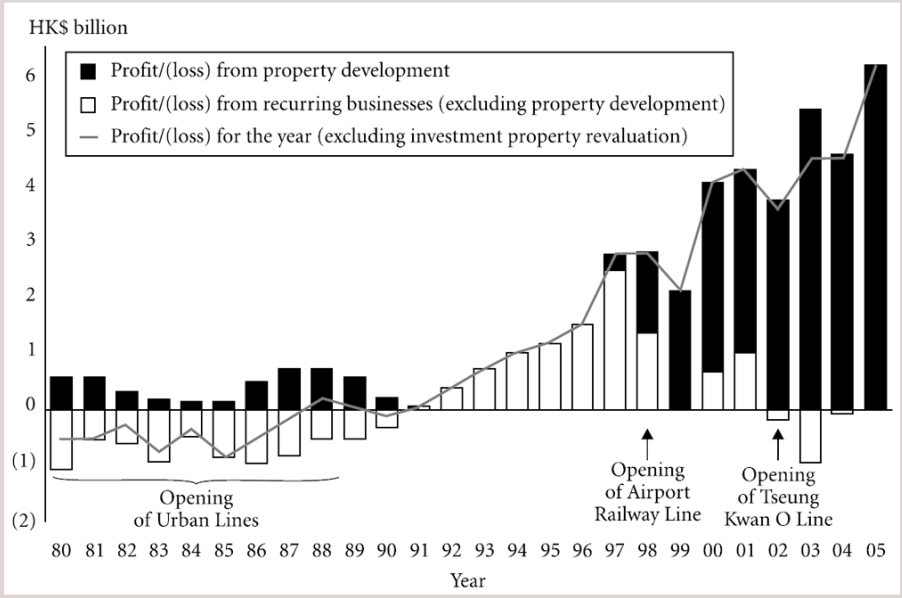
Figure 1 Hong Kong, China's Land Value Capture Mechanism: Relationships among the Hong Kong, China Government, MTRC, and Developers



Source: Financing Transit-Oriented Development with Land Values (World Bank 2015)

The R+P approach went through different phases. Over the period of 1980 to 2005, property development contributed substantially to expansions of the rail lines, in particular during 1998 to 2005 (Figure 2).

Figure 2 Rail + Property Evolution



Source: Murakami and Cervero (2009)

By end-2015, MTR Corporation completed developments at 33 MTR stations, generating some 100,000 housing units and more than 2 million square meters of commercial space. The corporation is one of the largest property managers in Hong Kong, managing over 96,000 units of residential flats, 13 shopping malls, and five office buildings (764,003 square meters of commercial and office space)[222].

3 MTR Corporation's R+P Approach

The R+P program has been implemented through public-private partnerships (PPPs) and transactions. The following describes the approach to the R+P program undertaken by the MTR Corporation.

Procedures of the R+P Program

The R+P program is considered on a line by line basis, considering market conditions, financing gap for the line construction and future operation and government requirements.

The Transport and Housing Bureau issues and updates on a regular basis a railway development strategy, with the practical advice of MTR Corporation, and of the Town Planning Board.

The Chief Executive in the Executive Council of the Hong Kong Special Administrative Region (HKSAR) then requests MTR Corporation to proceed with the preliminary planning and design of the line. This includes negotiations on the detailed scope, cost and implementation program for the line, and the identification of sites

[222] MTR Corporation, *Business Overview 2015*. https://www.mtr.com.hk/archive/corporate/en/publications/images/business_overview_e.pdf

to be reserved for development, subject to rezoning approval. MTR Corporation determines the financing gap for the line, and this gap is reviewed independently.

Once a decision is made to move forward with a specific line and R+P proposal, and once all parties are in agreement, the government of Hong Kong grants MTR Corporation exclusive development rights for specific sites, defining tower locations, permissible uses, and plot-ratio densities (i.e., floor space divided by land area). This includes land above and around new stations and depots transferred at the "before-rail" market price.

The Town Planning Department initially prepares a rough land use pattern associated with the land grant. MTR Corporation then prepares a master layout of the project, including the siting and massing of buildings, block designs, standards for building quality, and locations of vehicle access points. It also obtains necessary statutory planning approvals for the proposed development.

Next, MTR Corporation issues a tender among potential developers and selects a partner based on the attractiveness of competing financial offers, experience, management capabilities, and other factors. Developers are given some flexibility to recommend and negotiate site modifications to the R+P proposals. MTR Corporation uses its development rights to partner with developers (selected from a list of qualified bidders) based on the "after-rail" market price. MTR Corporation does not sell development rights to other private developers, but instead partners with property developers. It remains in full control of the land and sells/leases the completed units.

Financial sustainability approach

As a profit-oriented organization, MTR Corporation needs to ensure that a suitable rate of return can be achieved, prior to undertaking any investment.

Financial viability is estimated based on the 50-year net present value (NPV) for the new construction, discounted with a weighted average cost of capital of MTR plus 1 to 3 percent[223], depending on the risk level.

The government discusses the appropriateness of providing capital grants or property development rights to MTR Corporation based on the expected funding gap[224] of new rail construction (in the case of natural extensions) that could not be recovered through future operating revenues. Such a gap is estimated by MTR Corporation and external assessors. Those assessors include consultants for independent

[223] Cervero and Jin (2008) indicated that MTR Corporation aims to set returns for its investments based on the WACC – the weighted average cost of capital –set at 9.5% (reflecting the expected return in equity and interest from borrowing) plus a rent premium of between 1.5% and 3% for equity shareholders, yielding a 11% to 12.5% return. The WACC fluctuates based on loan rates charged by commercial banks. For riskier projects, the WACC might be set at 10% plus a 3% premium, yielding a 13% net return. MTR Corporation will invest in railway projects if these net rates of return (11% to 13%, depending on risks) are attained. This "WACC + premium" formula is used to guide not only railway investment but also MTRC's own real-estate investment, including shopping malls attached to stations.

[224] When a new rail project with property development rights is financially nonviable, the government considers providing capital grants.

checking, who review the cost and revenue of the proposed rail line, and surveying firms which review property valuation for land development, based on Valuation Standards on Properties published the Hong Kong Institute of Surveyors.[225]

To safeguard the public interest from granting too much land, any excessive capital grant will be reimbursed to the government with interest (claw-back mechanism)[226].

Market-driven approach

In the R+P model, MTR Corporation is the "master planner and designer" to align the interests of multiple stakeholders in different project phases. It prepares a development layout plan, resolves all interfaces with rail stations, takes care of tendering land parcels, acts as a liaison between the government and developers, monitors development quality and the sale or lease of completed properties, and manages properties after completion.

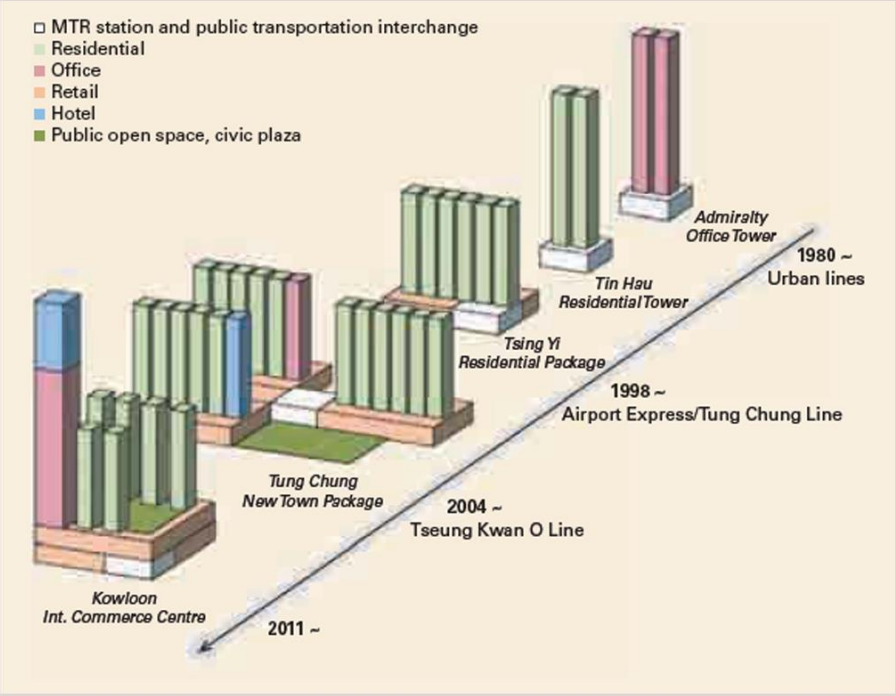
Within MTR Corporation, managers weigh factors like the value of land, density potential, and project size and scale in deciding whether to advance a specific R+P proposal. The assembly of land to be developed around the station is largely determined by market demand, constrained by zoning regulations. Commercial property development has occurred mostly at and near central city MTR stations while residential projects have been built mainly in outlying areas and at terminal stations.

While many properties are high-rise towers above MTR station podiums, the R+P model is not a "cookie-cutter" approach to making the cityscape transit supportive. Indeed, the development parameters of R+P (such as area size, building densities, floor uses, and site designs) vary from place to place, essentially depending on the city's urban planning and market demands. Floor Area Ratios (FARs) of at least 4.0 (as observed in recent MTR Corporation projects) are generally viewed as necessary if R+P is to be financially viable; however, MTR Corporation's actual site coordination remains flexible by covering large R+P sites with the CDA zone.

The design principles of R+P have evolved over the past 35 years (Figure 3). Since the late 1990s, development has integrated transit-oriented development design concepts—high-density, mixed-use, and pedestrian-friendly—in a more physically comprehensive manner than seen in the 1980s.

[225] http://www.hkis.org.hk/en/
[226] HKSAR legislative Council 2009.

Figure 3 Physical Typology and Evolution of Rail Plus Property Practices Since the 1980s



Source: Based on Cervero and Murakami 2009.

Risk management approach

MTR Corporation's approach to property development is based on minimizing direct risks in property development projects, reducing the company's exposure to the real estate market and its related risks. For their part, developers must cover all development costs (such as Government land premiums based on post rail value, construction and enabling work costs, marketing and sales expenses, professional fees, finance charges, and others) and cope with all project risks. MTR Corporation negotiates with developers to derive benefits from the property developments through sharing profits in agreed proportions from the sale or lease of the properties (after deducting development costs), sharing assets in kind, or receiving up-front payments from the developers, taken case by case[227]. The selection of one of those three mechanisms is directly related to the evaluation of market conditions and the considerations regarding the long-term value of a given development. For private developers, the rules of the game are very clear at the outset, which eases uncertainties.

One of the effective mechanisms MTR Corporation has used to both manage risks and address diverse market needs is to engage several developers to each station area (11 to 13 developers in recent cases).

[227] Studies show that R+P approach yields significant price premiums relative to fairly comparable non-R+P housing projects, especially by reaping the accessibility gains through the rail transit, which spur the developers to get involved. In Hong Kong, the best locations for development near stations are usually made available through the R+P program creating an incentive for developers to pay a premium.

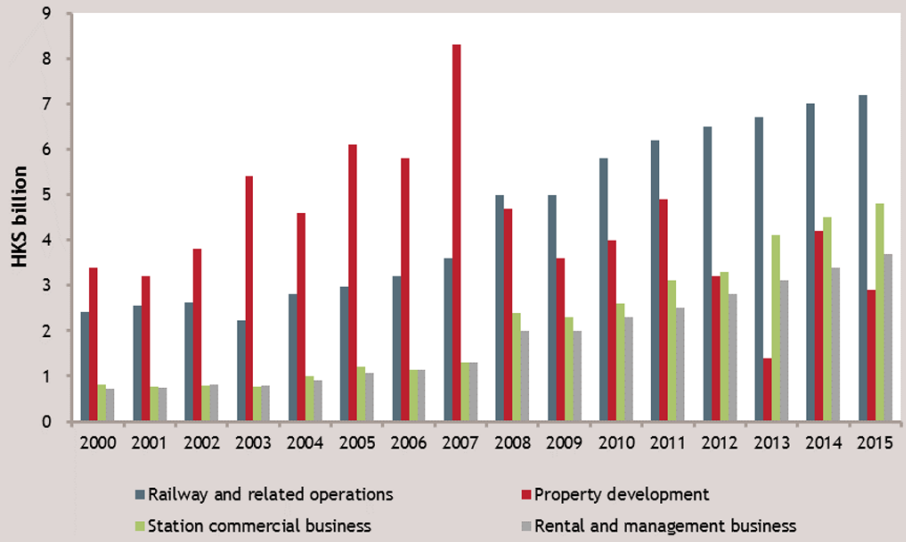
4 Results

The R+P approach has yielded financial and ridership benefits for MTR, as well as contributed to sustainable community development.

Financial impact

Profits from property development and related business of MTR Corporation, including HK station commercial business and HK property rental and management business, have accounted for more than 50 percent of MTRC's total profit between 2000 and 2015[228]. Profits from rail operations have also seen a fast increase due to expanding the rail network with funding support from property development and ridership increases brought by community development around the stations. The profit contributions for MTR Corporation are shown in Figure 4.

Figure 4 Profit Contributions of MTR Corporation

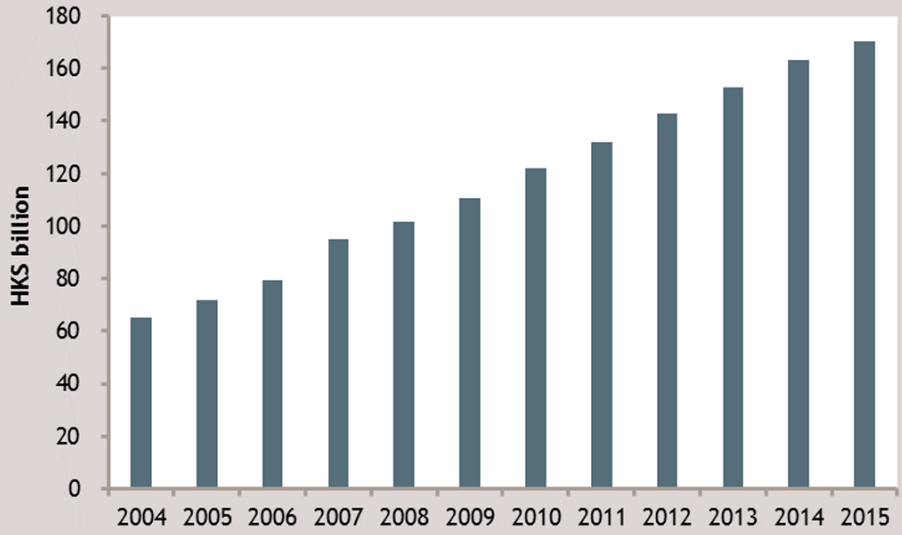


Note: The figure excludes project studies and business development expenses.
Source: MTR Corporation Annual Reports

The accumulated earnings and value brought by R+P model have increased MTR Corporation's return for shareholders, and the balance sheet value of equity attributable to shareholders has been steadily increased during the last decade (2004-2015) (Figure 5).

[228] We summarized the financial data about profit contributions from 2000 when MTR Corporation got partially privatized on Hong Kong Stock Exchange.

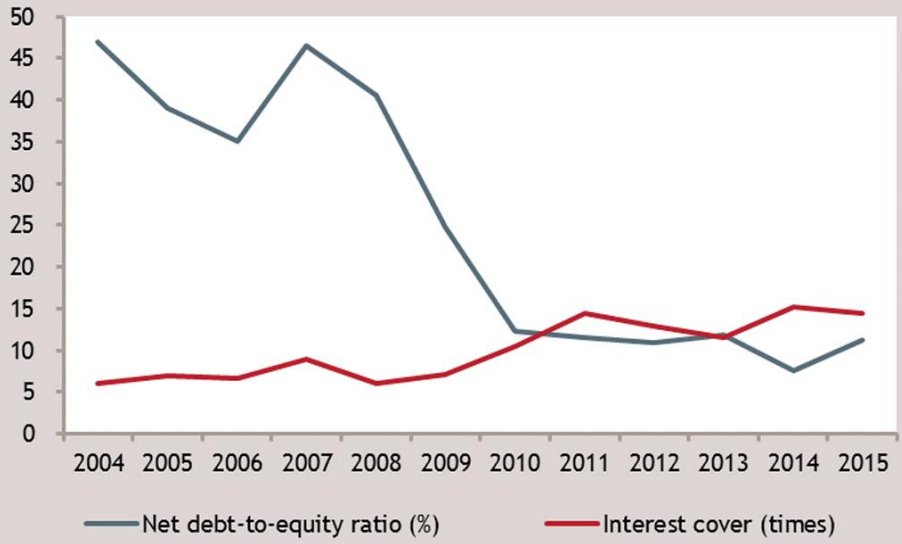
Figure 5 Total Equity Attributable to Equity Shareholders of MTR Corporation



Source: MTR Corporation Annual Reports

In addition, the corporation's debt servicing capability has also been improved with reduced debt ratio (Figure 6) over the same period.

Figure 6 MTR Corporation Debt Servicing Capacity



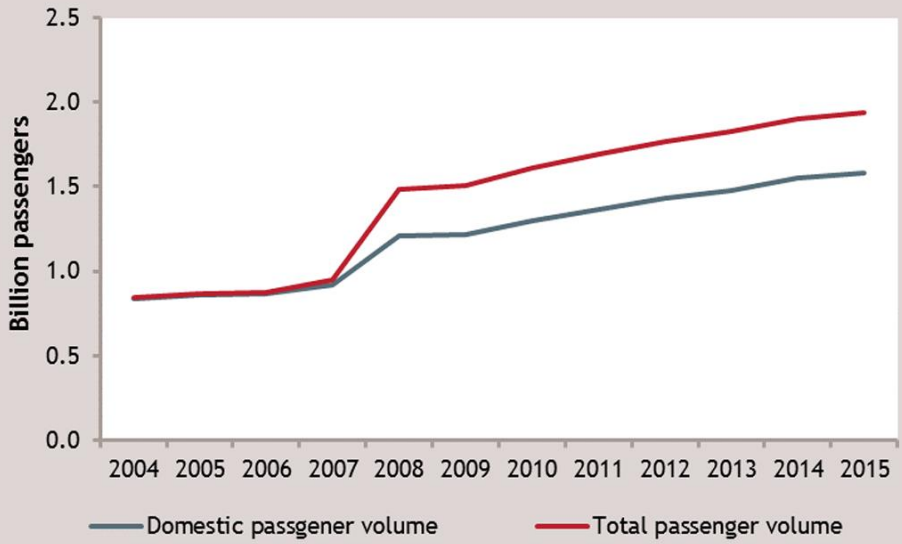
Source: MTR Corporation Annual Reports

Increased ridership

MTR Corporation has also seen higher passenger volume as a result of the high-quality communities developed around the stations through the R+P program. Growth of the total passenger number for the last decade (2004-2015) is shown in Figure 7.[229]

[229] The sharp increase of passenger number in 2008 is due to the rail merger in December 2007.

Figure 7 MTR Total Passenger Number



Source: MTR Corporation Annual Reports

Stakeholder impacts

The Government of Hong Kong: The R+P model enabled the government of Hong Kong to build a modern railway network with limited cash subsidy. Besides, the financial benefits of R+P Program are distributed to the government through dividends and appreciation of the value of its shareholding. From 1980 to 2005, the government received an estimated HK$140 billion (US$ 18 billion) in net financial returns (nominal value). This is based on the difference between earned income (HK$171.8 billion, or about US$22 billion, from land premiums, market capitalization, shareholder cash dividends, and initial public offer proceeds) and the value of injected equity capital (HK$32.2 billion, or US$4.2 billion).

Local communities: MTR Corporation also contributes to sustainable urban development and economic development by providing efficient transit services with affordable fares, high quality modern property development and quality retail business and facilities close to the housing area.

5 Conclusion

The R+P program applied by the MTR Corporation in Hong Kong has been central to the success of Hong Kong in developing its rail system. The R+P program enabled MTR Corporation to capture real estate income to finance part of the capital and running costs of new railway lines, and to increase transit patronage by facilitating the creation of high-quality, dense and walkable catchment areas around stations.

The following three key concepts applied in the R+P program are essential to the program success and can be adopted by other railways taking the transit-oriented development mechanisms to help finance new rail lines:

- Financial sustainability approach: The value for a rail company to only undertake those rail investments that can achieve a targeted rate of return (after factoring government support, in the form of land rights provided at before-rail price, used in a R+P program, or cash subsidies) to be financially sustainable.

- Market-driven approach: The need to plan development along each rail line comprehensively, with multiple stakeholders and partners, and to define the scale and timing of such developments based on market demand, location characteristics and institutional capacity.

- Risk management approach: The value for a railway company to bring in relevant expertise and transfer a large part of commercial risks to private developers through PPPs and transactions with external partnerships.

References

Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

MTR Corporation. *Business Overview 2015*. https://www.mtr.com.hk/archive/corporate/en/publications/images/business_overview_e.pdf

MTR Corporation. *Annual Reports* (for the period of 2001 to 2015).

Rand, C., and Murakami, J. (2008). *Rail + Property Development: A Model of Sustainable Transit Finance and Urbanism*. UC Berkeley Center for Future Urban Transport. http://www.its.berkeley.edu/publications/UCB/2008/VWP/UCB-ITS-VWP-2008-5.pdf

Suzuki, H., Murakami, J., Hong, Y., and Tamayose, B. (2015). *Financing Transit-Oriented Development with Land Values*. Washington DC: World Bank Group.

Case Study
Indian Railways

1 Railway Sector Structure

1.1 Railway Industry Organization

The Ministry of Railways (MOR) oversees the Indian railway sector through the Indian Railway Board, MOR (IRB). The MOR (IRB) exercises all central government policy powers and administers, supervises, and directs the entities that provide most of the rail services in India. The MOR (IRB) also fulfils most industry regulatory roles, except for safety oversight and railway rate appeals.

Indian Railways (IR) is the generic term used to refer to the network of railway infrastructure and services that are delivered by 16 geographically-based Zonal Railway Authorities (ZRs). Each ZR has separate responsibilities and operates its own livery. However, the MOR (IRB) is fully responsible for establishing, merging, or abolishing these ZRs and for ZR governance. The MOR (IRB) appoints ZR general managers, oversees their compliance with MOR (IRB) policies, determines staffing and remuneration policies, allocates rolling stock, fixes tariffs, approves ZR operating and capital budgets, approves certain capital expenditures above specified limits, and reallocates cash deficits or surpluses of each ZR to maintain financial balance.

Production units directly under the MOR (IRB) manufacture rolling stock. This is supplied to the ZRs, which are responsible for maintenance. The ZRs operate all trains within their territorial jurisdiction, including inter-Zonal trains under a system for apportioning revenue, usually collected at the originating station.

India's railways are now governed by the 1989 Railways Act (as amended), which replaced the old Indian Railways Act of 1890, under which Government was envisaged primarily as coordinator and regulator. The railway was nationalized in 1951, and virtually the entire rail system became part of the Government of India. The 1989 Railways Act authorized government and non-government railways. Now, a few separate special-purpose railways exist as joint ventures between the MOR and other entities such as the Kutch Railway Company Ltd. and the Konkan Railway Corporation Ltd. However, the ZRs still carry over 99 percent of railway traffic. The statistics throughout this case study relate to IR's own network and operations.

During the 1990s, perceived failures in operational performance and a deteriorating financial situation prompted Government to appoint an independent expert group to examine IR's situation and make recommendations. The 2001 so-called Mohan Report, named for the expert group's chairman, criticized railway sector governance, corporate governance, and the IR business model.

Subsequent actions by the MOR (IRB) improved business substantially (see Section 2), but many of the criticisms identified in the Mohan Report are yet to be fully addressed. Subsequently, similar reports have been commissioned to study IR. The 2012 Report of the Expert Group for Modernization of Indian Railways presented strategies for improvement under the fundamental themes of safety and growth. More recently, the 2015 so-called Debroy Committee report, again named after the expert group's chairman, was commissioned by the current MOR. The report identifies mechanisms to better mobilize resources for railway projects through new methods of financing and improvements to current resource utilization. It offers further suggestions on how to restructure the MOR and IRB.

1.2 Rail Sector Strategy

In December 2009, the MOR (IRB) published Indian Railways, Vision 2020, a sector strategy that embraces rapid growth and abandons the earlier idea of incremental change. The objective, which remains relevant today, was to reverse the erosion of rail freight modal share, improve the quality of passenger services, and embark on the construction of dedicated freight corridors (DFCs) and high-speed passenger routes.

IR has recently been the subject of a number of high-level strategic reviews. Each of these reviews looks in depth at various aspects and areas for improvement within IR, but as the following box demonstrates, the same overarching recommendations are echoed in each report.

Box 1 Strategic Reviews of IR

Report of the Expert Group for Modernization of Indian Railways, 2012

Under the themes of safety and growth, the Expert Group gives recommendations for IR under a five-pronged strategy:

- Modernize core assets such as tracks and bridges, signaling, rolling stock, and stations and terminals
- Explore new revenue models including public-private partnerships (PPPs), land utilization, DFCs, and high-speed passenger services
- Review project implementation process for financial viability, social benefits, and timeliness
- Focus on key enablers, namely information and communications technology (ICT), indigenous development and safety
- Mobilize resources, including new strategies for funding, strengthened human resources (HR) and business-oriented organizational structures

National Transport Development Policy Committee (NTDPC): Moving India to 2032, published in 2013

In order to address what is seen as a lack of a comprehensive growth strategy, NTDPC suggested, among others, necessary shifts for IR:

- Develop passenger, and freight and parcel business plans to fully satisfy passenger demand in the market, target 50percent freight market share by 2032, and shift long-distance parcel transport to rail

- Focus investment strategy on program objectives to increase speeds with high speed passenger projects and meet the 50 percent freight market share target through the development of priority DFCs
- Target better project execution, including the assurance of adequate funding for projects, more accountability on the management of project completion deadlines, and the creation of a partially independent authority to oversee construction projects
- Revamp research and development to focus on ICT upgrades and implementation
- Rationalize HR to align with the proposed reform goals

Debroy Commission Report, 2015
The Commission developed recommendations around the need for three major reforms within IR:

- Embrace commercial accounting practices
- Forego the 'departmentalized' structure of IR in favor of business-oriented HR strategies
- Establish an independent regulator to promote competition and protect stakeholders

The general consensus of the reviews and initiatives to improve IR favors enhancing the 'effectiveness and accountability' of IR through 'necessary reforms at all levels', particularly internal corporatization and commercialization of activities, but rejects the option of railway privatization. PPP structures are slated for a larger role in the industry—in station development, rolling stock manufacturing, logistics hubs, fiber-optic networks using railway right-of-way, and major new infrastructure projects such as high-speed rail lines and DFCs.

More recently, while presenting the 2015-2016 Railway Budget, the Minister of Railways, Suresh Prabhakar Prabhu, outlined a multifaceted 'Transformation Strategy' for India's railways. The key elements of the strategy can be seen as a bottom-up strategy targeting four main focus areas (see Figure 1 below), setting forth similar objectives to those outlined above:

- Marketing and customers
- Business management
- Network investment
- Structural change

Figure 1 Summary of Indian Railways Transformation Strategy

Focus Area	Themes	Initiatives
Markets and Customers	Passenger Markets	• Increase train speeds on semi-high speed corridors • Improve comfort and amenity on trains and stations • Increase passenger security and facilities for vulnerable groups • Implement new 'customer care' and feedback measures
	Freight Markets	• Increase rail freight haulage capacity through DFC lines • Use transit capacity of DFC lines to improve freight service • Target new, higher-value freight and logistics markets • Appoint specific 'key customer' managers for major rail users • Begin market-based tariff differentiation and explore contract concept
	Railway Safety	• Install Train Collision Avoidance System on all high density corridors • Phase-out all un-staffed level crossings
Business Management	Revenue Enhancement	• Exploit IR real estate holdings through lease or development • Cause IR manufacturing and service enterprises to seek non-rail customers • Create utilization plan for core-network capacity freed by DFC lines
	Cost Management	• Modernize procurement and consumption of goods, works and services • Target energy cost savings through demand and supply measures • Adopt modern financial and management accounting methods
System Investment	Investment Programs	• Scale-up investment in the railway network • Accelerate electrification and broad-gauge connectivity • Accelerate construction of ongoing DFC lines and start planning for new DFC lines • Create partnerships with States to develop suburban rail services • Progress the first High Speed Line and investigate others
	Program Delivery	• Decentralize and speed-up the project approvals process • Adopt EPC and other fixed price forms of construction contract • Change performance measure from construction to commissioning
	Financing	• Identify and deploy new long-term sources of investment capital • Encourage much greater private sector participation in qualifying projects • Create JV companies with States to finance/develop qualifying projects
Institutions and Governance	Public Policy and Regulation	• Create independent Rail Development Authority (RDA) to regulate railways • Create a Rail Planning and Investment Organization (RPIO) to direct investment and long-term sector plans
	IR Organization and Management	• Consolidate IRB financial divisions into more business-oriented lines • Implement change through mission teams rather than IRB branch structures • Empower Zonal Managers to increase responsibility/accountability • Create new R&D organization and streamline RDSO technical approvals
	Manufacturing Enterprises	• Explore transfer from IRB to a new Holding Company • Private participation in locomotive manufacture

Significant progress has been made in India's rail sector although many of the initiatives outlined in the strategy have yet to be implemented and are still in the conceptual or planning stages.

In late 2016, the MOR (IRB) held a Railway *Vikas Shivir* (Visioning Workshop) with approximately 600 MOR and IR managers to discuss the strategic vision of IR. The presentations and discussions centered on six identified challenges:

- Repositioning the railways to be a driver for growth in the economy
- Finding financial sustainability
- Regaining market share in freight
- Offering client-oriented services
- Expanding network capacity to meet future demand

- Modernizing the railway to ensure safety

The workshop detailed necessary actions under eight concrete themes made up of a series of 'big shifts' (Figure 2). A Dedicated Transformation Office has been established within IRB to drive implementation of the program and Mission Heads have been appointed to manage the strategic shifts under each theme. Over 800 strategies in line with the themes are set to be implemented at the zonal level.

Figure 2 Themes and "Big Shifts" from the Recent Visioning Workshop

Passenger Experience	1. Alter service contracts 2. Create a measure for passenger experience 3. Introduce user fee for station modernization 4. Implement access control (10 pilot stations) 5. Introduce in a phased manner only sealed, temperature controlled/air cooled coaches
Freight	1. Implement and track freight train timetable 2. Set up Railway Planning and Investment Organization 3. Redefine the pricing policy 4. Amend the policy framework to enable terminal expansion 5. Install special purpose rolling stock for select commodities
3x Infrastructure	1. Implementation of throughput quick wins 2. Implementation of throughput strategic measures 3. Fast-tracking infrastructure development projects from 7 to 14 km completion per day 4. Upgradation of goods terminals/sheds
Non-Fare Revenues	1. Prioritize 30 most profitable land parcels and modernize them 2. Hive off a separate business unit to handle parcel business 3. RDN rollout in 400 stations 4. Develop policy framework and organizational interventions
Near-Zero Fatalities	1. Roll out standardized training module for railway staff 2. Create specialized investigation task force 3. Implement low-cost trespassing solutions 4. Revise and implement existing system of penalties 5. Allocate additional funds for safety works
Technology	1. Ultra high speed wireless corridor along IR's network 2. Pan-IR Enterprise Resource Planning (ERP) 3. Heavy haul and high speed trains 4. Next generation customized rolling stock 5. Network of display technologies to enhance passenger experience
Cost	1. Reduce fuel cost by 20% by accelerating electrification and strategic procurement of diesel 2. Improve organizational effectiveness and productivity by 15% 3. Enhance asset reliability and performance by optimizing repair and maintenance procedures
Culture	1. Redesign performance management system 2. Implement cross-departmental exposure program 3. Set up a platform for innovations to be captured, rewarded and shared 4. Organize customer centricity training across levels

Source: "Strategic Shifts" PowerPoint presentation at Railway Vikas Shivir (Vi-sioning Workshop), dated November 20, 2016

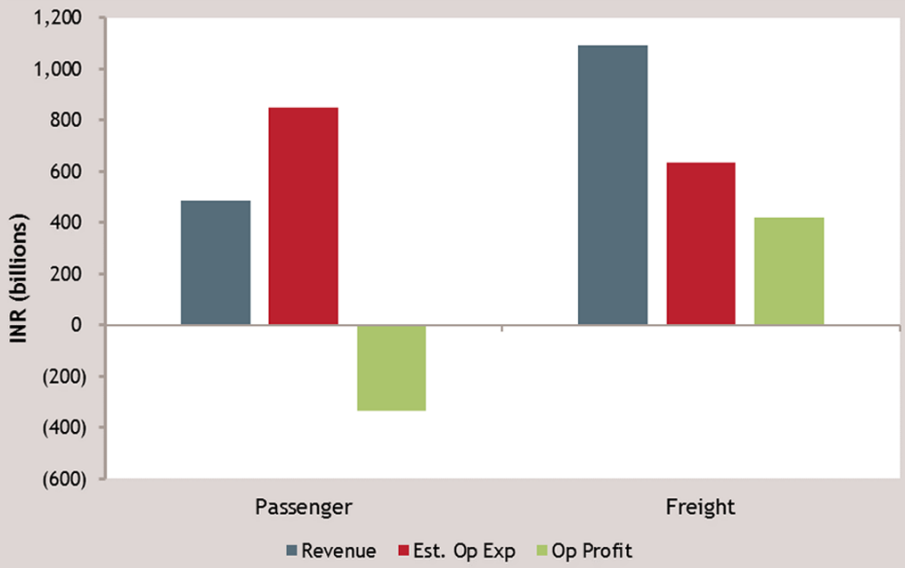
1.3 Purchase of Transport Services

No policy or system of explicit payments exists for loss-making passenger Public Service Obligations (PSOs) in IR, but substantial internal cross-subsidy takes place for train operations within the passenger sector, as it does between individual ZRs. Also, most of the aggregate burden of infrastructure costs falls on freight customers. Therefore, the MOR (IRB) has accepted internal cross-subsidy of passenger services and an implicit tax on freight, rather than direct subsidy, to fund passenger service obligations.

Historically, railway revenues covered railway operating costs and contributed about a third of capital investment. However, as of late, IR is facing difficulties balancing the budget. Passenger losses are placing an increasingly high burden on

freight (Figure 3). Freight services in turn must compensate with high tariffs, reducing its competitiveness.

Figure 3 Cross-subsidization of Passenger Services (2015/16 estimates)



Source: Indian Railways Annual Report & Accounts and Indian Railways Annual Statistical Report, Schedule 15.

1.4 Industry Regulation

The MOR (IRB) is responsible for most aspects of railway economic regulation, but the Research Design and Standards Organization (RDSO), which has legal status equal to ZRs, supplies technical advice to the MOR (IRB), and the operating ZRs and their production units, on railway infrastructure and equipment design, technology, materials, product standards, testing, and so forth.

The office of the Chief Commissioner of Railway Safety (CCRS) is responsible for all safety-related aspects of IR operations and is assisted by Commissioners of Railway Safety (CRSs). To maintain independence from IR, the CCRS is under the Ministry of Civil Aviation, not the MOR. The CRS certifies permanent way and rolling stock, conducts routine inspections of IR facilities and equipment, and investigates serious railway accidents.

Government is legally responsible for passenger and freight tariffs, which are set by the MOR (IRB). The 1989 Railway Law is silent on pricing principles or objectives, and frequently tariff structures and levels are subject to wider political influences. However, an independent Railway Rates Tribunal, comprising a senior judge and two members, can examine complaints regarding freight tariffs, ancillary charges, or preferential treatment given to specific customers or commodities.

The recent Transformation Strategy does not propose to remodel the structure of the MOR (IRB) and the ZRs, but instead recommends the creation of new regulatory body, the Rail Development Authority (RDA) and to strengthen IR's planning processes and coordination of investment through creation of the Rail Planning

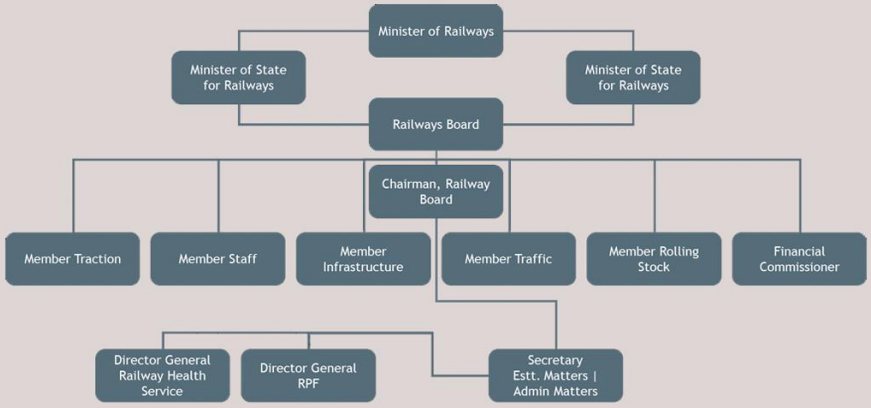
and Investment Organisation (RPIO) and the Special Unit for Transportation Research & Analysis (SUTRA).

The RDA, approved by the Government on April 5, 2017, may be the most fundamentally transformational aspect of the new plan. The RDA will be an independent body, funded through the annual railway budget.[230] The RDA's responsibilities will include: tariff setting, with the goal to reduce cross-subsidies of freight to passenger services; ensuring a competitive and fair environment for private investment; establishing and monitoring performance standards; and collecting and disseminating data and statistics pertaining to the rail sector.

1.5 Ministerial Apparatus

The MOR (IRB) organigram and IRB Directorates are presented in Figure 4.

Figure 4 Ministry of Railways Organigram and Directorates (Indian Rail Board)



Accounts	Civil Engineering	Coaching	Computerization & Information Systems
Corporate Co-ordination	Economics	Efficiency & Research	Electrical Engineering
Establishment	Finance	Finance (Budget)	Finance (Expenditure)
Health	Infrastructure	Land & Amenities	Legal
LRDSS	Management Services	Mechanical Eng.	Mechanical Eng. (PU&W)
Official Language	Pay Commission	Planning	Projects
Public Relation	Environment Management	Railway Sports Promotion Board	Safety
Secretary Branches	Security	Signal	Statistics & Economics
Stores	Telecommunication	Track	Traffic Commercial
Traffic Transportation	Tourism & Catering	Vigilance	Works
Works Planning	IRCA	High Power Committee	Secret Ballot Election Committee
High Level Committee for Railway Restructuring	Accounting Reforms	Passenger Amenities Committee	

Source: Ministry of Railways (Railway Board) website: http://www.indianrailways.gov.in/railwayboard/

[230] RDA will be made functional by executive order.

2 Indian Railways

2.1 Governance and Organization of Railways

The MOR (IRB) has formal responsibility for governance of the 16 ZRs, which therefore have no separate or independent Boards of Directors, but are subject to independent oversight from the CCRS on safety matters. Employees of IR are public servants or are deemed public servants.

The 16 ZRs have general managers reporting to the MOR, and typically, each ZR headquarters has around 15 function-based departments—accounts, administration, commercial, conversion, electrical, engineering,[231] IT, mechanical, medical, operating, personnel, press, signaling and telecommunications, safety, security, stores, and vigilance. Department Heads report directly to General Managers and have a functional reporting line to the appropriate functional MOR (IRB) Board Members.

The 16 ZRs are sub-divided into 67 divisions, each with divisional headquarters. The divisions can include workshop and construction divisions, but most are operating divisions that comprise the primary production units of IR; each has its own functional management structure mirroring the organization of ZR headquarters. Accounts maintained by each division (operating division or workshop) are consolidated at the ZR level, and further consolidated at the MOR (IRB), including accounts of production units and other activity units directly under the MOR (IRB).

Since the 1989 Railway Law was introduced, the traditional organization and governance of IR has remained unchanged. Nevertheless, the MOR (IRB) policies have established corporatized entities to manage selected railway business segments outside the full bureaucratic and public service framework of ZRs. These entities include the following organizations, among others:

- IRCON International Ltd - a transport infrastructure construction company (formerly Indian Railway Construction Company)
- Container Corporation of India Ltd (CONCOR) - operates a network of about 60 container terminals, offering rail and road container services between the hinterland and ports, and between major metropolitan areas (but IR retains responsibility for providing locomotives, train crews and train dispatching)
- Indian Railways Finance Corporation (IRFC) - a dedicated financing arm of the MOR
- Rail Vikas Nigam Limited (RVNL) - created to develop projects, mobilize financial resources, and implement projects to strengthen so-called golden quadrilateral lines (the four main long-distance transport corridors in India) and connections to ports
- Rail Land Development Authority (RLDA) - statutory authority for generating revenue by developing vacant railway land for commercial use

[231] The engineering department is responsible for track and other civil works.

- Dedicated Freight Corridors Corporation of India Ltd (DFCCIL) - established to procure and operate selected new DFCs, now wholly owned by MOR (IRB)
- RITES - a domestic and international railway and transport consulting company

2.2 Network

IR's network is just over 66,000 route-kms (Figure 5).[232] The network has been progressively duplicated and electrified. Since 1990, upwards of 25,000 route-kms have been standardized to the broad gauge (1,676 mm).

Figure 5 Indian Railways Network Characteristics 1990/91-2015/16

	1990/91	1995/96	2000/01	2005/06	2010/11	2015/16
Route-kms	62,367	62,915	63,028	63,332	64,460	66,687
Track-kms (running line)	78,607	80441	81,865	84,370	87,114	92,081
Track-kms (total)	108,858	108,336	108,706	109,808	114,037	119,630
Route-kms with multiple track	14,331	15,156	16,010	16,896	19,223	21,237
Electrified route-kms	9,968	12,306	14,856	17,907	19,607	23,555
Broad gauge route-kms	34,880	40,620	44,776	48,574	55,188	60,510

Source: Indian Railways Statistical Data

IR is investing heavily in its infrastructure. Capital expenditure in 2015-2016 was estimated at 940 billion INR (14.7 billion USD[233]) with the commissioning of 2,500 km of new broad gauge rail during the year[234]. This investment is 95 percent higher than the cumulative investment made in the five previous years, and a further 1,210 billion INR (18.1 billion USD) is planned for 2016-2017, which will result in 2,800 km more of new broad gauge rail[235]. The plan also targets the electrification of more than 10,000 km of the network from 2015 to 2019. For the first time, the availability of funds are assured to help completion targets.

2.3 Railway Transport Markets

In terms of total traffic volume, IR is the world's second largest passenger railway and fourth largest freight railway after the U.S.A., China, and Russia. India's large and rapidly expanding population provided steady but relatively slow growth in railway passenger traffic during the last decades of the twentieth century as other modes gained market share. During the last decade, accelerated economic development increased purchasing power and, in combination with politically imposed low fares, boosted railway passenger traffic growth by nearly 100 percent.

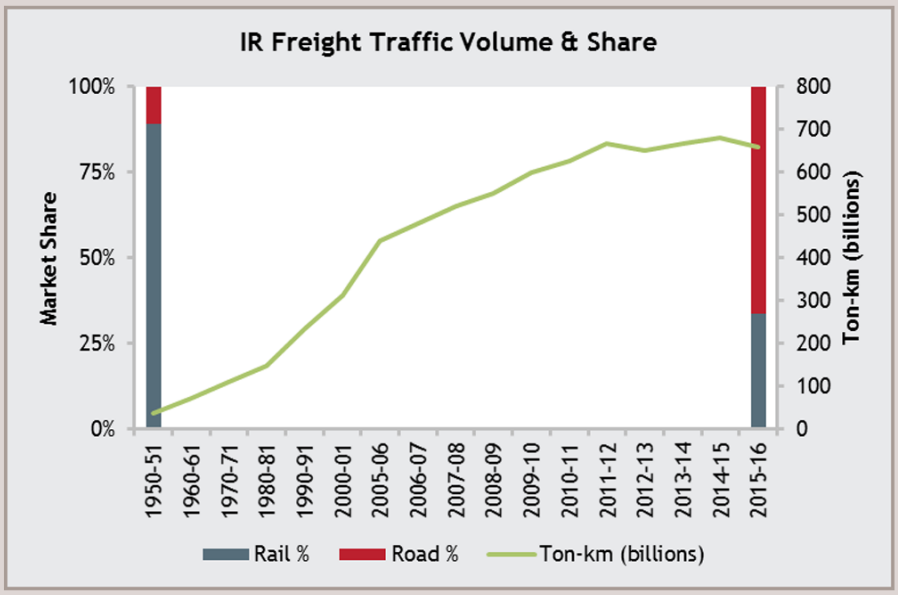
India has a mix of passenger services. Over the last 30 years, as cities have expanded, suburban passenger journey length has increased from an average of

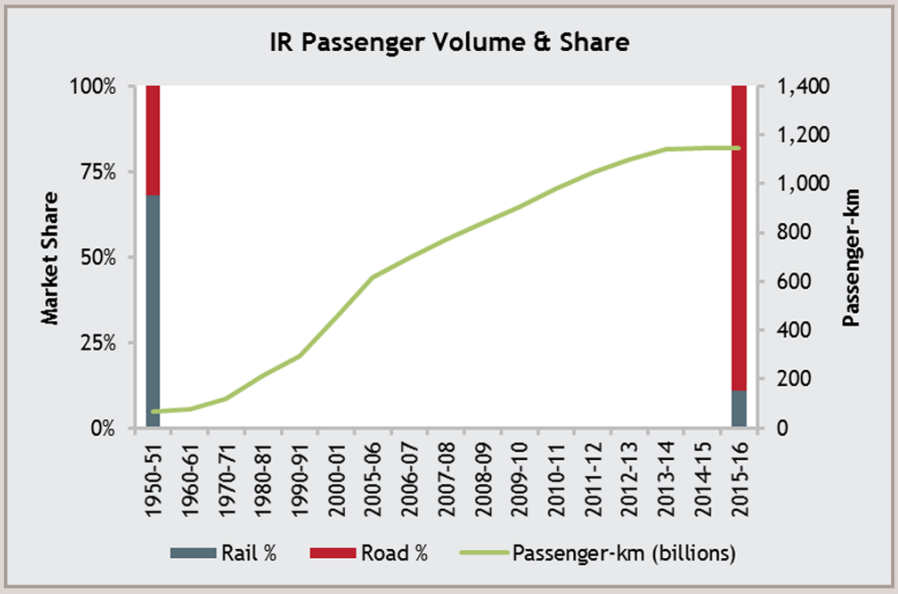
[232] In March 2015, IR had 66,030 route-km of which 58,825 were broad gauge (1,676mm), 4,907 km meter gauge (1000 mm) and 2,297 narrow gauge (762 and 610 mm). Broad gauge generated 99.9 percent of freight output (ntkm) and 98.7 percent of passenger output (pkm).
[233] 1 USD = 64.1 INR (2015), Global Economic Monitor (GEM), World Bank
[234] Between 2009 and 2014, 1,520 km of new broad gauge rail was commissioned.
[235] Indian Railways Presentation, "Transformation Underway"

about 20 kms/trip to 34 kms/trip, and average journey lengths for inter-city services increased from about 87 kms/trip to 268 kms/trip. In terms of modal share, IR is estimated to carry about 15 percent of non-urban passenger traffic.

Historically, IR's passenger transport services could be categorized as poor to middling quality, suffering from long ticketing queues, slow travel times, and limited journey comfort and amenities. However, a series of investments in faster lines and customer-services initiatives have resulted in continual improvement and customer satisfaction.

Figure 6 Indian Railways Passenger and Freight Volumes and Shares 1950/51-2015/16





Source: Indian Railways Yearbook & NTDPC, India Transport Report

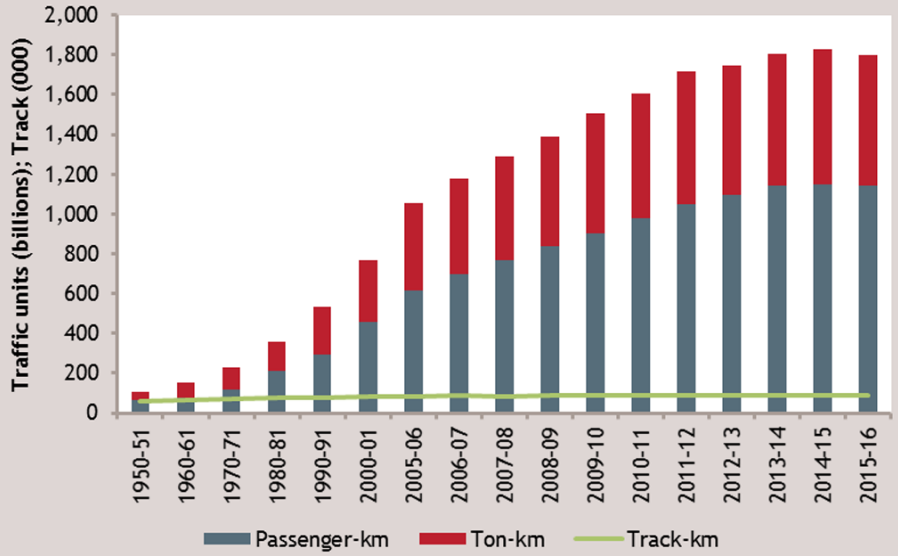
At the present phase of development, India's economy generates large volumes of freight types that are well-suited to railway transport and carried for relatively long distances. In 2015, coal comprised an estimated 45 percent of rail freight ton-km,

followed by grain, 10.1 percent, cement, 8.9 percent, and iron ore, 5.5 percent. Rapidly growing container traffic now constitutes 13 percent of traffic task. The average freight haulage length is 620 kms, and IR carries an estimated one-third of national inland freight task.

Despite what appears as significant absolute growth in passenger volumes and a freight market that is on the surface conducive of rail transport, IR's market share since the 1950s has been severely eroded by a shift to road transport (Figure 6). While rail market shares of the 1950s are unlikely to be achieved, considerable potential exists to increase Indian Railways market share of freight.

One of the major challenges for the freight rail market has been insufficient capacity for freight trains. Nearly two-thirds of the IR network is allocated to passenger trains, and freight trains are dispatched with no timetable and with the lowest operational priority. In addition, the fact is that investment in expansion of the rail network has not kept up with the immense growth of the Indian economy. The issue of insufficient capacity, combined with IR being slow in improving its service offerings, led to stagnated growth in both passenger and freight traffic. (Figure 7).

Figure 7 Indian Railways Freight and Passenger Track and Traffic Growth 1950/51-2015/16



Source: Indian Railways Yearbook

A series of programs aim to address the above challenges, most notably improvements to passenger speeds and new DFCs. 'Mission Raftaar', a semi high-speed corridor program, targets an increase of average speed by 25 km/h along key passenger links over the next five years. The Delhi-Agra link (which pre-dates Raftaar) is already operational, known as the Gatiman Express. Additionally, a special purpose company, High Speed Rail Corporation of India Ltd. (HSRC), has been established with the Government of Japan to plan and implement a 350 km/h dedicated passenger line from Mumbai to Ahmedabad.

The MOR has also modernized on-board passenger comfort and amenities, including on-line ticket purchasing; free WiFi at major terminals; setting targets for

cleanliness standards along with independent monitoring of compliance; station beautification investment; and the installation of bio-toilets in trains, among others. One of the most recognized and lauded initiatives has been the implementation of real-time customer care and feedback. The MOR has introduced the use of social media platforms to allow customers to receive quick and publicly visible feedback from the Ministry. CCTV surveillance has also been installed in all major stations, and the MOR has introduced a national telephone helpline.

The commissioning of DFCs is intended to increase freight capacity along the targeted corridors by three-fold. The Western Corridor (Delhi-Mumbai) is 1,499 km long and is in the early stages of implementation; the Eastern Corridor is 1,839 km (Ludhiana to Kolkata) and is due to open in 2019. The lines will be built with a maximum speed of 100 km/h, will carry 6,000 or 12,000 gross tons at 25 axles load, and have the ability to migrate to 32.5 tons axle load in the future. Perhaps most importantly, the DFC will operate on timetables and will not need to cede priority to passenger trains. The strategy will also review the tariff policy, with the intention of creating a more competitive rate structure, including the principle of rate differentiation by route in order to drive up traffic on less utilized routes. Finally, it is anticipated that, by creating a faster, reliable, and more competitive offer, the DFC program will attract underrepresented market players onto the rail network.

2.4 Transport Operations

Trends in operational indices are summarized in Figure 8; most resource utilization indicators show significant improvement. Over the last two decades, passenger train speeds have increased by 27 percent, and passenger loadings per railcar by 88 percent. Freight train weight has increased by 61 percent, and output per freight locomotive has increased by about one-third.

Figure 8 Indian Railways Operating Indicators 1990/91-2015/16

	1990/91	2000/01	2005/06	2010/11	2015/16*
Percentage of traction task (freight)					
Steam	1	0	0	0	0
Diesel	58	40	39	36	35
Electric	41	60	61	64	65
Average commercial speed (km/h)					
Passenger, EMU broad gauge	34		41	44	
Freight, broad gauge	22	24	23	26	24
Average weight of freight train, broad gauge (gross tonnes)	2,122	2,533	2,949	3,063	2,955
Passenger-kms/coach/year (000)	7,677	10,714	12,386	16,408	16,273
Ntkm/bogie wagon/year (000)	701	1,420	2,124	2,724	2,609
Average freight haul (kms)	709	644	657	674	620
Average wagon turnaround (days)	11.5	7.5	6.1	5.0	5.0
Traffic Density					
Passenger (million pkm/route-km)	4.7	7.3	9.7	15.2	17.1
Freight (million ntkm/route-km)	3.9	5.0	7.0	9.7	9.8
Labour productivity (000 traffic units/staff)	326	500	749	1,205	1,351

* In select instances, data is taken from the 2009-10 fiscal years when corresponding data was not available
Source: Indian Railways Statistics

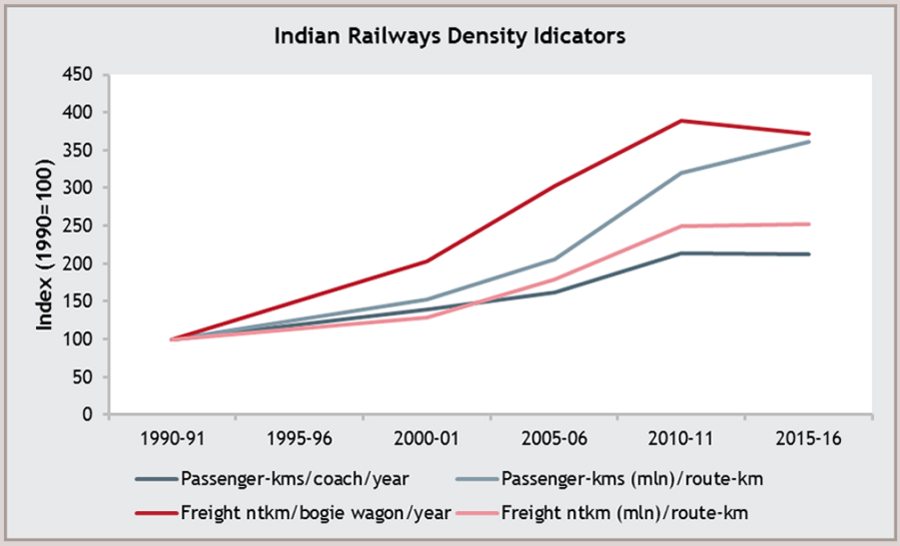
In 2001, the Mohan Report criticized IR's transport operations, citing an outdated business structure, inefficiency and low productivity, low-quality overpriced rail freight services, lack of customer focus in freight and passenger services, and a serious infrastructure maintenance and renewal backlog. At that time, the IR system was run down and floundering under huge arrears of renewals and replacements,

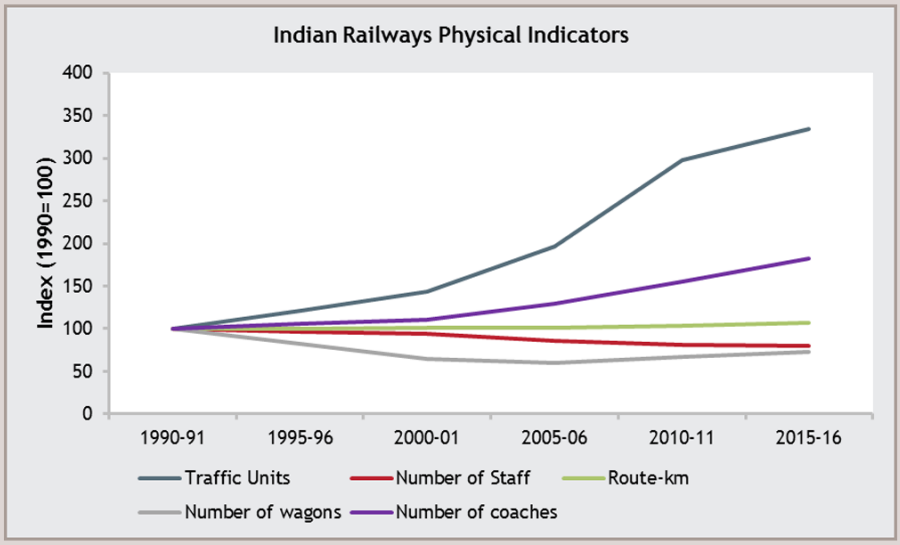
high asset failure rates, and a poor and deteriorating financial operating ratio. Although more recent reports highlight ongoing issues that IR continues to face, many improvements were indeed made. In less than a decade, IR eliminated maintenance deferrals, paid back Government for deferred dividends, replenished its depreciation reserves, and earned record surpluses.

In 2007, the World Bank commissioned independent research on this remarkable turnaround. The study found that some accounting changes had improved the operating ratio, but even allowing for that, IR had improved its real commercial performance and financial results substantially, based on the following:

- Traffic growth. IR enjoyed a period of increasing volumes; most incremental railway traffic can be carried at a marginal cost much lower than average cost, thus improving financial performance (Figures 7 and 9).
- Tariff increases. Gains due to higher volumes and lower average costs were magnified by real increases in freight rates during the early- to mid-2000s, implemented as part of a revised and simplified tariff system.
- Labor productivity. Beginning in 2001, labor productivity accelerated and, by mid-2000, had almost doubled, reflecting traffic growth and a policy of labor force downsizing.
- Revenue density of freight trains. IR increased the permissible axle-loading for major commodities such as coal and iron-ore and charged accordingly, thereby capturing revenue from some existing customers who were already (contrary to regulation) overloading, and attracting real extra volume and revenue from customers who had not previously loaded beyond nominal limits (Figure 9).
- Revenue density of passenger trains. Responding to a growing market, IR increased train length, seating capacity, and occupancy, and optimized train consists and coach layouts. Ancillary passenger income was increased and losses were reduced on catering and parcels services (Figure 9).
- Wagon utilization. IR significantly improved rolling stock utilization by increasing wagon velocity through infrastructure improvements and management. These improvements encouraged customers to consign full rakes of wagons, to avoid hoarding wagons, and to strive for quick turnaround—at the same time, IR rationalized train examination procedures, reduced in-service delays, and improved wagon tracking and management.
- Public Infrastructure Investment. After Government established a dedicated Railway Safety Fund to improve rail infrastructure, IR renewed and upgraded substantial portions of the main line with heavier rail, improved bridges, new signaling, and upgraded information systems. This laid the foundation for raising axle loading and line capacity, and improving equipment utilization.

Figure 9 Indian Railways Indicators 1990/91-2015/16





Source: Indian Railways Statistics

Many of the trends have continued to show positive results beyond the year of the initial research, and can therefore still be attributed to IRs overall success.

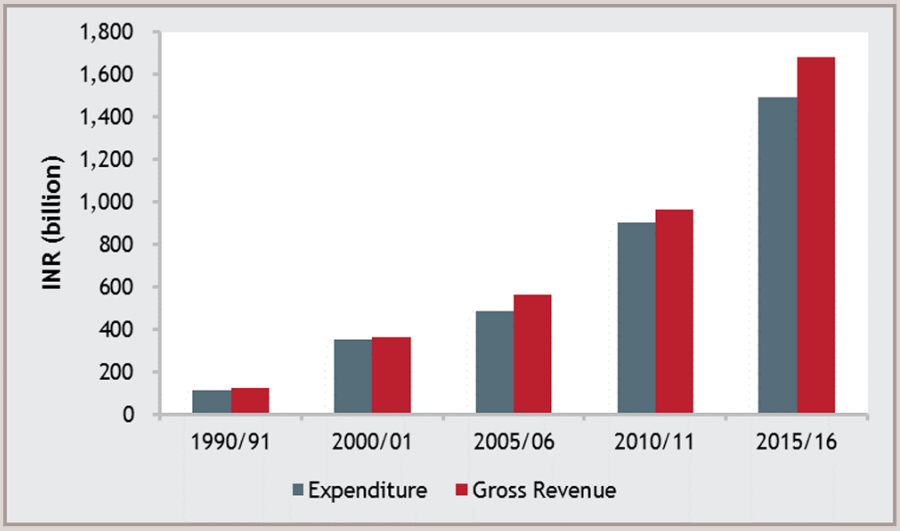
These improvements boosted financial performance substantially after 2004-05, but by 2008-09, most of the gain was distributed in substantial pay increases to staff, returning the ratio of expenditure to revenue to the 2004-05 level. Some improvements also contributed to better customer service, but IR still has a seller's market—demand exceeds supply in both freight and passenger sectors, the former in part due to an as-yet underdeveloped highway network and the latter partly due to fares that have lagged inflation substantially under political intervention. Vision 2020 stressed the need for better service and customer care, and the Transformation Strategy of 2016 similarly identified the need to improve passenger and freight services to remain competitive; recent investment and customer-centered initiatives seem to be paying off.

2.5 Financial Performance

Figure 10 shows financial performance indicators[236] for the MOR (IRB) railway component for selected years.

Figure 10 Indian Railways Transport Revenue and Expenditure 1990/91-2015/16 (INR millions, current prices)

	1990/91	2000/01	2005/06	2010/11	2015/16
Passenger revenues	31,447	104,832	150,808	257,056	442,833
Freight revenues excl. wharfage & demurrage	82,470	230,454	355,347	606,871	1,069,406
Gross Revenue	124,516	360,110	563,155	966,810	1,683,796
Working expenses incl. depreciation	113,378	349,397	483,096	903,349	1,491,511
Net Revenue	11,138	10,712	80,059	63,461	192,285
Operating Ratio	91%	97%	86%	93%	89%



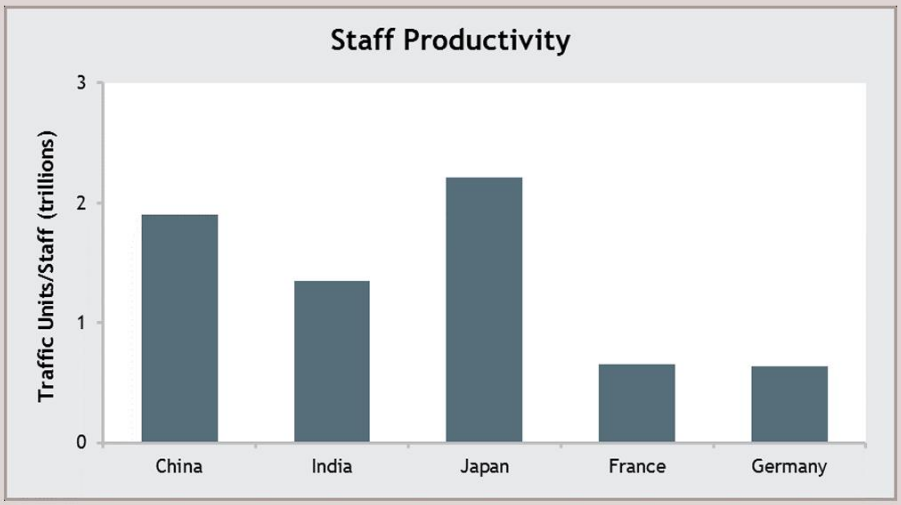
Source: Indian Railways Annual Reports

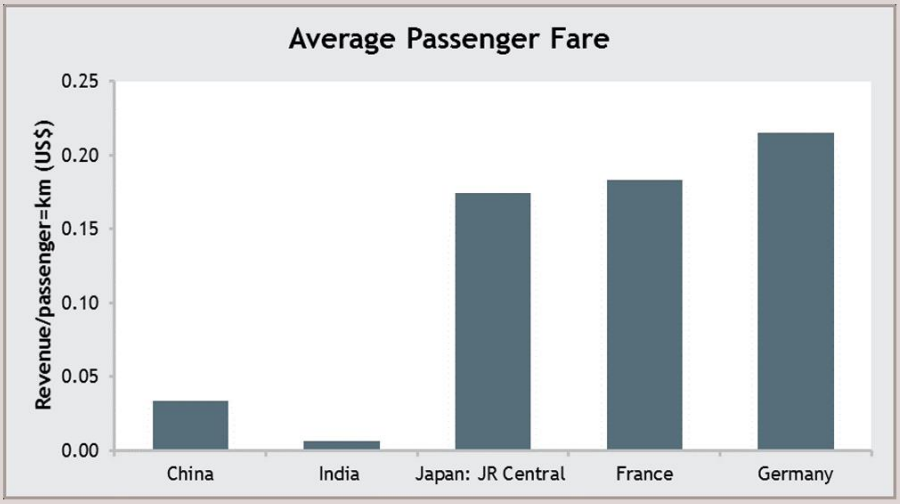
IR is basically a self-funding organization through extensive internal cross-subsidization. It receives no operating subsidies from India's central budget, but receives significant capital investment support from Government. The current strategy assumes a substantial injection of new public finance.

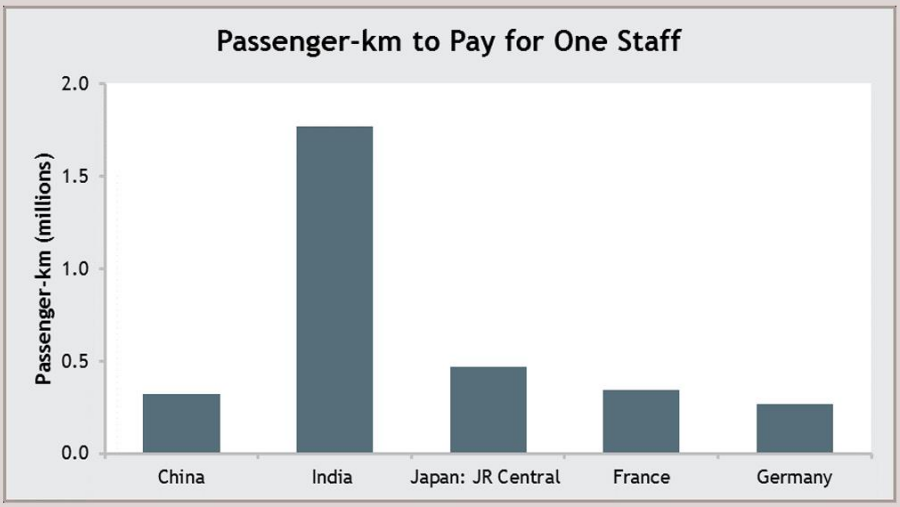
Passenger fares are still heavily subsidized and offer cheap transportation options for India's poorest population. In comparison to other countries, IR performs well in terms of staff productivity, equal to 70 percent of China and more than twice that of France or Germany. However, that ticket revenues of IR are significantly lower than in other countries. IR's revenue per passenger-km is less than one fifth that of China, while the average salary is approximately the same. The result is a very high passenger-km to salary ratio. (Figure 11)

[236] Financial statements deviate from accepted international accounting standards and should be treated with care.

Figure 11 International Comparison of IR Staff Productivity, Passenger Fare Revenues, and Labor Costs







Source: International Railway Union, Indian Railways Statistics, China Railway Statistics, Russian Railways Annual Report, JR Central Annual Report.

The fares are cross-subsidized within IR from freight service revenues, which has in part led to uncompetitive freight tariffs. The rail sector is also now more than ever experiencing competition from the road sector.

The subsidization of passenger rail fares is a widely accepted social policy, and is not itself inherently problematic. However, if IR wants freight to compete with road on an equal playing field, it needs to reconsider the use of cross-subsidization to meet this goal. MOR must look to build new revenue sources for passenger services, including a direct Government subsidy through a PSO, in order to support needed investment and service improvement.

3 Conclusions

Not only does India have one of the largest and busiest railways in the world, but also, IR is arguably the most traditional and monolithic in its basic structure. In fact, it closely resembles the archetypal railway described in this toolkit—prior to considering the alternatives (Chapter 5). Traffic growth has underpinned management initiatives to attain steady and significant improvements in staff productivity and equipment utilization. Nevertheless, IR was historically not notably innovative in using modern rail technology, nor in transforming to more commercial management structures, nor focused on service quality or market-responsiveness. Instead, when seeking commercial focus, it has tended to create semi-autonomous enterprises that bypass its own structures. The burst of improvements and achievements in business processes during 2004-08, described in Section 2 above, appear to have been originated and driven by specific Ministerial leadership, rather than emerging from the permanent institutions of industry structure.[237] And the subsequent diversion of a large part of those gains into the wage bill is a common feature of politically driven enterprises.

Without losing sight of IR's institutional and structural shortcomings, recent improvements stemming from the Transformation Strategy under the current Minister of Railways, Suresh Prabhakar Prabhu, warrant praise. The modernization and overall improvement to customer relations are remarkable and is a demonstrable shift toward market-oriented decision-making. Recent capital expenditure – intended to increase average speeds, build high-speed rail lines, expand the broad gauge network, and revitalize the sorely neglected rail freight industry (most notably the DFC program) – eclipses previous spending. Under the strategy, PPPs are intended as the main mode of delivery for various projects, most notably DFCs and high-speed passenger rail development. Indeed, in 2014, Government opened up the sector to PPPs in a series of rail activities previously limited to the public sector, including: construction, operation and maintenance of suburban corridors, high speed rail, DFCs, rolling stock, railway electrification, signaling, freight terminals, passenger terminals, infrastructure in industrial parks, industrial connections and rapid transit.

Railway policy-making and regulation are ultimately about discerning long-term public interest in railway transport and then protecting it. Now, these MOR (IRB) responsibilities are by statute and design wholly interwoven with responsibility and accountability for the commercial service delivery of ZRs. This structure appears to be based on implicit assumptions that the interests of IR and the public are one and the same—or that any conflicts that arise between IR interests and public interests are best resolved by a single body with both policy and commercial

[237] Sudhir Kumar and Shagum Mehrotra, *Bankruptcy to Billions-How the Indian Railways Transformed*, (Oxford University Press, 2009).

responsibilities. However, these assumptions are no longer accepted in most economic sectors and in most countries. Instead, modern business eschews these structures on the grounds that they barricade institutions against encroachment, discourage innovation by new participants, undermine market focus, and inhibit commercial instincts. The Indian experience does little to contradict the theoretical structural weaknesses of the monolithic railways structure.

The overall degree of private sector participation in India's rail sector is currently low by international standards, and it will be interesting to monitor the success of the newly minted PPPs as they mature. In practice, these PPPs should reduce the industry's monolithic nature. It remains to be seen, however, whether policy change in favor of private sector participation will result in the institution truly embracing a more pluralistic industry. The liberalization of the market (not to be understood as privatization) would promote competition by allowing the entry of new operators, but will only be possible if there exists an adequate regulatory body that protects all stakeholders. The need to establishment an independent regulator in order to advance the industry further cannot be stressed enough.

As the many strategic reports correctly identify, IR continues to suffer from confusion between commercial objectives and social roles, and politicized decision-making that hampers commercial focus. Beyond the measures that have since been taken, the truth remains that government policy functions should be separated from commercial operations, non-core activities should be spun off, and commercial management on lines of business and market segments should be refocused. IR continues to house many activities outside what would be considered core functions, and should critically evaluate their impact on operating a financially stable and customer-focused railway business.

IR has set forth a series of clear and ambitious targets at its most recent Visioning Workshop. It will need to focus its efforts on implementing the shifts it promoted. Otherwise, IR risks exacerbating the critical issues that currently threaten its sustainability: lack of investment in addressing capacity constraints that are limiting growth; shrinking market shares compared to a booming road sector; and uncompetitive freight tariffs stemming from cross-subsidization of passenger services and overall inefficiencies.

Since the 1989 Railway Act, India's economy has been modernized and transformed by more open international trading relationships, greater reliance on market forces, a stronger role for the private sector, and greater competition in trade and services. Now nearly thirty years on, and based on performance as well as governance principles, it is appropriate for India to consider whether its railway sector's traditional institutions remain in the best interests of India's new economy.

Case Study
Lithuanian Railways

1 Introduction

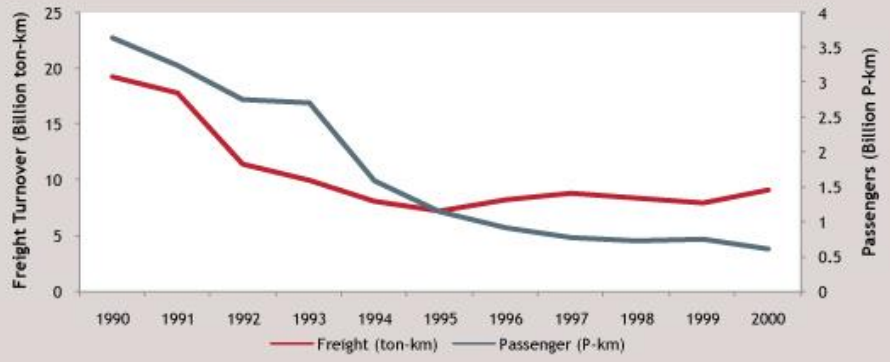
In 2000, Lithuania initiated railway industry reforms, in part driven by a desire to join the European Union (EU), an alliance that promised significant strategic benefits to the country in general, and to Lithuanian Railways in particular. EU membership promised hundreds of millions of Euros in national developmental aid and tens of millions of Euros to invest in railway infrastructure. Secondly, EU membership would enable Lithuanian Railways to grow the predominantly EU-based north-south traffic and reduce its dependence on traffic to and from Russia. Almost a decade earlier, the political disintegration of the Soviet Union had triggered a catastrophic economic collapse; freight and passenger market turnover had dropped by over 50 percent, profitability had vanished, assets condition deteriorated, and productivity plummeted. This case study describes reforms that Lithuania Railways initiated to prepare for EU accession, and address economic challenges that confronted former Soviet Union railway companies.

2 Before Reforms

Since 1940, Lithuanian Railways had been one of three operating divisions of the Baltic Railway, one of the Soviet Union's 32 regional railway administrations that reported to the Ministry of Railways (MPS) in Moscow.[238] In 1991, Lithuanian independence created a national railway company, Lietuvos Geležinkeliai (LG), (Lithuanian Railways) from what had been an operating division of a regional administration.

[238] The Soviet Union had 170 such divisions.

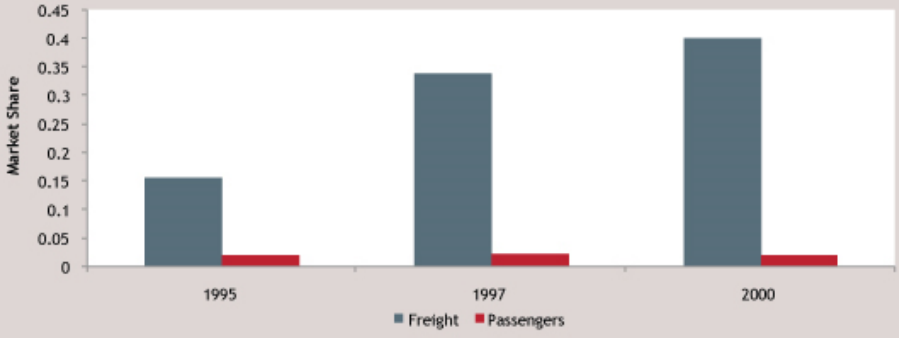
Figure 1 Significant Drop in Lithuanian Railways Market Turnover



Source: World Bank's Railways Database, Lithuanian Railways

Lithuania had always been an important transit route for traffic from Russia and other Union republics to Kaliningrad and the Lithuanian port of Klaipeda. The regional economic collapse that followed Soviet Union disintegration precipitated severe challenges for the new national railway company. During 1990-00, traffic turnover plummeted by 54 percent for freight and 84 percent for passengers (Figure 1). The LG passenger volume modal share stagnated at 2.0 percent; freight business increased modal share due to increased rail transit of oil from Russia relative to other freight (Figure 2).

Figure 2 Lithuanian Railways Volume Modal Share



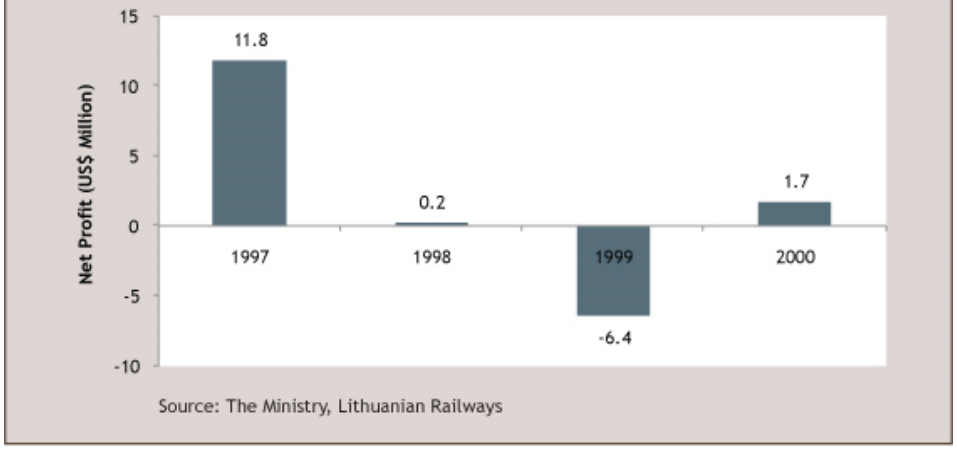
Source: Statistics Department, Lithuanian Government; freight modal share excludes pipeline transport

As LG's market turnover suffered, profitability took a nose dive. Profits of US$11.8 million sank to a loss of US$6.4 million in 1999 before rebounding to US$1.7 million in 2000 (Figure 3). Real investments in railway transport infrastructure maintenance sank as well. During 1993-95, investment declined by 11 percent,[239]

[239] *Investment in Transport Infrastructure: Country Studies,* (European Conference of Ministers of Transport, 1999)

and during 1997-99, track replacement volumes dropped by 49 percent.[240] Thus railway infrastructure was dilapidated and the rolling fleet was outdated.[241]

Figure 3 Decrease in Lithuanian Railways Profitability



Source: The Ministry, Lithuanian Railways

Similarly, productivity suffered as a result of the drop in traffic. Coach productivity declined by 78 percent, wagon productivity, 36 percent; employee and track productivity declined by about 50 percent (Figure 4).

Figure 4 Productivity at the Lithuanian Railways

	1991	1995	2000
Coach Productivity (000, P-km per coach)	4,857	1,605	1,085
Locomotive Productivity (000, TU per locomotive)	84,911	24,704	34,277
Wagon Productivity (000, ton-km per wagon)	1,380	538	881
Employee Productivity (000, TU per employee)	1,126	477	611
Track Productivity (000, TU per standard track km)	10,450	4,171	5,002

Source: UIC, World Bank Railway Database and Lithuanian Railway

3 Reform Goals

Lithuanian Railways strategy objectives are articulated in Resolution No. 692 - Development Strategy of the Lithuanian Transport System (2002), and summarized below:

- Create a legal framework and strengthen market regulatory authority to participate effectively in the EU railway transport market;
- Fully restructure the railway sector;
- Create a strong and effective traffic safety control system;

[240] *Transport Restructuring in the Baltic States: Toward EU Accession*, (World Bank, 2004)
[241] *Resolution No. 692: Development Strategy of the Lithuanian Transport System*, pp. 23, 58

- Create an integral system of railway environmental protection covering all potential sources of pollution;
- Modernize infrastructure for successful integration with EU transport system;
- Acquire passenger/freight rolling stock to comply with modernized infrastructure parameters; and
- Ensure railway transport safety.

4 Reform Process

The reform process emphasized commercial management in addition to structural changes needed to meet EU membership requirements. Under the Soviet system, Baltic regional railway headquarters were in Riga, Latvia. As a result, LG did not inherit an ossified bureaucratic culture and began with a clean slate to implement structural changes and commercial management practices. Reforms were legally supported by the following key legislation:

- Lithuanian Railway Transport Law (2001), based on three EU Directives (2001/12/EC, 2001/13/EB, and 2001/14/EB), allowed separate transport operations and infrastructure management, through divisions within the company, or separate companies under a joint stock holding structure.
- Resolution No. 853 - Long-term Economic Development Strategy of Lithuania (2002) enhanced competition by allowing independent operators on the rail network and liberalizing the market.
- Resolution No. 692 – Long-term (until 2025) Development Strategy of the Lithuanian Transport System (2005) continued the organization of a joint stock company, and restructured the railway sector according to EU legislation.

This section describes Lithuanian Railways progress in the reform process guided by these laws.

In 2005, an Order of the Minister of Transport and Communication established AB Lietuvos Gelezinkeliai (LG) as a public limited liability company. In 2006, LG established three directorates: Freight Transportation, Passenger Transportation and Railway Infrastructure Management. This improved transparency within LG, prepared groundwork to form a joint stock holding company, and met a major goal of the 2001 Lithuanian Railway Transport Law.

The LG is now organized as a joint stock holding company, wholly Government-owned, and comprising commercial entities and entities managing public property. Freight and passenger directorates and ancillary service subsidiaries are commercial entities. Subsidiaries include UAB Gelmagis and UA Gelezikelio Tiesimo Centras (railway construction), UAB Vilaniaus Lokomotyvu Remonto Depas (overhauling locomotives and diesel trains), UAB Gelsauga (security services) and UAB VAE Legetecha (turnout manufacturing). The infrastructure directorate is non-commercial and manages railway infrastructure.

Legally, the Lithuanian railway network is open to private freight train and international passenger train operators under the Lithuanian Railway Transport Law

and Resolution No. 853. However, in practice, LG remains the dominant rail operator; the private sector is involved primarily in network appendages such as port operations. In 2009, only 22 passenger trains from other countries passed through Lithuania.[242] The Transport and Transit Development Strategy aims to further liberalize the railway market, and by 2015, to create conditions for open operator access to railway networks.

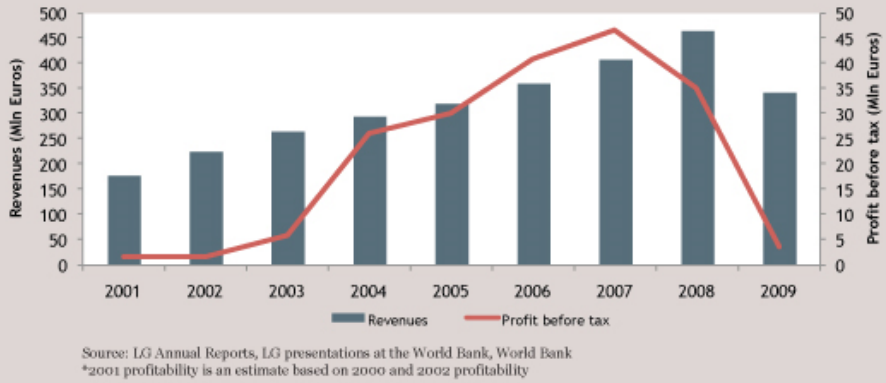
Beyond these structural changes, LG introduced commercial management practices that use modern management systems and information technology to improve productivity and transparency. LG prepares and publicly discloses its audited financial statements according to International Financial Reporting Standards. Publicly available procurement procedures improve procurement transparency. The management body comprises a director general, deputy director general, and directors of passenger, freight, and infrastructure directorates. Most management body members have backgrounds in commercial business, and a few, in politics.

5 Reform Results

5.1 Financial Performance

As the global economy recovered from the 1999 economic downturn, Lithuanian Railways was rewarded for establishing commercial management practices during reforms. During 2001-09, revenues improved by an impressive 93 percent (Figure 5). In 2006, profits peaked at 11 percent of total revenues before plummeting by 93 percent ahead of global financial crisis. The fall in profitability was driven partly by a 37 percent increase in total costs during 2006-08. Thus, LG must continue the reform process to establish solid profitability.

Figure 5 Revenues and Profitability at Lithuanian Railways



Source: LG Annual Reports, LG presentations at the World Bank, World Bank
*2001 profitability is an estimate based on 2000 and 2002 profitability

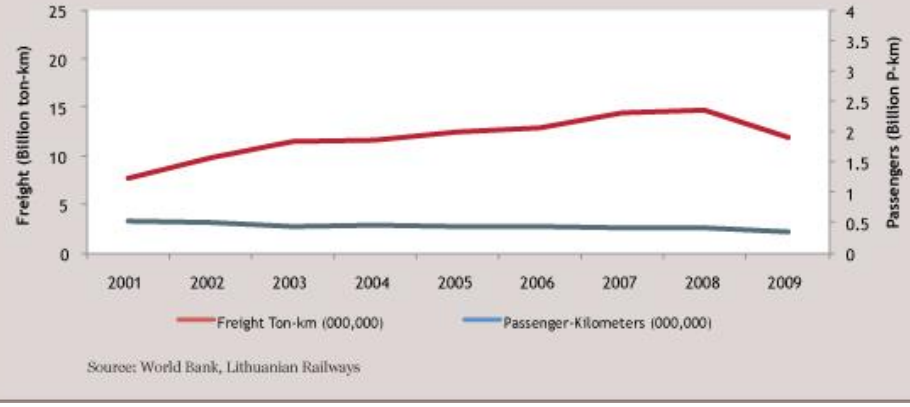
5.2 Market Performance

Before the fall caused by the global financial crisis, freight turnover increased by 91 percent (Figure 6), and freight market share increased by 9.0 percentage points (Figure 7). Freight traffic is dominated by transit cargo from/to Kaliningrad and to

[242] *Annual Report* (LG 2009)

the main Lithuanian port of Klaipeda. Oil products are the most common cargo, and railway transport can handle much larger volumes

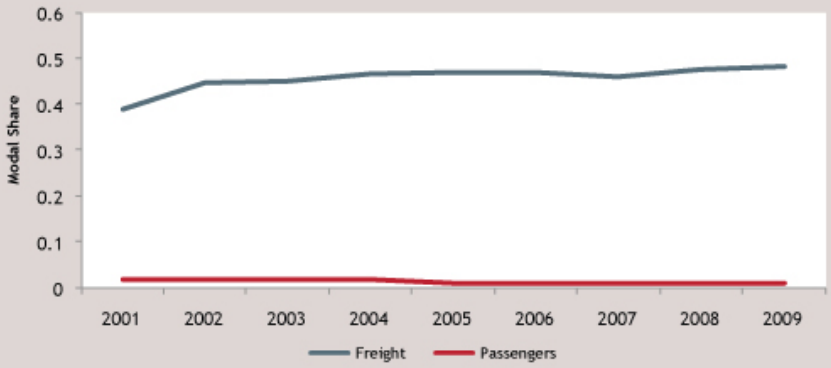
Figure 6 Continued Decline in Railway Market Turnover



Source: World Bank, Lithuanian Railways

at much lower cost than road transport. In contrast, passenger turnover declined by 25 percent (Figure 5) and market share fell from 2.0 to 1.0 percent (Figure 6). The continued loss of passenger market share is due to the relatively short distances of most routes within Lithuania, increased motorization among Lithuanians, limited modernization of rolling stock, and better regional accessibility compared to rail transport.

Figure 7 Railway Modal Share



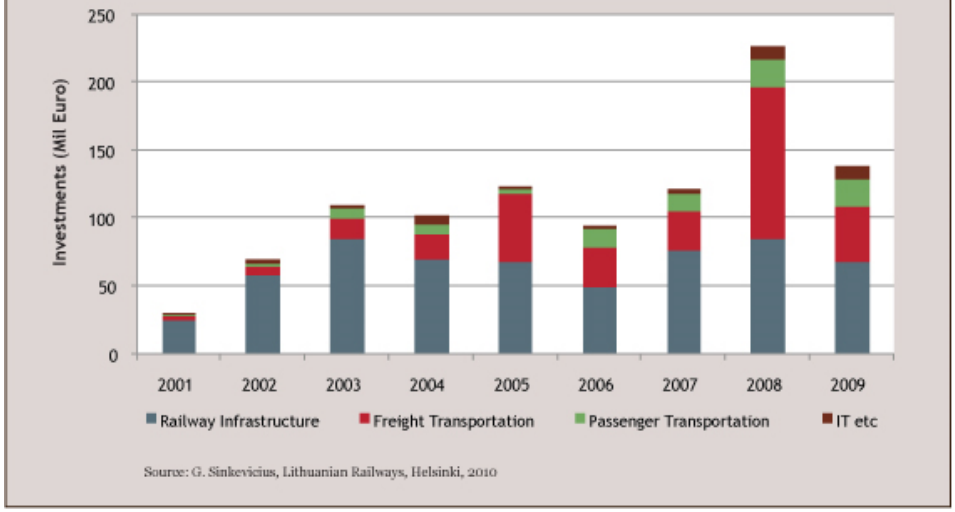
Source: Statistics Department, Lithuanian Government. Analysis excludes pipeline transportation

5.3 Asset Condition

Figure 8 shows that investment has increased in improving assets condition since reforms began. In 2008, investment peaked at €226 million when LG purchased 34 locomotives from Siemens. About half of shunting locomotives are less than 20 years old, and rolling stock is in fair condition compared to that in neighboring countries. About half of the investment came from LG funds, 5.0 percent from state funds, and 25 percent from EU grants. Nonetheless, railway tracks need significant additional investment. About 40 percent (850 km) of tracks need repairs and

maintenance, and maximum allowable speeds are as low as 40-60km/hr on some sections.[243]

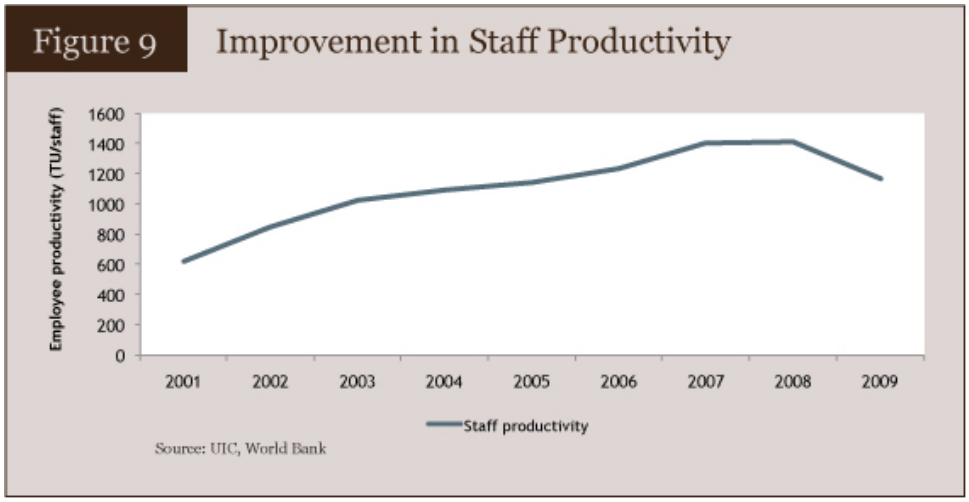
Figure 8 Improvement in Track Renewal



5.4 Operational Productivity

In 2001, LG began with 13,307 employees; by end-2009, it had only 10,506, which, combined with improved traffic, boosted staff productivity by 87 percent (Figure 9). Also, wagon and locomotive productivity improved by 50 percent, and coach productivity by 37 percent (Figure 10). Track productivity improved the least, although it remains substantially higher than the EU average. In part, this is because track length is not easy to adjust when the market slows down, and in part because LG, perhaps due to political influence, has closed few of the lines with the lowest traffic density on the network.

Figure 9 Improvement in Staff Productivity



[243] *Country Report Lithuania*, "Study on Strategic Evaluation on Transport Investment Priorities under Structural and Cohesion funds for the Programming Period 2007-2013,"(European Commission, 2006)

Figure 10 Increase in Asset Productivity

	2001	2005	2009
Coach Productivity (000, P-km per coach)	993	916	1,357
Locomotive Productivity (000, TU per locomotive)	31,223	53,688	46,559
Wagon Productivity (000, ton-km per wagon)	827	1,338	1,243
Employee Productivity (000, TU per employee)	622	1,140	1,166
Track Productivity (000, TU per standard track km)	6,454	7,271	6,930

Source: Lithuanian Railways, UIC, World Bank Analysis

6 Conclusion

Lithuania is moving ahead with railway reforms and significant improvements have been observed due to commercial management of the process. Since 2001, LG revenues have risen by 93 percent, freight modal share improved by 9.0 percentage points, investment in assets rose by 360 percent, and operational productivity has improved across the board. Lithuania Railways' current strategy focuses on improving infrastructure to enhance interoperability with EU railway networks. The EU Community Strategic Guidelines prioritizes "the most important infrastructures for international traffic, bearing in mind the general objectives of the cohesion of the continent of Europe, modal balance, interoperability and the reduction of bottlenecks."[244] Thus, EU Cohesion Funds, Europe's Regional Development Funds, and Structural Funds are the primary sources of funding for transport infrastructure development in Lithuania.

[244] *Ibid.*

Case Study

London King's Cross[245]

1 Introduction

King's Cross Terminus—including St. Pancras and Euston stations—is expected to function as the principal transit center for London. The 2004 London Plan anticipated King's Cross becoming the most accessible location in Greater London, with the completion of the Channel Tunnel Rail Link – High Speed 1 (HS1), Thameslink 2000, and the Cross River Tram. King's Cross is also the biggest inner-city transit interchange in London, linking six metro lines at one venue.

The King's Cross Regeneration Program entails the transformation of a 27-hectare area in central London on former rail land to the north of King's Cross and St Pancras stations into a mixed-use urban regeneration project, with up to 739,690 square meters of floor space. This regeneration program, one of the largest in Europe, has managed to attract a number of lead tenants, including Google, and has turned a disused area of London into a new vibrant urban space. It is also expected to provide substantial returns to its developers in the medium to long terms. From a planning perspective, King's Cross is a unique development, considering the six years it took to design and negotiate. The process included four rounds of public consultation, involving around 30,000 people, leading to a well-tailored solution for urban regeneration.

This case study illustrates the process of leveraging high connectivity and public-private partnerships (PPPs) in increasing real estate market value of areas around a major railway hub. Such approach exemplifies a strategic approach to urban transformation through Transit Oriented Development (TOD)[246].

2 Regeneration Programme

In Victorian times, King's Cross was an important industrial transport center. However, by the late 20th century, the area had become one of disused buildings, railway sidings, warehouses and contaminated land. By the 1980s, it had some of the lowest rent areas for central London, with ample vacant land. Plans for redevelopment in the early 1980s fell through, due to weak market conditions and uncertainty about delivering the high-speed Channel Tunnel Rail Link (CTRL), now

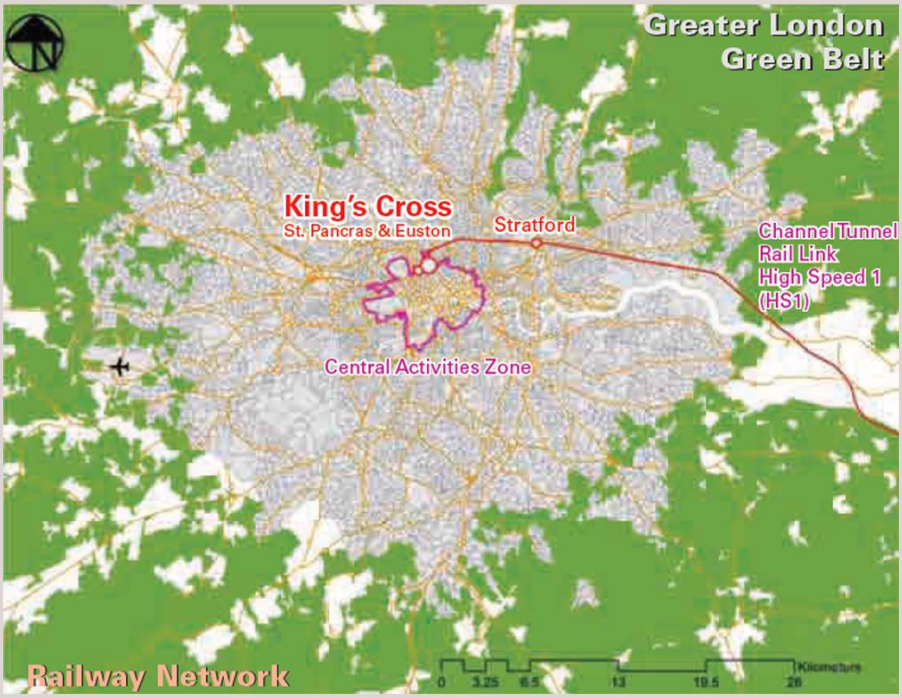
[245] This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

[246] Transit Oriendted Development (TOD) is outlined in the 2017 publication "Transforming cities through Transit Oriented Development: the 3V Approach", The World Bank. Available at: http://hdl.handle.net/10986/26405

called High Speed 1 (HS1) and related development projects. The location of King's Cross, to the north of central London, was also not aligned with London's focus on regenerating its east side (Docklands).

Over the past decade, London started to experience growing market demand, with a rapid increase in the number of jobs in the City of London and in particular in central London (reaching densities of 155,000 per square kilometers), and in the rapidly developing Canary Wharf, a business district located in East London. The 1996 decision to move HS1 from Waterloo to St Pancras station (facing King's Cross station) became a catalyst for change in the King's Cross area. It involved major infrastructure investments in the St Pancras station and its surroundings, with reconstruction of interchanges to the metro links. The area was identified as one of the five "Central Area Margin Key Opportunities" in the strategic planning guidance for London. The landowners – London & Continental Railways (LCR) and DHL – decided to develop the land.

Figure 1 Location of King's Cross Station and High Speed 1 on Greater London's Railway Network, 2011



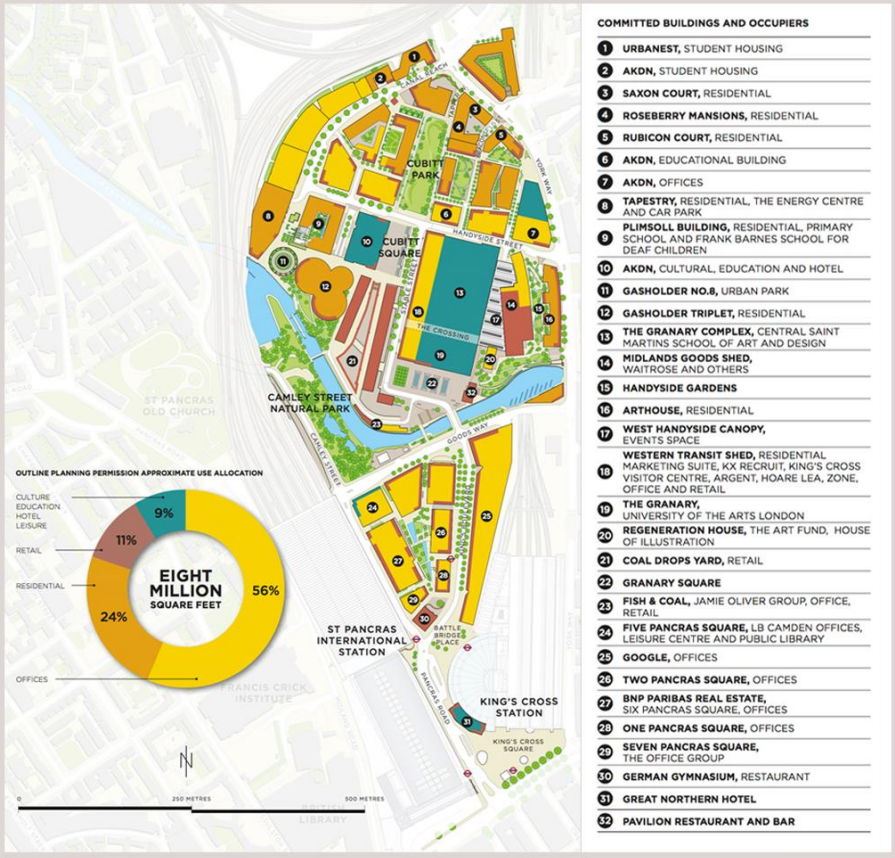
Source: Data from the London Datastore, Greater London Authority, and Open data, Transport for London.

The landowners were also encouraged by the implication of upgrades and restoration of the underground stations and national mainline stations on the site, set to be completed by 2007. They realized that any proposal would need to respond to and accommodate the large number of people who would be using the new international interchange.

About 27 hectares of land is planned to contain more than 1,900 homes, 50 new and refurbished office buildings, 500,000 square feet (about 47,000 square meters) of shops and restaurants, 20 new streets, and 10 major new public spaces for a projected 50,000 people (Figure 2). While the majority of private floor space will

be allocated to produce business profits, more than 40 percent of the redeveloped former "brown-field" site will be used for public purposes, and, across the redevelopment site, 20 historic buildings will be restored for modern use.[247] Figure 2 below shows the map and the committed building and occupiers as of 2016.

Figure 2 Redevelopment Schemes of the King's Cross Opportunity Area



Source: 2016 Argent (Property Development) Services LLP. Used with permission

3 Redevelopment Approaches

The following approaches have been applied to the King's Cross redevelopment programme:

Generating high market value around a highly connected hub with substantial market potential through high quality public space

King's Cross, in the core of London, is a major interchange station of the city, of UK, and of Europe. King's Cross is the biggest inner-city transit interchange in London, linking six metro lines at one venue. King's Cross Central combines two major train stations (International high speed Eurostar and domestic) and is also

[247] Urban Land Institute (ULI) (July 2014). *ULI Case Studies: King's Cross*. Retrieved from: http://casestudies.uli.org/wp-content/uploads/sites/98/2016/01/king-scross_16pgs_v11.pdf

one of the busiest routes for buses (17 routes). Its ridership is up to 140,000 commuters, visitors and residents per day. Passengers can reach the center of Paris in 2hrs 15, Brussels in 1hr 51 and Lille in 1hr 20. These destinations will be joined by Amsterdam, Cologne, and Frankfurt via Deutsche Bahn's high speed ICE. This transport hub is expected to support 63 million passengers a year from 2020.[248]

The King's Cross regeneration program aims at delivering an accessible, high-quality mixed-use environment, with a strong focus on art, culture, and heritage. The provision of good quality public space enhances the image and appeal of a location. Over £2 billion has been spent on the local transport infrastructure, including St Pancras station and public areas. The master plan presented a network of public open spaces, streets, lanes, squares, and parks that permeated the urban blocks and made connections beyond the site into the wider city.

The development of the site is anchored by a vision under which it transforms from a slightly decentered derelict place to a core part of central London, which would work 24 hours a day and seven days a week, and would be open, democratic and accessible. That meant dividing the area into development zones, with maximum building heights, and environmental specifications, but also producing hundreds of urban design analysis options, to define possible use and leverage the existing historical heritage in the area like Granary Square. The historic fabric was embedded in the plan in a sophisticated manner, rather than simply preserved. Each retained building has a new use, and each has a relationship to its neighbors and the spaces in between.

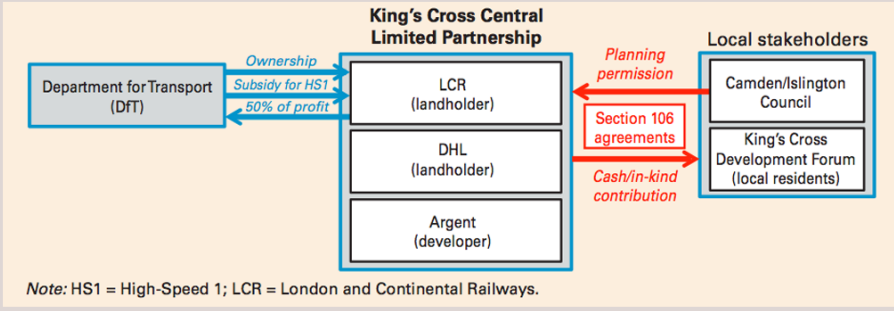
Public-Private Partnerships (PPP) for infrastructure funding and property development

In London, local governments and the private developer redeveloping the King's Cross rail yard stress the importance of sharing the costs and benefits conferred, particularly around the newly integrated transit terminus.

The partnerships and stakeholders involved in the redevelopment scheme around King's Cross are shown in Figure 3.

[248] The estimated number of passengers are for the total, accounting for six London metro lines, domestic railway lines and international high-speed rail lines. Based on: Urban Land Institute (ULI) (July 2014). *ULI Case Studies: King's Cross*. Retrieved from: http://casestudies.uli.org/wp-content/uploads/sites/98/2016/01/king-scross_16pgs_v11.pdf

Figure 3 Stakeholders and Partnerships in the Redevelopment Scheme around King's Cross



Source: Financing Transit-Oriented Development with Land Values (World Bank 2015)

Partnership with the private developer

LCR[249] has played a crucial role for the regeneration around King's Cross. In 1996, as a private consortium, LCR was selected by the UK Government to build and operate HS1, a high-speed rail link. One of the key objectives behind HS1 was to stimulate regeneration in inner London and in particular around King's Cross.

In 2001, LCR selected property developer Argent, one of the UK's most respected property developers, was selected as a private development partner for the King's Cross regeneration program, given its rich experiences in regeneration and mixed-use developments. With a strong portfolio of urban regeneration projects and mixed-use development, Argent proceeded to plan, manage, and deliver the scheme starting in the same year. Argent started from a blank piece of paper, built the scheme on principles and precedents, and then realized these in the master plan. Aside from active public consultation, there were also two master planning teams and four independent design review panels that allowed for the development of a tailored solution for the site over six years of planning. The master planning and consultation were paid for by Argent, but were offset as upfront cost within the financial arrangements with LCR. The developer took the overall planning risk. Argent brought the backing from a large pension fund (BTPS managed by Hermes Investment Management), essential for the private development of the site.

The London Borough of Camden granted outline planning permission for regeneration in 2006, with a target completion date of 2016. Argent entered into a joint collective ownership acquisition and development agreement with the landowners, LCR and DHL. This deal included an agreement that the land was to be valued based on its open market value, following the approval of planning permission and completion of the Channel Tunnel Rail Link. Upon valuation, Argent was given the option of acquiring the land from the landowner or entering into a 50/50 partnership. It chose the latter option – a long-term 50/50 development partnership. This

[249] LCR subsequently ran into financial difficulties and has been owned by the Department for Transport (DfT) since 2009. After the delivery of HS1, in November 2010, LCR sold HS1 with its 30-year concession for the track and stations to a consortium for £2.1 billion. As of early 2015, LCR's primary focus had become in the area of property development and land regeneration and was a joint venture partner in two major regeneration programs, at King's Cross, in partnership with Argent and DHL, and at the International Quarter, Stratford City, in partnership with Lend Lease.

created the King's Cross Central Limited Partnership (KCCLP), which became the single landowner and developer of King's Cross[250], making development and delivery easier.

The price paid by Argent was to be discounted according to that value, with that discount increasing as the open market value of the land rose. The deal incentivized Argent to optimize the value of the scheme. The agreement was that the crystallization of land value would come when the landowners – LCR and DHL – could provide vacant property, after HS1 was completed and open and the developer had completed planning and a viable business plan and secured funding. The partnership was designed provide financial return when certainty was delivered by all parties, for the benefit of all parties.

The partnership made a £250 million investment in infrastructure at King's Cross Central since 2009 to 2014, which unlocked the 6 million square feet (557,000 square meters) of development on the project. The partnership's equity funding went towards new roads, new public spaces, a new bridge across Regent's Canal, canal-side improvements, and the Energy Centre and its associated district heating and distribution networks.[251]

LCR adopts a long-term strategy with respect to the development of King's Cross Central. It focuses on minimizing property cost and maximizing the value of assets.[252] Land is valued in nominal terms in its financial statement. The value of land rises over time as development takes place. Many of the people working on the project have been involved from the beginning. This brings an unusual level of continuity and commitment. A holistic approach was adopted for the regeneration of Kings' Cross regeneration scheme. All the landowners are working together within one overarching, shared vision.

The primary risks for the business relate to the uncertainties of the economy and in particular the strength of the property market. These risks are managed actively through the governance of the joint venture companies and the skills of the commercial development partners.[253]

Partnership with the Central Government

Originally, HS1 was planned to be privately financed, owned, and operated, but there was significant doubt about the project's financial viability. Consequently, as part of the financing arrangements for the construction of HS1, the Department of Transport (DfT) provided cash grants, underwrote a bond issue, and provided property development rights around King's Cross and Stratford stations to LCR. This arrangement was to continue until the concession contract expires in 2086, at which point the assets would be returned to the government. Following the sale

[250] As of early 2015, U.K. property developer, Argent had a 50 percent interest, the now U.K. Government-owned LCR, holding a 36.5 percent interest, and DHL Supply Chain (formerly Exel) with a 13.5 percent stake.
[251] Urban Land Institute (ULI) (July 2014). *ULI Case Studies: King's Cross*. Retrieved from: http://casestudies.uli.org/wp-content/uploads/sites/98/2016/01/king-scross_16pgs_v11.pdf
[252] Department for Transport (DfT) (2011). *Department for Transport: Land Strategy*. Retrieved from: https://www.gov.uk/government/publications/department-for-transport-land-strategy-housing-land-supply
[253] Ibid

of HS1, LCR was restructured into a property development entity in 2011. Based on the 1996 arrangement between the government and LCR, DfT expected to receive a 50 percent share of LCR's net profit after deducting the costs for the King's Cross development scheme.

Partnership with local communities

The process of development for King's Cross entailed major engagement, based on publication of proposals and active discussions with local communities. It led to the development of ten design principles for a human city, as well as the preparation of parameters for regeneration, learning from other examples in London. Those were embedded in a series of design frameworks, guiding the individual parcels. There were four rounds of public consultation, allowing a balancing of local benefits against profitability for the developer. Both the developer and the government listed and adapted the scheme.

One key land value capture technique adopted by local governments in England and Wales is their use of Section 106 of the Town and Country Planning Act of 1990. This provides a means for local authorities to negotiate agreements or planning obligations with a landowner or developer, in association with the granting of planning permissions. Section 106 agreements can be financial in that landowners or developers are required to make some sort of financial commitment (lump sum or recurring) in exchange for development permission; or can be in-kind support to local interest, such as affordable housing or community facilities. S106 agreements have to be related to offsetting the impacts of the development, and be in accordance with an approved plan. They cannot be cash payments for general community services. The rules are clearly set out in Government guidance. Once a Section 106 agreement is signed and planning permission is granted, developers have three years to exercise their property development rights, or the permission lapses.

The Section 106 agreement package around King's Cross includes cash and in-kind contributions to the provision of local infrastructure and community services by the joint developer for the Camden council, including £2.1 million to create 24,000-27,000 local jobs through a Construction Training Centre and Skills and Recruitment Centre; 1,900 homes, more than 40 percent of which will be affordable housing[254]; cash and in-kind contributions for community, sports, and leisure facilities; new green public spaces, plus new landscaped squares and well-designed and accessible streets, accounting for about 40 percent of the entire site; a new visitor center, education facilities, and a bridge across the canal to link streets; and cash contributions to improve adjacent streets, transit stops, and bus services[255].

Long-term commitment and flexibility for land value capture

Regeneration initiatives must have a long-term perspective if a lasting contribution is to be made.[256] This requires a long-term commitment from all stakeholders, including the developer, residents, occupiers and public services.

[254] Affordable housing is targeted at couples with a combined income below £60,000, and arranged for people with skills needed by the city.
[255] Camden Council 2006.
[256] British Urban Regeneration Association 2002

Plans to redevelop the King's Cross area started in early 1990s, a vision was outlined in 1997, the outline planning permission was granted in 2006, with a target completion date of 2016. A long-term vision to be implemented by stages was also set (Figure 4).

Figure 4 Figure 4 Long-term Vision for King's Cross Regeneration Scheme

Source: King's Cross Regeneration Review 2014

Under the supervision of the DfT, LCR has been mandated to maximize its long-term asset value, and its development strategy has been to use its major sites as equity to participate in joint-venture development companies that can make long-term profits through urban regeneration around the HS1 stations—mainly King's Cross and Stratford.

Local authorities also supported a long-term redevelopment approach by allowing flexibility in the planning permission. The Section 106 agreements for King's Cross set out very flexible allocations of property floor uses, allowing the joint developers to respond to changes in market and other conditions as the regeneration proceeds. The agreement contains the broad principles of the redevelopment scheme with "floor space maxima" to guarantee diverse site use. Yet these allocation figures allow for some flexibility as redevelopment is likely to take 10-15 years to complete. Thus, floor space of one use could, to a limited extent, be traded against another, depending on market conditions. This flexibility in planning parameters allowed the regeneration to be adjusted to market needs over time.

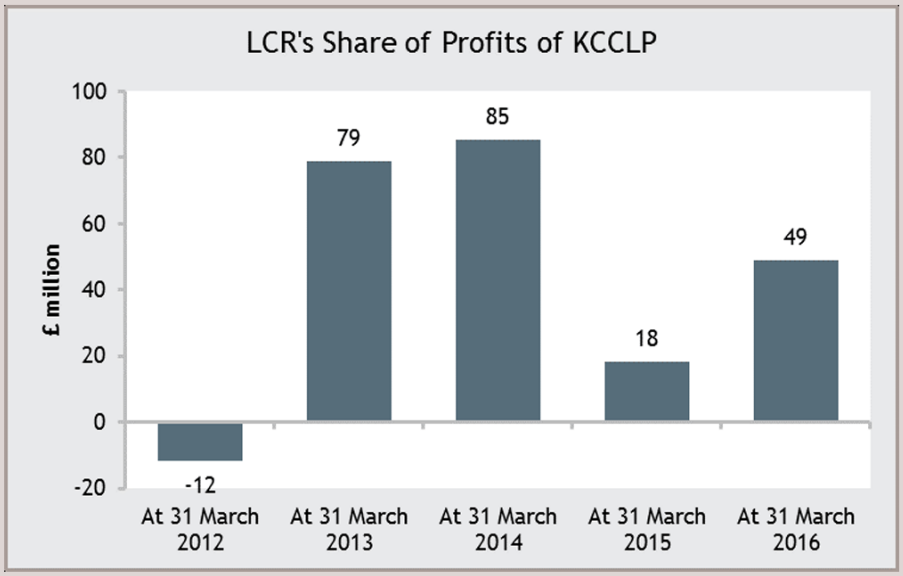
4 Results

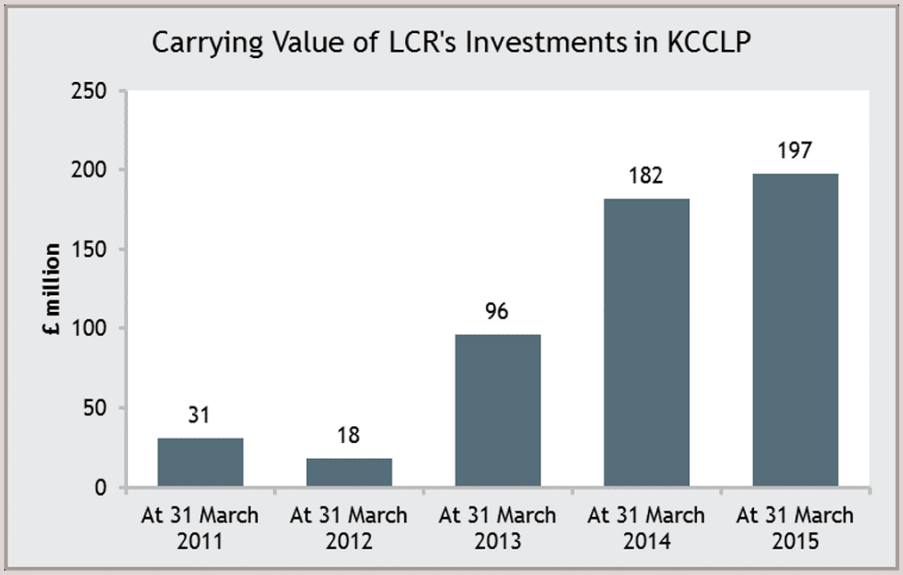
Financial impact

Since LCR has been restructured into a property development and management company, a central feature of LCR's business profile is that returns from LCR's property interests are expected to be mainly in the form of capital appreciation in the 5-10 year time horizon.

By March 31, 2014, over 57 percent of the regeneration project by floor area had been either completed or committed. The project continued to make good progress and started to make financial contributions to LCR. LCR recognizes its 36.5-percent share of KCCLP results, which amounted to £85.1 million for the financial year ended March 31, 2014.[257] In the financial year ending March 31, 2016, LCR's profit was £48.9 million.[258] On January 22, 2016, LCR sold its shares in KCCLP to Australian Super for £371.1 million. This brought Australian Super's ownership in KCCLP to 67.5 percent.

Figure 5 LCR's Share of Profits of KCCLP and Carrying Value of LCR's Invest-ment in KCCLP





Source: LCR group reports and accounts

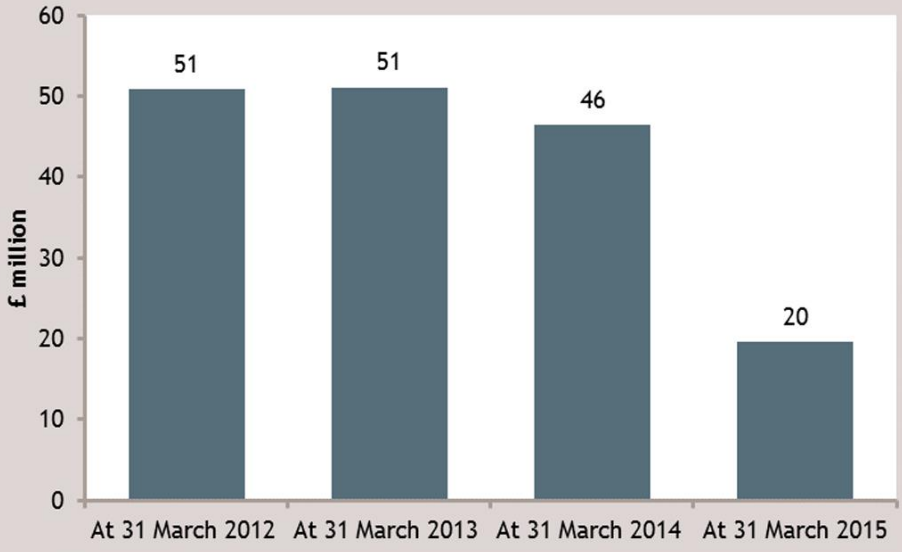
The financial contributions to LCR through King's Cross redevelopment for the last five financial years and the carrying value of LCR's investments in KCCLP are

[257] LCR group report and accounts.
[258] *Ibid*

shown in Figure 5. The increases in the profit contributions and investment carrying value are predominantly arising from disposal and revaluation of investment properties.

Loans were also provided by LCR to KCCLP for the regeneration, as shown in Figure 6.[259]

Figure 6 Loans by LCR to KCCLP



Source: LCR group reports and accounts

Social and economic benefits

The regeneration scheme around King's Cross is expected to directly deliver significant social and economic benefits and to fundamentally improve the physical environment, throughout the construction period and beyond. The construction program required a large amount of infrastructure to be built before any buildings were begun. This included improvements to local roads, phased opening of some routes through the site, improved drainage and storm water run-off (preventing flooding) and enhanced local electricity capacity. The length of the King's Cross Central construction period also means that there is the potential for the construction sector to become a long-term stable employment base within the local economy.

Ongoing development is transforming the physical environment around what was historically considered unsafe, underused and vacant land. The applicants are committed to the creation of a high quality public realm maintained by a comprehensive management regime. In fact, the development at King's Cross is fast becoming one of the most attractive places to live, work and visit in London, and there has been strong demand for both the offices and residential units, together with restaurants and retail shops opening.

[259] Loans to KCCLP were sold to Australian Super on 22nd January 2016.

The regeneration program is expected to also deliver thousands of new jobs. With the right employment brokerage and training measures in place, a significant percentage of them could be taken up by local people According to an assessment by LCR in 2009, the incremental economic impacts of HS1 combined with the regeneration of King's Cross were estimated to result in about 22,100 permanent jobs and 2,000 dwellings in the area. By 2020, it is anticipated that up to 50,000 people will be studying, living and working in King's Cross.

Moreover, development is expected to also significantly increase Business Rate and Council Tax revenues for the Local Authorities. The mix of uses and building types in the King's Cross Central proposals is expected to act as a catalyst for economic clustering and further diversity in industry sectors in North London. In turn, this would generate greater opportunities for training and wider choice of employment.

The first phase of the regeneration project started with a £100 million construction contract, the University of the Arts London, which opened its new campus in autumn 2011. Commercial space is thriving, with occupants such as Google, BNP Paribas Real Estate, and Louis Vuitton, which will bring more value and people to this area. Between the initial stage of development and 2014, average blended price of houses increased from £700 per square foot to £1,400[260] and rents for commercial space have exceeded initial expectations.

Google has spent about £650 million to buy and develop a one-hectare site from KCCLP on a 999-year lease. The finished development, which will be 93,000 square meters, will be worth up to 1 billion £[261]. Several thousand staff will occupy the low-rise structure when it is complete. The building will form an important part of the King's Cross scheme and will become the internet search firm's largest office outside its Googleplex corporate headquarter in California. The building will include 4,650 square meters of ground-floor retail. Google presence is expected to draw other technology companies to King's Cross – especially small start-ups – which will help to bump up rents. It is expected that when the regeneration scheme is complete, a total value of nearly £5 billion will be created[262].

Benefits to key stakeholders

DfT: DfT provided financial assistance, as well as development rights, to LCR for the construction and operation of HS1 and the regeneration around King's Cross. In return, it received part of LCR's net profit after deducting the costs for the King's Cross redevelopment program. As part of the government's deficit reduction program, LCR sold its 36.5-percent stake in KCCLP to Australian Super in January 2016, and the proceeds from that sale were returned to the Treasury.

Local authorities in London: They were consulted with during the planning of the regeneration program through the King's Cross Development Forum. The

[260] Urban Land Institute (ULI) (July 2014). *ULI Case Studies: King's Cross*. Retrieved from: http://casestudies.uli.org/wp-content/uploads/sites/98/2016/01/king-scross_16pgs_v11.pdf

[261] As of June 2016, five floors of the building have been completed. Source: Business Insider UK http://uk.businessinsider.com/googles-new-11-storey-office-in-londons-kings-cross-2016-6

[262] LCR Group Report and Accounts, 31 March 2014.

planning permission was granted with flexibility in planning parameters, which allowed the plan to be adapted to market conditions as the redevelopment proceeded. On the other hand, local authorities also required the partnership developer to provide cash or in-kind contributions to the infrastructure and facilities in the communities in exchange for the planning permission.

Local communities: There was intense consultation with local communities (over 4,000 meetings) during the planning process, which established the framework for the regeneration program to ensure that those living and working close by felt the benefits of the development.[263] Local communities benefit from the Kings' Cross regeneration scheme employment and training opportunities, housing, health and other community services and facilities, and safer, cleaner streets.

5 Conclusion

The King's Cross redevelopment program illustrates how a rail company (LCR) and its partners are in the process of generating high increases in real estate market value, near a major railway hub, by leveraging high connectivity, high quality public space, PPP, and public consultation.

The case study demonstrates the following four key concepts that can be adopted by railways around the world:

- Major market value can be generated around highly connected hubs, with substantial market potential, when combined with high quality public space;
- PPP is an effective instrument for infrastructure funding and property development of this type, seeking to find the right balance between the developer's long term aspirations to create and manage an estate and the local authority's desire to integrate development into the surrounding communities. The master developer can bring a wide range of skills and help secure long term financing;
- Active public participation can ensure a strong buy-in of stakeholders and achieve better results; and
- Such development requires long-term commitment and flexibility from all parties, in order to reflect and respond to evolving market needs.

[263] Urban Land Institute (ULI) (July 2014). *ULI Case Studies: King's Cross*. Retrieved from: http://casestudies.uli.org/wp-content/uploads/sites/98/2016/01/king-scross_16pgs_v11.pdf

References

ARUP (April 2014). *Argent St. George, LCR and Exel, King's Cross Central Regeneration Strategy*. Retrieved from: https://www.kingscross.co.uk/media/37-regen-strategy.pdf

Department for Transport (DfT) (2011). *Department for Transport: Land Strategy*. Retrieved from: https://www.gov.uk/government/publications/department-for-transport-land-strategy-housing-land-supply

Suzuki, H., Murakami, J., Hong, Y., and Tamayose, B. (2015). *Financing Transit-Oriented Development with Land Values*. Washington DC: World Bank Group.

Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

LCR Group Report and Accounts. Retrieved from http://www.lcrhq.co.uk/useful-information/financial-information/

Urban Land Institute (ULI) (July 2014). *ULI Case Studies: King's Cross*. Retrieved from: http://casestudies.uli.org/wp-content/uploads/sites/98/2016/01/kingscross_16pgs_v11.pdf

Case Study

Mexico Railways[264]

1 Introduction

In the 1980s, Mexican Railways were suffering from poor productivity, significant operating deficits, and dwindling freight volumes. After unsuccessful attempts to overhaul the vertically integrated national railway company, the Mexican government set forth on a reform to open the railway sector to private investment and operation. Between 1996 and 1999, three major concessions were awarded, which guaranteed 30-year exclusive operating rights under 50-year operation and maintenance contracts. The concessions were allocated by geographic region, and were designed to spur competition through alternative access to key markets, parallel routings, and use of trackage rights along specified segments of track.

To date, the reform has been a very positive achievement for the Mexican Government. Freight tariffs have dropped, government subsidies for freight services have been entirely eliminated, and productivity has risen dramatically. Implementing the competitive trackage rights, however, has been an ongoing challenge. In 2016, a dedicated railway regulator was established in order to address, among other issues, trackage rights and tariff disputes. The new regulator remains untested, but its conduct in the coming years will have an impact on market behavior, particularly as the concessionaires near the end of the 30-year exclusivity period.

2 Situation before the Reform

Mexico's railways were originally built during the late 19th century to serve private sector mining and industry traffic. The network was financed by foreign capital and ventures, which were given concession rights and benefited from government subsidies.[265]

Over time, a popular movement to bring economically critical services under government authority led to the nationalization of the railways. In 1983, the Mexican

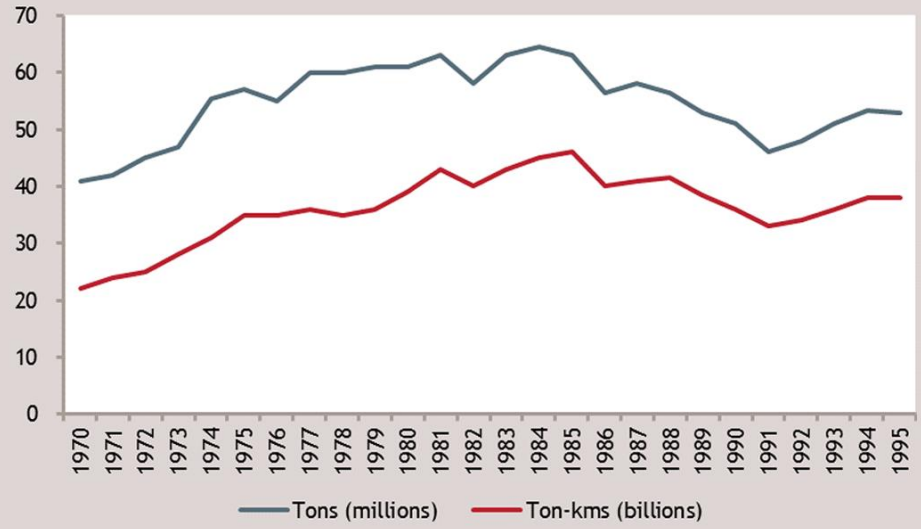
[264] This case study was prepared largely based on the following reports: OECD (2016). "Establishing Mexico's Regulatory Agency for Rail Transport: Peer Review of Regulatory Capacity." International Transport Forum (ITF); OECD (2014). "Peer Review of Railway Freight Development in Mexico." International Transport Forum (ITF); Campos, J. (2001). "Lessons from Railway Reforms in Brazil and Mexico." Transport Policy 8 (2001), p. 85-95; and Villa, J. C. & Sacristán-Roy, E. (2012). "Privatization of Mexican railroads: Fifteen years later." Research in Transportation Business & Management 6 (2013), p. 45-50.

[265] Powell, F. W. "The Railroads of Mexico." Boston: The Stratford Co, 1921. Accessed online at: https://archive.org/stream/railroadsofmexic00powe#page/2/mode/2up

Constitution was amended to ensure that the federal government retained ownership and operations of the country's main rail services.[266] This changeover was legislated in the 1985 Ley Orgánica de los Ferrocarriles Nacionales de México (the Constitutional Law of the National Railways of Mexico), under which all rail lines were incorporated into the state-owned company, Ferrocarriles Nacionales de México (FNM, National Railways of Mexico). Mexico's Secretariat of Communications and Transportation (SCT) owned FNM, which was a vertically integrated monopoly offering domestic and international freight services as well as limited intercity passenger services.

By then, the Mexican rail network was characterized by poor performance and low productivity. Rail freight volumes in Mexico grew during the early-1970s, but by the mid-1980s, faced a decline in both volume and market share as competition from road freight transport increased[267] (Figure 1).

Figure 1 Rail Freight Traffic in Mexico 1970-1995



Source: Secretariat of Communications and Transportation 2014, and OECD (2014). "Peer Review of Railway Freight Development in Mexico." International Transport Forum (ITF).

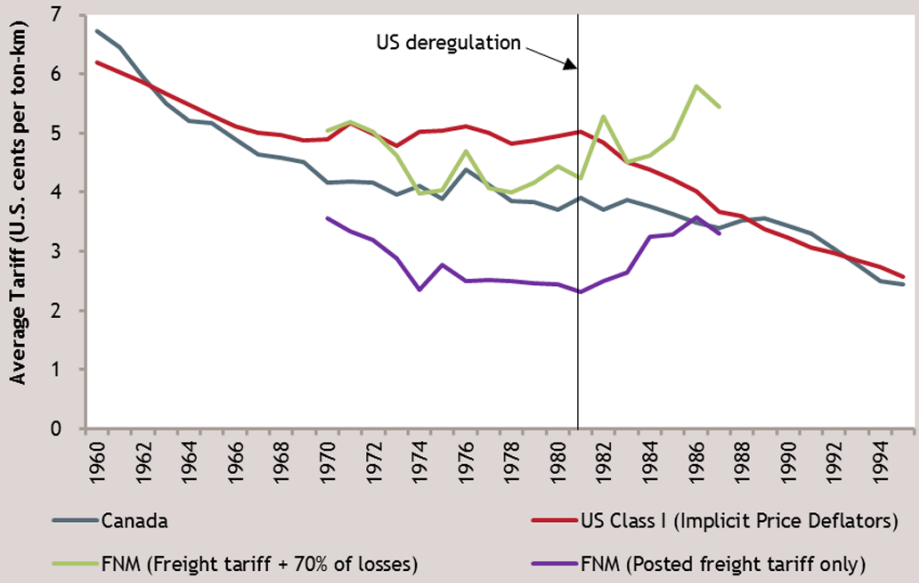
During the 1970s, FNM tariffs averaged less than 3 US cents per ton-km (Figure 2). At this tariff, FNM suffered substantial losses, which were subsidized by the government. By comparison, the deregulation of the US Class I railways in 1981 led to significant reductions in average freight tariffs across the country, to around 2.5 US cents per ton-km by 1995, indicating a notable improvement in efficiency (private rail operators in the US do not receive subsidies on freight tariffs).[268]

[266] Campos, J. (2001). Lessons from Railway Reforms in Brazil and Mexico. Transport Policy 8 (2001), p. 85-95.

[267] Villa, J. C. & Sacristán-Roy, E. (2012). "Privatization of Mexican railroads: Fifteen *Years Later*." Research in Transportation Business & Management 6 (2013), p. 45-50.

[268] OECD (2014). "Peer Review of Railway Freight Development in Mexico." International Transport Forum (ITF).

Figure 2 Tariffs in North American Railways 1960-1995 (Constant US 2015 cents)



Source: Thompson, L.; FNM company statistics, 1987; Statistics of Class 1 Railways, published by the US STB; Railway Trends, published by the Railway Association of Canada.

FNM undertook several largely unsuccessful institutional reforms during the 1980s, and by the early 1990s, was operating with an annual deficit of over a half billion US dollars – the equivalent of 37 percent of its overall operating budget[269]. In an effort to improve its financial standing and productivity, commercially-oriented structural changes were announced under the Program for Structural Change (PCE). The initiative did lead to higher labor and locomotive productivity as well as improvements in FNM's financial performance, but the overall outcomes were insufficient to turn around the organization.[270]

Faced with an underperforming FNM and heavy competition from trucks, and the financial crisis of 1994-95, which required the government to take severe measures to reduce public spending, Congress amended the Constitution to permit private participation in the national railways in 1995. The same year, the government of Mexico announced that the FNM's network would be divided into manageably-sized rail lines for concessioning. A new railway law, the 1995 Railway Services Regulatory Law (LRSF), was passed outlining general procedures and conditions for private sector investment in the sector. Regulation of railway services continued to be administered by Mexico's Secretariat of Communications and Transportation (SCT).

[269] Villa, J. C. & Sacristán-Roy, E. (2012). "Privatization of Mexican railroads: Fifteen Years Later." Research in Transportation Business & Management 6 (2013), p. 45-50.
[270] Campos, J. (2001). "Lessons from Railway Reforms in Brazil and Mexico." Transport Policy 8 (2001), p. 85-95.

3 Reform Goals

The Mexican government's reform objectives were to:

- Transfer the management of the railway from the publicly run FNM to the private sector
- Design an industry structure that encourages rail-to-rail market competition among vertically integrated operators
- Enable the railways to gain stable financial footing and minimize government subsidies in the railway sector

4 Reform Process

Much consideration was given to how to break up the FNM network into manageable concessions, and it was ultimately decided that a combination of geographic divisions and key freight markets would best foster intra-modal competition while also offering the highest return for the government. Under the design, no one concessionaire was to be granted sole access to a selected set of major cities, industrial areas, or key ports (Figure 3). In other words, the Mexican government used prescribed competition along routes or corridors where traffic levels were sufficiently high that two operators could be competitively sustained.

Three major rail lines were demarcated for concession, named after the geographic region they served – Pacific-North, North-East, and South-East – as well as a number of small concessions along purpose built or low traffic short-lines.

Figure 3 Geographical Characteristics of the Concessions

	Pacific-North	North-East	South-East	Short-lines
Track (% of total)	30.3	19.3	10.7	38.7
Freight traffic (% of total)	46.2	37.6	8.6	7.8
Revenues (% of total)	44.7	37.1	9.8	8.4
Main cargoes	Iron, coal, oil, grain	Corn, wheat, iron	Corn, wheat, oil	Various
Major industrial cities	Mexico City, Monterrey, Guadalajara	Mexico City, Monterrey, Guadalajara	Mexico City	Various
Major ports	Tampico, Manzanillo	Tampico, Veracruz, Lax, Cardenas	Veracruz, Coatzacoalcos, Salina Cruz	None

Source: Campos, J. (2001). "Lessons from Railway Reforms in Brazil and Mexico." Transport Policy 8 (2001), p. 85-95; SCT, 1996; Diario de la Republica Mexicana (Official Gazette)

Under the terms of the concessions, three guiding principles were used to drive competition as well as provide sufficient incentive to concessionaires:

- Allowance for parallel tracks
- Creation of alternative routes from ports and borders to key markets
- Designation of trackage rights[271] along defined segments of the network

[271] Trackage rights are agreements that grant one company (the "tenant") the right to operate along a railroad owned by or concessioned to another company (the "owner"),

Between 1996 and 1999, three major concessions (Figure 4) were granted along the major rail lines, as well as a series of short-line concessions (Figure 5)[272].

Figure 4 Main Concessions Awarded

Concessionaire	Rail Line	Length (km)	Concession date	Approx. value (US$ million)	Concession period (years)
Kansas City Southern de Mexico (KCSM, formerly TFM)	Northeast Railroad	4,300	May 1997	1,400	50
Ferrosur	Southeast Railroad	1,480	Dec 1998	322	50
Ferrocarril Mexicano (Ferromex)	Pacific-North Railroad	8,450	Feb 1998	527	50

Source: Texas Transportation Institute (2001). "The impact of Mexican rail privatization on the Texas Transportation System"; and Villa, J. C. & Sacristán-Roy, E. (2012). "Privatization of Mexican railroads: Fifteen years later." Research in Transportation Business & Manage-ment 6 (2013), p. 45-50.

The concessions were awarded through a competitive bidding process and were each 50-year terms for the operation and management of the infrastructure, with 30-year exclusive operating rights. After the 30th year of the concessions, which will occur in 2027, the exclusivity rights are open to renegotiation, and concessionaires may lose their exclusive access. The Mexican government received approximately US$ 3 billion from the concessions (2014 prices)[273].

In the case of Mexico City, equal access was made possible by designating neutral track managed by a terminal company (TFVM) jointly owned by the three major concessionaires and the government of Mexico.

Passenger services were not a major concern in the reform process as public road transport in the country was largely considered sufficient, and passenger rail services were discontinued when alternative land transport was available. Where deemed essential, passenger services were either included in the aforementioned concession contracts, or were awarded under separate concessions to whichever company that offered to operate with the lowest subsidy.[274] The reason the Government had retained an interest in the Vale de Mexico concessions was so that it could award suburban passenger service concessions on some of the system, notably the part that was electrified some years ago, but the electrification was never used by FNM.

for agreed upon fees and access rights. In Mexico's case, trackage rights were mandated by law along certain routes to force competition. The total distance amounted to 2,160 km, equal to 12% of the total concessioned tracks.

[272] Chiapas-Mayab, a Mexican subsidy of the private investor, Genesee and Wyoming, decided to exit the Mexican market after the railway was heavily damaged by a hurricane. Given the traffic levels, costs of maintaining the network and overall difficulty of the operation prevented the private investor from continuing with the concession after the damage. The government re-took the railway, but it is uncertain if the government will concession that portion of the railway or if there is enough traffic to sustain a private operator.

[273] OECD (2016). "Establishing Mexico's Regulatory Agency for Rail Transport: Peer Review of Regulatory Capacity." International Transport Forum (ITF).

[274] Campos, J. (2001). Lessons from Railway Reforms in Brazil and Mexico. Transport Policy 8 (2001), p. 85-95.

Figure 5 Map of Conessioned Lines

In 2001, FNM was dissolved and its 1985 enabling law (the Constitutional Law of the National Railways of Mexico) was repealed[275].

In 2002 and 2006, Grupo Mexico, owner of Ferromex, attempted a buy-out of Ferrosur, but was twice blocked by the Federal Competition Commission (COFECE, formerly CFC) and KCSM, one of the other concessionaires. Eventually, KCSM withdrew their objection to the transaction after KCSM and Ferromex reached an agreement on trackage rights along critical sections of the network, which led to the successful takeover of Ferrosur by Grupo Mexico.[276] The end-result stresses the importance of trackage rights in ensuring fair competition between concessionaires.

[275] See the 2001 Decreto por el que se extingue el organismo público descentralizado Ferrocarriles Nacionales deMéxico y se abroga su Ley Orgánica

[276] OECD (2016). "Establishing Mexico's Regulatory Agency for Rail Transport: Peer Review of Regulatory Capacity." International Transport Forum (ITF).

In 2015, an amendment to the 1995 LRSF that addresses, among other issues, trackage rights and tariff setting was passed. The amendment also established the Railway Transport Regulatory Agency of Mexico (ARTF), a decentralized government body under SCT whose purpose is to serve as the dedicated regulator of Mexican railways[277], which started operation in August 2016. Specifically, ARTF's mandate is to resolve rate and service disputes and to set forth conditions for access through trackage rights when concessionaires cannot reach an agreement on their own accord.

5 Reform Results

The Mexican reform process did many things right. The Mexican government made a well-conceived plan for undertaking the concessions, and by revising or rewriting the laws accordingly, established a conducive legal environment for the private sector participation in the country's rail sector. By setting objectives for reform and designing a clear framework on how concessions were being offered, they were able to attract serious investors into the bidding process. The government decided on liability-free concessions, meaning that the concessionaires were not responsible for FNM's historical debt or existing union labor contracts.[278]

The reforms and associated laws allowed for a liberated market in terms of tariff setting. As a principle, railways need to be regarded as commercial businesses in order to encourage efficiency and engender both intra- and inter-modal competition. The Mexican government provided the concessionaires with the legal and regulatory freedom to set tariffs with individual shippers, so long as competitive alternatives were present.

However, trackage rights have been a constant challenge in the Mexican reform, and to date, many disputes remain unresolved. The concessions could have provided more benefits if the terms, conditions, and deadline for trackage right agreements had been specified during the concessioning process. Clear guidelines on this issue could have facilitated different concessionaries and the government to reach an agreement on the trackage rights, which, in turn, would have expedited investment to improve rail service.

Although the concessions explicitly delineated which lines would be subject to trackage rights, the law does not provide the terms of the agreements. The issues of trackage rights have been left at the discretion of the concessionaires to negotiate amongst themselves. In cases where concessionaires are unable to reach a voluntary agreement on trackage rights or where no effective competition exists, SCT is intended to intervene[279].

---

[277] Posada, M. Inicia operaciones Agencia Reguladora de Transporte Ferroviario, 18 Aug, 2016. Accessed at: http://www.jornada.unam.mx/ultimas/2016/08/18/inicia-operaciones-agencia-reguladora-de-transporte-ferroviario

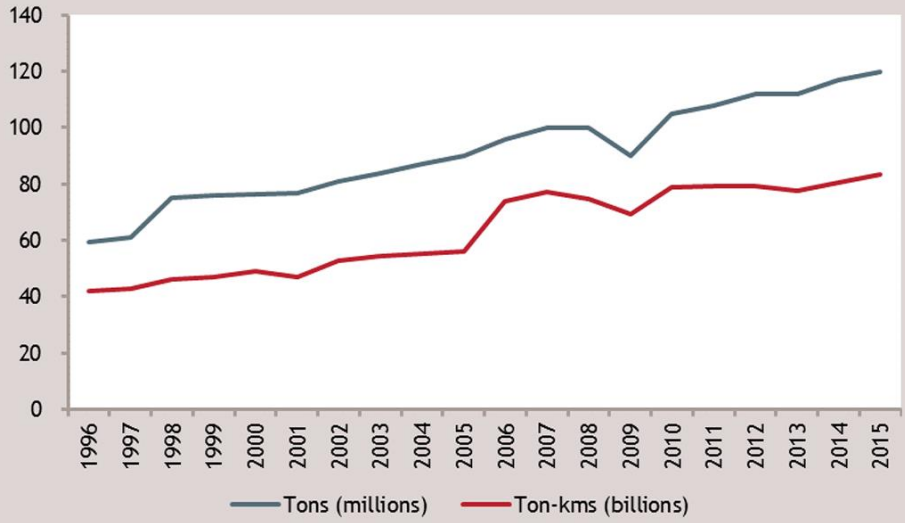
[278] Villa, J. C. & Sacristán-Roy, E. (2012). "Privatization of Mexican railroads: Fifteen years later." Research in Transportation Business & Management 6 (2013), p. 45-50.

[279] The role of the SCT is in many ways envisioned to be similar to the regulators in the US and Canada and is limited to intervention in the case that no effective competition exists (which was in itself controlled for in the geographic design of the concessions) or when concessionaires are unable to agree on trackage rights.

These negotiations have largely resulted in stalemates. A major reason why trackage rights were contentious was that KCSM's extremely high bid was based on the market power granted in the concession design. If the Government forced competitive access on inadequate terms, it would attack the value of the concession and compensation would probably be required.

When faced with legal challenges, in many cases SCT has been unable to defend its case with sufficient analysis and argumentation[280]. The establishment of ARTF was needed precisely to build effective evidence-based cases. Further, setting cost-recovery tariffs have proved challenging due to the characteristically high capital cost of railways[281]. These disputes directly reduce market competition, since operators are effectively blocked along key trade corridors. In response, shippers from various industries (in particular, steel, minerals, and cereals) have contested tariffs citing a lack of alternative access.[282]

Figure 6 Rail Freight Traffic in Mexico 1995-2015



Source: SCT 2015, OECD (2014), "Peer Review of Railway Freight Development in Mexico." Interna-tional Transport Forum (ITF)

Notwithstanding, the reform can be hailed as a success. Mexican railways compare favorably with North American railways in terms of operating efficiency, which are

[280] The "amparo" mechanism in Mexico is designed to protect citizens and businesses from arbitrary government action. Thus, if an SCT decision is not backed by sufficient analysis and argumentation, judges will rule against it under the amparo mechanism.

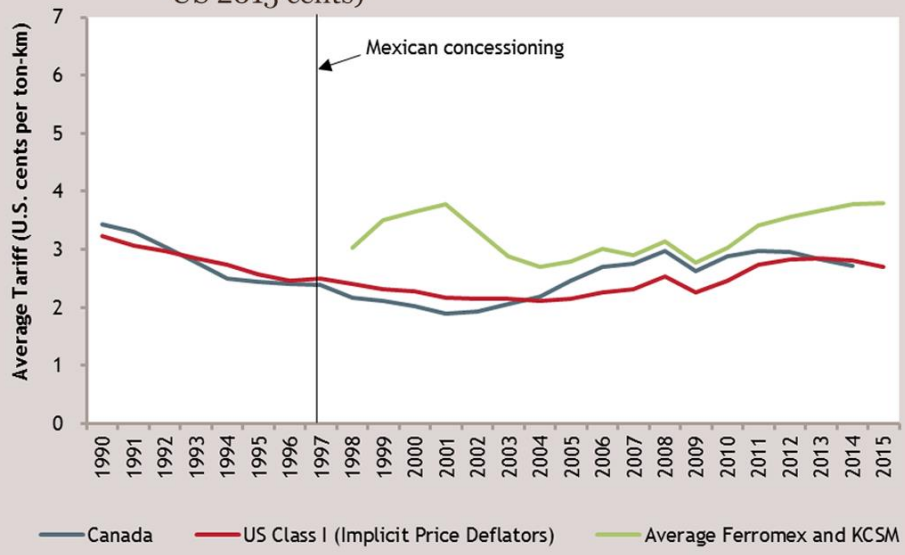
[281] An important aspect of tariff setting is that railways have characteristically high capital costs and low marginal costs. Thus, a tariff structure needs to allow vertically integrated operators to, in one way or another, recoup capital costs associated with its fixed infrastructure assets. Naturally, tariffs should be set high enough to cover the operating costs associated with shipping freight to its destination, but the decision as to how capital cost should be recovered is not as simple. In Mexico, a structure modelled on Ramsay pricing is used, whereby each shipper pays the highest individualised tariff based on the elasticity of their demand, i.e. discriminatory pricing. Each shipper does, without exception, benefit from discriminatory pricing because the cost is optimised: larger, less elastic shippers receiving higher tariffs are still paying a lower tariff than they would if smaller, more elastic shippers were priced off the railways.

[282] OECD (2016). "Establishing Mexico's Regulatory Agency for Rail Transport: Peer Review of Regulatory Capacity." International Transport Forum (ITF).

among the top-performing railways in the world in this regard. Both Ferromex and KCSM are Class I railways, with operating revenues exceeding US$250 million or more (measured in 1991 dollars). Traffic volumes doubled from 1995 to 2015 (Figure 6), and over the same timeframe, the rail market share compared to road has increased from 19 percent to over 25 percent[283].

Since the concessions took place, Mexican freight tariffs have been competitive compared to those in the US[284] and Canada (Figure 7). Subsidies from the Mexican government in the rail sector have been entirely eliminated.

Figure 7 Tariffs in North American Railways 1990-2015 (Constant US 2015 cents)



Note: 70% of FNM losses are assumed to be attributed to freight services between 1970 and 1987, while the remaining 30% are assumed to be attributed to the limited passenger services.

Source: Thompson, L.; Ferromex and KCSM reports to the Association of American Railroads (AAR) published in Railroad Facts; Statistics of Class 1 Railways, published by the US STB; Railway Trends, published by the Railway Association of Canada.

Productivity improved markedly and across the board since the concessionaires took over from FNM (Figure 8). By 2005, less than ten years after the concession, locomotive productivity more than doubled, while wagon productivity improved by 84 percent. Both have remained steady or improved ever since.

Figure 8 Mexican Railways Productivity Results

	1995	2000	2005	2010	2015
Locomotive Productivity (million ton-km per locomotive)	26.9	37.9	61.2	65.0	65.2
Wagon Productivity (million ton-km per wagon)	1.1	1.6	2.0	2.8	2.5
Labor Productivity (million ton-km per employee)	0.8	3.6	5.3	5.5	5.4

Source: SCT Statistical Yearbooks

[283] OECD (2014). "Peer Review of Railway Freight Development in Mexico." International Transport Forum (ITF).

[284] When average US freight tariffs are adjusted to account for the low tariffs associated with the coal industry in the US, Mexican freight tariffs are more or less equal to the US average.

Investment made by the private sector includes renewal of rolling stock, while reducing the fleet size and yet still keeping up with growing market demand through the purchase of higher horse power locomotives to replace older models. At the same time, productivity of the existing and new equipment was augmented by better maintenance and management practices, introduced in some cases by management from the U.S. and Canadian railways. Further, capital expenditure in track and equipment equating to almost twice as much as was committed in the concession agreements. Track improvements have allowed for the use of double-stacked container trains along major lines. The public sector has also invested in bypasses for congested city centers. Altogether, over US$9 billion[285] has been invested in Mexico's railway network since the reform.

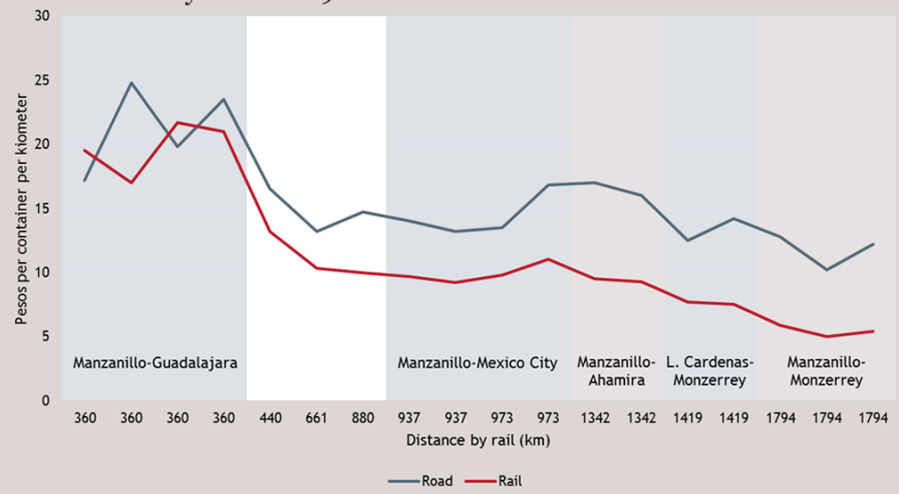
In terms of the labor force, employee productivity increased almost seven-fold. An important aspect in the design of the reform was how the Mexican government handled labor liabilities. The Railroad Union (STFRM) was continuously consulted during the concession process, and STFRM's contract was renegotiated whereby the government would pay all workers and terminate their contracts. A trust fund for retirees was created from the sale of the concessions. This approach effectively removed the labor liability from the future concessionaires and allowed them to re-hire necessary employees based on needs and employees' qualifications and experience.[286]

In the three years after the concessions took hold, the workforce was reduced by 62 percent, from 45,500 to 17,500. In subsequent years, the sector shed on average just below 7 percent per year[287]. Meanwhile, traffic volumes and market share were growing.

Tariffs have decreased substantially and are both in line with North American freight rates and competitive with road, particularly over long distances (Figure 9).

[285] Villa, J. C. & Sacristán-Roy, E. (2012). "Privatization of Mexican railroads: Fifteen years later." Research in Transportation Business & Management 6 (2013), p. 45-50.
[286] Ibid.
[287] Campos, J. (2001). "Lessons from Railway Reforms in Brazil and Mexico." Transport Policy 8 (2001), p. 85-95.

Figure 9 Cost per Kilometer for Containers Carried by Truck and by Rail 2009



Source: OECD (2015). Logistics Strategy and Performance Measurement: Mexico's National Ob-servatory for Transport and Logistics. International Transport Forum (ITF).

Grupo Mexico (including Ferromex and Ferrosur) and Kansas City Southern (holding company of KCSM) both operate profitable rail divisions and are publicly traded companies.

Grupo Mexico is comprised of three complementary divisions: Mining, Transport, and Infrastructure. Grupo Mexico is listed on the Mexican Stock Exchange (BMV) and is the fourth largest in the market in terms of market capitalization. Between Ferromex and Ferrosur, Grupo Mexico holds approximately two-thirds of the rail market share in Mexico. Its rail holding company produced net sales of US$ 1.89 million in 2015 with a gross margin of 40 percent. In 2014, its EBITDA margin was 34.5 percent, and its profit margin was 17.4 percent.[288]

Financial results from Ferromex are presented in the table below. Prior to the 2011 approval of the merger of Ferrosur and Grupo by COFECE, the financial information for Ferrosur was not consolidated with Grupo México.

Figure 10 Ferromex (of Grupo Mexico) Key Financial Statistics (million USD)

	2005	2010	2015
Operating Revenue	764	1,168	1,511
Operating Expenses (incl. admin.)	582	900	1,090
Operating Income	182	267	421
Net railway operating income	136	200	306
Capital Expenditures	89	127	290

Source: AAR Handbook

[288] Grupo Mexico Annual Reports.

Kansas City Southern is a transportation holding company with railroad investments in the U.S., Mexico, and Panama, and is listed on the New York Stock Exchange (NYSE). KCSM is its Mexican subsidiary, which operates a rail service between Mexico City and Laredo, Texas in the U.S. The border city is the busiest crossing between the two countries, in terms of both value and volume of road and rail traffic[289].

Historical financial results of KCSM are presented below. KCSM accounts for nearly half of Kansas City Southern's total freight revenue[290].

Figure 11 Kansas City Southern de Mexico (KCSM) Financial Statistics (million USD)

	2005	2010	2015
Operating Revenue	718	795	1,170
Operating Expenses	674	563	740
Net Income	104	64	289
Total CAPEX	81	101	337

Source: AAR Handbook

6 Conclusion

The Mexican railway reform transformed what was a deteriorating rail industry in the 1980s into a profitable and increasingly efficient railway. The thoughtfully-designed and well-executed concession process met the government's objectives for reform. Private sector operators were ushered in, which created intra- and intermodal competition, reduced tariffs, eliminated government subsidy in the freight market, and significantly improved productivity in the sector. The Mexican rail freight market has grown, both in terms of market share and volume.

The success of the concessions to date has been driven by a number of key factors, including a favorable existing environment at the time of concessioning. Although traffic had declined historically, the rail network remained functional at the beginning of the concessioning process. Initial investment in track and rolling stock was used to increase capacity and productivity in key areas, but was not needed to revive a non-existent network.

The Mexican rail network has always been directly linked with the North American integrated network, which has been mostly under private operation throughout its history. This has provided an ongoing example of effective mechanisms for long-distance movement of freight through interline agreements and clear mechanisms for division of through tariffs. In terms of cross-border trade, NAFTA has increased

[289] Villarreal, M. and Wilson, V. "Transportation Policy Brief #4 Rail and Logistics Hubs: Opportunities for Improvement." University of Texas. September 2015.

[290] Prince, S. How Kansas City Southern's Intermodal Performed against US Railroads. Nov 15, 2016. Accessed at: http://marketrealist.com/2016/11/how-kansas-city-southerns-intermodal-performed-against-us-railroads/

North-South flows throughout North America. Mexico and its rail industry benefited in particular from near-shoring of the automotive industry, whereby manufacturers have relocated to Mexico to serve the US market.

Since the concessions, regulation of the Mexican railway industry has been light-handed, essentially limited to resolving conflicts that could not be resolved through commercial negotiation. The design of the concessions, particularly the combination of geographically defined exclusivity periods and limited designated trackage rights with access fees, was carefully thought out from the start, despite implementation proving somewhat difficult. Although some disputes have been resolved, trackage rights remain a central issue.

The original concessions provided operators with 30 years of exclusive rights to their tracks, which are due to expire in 2027. As the expiration date nears, any uncertainty in the regulatory environment of the sector may slow investment and adversely affect industry performance. A common concern with concessions is that railway assets can become rundown over the course of the concession. Despite ongoing investment, Mexico's situation is not immune to this risk. The concessionaires and the government are going to need to deal with increasingly aging assets and associated investment needs, well beyond the 2027 expiration date.[291]

To assure operators, ARTF will need to exhibit both confidence and restraint in managing trackage rights and tariff disputes, as well as the broader challenges related to the sector framework and operations. In order to clear impact on disputed tariffs, ARTF must be afforded the resources to be able to make sufficiently argued, evidence-based decisions that will be accepted by judges in the technical courts. ARTF should decide early on what is exempt from regulation, and whether they will settle disputes through mediation, final offer arbitration, or constrained market pricing (the latter being much more data intensive). It would be advisable to adhere to regulatory and technical standards similar to those in Canada and the US, and to favor a model with manageable information requirements as well as human resource needs.[292]

Consultation with market players will be a key factor in ensuring that the concessionaires remain confident in the system leading up the end of the 30-year exclusivity period. ARTF will face not only short-term challenges, but will need to provide stability in the sector to insure that investments are not interrupted and that the assets do not suffer over the long term.

[291] OECD (2016). "Establishing Mexico's Regulatory Agency for Rail Transport: Peer Review of Regulatory Capacity." International Transport Forum (ITF).
[292] Ibid.

Case Study
Moroccan Railways

1 Situation Before Reform

The Moroccan railway network was built in the 1920s and operated by three private foreign-owned concession companies. In 1963, the Government of Morocco created the *Office National des Chemins de Fer* (ONCF), a public corporation (*Etablissement public industriel et commercial or* EPIC) under the Minister of Transport, which took over management of the existing network and railway services operation. The ONCF is administered by a Board of Directors, chaired by the Minister, comprises eight representatives from various ministries, and has a General Manager appointed by *Dahir* (Royal Decree). During ONCF's first 25 year, ONCF, headed by the same General Manager, extended the network to better serve the phosphate mining industry, modernized infrastructure (high-volume traffic routes were electrified), and introduced high-quality passenger services on selected routes. As a result, traffic increased significantly: during 1963-78, phosphate traffic rose by 10 million tons and during 1980-88, passenger traffic more than doubled.

1.1 Economic Model Running Out of Steam

In the mid-1980s, the 1,900 km railway network was considered adequate; it served most of Morocco's major towns, ports, industrial and mining areas. The ONCF was active in three transport market segments: (a) the monopoly on phosphate rock transport from mines to ports; (b) general freight transport where stiff competition existed with the trucking industry; and (c) intercity passenger transport with significant market share on the few routes it served. Traffic density was high at 3.4 million traffic units per route-km. Most infrastructure was in good condition but close to capacity on some routes. Some rolling stock and locomotive power was nearing the end of its useful life but availability was satisfactory; 80 percent of rolling stock was more than 20 years old. Locomotive, freight wagon, and passenger coach productivity in ONCF was equal to or better than Western European railways, especially staff productivity (in 1988, ~570,000 traffic units per employee). In ONCF, managers and staff were technically competent and the working atmosphere was generally good.

Despite these favorable aspects, by the end of the 1980s, the railway economic model was declining in relevance. Beginning in 1980, ONCF's financial situation was seriously deteriorating and by 1986, the deficit had reached 30 percent of traffic revenues. Balancing ONCF's books depended increasingly on substantial funding transfers from Government, which was having its own fiscal problems. The transfers were not only unsustainable but also not fully transparent. Moreover,

competition was increasing from the deregulated road sector and ONCF competitiveness was seriously hampered by a 'technically oriented' internal organization and by cumbersome bureaucratic management procedures. Government had to approve tariffs, a State financial controller had prior review of expenses, and public procurement procedures were mandatory. In 1988, ONCF suffered a serious financial crisis that threatened its technical performance.

In 1994, as the financial crisis deepened, Government appointed a new ONCF general manager who enjoyed full Government support at the highest level. The formerly private-sector manager was granted a general mandate to 'fix' the railway. He assembled a new management team, promoted well-trained younger managers who were ready and willing to participate in railway sector turnaround, and established salary levels comparable to the private sector.

2 Reform Goals

2.1 Pragmatic and Progressive Approach

The restructuring program objective was to adapt railways to a more competitive transport sector, improve competitiveness and financial performance, and reduce Government financial transfers. The core restructuring program was implemented during 1994-02, and subsequently refined. The program transformed how railway activities were managed and ONCF's relationship with customers, Government, and company managers. The new ONCF management team dominated the design and implementation of the restructuring program, which was pragmatic and progressive, and tapped technical support from local and international consultants and international financial institutions, including the World Bank.

The team built consensus among primary stakeholders, including Government and ONCF staff, on the main reform components. The Directorate for public enterprises in the Ministry of Finance played a critical role in financial restructuring, a key element of the program. The medium-term restructuring program did not aim to transfer core railway activities to the private sector, which was considered premature and unviable—economically and politically. However, private sector involvement in support activities was considered favorably. Also, infrastructure separation was ruled out since the railway was too small for competition between operators, the primary benefit of creating separate legal entities for railway infrastructure management and rail services operation. The main components of the restructuring program are presented below.

3 Reform

3.1 Adapting to a More Competitive Transport Market

Freeing ONCF to determine service configuration and tariffs

In the general context of transport market deregulation already underway in road transport, the Government relinquished control to ONCF management, which reacted rapidly to rationalize passenger rail services by cancelling low-quality, low-use services. This reduced overall passenger services by about 25 percent, and passenger train stops by about 30 percent for a total loss in revenue of only 1.0 percent.

For retained passenger services, average fares were increased by 7.0 percent in 1994, and simultaneously ONCF introduced market-based fares and new passenger services (see below). For freight traffic, ONCF progressively replaced official tariffs with 'contract rates' to its main customers.

Adjusting phosphate rates

In 1994, rates for phosphate rock transport were adjusted. Phosphate rock transport carried out for the State-owned *Office chérifien des phosphates* (OCP) accounted for about half of total railway activity and rates had always been low to support the phosphate industry. Initially, the OCP refused any increase in ONCF-proposed base rate for phosphate transport but an independent audit of operations and operating costs convinced Government to approve a substantial increase.

Improving rail services quality

Improving customer services was a restructuring program priority. Phosphate transport and general freight services were good, so initially most improvements focused on passenger services. A new commercial strategy introduced 'shuttle' services on main routes, and the strategy was refined during restructuring. This influenced the investment program, which was developed and implemented during the restructuring period and beyond.

3.2 Slashing Operating Costs

The restructuring program pursued a rapid substantial reduction of operating costs. In 1995, thanks to a strict short-term ONCF management action program, operating costs were reduced by 20 percent over those of 1994. Improved control of staff costs was key and in 1994, the railways abolished recourse to temporary labor (about 5,000 staff), plus some managers' benefits. Also, the restructuring program introduced strict control of overtime and staff travel expenses; retired staff were no longer replaced. Other cost control measures included rationalizing spare parts management and reviewing maintenance procedures. Rationalizing passenger services also reduced operating costs.

3.3 Introducing a New Personnel Policy and Pension System

Reforming personnel policy

A long-term personnel policy was introduced that included: (a) new job descriptions for all positions to increase staff polyvalency; (b) new medium-term target staffing levels; and (c) new staff rules and regulations, based on private sector models, adopted through negotiation with unions. These changes were implemented without social unrest except for a brief employee strike in 1994. By 2002, staffing levels had plummeted to just under 10,000 from 14,367 in 1994, not including 5,000 'temporary' staff. By 2004, this number had dropped to 9,347. The ratio of staff costs to traffic revenue—a major determinant of railways' financial profitability—was 48 percent in 1994, 34 percent in 2002, and 30 percent in 2004. By 2004, staff productivity had risen from 450,000 traffic units/ employee to 875,000.

Transferring the pension system to RCAR

In January 2002, ONCF transferred the pension system to RCAR—a major step in restructuring. Prior to the onset of restructuring, ONCF managed an internal pension fund for retired permanent staff that was based on civil servant pension system rules. However, the staff demographic ratio was deteriorating and pension payments to retirees were rising, producing a mismatch of legally mandated ONCF pension contribution amounts. In 1994, the ONCF subsidy to fill this gap reached 21 percent of the ONCF wage bill and projections indicated the subsidy would rise to about 60 percent of the wage bill in 2007, and 90 percent by 2015. Clearly, the existing pension system was unsustainable and would jeopardize ONCF's financial position in the medium-term. The ONCF negotiated with an external pension fund, *Régime Collectif d'Allocation des Retraites* (RCAR), which assumed pension services for existing and future retirees. ONCF and RCAR agreed on a payment to RCAR of DH 5,868 million (equivalent to ~US$ 300 million). The ONCF mobilized DH 4,923 million in financing under favorable conditions on the Moroccan bond market; and DH 945 million in medium-term loans from Moroccan banks. Previously, Government accepted that, as a component of the ONCF financial restructuring package mentioned below, it would 'reimburse' ONCF for the cost of pension system transfers through annual equity participation in ONCF to be subscribed by the Government over a period of 15 years. Transfer of the pension system to RCAR—a major step in the restructuring program became effective on January 1, 2002.

3.4 ONCF Financial Restructuring

The ONCF financial restructuring was a crucial component of the restructuring program that ONCF management negotiated with the Directorate in charge of public enterprises in the Ministry of Finance. Agreements were formalized in two *Contrats-programmes* (CP) between Government and ONCF in 1994 (CP for 1994-98) and in 1998 (CP for 1998-02).[293] The CP defines primary policy elements and financial objectives for ONCF to implement during the period, and specifies Government commitments for financial support to ONCF by the Treasury. The main features included in the CPs for ONCF financial restructuring included:

- in 1994, Government provided an exceptional contribution to the 'rehabilitation' of ONCF balance sheet to compensate for the 'sins of the past' and allow ONCF to resume its operations on a sound financial footing; this contribution (DH 10,920 million, equivalent to ~ US$ 1,200 million) was provided, notably through conversion into equity of a substantial part of the debt previously contracted by ONCF.

- The Government reimbursed ONCF through subscription to ONCF equity over a 15-year period for the cost borne by ONCF to transfer the pension system to RCAR; (c) the Government did not pay operating subsidies to ONCF, except for explicit requests for ONCF to operate a service under a Public Service Obligation scheme (which never occurred during the period).

[293] ONCF further signed CPs in 2002 for the 2002-2005 period and in 2005 for the 2005-2009 period.

- ONCF implemented the investment program described in the CP; the program included principally infrastructure renewal and upgrade on the existing network and rehabilitation and acquisition of rolling stock.

- An investment program financing during the 1995-02 was mobilized through ONCF internal cash generation and loans subscribed directly by ONCF and through an increase in ONCF equity to be subscribed by Government for DH 700 million (~ US$ 80 million).

Remarkably, Government and ONCF honored the CP provisions.

3.5 ONCF Corporate Reorganization

In 1994, ONCF was organized along traditional lines that were common in European railways at that time—technical functions took precedence—infrastructure, operations, including train movements, rolling stock and locomotive power, including train driving. The operations department handled marketing and commercial functions but these were given little importance. During the first phase of restructuring, ONCF management chose to retain this organization in principle, with a streamlined simplified chain of command well-adapted to implementing the first priority—rapidly cutting operating costs. A major change was that the finance department became a key player in the decision-making process, no longer merely a 'cashier.'

After a few years, it was clear that the traditional organization was unsuitable for commercial management of the railway. Instead, the ONCF management organized by internal business units, using principles that had been successful elsewhere, notably in North American railways. After adopting the new organizational architecture, unit managers were designated in advance. Working groups benefitted from the support of a high-level consultancy firm that designed the new organization in detail, including preparing new job descriptions, defining new procedures, and selecting staff. This process, which took more than one year, was an investment in developing full ownership of the new organization by managers and staff.

The development process facilitated a paradigm shift—the old organization ceded to the new organization on July 1, 2002, without disturbing railway functioning. Very little organizational fine-tuning was necessary in the following months. The new corporate organization has two main components: (a) four business units—infrastructure, including train movement control, phosphate transport, freight transport, and passenger transport; and (b) a general management unit, including functional and support departments, including finance, personnel, strategy, information systems, etc. Transport units are managed as autonomous entities, responsible for commercial relations with customers, full control of staff, rolling stock and locomotive power operations and maintenance. The new organization was instrumental in improving customer relations, encouraging innovations in service design and quality, and developing traffic volume and profitability.[294]

[294] Changes were introduced in the organization in 2009 to adapt ONCF to the new challenges it is facing. A new business unit has been created for Infrastructure Development (in charge notably of construction of a High Speed Passenger line). Rolling Stock Maintenance has also been concentrated in a separate business unit, with a perspective of facilitating in the future a possible partnership with the private sector in this field.

3.6 New Legal Framework for Railway Activity

Opening to competition

In parallel with implementing ONCF restructuring, work began on a new legal framework for railway activity. The legal underpinning of the sector dated to the creation of ONCF in 1963, when railway activities were considered 'public service' rather than 'commercial'. Preparing a new legal framework required discussions among ministries and the ONCF, and a lengthy parliamentary procedure. Eventually, on January 20, 2005, a new law was adopted and promulgated. The law opens railway activities to competition and allows railway enterprises to be created distinct from ONCF.

The law is flexible, allows separation of infrastructure from operations and vertical integration of railway activities. According to legal provisions, railway enterprises comprise 'rail infrastructure management enterprises' in charge of maintenance and operation of rail infrastructure, and 'railway services operators' in charge of technical and commercial operations of railway services. Legally, rail infrastructure management enterprises operate under concessions signed by Government; railway services operate under licenses granted by Government. Also, a railway enterprise may merge the role of a rail infrastructure management enterprise and a railway services operator; in which case its legal basis is a concession regime. The law distinguishes between 'commercial' railway services and public service obligations resulting from a formal Government request. To date, no railway enterprise distinct from ONCF has been created.

Creating a joint-stock company to replace ONCF will abolish ONCF as an *Etablissement public industriel et commercial* (EPIC) and rail infrastructure management and railway services operations on the existing network will be granted under a concession agreement to a fully State-owned joint stock company, the *Société marocaine des chemins de fer* (SMCF). The new joint-stock company will have autonomy to manage the railway enterprise, facilitate private-sector partnerships, and reinforce an 'arm's-length' relationship between Government and railways. Under law, ONCF will become SMCF when Government signs the concession agreement, which has yet to happen. When the law to transform ONCF into SMCF was adopted, it was discovered that under existing financial regulations, ONCF would owe some DH 14,000 million in taxes (~US$ 1,600 million) to the Treasury, which is infeasible. Therefore, Parliament is reviewing a draft bill to amend the January 20, 2005 law, which would remove the financial impediment to creating SMCF; adoption of the law is expected soon.

4 Results

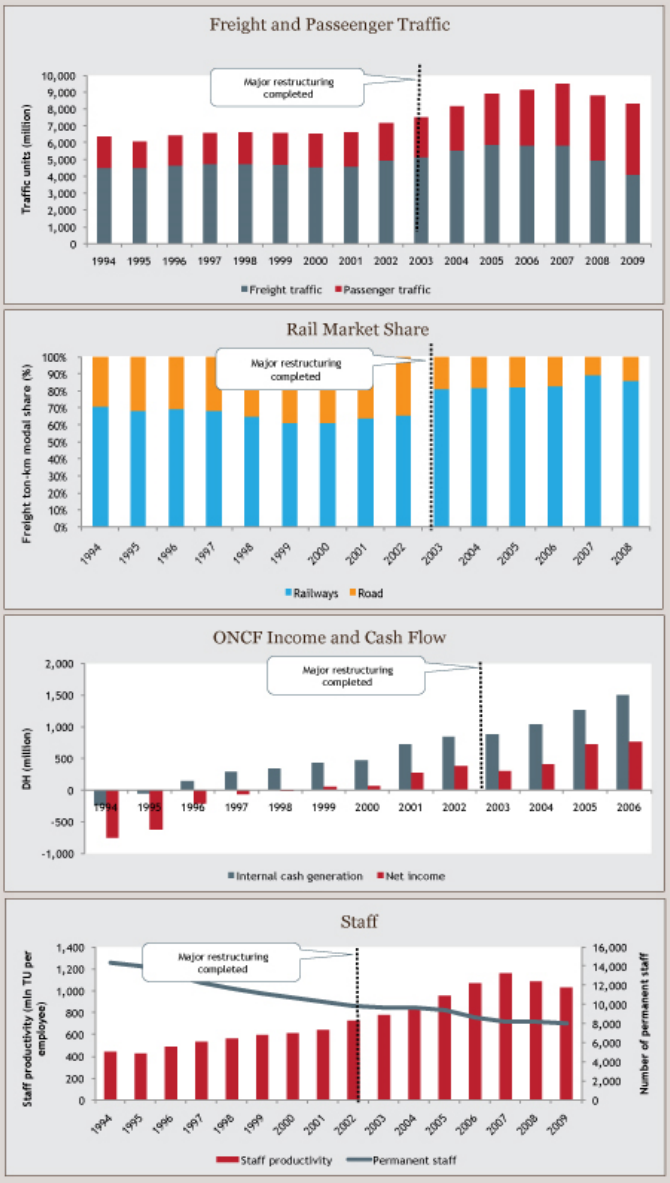
The Moroccan railways restructuring process is a great success, despite the delay in creating the joint stock company to manage and operate the railway network. Restructuring publicly owned railways without an upfront legal and institutional shakeup is rare. By 2004, Morocco had transformed ONCF into a truly commercial, financially sound, business-oriented enterprise. Compared to 1994, traffic volume increase was noticeable, railway modal share had increased compared to freight carried by road, and staff productivity had almost doubled (Figures 1 and 2).

Figure 1 ONCF Operational and Financial Indicators 1994-2006

	1994	2004	2006
Freight traffic (000,000 tkm)	4555	5535	5827
Passenger traffic (000,000 vkm)	1922	2645	3333
Total traffic (000,000 tu)	6477	8180	9160
Traffic density (000 tu per route-km)	3395	4304	4803
Permanent staff	14367	9347	8625
Staff productivity (000 tu per employee)	451	875	1062
Ratio of staff costs to traffic revenue (%)	48	30	27
Internal cash generation (DH million)	234	1043	1506
Net income (DH million)	744	411	762

Financial recovery was spectacular, primarily achieved by generating substantially higher net income that improved the ratio of staff costs to traffic revenue. By 2004, these achievements had laid a solid foundation of commercial, technical, and financial success for future sector improvements, as demonstrated by excellent results in 2006.

Figure 2 ONCF Operational and Financial Indicators 1994-2009



Source: UIC, ONCF and Statistical Yearbooks of Morocco 1997-2008

5 Conclusion

Lessons learned from the Moroccan experience in restructuring state-owned railways are as follows.

- Typically, crisis is the best driver for reforming the railways. Government agreed to embark on a restructuring process only after a few years of financial crisis forced it to confront the fiscal implications of railways operations and management.

- Restructuring is a long process; in Morocco it took six to ten years. Restructuring required continuity in senior management and tenacity for implementation because it involved multiple stakeholders and a complete change of vision of railway activities. By contrast, almost instant and visible results must happen early on to establish credibility and get buy-in for further reforms; generally, this means rapid cost cutting.

- Government must make a huge financial contribution to expunge past debts. Government must make a clear commitment and abide by it—Morocco used the Contrat-programme tool.

- Government ministries and bodies must agree on and actively support the general restructuring strategy, but avoid meddling in railway enterprise management or 'tactical' implementation of the restructuring program.

- Restructuring champions are necessary, preferably inside the railway enterprise; in Morocco, a strong and dedicated general manager was substantially instrumental in the success. Champions keep the momentum going because railway management and staff must be convinced that restructuring is being undertaken to strengthen the railway, not to undermine it.

Case Study
Polish Railways

1 Introduction

The Polish railway industry was devastated by the collapse of the planned economy in Eastern Europe and Central Asia. Traffic volumes plummeted as traditional rail customers vanished. At the same time, Government deregulated road transport, unleashing fierce competition for the remaining traffic. This led to severe financial, market, operational and asset challenges for the railway industry. Government responded with well-planned railway industry reforms, consistent with the European Union (EU) acquis communautaire[295] as it relates to railways.

Although the reform put in place an appropriate industry structure, the PKP Group initially lacked the leadership needed to benefit from the reforms. It was not until 2012 with the introduction of a commercially-oriented management fully supported by government policymakers that the reform began to take hold and see adequate allocation of funds, financial stability among key subsidiaries, and improvement in customer services. This case study describes these reforms, and their impact on the structure and performance of the Polish railway sector.

2 The Situation Prior to Reforms

In the early 1990s, the Soviet economic system collapsed, reducing steel and coal shipments, and driving down railway freight traffic in Poland. Polish State Railways, Polskie Koleje Panstwowe's (PKP), conducted all rail sector activities in the country, including freight and passenger rail operations. During the 1990s, PKP's freight revenues dropped by 67 percent in real dollars (Figure 1).

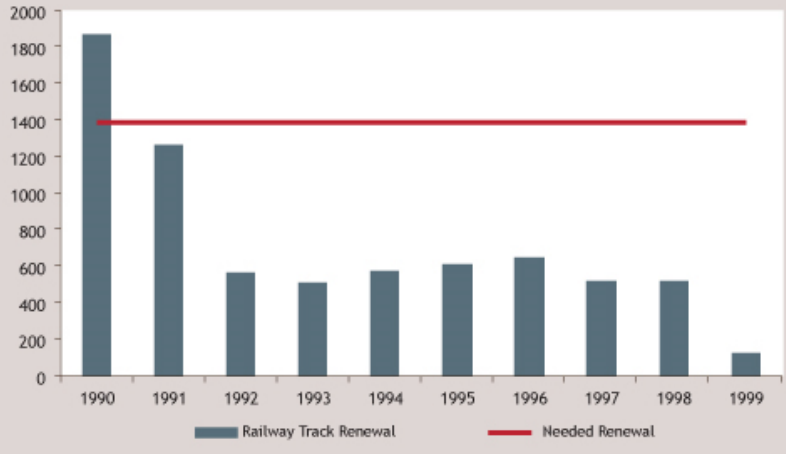
[295] The acquis communitaire is the accumulated body of European Union (EU) law and obligations as it has evolved since 1958 to the present day. It comprises all the EU's treaties and laws (directives, regulations, and decisions), declarations and resolutions, international agreements, and the judgments of the Court of Justice.

This drop was the result of a 34-percent slump in freight market turnover, and a 48-percent slump in passenger turnover (Figure 2). By end-1999, subsidies to sustain PKP were reaching 2.0 percent of GDP[296], and PKP's freight modal share had tumbled to 35 percent from a high of 51 percent.[297]

As railway financial and market performance plummeted, PKP's track maintenance backlog kept mounting, thus increasing infrastructure costs, and requiring the railways to impose slower speed limits on many lines (Figure 3). Maintenance and renewal backlogs were mounting in other asset classes as well, for example, 60 percent of the PKP signaling system was more than 40 years old.

[296] Technical Paper Number 533 – Expenditure Policies Toward EU Accession (World Bank)
[297] World Bank Railway Database

Figure 3 Increase in Infrastructure Maintenance Backlog



Source: World Bank, Poland: Towards a Sustainable Land Transport Sector

Operational productivity declined less than traffic—and in some cases improved—because PKP employed multiple strategies to cope with the tough market and financial environments (Figure 4). Employee productivity improved as PKP transferred some non-core activities to other ministries, and offered severance packages to some staff. Asset productivity was mixed, as PKP responded to the market by moving excess capacity out of rotation as political and physical constraints allowed.

Figure 4 Summary of Subsidiary

	1991	1995	1999
Coach Productivity (000 of Pkm per Coach)	3,156	1,817	2,101
Locomotive Productivity (000 of TU per Loco)	15,241	14,632	18,379
Wagon Productivity (000 of ton-km per Wagon)	279	592	574
Employee Productivity (TU per employee)	337	371	374
Track Productivity (TU per standard track km)	4,488	4,062	3,571

Declining revenues, market performance, asset condition, and mixed operational productivity indicated that aggressive reforms were needed in the Polish railway industry.

3 Reform Goals

Polish State Railways reform objectives, as adopted by the Council of Ministers in 1999, included the following:

- Financial and debt restructuring;
- Organizational restructuring, to transform into a holding company and prepare for private sector participation through open access and in subsidiaries through commercialization;

- Employment restructuring, to right-size the workforce, while ensuring social protection; and
- Asset restructuring, to improve assets condition and restructure ownership.

4 Reform Process

1995-2011

In 1995, Poland passed the first law to reform the railway system. The law mandated PKP separate accounting for freight, passenger, and infrastructure services, in order to provide transparency in business lines operations within PKP. In 1997, the law was fully implemented when the Polish government passed the Railway Transport Law, which aligned Poland with the EU acquis communautaire, established infrastructure, freight operations, passenger services, and traction as separate directorates under PKP. The 1997 law also initiated private sector involvement in the railway supply industry, and opened the railway network to third-party Polish operators. Thus this stage of the reform process accomplished three major goals:

- Prepared PKP for joint stock company formation by creating separate lines of business;
- Initiated private sector participation in the railway supply industry; and
- Opened the network to third-party Polish operators.

These organizational changes set the stage for further reforms but were insufficient for the railway sector to withstand the second economic crisis in 1999, which forced Government to take more aggressive actions to restructure PKP. In 2000, Government passed the Railway Restructuring and Privatization Law[298], based on EU Directive 91/440/EEC. The law established PKP SA as a fully state-owned joint stock holding company in January 2001. In October 2001, 24 subsidiaries were established, including PLK, which manages railway infrastructure; PKP Cargo, which operates freight services; PKP Intercity, which operates long-distance and international passenger transport; PKP Energetyka, which operates energy and traction services; PKP Przewozy Regionalne, which operates short-distance and regional passenger transport; and PKP Informatyka, which is in charge of telecommunications. Urząd Transportu Kolejowego (UTK) was established to regulate the railway market. PKP SA, the parent company, took over the total nominal debt of the transformed, post-governmental entity.

The new Law on Railway Transport was passed in 2003. It replaced railway concessions for operating on the network with more liberal licenses, with the aim of encouraging competition through private sector participation in the rail industry. In the two years following the enactment of the 2003 Law on Railway Transport

[298] Reforms were adjusted as they progressed, responding to the realities of domestic politics, economics, and evolving acquis communautaire requirements. The 2000 law (the Railway Restructuring and Privatization Law), which established the joint stock company holding structure, was amended in 2001, 2002, 2003, and 2004.

(which was amended in 2004), the regulatory body issued 57 licenses to independent operators. In 2006, under EU regulations, the Polish railway network opened to international operators.

Despite the conducive legal environment and the successful structural reform, PKP financial stability failed to improve immediately after the joint stock company was established. The operational and financial results of the reform through 2012 can be characterized as limited, largely attributable to poor governance and management that failed to operate the railways on commercial principles. The reform efforts also failed to gain strong support from politicians and trade unions, and therefore private sector involvement in PKP Cargo was deferred, and for other subsidiaries, substantially delayed.

Between 1990 and 2009, PKP reduced its labor force by 60 percent, mitigating negative social impacts with early retirement and severance packages. These packages were negotiated among PKP, trade unions, and Government, and financed by PKP from loans, own funds, and bonds. The World Bank and EBRD helped fund the severance program. This was important because availability of funds created management commitment to proceed and confidence with organized labor that severance could be paid.

2012 Onward

In 2012, PKP began a second wave of internal restructuring. After 11 years of implementing the Railway Restructuring and Privatization Law, PKP still faced a number of structural problems, including drastically decreasing number of passengers (-33% between 2009 and 2014), decreasing quality of services (in Eurobarometer survey conducted by EC in 2011, PKP was given the lowest rate in seven out of the eight categories among the 25 surveyed countries), deteriorating railway infrastructure and rolling stock quality, falling safety indicators, high level of debt and thus high debt servicing charges.

New market-oriented management supported by government was appointed in April 2012, and was given a high level of independence in decision making. The new management prepared a corporate strategy, which took into account the market orientation of its services and state-ownership relation. The following four strategic areas were identified to address the most compelling problems at hand:

- Systemic issues;
- Client;
- Finance and debt; and
- Management and Corporate Governance.

The strategy set clear objectives to improve the commercial performance of the subsidiaries, reduce traffic losses, and improve passenger satisfaction indicators. Better asset management was expected to improve PKP SA's asset productivity and identify assets for privatization. With a performance-based management program, a transparent incentive and remuneration system for management was introduced.

The first priority was to address systemic issues, namely improving: 1) the Public Service Contract (PSC); 2) investment process; and 3) safety. The primary goal concerning the PSC in 2012 was to renegotiate the formula used in the contract to increase its efficiency. The model used for calculating the compensation and reasonable profit did not provide sufficient revenue for PKP Intercity to be sustainable, particularly concerning its capability to undertake long-term investments. PKP SA began renegotiating the PSC in 2012 and 2013. Consequently, an annex to the PSC was signed on 28 August 2013, increasing the subsidy allocated to PKP Intercity by 62 percent until 2021. This helped PKP Intercity achieve long-term financial stability and provided the company with a concrete foundation for future development.

Second, to address the deficiencies in EU funds absorption, PKP needed to reorganize its investment management process. Expediting the infrastructure modernization required establishing a professional project management office responsible for overseeing timelines and project risks, engaging subcontractors, and implementing quality control audits. Increasing organizational competencies enabled PKP to increase the absorption of the EU funds from 12 percent at the end of 2011 to 99 percent of what was planned for the end of the 2007-2013 perspective settlement period in 2015. The remaining part of the investment program undertaken by PKP was the modernization of railway stations to address the needs of both passengers and surrounding communities, thus redefining the central areas in nearly every sizable Polish city.

Railway transport safety was among the crucial priorities for the government, and its importance was stressed even further after the 2012 rail crash near Szczekociny. The Ministry of Transport developed a comprehensive Railway Traffic Safety Improvement Program, which included 103 actions. Over time, the program was expanded to include more than 200 initiatives in four areas: investment, technical, organizational, and staff. The primary operational task in the program was the large-scale requalification and revitalization of the railways, with a focus on the elements that have the greatest impact on safety of the railway traffic. Particular emphasis was placed on modernization and reconstruction of level crossings, where the risk of accidents is substantially higher. The Program carried out by PKP improved railway safety, as evidenced by the substantial reduction in the number of accidents, fatalities and injuries. In this respect, 2014 was the safest year in the history of Polish Railways since 2005.

In terms of customer satisfaction, an initial diagnosis was conducted as a part of an effort to optimize customer contact points. It included a comprehensive review of the passenger experience at every stage of the journey – from buying a ticket, waiting at the train station, to the actual journey itself. To broaden the understanding of customer experience, a quantitative study was conducted to measure the level of satisfaction with respective services. Subsequently, a series of surveys were carried out biannually to track performance. This comprehensive approach to assessing customer service highlighted numerous shortcomings and generally low quality of services, in particular related to journey planning and ticket purchase, commercial offers, and cleanness of the trains and the stations. The annual timetable did not ensure regularity and interconnectivity, reducing the attractiveness of rail as a mode of transport. The implementation of all initiatives supported by

the modernization of infrastructure led to, in 2015, the first passenger traffic increase since 2011 and a significant improvement in customer satisfaction. What is more, PKP introduced dynamic pricing system, which allowed customers to buy tickets with significant discounts earlier before the journey. This solution proved to support increasing the customer base of PKP Intercity.

In financing, PKP successfully privatized four of its subsidiaries in the beginning of 2013. The transactions amounted to US$ 1.2 billion in transaction revenue. The largest transaction was the sale of shares in PKP Cargo (50 percent minus one share) through an initial public offering (IPO) on October 30, 2013. PKP decided to list PKP Cargo (as opposed to selling to a strategic partner) to generate financing while retaining some control over the company. The transaction was a first of its kind in EU, and to date, is the only national freight carrier listed on a European stock market. On its debut, the company was valued at US$ 1.16 billion, and its share price closed 19 percent higher than offer. The decision to list PKP Cargo through an IPO was both innovative and successful, and the process was selected as the Best IPO on the Warsaw Stock Exchange in 2013.

PKP continued to implement its ambitious privatization plan. In 2015, the management board conducted two privatization transactions: TK Telekom (telecommunication subsidiary) and PKP Energetyka (energy supplier). The privatization revenue made it possible for PKP to repay the historical debt. Consequently, Fitch increased the long-term rating of BBB foreign currency and BBB+ domestic currency, substantially reducing the cost of debt service and state guarantees issued to PKP. The funds gained from privatization were also partially utilized for recapitalization of the passenger carrier, PKP Intercity, for the amount of US$ 300 million. These funds comprised the majority of the company's investment program for the period of 2016-2018 worth US$ 500 million.

In addition, after conducting a strategic inventory of its real estate portfolio, PKP was able to increase sales of its redundant real estate assets from US$ 180 million during 2008-11 to US$ 370 million during 2012-15. PKP improved its asset management efficiency by selling redundant asset[299] and increasing the occupancy rate of commercial space at its stations. In addition, PKP SA also recognized the potential of undeveloped land in city centers surrounding the central railway stations and initiated several development projects to maximize income from such properties. For this purpose a special company was established – Xcity Investment, which realizes development projects jointly with developer companies.

Since 2012, PKP has made significant headway in the repayment of its historical debt, which decreased to US$ 130 million in 2015 from US$ 1.01 billion in 2012. A combination of the privatization of its subsidiaries and the sale of redundant assets allowed PKP to both gain control of its debt repayment obligations and fund its ongoing rolling stock modernization program for 2016-2018.

Adjusting the organizational structure and improving the management of PKP Group companies was crucial to successful implementation of its strategic initiatives. Since 2012, PKP has undertaken a number of initiatives to improve corporate

[299] For example, the PKP Group owns over 2,000 stations, but only about 600 of them are operating, and less than ten of the brought profit in the past.

governance standards. Better management at the operational level was achieved by reducing the number of board members at the Group companies. The largest companies introduced a system of management by objectives (MBO), whereby the level of remuneration depends on performance. To enhance the effectiveness of corporate governance, Audit Committees were set up by the supervisory boards of the subsidiary companies. The overall improvement in management effectiveness realized an increase in dividends paid by subsidiary companies to PKP SA. To optimize and integrate the support functions in PKP, PKP SA initiated group purchasing for all its subsidiary companies. This allowed for a stronger negotiating position in bulk purchase and yielded over US$ 40 million in savings.

5 Reform Progress Results

5.1 Market Performance

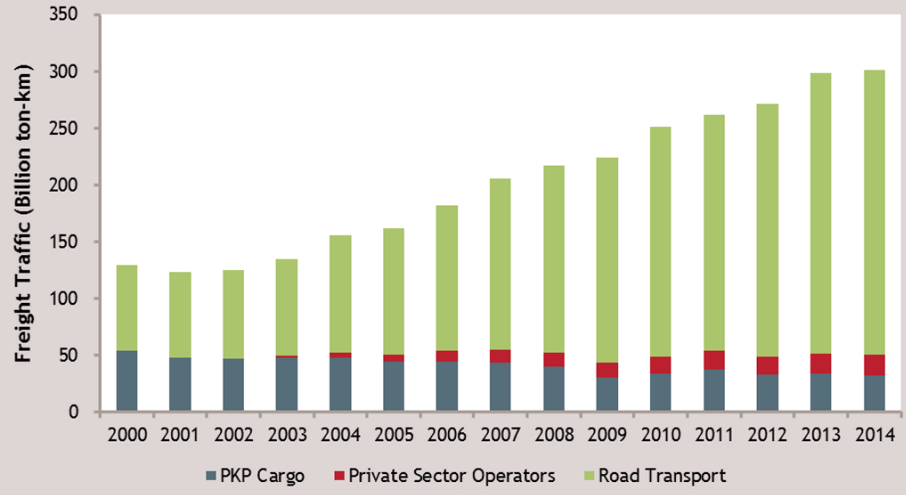
In Poland, rail freight companies faced increasingly stiff competition from road transport—a major reason why railway market performance failed to improve after the reform. Since early 2000s, passenger transport (by all public modes) has steadily decreased, while private auto traffic increased. Freight volumes in Poland have grown substantially, but the shift to trucks has been dramatic. The 2003 Railway Law and subsequent reforms opened the door for independent operators in the Polish rail industry, and thus PKP also faces direct competition from new rail operators, which has further reduced PKP's market share of what has become a shrinking market for overall passenger and freight rail services.

While PKP, which has become one of the rail operators in Poland, lost its rail market share due to the competition generated by the reform, the sector reform as a whole should be considered a success as the users of the services would ultimately benefit from the generated competition.

Freight Services

The PKP Group has two subsidiaries that provide freight transport services, PKP Cargo and PKP LHS. Despite a significant growth in freight transport in Poland, PKP has seen a decline in turnover because of the combination of: (i) a loss of freight transport market share to trucks; and (ii) increasing competition from private rail operators since the opening of the rail market to the private sector (Figure 5).

Figure 5 Road and Rail Freight Transport in Poland



Source: Author's analysis based on Eurostat Data; PKP Annual Reports; World Bank Data

Reforms have successfully engendered competition within rail cargo transport. By 2014, private operators' market share (Figure 5) in freight ton-kilometers had risen to over 40 percent. Significant private operators include CTL Logistics and DB Cargo Polska. Substantial international competition also entered the market as Poland joined the EU.

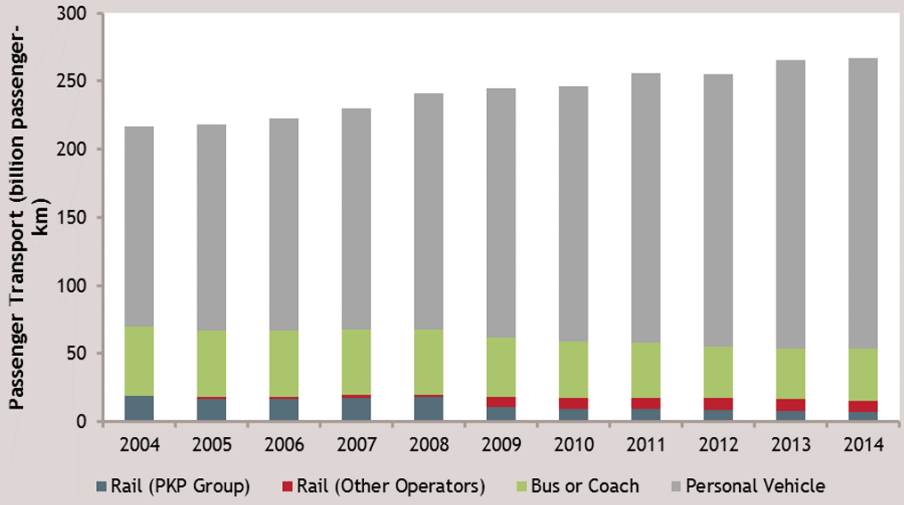
Passenger Services

As of 2008, passenger rail services were offered by two of the PKP subsidiaries, PKP Intercity and PKP SKM.

A broadly similar pattern holds for rail passenger transport[300]. While the overall passenger market grew, the volume of public passenger transport (rail and bus) declined, more than offset by an increase in the use of private cars. Passenger movement by rail decreased in absolute terms between 2004 and 2014, and as with freight traffic, PKP also saw a growing shift of rail passenger traffic to private rail operators (Figure 6).

[300] It should be noted that, in 2008, the shares of PKP Przewozy Regionalne, which offers local and regional domestic passenger rail services and whose revenues amounted to 2.8 billion PLN, were transferred to Poland's regional governments. In turn, PKP Intercity took over regional domestic transport in December 2008. This accounts for the significant jump in the market share attributed to other operators between 2008 and 2009 (Figure 6), but does not detract from the observed trends.

Figure 6 Passenger Market Turnover by Mode



Source: Author's analysis based on Eurostat Data; PKP Annual Reports

Prior to 2012, passenger services were seen as having poor quality of service, non-competitive travel times, lacking cleanliness, and poor communication with customers left travelers seeking alternative means of transport. However, under the new PKP Group management of 2012, there was a significant shift toward improving client satisfaction, with PKP Intercity customer surveys showing an increase of 21 percentage points in satisfaction, from 42 percent in 2013 to 63 percent in 2015. The PKP Group also reported its first increase in passengers during Q1 of 2015 since Q1 of 2011. This trend followed in 2016 (+20 percent of the number of passengers year/year) and continues in 2017.

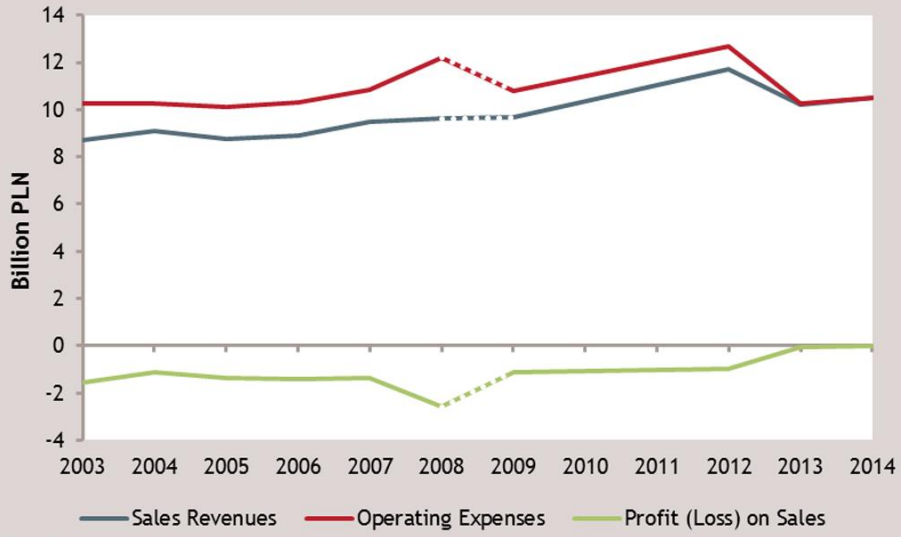
5.2 Financial Performance

PKP Group Sales Revenues

After the formation of PKP as a joint stock holding company, the consolidated revenues of the group initially increased by 10 percent between 2002 and 2008 (Figure 7). The 2009 economic crisis had a shock effect on the company and its subsidiaries, most notably its freight business, where PKP Cargo saw a 28.3% fall in revenue (Figure 7) and recording a decrease in transport volume of 22.8%. Since that time there has been a modest but steady improvement in net income (profit) on sales of PKP Group.

Passenger revenues from 2008 and 2009 cannot be interpreted without a mention of the previously noted transfer of shares of PKP Przewozy Regionalne to regional governments and of regional domestic railway services to PKP Intercity.

Figure 7 Sales Revenues, Operating Expenses, Profit/Loss of PKP Group



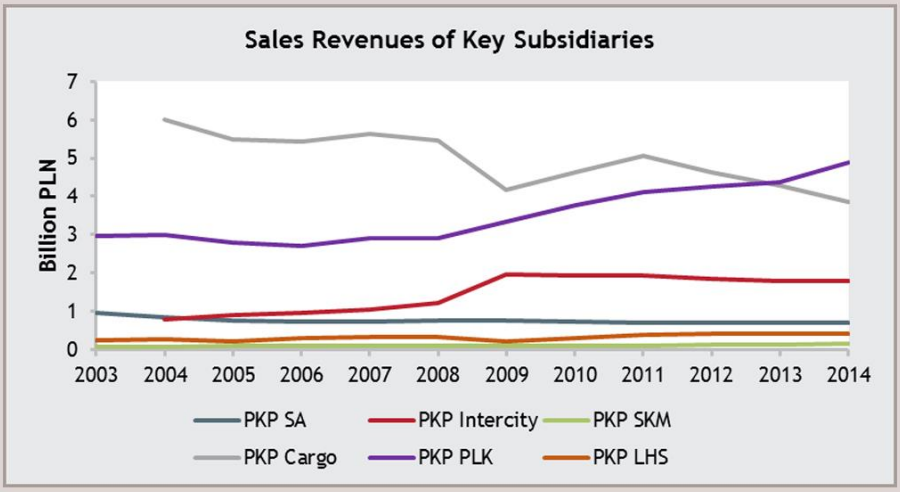
Note: Year 2010 & 2011 interpolated
Source: PKP Group Annual Reports

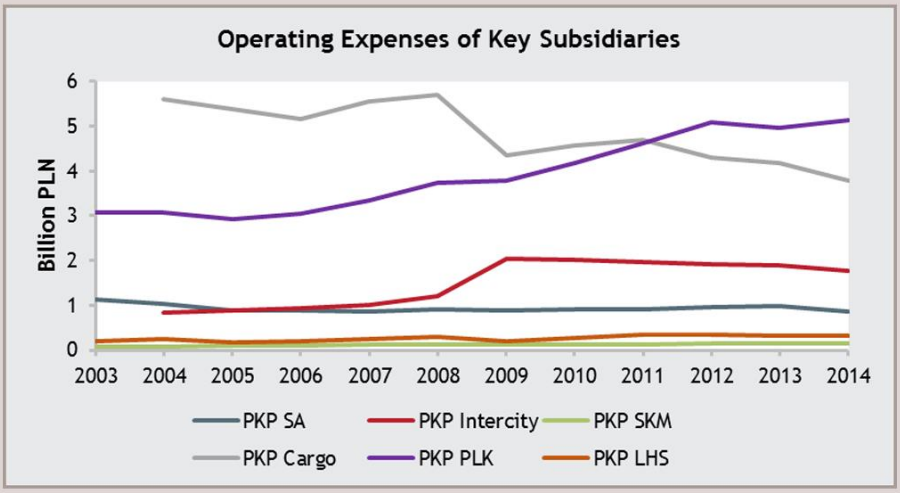
Since October 2013, PKP Cargo has been listed on the Warsaw Stock Exchange, and as of December 2014, PKP S.A. owns 33 percent of shares in PKP Cargo. Since 2012, PKP Cargo has seen year-on-year decreases in net profit of sales, due primarily to a decrease in freight revenues (Figures 8).

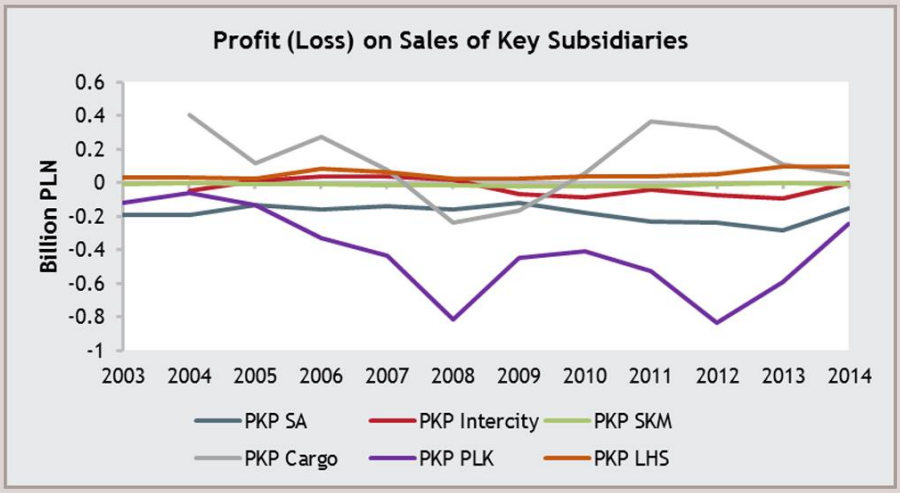
Since 2009, PKP LHS has grown its sales profit year-on-year, increasing from 21.0 million PLN in 2009 to 92.8 million PLN in 2014 (Figures 8). The growth in transport services revenues are largely attributed to an increase in the volumes of goods transported and additional fees.

PKP SKM and PKP PLK have reported losses since 2002 (Figures 8). In recent years, PKP Intercity has faced increased competition in a stagnant market and has suffered losses on its sales since 2008.

Figure 8 Financial Performance of Key Subsidiaries







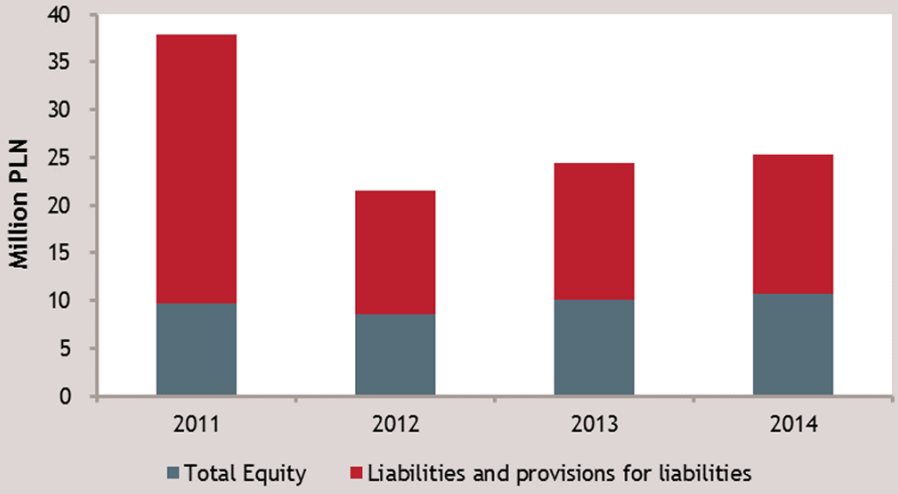
Source: PKP Group Annual Reports

PKP Group Balance Sheet Restructuring

In 2001, PKP Group began restructuring its balance sheet to convert its short-term liabilities into long-term ones. The objective was to improve the financial liquidity and change the debt structure, inherited from the SOE.

As previously described, in 2012, PKP subsequently began divesting its ownership of certain subsidiaries and redundant assets and using the proceeds to reduce debt. In 2012, the consolidated balance sheet showed a decrease in total assets of 43 percent from 2013. Through this process, PKP was able to reduce their leverage from 2.9 to 1.5. (Figure 9)

Figure 9 PKP Group Balance Sheet Restructuring



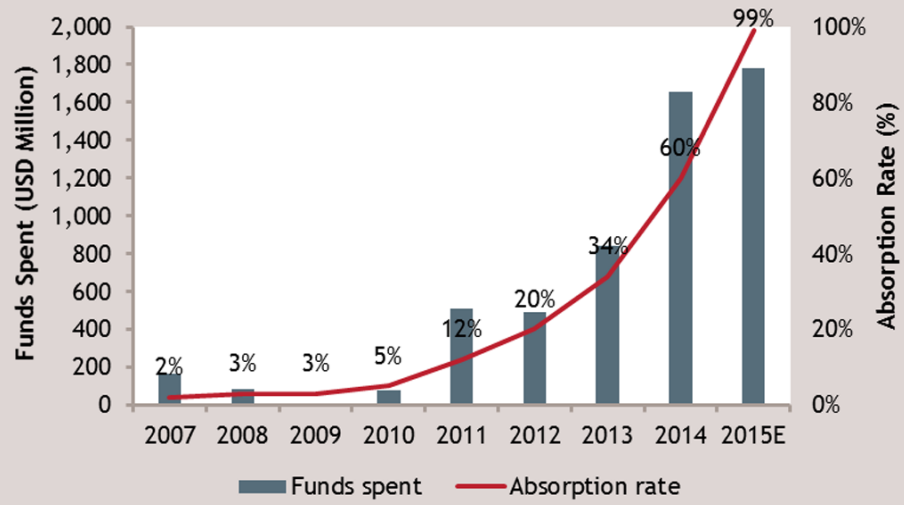
Source: PKP Annual Reports

5.3 Asset Condition

The reforms initially yielded mixed results in improving PKP's asset condition. Despite initial increased spending on infrastructure in the years following the reform, the investments were insufficient. Earmarked infrastructure and rolling stock projects suffered delays, leaving the railway network in an unsatisfactory condition. However, large-scale investments were made possible by the EU 2007-2013 Cohesion Fund, and since a 2012 restructuring of the PKP, the situation has improved markedly as infrastructure upgrading took place.

As discussed earlier, the utilization of available EU funds increased from 12 percent in 2011 to 99 percent by 2015 (Figure 10). The program saw US$ 1.3 billion allocated to the modernization of rolling stock (US$ 0.6 billion from the EU fund) and US$ 0.25 billion to an overhaul of the network's railway stations.

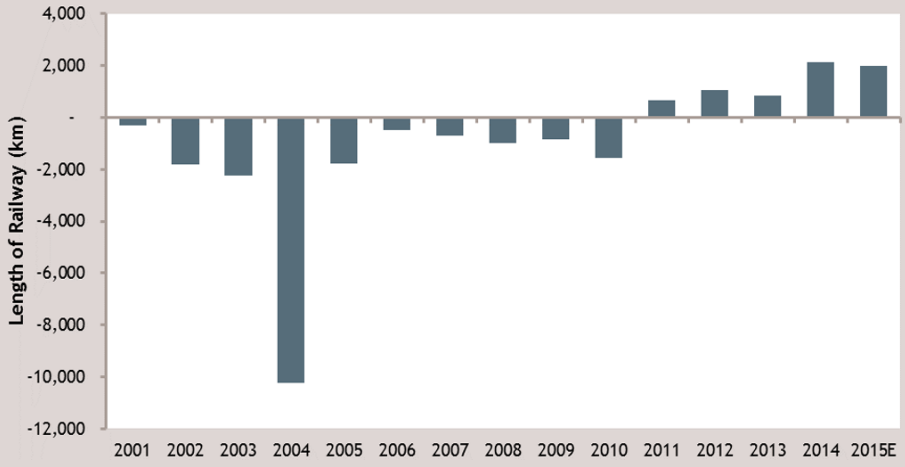
Figure 10 Use of EU Funds



Source: Analysis of PKP Data by Jakub Karnowski

In the same timeframe, PKP secured financing for the modernization of nearly 4,500 km of track, resulting in a net increase in maximum speed on 6,000 km of the network, compared to a net decrease on over 11,000 km seen during 2001-2011 (Figure 11).

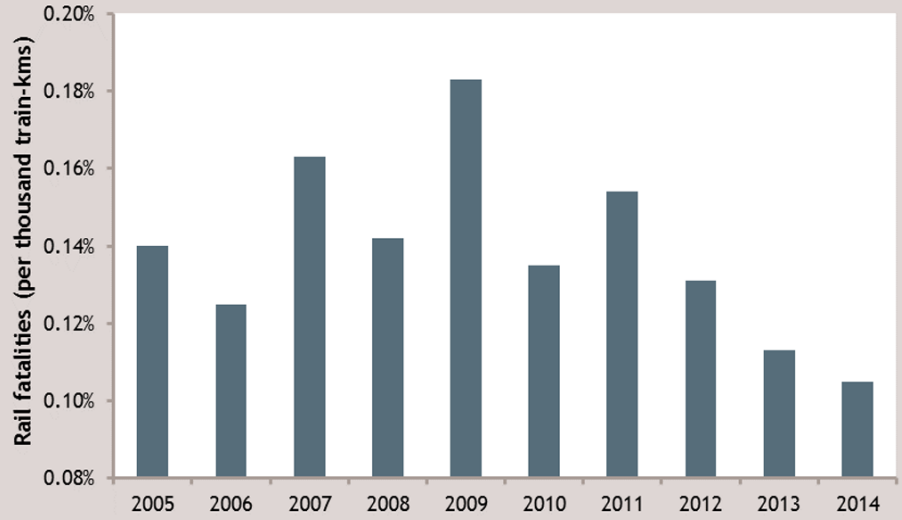
Figure 11 Length of Railway Lines (Km) with Maximum Speed Increased/Decreased



Source: Analysis of PKP Data by Jakub Karnowski

Under the same investment program, PKP Group prioritized railway passenger traffic safety, and in 2012, invested in modernizing its platforms, crossings, and grade crossings, installing the European Train Control System (ETCS) and European Railway Traffic Management System (ERTMS) on main routes, and investing in railway traffic safety training for its employees. The result was an overall decrease in the relative incidence of accidents, fatalities, and injuries since 2011 (Figure 12).

Figure 12 Fatalities from Rail Accidents in Poland per Thousand Train-kms

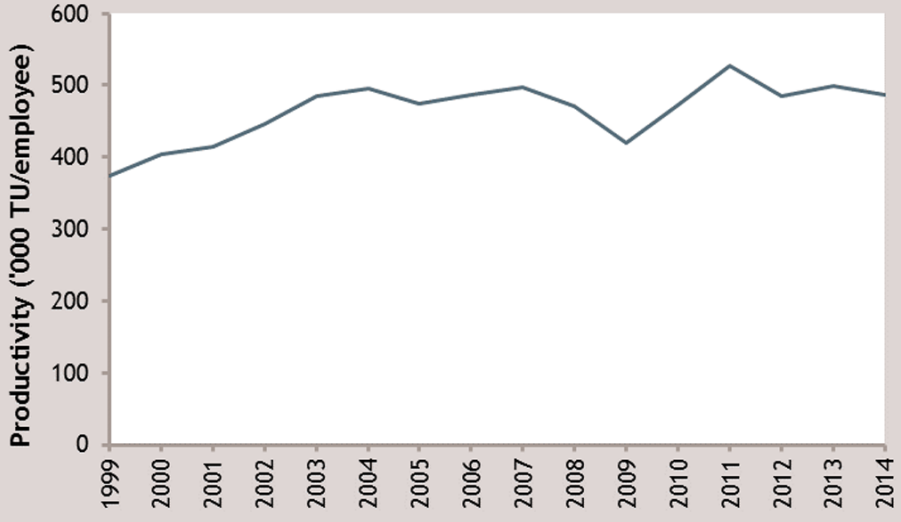


Source: OECD Data

5.4 Operational Productivity

PKP Group is one of the largest employers in Poland, and PKP PLK and PKP Cargo are independently among the top ten employers in the country. At the end of 2014, PKP Group employed 78,900 people across its subsidiaries. Employment volume has seen consistent downward adjustments since the beginning of the reform, which has allowed to maintain relatively constant staff productivity despite falling traffic. Staff productivity (Figure 13) in the PKP group is comparable to EU-27 averages. This is expected to further improve in the future with PKP Cargo and PKP SA putting more efforts in increasing employee efficiency.

Figure 13 PKP Group Staff Productivity



Source: Calculated based on PKP Annual Reports

Asset productivity (Figure 14), on the other hand, has been more mixed, with relatively stable results for locomotive and wagon productivity, as fleet size was reduced during the modernization program described above. Coach productivity is similar, as PKP's passenger companies right-sized their fleets. Track productivity has decreased substantially, owing to lower passenger numbers using a relatively fixed asset.

Figure 14 Asset Productivity

	1999	2005	2010	2014
Coach Productivity (000 Pass-km per coach)	2,101	2,167	2,903	2,661
Locomotive Productivity (000 TU per locomotive)	18,379	16,412	15,670	15,629
Wagon Productivity (000 ton-km per wagon)	574	583	486	518
Staff Productivity (000 of TU per staff)	403	473	473	486
Track Productivity (000 of TU per km)	3,571	3,104	1,702	1,569

Source: Calculated based on PKP Annual Reports

6 Conclusion

Polish railways reforms have broadly succeeded, in terms of the four goals initially defined:

- Financial and debt restructuring;
- Organizational restructuring;
- Employment restructuring to right-size the workforce; and
- Asset restructuring.

Revenues have recovered from the 2009 financial crisis, and the freight business is on a stable financial footing. Asset sales have significantly reduced debt. Both freight and passenger rail market competition has increased, with private operators moving 43 percent of rail freight and 54 percent of rail passengers in 2014. Running speeds have been increased on major sections of the network, permitting higher equipment utilization for freight and higher service levels for passengers. A new market-oriented management has been appointed, and the work force has been continuously reduced in response to market conditions.

The market for rail services – freight and passenger, publicly or privately provided – continues to decline. As the private rail freight sector grows, PKP finds itself carrying a declining share of a market that is itself shrinking. The continuing challenges for PKP, particularly for freight traffic, will thus be to compete effectively with both other rail operators and the road sector. This will involve keeping PKP staffing, PKP rolling stock, and the fixed rail assets shared by PKP and private operators aligned with the business volume of PKP and the overall rail sector.

Analysis of PKP experience offers valuable insight into the strategic development factors for railway companies:

- Effective governance and organization structures were a prerequisite for PKP management to carry out the restructuring program.

- Focusing on customer satisfaction was of utmost importance. Increasing service delivery standards required simultaneous changes in a range of areas, including: rehabilitating rolling-stock, modernizing railway and station infrastructure, increasing travel speed, improving passenger services and passenger information system, assuring service punctuality and reliability, and improving safety on the trains and at the stations. These strategic factors are complementary, thus these improvements had to be done at the same time.

- Since railways require heavy long-term capital investment, securing funding for infrastructure projects is vital. For that, it was critical that the country had a sound long-term transport strategies and effective sector regulations. It was also important for PKP to build implementation capacity, developing capable staff with strong project management skills who were given clear performance targets to improve its infrastructure project management.

- Bringing in better IT system enhanced management and control of the railways and should be prioritized in other restructuring programs in the future. Investments in the workflow and resource planning systems are among key tools for efficient decision-making processes and to improve staff productivity.

- Implementation of sound corporate governance and effective internal audit led to improved risk management and prevention of frauds or irregularities.

- As customer satisfaction is a key issue, well-designed services should be combined with reliable service delivery.

Case Study

RailTel[301]

1 Introduction

This case study describes how Indian Railways (IR) profitably commercialized its telecom assets and rights-of-way through the creation of a separate subsidiary entity, RailTel Corporation of India Limited (RailTel). RailTel has become a pre-eminent example of infrastructure sharing between the railway and telecommunications sector. In addition to partly managing IR's internal telecommunications needs, RailTel delivers telecommunications services to a large number of external users.

The case of RailTel illustrates that a state-owned railway can set up a separate, viable entity to commercialize and operate its rights-of-way and existing telecommunications infrastructure. Doing so can create additional revenues for the railway, while allowing for the professional management of its telecom assets, thereby supporting and improving national telecommunications.

This case study describes the situation prior to the emergence of RailTel and the situation subsequent to its emergence. It then describes RailTel's current infrastructure and service offerings, as well as the Indian telecommunications industry's market structure and institutional and regulatory framework. The case then discusses RailTel's financial performance, and concludes with a summary of the lessons to be drawn from IR's approach to developing RailTel.

2 Situation Prior to the Emergence of RailTel

In the early 1970s, Indian Railways (IR) began deploying its own internal communications systems to increase circuit efficiency on its rail lines[302]. Prior to that time, IR was entirely reliant on the Department of Telecommunications, then the state-owned monopoly provider of telecommunications, for its internal communications needs.

In 1983, the Railway Reforms Committee decided to install a dedicated fiber optic network for IR, replacing its existing communications systems. The aim was to increase safety, reliability, availability and serviceability. In 1988, IR commissioned its first fiber optic network in Mumbai. The network comprised 60 route-km across 28 stations and was used only for train operation and control.

---

[301] This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

[302] It used overhead telephone lines, quad cables, microwave systems and other available technologies.

Initial expansion of the IR fiber optic network was slow, growing to approximately 4,000 route-km over the next decade. Though IR was only using a small portion of the network's available capacity, it was not in a position to commercialize this excess fiber optic capacity under the then-prevailing policy and regulatory environment.

As part of the New Telecom Policy of 1999, the Government of India opened up national long-distance communications services to private operators, introducing competition in the market. To support this new competitive environment, cross-sector infrastructure sharing by public utilities was encouraged. This allowed for the use of existing backbone networks belonging to public and private power transmission companies, IR, and oil and gas companies for national long-distance data communication and national long-distance voice communications[303].

Motivated by this policy change, IR decided to form a separate entity to market and exploit the excess capacity on its fiber optic network, generating additional revenues, which could be used to further expand the network. This separation of telecoms from rail operations would permit IR to maintain its focus on its core activity of rail operations.

3 The Emergence of RailTel

RailTel was formed in September 2000 as a public sector undertaking, with a mandate to both modernize the IR communications network and to significantly contribute to realizing the goals and objectives of the New Telecom Policy of 1999. RailTel was established as a commercial organization, independent from IR.

The existing fiber optic network of IR, then approximately 4,500 route-km, was transferred to RailTel upon its formation. In 2001, RailTel began rolling out fiber optic cables along national railway routes, laying over 25,000 route-km by 2006 and over 47,000 route-km by April 2016. In August 2016, work was underway on another 6,700 route-km.

Through a contractual arrangement with the Ministry of Railways, RailTel has been able to use the rights of way of IR (approximately 63,000 route-km of railway track passing through 7,000 railway stations across India) to lay fiber optic cable and install other telecom infrastructure[304]. For its last mile and other access networks, RailTel has acquired rights of way directly from local authorities. As of August 2016, the network reached over 4,600 cities and towns across India, including many in remote and rural areas.

RailTel's infrastructure and services

RailTel's fiber optic network consists of armored 24-fiber cables, deployed in ducts. Four fibers in each cable are dedicated for use by IR, although they are maintained by RailTel. A centralized network management system in New Delhi manages the network, with a backup system in Secunderabad/Kolkata.

[303] Government of India (1999), *New Telecom Policy 1999*. Retrieved from http://pib.nic.in/focus/fomar99/fo3103991.html

[304] Indian Railways has over 65,000 route-km of track, which is one of the largest railway track networks in the world.

In addition to its fiber optic backbone network, RailTel has rolled out:

- An MPLS-IP [Multiprotocol Label Switching - Internet Protocol] backbone network with points of presence in 40 cities to provide virtual private network services, broadband internet access and multicast services;
- A Next Generation Network in 36 cities for carrying voice-based traffic as well as data and value added services; and
- A fiber access network in over 100 major cities in India.

One of RailTel's objectives is to modernize the telecommunications network of IR, permitting safer and more efficient train operations. Every station on RailTel's network has been provided with links to support IR's data connectivity needs, including its passenger reservation and ticketing systems. RailTel also provides connectivity among IR's field organizations and offices of the Ministry of Railways, among other services.

RailTel obtained an Infrastructure Provider (IP-2) license[305] in 2002 and began offering wholesale bandwidth services to telecom network operators. This license allows RailTel to lease, rent out, and sell end-to-end bandwidth (i.e. digital transmission capacity) for a period of 20 years from the date of license agreement.

RailTel promoted its services through direct marketing and through sales to India's telecom operators. The initial services utilized by these operators were leased lines and co-location of telecom equipment on RailTel's fiber network and towers. RailTel's infrastructure was used extensively by all of India's mobile network operators to roll out their networks. Many of these and other entities have built competing fiber optic networks along public roads, though they often use RailTel's network to provide redundancy along a separate route.

RailTel has other service offerings, including:

- Virtual private network services to enterprises, banks education institutions and government entities;
- Dedicated Internet bandwidth to enterprises and education institutions;
- Dark fiber leasing to cable television operators;
- Data center services;
- Audio/video conferencing services in facilities in major cities;
- Railwire, a retail broadband initiative that utilizes partnerships with local network operators; and
- Consultancy services for the execution of IT and telecom projects.

[305] IP-2 licenses are granted to applicants so long as the foreign equity of the applicant company does not exceed 74%. There is no entry fee for IP-2 and there is no restriction on the number of licensees.

As RailTel is ultimately owned by the Government of India, it plays a direct role in furthering the Government's telecom policy initiatives. For example, RailTel is one of the implementing partners in laying fiber optic cable, further expanding the National Optical Fiber Network. This project is led by state-owned Bharat Broadband Network Limited. Its goal is to provide connectivity to all the 250,000 Gram panchayat's (village-level units of local government) using the existing fiber optic cables of public utilities, including RailTel, Power Grid and Bharat Sanchar Nigam Limited (the state-owned telecom incumbent)[306].

4 Industry Structure and Institutional/Regulatory Framework

The telecommunications market

India's telecommunications market is fully competitive across all market segments (international and national connectivity, fixed and mobile networks) and is dominated by private firms[307]. As of 31 May, 2016, there were a total of 1.058 billion telephone subscriptions across the country, and 160 million broadband subscribers[308]. The broadband services user-base in India is projected to grow to 250 million connections by 2017[309].

Driven by strong adoption of data consumption on handheld devices, the total mobile services market revenue in India reached US$7.5 billion in 2014[310]. India was also estimated to have 371 million mobile internet users in June 2016, a significant rise from 238 million a year earlier[311].

Policy and regulation

The policy and regulatory regime in India has been evolving since the liberalization of the sector in 1992. Since that date, a number of markets have been opened to private and foreign investment. Between April 2000 and September 2016, the telecommunications sector attracted foreign direct investment worth US$21.17 billion[312].

---

[306] Bharat Broadband Network Limited, National Optical Fibre Network (NOFN) (2015). Retrieved from http://www.bbnl.nic.in/content/page/national-optical-fibre-networknofn.php

[307] The state-owned incumbents currently have about 9 percent of the market for telephone subscriptions.

[308] Telecom Regulatory Authority of India (2016), *Highlights of Telecom Subscription Data as on July 31, 2016*, Press Release No. 18/2015. Retrieved from http://trai.gov.in/WriteReadData/WhatsNew/Documents/Press_Release_No.97_Eng_07_10_2016.pdf

[309] Economic Time of India, *GSMA expects 250 million broadband connections in India by 2017*. Retrieved from http://economictimes.indiatimes.com/industry/telecom/gsma-expects-250-million-broadband-connections-in-india-by-2017/articleshow/45096822.cms

[310] GSMA Intelligence, India Market Report (April 2015). This is a subscription service.

[311] Indian Express, *Mobile Internet users in India to reach 371 mn by June 2016,* Retrieved from http://indianexpress.com/article/technology/tech-news-technology/mobile-internet-users-in-india-to-reach-371-mn-by-june-2016/

[312] Department of Industrial Policy & Promotion, *Fact Sheet on Foreign Direct Investment (FDI),* Retrieved from http://dipp.nic.in/English/Publications/FDI_Statistics/2016/FDI_FactSheet_April_Sep_2016.pdf

The Telecom Regulatory Authority of India (TRAI) is the regulator of telecom service providers in India, but does not regulate cross-sector infrastructure sharing per se. The TRAI does set ceilings on the tariffs that can be charged for leased line services. RailTel has indicated that its tariffs use high discount structures and therefore effectively are negotiated freely in the market. Although RailTel's pricing is not otherwise directly regulated, its telecom operator customers have aspects of their pricing to customers and other operators regulated, and this regulation has an impact on how RailTel prices its services to these customers.

The Department of Telecommunications, under the Ministry of Communications, is responsible for granting telecom licenses. RailTel is an Infrastructure Provider Category 2, which allows it to provide passive assets for telecom use such as dark fiber, rights of way, duct space and towers. No license is required, but registration with the Department is mandatory. RailTel also holds a National Long Distance license, for its provision of leased line, voice transit and virtual private network services, and an Internet Service Provider (Class-A) license, for its provision of internet services across India.

As a wholly state-owned entity, RailTel is subject to public procurement policies and falls under the jurisdiction of the Central Vigilance Commission, a government body established to prevent corruption in government institutions and public administration. A Telecommunications Dispute Settlement and Appellate Tribunal has been established to adjudicate disputes, including those between two or more service providers or between a service provider and a group of consumers.

IR is a state-owned and Government-controlled monopoly, with oversight provided by the Ministry of Railways. The Indian Railways Act had to be amended to allow for the use of the telecommunications assets of the railway network for commercial purposes; the original Act only permitted these assets to be used for internal telecommunications purposes.

RailTel manages the administrative communications of the IR, but all mission critical aspects of IR communications continue to be managed internally.

5 Financial Performance

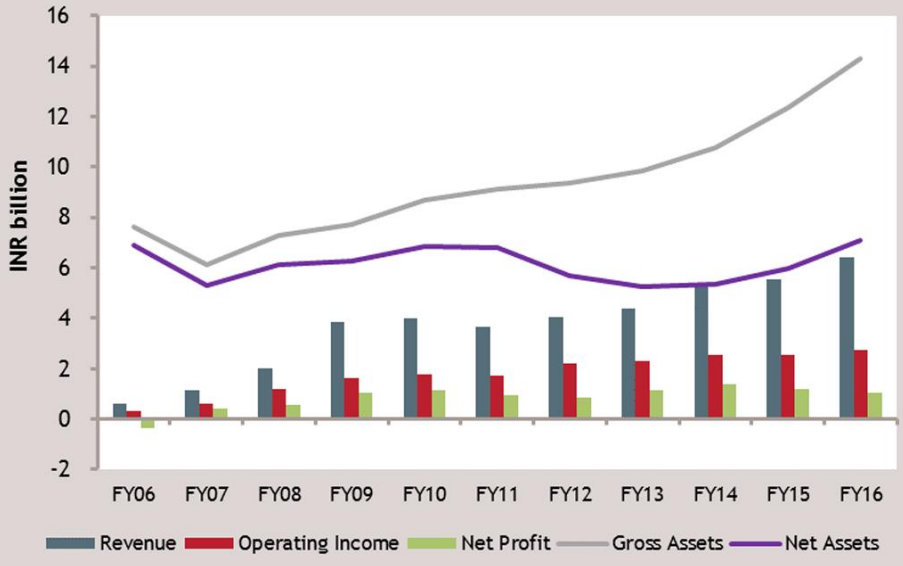
RailTel's network roll-out was financed with Indian Rupees (INR) 4 billion (US$ 62 million in 2015 US$[313]), provided by a consortium of banks led by the State Bank of India. These loans were repaid in full by January 2013, and today RailTel is debt-free. RailTel achieved its first profitable year in 2007, after seven years in operation.

RailTel is financially self-sufficient and does not receive any funding from the Government of India. It finances network expansion from its revenues. Because RailTel is independent from IR, its sole shareholder, it files its own annual reports in accordance with Indian accounting rules.

[313] All conversions from INR to USD in this section are based on an exchange rate of 1 USD = 64.15 INR. See http://data.worldbank.org/indicator/PA.NUS.FCRF?end=2015&locations=IN&start=2004&view=chart&year_high_desc=false for more information.

In its 2015-16 financial year, RailTel declared total gross revenues of INR 6.41 billion (US$ 99.9 million) with a net profit of INR 1.04 billion (US$ 16.2 million)[314]. Details on the financial trends for RailTel are in the Figure 1.

Figure 1 RailTel Financial Trends



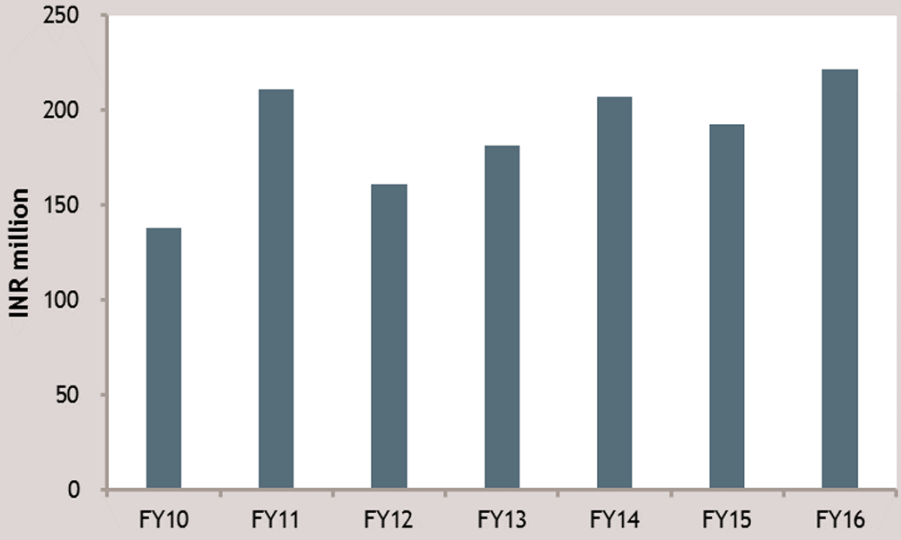
Source: RailTel Financial Report, 2013-2014 & 2015-2016. Gross assets refers to total value of assets owned, and is net assets plus accumulated depreciation.

RailTel shares a portion of its revenue with IR, as compensation for use of its rights of way. For RailTel's 2015-16 financial year, this sharing amounted to INR 220 million (US$ 3.4 million). This 'revenue share' over time is in Figure 2. As IR utilizes four fibers in each 24-fiber cable, it bears a proportionate cost of capital expenditures for network deployment. RailTel also pays annual dividends to its government shareholder. Between 2005 and 2016, RailTel paid a total dividend of INR 1.46 billion (US$ 22.8 million) to its only shareholder, the Government of India[315].

[314] RailTel, *Annual Report (2015-2016)*, Retrieved from http://www.railtelindia.com/uploads/financialresult/1473836519_RailTel%20Annual%20Report%202015-16%20English%20Version.pdf

[315] Ibid.

Figure 2 Revenue Share



Source: RailTel Financial Report, 2013-2014 & 2015-2016.

6 Conclusion

When the Government of India opened up long-distance telecommunications services to the private sector, IR saw the opportunity to sell unneeded capacity on its telecommunications network and to use the proceeds to further expand its fiber optic network.

Through the creation of RailTel, IR was able to successfully share its infrastructure across sectors and to realize the inherent value of the railway's rights-of-way and telecommunications assets, in addition to the strong technical expertise and management capacity of IR staff. As a result, RailTel has played a significant role in the proliferation of telecommunications services in India. The Company's extensive fiber network has permitted telecom operators to provide services with limited capital expenditures in large areas of the country that were previously unserved or underserved.

References

This case study includes information provided by RailTel through an interview conducted in March 2015.

Bharat Broadband Network Limited, National Optical Fibre Network (NOFN) (2015). Retrieved from http://www.bbnl.nic.in/content/page/national-optical-fibre-networknofn.php

Department of Industrial Policy & Promotion, *Fact Sheet on Foreign Direct Investment (FDI),* Retrieved from http://dipp.nic.in/English/Publications/FDI_Statistics/2016/FDI_FactSheet_April_Sep_2016.pdf

Economic Time of India, *GSMA expects 250 million broadband connections in India by 2017*. Retrieved from http://economictimes.indiatimes.com/industry/telecom/gsma-expects-250-million-broadband-connections-in-india-by-2017/articleshow/45096822.cms

Government of India (1999), *New Telecom Policy 1999*. Retrieved from http://pib.nic.in/focus/fomar99/fo3103991.html

GSMA Intelligence, India Market Report (April 2015). This is a subscription service.

Indian Express, *Mobile Internet users in India to reach 371 mn by June 2016,* Retrieved from http://indianexpress.com/article/technology/tech-news-technology/mobile-internet-users-in-india-to-reach-371-mn-by-june-2016/

Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

RailTel, *Annual Report (2015-2016)*. Retrieved from http://www.railtelindia.com/uploads/financialresult/1473836519_RailTel%20Annual%20Report%202015-16%20English%20Version.pdf

Telecom Regulatory Authority of India (2016), *Highlights of Telecom Subscription Data as on July 31, 2016*, Press Release No. 18/2015. Retrieved from http://trai.gov.in/WriteReadData/WhatsNew/Documents/Press_Release_No.97_Eng_07_10_2016.pdf

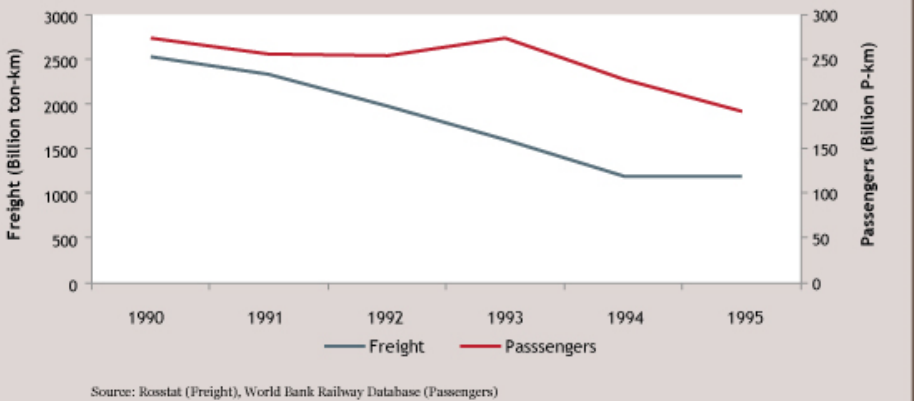
Case Study
Russian Railways

After the dissolution of the Soviet Union, the Russian railway industry entered challenging times. Freight volumes declined, the share of loss-making passenger traffic increased, financial losses mounted, assets deteriorated, and operational productivity declined precipitously. The Government embarked on an ambitious railway reform program to tackle these challenges. This case study summarizes the reforms and their impact on the Russian railways industry.

1 Before the Reform Process

Railway transportation is critical to the Russian economy. At the beginning of the 1990s, railways transported 70 percent of surface freight and 40 percent of public passenger service. However, the dissolution of the Soviet Union caused economic dislocations that had catastrophic consequences for the rail industry. Between 1990 and 1995, freight traffic plunged by 52 percent and passenger traffic by 30 percent (Figure 1).

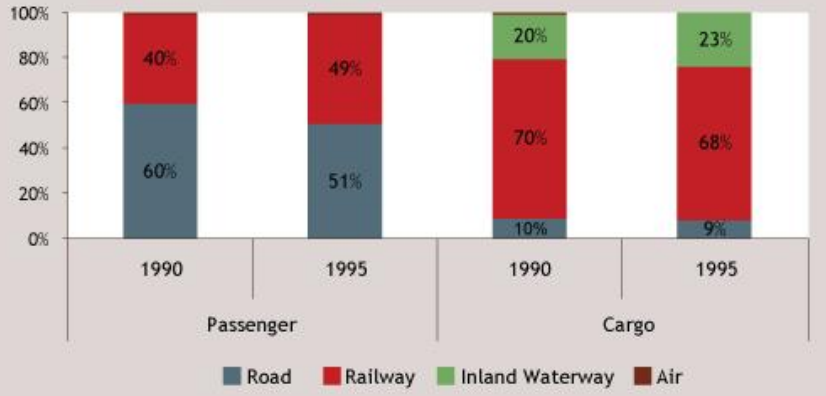
Figure 1 Decline in Freight and Passenger Traffic



Source: Rosstat (Freight), World Bank Railway Database (Passengers)

Prior to that, freight traffic had been profitable enough to cross-subsidize the loss-making passenger traffic. To compensate for the overall losses, the railways raised freight tariffs, which depressed freight traffic even further. Freight modal share declined, while the rail share of loss-making passenger traffic increased from 40 to 49 percent (Figure 2).

Figure 2 Freight and Passenger Modal Shares



Sources: Rosstat Note: Cargo traffic is in ton-km, passenger traffic is in passengers. Market share calculations do not include pipeline transportation

These significant traffic declines without corresponding operational reforms reduced both asset and staff productivity. Track and staff productivity declined by 50 percent; wagon productivity increased by a modest 10 percent (Figures 3 and 4).

Figure 3 Decrease in Asset Productivity

	1990	1993	1995
Coach Productivity (000, P-km per Coach)		7,536	6,490
Locomotive Productivity (000, TU per Loco)	253,857	206,454	
Wagon Productivity (000, ton-km per Wagon)	2,983	2,452	3,298
Employee Productivity (000, TU per employee)	1,751	1,144	858
Track Productivity (000, TU per standard track km)	32,535	21,562	16,062

Source: World Bank Railway Database, Russian Railways, UIC

Investment in new equipment and maintenance declined, with new equipment deliveries falling by over 30 percent. As assets and infrastructure deteriorated, the number of track kilometers subject to speed restrictions increased by about 30 percent.[316] Clearly, railways could not maintain their pivotal role in the economy without reforms.

[316] *Transport Strategies for the Russian Federation* (World Bank)

Figure 4 Decrease in Staff Productivity

Source: World Bank Railway Database

2 Reform Goals

Edict Number 426 (1997) established the following major goals for railway reforms:

- Stabilize quality and safety;
- Preserve a pan-Russian institution and ensure economic development;
- Ensure system interoperability[317];
- Reduce system costs; and
- Meet demand for transport services.

Decree Number 448 (1998) refined these goals, adding: end cross-subsidies, improve tariff-setting supervision, and increase transparency of financial flows in the industry.

To achieve these goals, the railway reform strategy would need to leverage financing from the private sector. Government regulation and market mechanisms would need to create a favorable environment for private sector participation and increased competition in the railway sector.

[317] RZD needed to improve interoperability with its neighbors (part of its growth strategy is to expand outside of Russia). It has signed agreements on freight cooperation with some EU countries, e.g. Poland, Germany, and Finland. The strategy also included building of new lines to Iran, Azerbaijan, etc. In addition, RZD signed an agreement with the Chinese on container standardization.

3 Reform Process

The railway reform had three phases, illustrated in Figure 5:

Figure 5 Phases in the Russian Railway Reform Process

Phase	Timeframe	Steps
Preliminary	Pre-2001	Establish legal framework for reforms Transfer social services to appropriate ministries Encourage private sector participation in supply industries
Phase I	2001-03	Establish joint stock holding company Encourage private wagon ownership
Phase II	2003-06	Separate subsidiaries into independent companies Begin phasing out cross-subsidization of passenger services
Phase III	2006-10 and beyond	Develop competition Increase private sector participation

Source: Russian Railways Reform, http://eng.rzd.ru/statice/public/en?STRUCTURE_ID=23 (Accessed November 8, 2016)

3.1 Preliminary Phase

This phase set the stage and established objectives. Federal Law 153 (1995) established a legal basis for the railway sector's organization and the relationships among entities involved. Presidential Edict No. 426 (1997) set the reform's objectives and Government Decree No. 448 (1998) added refinements. The Railway ministry transferred social services, such as hospitals and rest areas, to the appropriate ministries, and encouraged private sector participation in supply industries.

3.2 Phase I—Separation of Regulations and Operations

In early 2003, the 'Federal Law on Railway Transport in the Russian Federation' came into effect. This law separated the Ministry of Railways into the Federal Railway Transport Agency (FRTA) and Russian Railways (RZD). The FRTA became a Ministry of Transport agency that would regulate rail transport, and RZD became a state-owned company in charge of railway infrastructure and train operations for freight and passengers. The law defined the relationship between railway infrastructure services, train operations, and Government; it created a legal basis for railway operators (managers of wagons) and railway carriers (managers of wagons and locomotives), and required RZD to provide open access to railway infrastructure for carriers and operators. In the spirit of separated services, RZD tariffs separated infrastructure charges from wagon and locomotive charges. The 2003 Federal Charter of Railway Transport specified business models and legal responsibilities for rail infrastructure service providers.

Under the new legal structure, independent cargo companies could manage their own cargo. However, RZD remained the primary carrier.[318] Rail operators and rolling stock leasing companies emerged as private businesses; rail operators functioned as freight forwarders that owned or rented wagons and handled all customer rail logistics; and rolling stock leasing companies purchased and leased wagons.

[318] Carriers have the universal service obligation of being willing and able to provide service to customers anywhere in Russia. This favors RZD, which has national scope.

In preparation for phase II, RZD made some internal changes: it created business units with separate accounting, creating financially transparent operations in each division.

3.3 Phase II—Separating Functions and Establishing a Joint-Stock Holding Company

Later in 2003, Decree No. 585 established RZD as a joint stock holding company (see Box), and separated many institutional activities. To enable this separation, RZD created 63 subsidiary companies, such as JSC TransContainer, RailTranAuto, Rail Passenger Directorate, Russian Troika, TransGroup, and Refservis. Subsidiaries focus on serving niche markets; for example, Refservis serves the refrigerated transport market. Ownership structures vary, and some companies can sell shares to the public. For example, in 2008, TransContainer sold 15 percent of its shares, raising about 7.8 billion rubles (approximately US$ 314 million). In 2010, TransContainer sold another 35 percent of its shares, which raised another US$ 400 million. This brought the private sector share in TransContainer to just under 50 percent.[319] Today, RZD owns 50 percent plus two shares in TransContainer.[320]

By 2005, one-third of the country's freight moved in privately owned wagons, and by 2013, private operators owned 80 percent of the wagon fleet. In 2011, Independent Transport Co. paid 125.5 billion rubles (US$ 4.3 billion) for 75-percent ownership of First Freight Company (FFC), which owned roughly half of RZD freight wagons. It bought the remaining 25 percent of the shares in 2012 for an additional 50 billion rubles (US$ 1.6 billion).[321]

Box 1 RZD Corporate Governance

The Government of the Russian Federation is the sole shareholder of RZD. RZD's board of directors (supervisory board) consists of ten members elected at the General Shareholders Meeting. Currently, six members are representatives from the Russian Federation, including the President of RZD, and four are independent directors.

Annual reports and financial statements are prepared according to International Financial Reporting Standards and are publicly published. Its executive body (management board) consists of 23 members from a variety of political and commercial backgrounds and is headed by the president of the company.

[319] Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800 P.47

[320] RZD Interim Condensed Consolidated Financial Statement as of 30 June 2016

[321] Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800 P.47

3.4 Phase III-Developing Competition

As part of its focus on creating competition, RZD formed First Freight Company (FFC), capitalizing it with 200,000 wagons, and formed Second Freight Company (SFC), which it capitalized with 217,000 wagons. Both faced competition from independent operators such as GlobalTrans and operating companies set up by major natural resources companies such as Gazprotrans. In 2012, RZD completed the sale of its shares in FFC. By that time, RZD had transferred a substantial portion of its wagon inventory to its subsidiaries and had subsequently sold shares of some of the subsidiaries, thereby, creating a competitive market for freight wagons and container operations.

This shift in wagon ownership to its subsidiaries and private companies meant that RZD itself needed fewer repair and maintenance facilities. By June 2010, RZD had sold 18 freight wagon repair depots to private companies, and had plans to separate the remaining repair depots into two competing companies, selling partial interest in each.

3.5 Passenger Service Reform

Since 2006, reforms have expanded to include passenger transportation. The Rail Passenger Directorate was formed to focus on managing long-distance passenger services as a business entity. Subsidiaries jointly owned by RZD and local governments have been formed for local passenger service, which allows RZD access to local government financial support for these loss-making services. In addition, private companies emerged to offer specialized passenger services, mostly on the St. Petersburg-Moscow line. The companies own and operate passenger coaches, set prices, sell tickets, and provide both on-board and in-station staffing. RZD locomotives and drivers haul these coaches. CJSC TC Grand Service Express and LLC Tverskoy Express were the most prominent private companies in 2009, having 0.3 percent of the market for long-distance passenger transportation.

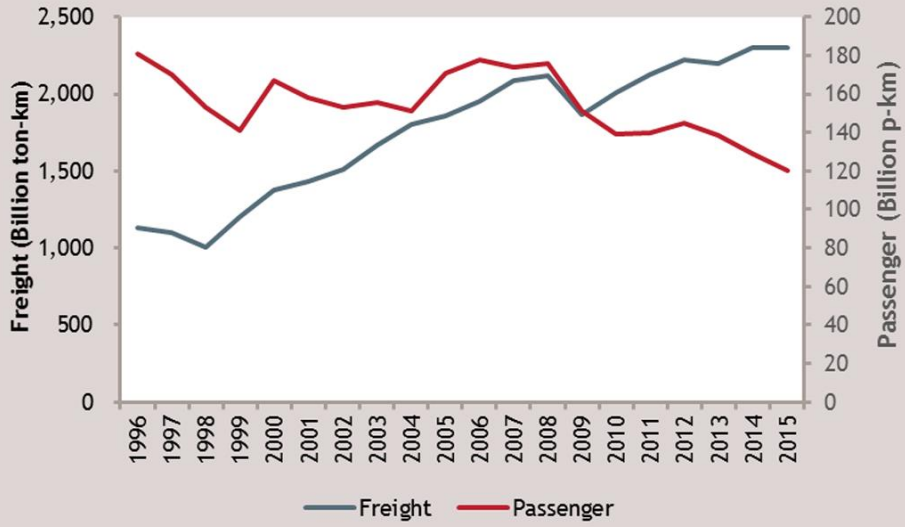
By 2010, RZD reforms increasingly included suburban passenger transportation, for which the immediate goal was to reach the break-even point. RZD created a new system for tariffs that would eliminate fare evasions by introducing electronic ticketing and security services on some lines, improving terminals, and leasing vacant space for commercial use.

4 Results of Reform

4.1 Market Performance

Freight transportation underwent the most significant reforms, and market performance results are impressive. Between 1995 and 2009, freight turnover improved by a dramatic 87 percent before succumbing to the effects of the 2008 global economic crisis (Figure 6). Since 2010, freight turnover has been steadily increasing while passenger turnover has been on the decline.

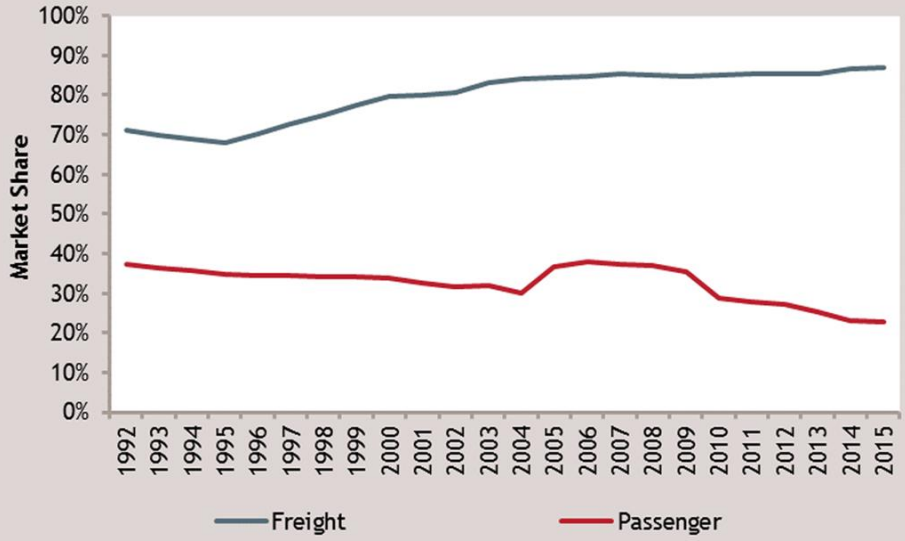
Figure 6 Passenger and Freight Market Turnover 1996-2015



Source: RZD Annual Reports

Freight traffic accounted for 2.30 trillion ton-km in 2014, which was 42.3 percent higher than in that of 2003.[322] In the first half of 2015, however, traffic fell by 0.7 percent to 1.12 trillion ton-km compared to the same period of 2014 due to the political crisis in Ukraine coupled with economic sanctions against Russia.[323] The total freight traffic of 2015 remained at the same level as 2014.

Figure 7 Freight and Passenger Modal Shares 1992-2015



Note: Cargo traffic is in ton-km, passenger traffic is in passenger-km. Freight market share calculations do not include pipeline transportation. The data for years 1993-94, 1996-99, and 2001 are missing and figures shown shows these miss-ing data points spliced.
Source: RZD Annual Reports and ROSSTAT

[322] Polikarpov, A. (2015). "Russian Rail Freight Market". International Railway Journal
[323] Ibid

Currently, RZD continues to control all main line locomotives and traction services.[324]

The recent slowdown in Russia's economic growth coupled with reduced demand for passenger services, and aggressive competition from airlines[325] saw a decrease of 6.5 percent from the previous year in passenger transport services, particularly for long-haul and suburban passenger transportation.[326]

Despite this decline in passenger numbers, RZD saw an increase in demand for new rapid transit trains, with the highest passenger traffic increase seen on the Mosco-Smolsnek route and the Moscow-Belgorod route. Passenger turnover on rapid transit trains grew 25 percent to 2.5 bln passengers per km in 2015.[327]

Suburban passenger services continues to operate with shortfalls, and as such compensation in the form of subsidies is provided by the government to cover decrease in incomes from the government tariff regulation. These measures allowed for RZD's suburban transportation to break even in 2015.

4.2 Financial Performance

RZD's financial performance was slow to improve in the early stages of the reforms. However, revenues continued to increase steadily, thanks to both growing freight traffic and increasing prices. Profits from freight services increased between 2000 and 2008 but declined steadily between 2011 and 2013. This was a result of an increase in RZD operating expenses. Lower freight volumes due to economic sanctions and the drop in crude oil prices have also continued to plague RZD's financial performance in recent years.[328]

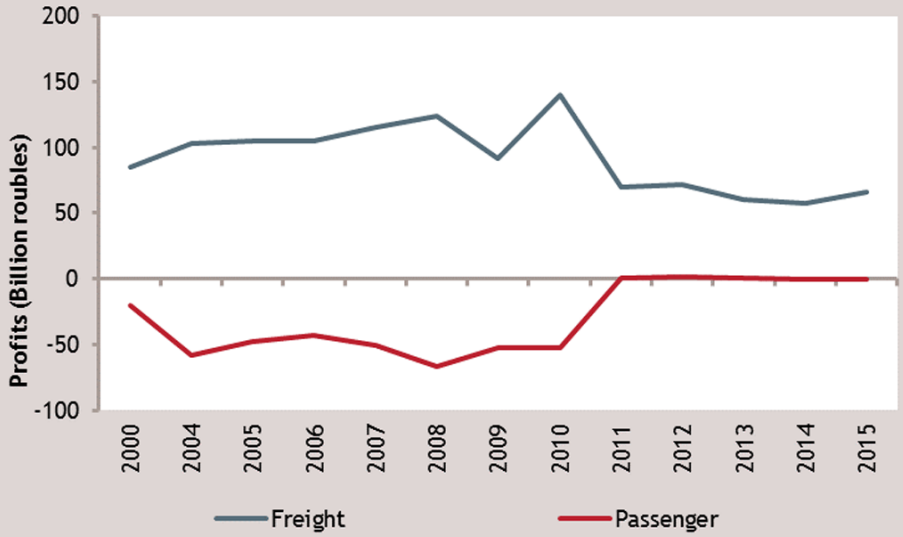
On the generally loss-making passenger services, RZD substantially reduced losses. Between 2010 and 2013, RZD even managed to produce small profits, with improvement in transport availability, government subsidies, and people's mobility. While the passenger services balance turned negative in the following years, the losses are very minimal, almost breaking even. Creating joint ventures with local authorities was successful in generating additional financial support for these services. In 2015, three-fourths of the operating shortfall for suburban services was covered by local subsidy.[329]

In 2015 and much of 2016, RZD's financial performance was negatively affected by the broader effects of lower oil prices and economic sanctions on the Russian economy. Reduced access to, and the higher cost of, capital led to a reduction in the company's investment program.

---

[324] EBRD (2016). "The EBRD's projects in the Russian railway sector". EBRD Evaluation Department.
[325] A very competitive tariff policy set by airless and a decrease in international passenger traffic due to conflict in Ukraine contributed to a decline in demand for passenger rail services.
[326] RZD Annual Report, 2015
[327] Ibid
[328] RZD Annual Reports
[329] RZD Annual Report, 2015, p. 85.

Figure 8 RDZ Profitability 2000-2015



Source: RZD Annual Reports

4.3 Asset Condition

In the early years of the reforms, the Government faced challenges in bringing substantial new investment to the Russian railway industry. During 2004-08, the percentage of life-expired locomotives rose from 11.4 to 18 percent (Figure 9). In 2012, RZD owned 20,618 locomotives and 37,100 non-commercial freight wagons.[330]

Figure 9 Expired Life in RZD Rolling Stock 2004-2009

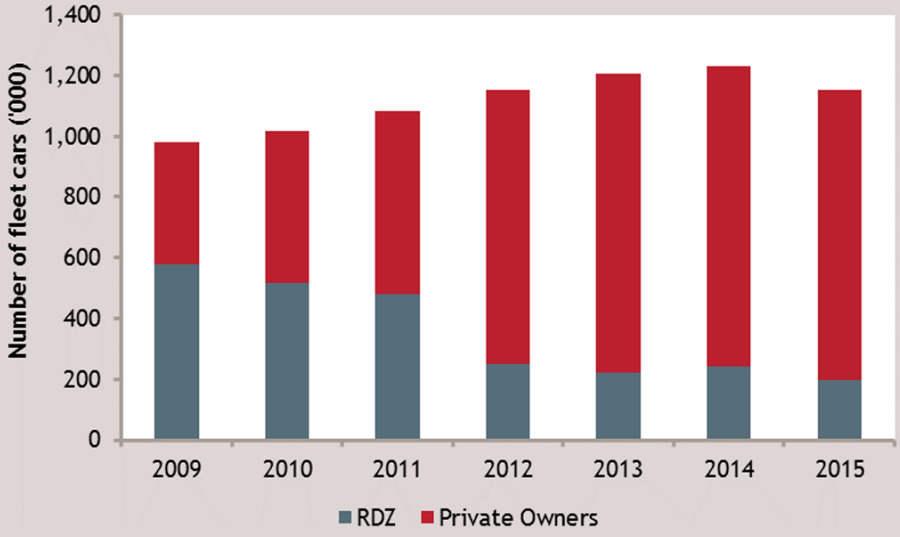
	2004	2005	2006	2007	2008	2009
Locomotives						
Stock	19,551	19,549	19,631	19,765	20,003	20,101
Renewals and purchases	352	494	595	571	743	355
%with expired service life	11.4	13.1	13.6	14.5	18.0	20.4
Freight Wagons						
Total Stock ('000)	624	631	618	568	405	339
Average age (years)	20.2	20.7	21.1	21.4	21.7	24.8
Purchased ('000)	6.0	8.0	8.6	15.4	21.3	0.3
Modernized ('000)	5.9	5.0	7.3	5.3	16.9	22.6

Source: RZD Annual Reports

In the crisis period, RZD lacked the financial resources to put towards the renewal of both locomotives and wagons leading to significant number of its fleet being life expired. The railway reform process enabled private sector to invest in wagons readily, but less so for the locomotives. This resulted in a significant increase in the private sector providing wagon services, as shown in Figure 10. With the increase in the supply of wagons from the private owners, RZD was able to focus its resources on investing in renewal of its locomotive fleet.

[330] Murray, B. (2014) "Russian Railway Reform Programme" Working Paper. European Bank for Reconstruction and Development. June 2014. p.8.

Figure 10 Freight Wagon Ownership 2009-2015



Source: RDZ Annual Reports

Once RZD allowed private sector participation in wagon ownership, customers were able choose between using RZD wagons at the regulated tariff price or wagons managed by a non-RZD operator at a market-determined price. With better wagons provided by non-RZD operators, more customers shifted to commercial operators. Over time, more and more wagons were supplied by commercial operators at market prices.

In 2015, RZD owned approximately 10,000 wagons directly (0.9 percent of the overall fleet of 1.15 million wagons), which were primarily used for its internal transport. Private wagon operators owned an estimated 955,000 wagons, with remainders owned by commercial wagon operating companies affiliated with RZD.[331] With private investors supplying wagons, RZD has been able to direct the bulk of that financing to infrastructure and other needs such as the renewal of its locomotive fleet.

4.4 Operational Productivity

General rail sector operational productivity – locomotive and track productivity – has improved drastically due to reforms (Figure 11). As of the end of 2015, RZD locomotive productivity was 191 million TU per locomotive and track productivity at 28 million TU per track kilometer. However, the wagon productivity has remained relatively at the same level over the years, and coach productivity shows continued decline.

[331] RDZ Annual Report 2015.

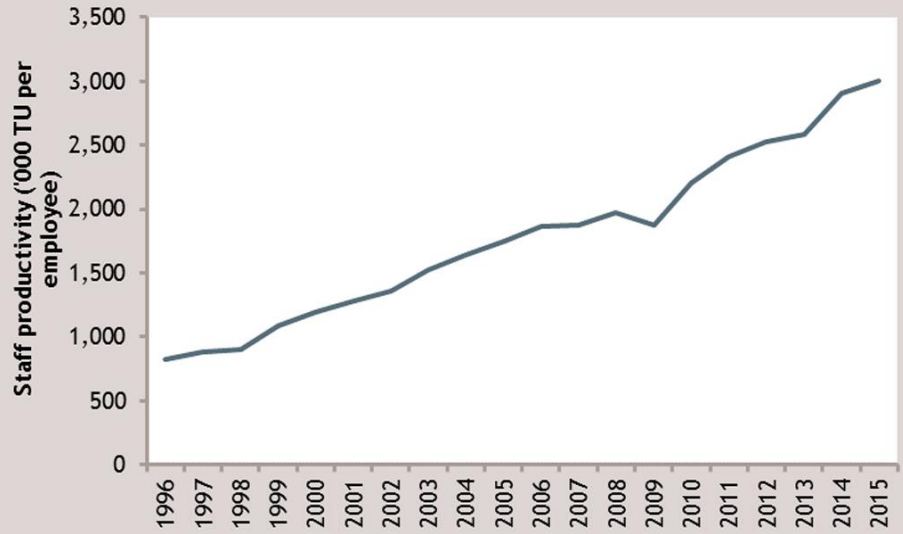
Figure 11 Russia's Rail Sector Operational Productivity 2000-2015

	2000	2005	2010	2015
Coach Productivity (000, p-km per coach)	8,072	6,562	4,045	3,033
Locomotive Productivity (000, TU per loco)	-	91,555	106,303	191,021
Wagon Productivity (000, ton-km per wagon)	2,507	2,946	1,978	2,002
Employee Productivity (000, TU per employee)	1,190	1,729	2,203	2,998
Track Productivity (000, TU per standard track km)	17,895	23,817	25,210	28,444

Note: RZD's productivity is presented as proxy for the general sector productivity, except for wagon productivity. Wagon productivity takes into account Russia's entire wagon fleet.
Source: Russian Railways, WB Railway Database, RZD Annual Reports, UIC statistics, and WB estimates

Similarly, since 1996, Russian Railways staff productivity has continued to improve, growing at 3.3 percent in 2015 (Figure 12) even with national labor productivity figures declining. Some of this may be because RZD no longer maintains a substantial proportion of the freight wagon fleet. RZD's staff productivity is about three times the EU average.[332]

Figure 12 Staff Productivity at RDZ 1996-2015



Source: ROSSTAT, WB Railway Database, RZD Annual Reports, and WB estimates

5 Conclusion

Railways are crucial to the economy, and Russia approached reforms gradually, leaving RZD as the dominant party. Reforms have taken over 15 years, the years between 2000 and 2010 were the most active, which is longer than was originally planned, but progress has been steady. As a result, reforms have succeeded in expanding rail freight traffic, expanding market share, reducing freight rates, restoring operational productivity, and attracting private capital to profitable sector elements such as high-value freight. The introduction of private companies into provision and maintenance of rolling stock brought more than $50 billion of capital

[332] RDZ Annual Report 2015.

to the railway sector, freeing up RZD's capital for the improvement of freight services.[333]

However, significant issues remain unresolved. These include[334]:

- Regulatory and tariff reform;
- Opening the locomotive market and train operation to private sector participation;
- Improving financial sustainability, particularly for passenger transport;
- Creating competition in the passenger transport business;
- Increased investment in infrastructure upgrades, railway technology and development of new railway lines; and
- Establishing an effective public service obligation (PSO) mechanism.

For passenger transport, financial sustainability remains elusive. The Government issued Decree Number 377 (2008), "On Federal Target Program-Modernization of the Russian Transport System (2010-2015)", and passed "The Strategy of Railway Transport Development in Russian Federation to 2030" to tackle these challenges. The Strategy aims to increase asset renewal and resolve remaining economic challenges such as a stagnant economy with an updated mid-term action plan that spells out new infrastructure investment activities with adjusted project implementation deadlines and stages. In 2010, Prime Minister Putin authorized RZD to use proceeds from subsidiary IPOs to finance the Strategy. In February 2010, RZD announced share sales in 30 subsidiaries, including FFC, TransContainer, and Refservice, but will retain controlling shares in each. In 2011, the Russian government sold 75 percent minus two shares in FFC[335] and in 2012, RZD completed the sale of its remaining 25 percent stake in the company.[336]

[333] Murray, B. (2014) Russian Railway Programme, p.5.EBRD; and Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800 p.51.
[334] EBRD (2016). "The EBRD's projects in the Russian railway sector". EBRD Evaluation Department.
[335] International Railway Journal (2011). http://www.railjournal.com/index.php/news/rzd-to-sell-75-of-first-freight-company.html Accessed November 8, 2016
[336] Global Rail News (2012). http://www.globalrailnews.com/2012/11/29/rzd-sells-remaining-freight-one-stake/. Accessed November 8, 2016.

Case Study

SNCF Réseau[337]

1 Introduction

France was the first country in Europe to use the Public-Private Partnership (PPP) model to finance high speed rail (HSR) investment. France has the largest PPP program in Europe, accounting for about 57 percent of the total PPP investment in HSR across all European countries.

Using PPPs allowed the French rail infrastructure manager, Réseau Ferré de France (RFF, now SNCF Réseau[338]), to significantly accelerate the development of the French HSR network beyond what it could have with traditional state funding and RFF resources. Before the use of PPPs, the first four HSR projects took about 20 years to be completed[339]. With the use of PPPs, however, RFF was able to launch and construct four additional HSR projects within a seven-year period[340].

This case study begins by describing the reforms undertaken by the French national railway. It then discusses the emergence of PPPs as a new tool for financing railway investments in France. The study then proceeds to discuss the institutional structures, laws, and regulations underpinning the French national railway, followed by a discussion of the financial impact that PPPs had on RFF (prior to its restructuring). The case study concludes with lessons to be drawn for other railways considering the use of PPPs in financing new developments.

2 The Reform Process

French National Railway Reform

Prior to 1997, the French National Railway Company (SNCF) was a vertically integrated railway, managing both rail infrastructure and train operations. SNCF was restructured in 1997 to satisfy the European Union acquis communautaire for railways, which required vertical separation of the accounts for rail infrastructure and

[337] This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

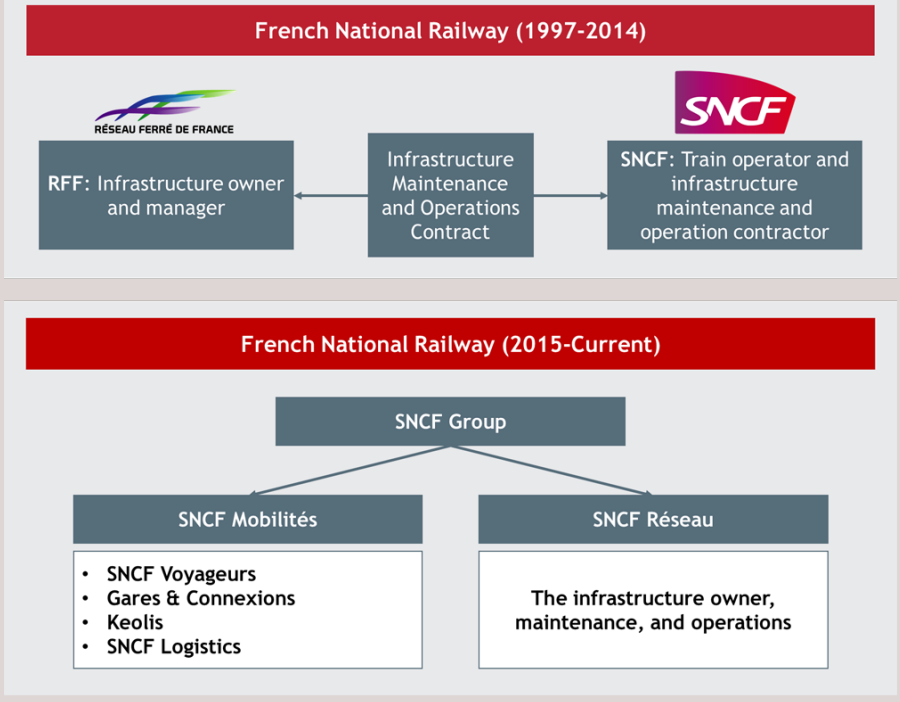
[338] On January 1, 2015, RFF was restructured and subsequently renamed as SNCF Réseau, a division of SNCF.

[339] Inclusive of approvals, construction, and operations.

[340] The four PPP projects include: (1) the GSM – Rail Telecom Project (signed 2010), (2) the South Europe Atlantic HSL (signed 2011), (3) the Brittany-Loire Valley HSL (signed 2011), and (4) the Nîmes and Montpelier Bypass HSL (signed 2012). Whereas the GSM-Rail Telecom Project was concluded on 31 March, 2016, the remaining three projects are reported to be on schedule, becoming fully operational by the final quarter of 2017.

train operations. Ownership of the railway network was transferred to a separate company, named Réseau Ferré de France (RFF)[341]. RFF focused on track improvement and development, network investment choices and financing. RFF contracted with SNCF to undertake the maintenance and operation of railway infrastructure. All national rail infrastructure and infrastructure-related debts were put into RFF (€20.5bn)[342]. SNCF continued to provide train services, in addition to maintaining and operating the railway infrastructure under contract with RFF, and paid track usage charges to RFF. (See Figure 1.)

Figure 1 French National Railway 1997-2004 and 2015-Current



Source: SNCF and RFF

On 1 January, 2015, RFF and SNCF were once again restructured to be combined into the SNCF Group[343]. All infrastructure assets were put into SNCF Réseau, which became responsible for infrastructure development, operations and maintenance. Units of SNCF that previously carried out the infrastructure maintenance and operations contract were transferred to SNCF Réseau, enabling SNCF Réseau to carry out these activities directly. SNCF Mobilités became responsible for the provision of transport services, including freight and passenger services, as well as station management and development.

[341] Law No. 97-135 effectively reorganized the French railway sector and created RFF.
[342] Decree 97-444, 97-445 and 97-446 of 5 May 1997 respectively set out the duties and articles of incorporation of RFF, the initial assets of the public establishment, and charges for the use of the national rail network payable to Réseau Ferré de France - This decree established the rules for the calculation and collection of charges for the use of the national rail network.
[343] The Act of 4 August 2014 created the new state-owned SNCF Group as of 2015. The Group's components included SNCF Mobilités, which became responsible for all SNCF transport operations (both in France and internationally), and SNCF Réseau, which became responsible for managing France's national rail network.

3 Institutional Structures, Laws, Regulations, and Environment

Actors influencing the development and operations of French rail

In addition to the SNCF Group, the French railway sector includes a number of other licensed railway operators providing train services using the infrastructure of SNCF Réseau.

The railway sector, including the HSR lines, is subject to regulation from the following:

- The Railway Activities Regulatory Authority (ARAF), which is responsible for ensuring that all railway operators have fair and equal access to the railway infrastructure in France. ARAF was created by the Act on the Organization and Regulation of Railway Transport in 2009 and is an independent administrative authority responsible for *guaranteeing* equal treatment for all organizations involved in the railway system. It ensures that access to the national railway network is provided under equal conditions for all railway companies, and that the development of competition is not hindered by rules governing the pricing of infrastructures in particular; and
- The Public Establishment for Railway Safety (EPSF), which ensures compliance with safety rules and consistency in operational safety and technical conditions for all railway companies, on behalf of the Minister for Transport.

The French PPP structure includes three groups of actors: public authorities, railway procurement authorities and the private sector.

- **Public Authorities:**
    - The Ministry of Economy, Finance and Industry and the Ministry of Budget, Public Accounts and Civil Administration provide high-level guidance on railway investment, defining the network's general directions, making decisions on major works, and participating in the financing of projects and the renovation of the network.
    - The MAPPP, a central PPP unit, was created in 2004 and is responsible for the preliminary evaluation of PPP projects.
    - The regional governments are taking on a growing number of responsibilities in the area of public transport. On 1 January, 2002, they became regional transport organization authorities, and have since made a significant contribution to defining transport policies and financing the development of the network, particularly under State/Region Strategic Plans (CPER).
- **The Railway PPP Procurement Authorities:**
    - SNCF Réseau (formerly RFF) is the owner and operator of the French railway system. It decides how the network is to be run and maintained.

- European Organizations help to define and ensure compliance with the access and other rules imposed on all national companies.

- **The Private Sector:**

  - A number of private sector companies have been involved in PPP rail projects. In France, three contractors (Eiffage, Vinci, and Bouygues) have won most of the rail PPP projects to date.

Laws and regulations

French PPP legislation very clearly outlines the scope and applicable models of PPPs. The legislation covers the obligations of public authorities with regard to feasibility and consultation, procurement procedures, issues to be addressed in contractual provisions, payments, the institutional framework and the duration of projects. This clarity has allowed the private sector to clearly understand the risks it accepts in a PPP deal, and has therefore facilitated its continued involvement in HSR projects.

SNCF governance and incentives

SNCF Réseau is the ultimate owner and manager of the French railway network. Regardless of the financing model used for a particular project, SNCF Réseau remains in charge of the network, ensuring a national perspective in network development and management.

SNCF Réseau is governed by a Supervisory Board (Board of Directors) that defines the company's policy and oversees its implementation. The Board is composed of representatives from the company (1/3), representatives of the state (1/3), and representatives of employees (1/3). The Chairperson of SNCF Réseau is appointed by the French Government's Council of Ministers, following the Board's proposal. The Chairperson is responsible for applying the policy defined by the Board, improving the economic and financial situation of the company, and coordinating amongst the national and territorial divisions of SNCF Réseau.

Well established HSR sub-sector

The high speed rail sub-sector capacity had become mature after more than two decades of experience in building high speed lines, with a high level and constant commitment from the various governments. Thus, when PPPs were launched, consultation processes were well established at provincial and local levels, commercial experiences successfully carried out, and technologies well known and tested. This experience provided a level of comfort to private financiers and enabled the private sector, with higher financial interest and bringing technical know-how, to participate and perform well.

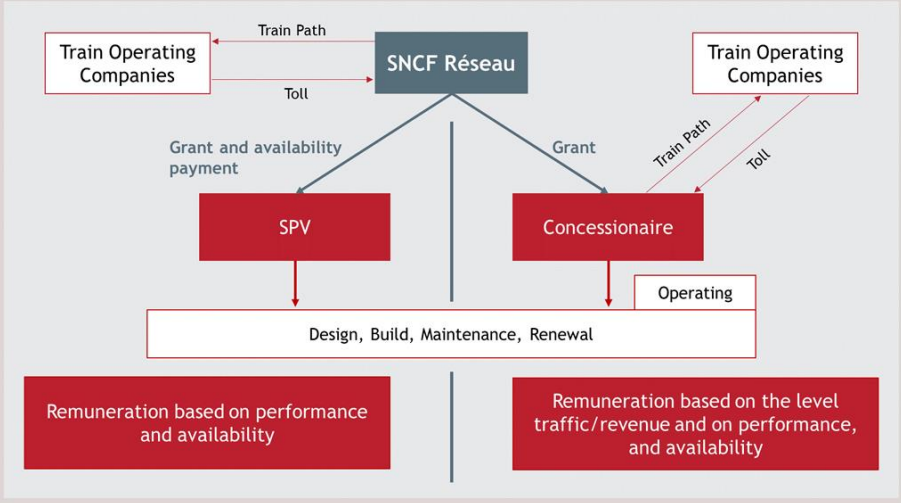
4 PPPs for Financing Railway Investment Projects

PPP Models in French HSR

In 2004, new legislation created a legal framework for Public Private Partnerships and established a central PPP unit (MAPPP) to carry them out[344]. One year later, MAPPP was set up and began operating.

In 2006[345], modifications to the existing legislation allowed RFF to enter into PPPs. This allowed RFF to draw on the technical and financial capacity of the private sector to help finance and deliver major infrastructure projects.
Two main PPP models have since been adopted in French HSR: partnership and concession[346]. Both models have the same objective—to finance, design, build and operate railway infrastructure. The main difference is in the allocation of traffic risk between the public and private parties, which alters the basis on which the private sector partner is reimbursed for providing new facilities. The mechanism behind each model is shown in Figure 2 and discussed below.

Figure 2 Partnership vs. Concession Models



Source: Adapted from RFF website

The partnership model: In the partnership model, SNCF Réseau pays a rental or availability fee for the asset for the duration of the agreement. The fee is based on the performance of the private sector partner against contractual performance indicators, related to both the quality and availability of the infrastructure provided. The fee paid to the partner is not related to the volume of traffic using the infrastructure asset. SNCF Réseau collects track access fees from train operators, assuming the entire traffic risk. The partnership model is used when forecast traffic

[344] The Legislation of 2004 (PPP law) created a central PPP unit (MAPPP), which became responsible for the preliminary evaluation of PPP projects.
[345] Law No. 2006-10 of 5 January 2006 modified the constitutive law for RFF. RFF was required to allow the participation of private parties in the construction, maintenance and operation of railway infrastructure. However, RFF would remain the ultimate owner of any infrastructure. SNCF remained in charge of the management of regulation and safety systems and the operational management of rail traffic.
[346] The 6 December 2006 Decree clearly defined the roles and the obligations of RFF and its private sector partners.

is relatively low, so the private sector partner is unwilling to accept any traffic or revenue risk.

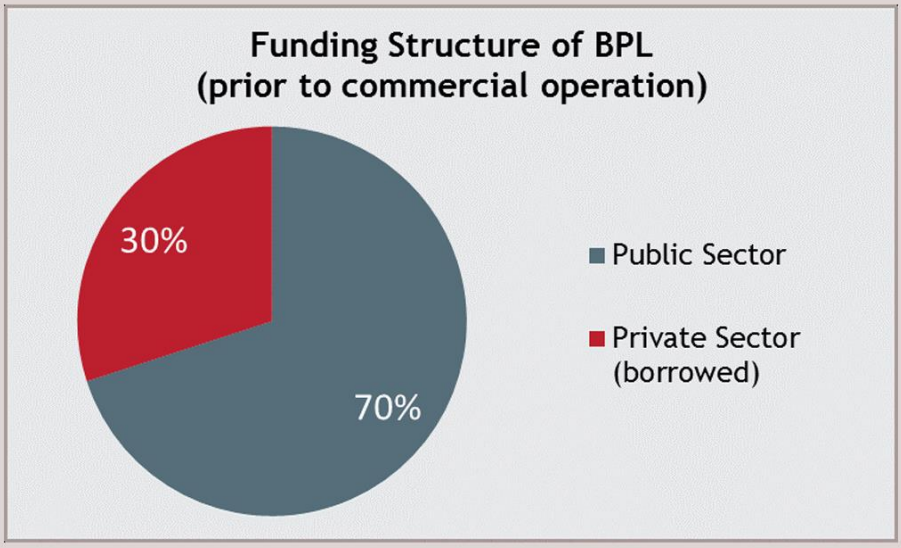
An example of the partnership model is the Bretagne Pays de la Loire (BPL) high-speed rail line in France. Built at a cost of 3.4 billion euros, the 182 km BPL HSR line connects Le Mans with Rennes (see Figure 3). With the improved travel speed, travel time between Paris and Rennes will be reduced by 37 minutes to 86 minutes. Once commercially operational in 2017, this line is expected to provide significant economic benefits to western France, improving connectivity between regional centers and to major European cities. Shifting passenger traffic to the new line will also increase capacity for freight on the existing lines.

Figure 3 Partnership Example: BPL Line

Source: RFF

Eiffage Rail Express (ERE) was contracted to build and maintain the BPL line, under a 25-year PPP contract. Figure 4 provides the breakdown of the funding sources prior to the BPL line's commercial operation and a breakdown of the funding sources throughout the concession (i.e. the project is fully financed by the public sector).

Figure 4 Funding Structure of BPL



Proportion of BPL Funding over Concession Period

Source	Proportion
RFF	43%
French Government	28%
Regional Authorities	28%
European Union	0%

Source: http://www.eiffage.com/files/live/sites/eiffage/files/Actualites/communiques/en/dossier_de_presse_en.pdf

The concession model: In the concession model, the private sector investor collects access charges from railway operators who use the infrastructure asset. These access charges pay for the operational costs of the line, in addition to providing for a return on the private investment. Since access fees are rarely sufficient to provide a return on the whole investment, RFF (now SNCF Réseau), regional authorities, and the national government must fund part of the investment. The concessionaire takes on the risks of project construction, financing, and operation.

An example of the concession model is the LGV Sud Europe Atlantique (SEA) line; a 303-kilometer HSR line connecting Tours and Bordeaux. The SEA is the largest Greenfield HSR project in Europe, with an estimated cost of 7.8 billion euros. Once the SEA is operational, it is expected that the travel time between Paris and Bordeaux will be reduced from three hours to two hours and 10 minutes. With the improved accessibility, this line is expected to carry about 18 million passengers per year when it opens in 2017.

Figure 5 Concession Example: SEA Line

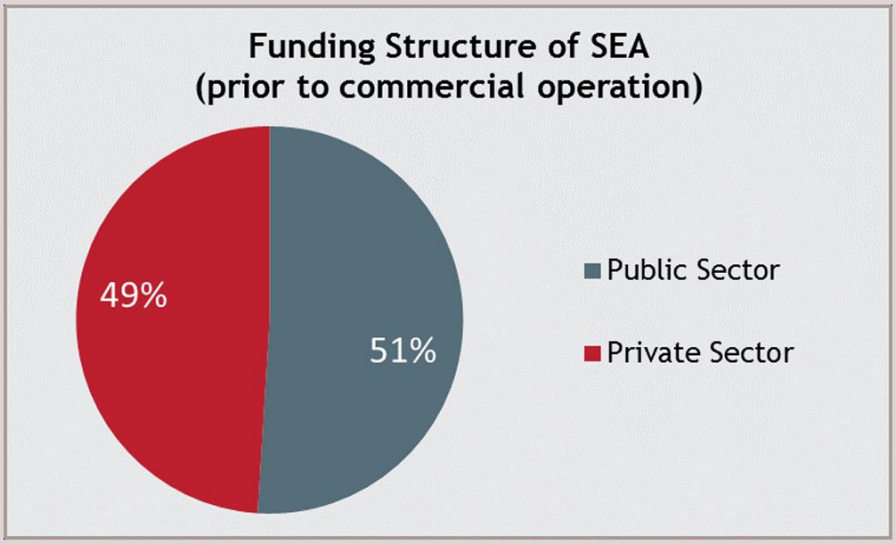
Source: Skyscraper city

The SEA project has been structured on a 50-year concession model, contracted with the Vinci-LISEA consortium in 2011. All design, construction, and operations risks, including traffic risk, are borne by the concessionaire. In return, the concessionaire will collect track access fees on trains using the corridor, including both those operated by SNCF Mobilités and other operators.

Figure 6 provides the breakdown of the funding sources prior to the SEA project's commercial operation and a breakdown of the funding sources throughout the concession. The overall funding of this project included a mix of debt and equity contributions, with about 13 percent of the total costs funded by RFF (now SNCF Réseau), and 39 percent funded by the national government, regional authorities, and the European Union. Given the concessionaire's acceptance of traffic risk, the Vinci-LISEA consortium directly contributed nearly 10% in equity, in addition to having raised the remaining 39 percent in debt (i.e. the privately financed share is greater under a concession than it is under a partnership since the private sector accepts traffic risk)[347].

[347] Note that 28.4% of the (private) debt raised by the concessionaire is backed by guarantees provided by the national government and RFF (now SNCF Reseau).

Figure 6 Funding Strucure of SEA



Sources of SEA Funding over Concession Period

Source	Proportion	Amount (millions of Euros)
French State, Regional Authorities & European Union	39%	3,000
Debt backed by French Government	19%	1,460
RFF	13%	1,000
Debt backed by RFF	10%	757
Concessionaire Equity Contribution	10%	772
Non-Guaranteed Debt	10%	812
Total	100%	7,801

Such PPP arrangements are not without challenges. As the train schedule is being developed, SNCF is arguing that the track access costs are too high compared to the existing conventional line. SNCF has also suggested a reduction in the number of stops, to shorten transit time. This, however, runs counter to the interest of local authorities, which have provided substantial financing for the development of the line. The concessionaire notes that the rates were set in the original concession agreement and are competitive when compared to other similar HSR lines. Managing such negotiations has added to the project's complexity.

Risk Allocation

In HSR projects with full public funding, the risks of financing, design/construction, operations and maintenance, and traffic all belong to SNCF Réseau. However, the use of PPPs transfers the financing, design/construction, operations and maintenance risks to the private sector. In the concession model, the private sector also takes the traffic risk, while in the partnership model, SNCF Réseau would assume the traffic risk. The allocation of traffic risk to the public sector reduces the risk of the private sector taking a short-term view, in order to ensure adequate revenue to service the debt in the early years. (See Figure 7.)

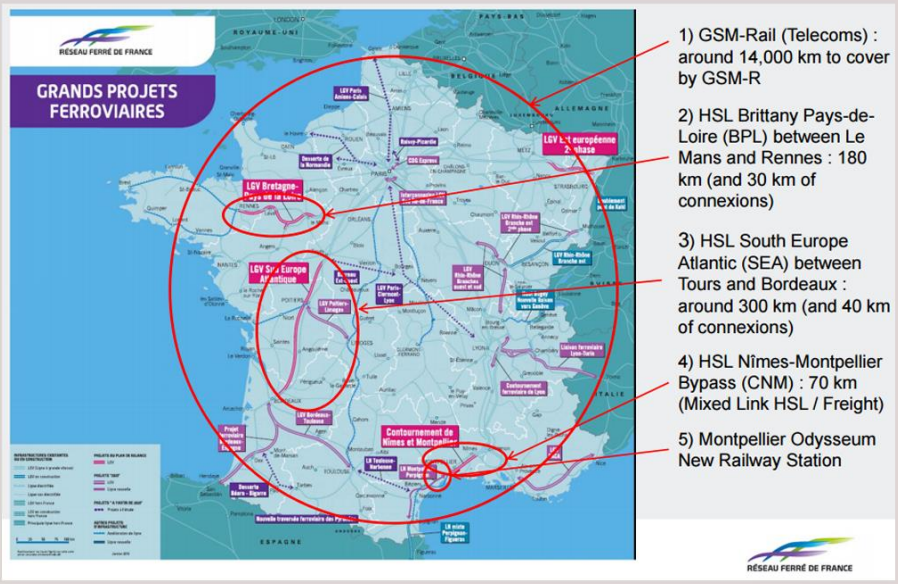
Figure 7 Allocating the Risks

	Public Scheme	Partnership	Concession
Financing Risk	State & SNCF	SPV/Concessionaire	SPV/Concessionaire
Design and Construction Risk	State & SNCF	SPV/Concessionaire	SPV/Concessionaire
Operation and Maintneance Risk	SNCF	SPV/Concessionaire	SPV/Concessionaire
Availability Risk	SNCF	SPV/Concessionaire	SPV/Concessionaire
Traffic Risk	SNCF	SNCF	SPV/Concessionaire

Source: Henn, L., Sloan, K., and Douglas, N. (2013). European Case Study on the Financing of High-Speed Rail. Australasian Transport Research Forum.

Using the partnership and concession models, RFF launched four HSR-related projects between 2010 and 2012 and also had a train station built (see Figure 8). In total, the length of new lines being built through PPPs is over 620 km, with an estimated cost of 15 billion euros, of which, the central government has financed only about 2.2 billion.

Figure 8 Recent PPP Projects



Source: PPP Projects for the Railways Network in France, 2012

5 Financial Impact

Changes in Financial Structure

Prior to 1997, French TGV lines were financed by SNCF debt, on the basis of estimated profitability. For example, the Sud-Est line was fully financed with SNCF debt, while the Nord line was financed with 20 percent of the funding from public authorities and 80 percent with SNCF debt.

With the introduction of RFF (now SNCF Réseau) in 1997, all debt related to existing HSR lines was transferred to RFF, the new infrastructure manager, (about 20 billion euros, accounting for some 60 percent of SNCF debt in 1997). During this phase, the total investment cost of each project was covered by RFF, together with subsidies from the French state, local authorities, other neighboring states and EU

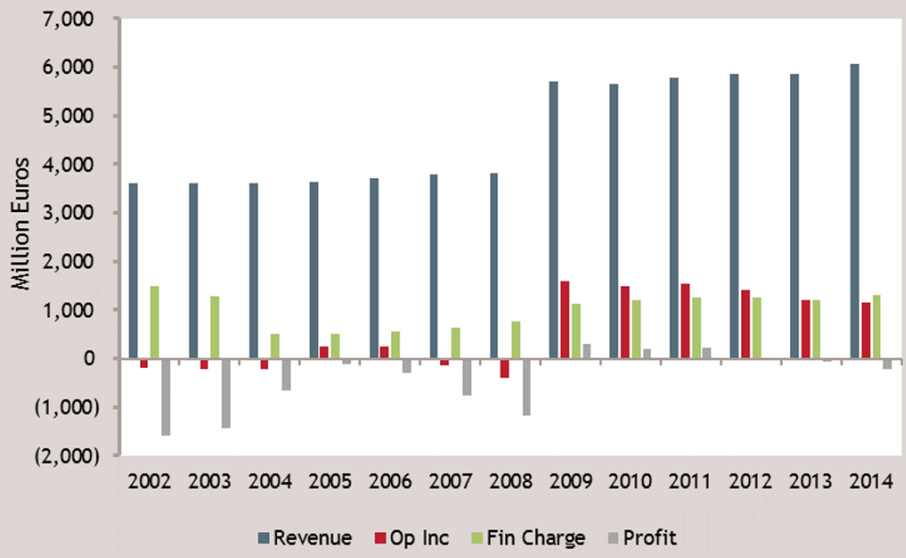
contributions. For example, 40 percent of the TGV Est line, opened in 2007, was financed by RFF.

With the introduction of PPPs, the financial strategies and structure changed significantly. The private sector now plays a major role, contributing financing through either a partnership or concession contract. Between 2010 and 2012, RFF launched four PPP projects (including GSM-Rail Telecom, BPL, CNM, and SEA) with varying degrees of private financing. For example, in the case of LGV Sud Europe Atlantique (SEA), private financing will amount to 3.8 billion euros throughout the concession period, almost 50 percent of the total cost.

Financial impacts for RFF

In the 2014 financial year, RFF declared total gross revenue of 6,067 million euros, with a net loss of 213 million euros. Details on the financial trends for RFF are shown in Figure 9. RFF revenue and operating results improved as of 2009, when access charges were significantly increased. Between 2009 and 2012, operating income exceeded financial charges, and RFF showed a small profit. However the "profit" (the gap between operating income and financial charges) declined steadily during this period. RFF resultantly recorded a loss in 2013 and 2014[348].

Figure 9 Financial Impacts to RFF



Source: RFF Financial Report (2001-2014)

[348] Because RFF was restructured into SNCF Reseau as of January 1, 2015, financial statement for RFF are only available through 2014.

6 Conclusion

This case study highlights the role of PPPs in the development of French HSR. In particular, it illustrates that:

- The PPP model can attract private sector financing for HSR infrastructure and enable projects to be delivered more quickly than would be possible with a traditional strictly public sector rail financing approach;
- A clear, predictable and legitimate institutional framework/law/regulation facilitated the development of HSR PPPs;
- PPP models that allocate traffic risk differently (partnership vs. concession model) are needed to attract the private sector, depending on anticipated traffic levels and financial performance of the project; and
- The PPP mechanism provides a way to get the private sector to define the degree to which a proposed investment is self-funding or requires a subsidy or revenue guarantee to be viable. PPPs therefore provide a transparent mechanism for outlining the initial and ongoing financial support which lower volume lines may require to be financially viable.

However, the overall financial rate of return of new HSR lines is declining as the network has become mature. The lines with highest traffic (i.e. those with the most potential for private financing) were built in the last two decades while the new projects are mostly for lower density branches. This will likely limit the appetite from the private sector.

References

Crozet, Y. (2014). *Extension of the High-Speed Rail Network in France: Facing the Curse That Affects PPPs in the Rail Sector*. Research in Transportation Economics 48 (2014) 401-409.

Dehornoy, J. (2011). *The Evolution of Public Funding to the Rail Sector in 5 European Counties-A Comparison*.

Eiffage (2011). *Ligne a Grande Vitesse Bretage-Pays de la Loire Press Release 07/28/2011*. Retrieved from: http://www.eiffage.com/files/live/sites/eiffage/files/Actualites/communiques/en/dossier_de_presse_en.pdf

Eiffage (2013). *LGV BPL PPP Contract: Funding*. Retrieved from: http://www.ere-lgv-bpl.com/financement

European Investment Bank (2011). *Tours-Bordeaux Sud Europe Atlantique high-speed line – RFF signs Europe's largest high-speed rail concession agreement with VINCI - Unprecedented EIB financing of EUR 1.2bn*. Retrieved from: http://www.eib.org/infocentre/press/releases/all/2011/2011-083-ligne-a-grande-vitesse-sud-europe-atlantique-tours-bordeaux-financement-sans-precedent-de-la-bei-1-2-milliards-deuros.htm

European PPP Expertise Centre (EPEC) (2012). France-PPP Unit and related institutional framework, European PPP Expertise Center

European PPP Expertise Centre (EPEC) (2010). *Market Update: Review of the European PPP Market 2010*. European Investment Bank: Luxembourg.

Henn, L., Sloan, K., and Douglas, N. (2013). *European Case Study on the Financing of High-Speed Rail*. Australasian Transport Research Forum.

INSEE. http://www.insee.fr/fr/

Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

Ligne a Grande Vitesse Bretagne – Pays de la Loire (2016). *Characteristics and Implementation of the Project*. Retrieved from: http://www.lgv-bpl.org/index.php

LISEA (2016). *The South Europe Atlantic high - speed line, Press Kit*. Retrieved from: http://www.slideshare.net/LISEA_LGVSEA/lisea-et-lgv-sea-dossier-de-presse-2016-version-anglaise

Railway Gazette (2009a). *LGV Est Phase 2 Tendering Gets Underway*. September 2009.

Railway Gazette (2009b). *Perpignan - Figueres Concession Extended*. November 2009.

Railway Gazette (2007). *RFF Explores PPP Models to Fund Infrastructure Enhancements*. 02 June 2007.

Railway Technology (2015). *Brittany–Loire Valley High-Speed Line, France*. Retrieved from: http://www.railway-technology.com/projects/brittanyloire-valley-high-speed-line/

RFF (2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014). *Annual Financial Report*. Retrieved from http://www.rff.fr/en/media-library/publications-346/annual-reports

SNCF Réseau (2015). *LGV SUD-EUROPE-ATLANTIQUE*. Retrieved from: http://www.sncf-reseau.fr/fr/projets-chantiers-ferroviaires/france-europe/lgv-sud-europe-atlantique

World Bank (2015). *Private Participation in Infrastructure Projects Database (2015)*. Retrieved from: http://ppi.worldbank.org

Case Study

Southern Pacific[349]

1 Introduction

This case study of Southern Pacific Railroad[350] (SPR) illustrates how it commercialized its telecom assets and rights-of-way (ROW), and later spun off two separate telecommunications companies. It shows how a railway can use its existing assets (e.g. ROW, fiber optic cable and microwave networks) to create additional revenue streams. Moreover, it demonstrates that a major railroad network can benefit from the sale or lease of such assets, and that its core operations can remain unaffected by such divestiture. This case also highlights the maturity of this practice, given that the usage of the SPR assets and their commercialization (and later sale) were all undertaken between 1972 and 2000.

This case study first provides an overview of the US telecommunications industry, which, in the 1970s and 80s, allowed for the proliferation of private companies in a sector that was previously served by one dominant entity (AT&T). It then describes how SPR created the Southern Pacific Communications Company (SPCC), which later came to be known as Sprint, and Southern Pacific Telecom (SP Telecom), which came to be known as Qwest, following its acquisition of the latter. This is followed by discussions of SPCC and SP Telecom's financial performance in the short and long terms, as well as the broader impact that the two entities had on the US telecommunications sector. This case study then concludes with a few observations from SPR's approach to developing SPCC and SP Telecom.

2 US Telecommunications Industry Overview

The USA is one of the world's largest information technology and technology markets, with major corporations in software, IT services, telecommunications, and content creation and distribution. It has a number of major innovation hubs; some that are long standing, and some that are only now emerging. The USA is also the third largest mobile telecommunications market by subscriber base, behind China and India, but the largest by revenues, with the service revenues in 2014 at US$368 billion[351].

---

[349] This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

[350] Note that Southern Pacific is now owned by Union Pacific Railroad. It is a "significant subsidiary" of Union Pacific Corporation.

[351] TeleGeography, GlobalComms database (by subscription), available at www.telegeography.com

The US telecommunications market is de jure and de facto competitive although some markets (such as mobile telephony and cable TV) have consolidated at the national level, with a small number of large operators and many smaller regional or state-level players. There is limited public sector involvement in telecommunications, with no state-owned enterprises in existence, although various government agencies (at the national, state, or municipal levels) have begun to fund or support the deployment of fiber optic and wireless broadband networks in recent years.

The market is also regulated at these three levels, i.e. at the federal (national) level by the Federal Communications Commission (FCC), at the state level by "public utility regulatory commissions" (PURCs), and at the local level by municipal agencies. The scope of regulated markets varies: the FCC regulates all wireless communications (including radio and TV broadcasting) and all interstate and international communications, while the state PURCs regulate intrastate telecommunications, and the regulation of cable TV is done by either PURCs or municipalities.

A major turning point in the US telecommunications market occurred in the late 1970s and early 1980s, and particularly in 1984, when a court-enforced judgment ended the monopoly of AT&T on interstate and international telecommunications (local and intrastate telephony was always competitive). This ushered in competition in long-distance and wireless telecommunications and permitted the entry of many other private networks into the growing long-distance telephony and later data markets.

3 The Creation of Southern Pacific Communications Company (Sprint)

The Southern Pacific Railroad (SPR), like other railway networks, operated an internal telephone system, first using copper-based telephony and then, by the 1950s, using microwave radio systems with towers located on railway ROW alongside its railway tracks. The latter technology enabled dispatchers to communicate directly with the railroad's train engineers and also eliminated the need for the railway to routinely maintain its vast network of pole-mounted aerial wire. Recognizing that there was an opportunity to use this internal "switched private network" commercially by selling excess and unused capacity to other businesses, SPR set up the Southern Pacific Communications Company (SPCC) in January 1970 to offer public and corporate access to its Private Branched Exchange (PBX) service. At the time, the US had a regulated national and international monopoly on telecommunications, which was AT&T[352].

The SPR-SPCC network began operations in December 1973, and by July 1974, SPCC was the first non-AT&T company to provide nationwide voice telecommunications by microwave radio. This move created a major national competitor to AT&T, because SPCC was able to take advantage of a ruling by the US national telecommunications regulator, FCC, which further opened the market. The ruling, made in 1971, required AT&T to provide competing service providers with open access to its local telephone exchanges (i.e. AT&T's end-subscribers). However, a

[352] AT&T made use of a public exchange, and was therefore regulated by the FCC.

series of court cases among AT&T (to protect its monopoly), the FCC, and the competing networks (including SPCC) prolonged the status quo. Finally, a decision by the court in April 1978 (known as the "Execunet II case") forced AT&T to allow private networks to access its local exchanges.

Creation of Sprint

In November 1978, after a clear decision by the Supreme Court in favor of competition in telecommunications, SPR sought to further expand its communications network through installing fiber optic cables along its railroad ROW. Within a year of the Supreme Court's decision, SPCC witnessed its customer base grow from an estimated 1,000 customers to nearly 30,000 customers. Owing to SPCC's success during this period, SPR rebranded SPCC's services and SPCC itself as Sprint. SPR further sought to spin this subsidiary off to a third-party, and to subsequently lease back capacity for its own internal communications needs.

By mid-1979, the Sprint network had grown to serve 72 cities, making it the nation's largest specialized communications common carrier.

By 1981, Sprint had 200,000 customers and was handling an estimated 60,000 long-distance calls per day, at rates that were 20-50 percent lower than those being charged by AT&T.

Finally, in 1983, SPR sold Sprint to General Telephone & Electric Corporation (GTE Corporation), then the largest non-AT&T telecommunications company in the US. GTE paid US$940 million (comprised of $740 million cash and $200 million debt)[353].

4 The Creation of Southern Pacific Telecom (Qwest)

In 1988, SPR was acquired by Philip Anschutz, then owner of Rio Grande Industries, a parent company of Denver and Rio Grande Western Railroad. The railway's new shareholder and management believed that there remained the potential to exploit SPR's remaining ROW to deploy additional telecommunications infrastructure (i.e. fiber optic cables) and to commercialize it although SPR had divested its ownership in Sprint[354]. Therefore, in March 1989, SPR created Southern Pacific Telecommunications (SP Telecom) as a new subsidiary company.

In September 1991, Philip Anschutz paid $55 million to acquire SP Telecom under the Anschutz Corporation, separating it from SPR. SP Telecom retained full and exclusive rights of access to the railroad's ROW for the purposes of installing telecommunications infrastructure, thereby eliminating the possibility of new entrants using its ROW. In December 1994, SP Telecom acquired another (competing) telecommunications company, Qwest.

As a result, SPR's original ROW ultimately led to the creation of two competing telecommunications networks, namely Sprint and Qwest.

---

[353] This purchase took place around the time that GTE was positioning itself to roll out a national network, given the end of AT&T's monopoly on the national long-distance telephony market (this ultimately happened in 1984).

[354] Access to the SP ROW for the installation of fiber optic cables was reported to be one of the main reasons behind Anschutz's acquisition of SP.

5 Results

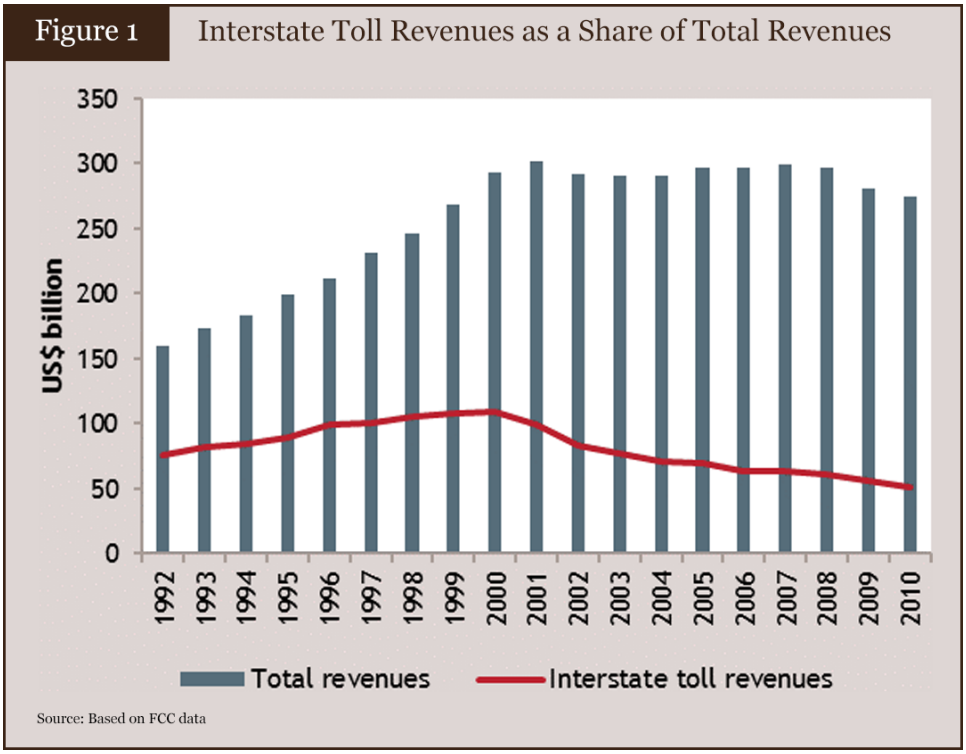
Financial

SPR was able to derive significant value through creating SPCC (later Sprint) and SP Telecom. In the case of Sprint (and its predecessor, SPCC), its customer base grew from 200,000 to 900,000 customers in 45 states of the USA between 1981 and 1984. By the early-1980s Sprint was profitable, reporting a US$34 million operating profit.

SP Telecom had annual revenues of more than $50 million by 1993, and employed an estimated 410 people. Longer-term value was derived from merger and acquisition (M&A) and initial public offering (IPO) activities associated with each subsidiary. Sprint was acquired by GTE, a large telecommunications company, for almost US$940 million; this was "30x estimated earnings for 1982, and nearly 7x net assets." SP Telecom (acquired and rebranded as Qwest), initiated an IPO in June 1997. This gave the company a market capitalization of $2.1 billion.

Although there is no doubt that SPR's commercialization of its telecom assets and ROW was of great benefit to the railway, it is important to remember that these specific longer-term financial impacts were realized due to the timing of the sales, acquisitions, and IPOs of the Sprint and SP Telecom/Qwest networks. The period until the 1990s saw a fairly quick and consistent increase in the revenues generated by long-distance telecommunications traffic (see Figure 1). These companies likely would have yielded much lower valuations had they been sold later, following the bursting of the telecommunications-internet bubble in the USA in the early 2000s, and the subsequent rapid descent in the prices of data and telephone communications (even as usage grew exponentially).

Figure 1 Interstate Toll Revenues as a Share of Total Revenues



Source: Based on FCC data

The short-term impacts and the underlying value of these networks are clear, with both having been built using ROW owned and utilized by the railway, realized through private investment.

Other

Sprint played a direct role in increasing competition in the US telecommunications market. From the 1970s, as pressure mounted on the FCC and AT&T to deregulate the market, Sprint (and other companies such as MCI) was critical players in the court cases and regulatory proceedings that led to the ultimate breakup of the monopoly held by AT&T. While neither Sprint nor Qwest exists today in their original form (they have been re-acquired, merged, rebranded, and reorganized a number of times since), these companies played a key role in the development of the highly competitive US telecommunications market. This underscores the potential game-changing role that the strategic use of the ROW held by railways can play in overall market development of non-rail services.

A mark of the continued value placed on the ROW is that Union Pacific Railroad, which now owns the erstwhile SPR system, continues to offer "railroad rights of way to connect major metropolitan cities and other geographic regions generally west of the Mississippi River."[355] Union Pacific currently operates over 32,000 miles of ROW and "maintains a presence in the fiber optic and wireless market place by leveraging assets, including continuation as a provider of ROW and wireless facilities." Union Pacific continues to manage its own internal telecommunications.[356]

6 Conclusion

This case highlights how SPR was able to capture a revenue opportunity in the (liberalizing) USA long-distance market through using its internal telecommunications network and railway ROW for commercial purposes.

At the time the market was growing, businesses across the USA sought higher-capacity national data connectivity from operators who were competitors to the then monopolistic AT&T telecommunications system. SPR saw this opportunity as early as 1972 and sought ways to use its then microwave communications network for long-distance telecommunications. The move put a dent in AT&T's longstanding long-distance monopoly, and addressed the growing demand for data connectivity. In 1988, under new ownership, SPR once again saw an opportunity to exploit its existing ROW to provide for a newer telecommunications technology, underground fiber optic lines.

The SPR case is unique, in that its ROW were used and commercialized on two separate occasions—first for microwave telecommunications, and later for fiber optic cables. Both instances led to the emergence of successful companies that were highly valued at the time of their sale (Sprint to GTE, for about $1B) and IPO (SP Telecom as Qwest, at about $2.1B). The SPR case should be regarded as a specific example of a more general opportunity open to many railways (i.e. recognizing a specific business opportunity based on existing rail assets). A change in both the

[355] Union Pacific: Fiber Optic Overview. Retrieved from: https://www.up.com/aboutup/community/telecom/overview/index.htm
[356] *Ibid*.

available technology and the regulatory environment permitted SPR to sell off spare capacity in an essential support activity (internal communications utilizing the railway ROW) without reducing the capacity or reliability of the communications services essential for railway operations, the core activity of SPR.

References

Breen, D., Federal Trade Commission (2004). *The Union Pacific/Southern Pacific Rail Merger: A Retrospective on Merger Benefits*. Retrieved from https://www.ftc.gov/sites/default/files/documents/reports/union-pacific/southern-pacific-rail-merger-retrospective-merger-benefits/wp269_0.pdf

Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

O'Reilly, B., Harrington, A. Fortune Magazine (1999). Billionaire Next Door Philip Anschutz may be the richest American you've never heard of. But this in many ways ordinary guy is an extraordinary businessman, as we learned when we went hunting for the elusive. Retrieved from: http://archive.fortune.com/magazines/fortune/fortune_archive/1999/09/06/265307/index.htm

Surface Transportation Board. *Financial and Statistical Reports (R-1)*. Retrieved from http://www.stb.dot.gov/stb/industry/econ_reports.html

TeleGeography, GlobalComms database (by subscription), available at www.telegeography.com

Union Pacific Railway Corp. (1994-2005). *10-k Reports*. Retrieved from http://www.sec.gov/edgar/searchedgar/webusers.htm#.VSLHFtLER8E

Union Pacific: Fiber Optic Overview. Retrieved from: https://www.up.com/aboutup/community/telecom/overview/index.htm

United States General Accounting Office (2002). R*eport to the Chairman, Committee on Transportation and Infrastructure, House of Representatives*. Retrieved from http://www.gpo.gov/fdsys/pkg/GAOREPORTS-GAO-02-524/pdf/GAOREPORTS-GAO-02-524.pdf

US General Accounting Office (2002). *Railroad Regulation: Changes in Freight Railroad Rates from 1997 through 2000*. GAO-02-524. Retrieved from http://www.gao.gov/assets/240/234838.pdf

UtahRails.net (2015). *SP and Sprint*. Retrieved from: http://utahrails.net/sp/sprint.php

UtahRails.net (2015). *Southern Pacific Corporate History*. Retrieved from: http://utahrails.net/sp/sp-corp-hist.php

Case Study

Tokyu Corporation[357]

1 Introduction

Rail lines beginning in the central city can create value in the areas immediately surrounding the rail lines, by improving accessibility and facilitating agglomeration economies. Such value can be greatly enhanced through effective land use planning and development of diverse real estate development around stations, closely aligned with market demand. Integrated land use planning can thus both increase the land value and generate substantial additional rail traffic.

Tokyo's railway companies have historically leveraged real estate to pay for infrastructure development while producing a profit for shareholders. Tokyu Corporation, one of Japan's major private railway operators, is well known for its development-based land value capture practices and was among the first to advance the business model of railway and new-town co-development.

This Futako-tamagawa Station redevelopment project in Japan illustrates the use of land value capture with transit-oriented development employed by Tokyu Corporation, increasing ridership on the Den-en-toshi line, generating steady cash flows, and recouping investment costs.

The case study first provides the overview of Tokyu Corporation and Futako-tamagawa Station. This is followed by a description of the Futako-tamagawa Station redevelopment project, the institutional and regulatory framework, within which the land value capture approach was undertaken, and the key mechanisms used in the redevelopment project. This case study finally presents the impacts of the redevelopment project and concludes with a summary of the lessons to be drawn from Tokyu Corporation's approach.

2 Tokyu Corporation

The Tokyu Corporation is Tokyo's largest private railway company and a major private railway operator (with eight railway lines), as well as being a land developer in the Greater Tokyo Area of Japan. The Corporation was established in 1922 as both a railway operator and a property developer. Its current business portfolio includes railways, urban real estate development (development of houses, apartments, buildings and commercial facilities, property lease, management and investment for office buildings), lifestyle services (retail services, cultural facilities,

[357] This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

cinemas, sporting facilities, travel agencies, cultural schools and other daily living services), and hotels and resorts. Property development around transit stations has become a major source of income for the company.

Between FY2004 and FY2016, real estate accounted for about 36 percent of Tokyu Corporation's operating profit (about ￥321 billion, US$ 2.7 billion equivalent[358]), and transport (railway and feeder bus services) about 40 percent. It secures about 24 percent of its operating profit from retail, leisure and hotel services, which indicates the growing importance of providing multiple services along with railway investment and real estate development, to support the railway's long-term operation and maintenance costs.

Tokyu Corporation's market includes about 490 square kilometers across the 17 jurisdictions, with now some 5 million residents in 2.5 million households, whose income is 50 percent higher than the national average.

3 Futako-tamagawa Station

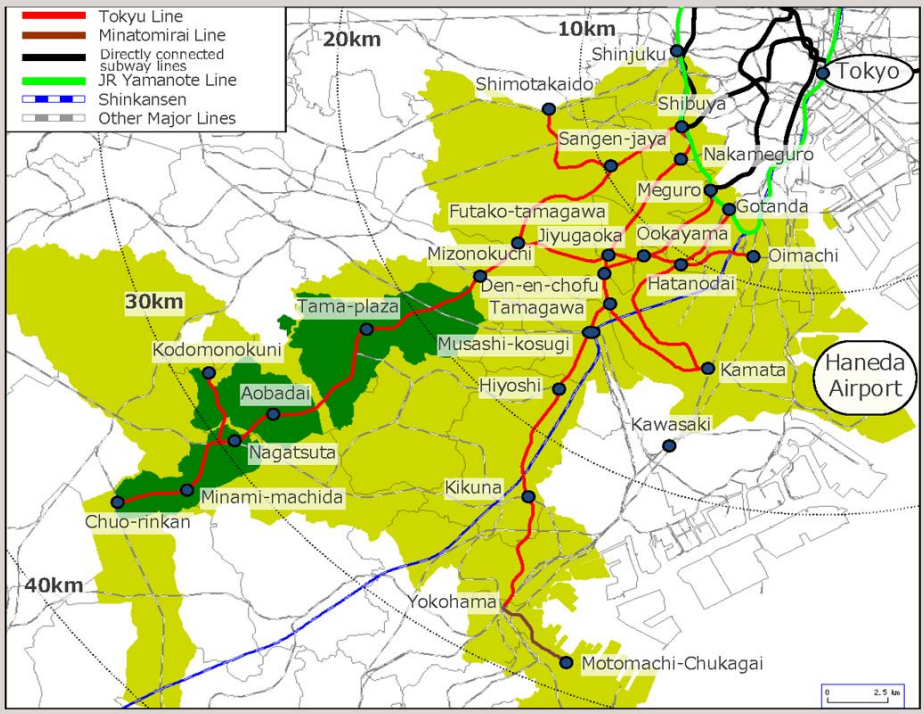
The Futako-tamagawa train station is located in the southwestern suburbs of Tokyo, on the Den-en-toshi[359] Line, a major artery providing access to central Tokyo and one of Tokyu's most crowded commuter lines (see Figure 1). The Den-en-toshi line has an underground section that starts in Shibuya and ends at Futako-tamagawa (9.4 km away), and an above-ground section, which passes through many suburbs of Tokyo and Yokohama.

More than 95,000 passengers use the Futako-tamagawa Station every day[360], riding on two suburban rail lines, the Tokyu Oimachi and Tokyu Den-en-toshi, which connect the suburb to the urban core in less than thirty minutes.

The Den-en-toshi line was developed in the 1940s-1980s[361], which coincided with the rapid urbanization of Tokyo, generating strong demand for both new housing and public transport to the center of Tokyo.

[358] All conversions from JPY to USD in this section are based on an exchange rate of 1 USD = 121.04 JPY. See http://data.worldbank.org/indicator/PA.NUS.FCRF?end=2015&locations=IN&start=2004&view=chart&year_high_desc=false for more information.
[359] Literally means "garden city" in Japanese.
[360] Average for 2015. Tokyu Corporation website (as of January 19, 2017): http://www.tokyu.co.jp/railway/data/passengers/
[361] Tokyu Corporation website(as of January 19, 2017): http://www.tokyu.co.jp/railway/data/train_line/dt.html

Figure 1 Regional Map of Tokyo Area



Source: Tokyu Corporation, Fact Book 2014

Garden city concept

Tokyu Corporation's garden city concept, launched in 1953, included provision of larger, clean houses for commuters living in Tokyo. The garden city aimed to attract many white collar workers to the new towns along the line.

Tokyu Corporation practiced this garden city concept for property development along its Den-en-toshi Line extensions between 1966 and 1984. The garden city development is high-quality and self-sufficient and supports a well-mixed variety of businesses within a suburban setting: offices, banks, universities and private schools, medical and community centers, public service branches, department stores and supermarkets, hotels, and recreational facilities. The garden city districts account for about 50 square kilometers with 600,000 residents along the Den-en-toshi Line[362].

4 The Redevelopment Project

4.1 The Project

In 2000, Tokyu Corporation launched the Futako-tamagawa Station redevelopment project (Figure 2), one of the largest redevelopment projects in Tokyo, on an 11.2-hectare block at the site of the former Futako-tamagawa Amusement Park. The project, completed in 2015[363], forms a new center for commercial, residential,

[362] As of 2012. Tokyu Corporation website (as of January 19, 2017): http://www.tokyu.co.jp/company/business/urban_development/denentoshi/

[363] The grand opening of the Futako-Tamagwa Rise Phase 2 in 2015 marked the completion of the Futako-tamagawa Station Area Redevelopment Project. Tokyu Corporation

and leisure activities, with urban accessibility around Tokyu's railway station by the Tama River.

The project is designed in part to reflect demographic changes in Japan and Tokyo and the need for strategic and well-designed cities to attract workers and population, by including a number of unconventional service facilities. This is in line with the company's development strategy in recent years, which has evolved to tackle the major demographic and business changes along the railway corridors.

Figure 2 Futako-tamagawa Station

Source: Financing Transit-Oriented Development with Land Values (World Bank 2015)

4.2 Institutional and Regulatory Framework

Japan has employed a number of regulatory instruments that have facilitated transit-oriented development. These include land readjustment and air rights sale. They are described below.

Land readjustment

Land readjustment, allowed under the 1989 Housing and Railway Act, has been one of the most significant instruments, through which government entities, private railway corporations and private developers have been able to channel the earnings from land value capture to finance transit-oriented developments. It is done in close cooperation with the planning authorities, from which approval is needed to decide future station locations.[364]

website (as of January 19, 2017): http://www.tokyu.co.jp/company/business/urban_development/work/

[364] For a detailed coverage of land readjustment in Japan, see the case study on "Land Readjustment in Japan" produced by the Transit Oriented Development Community of Practice. Available at: https://collaboration.worldbank.org/servlet/JiveServlet/downloadBody/23643-102-1-30762/Land_Readjustment_Japan.pdf

Using the land readjustment approach, multiple landowners organize a cooperative body that pools their land parcels together into fully serviced and regularly shaped residential and commercial parcels with higher property values. A private rail company can take a leading role in administrating such a cooperative entity. To capture the likely accessibility options of transit stations, the local government converts zoning codes to allow both high-rise and mixed use buildings.[365]

Land readjustment is often administered alongside the national government's Road Program or Urban Street Program. These programs effectively subsidize transit-oriented infrastructure and facilities, including bus lanes, station plazas and transport terminuses, pedestrian access and circulation systems, bicycle parking, urban green space, and street amenities.

Air right sale

This regulatory instrument involves giving landowners permission to transfer part of their unused air development rights, such as surplus Floor Area Ratio, permitting another landowner to construct a taller building in a designated project area.[366]

4.3 Key Mechanisms

The key mechanisms used for the redevelopment of the areas surrounding the Den-en-toshi Line and the Futako-tamagawa Station are described below.

Internalization of accessibility and agglomeration benefits by rail company

Tokyu Corporation bought large tracts of agricultural land prior to building the Den-en-toshi rail line. The Corporation then developed rail-integrated communities along the line over time, with massive housing construction supporting Tokyo's middle class suburbanization. This allowed the company to capitalize on the land appreciation from its investment made between the 1960s and the early 1980s.

In other cases, private railway agencies collectively carried out land readjustment projects or proactively purchased land parcels around stations (under the market freehold system in Japan) and internalized the capital gains from real estate businesses and development opportunities.

Market-driven redevelopment strategy

The redevelopment strategy for the redevelopment around Futako-tamagawa Station is market-driven. It targets well-defined groups. The inner-city office space included in this mixed-use development targets innovative industries and creative workers, distinguishing itself from other office buildings for conventional white-collar businesses in Tokyo's central areas.

[365] Murakami, J. (2012). *Value Capture and Land Policies. Lincoln Institute of Land Policies.*
[366] Ibid.

The corporation has also differentiated the new shopping facilities for younger consumers from existing retail stores for elderly residents around the station. This includes, for example, the opening of the Futako-tamagawa Rise Shopping Center in March 2011, a center expected to house about 150 specialty shops targeting young women in their 20s and 30s. Such an approach is in strong contrast with developments undertaken in the 1970s and 1980s.

Integration of transport and commercial hub with high-quality livable environment

The Futako-tamagawa Station redevelopment took a high-quality integrated approach in attracting its target groups. It aimed to achieve urban development where everyone could live in comfort, making use of the site's inherent natural resources, geographical location as a gateway to West Tokyo, and an established commercial hub.

Specifically, the area has been revitalized by reinforcing commercial and business functions around the station while developing the water and green space in harmony with the surrounding rich natural environment. This includes major public subsidies (¥ 36.6 billion / US$ 302 million) for the development of public facilities, such as a transit plaza, local roads, and parks.

This uncommon combination of urban and natural environments allowed the rapid sale of new apartment like the Futako-tamagawa Rise Tower & Residence apartments completed in May 2010.

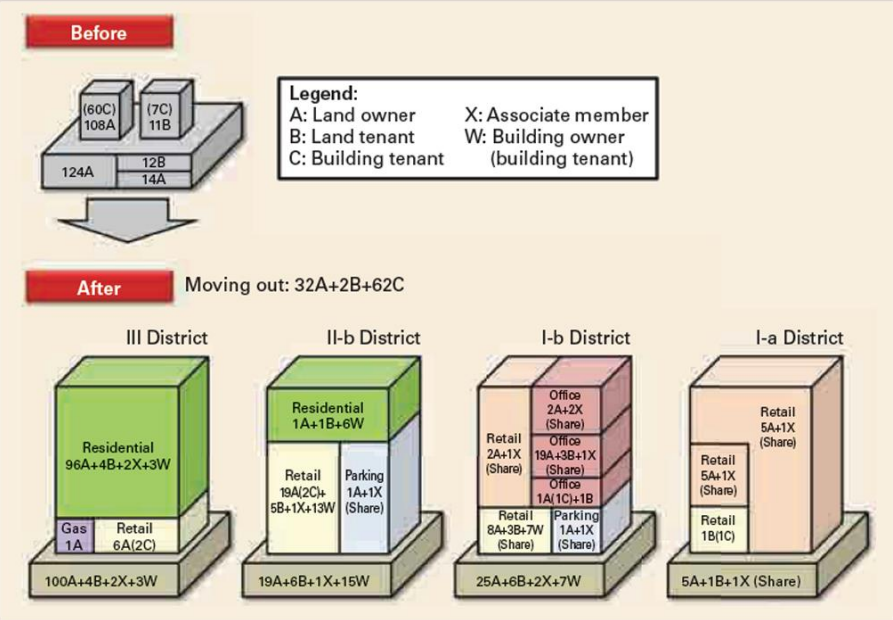
Inclusive and long-term redevelopment scheme

The Futako-tamagawa redevelopment involved more than 200 landowners and tenants in inclusive and complex floor area reallocation procedures. Figure 3 illustrates the number of land owners, land tenants, and building tenants before and after the redevelopment. Owning more than 95 percent of the property rights around the station, Tokyu Corporation made a real effort to integrate multiple objectives and functions into one redevelopment, to generate recurrent benefits through synergistic area management activities rather than temporary profits from speculation.[367]

Nonetheless, considering the high cost of such redevelopment, substantial public subsidies were also required to develop accompanying public facilities through an urban redevelopment scheme that raised public subsidies (¥ 36.6 billion / US$302 million) to supplement the substantial floor area sales (¥ 100.1 billion / US$827 million) used to fund the redevelopment. This overall process has taken nearly 15 years.

[367] Ibid.

Figure 3 Futako-tamagawa Redevelopment Floor Area Reallocation, Phase 1



Source: Financing Transit-Oriented Development with Land Values (World Bank 2015)

5 Results

Financial impact on Tokyu Corporation

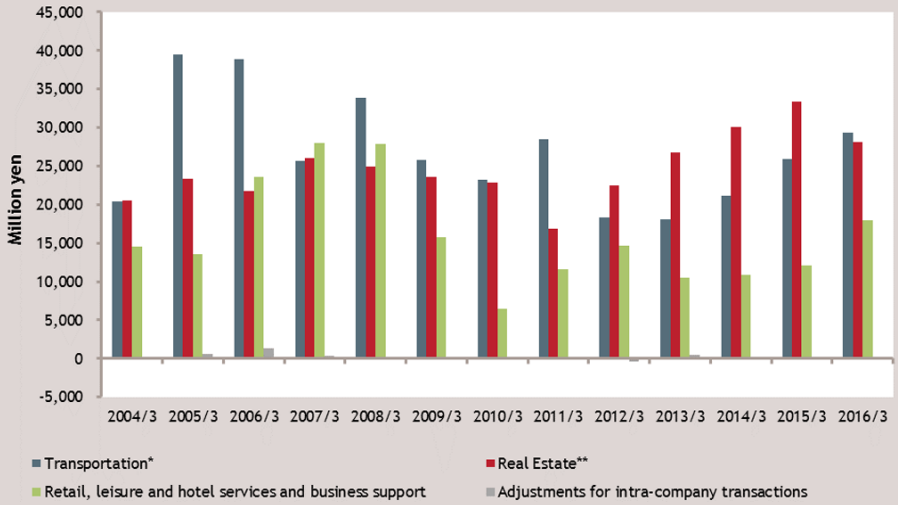
Transport, property development and retail and other business and lifestyle services have been major income sources for Tokyu Corporation, as evidenced by the company's operating profit shares from multiple business practices for FY2004-16 (shown in Figure 4). Through the redevelopment, Tokyu Corporation has created a transit-supportive environment, which further increases its ridership and recurrent profits.

The first phase of the Futako-tamagawa redevelopment project completed in March 2011, added two new shopping malls, a 16-storey office building, and five residential buildings, providing 1,033 new apartments to the east of the station.

The apartments, ranging in price from ￥46 million to ￥220 million (equivalent to around US$380,000 to US$1.8 million) for a 140-squaremeter apartment, went on sale in 2008. In spite of the economic slump and the prospect of more construction work during the second phase of the building, all but 12 units at the higher end of the price range were sold by 2012[368]. Tokyu Corporation is funding the cost of redevelopment to a large extent by direct sales (￥120 billion, or US$ 991 million equivalent), while keeping part of the newly developed property for long-term income generation.

[368] Nakamoto, M. (2012, February 17). "East Side Story", *Financial Times*. http://www.ft.com/cms/s/2/81aefc64-5310-11e1-950d-00144feabdc0.html

Figure 4 Operating Sources of Tokyu Corporation



Source: Tokyu Corporation annual reports.
* A portion of the business was changed to the Hotel and Resort business in FY2012
** A portion of the business was changed to the Lifestyle Service business and the Hotel and Resort business in FY2012;
In FY2016, operations formerly categorized in the Business Support segment were transferred to other business segments

Impact on ridership

The redevelopments around the Futako-tamagawa Station have also increased the ridership for the Den-en-toshi Line owned and operated by Tokyu Corporation, which drives traffic to retail shops and other lifestyle services provided by the company in the area.

Impact on local landholders and tenants

Local landowners provided their land parcels for the new buildings, and in return got joint ownership of land for new buildings with higher access and better public infrastructure and service provision, such as pedestrian access, street amenities, and bus lanes.

Impact on national government

The public facilities developed by Tokyu Corporation under Futako-tamagawa redevelopment project reduced the national government's costs for road and other public infrastructure construction.

Impact on local authorities

Mixed use developments such as those under the Futako-tamagawa redevelopment project yielded higher property taxes, promote local economic development and build townships resilient to natural disasters.

6 Conclusion

Given the high cost of developing new rail lines in major cities, investors need to maximize related income that they can derive to make such lines financially attractive. The transit-oriented development with land value capture illustrated in this case study is one of the effective ways to finance costly rail infrastructure by:

- Ensuring that enough people and activities are gathered around stations; and

- Creating stable cash flow and recouping some of the investment costs through real estate development income and appreciation.

The example of Futako-tamagawa Station redevelopment project on the Den-en-toshi Line in Japan highlights the following concepts required for successful land value capture practices:

- Accessibility and agglomeration benefits from railway investments can be internalized by a rail company by securing land around stations through purchase or land readjustment at the time of developing a line, and by developing such land over time;

- The most appropriate type of property development around rail stations is highly market dependent;

- Quality of life including development of appropriate public space, combined with accessibility and agglomeration economies, are driving forces for value creation; and

- Redevelopment is a mechanism requiring time, an active partnership between public-private stakeholders, and public sector funding.

Tokyu Corporation has successfully combined land value capture with rail development to increase ridership across new lines, generate steady cash flows and recoup investment costs. The land value capture approach has also allowed the company to adjust the development model around rail stations for sustainability as the market demand shifts over time.

References

Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

Murakami, J. (2012). *Value Capture and Land Policies. Lincoln Institute of Land Policies*.

Nakamoto, M. (2012, February 17). "East Side Story", *Financial Times*. http://www.ft.com/cms/s/2/81aefc64-5310-11e1-950d-00144feabdc0.html

Suzuki, H., Murakami, J., Hong, Y., and Tamayose, B. (2015). *Financing Transit-Oriented Development with Land Values*. Washington DC: World Bank Group.

Tokyu Corporation. *Annual Reports* (for the period 2004 to 2016).

Tokyu Corporation's website (various).

Tokyu Corporation (2010). *Development of Stations and Surrounding Areas, Large Tokyu Development Projects around Shibuya, Futakotamagawa and Tama-plaza Stations*.

Tokyu Corporation (2010), *Large Tokyo Development Projects around Shibuya, Futakotamagawa and Tama-plaza Stations*, Japan Railway& Transport Review, No.56, Dec 2010, 22-25.

Case Study

TTX Company[369]

1 Introduction

TTX Company (TTX) is a rail wagon pooling company that provides North American railways with intermodal, automobile and general use railway wagons. The Company was formed in 1955[370] to invest in what was then a new technology—flat wagons that would carry truck trailers. Owned by a group of North American railways[371], TTX's purpose is to provide its shareholders with an appropriately sized and efficiently managed fleet of wagons, available under neutral wagon distribution rules[372].

TTX Flat wagons. Source: TTX Company.

TTX illustrates that a rail wagon pooling business model can be financially viable, raise capital from the private sector, and benefit its railway shareholders through risk sharing and the efficient operation and maintenance of wagons.

This case study describes TTX's operations and the benefits derived from its existence. It then concludes with lessons to be drawn for other railways considering a pooling model.

2 TTX's Operations

2.1 An Overview

The TTX fleet includes over 220,000 wagons. Most are flat wagons (intermodal, automotive, general merchandise) with the remainder being box wagons and gondolas (see Figure 1). The Company's fleet makes up approximately 15 percent of

---

[369] This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

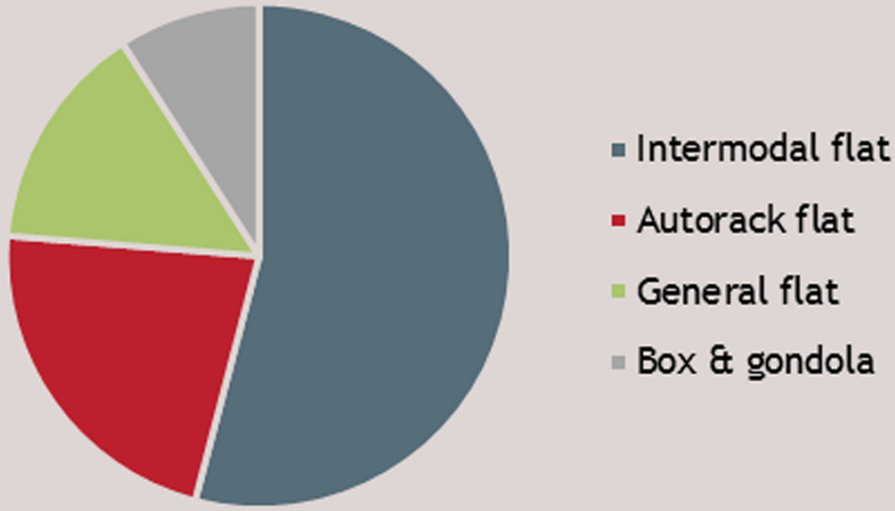
[370] The company was called Trailer Train at its inception in 1955.

[371] TTX is owned by the following railway companies: Burlington Northern Santa Fe, Canadian National, Canadian Pacific, CSX, Ferromex, Kansas City Southern, Norfolk Southern, Pan Am Railways and Union Pacific.

[372] Access to wagons is subject to rules that apply equally to each railway participant.

the total freight wagons in service in North America. TTX owns the majority of the wagons in its fleet (88 percent) and maintains its fleet, using a network of repair shops (4), field maintenance operations (52) and authorized independent repair facilities. TTX rents its wagons to participating railways. These railways pay TTX time- and distance-based charges for the TTX wagons on their lines.

Figure 1 TTX Wagon Fleet



Source: TTX website and Application for Reauthori-zation of the TTX Flatcar Pool.

TTX's leasing model differs from a typical leasing company's in that the wagons belong to a pool and not to the individual railways. Therefore TTX wagons operate freely on the entire rail network, without the sort of wagon return restrictions that tend to apply to typically leased wagons.

2.2 The Mechanics

TTX's interactions with its owner railways are governed by a pooling agreement that must be approved by the economic regulator of the railway industry, the Surface Transportation Board (STB). The most recent approval, granted in 2014, authorized the arrangement for flat wagons for 15 years. Key aspects of the pooling agreement include the following:

- TTX is to gather market information from participating railways, raise financing, purchase and maintain wagons, and manage a pool of wagons for the use of participating railways;
- Rates charged for the use of wagons are maintained at the lowest level "required to meet TTX's ordinary and necessary costs and expenses, including as appropriate, return on investment.[373]" At the end of each year, any funds deemed to be in excess of that requirement are returned to the owners based on their use of TTX equipment during the year.

[373] TTX Company (2014). *TTX Pooling Agreement*, p. 5.

- Access to wagons is subject to rules that apply equally to each railway participant.
- The wagons may be used for loading to any point in the USA railway network and approved locations in Mexico and Canada.
- Participating railways are free to own as many wagons in their own fleets as they choose.

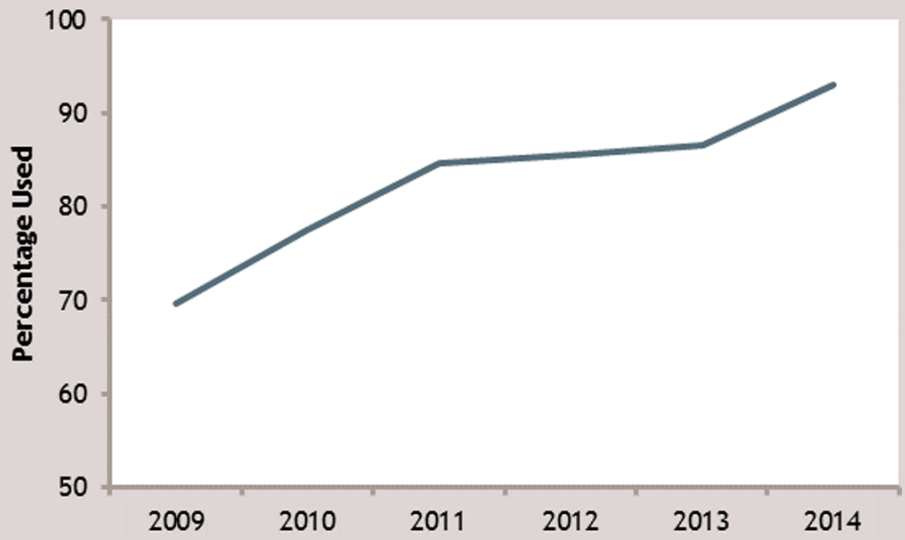
The charges and rules for distribution of wagons in the pool are contained in a subsidiary Car Contract. Under this contract, each participating railway receives an "entitlement" to a share of the wagons, based on its historic use. If a railway has more wagons on its lines than its entitlement, TTX can require it to send the wagons to another railway that has less than its entitlement.

TTX charges to the participating railways are comprised of an hourly charge and a mileage charge for the use of its wagons. For example, as of April 2013, the base rate for TTX single unit wagons was US$ 0.69 per hour, for TTX double-unit wagons was US$ 1.37 per hour, and for TTX five-unit wagons was US$ 2.27 per hour.[374] The prices are established by the TTX board of directors. TTX's goal is not to maximize profits, however, so the prices are set at the levels necessary for TTX to be financially sustainable and be able to raise financing for fleet expansions when needed.

When a railway has more wagons than it needs, it informs TTX. TTX will only charge it for five days of use of the wagon after this notification. If the wagon is needed on another railway, TTX will direct it to be sent to that railway. If it is not needed, it will be stored and no wagon hire will be charged. The railway participants benefitted substantially from this provision during the recession that began in 2008. As shown in Figure 2, TTX's wagon utilization rate, which dropped to 70 percent in 2009, returned to a pre-recession level of 93 percent by 2014.

[374] TTX Company (1960). *Car Contract Between Trailer Train Company and the Atchison, Topeka and Santa Fe .Railway Company, supplement No., 227* (2013).

Figure 2 TTX Wagon Utilization



Source: FitchRatings (2014), TTX Company Full Rating Report p. 7 and Fitch Affirms TTX Company at 'A-'; Outlook Stable p. 1.

If some railways want to use more than their entitlement and some want to use less, the Car Contract allows a railway to "give" some of its entitlement to another railway. It also contains provision for fair distribution of surplus wagons to railways needing more wagons, in the absence of an entitlement "gift."

The TTX rules for wagon distribution differ from the general rules administered by the Association of American Railroads (AAR),[375] which apply to all other wagons. The AAR rules allow the wagon owner to designate what should be done with the wagon after it is unloaded on another carrier's lines. The options range from: (i) returning the wagon empty via reverse of the routing by which it came; (ii) allowing the wagon to be reloaded in the direction of its owner railway; to (iii) allowing the wagon to be reloaded for any destination.

If the receiving railway does not have a load that meets the return rules of the owner railway, the wagon will be sent to its owner empty. The receiving railway will pay time-based charges for the wagon belonging to the other railway for as long as it is on the receiving railway's lines. This creates a strong financial incentive to send unneeded wagons "home."

Since TTX wagons can be loaded for any destination (not just the owner railway) and there is less incentive to move empty wagons off line to avoid charges, TTX wagons operate about a third less empty km than other similar type wagons in North America.

2.3 Corporate Governance

TTX is governed by a 10-person Board of Directors. Each of the nine shareholder railways nominates one board member, and the tenth member is the President of TTX. The directors have a mix of backgrounds and skills including marketing, finance and operations.

[375] Association of American Railroads (2015), Circular OT-10.

The Board has an audit committee and other committees that are "typical for a closely held corporation." TTX Company's accounts are audited by a qualified independent auditor, who reports to the Audit Committee of the Board of Directors. According to TTX's Senior Vice President for Law and Administration, "If you want to borrow money, you need good governance and transparency."

2.4 Financials

TTX's main source of revenue is wagon hire charges paid by the participating railways. It derives a small share of revenue from non-member wagon repair services. Expenses are mostly related to owning, maintaining and distributing wagons. Cash flow from operations has been more than sufficient to cover debt service. TTX's aims to keep its fixed charge coverage ratio (operating and other income/interest and amortization of debt repayment) at 1.8 and has mostly managed to do this. (It fell to a low of 1.58 in 2009 during the recession.)

TTX does not normally pay dividends[376]. If its cash is greater than requirements, it benefits its shareholders through rebates or reducing rates.

TTX is financed primarily by unsecured debt and has more than US$ 3 billion of debt on its balance sheet[377]. Between 2009 and 2013, debt (including financial leases and principle portion of operating leases) made up about 63 percent of the TTX capital structure. Most of this debt is *not* secured by a claim on TTX assets. In 2013, only three percent of TTX's debt was secured by assets. Debt maturities are laddered (spread over time). Equity has come mostly from retained earnings.

Between 2009 and 2013, TTX invested US$ 3 billion for items including rehabilitation of wagons, conversion of wagons from 48' to 53' to improve their marketability, and purchase of new wagons.

3 Benefits Derived from TTX

TTX has supported the development of intermodal transport of freight in North America by making flat wagons available to the railway industry. Rail intermodal in the USA grew from 3 million containers and trailers in 1980 to 13.7 million containers and trailers by 2015[378].

TTX provides three main benefits to its participating railways:

- *Capital avoidance*. TTX has invested over US$ 12 billion in rail wagon and maintenance facility assets and spends US$ 700 million per year on wagon maintenance, enabling the participating railways to avoid this investment.

- *Efficient wagon utilization*. The pooling approach improves the efficiency of wagon distribution. For example, TTX has seven percent empty wagon-km,

[376] It has only paid dividends twice in its history.
[377] FitchRatings (2015). *Fitch Affirms TTX Company at 'A-'; Outlook Stable*.
[378] Association of American Railroads (May 2016). *Rail Intermodal Keeps America Moving*. Retrieved from: https://www.aar.org/BackgroundPapers/Rail%20Intermodal.pdf

which is 31 percent more efficient than non-TTX-owned wagons.[379] By operating more efficiently, fewer wagons are needed to move the traffic, saving investment and maintenance costs. Wagon movement costs are also saved. TTX estimates that this saves the participating railways US$ 250 million per year.

- *Shared Risk*: Since wagons are shared, a surplus of wagons in one region may be used by a railway in another region, sharing the risk of the wagon purchase.

Each railway participant is free to pursue its own fleet acquisition strategy with no obligation to use TTX wagons.

4 Conclusion

The case study illustrates how a group of railways can create a company that buys/leases, maintains and manages railway wagons on a pooling basis in order to benefit its owners. In particular:

- A rail wagon pooling company can finance wagons with private sector funds, if it is set up as a private entity with compensatory prices. For instance, TTX has raised more than US$ 3 billion in private debt financing, reducing the capital burden of its investors; and

- A rail wagon pooling company can lower the cost of owning and using wagons if managed efficiently and neutrally between owners. The TTX pooling arrangement has improved wagon utilization, reducing the size of the fleet needed to serve the traffic. This has created an annual savings for the railways estimated at US$ 250 million.

[379] Rennicke W (2013). *Verified Statement of William J. Rennicke* contained in TTX Company Application of Pooling of Car Service with Respect to Flatcars, Surface Transportation Board Finance Docket No. 27590 (sub-No. 4), p. 9.

References

Association of American Railroads (2015), Circular OT-10.

Association of American Railroads (May 2016). *Rail Intermodal Keeps America Moving*. Retrieved from: https://www.aar.org/BackgroundPapers/Rail%20Intermodal.pdf

FitchRatings (June 2016). "*Fitch Expects to Rate TTX's 30-Year MTNs 'A-'*", *TTX Press Release*.

FitchRatings (2015). *Fitch Affirms TTX Company at 'A-'; Outlook Stable*.

FitchRatings (2014). *TTX Company Full Rating Report*.

Interviews with Patrick B. Loftus, TTX Company, Senior Vice President, Law and Administration and with Ronald Sellberg, Assistant Vice President - Engineering & Research, retired.

Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

Moody's Investor Service (2015). *Credit Opinion: TTX Company*.

Rennicke, W. (2013). *Verified Statement of William J. Rennicke*, contained in TTX Company Application of Pooling of Car Service with Respect to Flatcars, Surface Transportation Board Finance Docket No. 27590 (sub-No. 4).

TTX Company (1960). *Car Contract Between Trailer Train Company and the Atchison, Topeka and Santa Fe .Railway Company, including supplements No. 15, 29, 40, 69, 76 78, 99, 121, 128, 146, 154, 170, 172, 182, 194, 197, 198, 199, 201, 203, 207, 212, 215, 217, 220, 222, 224, 225, 226, 227, 228, 229, 230, 231* (1968 - 2014).

TTX Company (2014). *TTX Pooling Agreement*.

TTX Company website (2015). Retrieved from: http://www.ttx.com

Case Study

Union Pacific[380]

1 Introduction

During the mid-late 1990s, the management of Union Pacific Railway (UP) adopted a significant change in business strategy, focusing on its core railway business. During the late 1970s and throughout the 1980s, UP had sought to diversify away from its core business through large investments in non-railway ventures, including subsidiary companies in the solid waste, trucking, and natural resources sectors (i.e. oil and gas). During the 1990s, however, supported by a more favorable regulatory and policy environment, UP sought to compete better with the trucking sector through redeploying its capital towards expanding and optimizing its core railway business. UP's transition towards a "pure" railway had the following three key elements:

- The divestiture of select non-railway assets to free up capital;
- The acquisition of Chicago and Northwestern and Southern Pacific to grow its railway-related business, using a mixture of debt and equity; and
- Intensive capital investment and the rationalization of railway assets, to improve the overall efficiency of its network.

Between 1994 and 1996, UP went from a railway-intensive conglomerate to a nearly-pure railway business. This transformation was completed in 2003 with the spinoff of UP's trucking business, Overnite Corp[381]. This allowed UP to have a sharper focus on railways, which helped UP to get more from its assets and to offer a better service.

Although the financial impacts of UP's decision to focus on its core railway business were negative in the short and medium terms, the company's decision to shift its focus resulted in improved technical and financial performance over the long term.

This case study first describes the policy and regulatory environment prior to and during UP's transition. It then discusses the actions UP took to effect a transition

[380] This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

[381] UP had originally attempted to sell its trucking business in 1998 but failed to receive a favorably priced offer.

and the challenges the company faced during its transition, followed by the discussion of the transition's overarching results and finally conclusions with lessons drawn from UP's experience.

2 The Situation Surrounding UP's Transition

2.1 Pre-Transition

Throughout the 1970s, unfavorable railway regulation alongside increased competition from trucking adversely affected the technical and financial performance of the US railway industry. Between 1970 and 1979, the industry's return on investment resultantly never exceeded 2.9 percent[382]. During this period, UP's non-railway businesses in oil, natural gas, coal and soda ash resources (all originally developed from land grants) increasingly contributed to the company's net income. Whereas these non-railway business contributed to 21 percent of UP's net income between 1969 and 1974, they contributed 61.7 percent between 1979 and 1982[383].

Believing that there could be more opportunities for higher returns in the non-railroad business, UP's management sought further diversification. By 1988, UP had become a conglomerate with extensive and growing interests in the real estate, natural resources, trucking, and solid waste sectors. Notable holdings in 1988 included:

- Upland Industries Corporation, a company charged with administering UP's real estate holdings, estimated at nearly one million acres of land, in addition to approximately seven million acres of mineral rights in 13 states;
- Companies involved in the exploration, development and production of natural gas liquids and crude oil throughout several basins in the US and Canada;
- Ventures in the oil and gas sector's midstream (refining) and downstream (marketing) value chain;
- Joint venture and royalty interests in several coal and trona (natural soda ash) mines in Wyoming;
- Overnite Transportation Company, an interstate trucking company serving all U.S. states, Canada, Mexico, and the U.S. Virgin Islands; and
- United States Pollution Control Incorporated, a hazardous waste disposal company.

[382] Association of American Railroads. (Apr. 2016) "America's Freight Railroads under Balanced Regulation." Association of American Railroads. https://www.aar.org/BackgroundPapers/Impact%20of%20the%20Staggers%20Act.pdf

[383] Ibrayeva, E., and Terrence, T. "Union Pacific: Through Deregulation & Beyond." American Journal of Management 14.1-2 (2014): 47-61. http://www.na-business-press.com/AJM/IbrayevaE_Web14_1-2_.pdf

2.2 The Prevailing Policy and Regulatory Environment

In 1980, the Congress passed the Staggers Act, which, for the first time in decades, allowed for railways to compete more effectively with trucks, through enabling railways to take previously disallowed actions to enhance their operational and financial performance.

Prior to Staggers, the railway industry was primarily guided by the Interstate Commerce Act of 1887. The Act created the basic legal and regulatory framework for railways through assigning them with common carrier and passenger service obligations, limiting reductions in railway levels of service and/or track, regulating railway tariffs, and forbidding discrimination in service and/or tariffs. In 1976, following one of the worst financial years in the history of American railways, the Railroad Revitalization and Regulatory Reform Act was introduced. This Act modified the Interstate Commerce Act, introducing some flexibility in rates and allowing more track/service reductions. Although the Railroad Revitalization and Reform Act marked a step in the right direction, more sweeping reform was required[384].

The Staggers Act allowed railways to price competing routes and services differently, and also streamlined procedures for the abandonment and sale of rail lines[385]. The enabling effects of Staggers, combined with continued competitive pressures from the trucking sector, led to an unprecedented trend of mergers and acquisitions among large railways in the United States throughout the 1980s and 1990s. Such mergers were aimed at helping railways achieve economies of scale, scope and density, ultimately enhancing their ability to compete with the trucking industry[386].

2.3 UP's Change in Strategy

Supported by a more favorable policy and regulatory environment for railways, by 1989, UP's management believed that extending UP's network and improving its overall efficiency would better position the company to compete with trucking while earning higher returns. UP's management therefore refocused its interest on the railway business. This appears to have been the driving force behind UP's decision to divest non-railway businesses and redeploy capital towards becoming a "pure" railroad.

---

[384] The Staggers act further modified the Interstate Commerce Act and Railroad Revitalization and Reform Act to provide for substantial deregulation of freight tariffs, allowing railways to contract with customers, easing restrictions of railway mergers and allowing the railways to close and divest any railway lines with insufficient traffic. The Rails to Trails act of 1983, further enhanced the ability of railroads to abandon freight service on specific lines.

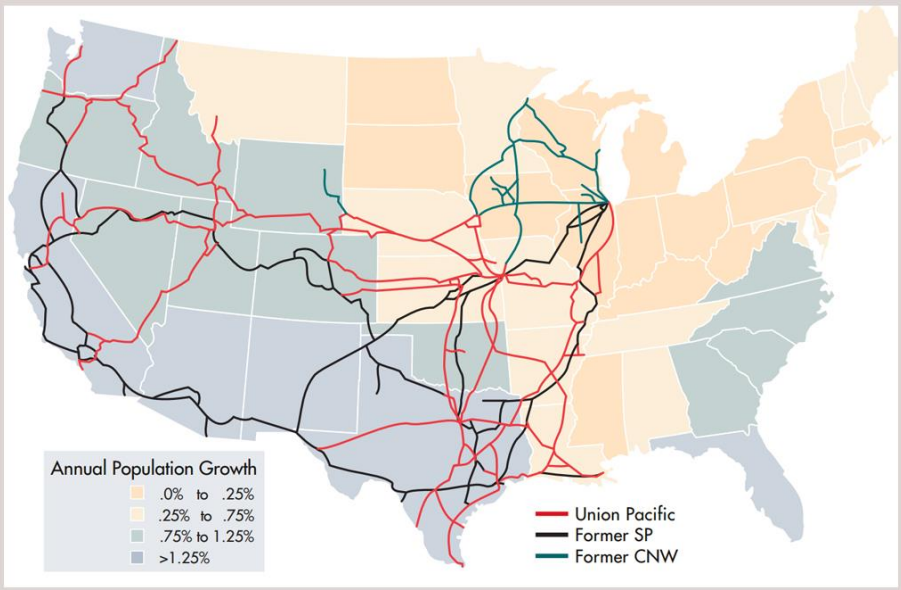
[385] Prior to Staggers, rates between a given origin and destination were mandated by the ICC and railways were required to service routes irrespective of their traffic potential.

[386] When UP began its transition, the railway industry in the US included eleven large, vertically integrated, private investor-owned freight railways (Class 1 railways). Today, the US has four large and three small "Class 1" railways, in addition to more than 500 smaller railways.

3 UP's Transition

The most notable events in UP's transformation were: (i) the sale of its non-railway businesses in 1994 and 1995; and (ii) its railway acquisitions in 1995 and 1996. (See Figure 1 and Figure 2.)

Figure 1 Integrated UP Network Map 1999



Source: UP 'fact book' 1999.

Figure 2 Key Indicators for UP

	1994 (pre-acquisitions)	1996 (post-acquisitions)	2001 (5 years post)
Mainline (km)	22,266	44,104	44,341
Branch Lines (km)	5,896	13,568	9,709
Freight traffic (million revenue tkm)	379,473	594,958	834,744
Passenger traffic	N/A	N/A	N/A
Employees	45,000	54,800	61,800

Source: Union Pacific 10-K reports.

These events are described below, followed by post-acquisition improvements.

3.1 Divestiture of Non-Railway Assets

The starting point of UP's transition was the sale of its non-railway assets, namely:

- The US$ 225 million divestiture of a waste management business in 1994; and
- The US$ 2.4 billion spinoff of a natural resources business in 1995.

The spinoff of UP's natural resources business in particular helped to free up capital for redeployment on railway-related endeavors. In 1998, UP also sought to sell its stake in a less-than-truckload shipping business known as "Overnite." However, this divestiture was delayed until 2003 when UP secured a favorable price.

3.2 Acquisition of Railway Businesses

In 1995, UP purchased the Chicago and North Western Transportation Company (CNW) for US$1.4 billion in cash. CNW's east-west mainline gave UP a direct route from Los Angeles to Chicago. At the time of the purchase, UP already owned 25 percent of CNW, and CNW moved UP's trains under a haulage agreement.

This was followed in 1996 by a merger with Southern Pacific Railway (SP). The SP merger was particularly influential in shaping UP's business around a renewed focus on railways alone. The merger cost UP US$4.1 billion. Equity share conversions financed 60 percent of this price, with cash paying for the remaining 40 percent.

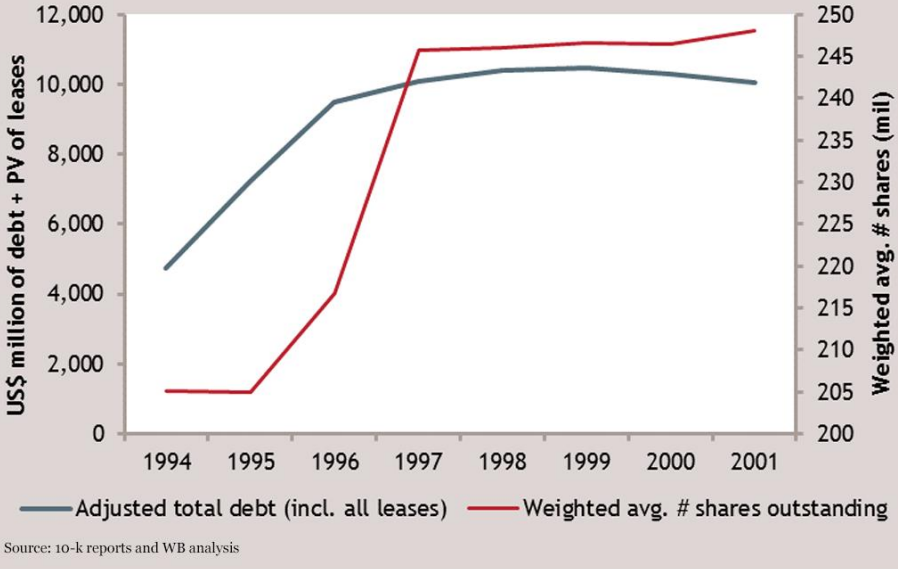
Between 1994 and 1997, UP's acquisitions and capital investment program increased the net value of railway assets on its balance sheet by nearly three times. In 1993, railways constituted only 70 percent of UP's net assets with non-railways businesses accounting for the balance. By 1996, railways constituted 97 percent of UP's net assets.

Prior to these major purchases, the market value of UP's debt and equity was approximately US$ 8-9 billion. The CNW acquisition was relatively small compared to the overall size of UP. In contrast, the SP merger increased the size of UP's railway business by about half.

Supplementary Acquisition Strategies

Equity and debt – more of both: The financial mechanisms that UP used to execute its change in business strategy included corporate debt instruments and issuance of additional equity shares on the New York Stock Exchange. On balance, UP used more debt than equity in funding its transformation and increased its lease-adjusted debt to equity ratio from roughly 1 in 1994 to 1.5 in 1996. (See Figure 3.)

Figure 3 Using More of Equity and Debt



Source: 10-k reports and WB analysis

Stretching the balance sheet: Aside from conventional debt and equity financing, UP made greater use of leasing arrangements. While these instruments have debt-like features (i.e. a promise of future payment), provisions in US Generally Accepted Accounting Principles enable lessors to avoid capitalizing some types of leases on their balance sheet as debt liabilities. The net effect is to provide more accounting headroom for borrowing for other purposes.

3.3 Post-Acquisition Improvements

UP's acquisition of CNW and SP had the immediate effect of expanding the single network by 18,388 km to more than double its 1994 length. Though integrating operations proved difficult (see post-acquisition challenges below), UP eventually succeeded in capturing important efficiencies that this larger network could offer. Most notably, the integrated network gave shippers access to direct routes that saved time and offered increased reliability. For example, the CNW Acquisition gave UP a direct line from Los Angeles to Chicago, a main intermodal route. The combined UP-SP merger created a single-line rail service along the I-5 interstate corridor between the US Pacific Northwest and destinations in California. UP's combined network allowed for new service offerings that specifically aimed at competing with the road trucking industry. One offering this provided was "5-7-9 Service", which promised shipment from the Pacific Northwest to Northern California within five days, Southern California within seven days and Las Vegas/Phoenix within nine days.

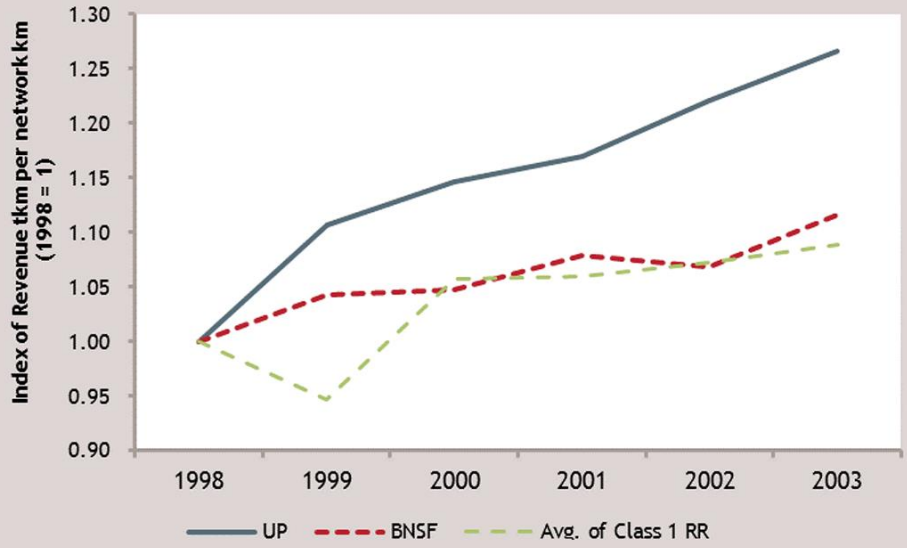
In addition, the acquisitions also gave UP access to the Powder River Basin in southeast Montana and northeast Wyoming, known for coal deposits. This access enabled UP to generate important revenue to maintain and invest in its network. It also set the stage for improvements to the Alameda Corridor, which has benefited the ports, the City of Los Angeles, and the US in general, by creating an efficient rail-port connection.

Aside from offering a longer network and more direct routes, UP also achieved three key improvements in the post-merger years:

- The rationalization of track assets;
- The increased use of rolling stock assets; and
- Intensive capital investment in rehabilitation / refurbishment.

Along with the rationalization of track assets, the convenience of more direct routes helped improve the utilization of the UP network faster than the national average for Class 1 railways in the years following the acquisitions. Increases in the utilization of UP's post-acquisition network also significantly outpaced the nearest competitor, BNSF. (See Figure 4.)

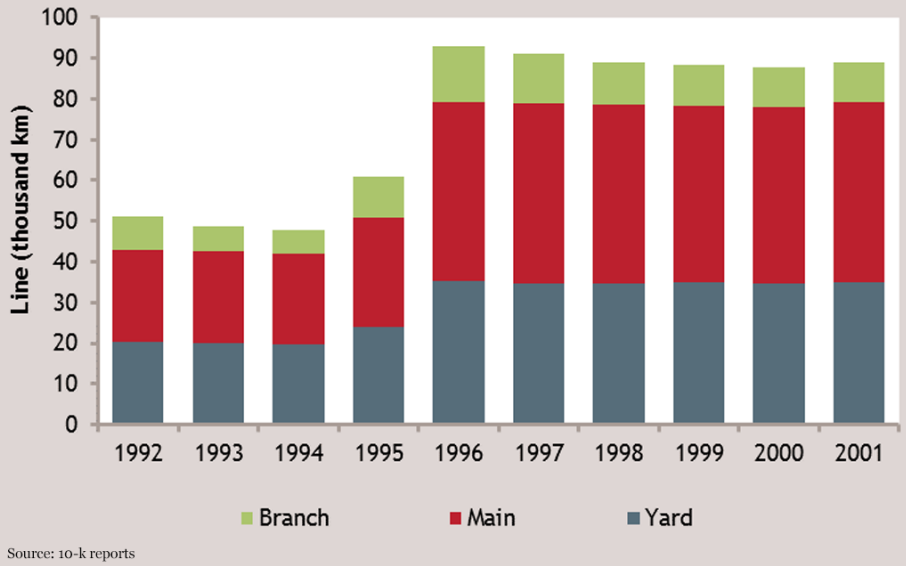
Figure 4 Utilization of the UP Network



Source: Surface Transportation Board R-1 reports

In the years following the acquisition, UP slowly divested of, or abandoned, less profitable lines (see Figures 4 and 5). Most notably, UP's branch line network shrank by 2,398 km (28 percent) in the five years between 1996 and 2001. This helped UP focus its "pure" railway business on a core network of more profitable routes. UP's strategy helped capture increased "economies of density" whereby more freight traffic moved over a smaller, more efficient route network (see Figure 5).

Figure 5 Evolution of the UP Network



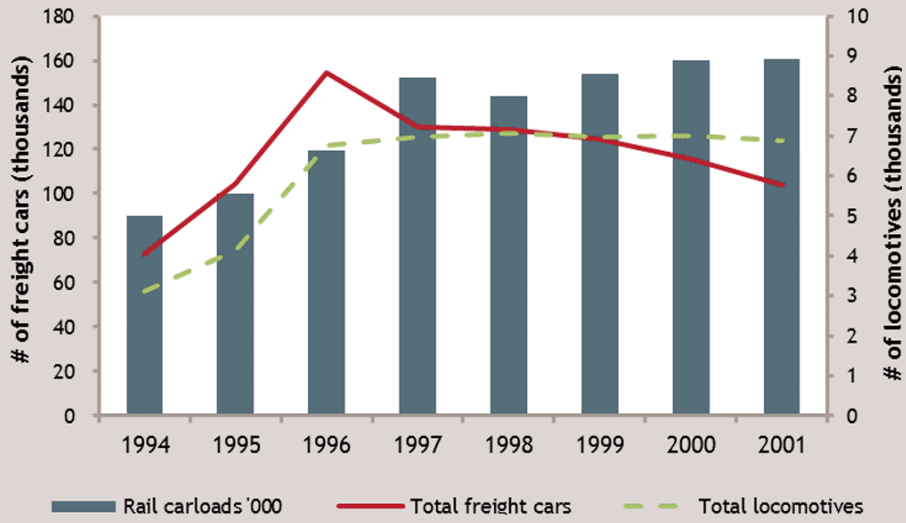
Source: 10-k reports

Acquiring CNW and SP roughly doubled the number of freight wagons UP owned or leased. After integrating operations, UP reduced this fleet while increasing the number of car loads carried. A key part of this strategy entailed reducing wagon

turnaround time, by reducing the amount of time that freight wagons sat idle in-between loads.

Improved planning, preventative maintenance, and consolidation of rail yards contributed to better utilization of freight wagons. Between March 1998 and March 2000, UP reduced freight car terminal dwell times by 34 percent (from 40 hours to 26 hours on average). UP also significantly increased the use of "private line" wagons (i.e. freight wagons owned by shippers themselves) (see Figure 6). Between 1996 and 2001, the loaded private wagon-km traveled on the UP network increased by 71 percent. This effectively allowed UP to leverage the rolling stock investments of others rather than tying up its own capital.

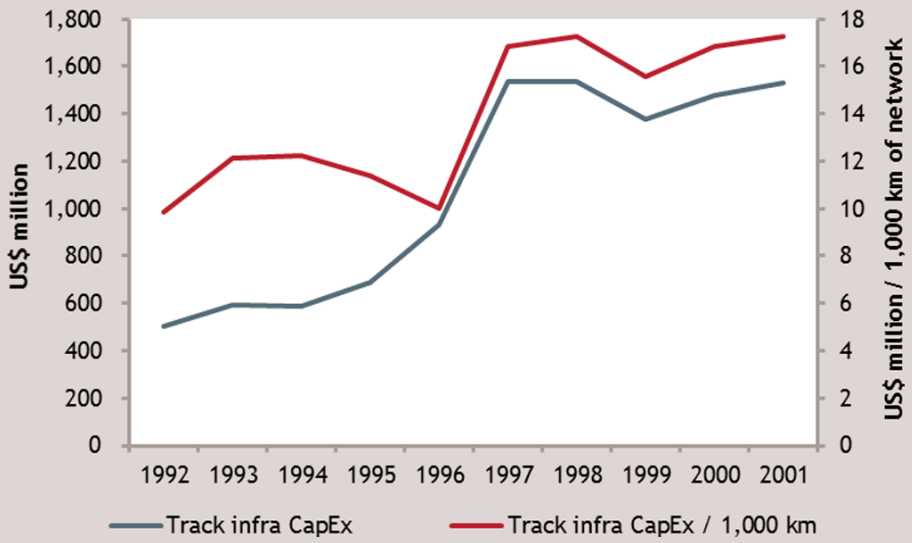
Figure 6 Utilization of Wagons and Locomotives



Source: 10-k reports

Following the merger with SP, UP significantly increased capital investments in network rehabilitation and maintenance (see Figure 7). This was in part a condition of merger approval that STB had required. During the three years after 1996 UP spent roughly 1/3 more money on capital expenditures per km of its network than in the three years prior to 1996.

Figure 7 CapEx and Network Refurbishment



Source: 10-k reports

The combined UP-SP network also enabled UP to establish a "hub and spoke" model for crewing trains. This model based crews at one of the combined network's major terminals. Crews could then serve any route emanating from their respective "hub." The hubbing of crews proved more efficient for utilizing human resources than the prior model of dedicating crews to specific routes.

Acquisition considerations

Developing Business Cases for M&As: One of the interesting aspects of the UP-SP acquisition was that the networks of each company significantly overlapped and complemented each other. This resulted in a business case for the acquisition that included both cost savings and increased network coverage. Overlaps along several lucrative routes such as Oakland-Denver, Houston-New Orleans, and San-Antonio-Chicago offered clear opportunities to achieve cost savings by eliminating redundancies. However, the SP network also gave UP access to routes along the US West Coast and Southwest regions, much the same as how CNW network provided access to the Midwest (i.e. Chicago).

Ensuring Regulatory Compliance: In 1995, the industry became subject to economic regulation by the Surface Transportation Board (STB) [387]. The STB also held jurisdiction over rail mergers. Although the regulatory framework for railway mergers was evolving during UP's transition, worries about reduced competition compelled the STB to temporarily halt Class 1 railway mergers in 2000, and subsequently to impose a higher burden of proof on future merger applications. The STB's ban was lifted in 2001, though no US Class 1 railway mergers have occurred since[388].

[387] The STB also has a limited amount of authority over railway prices.

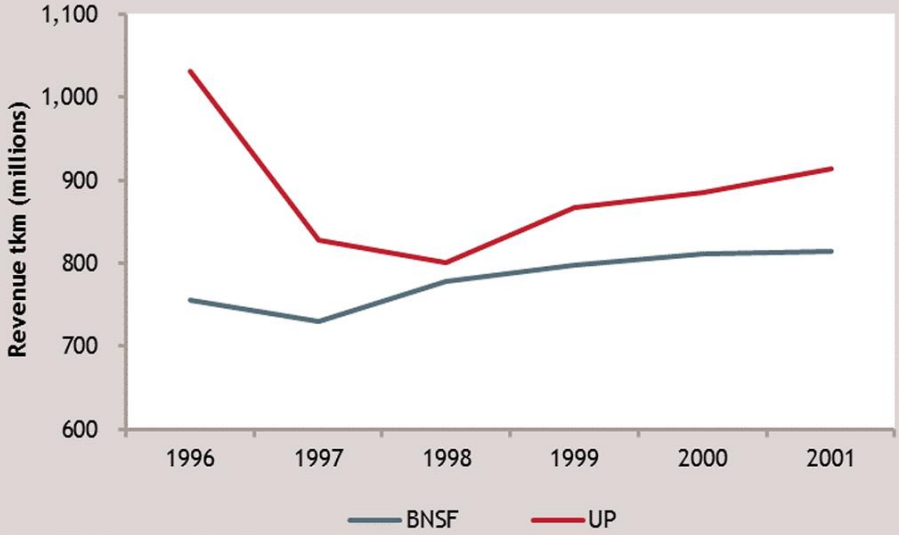
[388] However, it is worth noting that a number of mergers have been attempted but not completed since 2001, including most recently by CP Rail in its nearly $30 billion pursuit of Norfolk Southern. Rationalization did continue, as a number of Class 1 railway networks have expanded by taking over smaller networks.

The UP-SP merger underwent extreme scrutiny by US authorities (both the STB and the Department of Justice) to ensure that it complied with relevant anti-trust regulations and railway laws. Trackage rights in particular became a key issue due to concerns over reduced competition following the elimination of one freight services competitor. Most notably, this focused around the ability of another competitor, BNSF, to access segments of the post-merger UP-SP network. UP ultimately ceded trackage rights along more than 6,000 km of its network, including a key segment between Denver and Oakland. In addition, the STB also imposed requirements relating to negotiations with unionized labor prior to combining the operations of UP and SP.

3.4 Post-Acquisition Challenges

Immediately after the acquisitions, UP's network saw service disruptions and delays, attributable to the high demand for rail transport combined with the poor condition of the former SP network – particularly around the Houston area in 1997/1998. This created a knock-on effect, resulting in congestion and delays that affected service throughout the entire Western USA. UP was eventually able to resolve the disruptions, but not before the revenue t-km carried on the UP-SP network dropped considerably (Figure 8).

Figure 8 Revenue ton-km 1996-2001



Source: Surface Transportation Board R-1 reports

The service disruptions also had a negative impact on perceptions regarding the UP-SP merger. In 2000, the National Transportation Industrial League conducted a survey of 47 major UP customers to gauge their perceptions of UP pre- and post-SP merger. Ninety-four percent of UP customers and 70 percent of former SP customers ranked services worse than the pre-merger period.

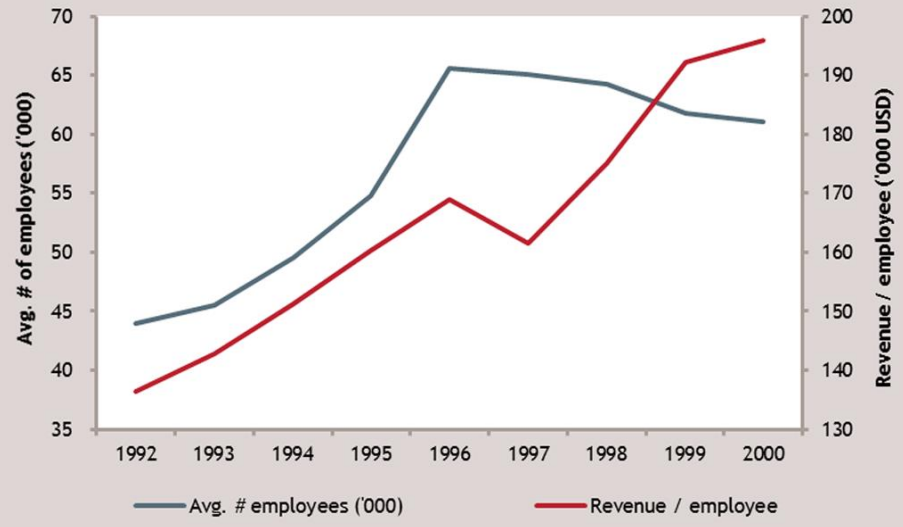
It remains worth questioning whether the network congestion problems encountered following the UP-SP acquisition would have occurred regardless of the merger. SP's financial difficulties had resulted in chronic underinvestment in infrastructure that could have resulted in technical shortcomings regardless of who owned the assets.

4 Results

Beneficiaries of UP's transition included railway customers, who gained from the economies of scale and scope that UP's larger post-merger network provided. Over the medium term, a sharper focus on railways helped UP to get more from its assets and to offer a better service. The STB, the Federal Trade Commission (FTC), and the Government Accountability Office (GAO) undertook ex-post reviews regarding the impact of UP's acquisition, in an effort to assess whether economic benefits materialized as UP had promised to regulatory authorities. While it is difficult to disentangle UP-specific results from overall industry and economic trends, these reviews were generally positive in terms of broader public benefits achieved. Most notably, the STB observed that inflation-adjusted freight rates declined 9.2 percent in the Western USA (served by the UP/SP network) vs. 5.1 percent in the Eastern USA. The GAO found the UP-SP merger attributable for reduced rates on four of the six commodity routes it studied.

The largest beneficiaries of UP's transition, however, may have been unionized workers and the US Government. SP's railway assets and finances were in relatively poor health at the time of UP's acquisition. The merger with UP may have helped avoid a politically difficult decision about possible government intervention if SP became financially distressed. The involvement of politically influential unions would have made any decision much more complicated and contentious. As UP's annual reports show, streamlining staff resources subsequent to the SP merger was difficult.

Figure 9 Employee Statistics 1992-2000



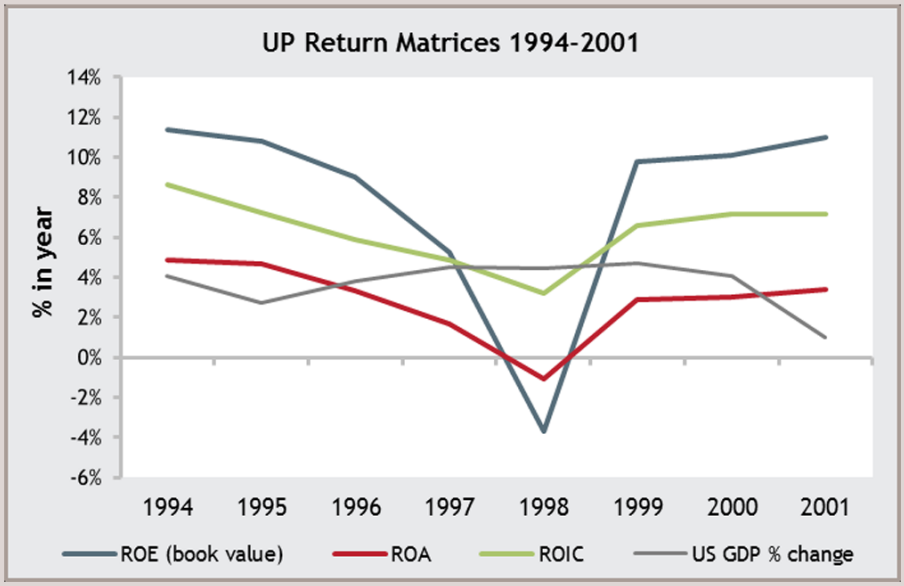
Source: UPC 10-k reports and WB analysis

A large part of UP's labor force was "off limits" to restructuring, due to deals struck with the STB and labor unions that represented train crews as a condition of the merger between UP and SP. Though UP did lay off approximately 5,000 employees (see Figure 9), the majority of layoffs did not involve train crews. In this respect, the former SP's train crews may have been amongst the biggest beneficiaries, as they traded a financially unhealthy employer for a more sustainable one. Though

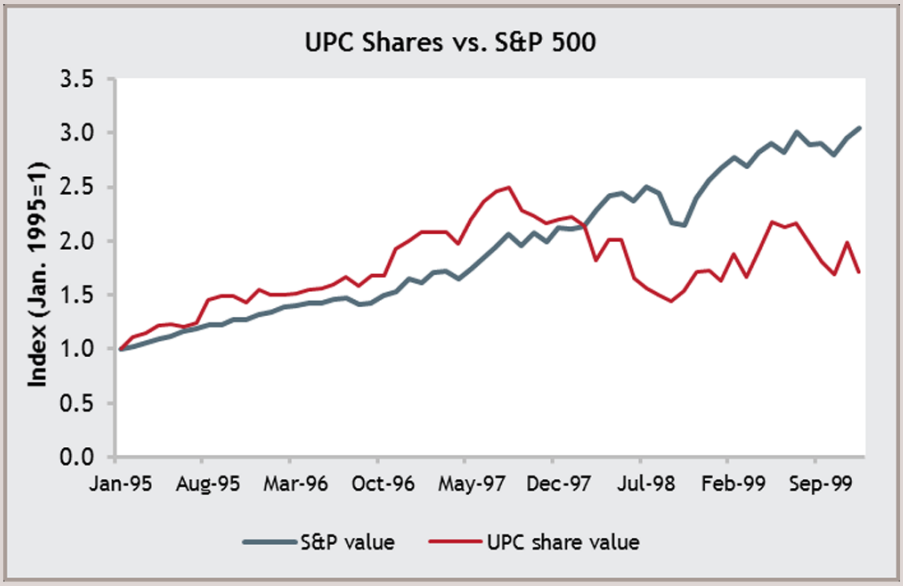
UP's layoffs occurred gradually in the post-acquisition years, as the company's operations became less labor-intensive, it is important to note that staff reductions were concentrated in functions where organized labor's influence was less pronounced. The rate of staff reductions between 1996 and 2000 also appears have been more in line with natural attrition, rather than resulting from a sudden redundancy program.

Shareholders suffered in the short run following UP's acquisition, as they experienced dilution from the issuance of new shares and sub-par returns during the integration of SP's operations. In the years immediately following the acquisitions, UP's Return on Assets (ROA), Return on Equity (ROE), and Return on Invested Capital (ROE) all underperformed relative to both pre-acquisition trends and to the overall trend in US GDP (Figure 10). Despite an initial spike at the time of the

Figure 10 UPC Financial Performance



Source: Union Pacific Corp. 10-K reports



Source: Yahoo! Finance data and WB analysis

acquisitions, UP's share price significantly underperformed relative to the S&P 500.

UP's poor financial performance immediately following the acquisitions suggests one or more of the following:

- UP overpaid for its acquisition targets;
- The cost of regulatory concessions given to obtain approval for the SP merger exceeded expectations; or
- Integrating different operating companies offered more challenges or less financial benefits than envisaged.

In 2001/02, BNSF was carrying only five percent of the freight traffic along UP's key central corridor from the mid-west to California under the trackage rights regime prescribed by the STB. This suggests that trackage rights were not the primary reason why shareholders lost value initially. Rather, the most likely reason why shareholders initially lost is that UP struggled more than anticipated to integrate operations with SP[389]. This challenge peaked in 1998, which became and "annus horribilis" for both technical and financial performance.

Figure 11 Changes in UP's Annual Financial Results between 1994 and 2001 (US$ Millions)

Income Statement	Change	% change
Revenue		
Rail services	5,482	103%
Government support	0	0
Other	-1,307	-53%
Total	4,175	54%
Operating Expenses		
Wages & benefits	1,816	74%
Materials & energy	968	109%
Depreciation	1,805	145%
Other	1,368	77%
Total	4,653	89%
Operating Income		
Interest & other	354	202%
Financial exp.		
Income before Income tax	635	71%
Income tax	237	72%
Net Income	**420**	**77%**

Balance Sheet	Change	% change
Assets		
Current assets	-280	-15%
PPE (net)	16,521	135%
Other long term assets	-632	-34%
Total	15,609	98%
Liabilities		
Current liabilities	746	37%
Deferred taxes	5,484	229%
Long term debt + leases	5,321	113%
Other	102	3%
Total	12,753	148%
Equity	**4,444**	**87%**

Cash Flow	Change	% change
Operations	786	73%
Investing		
Capital investment	696	79%
Sale of assets	162	579%
Other	-295	-100%
Total	239	-221%
Financing		
Financing proceeds	150	21%
Retire long term debt	-900	282%
Dividends	-136	-41%
Other	53	N/A
Total	-561	N/A
Net Change in Cash	**-8**	**-7%**

Source: UP Corp. 10-K Reports.

UP was, however, eventually able to capture considerable efficiencies once it managed its combined railway assets effectively. There is clear evidence that UP increased the utilization of its network faster than either its main competitor (BNSF) or the overall US rail industry. In part, this reflects prudent capital budgeting decisions and targeted reductions of less profitable branch lines. Similarly, UP achieved increased rates of utilization in its fleet of rolling stock. The absence of

[389]Aside from debt service, much of UP's cash (that could have otherwise funded dividends) went into funding capital investments aimed at rehabilitating SP's aging assets that had suffered from years of under investment.

distractions from non-railway businesses may have helped UP's management to achieve these critical improvements.

5 Conclusion

UP's shift in strategy following the introduction of enabling legislation and regulation offers many valuable lessons, particularly because the outcome was mixed. On the whole, UP's decision to focus on its core railway business appears to have been a success, when looking at long-term efficiency metrics. However, the history of UP's transition shows that major railway restructurings can be tremendously disruptive in the short run. The route to achieving operational improvements "on the ground" was much more difficult than executing the financial transactions that enabled it to take place. This is particularly evident in the financial and technical performance of UP in the years immediately following its acquisitions. The US regulatory framework created additional challenges, requiring concessions as a condition of merger approval. The regulator compelled UP to offer trackage rights, to execute labor agreements with unions, and to promise certain levels of capital investments as a condition of merger approval.

The relevant lessons for entities with holdings in both railway and non-railway businesses, which are looking to restructure their portfolio and/or operations include the following:

- ***Focusing a railway operating company's efforts around a core railway business can help drive operational improvements.*** In addition to having an enabling legal and regulatory framework, becoming a better railway likely requires substantial investment and management effort before results become visible to customers. Reducing the amount of time and capital tied up in other endeavors is critical to allowing a sharper focus.

- ***Major railway restructurings are complex and likely to be disruptive in the short run, although they can be very positive in the medium to long run.*** This is true in both developed and developing country contexts. As the UP case shows, major operational changes and the political economy of labor relations in particular can be disruptive. However, working through the initial difficulties can unlock longer term, sustainable efficiencies.

- ***Consistently making sound commercial investments is essential for improving operating results.*** The nature of railway assets means that restructuring is a long-term proposition. Capital programs span multiple years. Their relative success depends on consistently making good investments and optimizing the use of assets – regardless of shorter-term financing decisions. Evidence from the UP experience demonstrates how consistently sound investments can even overcome a difficult start to restructuring.

- ***The right regulatory framework applied at the right time helps customers and the broader economy to "win."*** Capable regulators can help ensure that restructurings serve customers and the broader economy rather than a narrow group of stakeholders. In particular, the UP example shows how regulatory mechanisms can help distribute the benefits of restructuring more broadly.

References

Association of American Railroads. (Apr. 2016) "America's Freight Railroads under Balanced Regulation." Association of American Railroads. Retrieved from: https://www.aar.org/BackgroundPapers/Impact%20of%20the%20Staggers%20Act.pdf

Breen, D. (2004). *The Union Pacific/Southern Pacific Rail Merger: A Retrospective on Merger Benefits*. Federal Trade Commission. Retrieved from: https://www.ftc.gov/sites/default/files/documents/reports/union-pacific/southern-pacific-rail-merger-retrospective-merger-benefits/wp269_0.pdf

Hamberger, E. R. "Hearing on the 35th Anniversary of the Staggers Rail Act: Railroad Deregulation Past, Present, and Future. Proc. of Committee on Transportation and Infrastructure before the U.S. House of Representatives, Washington". Washington: Association of American Railroads, 2015. 1-25.

Ibrayeva, E., and Terrence, T. "Union Pacific: Through Deregulation & Beyond." American Journal of Management 14.1-2 (2014): 47-61. Retrieved from: http://www.na-businesspress.com/AJM/IbrayevaE_Web14_1-2_.pdf

Lawrence, Martha; Ollivier, Gerald. 2015. *Attracting Capital for Railway Development in China*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23800 License: CC BY 3.0 IGO. URI: http://hdl.handle.net/10986/23800

Surface Transportation Board. *Financial and Statistical Reports (R-1)*. Retrieved from: http://www.stb.dot.gov/stb/industry/econ_reports.html

Union Pacific Railway Corp. (1994-2005). *10-k Reports*. Retrieved from: http://www.sec.gov/edgar/searchedgar/webusers.htm#.VSLHFtLER8E

United States General Accounting Office (2002). *Report to the Chairman, Committee on Transportation and Infrastructure, House of Representatives*. Retrieved from: http://www.gpo.gov/fdsys/pkg/GAOREPORTS-GAO-02-524/pdf/GAOREPORTS-GAO-02-524.pdf

US General Accounting Office (2002). *Railroad Regulation: Changes in Freight Railroad Rates from 1997 through 2000*. GAO-02-524. Retrieved from: http://www.gao.gov/assets/240/234838.pdf

Case Study
Virgin Trains

This case study describes how a successful private railway operating company doubled passenger numbers over a period of 12 years, partly through sound commercial management. Second, it describes the experience and lessons learned from franchising in an uncertain environment created by a major infrastructure investment by a separate railway infrastructure company.

1 Rail Franchising in Britain

After nearly 40 years in the public sector as British Rail (BR), the British railway industry was completely transformed over the period 1994-1997, with the separation of infrastructure from operations, franchising of passenger services, and selling off freight operations.[390] BR's passenger rolling stock was divided into three rolling stock leasing companies (ROSCOs), which were sold in 1996. Since then, the ROSCOs have also leased most new locomotives, coaches, and multiple units to passenger train operating companies.

Since privatization, passenger rail services in Britain have been operated by private sector companies mostly through franchises. Open access operators also serve some lines on a purely commercial basis. The right to run passenger train services rights were franchised to 25 (now 20) train operating companies (TOCs), creating 'competition for the market'. To make frequent franchising competitions possible, the TOCs were privatized with no significant asset base; they buy access to infrastructure services from Network Rail under terms approved by the independent Office of Rail Regulation. Franchises were let for 7-15 years; the longer franchises were awarded in return for commitments to invest.

1.1 Virgin Rail Franchises

British bus operators won most of the franchises, in part due to their expertise in cost cutting, gained during the 1980s when they were privatized. Two franchises, West Coast and Cross Country, were awarded to the Virgin Rail Group, a private limited company that is a subsidiary of Virgin Management, another private limited company controlled by Richard Branson, who established Virgin Atlantic airlines. Virgin's successful bid for the rail franchises was in part due to its aggressive timetable for replacing the aging fleet.

[390] More details on the railway reform in Britain can be found in "Reforming Railways—Learning from Experience" (http://www.cer.be/publications/books/2099-new-reforming-railways-learning-from-experience) and "Privatizing British Railways: Are There Lessons for the World Bank and Its Borrowers?" (http://siteresources.worldbank.org/INTTRANSPORT/214578-1099319223335/20273748/Final%20Version%20for%20Publication.pdf)

Both Virgin franchises were for long-distance intercity services that could benefit from Virgin's expertise in marketing and customer service. The 15-year franchises began in 1997 and are scheduled for termination in 2012. They were let for 15 years[391] because they were expected to involve major investments,[392] which require an extended pay-back period,[393] and create major disruption to infrastructure. The Cross Country agreement was terminated early, in 2007, under Government's re-mapping of franchise services, but West Coast remains with Virgin until 2012.

Under franchising, the regulatory relationships between Government and private operators such as Virgin were formalized through contractual provisions specified in franchise agreements and related documents. Box 1 summarizes key elements of the West Coast Franchise Agreement.

Box 1 Virgin West Coast Franchise Agreement

National Rail Franchise Terms (300 pages):

- defines the required contents of all franchise agreements (FAs)
- sets out what each FA must address
- deals with interpretation and definitions
- treated as part of FA

Franchise Agreement (90 pages):

- specific to each franchise
- defines some output measures, e.g., train performance, customer satisfaction
- deals with inputs, e.g., train fleet, key contracts, assets
- defines processes, e.g., timetable change, closures
- sets out fare regulations
- specifies total subsidy, to be received by operator or premium paid by operator for the right to run a set of services

Service Level Commitment:

- specifies routes and minimum services (can be exceeded if not detrimental to other users) including frequencies, stops, earliest/latest trains, and maximum journey times
- changes in response to investment (now on 4th since 2007 but, for other franchises, changes less often)

[391] The Government decided in 2010 to increase franchise lengths to 15-22.5 years again to increase investment. See http://www.dft.gov.uk/consultations/closed/2010-28/govresponse.pdf

[392] Bidders were asked to bid with and without the investments.

[393] Although franchisees leased rolling stock from ROSCOs, this was not a requirement; the possibility existed for TOCs to buy rolling stock themselves.

Franchisees generally bear most revenue risk[394] and all cost risks, except for changes in track access charges, which trigger an equivalent change in subsidy or premium payments.

2 Ownership, Governance and Organization

Virgin Rail Group is owned jointly by Virgin Management (51 percent) and Stagecoach Group plc (49 percent), which bought this share in 1998. Both owners are represented on the Board of Directors of Virgin Trains and each has a Joint Chairman. Its brand name is Virgin Trains.

Virgin Rail is headed by a CEO. Other management posts are a COO, an Executive Director, Commercial, and Directors for Business Support, Communications, Human Resources and Finance. Despite running far more services, West Coast Trains has only 3,000 staff, compared to 4,000 before privatization.

Virgin Trains' vision is: *'To become the most safe, consistent, reliable and profitable of the train operating franchises in a climate that respects different views and people need not be afraid to be open and honest'.*

Virgin differentiates itself from its competitors in its corporate organization and staff management. Its decentralized regional structure empowers local staff to suggest and implement changes and their proximity to customers helps them understand customer needs.

Front line staff are recruited for their interpersonal skills and are encouraged to interact with customers. More than 20 staff on the Human Resources team deal with recruitment, training, and career development. Virgin established a training academy to enhance staff skills; workshop themes include how to give and receive constructive feedback; ceremonies acknowledge outstanding employee performance; and indicators of staff morale such as sick leave and staff turnover, are closely monitored.

3 Fares and Ticketing

The Department for Transport regulates some Virgin ticket fares, which is common among franchises, for example, cheap returns not purchased in advance, and commuter seasons' tickets. To allow for inflation, increases are linked to retail price index changes. For other ticket types, Virgin operates an airline-style yield management system—computer software is programmed to set fares that maximize revenue. The system uses pricing to balance train use between peak travel times, when trains can be full and passengers may have to stand, and slack periods. Internet marketing shows passengers a range of ticket price options and times for journeys.

This system has resulted in much greater fares differentiation. The highest fares, which have increased dramatically, especially in First Class, are purchased on the day of travel. But, the lowest fares, available only through advanced booking, are

[394] Initially the franchises bore all revenue risk but the revenue is now shared with government when it differs significantly from amounts assumed at franchise award.

fraction of the highest fares. In addition to national discounts for special categories such as youth, elderly, disabled, and military, Virgin competes with cars by offering discounted fares for families and groups. Virgin launched a travel club for First Class ticket holders and also offer a 10 percent discount for 'carnets' of 10 tickets, witfree parking, and public transport at each end of the journey.

Virgin and other intercity operators have adopted ticketing innovations from airlines —customers can purchase tickets on line and print their own e-tickets.

To make it easier to for customers to buy tickets, Virgin introduced self-service ticket vending machines. It also established and owned a majority share in a major ticket retailer (thetrainline.com) but sold this in 2006. Virgin has now established a new website that sells tickets for other operators as well as for its own services.

Improving the journey

All trains have an onboard shop; enhanced mobile phone reception; power points for charging mobile phones and laptops; full public address throughout the train; a QuietZone™; and facilities for mobility impaired customers. Wi-Fi facilities, available on all trains, are free in First Class and fee-based in Standard Class. For safety and security, all trains are fitted with CCTV recording equipment.

Passenger charter and complaints

Virgin Trains has a Passengers' Charter that sets out services and undertakings to:

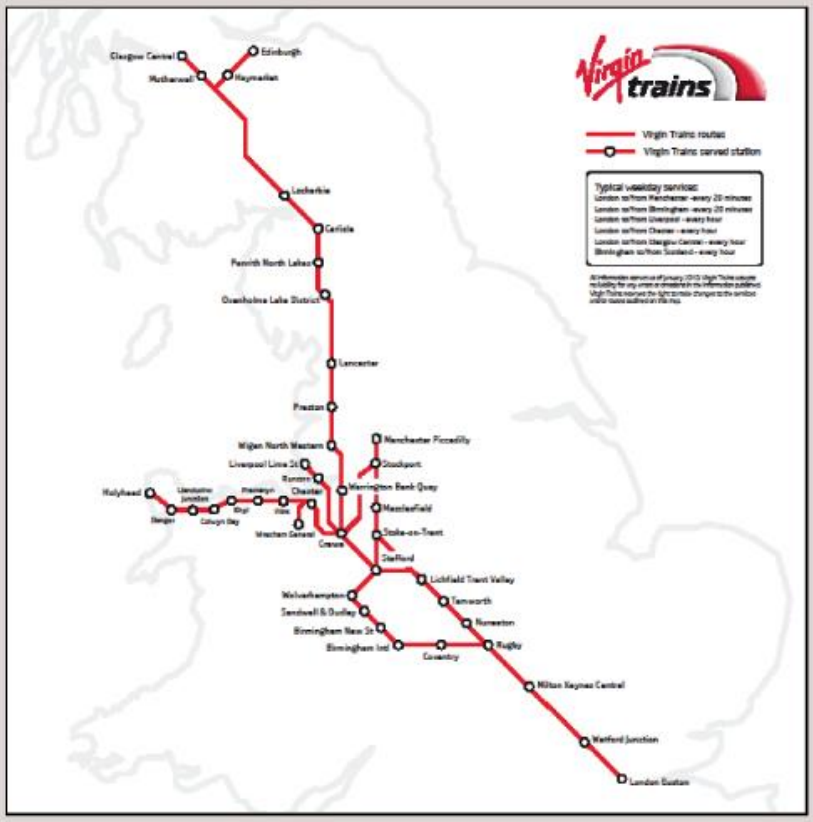
- Provide impartial information to customers about journey planning and ticket prices
- Meet the needs of customers with disabilities
- Inform customers about the handling of complaints

The Virgin Rail policy on responding to complaints is set out in its Passengers' Charter.[395] Complaint or comment forms are available on most trains, at major stations, and as downloads from the company website; passengers can mail forms free of charge to Virgin. If a customer is unhappy with Virgin's response, s/he can contact Passenger Focus, an independent Government watchdog that protects rail passenger interests.

The Virgin Trains Passengers, Charter does not create any contractual relationship between Virgin Trains and its customers. Instead, legal obligations are specified in the National Rail Conditions of Carriage, which apply to all train operating companies in the UK, and form part of the customer contract with Virgin Trains upon ticket purchase. These obligations apply to all train operating companies in the UK.

[395] http://www.virgintrains.co.uk/assets/pdf/global/passengers-charter-new.pdf

Figure 1 Map of Virgin West Coast Services



Source: Virgin website

4 Major Investment

Virgin Trains' plans for West Coast Trains and its original agreement with Government were predicated on the urgent need to replace rolling stock and renew infrastructure on the West Coast Main Line (WCML), which links London with major population centers around Birmingham, Manchester, and Glasgow (Figure 1). The WCML is the busiest line in Britain, carrying more than 40 percent of UK rail freight as well as Virgin and other passenger services. Government strongly supported the WCML upgrade project, even before franchising, to solve the major backlog in infrastructure renewal.

Under the vertically separated industry structure introduced at privatization, the WCML infrastructure was to be upgraded by Railtrack (now Network Rail). The project experienced major delays and cost overruns and, despite reducing the scope (principally, lowering the top speed from 225 to 200 kph), the final cost was about £9.0 billion—four times the original budget.

Railtrack's collapse led to financial difficulties for many TOCs and the franchise agreements for West Coast, Cross Country[396] and many others were replaced in 2002 by management agreements under which government assumed revenue and

[396] Cross Country had been loss-making but subsidized from West Coast profits. By 2002 both were in difficulties.

cost risks and operators were paid a management fee. The management agreements for the Virgin franchises continued until 2006—this was longer than for other such contracts due to the prolonged period of uncertainty before the infrastructure investment was complete, which made it difficult to finalize new franchise agreements.

During 2001-04, in anticipation of infrastructure upgrading, Virgin procured new rolling stock for West Coast, financed through financial leases with ROSCOs. For operation on electrified lines, 51 Pendolino trains (tilting electric trains–shown in photo below) were built and now are being maintained by Alstom and leased from Angel Trains (one of the ROSCOs). For operations that run off electrified lines, 21 Voyager trains (tilting diesel trains) were built and are being maintained by Bombardier and leased from Voyager Leasing (unusually, *not* one of the ROSCOs). Virgin was the first operator group to negotiate contracts to purchase new rolling stock that included manufacturer-provided maintenance. The manufacturer took over depots for this purpose. This major innovation may explain the success of introducing tilting trains, in contrast to the experience in other countries.

Pendolino using tilting technology (Source: Virgin website)

5 Services and Performance

Following completion of the infrastructure upgrade, Virgin introduced a new timetable on West Coast in December 2008, offering 30 percent more trains and faster journey times (Figure 2). The routes from Manchester and Birmingham to London had train frequencies increased to every 20 minutes, comparable to many commuter routes, and the most frequent long-distance train services in Europe. Although Pendolinos are capable of 225 kph, they travel at a maximum speed of only 200 kph due to signaling constraints. Nevertheless, the 640 km from London to Glasgow can now take as little as 4 hours 9 minutes.

Figure 2 Main Services Provided By Virgin West Coast From London

From London	Trains per direction per day	Fastest train (hrs:mins)	Average journey time (hrs:mins)
Birmingham New Street	49	01:22	01:26
Liverpool Lime Street	16	02:08	02:13
Manchester Piccadilly	46	02:07	02:09
Glasgow Central	13	04:09	04:26

The evolution of traffic levels on West Coast are summarized in Figure 3. Between 2002-03 and 2009-10, train km increased by 51 percent and passenger km by 81 percent. Despite the fact that most of the increase in services occurred after 2007-08, most traffic growth was before that date as new rolling stock improved services. After 2007-08, passenger growth slowed, partly due to the recession. Virgin Trains has succeeded in luring considerable traffic away from the airlines, especially for the London-Manchester market (300 km), where rail is most competitive and its share of the rail and air market now exceeds 75 percent.

Figure 3 West Coast - Growth in Traffic

	2002/3	2003/4	2007/08	2008/09	2009/10	2002/3-2009/10	2007/8-2009/10
Passengers m	15.2	14.9	21.8	23.0	26.6	75%	22%
Passenger km	2,899	2,745	4,211	4,453	5,255	81%	25%
Train km 000	23.5	24.6	24.2	29.7	35.5	51%	47%

Source: Office of Rail Regulation, various years.

Figure 4 shows that the Public Performance Measure or PPM (% trains less than 10 minutes late) and overall customer satisfaction improved dramatically over the period. The biggest improvements occurred immediately after new rolling stock was introduced in late 2004. Then, following completion of the upgrade in late 2008, both indicators continued to improve. However, in common with other TOCs, Virgin's West Coast customers continue to give poor ratings to 'value-for–money', some facilities and some aspects of service. Despite the Virgin Rail's focus on staff and customers, customer scores for staff performance were below overall customer satisfaction ratings, ranging from 70 to 90 percent, depending on the function.

Figure 4 West Coast - Quality of Service

	2003/4	2007/08	2008/09	2009/10
Public performace measure (PPM)	66%	79%	83%	85%
Overall customer satisfaction	79%	83%	85%	90%

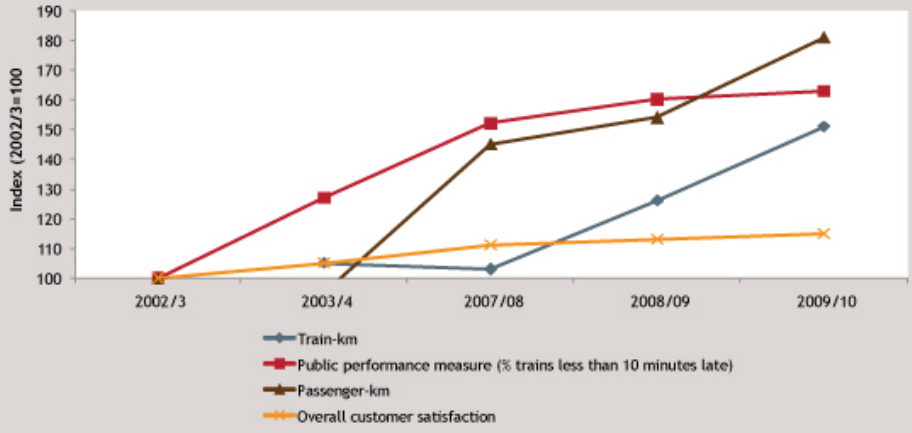
Source: Gourvish (2008), Stagecoach PLC Annual Report 2009/10 and author's calculations.

Figures 5 and 6 show indices of train km, train performance, passenger km and customer satisfaction, revealing that train km and train performance are closely correlated with traffic and customer satisfaction. Other factors in boosting demand appear to be the completion of rolling stock acquisition in 2004, and of the infrastructure upgrade in 2008.

Figure 5 West Coast - Performance Indices

Indices (2002/3=100)	2002/3	2003/4	2007/08	2008/9	2009/10
Train km	100	105	103	126	151
Public performance measure (% trains less than 10 minutes late)	100	127	152	160	163
Passenger km	100	95	145	154	181
Overall customer satisfaction	100	105	111	113	115

Figure 6 West Coast – Performance Indices



6 Financial Results

Figures 7 and 8 summarize the financial results for Virgin West Coast over the period 2000-01 to 2009-10.[397] Operating margins[398] for West Coast range from 4-13 percent (average 9.0 percent), more than on other Intercity franchises[399] and well above the typical margins of 3-4 percent for most British rail franchises.

[397] These are calculated from Stagecoach Annual Reports as Virgin Rail does not make financial reports available to the public. Data prior to 2008-09 is excluded as Virgin Rail ran Cross Country and West Coast then; therefore, the data were not comparable.

[398] Given that Virgin Rail has invested little of its own capital, operating margins are more relevant indicators of financial performance than rate-of-return on capital employed.

[399] Including Cross Country on which margins were quite low, often negative.

Figure 7 West Coast – Turnover and Profit (Current Prices)

	2000/1	2001/2	2002/3	2003/4	2004/5	2008/9	2004/5
Turnover (£m)	392.6	567	582.8	664	518.4	657.8	725.1
Operating profit	26.1	64.9	58	28.8	31.5	87.1	52.0
Operating margin	7%	11%	10%	4%	6%	13%	7%

Source: Gourvish (2008), Stagecoach PLC Annual Report 2009/10 and author's calculations.

Figure 8 West Coast – Turnover and Profit (Current Prices)

Figure 9 shows that subsidies peaked on Virgin West Coast at £328.4 million in 2003-04 because infrastructure and rolling stock were in poor condition and efficiency incentives were lacking for Virgin under the management contract. Due to these large Government subsidies, Virgin has made acceptable returns (see Figure 7). In 2006, Virgin returned to a franchise agreement and in 2008, the infrastructure upgrade was completed. Subsidies have, therefore fallen and in 2008-09, Virgin West Coast finally paid a surplus to Government.[400]

Figure 9 West Coast - Operating Subsidy (Current Prices)

	2000/1	2001/2	2002/3	2003/4	2004/5	2007/08	2008/09
Operating subsidy £m	57.7	190.9	188.8	328.6	113.0	161.6	-71.6

Source: Gourvish (2008) & Office of Rail Regulation.

7 Assessment

Problems with the Virgin rail franchises emerged, in part from overly optimistic revenue projections in the initial franchise bids (Nash et al) and, in the case of West Coast, a complex and disruptive infrastructure project that included many stakeholders, high political exposure, and reputational risk. The seriousness of these problems emerged only over time.

[400] Under the original franchise agreement Virgin should have paid its first premium in 2002-03. The switch to premium in 2008-09 also reflects lower track access charges in 2008-09, which are considered in setting the subsidy.

How did these problems arise? Some have alleged that Virgin out-negotiated Railtrack, a weak organization that failed to protect its own interests, and Railtrack could not deliver (Gourvish). It is true that Virgin negotiated skillfully to transfer project risks on to Railtrack, thereby protecting its own commercial interests and the interests of other operators. This helped ensure that the reputation of Virgin, and the reputation of the railways in general, did not suffer unduly since the railways' reputation was already tainted by ageing assets and unreliability.

It is debatable whether it was sensible to franchise West Coast as a vertically separated operator, given the complexity and disruption expected from infrastructure upgrading and the massive task of coordinating the introduction of new rolling stock. Some problems might have been avoided if Virgin had also been in charge of infrastructure, although new problems might have arisen since rail infrastructure is not a core competency of Virgin Trains.

Contracts within the British rail industry are complex and those for West Coast the most complex of all. Governments should embark on such arrangements *only* when they have considered them carefully, employed the best technical, commercial, and legal advice, and ensured a *genuine transfer of risk* to the private sector.

Still, there were some major achievements from Virgin's involvement that went far beyond the benefits of introducing marketing skills from the airline industry. Virgin is a single-minded and tough commercial operator with a strong customer focus, and involving Virgin led to the smooth introduction of tilting trains on a scale unprecedented anywhere in the world. In part, this can be attributed to the innovative procurement of rolling stock, which included maintenance provision. Virgin's skills, combined with substantial investment from other partners, doubled passenger volumes, mainly through taking market share from air. This enabled government to receive a payment from Virgin, rather than to continue paying subsidies.

This case study shows what can be accomplished by involving a competent private sector partner with strong commercial skills and a focus on its staff and customers.

References

Department for Transport, UK. Reforming Rail Franchising, July 2010, http://www.dft.gov.uk/consultations/closed/2010-28/consultationdoc.pdf
Gourvish, T. "Britain's Railways 1997-2005", 2008, Oxford University Press.

Nash C., & Smith A., (2006) Passenger rail franchising: British experience, http://eprints.whiterose.ac.uk/2477/2/Passenger_Rail_Franchising_secure.pdf

Office of Rail Regulation, various years, National Rail Trends, http://www.rail-reg.gov.uk/server/show/nav.1863

PPIAF provides technical assistance to governments to support the creation of a sound enabling environment for the provision of basic infrastructure services by the private sector. PPIAF also supports the generation and dissemination of knowledge on emerging practices on matters relating to private sector involvement in infrastructure. The production of this report was funded by PPIAF.

PPIAF
Enabling Infrastructure Investment

ppiaf.org

@PPIAF_PPP
#PPPs