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 transcontinental lines. In the 1990s, the federal and state governments undertook extensive
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.\textsuperscript{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.\textsuperscript{164}

### 2 Corporate Objectives and Management

The corporate mission of ARTC is, \textit{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 \textit{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

\textsuperscript{163} Appendix A describes the Australian rail sector and summarizes developments that led to creating ARTC.

\textsuperscript{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.
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).

### 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

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) 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 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.

\[165 \text{Depreciated optimized replacement cost (DORC) valuation is a process to establish the current value of an asset based on the cost to replicate the asset in the most efficient way, from an engineering perspective, given the service capability or requirement, and existing asset age.}\]
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.

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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$380 million 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.

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.\textsuperscript{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

\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.

\textsuperscript{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).

\textsuperscript{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.
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.

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](image)

<table>
<thead>
<tr>
<th>Corridor</th>
<th>1997</th>
<th>2000</th>
<th>2009</th>
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<tr>
<td>North South</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Melbourne-Sydney</td>
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<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Sydney-Brisbane</td>
<td>18</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Melbourne-Brisbane</td>
<td>19</td>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>East West</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melbourne-Adelaide</td>
<td>18</td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>Melbourne-Perth</td>
<td>66</td>
<td>70</td>
<td>71</td>
</tr>
<tr>
<td>Sydney-Perth</td>
<td>55</td>
<td>65</td>
<td>68</td>
</tr>
<tr>
<td>Sydney-Adelaide</td>
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<td>n.a.</td>
<td>13</td>
</tr>
<tr>
<td>Brisbane-Perth</td>
<td>n.a.</td>
<td>n.a.</td>
<td>40</td>
</tr>
<tr>
<td>Brisbane-Adelaide</td>
<td>n.a.</td>
<td>n.a.</td>
<td>46</td>
</tr>
<tr>
<td>Adelaide-Perth</td>
<td>n.a.</td>
<td>n.a.</td>
<td>82</td>
</tr>
</tbody>
</table>

Source: Ross Allen Hamilton 2003; GfK Health 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.
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. 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

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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. 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—hauliers 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 traffic is 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

<table>
<thead>
<tr>
<th>EAST - WEST</th>
<th>NORTH - SOUTH</th>
<th>HUNTER VALLEY &amp; INLAND</th>
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<tr>
<td><strong>All Freight</strong></td>
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<td></td>
</tr>
<tr>
<td>VARIABLE PRICE PER '000 GTH</td>
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<td>S</td>
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<tr>
<td>Flagfall Price per train km</td>
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<td>Super Freight</td>
<td>0.973</td>
<td>0.973</td>
</tr>
<tr>
<td>Standard Freight</td>
<td>0.402</td>
<td>0.402</td>
</tr>
<tr>
<td><strong>Heavy Freight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VARIABLE PRICE PER '000 GTH</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Flagfall Price per train km</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Freight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Express Freight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Express Freight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Freight</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Flagfall Application

- **Express Passenger**: Max train speed above 115kph; Max Axle Loading up to 19T
- **Regular Freight**: Max train speed 80kph / Max Axle Loading up to 23T / Length to corridor standard max
- **Super Freight**: Max train speed 80kph / Max Axle Loading up to 25T / Length to corridor standard max
- **Standard Freight**: Max train speed 80kph / Max Axle Loading up to 23T / Length to corridor standard max

### Trains

- **XPT**, **Intra Urban Passenger**, **Intra State Passenger**
- **Long Distance Passenger**
- **Bi Model**
- **Scheduled Services including Steel, Ore, Cement, Concentrates**
- **Limestone**
- **Intermodal, Land Bridging**
- **Non Scheduled Services including Grain, Minerals**

**Notes**

- # 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

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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

Case Study

Burlington Northern Santa Fe Railway

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

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, War-
ren Buffett called the acquisition an “all-in wager on the economic future of the
United States.”

Figure 1  BNSF Network

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. Own-
ers of BNSF were offered $100 per share or the equivalent in BH stock. The trans-
action required approval of holders of two-thirds of the outstanding shares (other
than those already held by BH). The transaction was approved by shareholders and
closed on February 12, 2010. BH paid US$ 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 au-
tonomy, value based capital allocation and a long-term perspective.

Management autonomy: At BH, company managers are in charge of all oper-
ating 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\textsuperscript{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.”\textsuperscript{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-


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,” BH stock that vested over time was provided as incentive compensation for exceeding return on capital invested targets. As Warren Buffett 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.”

### 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.

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

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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](image)

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\(^\text{182}\) (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).
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\(^\text{183}\).
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).

### 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. 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)

<table>
<thead>
<tr>
<th>Income Statement Change</th>
<th>Balance Sheet Change</th>
<th>Cash Flow Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rail services</td>
<td>7,414</td>
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<tr>
<td>Government support</td>
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<td></td>
</tr>
<tr>
<td>Other</td>
<td>537</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7,951</td>
<td></td>
</tr>
<tr>
<td>Operating Expenses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wages &amp; benefits</td>
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</tr>
<tr>
<td>Materials &amp; energy</td>
<td>766</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>464</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>697</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3,489</td>
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<tr>
<td>Operating Income</td>
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<td></td>
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<tr>
<td>Interest &amp; other financial</td>
<td>328</td>
<td></td>
</tr>
<tr>
<td>Income before Income tax</td>
<td>4,134</td>
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<tr>
<td>Income tax</td>
<td>1,607</td>
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<tr>
<td>Net Income</td>
<td>2,527</td>
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<tr>
<td>Assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets</td>
<td>1,682</td>
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<tr>
<td>PEE* (net)</td>
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<tr>
<td>Other long term assets</td>
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<tr>
<td>Total</td>
<td>43,028</td>
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</tr>
<tr>
<td>Liabilities</td>
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<td>Current liabilities</td>
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<tr>
<td>Deferred taxes</td>
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<td>Long term debt</td>
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<td>Other</td>
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<tr>
<td>Total</td>
<td>20,794</td>
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<td>Equity</td>
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<tr>
<td>Share capital</td>
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<td>Retained earnings</td>
<td>8,967</td>
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</tr>
<tr>
<td>Total</td>
<td>22,234</td>
<td></td>
</tr>
<tr>
<td>Net Change In Cash</td>
<td>-691</td>
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</tbody>
</table>

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.

**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.

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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


Case Study
Camrail

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.

[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. 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.\textsuperscript{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).\textsuperscript{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

\textsuperscript{188} Both freight and passenger traffic volumes had remained broadly constant for the previous five years.

\textsuperscript{189} Such as payments to make freight wagons available.

\textsuperscript{190} Comazar is no longer involved, and Bolloré now owns 77.4 percent of SCCF.
by rail, sea, or air, and providing ancillary services such as storage and maintenance.

**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.\(^{91}\)

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 In-

\(^{91}\) However, Government could cancel the concession after 10 years, after giving five years notice and upon compensation payment.
Railway Reform: Toolkit for Improving Rail Sector Performance

Case Study: Camrail

The World Bank

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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.

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. 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. 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 payable by the concessionaire to Government in an account managed by the concessionaire; (v) Government would finance US$27 million in passenger-

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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.
only rolling stock; and (vi) the concessionaire would finance US$290 million in rolling stock and rolling stock-related investment through 2020.

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).

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.  

In the years following the concession, the compensation for ‘omnibus’ passenger services included in the concession agreement 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

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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.
Cameroon rail network is split into two major segments, Douala to Yaounde (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-Saharan Africa.

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).

\[197 \text{ Average freight tariffs are US$0.06 to US$0.08 per ton-km in West African and East African corridors, and US$0.05 to US$0.06 in Southern Africa (2009 figures)} \]
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\textsuperscript{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.).

\textsuperscript{198} XOF = 0.0017 USD as of December 31, 2015
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)\(^\text{199}\). 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

\(^{\text{199}}\) 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.
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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.
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)

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), a newly-established state-owned enterprise responsible for commercial operation of the railway. (Figure 3)

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.

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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.

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. 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). 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.

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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.
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. 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.

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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. 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.

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-

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205 http://www.chinahighlights.com/travelguide/transportation/china-high-speed-rail.htm
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).
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.

208 http://www.reuters.com/article/chinapacificinsurance-railwayfund-idUSL3N0Z007O20150614
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\(^\text{210}\). 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
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\textsuperscript{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.

\textsuperscript{211} When compared to annual cumulative freight volumes (ton-km) of 2015; National Bureau of Statistics of China

\textsuperscript{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 350 km/h plus high-speed line opened between Wuhan and Guangzhou (961 km). Today, over 1330 CRH services are offered daily across the county.
**Figure 10** China Railways Operating Indicators 1990-2015

*Data presented for 2014 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.*

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. 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.

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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. 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 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. 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

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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.\footnote{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.}

### 4.5 Financial Performance

Figure 12 shows financial performance indicators\footnote{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.} 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\footnote{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}. 

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\footnote{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.}

\footnote{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.}

\footnote{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}
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 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.
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

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). 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...
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).

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).
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

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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, 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 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.


\(^{226}\) HKSAR legislative Council 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. 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).

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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. 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.

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.
In addition, the corporation’s debt servicing capability has also been improved with reduced debt ratio (Figure 6) over the same period.

**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.
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.
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IGO. URI: http://hdl.handle.net/10986/23800


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 (ZR). 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


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 50% 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
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.

<table>
<thead>
<tr>
<th>Figure 2</th>
<th>Themes and “Big Shifts” from the Recent Visioning Workshop</th>
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| **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 |
| **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. RGN 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 Shikshir (Visioning 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.

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. 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.

![Ministry of Railways Organigram and Directorates (Indian Rail Board)](source)

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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, 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

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The engineering department is responsible for track and other civil works.
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).

IR is investing heavily in its infrastructure. Capital expenditure in 2015-2016 was estimated at 940 billion INR (14.7 billion USD) with the commissioning of 2,500 km of new broad gauge rail during the year234. 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 rail235. 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

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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.

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).

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.

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.
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 for the MOR (IRB) railway component for selected years.

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)

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236 Financial statements deviate from accepted international accounting standards and should be treated with care.
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. 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

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 establish 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. 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.

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238 The Soviet Union had 170 such divisions.
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).

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.  

\footnote{Investment in Transport Infrastructure: Country Studies, (European Conference of Ministers of Transport, 1999)}
and during 1997-99, track replacement volumes dropped by 49 percent.\textsuperscript{240} Thus railway infrastructure was dilapidated and the rolling fleet was outdated.\textsuperscript{241}

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 3 Decrease in Lithuanian Railways Profitability

![Graph showing decrease in Lithuanian Railways profitability]

Source: The Ministry, Lithuanian Railways

### Figure 4 Productivity at the Lithuanian Railways

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<thead>
<tr>
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<tr>
<td>Coach Productivity (000, P-km per coach)</td>
<td>4,857</td>
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<td>1,085</td>
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<tr>
<td>Locomotive Productivity (000, TU per locomotive)</td>
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<tr>
<td>Wagon Productivity (000, ton-km per wagon)</td>
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<td>538</td>
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<tr>
<td>Employee Productivity (000, TU per employee)</td>
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<td>477</td>
<td>611</td>
</tr>
<tr>
<td>Track Productivity (000, TU per standard track km)</td>
<td>10,450</td>
<td>4,171</td>
<td>5,002</td>
</tr>
</tbody>
</table>

(Source: TRS: 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;

\textsuperscript{240} Transport Restructuring in the Baltic States: Toward EU Accession, (World Bank, 2004)

\textsuperscript{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.


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 Gelezinkeljai (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. 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.

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

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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 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.

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

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.” Thus, EU Cohesion Funds, Europe’s Regional Development Funds, and Structural Funds are the primary sources of funding for transport infrastructure development in Lithuania.

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244 Ibid.
Case Study
London King’s Cross

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).

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

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246 Transit Oriented 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.

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.\textsuperscript{247} Figure 2 below shows the map and the committed building and occupiers as of 2016.

3 Redevelopment Approaches

The following approaches have been applied to the King’s Cross redevelopment programme:

\textit{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

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.

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Partnership with the private developer

LCR\textsuperscript{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

\textsuperscript{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\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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

\textsuperscript{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.


\textsuperscript{253} Ibid
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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; 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.

**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. This requires a long-term commitment from all stakeholders, including the developer, residents, occupiers and public services.

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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).

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.\textsuperscript{257} In the financial year ending March 31, 2016, LCR’s profit was £48.9 million.\textsuperscript{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.

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

\textsuperscript{257} LCR group report and accounts.
\textsuperscript{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.png)

**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.

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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 headquarters 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-per cent 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

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\(^{261}\) 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](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. 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.

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References


Case Study
Mexico Railways

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.

Over time, a popular movement to bring economically critical services under government authority led to the nationalization of the railways. In 1983, the Mexican

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Constitution was amended to ensure that the federal government retained ownership and operations of the country's main rail services. 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 (Figure 1).

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).

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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. 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.

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 manageable-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).

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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.

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 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)\textsuperscript{272}.

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 30\textsuperscript{th} 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)\textsuperscript{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.\textsuperscript{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.

\textsuperscript{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.


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 de México y se abroga su Ley Orgánica

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, 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.

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 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 track-age 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. 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. 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.

Notwithstanding, the reform can be hailed as a success. Mexican railways compare favorably with North American railways in terms of operating efficiency, which are

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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.

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.

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.


\(^{284}\) 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 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.

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. 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).

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286 Ibid.
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.

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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.\(^{290}\)

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 inter-modal 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.

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.

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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). 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).

• 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).
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.
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 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).

\[\text{295 The acquis communautaire is the accumulated body of European Union (EU) law and obligations as it has evolved since 1958 to the present day. It comprises all the EU's treaties and laws (directives, regulations, and decisions), declarations and resolutions, international agreements, and the judgments of the Court of Justice.}\]
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, and PKP’s freight modal share had tumbled to 35 percent from a high of 51 percent.

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.
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.

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 Law298, 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

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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 cleanliness 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 efficiency. 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.

\(^{299}\) 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).
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).

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\(^{300}\) 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.
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.
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.
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](image)

**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.
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).

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).
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.
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.

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 workforce 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

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. 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.

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.

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. 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.

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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 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.

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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)\(^\text{306}\).

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\(^\text{307}\). As of 31 May, 2016, there were a total of 1.058 billion telephone subscriptions across the country, and 160 million broadband subscribers\(^\text{308}\). The broadband services user-base in India is projected to grow to 250 million connections by 2017\(^\text{309}\).

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\(^\text{310}\). India was also estimated to have 371 million mobile internet users in June 2016, a significant rise from 238 million a year earlier\(^\text{311}\).

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\(^\text{312}\).


\(^{\text{307}}\) The state-owned incumbents currently have about 9 percent of the market for telephone subscriptions.


\(^{\text{310}}\) GSMA Intelligence, India Market Report (April 2015). This is a subscription service.


\(^{\text{312}}\) 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.

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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](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.

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\(^{315}\).

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\(^{315}\) Ibid.
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.
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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).

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).
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).

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.\textsuperscript{316} Clearly, railways could not maintain their pivotal role in the economy without reforms.

\textsuperscript{316} Transport Strategies for the Russian Federation (World Bank)
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:

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<th>Phase</th>
<th>Timeframe</th>
<th>Steps</th>
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<tbody>
<tr>
<td>Preliminary</td>
<td>Pre-2001</td>
<td>Establish legal framework for reforms; transfer social services to appropriate ministries; encourage private sector participation in supply industries</td>
</tr>
<tr>
<td>Phase I</td>
<td>2001-03</td>
<td>Establish joint stock holding company; encourage private wagon ownership</td>
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<tr>
<td>Phase II</td>
<td>2003-06</td>
<td>Separate subsidiaries into independent companies; begin phasing out cross-subsidization of passenger services</td>
</tr>
<tr>
<td>Phase III</td>
<td>2006-10 and beyond</td>
<td>Develop competition; increase private sector participation</td>
</tr>
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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. 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.

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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.

320 RZD Interim Condensed Consolidated Financial Statement as of 30 June 2016
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.
Freight traffic accounted for 2.30 trillion ton-km in 2014, which was 42.3 percent higher than in that of 2003. 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. The total freight traffic of 2015 remained at the same level as 2014.

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 1992-94, 1996-99, and 2001 are missing and figures shown are those missing data points splined.

Source: RZD Annual Reports and Rosstat

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 airlines325 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-Smoltsne 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.

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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
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.\footnote{Murray, B. (2014) “Russian Railway Reform Programme” Working Paper. European Bank for Reconstruction and Development. June 2014. p.8.}

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.
Once RZD allowed private sector participation in wagon ownership, customers were able to 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.

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331 RDZ Annual Report 2015.
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 RDZ no longer maintains a substantial proportion of the freight wagon fleet. RZD’s staff productivity is about three times the EU average.332

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 to the railway sector, freeing up RZD’s capital for the improvement of freight services.333

332 RDZ Annual Report 2015.
333 Murray, B. (2014) Russian Railway Programme, p.5.EBRD; and Lawrence, Martha; Olivier, Gerald. 2015. Attracting Capital for Railway Development in China. World Bank,
However, significant issues remain unresolved. These include:

- 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 Ref-service, but will retain controlling shares in each. In 2011, the Russian government sold 75 percent minus two shares in FFC and in 2012, RZD completed the sale of its remaining 25 percent stake in the company.
Case Study

SNCF Réseau

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), 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. With the use of PPPs, however, RFF was able to launch and construct four additional HSR projects within a seven-year period.

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

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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). 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). 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.)

On 1 January, 2015, RFF and SNCF were once again restructured to be combined into the SNCF Group. 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.

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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. One year later, MAPPP was set up and began operating.

In 2006, 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. 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.

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

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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.

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).
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.
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).
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.)
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.

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.

**Figure 9**  
Financial Impacts to RFF

![Figure 9: Financial Impacts to RFF](source: RFF Financial Report (2003-2014))

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348 Because RFF was restructured into SNCF Réseau 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.
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INSEE. http://www.insee.fr/fr/


Case Study
Southern Pacific

1 Introduction
This case study of Southern Pacific Railroad (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

Footnotes:
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.

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

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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](Image)
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

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.
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Case Study
Tokyu Corporation

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,
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), 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 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, 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, which coincided with the rapid urbanization of Tokyo, generating strong demand for both new housing and public transport to the center of Tokyo.

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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.
361 Tokyo Corporation website (as of January 19, 2017): http://www.tokyu.co.jp/railway/data/train_line/dt.html
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,
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.

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

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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 administering 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.\textsuperscript{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.\textsuperscript{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.


\textsuperscript{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.

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367 Ibid.
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. 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.

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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-entoshi 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.
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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\textsuperscript{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\textsuperscript{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\textsuperscript{372}.

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

\textsuperscript{369} This case study is largely based on Lawrence, Martha; Ollivier, Gerald. 2015. \textit{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/10986/10986/23800

\textsuperscript{370} The company was called Trailer Train at its inception in 1955.

\textsuperscript{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.

\textsuperscript{372} Access to wagons is subject to rules that apply equally to each railway participant.
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.

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.

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),\(^3\) 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.

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\(^3\) 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. 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. 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.

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.

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376 It has only paid dividends twice in its history.
378 Association of American Railroads (May 2016). *Rail Intermodal Keeps America Moving.* Retrieved from: [https://www.aar.org/BackgroundPapers/Rail%20Intermodal.pdf](https://www.aar.org/BackgroundPapers/Rail%20Intermodal.pdf)
which is 31 percent more efficient than non-TTX-owned wagons.\textsuperscript{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.

- \textit{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.

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Case Study

Union Pacific\textsuperscript{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\textsuperscript{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

\textsuperscript{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

\textsuperscript{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. 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.

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.

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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.

The Staggers Act allowed railways to price competing routes and services differently, and also streamlined procedures for the abandonment and sale of rail lines. 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.

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.

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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.)

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](image-url)
**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.)
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).

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.

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.
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 since388.

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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 ton-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.

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 (ROIC) 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
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. This challenge peaked in 1998, which became and “annus horribilis” for both technical and financial performance.

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


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. 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.

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 because they were expected to involve major investments, which require an extended pay-back period, and create major disruption to infrastructure. The Cross Country agreement was terminated early, in 2007, under Government’s remapping 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)

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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 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

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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.
day of travel. But, the lowest fares, available only through advanced booking, are 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, with free 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 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. 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.

http://www.virgintrains.co.uk/assets/pdf/global/passengers-charter-new.pdf
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 and many others were replaced in 2002 by management agreements under which government assumed revenue and

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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.
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 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.
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

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<tbody>
<tr>
<td>Train km</td>
<td>100</td>
<td>105</td>
<td>103</td>
<td>126</td>
<td>151</td>
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<tr>
<td>Public performance measure (ª trains less than 10 minutes late)</td>
<td>100</td>
<td>127</td>
<td>152</td>
<td>160</td>
<td>163</td>
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<tr>
<td>Passenger km</td>
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<td>95</td>
<td>145</td>
<td>154</td>
<td>181</td>
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<tr>
<td>Overall customer satisfaction</td>
<td>100</td>
<td>105</td>
<td>111</td>
<td>113</td>
<td>115</td>
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### Figure 6  
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6  Financial Results

Figures 7 and 8 summarize the financial results for Virgin West Coast over the period 2000-01 to 2009-10. Operating margins for West Coast range from 4-13 percent (average 9.0 percent), more than on other Intercity franchises and well above the typical margins of 3-4 percent for most British rail franchises.

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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 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.\textsuperscript{400}

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.

\textsuperscript{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


Office of Rail Regulation, various years, National Rail Trends, http://www.rail-reg.gov.uk/server/show/nav.1863