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MANAGING FOR DEVELOPMENT RESULTS

RAIL INFRASTRUCTURE TARIFFS

ENABLING PRIVATE SECTOR DEVELOPMENT
IN MONGOLIA'S RAILWAY SECTOR



Asian Development Bank



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Foreword

Railways are essential for the development of the Mongolian economy, partly due to the importance of the country's mineral exports and the long distances to its markets. Effective development of the railway network can also help Mongolia diversify its economy and make Mongolia's development more inclusive. Until recently, the only railway carrier in Mongolia was the Ulaanbaatar Railways (UBTZ), which is jointly owned by the governments of Mongolia and the Russian Federation. With the development of the mining sector, the railway market is changing, new private railway companies have been established, and several major proposed railway investments are planned.

The State Policy on Railway Transportation was adopted by the Mongolian Parliament in 2010. This policy establishes the context for the liberalization of the railway freight market including the modernization of its regulatory framework. A key part of the new regulatory framework is to allow any qualified train operator to use any railway infrastructure, a system known as "open access," and to charge the operators infrastructure tariffs for the right to operate. The Ministry of Roads and Transportation therefore requested technical assistance from the Asian Development Bank to provide advice on development of a system of infrastructure tariffs for Mongolia.

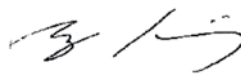
Open access is used for rail freight in Australia and the European Union, and similar arrangements are being developed in Kazakhstan, the Russian Federation, and Ukraine. A more restricted form of access is used on the private railways of North America. This paper reviews the infrastructure tariffs charged by the infrastructure managers in these regions in order to learn lessons for Mongolia and proposes a system of tariffs for the use of railway infrastructure to enable liberalization of the freight market.

While this study was being prepared, the Government of Mongolia took steps to begin bifurcating UBTZ into its infrastructure and transport operations parts. This required the urgent establishment of guidelines and tariffs for the use of UBTZ infrastructure. An interim system of tariffs, based on earlier work by the Ministry of Roads and Transportation and UBTZ, was adopted through ministerial orders in late 2011. These orders are reproduced in Appendix 2.

The Ministerial Order on Tariff Methodology has many elements in common with the approach and methodology proposed in this report, but there are also differences, which are described in Appendix 2. The adopted methodology provides a basis for separating the financial performance of UBTZ transport operations from UBTZ infrastructure, at least in the short term, but it is unlikely to provide a return on investment in infrastructure sufficient to draw private sector interest. The approach recommended in this report can be used to augment the methodology and facilitate private infrastructure development in the railway sector.



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Currency Unit

(as of 6 November 2013)

| Currency Unit | Equivalent |
|---------------|---------------------------------|
| \$1.00 | Mongolian togrog (MNT) 1,694.00 |

Abbreviations

| | |
|---------|---|
| AREM | Agency for the Regulation of Natural Monopolies |
| BTEG | Boroo Tumur Eruu Gol |
| CIS | Commonwealth of Independent States |
| DORC | depreciated optimized replacement cost |
| EU | European Union |
| km | kilometer |
| KTZ | Kazakhstan Temir Zholy (Kazakhstan Railways) |
| mm | millimeter |
| MNT | Mongolian togrog |
| MTC | Ministry of Transport and Communications |
| MTZ | Mongolian Railway Company |
| PRC | People's Republic of China |
| RAB | regulatory asset base |
| RMTPICD | Railway and Maritime Transportation Policy Implementation Coordination Department |
| RZD | Russian Railways |
| ton-km | ton-kilometer |
| UBTZ | Ulaanbaatar Tumur Zam (Ulaanbaatar Railways) |
| UK | United Kingdom |
| US | United States |
| UZ | Ukrainian Railways |

Executive Summary

Background and Purpose of the Report

The Mongolian railway market is dominated by the Ulaanbaatar Railways (UBTZ), which was founded in 1949 and is jointly owned (50/50) by the Government of Mongolia and the Russian Railways Joint-Stock Company. It is responsible for infrastructure and operations on the main line between the borders with the Russian Federation and the People's Republic of China, and on some branch lines and a separate section in the east. Until recently, it was the only railway carrier in Mongolia. The Mongolian Railway Company (MTZ) is a joint-stock company 100% owned by the state that was established in 2008 to act as a recipient of foreign aid. MTZ is expected to take responsibility for new railway construction and implementation of the government's railway network plan.

The State Policy on Railway Transportation was adopted by Mongolia's Parliament in 2010. This policy addresses the future development of the railway network in Mongolia, the liberalization of the freight market, and modernization of the regulatory framework. With the rapid development of the mining sector, the railways in Mongolia are in urgent need of development and it is expected that the private sector will play a major role. Already Boroo Tumur Eruu Gol, an iron ore company, has 85 kilometers of railway and 3,000 wagons (hailed by UBTZ on the UBTZ network).

This study examines the system of tariffs for the use of railway infrastructure that is needed to enable liberalization of the freight market.

International Experience with Reform

The report first examines international experience with railway reform since it is railway reform that mainly determines the requirements of the infrastructure tariff system. The study reviews experience in the following regions and countries:

- (i) Australia, which has adopted an open access model allowing carriers¹ to use both state and privately owned infrastructure.
- (ii) The Commonwealth of Independent States, where three countries (Kazakhstan, the Russian Federation, and Ukraine) have adopted an open access model for operators but not for carriers.
- (iii) The European Union, which allows open access for carriers in most markets and where open freight access is well advanced in many countries. Private sector participation is usually limited to rolling stock ownership and operations.
- (iv) In North America, where freight railways are all privately owned, third party access to freight railways is sometimes permitted on a commercial basis. The terms of access, including charges, are negotiated between the railways buying and selling access rights and generally remain

¹ Carriers generally operate their own locomotives using their own drivers whereas operators only have their own wagons.

confidential. Access rights may also be imposed by the regulator: for example, as a condition of a merger or if a shipper complains about abuse of monopoly power.

The review of international experience of restructuring provides the following lessons for Mongolia:

- (i) There are many ways to introduce competition in freight railways—providing access to other companies (third parties), as envisaged in Mongolia, is just one way (and not the most common).
- (ii) Mandatory access may be provided to carriers running trains, as in Australia and the European Union, or may be limited to operators just providing wagons (not traction), as in some countries in the former Soviet Union.
- (iii) Third party access, whether for carriers or just operators, provides new private sources of funding for investment in rolling stock and contributes to growth of the rail sector.
- (iv) Structure and provisions for third party access must be carefully designed to achieve the benefits of competition with minimum costs.

Competition should lead to reductions in customer tariffs and improved service, which benefit customers and the economy. However, unless competition is carefully planned, it may reduce returns on infrastructure investment, thereby discouraging such investment and long-term growth. This is particularly important when relying on private sector equity investment. It is difficult to attract private equity capital to invest in major new railway lines, and this generally requires a transparent and low-risk environment.

International Experience with Infrastructure Tariffs

In Australia, infrastructure tariffs can vary between infrastructure managers and lines/trains, but infrastructure managers must charge the same for the same service (they must be nondiscriminatory). Tariffs usually only vary between a floor (based on marginal cost) and a ceiling. Within this range, rates may be negotiated or set by arbitration.

In Commonwealth of Independent States countries, the tariffs per ton are set out by commodity for a range of distances by wagon type, weight loaded in each wagon, number of wagons shipped, wagon ownership (whether private or not), speed, whether there is a guard, whether the shipment is in a block train or not,² and other factors. The charge per ton increases with the distance shipped (this is tapered, i.e., the tariff increases less than in proportion to distance). Tariffs do not take account of location and are only loosely related to costs. Tariffs vary widely between commodities, partly reflecting ability to pay.

European Union legislation (Directive 2001/14)³ requires that rail infrastructure tariffs be based on the marginal costs of operating a service with a markup that depends on “ability to pay” (reflecting profitability) in different railway market sectors. Tariffs must not discriminate between different carriers competing for the same traffic.

In North America, infrastructure tariffs are usually negotiated between the railways buying and selling access rights. The companies selling train paths have a wide margin of freedom in setting tariffs.

² Block trains are trains that run from origin to destination without passing through marshaling yards at which wagons would otherwise be reorganized into new trains.

³ European Parliament and Council. 2001. Directive 2001/14/EC of the European Parliament and of the Council. *Official Journal of the European Communities*. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:075:0029:0046:EN:PDF> (accessed on 15 September 2012).

The tariffs are typically based on the number of trains, train-miles, and ton-miles. A code, which was negotiated between the railways and approved by the regulator, sets out the system for determining access tariffs.

The present review confirms the following:

- (i) The objectives of the infrastructure tariff system must be clear. The two key objectives are usually to achieve optimum traffic levels, which require tariffs based on marginal costs, and the full recovery of costs, which requires tariffs based on average costs. It is not possible to achieve both these objectives.
- (ii) For passenger services on railways built for freight, infrastructure tariffs often do not make a contribution toward the common costs of infrastructure (common with freight). These common costs can be paid for by freight services if freight is sufficiently profitable and/or through government subsidies for passenger services or for infrastructure.
- (iii) To pay for and provide incentives for investment in new lines, tariffs must cover the costs of these new investments.
- (iv) The infrastructure tariff system should be fair and promote competition between rail carriers on the same or different lines.
- (v) The infrastructure tariff system should be simple and easy for shippers to understand and for the regulator to regulate.

We do not recommend that the Russian tariff system be adopted in Mongolia for the following reasons:

- (i) It is designed to achieve different objectives, particularly economic development objectives aimed at assisting industry and ports in remote locations.
- (ii) It is only loosely based on costs, which leads to major inefficiencies.
- (iii) The separation of tariffs into infrastructure and other components allocates too high a percentage to infrastructure.
- (iv) It currently provides no funding for investment and is not designed for private sector participation in infrastructure development, both of which are required in Mongolia.
- (v) It is complex and difficult to understand.

Reforms in Mongolia

The Government of Mongolia wishes to develop the railway network, principally to allow the export of products from mines.⁴ According to this policy, the main line railways must be owned by the state as the dominant shareholder, although they may be used by the private sector for a limited period of time. The government recognizes that structural change will be required to improve the efficiency of the sector and to provide incentives for the private sector to invest.

⁴ State Policy on Railway Transportation, Resolution 32, 2010.

Planned reforms in the rail sector include the following three objectives that are most relevant to infrastructure tariffs:

- (i) To allow the open access to infrastructure for third parties, thus introducing competition in operations and thereby increasing efficiency.
- (ii) To pay for investment needed to increase the infrastructure capacity of existing lines.
- (iii) To create a railway network to serve new areas, particularly mining areas, using private funding to supplement or replace government funding.

Infrastructure Tariffs in Mongolia—Recommendations

Infrastructure tariffs need to generate sufficient funding for new investment by UBTZ or MTZ and provide an adequate return on any private investment in new lines. Infrastructure tariffs in Mongolia should therefore be based on average costs, not marginal costs.

To avoid discriminating against smaller carriers, the report recommends a one-part variable unit tariff, rather than a two-part tariff (fixed and variable).

Charges should be based on train-kilometer (train-km) as these are simple to measure. Use of train-km also provides an incentive to run longer and heavier trains thereby making best use of capacity which may be increasingly constrained.

The total cost of infrastructure has three components:

- (i) operation and maintenance cost,
- (ii) return on capital invested, and
- (iii) depreciation.

The return on capital invested should be determined by multiplying the regulatory asset base (RAB) by the cost of capital. We consider that historic costs, adjusted for inflation, should be used to calculate the RAB in Mongolia, because historic costs are simpler to calculate than replacement costs. The cost of capital should reflect the weighted average cost of capital (combining equity and debt), though this may be difficult to establish in Mongolia. The costs of capital used by the energy and telecommunications regulators may provide guidance, but these may need to be adjusted to reflect the different levels of risk.

The RAB normally also determines depreciation costs. For new lines, straight-line depreciation of the RAB over the life of the assets is the simplest method of calculation and is recommended. For UBTZ, the RAB is a poor guide and would provide too little for replacement. Actual investment plans should be used until the RAB is recalculated, possibly by applying inflation indexes to historic costs.

The analysis behind these recommendations and an illustration of the methodology for calculating infrastructure tariffs for UBTZ using 2010 data are given in Chapter 3.

It is desirable that infrastructure tariffs be set for several years into the future in order to allow infrastructure managers, carriers, and customers to plan their activities. If this is the case, one issue in determining tariffs will be what assumptions should be made about how quickly the infrastructure manager's efficiency would improve over time.

These recommendations cannot be definitive until decisions are made on the future rail system: the structure, concession arrangements, and funding of the industry. The key uncertainties are the role of the private sector, both as infrastructure manager and carrier or operator, and the contractual relationships between the private and public sectors.

Management and Financing of the Railway and Maritime Transportation Policy Implementation Coordination Department

To implement the tariff regulations, we propose the establishment of a tariff unit (full-time) and a working group (meeting on an ad hoc basis) within the Railway and Maritime Transportation Policy Implementation Coordination Department (RMTPICD), a government implementation agency under the Ministry of Roads and Transportation. Initially, technical support will be required from the Competition Commission and possibly other regulatory agencies. Consideration should be given to expanding the tariff unit once new lines are built.

The RMTPICD is currently funded directly from the state budget. In most countries, the financing of the regulatory organization is collected as a charge from railway organizations. The report recommends that this method of financing be adopted for RMTPICD in accordance with Article 12.1 of the Railway Transportation Law.

Legislative Changes Required

The existing law is suitable for opening up the market except that the following changes should be made to ensure fair access to infrastructure and services:

- (i) Ensure adequate fines can be imposed by the Competition Commission on infrastructure managers for failing to provide fair and nondiscriminatory access to the network.
- (ii) Introduce a regulation providing for the handling of complaints from carriers if an infrastructure manager fails to provide fair and nondiscriminatory access to the network.

The 1949 agreement on UBTZ must be changed to comply with Mongolian law, particularly on UBTZ's monopoly status and exemption from taxation.

The following changes to the law are required to implement the proposed infrastructure tariff regime:

- (i) First, the law does not state who should approve tariff increases but, in practice, the minister of transport does so, taking account of the recommendations made by RMTPICD. The law should be changed so that RMTPICD approves them. Article 7.1 of the Railway Transportation Law should be amended so that RMTPICD (or, failing that, the minister based on recommendations from RMTPICD) must approve tariffs, based on proposals from the infrastructure manager.
- (ii) Second, RMTPICD should ideally be independent of the ministry, possibly along the lines of the Energy Regulatory Commission of Mongolia.

1 International Experience in Rail Sector Reform

This chapter reviews the railway regulatory reforms undertaken in Australia, the Commonwealth of Independent States, the European Union (EU), and North America. It discusses industry structure, the forms of access provided to private and other companies for the use of railway infrastructure, and the involvement of the private sector in providing finance. This chapter includes a brief assessment of the relevance of comparator countries' reform experience to Mongolia. We examine experience in the following:

- (i) Australia, which is also a large, sparsely populated country with considerable mining, and has adopted an open access model allowing carriers¹ to use both state and privately owned infrastructure.
- (ii) The European Union, which allows open access for carriers in most markets. For freight, it is well advanced in many countries. Private sector participation is usually limited to rolling stock ownership and operations.
- (iii) Kazakhstan, which has also adopted an open access model for wagons, and, like Mongolia, is a large, sparsely populated country with considerable mining.
- (iv) North America, where freight railways are all privately owned and provide access to each other in certain circumstances.
- (v) The Russian Federation, which has adopted an open access model for operators but not carriers. Private sector participation is usually limited to wagon ownership and operations.
- (vi) Ukraine, which is adopting a model similar to that of the Russian Federation.

The objectives of railway sector reform vary among countries, but the reforms are generally aimed at greater efficiency and increased private sector participation to bring in investment and commercial skills. A brief review of other countries in the former Soviet Union showed that there were no significant structural reforms separating infrastructure from operations and, consequently, no infrastructure tariffs. Tariffs are briefly mentioned in this chapter. A more detailed discussion of infrastructure tariffs in different countries is provided in Chapter 2.

Australia

Railways in Australia were originally built as separate rail networks in each state, often using different track gauges. Several years of reform resulted in a national network with a mixture of public and private ownership. Most public rail networks are still owned by provincial governments, but some provincial rail networks are now managed by the national infrastructure manager. Australia also has private railways linking coal and iron ore mines to ports. There are about 10 freight carriers of significant size and

¹ Carriers generally operate their own locomotives using their own drivers whereas operators only have their own wagons.

about the same number of infrastructure managers for freight. Most networks are interconnected with other networks.

The Australian Constitution provides all parties with access to strategic assets. Railway infrastructure was designated as a strategic asset in the 1980s. This has transformed the Australian rail sector. Australia has introduced open access for freight railways built for common use, even if these are in private ownership. For example, the Australian Competition Tribunal in 2010 decided that third parties should be allowed to use some of the lines owned by two major iron ore companies. The third parties would, in practice, be smaller mining companies for whom it would not be economical to build their own lines. The tribunal did not, however, require open access for other rail lines owned by big mining companies.

Some railways have vertical separation of infrastructure,² while others have retained vertical integration. The isolated mining railways discussed above, however, remain vertically integrated. Most carriers and some infrastructure owners are in private sector ownership.

Infrastructure charges vary between infrastructure managers and lines/trains, but there are common rules:

- (i) Discrimination is not allowed—infrastructure companies must charge the same for the same service.
- (ii) Charges can vary between an established floor (based on marginal cost) and an established ceiling (based on total cost).
- (iii) Within this range, rates may be negotiated.

The European Union

Railways in most of the EU are predominantly for passengers but, in some countries in Eastern Europe and Scandinavia, freight is also important. EU countries have traditionally had state-owned railways, although some countries also have privately owned industrial lines. Operational integration within each network is provided by the infrastructure manager. There is coordination at EU level on technical standards and corridor development, but not on operational planning and control.

All EU countries are required by common agreement to provide open access to new rail carriers (using their own locomotives and wagons) that provide freight and international passenger services. The EU plans to liberalize domestic passenger services and some countries have already done so.

To ensure that there is no discrimination in favor of national operating companies, the following requirements are in place:

- (i) All countries are required to set up infrastructure entities with decision-making powers that are independent of any carrier using that infrastructure.
- (ii) Some countries have set up completely separate infrastructure companies. Where they have been separated in this way, infrastructure companies have, except temporarily in the United Kingdom (UK), remained under state ownership.

² Vertical separation of infrastructure is where the ownership and management of railway infrastructure is separate from the ownership and management of train operators.

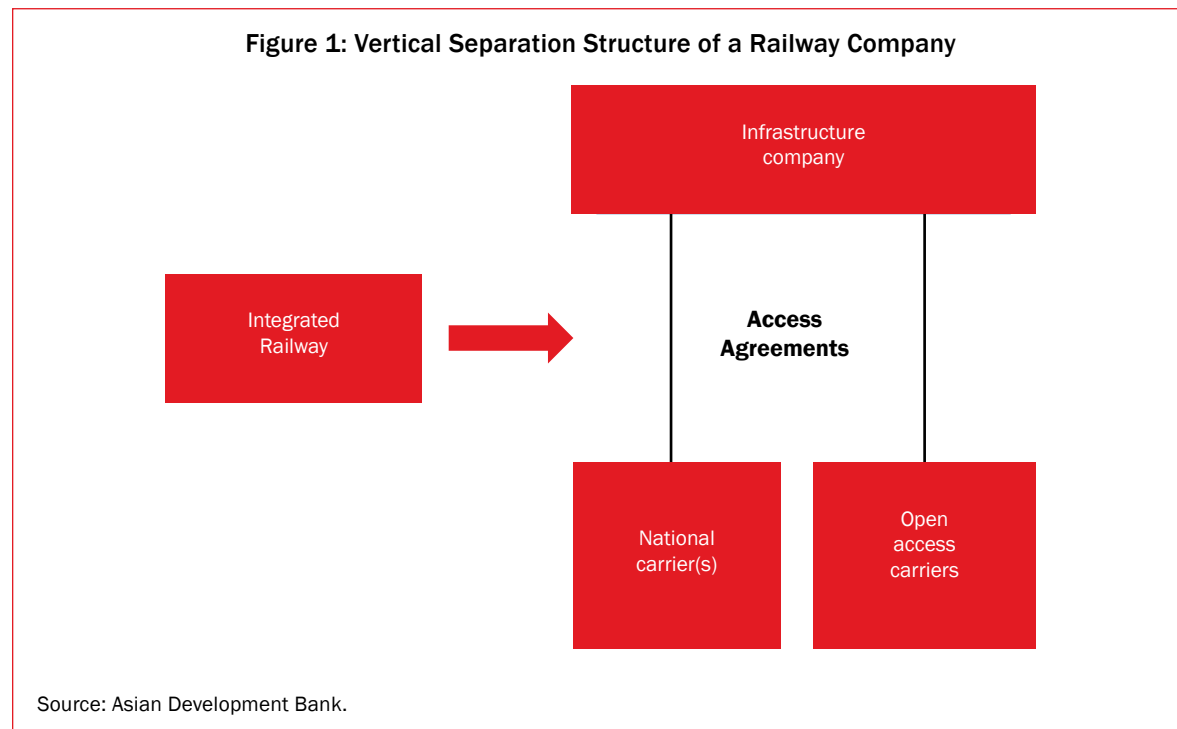
- (iii) Some countries have privatized freight companies and franchised passenger services—others are planning to do so.

Figure 1 shows the structure and trading relationships under these arrangements.

Vertical separation may be within a holding company, as in Germany where the infrastructure company and national carriers (one for each market sector) are subsidiaries of the holding company. Some countries, including all three Baltic states (Estonia, Latvia, and Lithuania), have established state-owned holding companies with infrastructure and operating subsidiaries.

Most countries in the EU have made reforms in line with the requirements set out in the EU law (which applies to all member states). New companies entering the market include both national carriers from other countries in the EU and private companies. The number of companies with freight licenses is less than 25 in most countries but over 300 in Germany, though not all of these actually provide services. Evidence is unclear on the impact complete vertical separation (companies under completely different ownership) has on competition and growth. The key issue is how the complex relationship between infrastructure and operating companies is managed. Countries that have open access have experienced faster traffic growth than those that have not.

Almost all railway infrastructure in Europe is state owned and managed. In the UK, infrastructure was privatized in 1996, but private ownership of infrastructure was abandoned in 2001, mainly because of the difficulty of aligning the incentives of private infrastructure owners with state policy and the commercial requirements of carriers. In Estonia, private ownership was also introduced but abandoned in 2004 partly because the access charging policy provided inadequate returns to investors.



New line construction is largely limited to high-speed lines in Western Europe, and attempts to build these using public–private partnerships have met with limited success so far because they are rarely profitable and it is difficult to separate the revenue streams of these new lines from those of the existing network to which they are usually connected.

Every country in the EU is required to establish a regulatory body that is independent of both the railway industry and government. Independent regulation is important to give new entrants confidence that the rules will not be changed by government in response to political expediency. The regulatory body sets rules to ensure that the overall national system works efficiently and fairly. To retain their licenses, all entities in the industry must abide by these rules. The precise role of the regulatory body differs between countries, but a key function under open access arrangements is to ensure that access to infrastructure is provided under arrangements that are nondiscriminatory and do not favor the national carrier.

Infrastructure tariffs—also referred to as access charges—constitute what the infrastructure manager charges carriers to use the track, stations, depots, and other facilities. According to EU rules, these must cover at least the marginal costs of providing and operating the infrastructure and related services (such as dispatching, train inspection) and may in addition include a mark-up to reflect different railway market sectors' ability to pay. In practice, many countries, particularly in Eastern Europe, do not differentiate charges between market sectors, and this may have contributed to traffic decline in markets with limited ability to pay.

Another requirement in the EU is that passenger and freight be established as separate businesses where they remain within the national carrier. This is particularly important in Eastern Europe where profits from freight have in the past been used extensively to cross-subsidize passenger services. Such cross-subsidies are no longer permitted under EU rules.

Kazakhstan

Kazakhstan, like Mongolia, is a large, sparsely populated country with an important mining sector. Railways are therefore essential for the economy.

Kazakhstan has made considerable progress in reforming its railways over the years. Social activities, such as schools, have been transferred to local authorities. Noncore service functions, such as several repair and maintenance companies, have been separated and some have been sold. Although contracts were established with private repair and maintenance service suppliers, and a market is beginning to develop, there have been problems with cost escalation because some specialized private suppliers exploit their local monopoly power. Some monopolies are due to high barriers to entry caused by long distances.

Since 2003, Kazakhstan Railways (KTZ) has been selling older surplus freight wagons to private companies. These private companies have refurbished these wagons and bought new ones. The wagons are used both for own-account operations and leased to third parties. Private wagon owners were operating about 40% of the national fleet by 2006.

The structure of the railway sector in Kazakhstan, as proposed in 2004, included the separation of loss-making enterprises from the core business (the core business being directly under the Ministry of Transport and Communications [MTC]), and other enterprises to be privatized or transferred to local authorities.

Under the 2004 plans, the activities of the headquarters of KTZ would be limited to managing the main line network. KTZ would still own 100% of the joint-stock companies responsible for core railway activities including KTZ's locomotive subsidiary (responsible for provision of locomotives and drivers) and its

subsidiary Kaztemirtrans, which is now responsible for the provision of wagons and will eventually be the freight carrier. It has now been decided that KTZ's locomotive subsidiary will be part of Kaztemirtrans.

Less progress has been made with private sector purchase of locomotives. Private companies appear to be reluctant to purchase locomotives and operate their own services due to the greater inherent risks and the perception of inadequate incentives provided by the tariff structure (i.e., they consider it cheaper and easier to use locomotives and drivers provided by "KTZ Locomotive"). The development of competition is also limited by the absence of clear rules defining the terms on which access to infrastructure can be provided.

One aim of the program was to resolve the issue of subsidies for passenger train operations by transferring ownership, along with operating and funding responsibilities for these services, to MTC and the oblasts (regional governments). KTZ would provide access to track and KTZ Locomotive would provide locomotives to passenger carriers.³ There would no longer be a need for cross-subsidies from KTZ freight operations to support passenger operations. This process has been delayed.

JSC Transport Services Centre was formed from KTZ to own, maintain, and operate most multi-user branch lines but not to act as a carrier. These multi-user branch lines typically connect single-user branch lines (owned by local industrial companies) to the main line. Most single-user branch lines and some multi-user ones have been sold, but the sale of multi-user ones has now been abandoned due to the risks of creating local monopolies.

As in the Russian Federation, tariffs are still calculated on the basis of Tariff 10-01, and total regulated tariffs have been separated into their component parts (infrastructure, locomotive traction, and wagons). Shippers therefore receive a discount for using their own wagons.

Generally, the less controversial and simpler reforms, such as the separation and sale of noncore activities, were completed quickly and private ownership of wagons has grown rapidly. Progress is slower in the other more difficult areas, particularly the transfer of passenger services to MTC and vertical separation of infrastructure to Kaztemirtrans (moving the national freight carrier from KTZ, which also manages infrastructure).

North America

The freight railways of the United States (US) consist of seven large Class I railways (including two Canadian-based railways that operate in the US) and several hundred smaller railways (mainly short lines connecting industries to the Class I railways). The freight railway industry in Canada has a similar structure with two major national vertically integrated railways. There is coordination at the national level on technical standards but not on operational planning and control: each railway is responsible for its own network and coordinates with other railways at boundaries.

All railways in North America are vertically integrated, as they used to be in all countries in the world and still are in most. Competition in freight is provided by overlapping rail networks, other modes of transport, and source competition (see glossary). Freight railways in North America are privately owned, and ownership crosses international frontiers. Passenger railways are all loss making and are publicly owned.

³ Most locomotives are used for both freight and passenger operations, and the fleet is therefore being kept together to avoid possible reductions in utilization.

To give investors in private and largely unsubsidized freight railways the best chance of recovering their costs and to ensure that there are adequate incentives to invest, they are not required to provide open access. Third party access (known in the US as trackage rights) is sometimes permitted but is not automatically available by law to all licensed carriers. The terms of access, including infrastructure charges, are usually negotiated between the railways buying and selling access rights and generally remain confidential. Trackage rights access may also be imposed by the regulator: for example, as a condition of a merger or if a shipper complains about abuse of monopoly power.

In North America, more than 60% of the freight wagon fleet is not owned by the railways themselves but by shippers or leasing companies (compared with 50% in the Russian Federation and 30% in the EU). However, these wagons are exclusively hauled by railway companies.

All wagons used in North America must meet technical standards developed by a joint industry committee and can be used throughout the entire network.

In Mexico, during the 1990s, the national railway was broken up into three (later four) major independent vertically integrated railways and sold. In each privatized railway, one of the conditions of sale was to provide access to a competing railway over part of the network. This was to ensure that there was competitive service to major industries or areas of production. Two of the concessions involved investors from US railways, which facilitated cross-border operations.

The Russian Federation

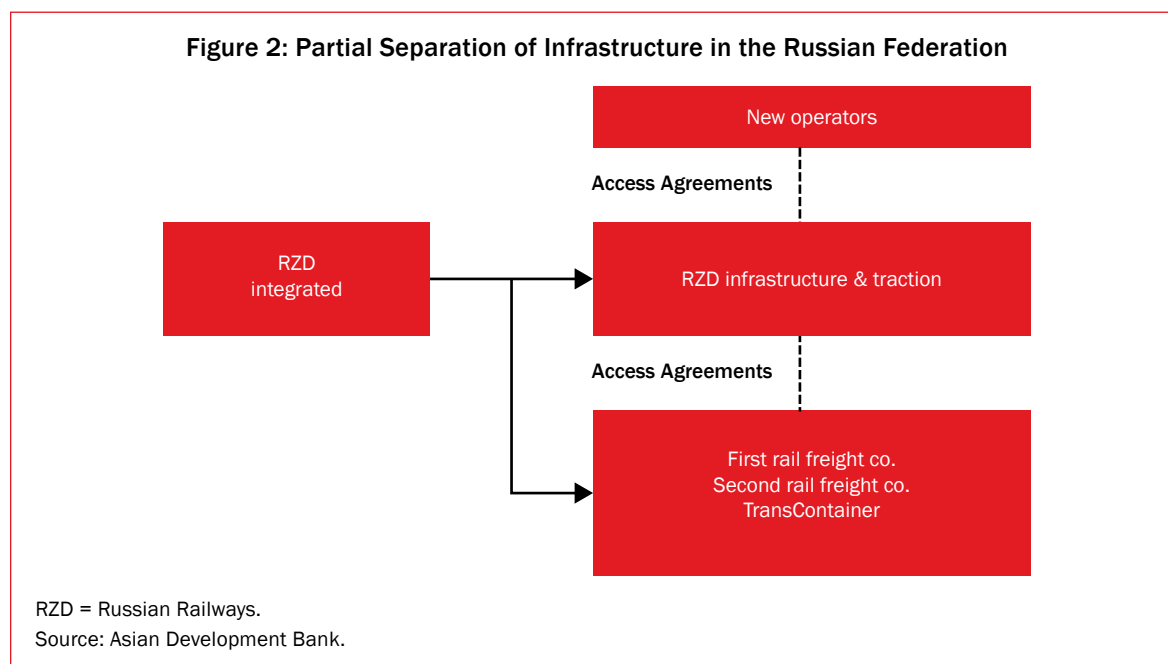
Railways in the Russian Federation are potentially less dependent on the government for regulation and financial support than in the EU because passenger services are relatively less important.

Russian reforms were based on a similar premise to the EU: that competition between rail service providers operating over the same infrastructure should improve efficiency. Competition between rail service providers is more necessary in the Russian Federation than in the EU because there is less competition from roads, especially east of the Urals. An additional objective of reforms in the Russian Federation was to attract much-needed investment in rolling stock from the private sector.

Although the original government plan was to allow private carriers providing their own traction (locomotives and drivers) as well as wagons, so far access has generally only been permitted to operators using their own wagons. Operators are not allowed to use their own traction except for some block trains where there is a shortage of Russian Railways (RZD) locomotives. These reforms have been accompanied by the development of a competitive wagon leasing market with both shippers and operators purchasing their own freight wagons or leasing them from newly formed specialized private leasing companies.

Both infrastructure and traction are therefore treated like legal monopolies and provided by RZD. RZD has opposed allowing private companies to provide their own traction as it considers there would be a loss of efficiency and that new carriers would take away the most profitable traffic, leaving RZD to carry out its “common carrier” obligations such as carrying domestic coal at discounted tariffs. RZD insists that any new carrier should be a common carrier. So far, the government has not insisted on allowing private companies to provide their own traction.

RZD has also established several freight operating subsidiaries to which it has transferred nearly all its wagons. These include two subsidiaries with about 225,000 wagons each, providing the full range of services across the country. It has also created some subsidiaries to serve niche markets, such as



TransContainer which runs intermodal services. These subsidiaries are being privatized to raise money for RZD to invest in infrastructure. The restructuring is summarized in Figure 2.

Profits from freight have been used to cross-subsidize loss-making passenger services. In 2006, RZD formed a Rail Passenger Directorate to focus on the management of long-distance passenger services. Local passenger entities (divisions of RZD or subsidiaries in joint ventures with municipalities) are also being created for local transport. RZD has made progress in obtaining support from federal and local governments to compensate it for loss-making suburban and long-distance services. The need for cross-subsidy from freight is therefore reducing.

In the Russian Federation, regulated tariffs have been separated into three component parts: infrastructure services, locomotive ownership and services, and wagon ownership. Shippers who provide their own wagons do not pay the wagon component of the tariff. The wagon component was designed to reflect broadly the costs of wagons (to ensure fair competition between RZD and private operators during the transition to operator-provided wagons). The wagon component is set quite low for some commodities, and this gives little incentive for private operators to provide their own wagons. The combined infrastructure and traction charge is the difference between a total tariff, based on distance and a broad commodity value classification, and an approximation of wagon costs. Infrastructure and locomotive tariff components therefore bear little relationship to costs. This reduces the effectiveness of competition in raising efficiency.

Reforms in the Russian Federation have been reasonably successful. In 2008, there were about 2,000 registered railway companies and freight forwarders, though some with only a few wagons. There has been about \$30 billion of private investment in about 500,000 wagons—almost half the total fleet. The remarkable growth of private wagon ownership can partly be attributed to the shortage of RZD wagons and the fact that private wagons are generally much newer than those owned by RZD subsidiaries and use newer technology. Most of the private wagons are used to carry more profitable high-value commodities, such as oil and oil products, in tank cars. Private wagon operators often serve niche markets and charge more than RZD.

The private fleet has helped railway capacity keep pace with growth in demand resulting from the Russian Federation's expanding economy. It has also helped improve the quality of service. However, far more investment is needed and, even with extra government funding, RZD may not have the sufficient resources for investment without greater involvement of the private sector. The government is now considering private locomotive ownership.

The government's 2008 Strategy for Developing Rail Transport in the Russian Federation up to 2030 also places emphasis on public-private partnerships in infrastructure, including high-speed lines.

Ukraine

Ukrainian Railways (UZ) has made fewer reforms than Kazakhstan and the Russian Federation. Because of its financial difficulties, UZ is unable to make adequate investments, leaving its wagon fleet old, inefficient, and unsuitable for some purposes. It therefore allows the use of private wagons.

UZ introduced substantial tariff discounts for privately owned wagons and, by 2007, private wagons made up about 25% of Ukraine's rail freight wagon fleet. Since then, the discounts have been reduced. Despite this, the increasing shortage of wagons has meant that private wagon operators have maintained their market share while charging above the UZ tariff and often making customers pay for the empty return.

In 2006, the cabinet approved the Concept of the State Program on Reform of Ukrainian Railway Transport, which stated that conditions should be created for equal access to rail infrastructure and related services. Despite this, there are currently no privately owned locomotives in Ukraine and hence no carriers. On 23 February 2012, the Ukrainian Parliament adopted the "Public Railroad Transport Company Law" and the "Railroad Amendment Law." The Railroad Amendment Law splits public administration and commercial functions of the State Administration of the Railroad Transport (Ukrzaliznytsya). Public administration functions were transferred to the Ministry of Infrastructure of Ukraine, while commercial functions were retained by a public railroad transport company that was established according to the Public Railroad Transport Company Law.

Lessons for Mongolia

This review provides the following lessons that are of relevance to Mongolia:

- (i) There are many ways to introduce competition in freight railways—providing access to other companies (third parties), as envisaged in Mongolia, is one way (but not the most common).
- (ii) Mandatory access may be provided to carriers running trains, as in Australia and the EU, or may be limited to operators just providing wagons (not traction) as in some countries in the former Soviet Union.
- (iii) Third party access, whether for carriers or just operators, provides new private sources of funding for investment in rolling stock and contributes to growth of the rail sector.
- (iv) Where there is more than one infrastructure manager in a country, each is responsible for operational planning and control on its own network; national control centers are not used.
- (v) Third party access of carriers may also be difficult to accommodate in some circumstances, as argued by RZD. It may also lead to increases in cost from lost economies of density.

- (vi) Provisions for third party access must therefore be carefully designed to achieve the benefits of competition with minimum costs. Access charges are a key element of this design.

Competition should lead to reductions in tariffs and improvements in services that benefit customers and the economy but, unless it is carefully planned, it may reduce returns on infrastructure investment and thereby discourage such investment and long-term growth. This is particularly important when relying on private sector equity investment.

In Australia, some infrastructure has been built recently with private finance. However, these lines are built by mines to provide short links to ports and are not part of the main line network, as envisaged in Mongolia. It is more difficult to attract private equity capital to invest in major new railway lines, and this generally requires a transparent and low-risk environment.

2 International Experience in Rail Infrastructure Tariffs

This chapter reviews the methodologies used internationally to implement tariff separation for railways into infrastructure and other components; summarizes the main features of the various approaches, their technical and operational merits, and the degree of success in cases where they have been applied; and discusses the applicability of the approaches to Mongolia. As with the previous chapter, this review highlights the experiences of Australia, Europe, Kazakhstan, North America, the Russian Federation, and Ukraine.

Objectives and Principles

Rail infrastructure tariffs are what the infrastructure manager charges carriers to use track, stations, depots, and other facilities to which the infrastructure manager provides access. Most infrastructure costs are for track, and track access tariffs are therefore the most important.

Rail infrastructure tariffs are set with two main objectives in mind:

- (i) To encourage the efficient use of infrastructure capacity.
- (ii) To encourage the efficient development of the network and allow funds to be raised to finance that development.⁴

Different countries attach different weights to these objectives so the approach to setting infrastructure tariffs varies.

However, irrespective of the objectives and priorities, rail infrastructure tariffs should cover at least the marginal costs (see Glossary) of infrastructure of which there are two main elements.⁵ Firstly, there is the “wear and tear” on the track caused by traffic, which increases the cost of maintenance and renewals. This depends on total gross ton-kilometer (ton-km) carried. Secondly, there is the cost of scarcity of capacity, when each extra train either means that (i) another train cannot operate (the opportunity cost); or (ii) the network cannot recover from operating disruptions, which leads to delays to other services. The cost of scarcity of capacity is most closely correlated with the number of train-kilometer (train-km) run. A third, but smaller, element of marginal costs is the cost of signaling and dispatching, which generally also depends on the number of trains.

⁴ C. A. Nash. 2010. Rail infrastructure tariffs—reconciling the conflicting objectives. Paper presented at the 5th International Symposium “Networks for Mobility,” Stuttgart, 30 September–1 October.

⁵ This paper uses the term “marginal cost.” Other terms are used elsewhere, such as variable cost (average variable cost per unit of output that varies with traffic), direct cost of providing services (used in the European Union legislation), and avoidable cost (the cost that would be avoided by not providing the service).

Review of Experience

Australia

The Australian rail industry is partly publicly owned (mainly infrastructure managers) and partly privately owned (mainly carriers). The infrastructure tariffs for the Australian rail industry are based on the following principles:

- (i) Infrastructure tariffs can vary between infrastructure managers and lines/trains.
- (ii) Discrimination is not allowed: infrastructure companies must charge the same for the same service.
- (iii) Tariffs usually only vary between a floor (based on marginal cost including the carrier's share of incremental costs for maintaining the segment of railway used by the carrier) and a ceiling.
- (iv) Within this range, rates may be negotiated.
- (v) In the event that negotiation fails, tariffs are set by arbitration—the setting of the floor and ceiling tariffs is intended to reduce uncertainty and negotiating costs.
- (vi) There remains scope for considerable variance between the floor and the ceiling, which can lead to uncertainty for carriers.

The ceiling for tariffs is based on total cost, including return on capital employed, which is obtained by multiplying the weighted average cost of capital by the value of assets. The value of assets used is based on the depreciated optimized replacement cost of the assets utilized.⁶ This approach is standard practice in regulated industries and is used in the UK to determine access tariffs in the railways.

The Bureau of Infrastructure, Transport and Regional Economics reports that the diversity of access regimes has a number of consequences:⁷

- (i) The absence of specific pricing principles increases uncertainty for train carriers.
- (ii) Inconsistency across access regimes increases duplication of effort and reduces efficiency and competitiveness.
- (iii) Different pricing levels and structures on a given freight route can generate inconsistent incentives to carriers in how a train is operated (e.g., train length and frequency).

There are about 10 infrastructure managers in Australia, most of which have their own regulators. This regulatory fragmentation means that transaction costs are higher than if carriers and infrastructure managers dealt with a single regulator.

The charging structure is typically based on a two-part tariff comprising a variable tariff and a fixed tariff. This is an effective way of recovering fixed costs since each train pays only the variable tariff and this means traffic is not lost to other modes. The problem with a two-part tariff is that the fixed tariff may

⁶ The depreciated optimized replacement cost (DORC) is an approach to allocating the capital costs of a project under which the regulatory asset base is periodically revalued to be equal to the price of building or buying a modern equivalent asset, depreciated to reflect the shorter remaining life of the existing assets. Under DORC, optimization takes account of the expectation that assets would not necessarily be replaced with assets that are identical to existing ones.

⁷ Bureau of Infrastructure, Transport and Regional Economics. 2003. *Rail Infrastructure Pricing: Principles and Practice*. Report 109. Canberra ACT. http://www.bitre.gov.au/publications/2003/report_109.aspx

discriminate against smaller carriers and makes it more difficult to ensure fair and equitable access for on-track competition.⁸

The European Union

European Union (EU) legislation (Directive 2001/14⁹) requires that rail infrastructure tariffs be based on the marginal costs of operating a service with a markup that depends on “ability to pay” (reflecting profitability) in different railway market sectors. Whatever the approach, legislation states that tariffs must not discriminate between different carriers competing for the same traffic.

Infrastructure tariffs are based on estimated infrastructure costs. This provides the right incentives: carriers will only operate trains if the value of the service (measured by the additional revenue) exceeds the additional costs.

Many railways in the EU have not fully complied with these requirements. There are several reasons for this:

- (i) On average, less than a third of rail infrastructure maintenance and renewals costs vary with traffic volume, meaning that tariffs based on marginal costs will fall a long way short of covering total costs, leaving a large financing gap.
- (ii) Many infrastructure managers find it difficult to charge only marginal cost as they receive minimal support from government and must therefore recover total costs.
- (iii) Some infrastructure managers, particularly those in Eastern Europe, find it difficult to measure marginal costs.
- (iv) Many infrastructure managers have difficulties in assessing the ability to pay of customers using different types of service as the managers often do not know what commodities are being carried on individual trains and lack understanding of customer markets. This makes it difficult for them to set different tariffs for different types of services or commodities. As a result, where it is necessary to recover total costs from infrastructure tariffs, infrastructure tariffs are uniformly high.

Setting different tariffs for different types of services or commodities is important because it increases the amount of traffic carried by rail, often an important objective of governments.¹⁰ The idea is to set higher infrastructure tariffs for less sensitive traffic; for example, traffic for which infrastructure tariffs represent a low proportion of total costs. Even in Europe, there is not much information on the sensitivity of traffic volumes to the level of tariffs. However, a UK study found that an increase in infrastructure tariffs would have a major impact on containers and construction materials traffic but a low impact on iron ore, nuclear materials, and coal. As a result, the British regulator allowed markups only for iron ore, nuclear materials, and coal.¹¹ This policy was subsequently abandoned, but it showed that this approach is feasible.¹²

Figure 3 illustrates the varied range of average levels of track tariffs between European countries. This variation is wide because some railways charge only for the marginal costs of track (some even less),

⁸ For this reason, the Federal Cartel Office required its abandonment in Germany where it had been introduced.

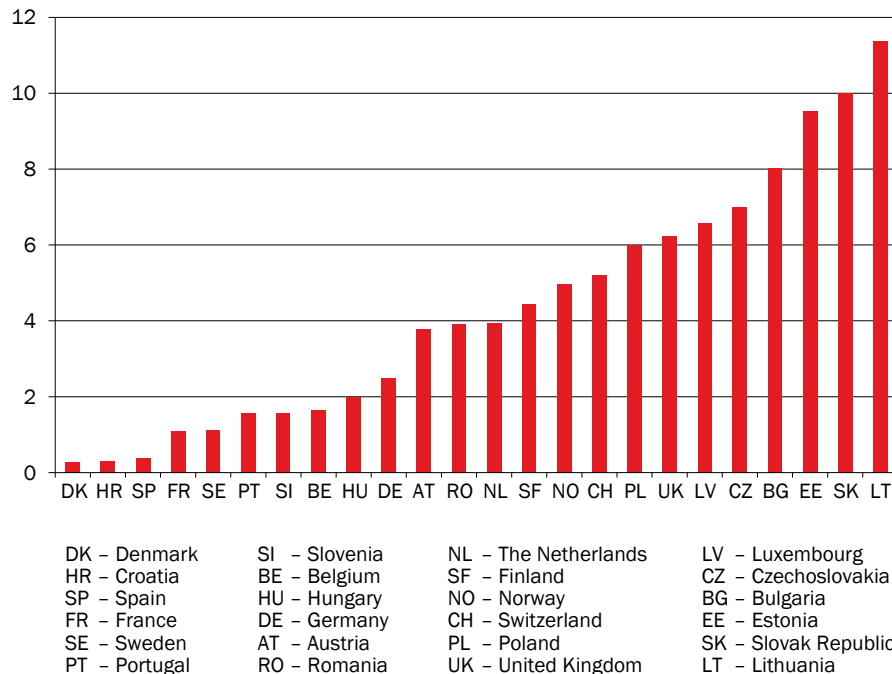
⁹ Footnote 3, p. ix.

¹⁰ It ensures that traffic that could contribute toward the “fixed cost” of rail infrastructure is not priced off the railways. A more detailed explanation may be found in Annex A of European Conference on Ministers of Transport. 2003. *Regulatory Reform in Russia*. Organisation for Economic Co-operation and Development.

¹¹ Footnote 8, p. 10.

¹² Office of the Rail Regulator. 2001. *Review of Freight Charging Policy: Final Conclusions*. October. United Kingdom. <http://www.rail-reg.gov.uk/upload/pdf/136-fchargfincon.pdf>

Figure 3: Track Tariffs for Typical 2000 Gross Ton Freight Train in Different European Union Countries (euros/train-kilometer)



Source: Adapted from L. Thompson. 2008. *Charges for the Use of Rail Infrastructure*. International Transport Forum. <http://www.internationaltransportforum.org/Pub/pdf/08RailCharges.pdf>

with the fixed cost made up by government support. Other railways, particularly those in Eastern Europe (especially Bulgaria, Estonia, Latvia, and Slovakia) where governments provide less support, attempt to recover full financial cost through track tariffs. Railways in Eastern Europe also tend to impose higher tariffs for freight in order to reduce the track tariffs for passenger services.¹³

EU Directive 2001/14 allows railways to charge above marginal cost if there is a shortage of track capacity. A number of countries in the EU have therefore introduced “reservation tariffs” that vary between busy and lightly used lines and by time of day. This reduces traffic at busy times on sections of track where there is a shortage of capacity and, at the same time, raises revenue.

Track access tariff regimes in the EU use a number of variables. The most common charging variables are gross ton-km and train-km, and some use a combination of the two.

Most systems make a distinction in their tariffs between passenger and freight services. Some systems differentiate tariffs by line category, others by type of rolling stock. Some make adjustments by type of commodity or according to the rates charged by the carrier. The Box (on p. 14) gives the example of the charging system in Germany, which aims to recover a high proportion of track costs from carriers. The German approach uses factors similar to the coefficients used in the Commonwealth of Independent States (CIS), although no distinction is made between commodities or between domestic, export, import, and transit traffic.

¹⁷ This practice also exists in much of the CIS.

Box: Structure of Track Access Tariffs in Germany

German track access charging policy aims to recover a high proportion of railway infrastructure costs from train operating companies. The charging system has three parts:

1. *Basic price for route category and utilization level*: Twelve route categories are grouped by infrastructure performance standard and transport importance. Basic prices are increased by a 20% premium on routes with very high utilization.
2. *Train path products (product factor)*: The basic price may be multiplied by other factors that depend on whether the company is operating freight or passenger train services.
3. *Special factors*: A series of multiplicative, additive, or regional factors such as those for extra-heavy freight trains.

The system is designed to reflect

- the costs of providing and maintaining infrastructure,
- train path standards for performance levels,
- capacity utilization, and
- differences between passenger and freight trains' ability to pay.

Using the tariff tables, tariff calculations are straightforward for any train operating company that wants track access for a specific train type or service on a particular route. The terms and conditions for network access include a detailed list of tariffs for train paths and for the other facilities and installations.

Source: The International Bank for Reconstruction and Development / The World Bank. 2011. *Railway Reform: Toolkit for Improving Rail Sector Performance*. http://www.ppiaf.org/sites/ppiaf.org/files/documents/toolkits/railways_toolkit/introductionandrailwaybasics.html

Over half of all rail freight in the EU operates across international boundaries. The different structure of track tariffs in different countries and the wide variation between the levels of tariffs therefore creates difficulties for freight carriers and customers. For example, where a country's tariffs are set per train-km, this will incentivize carriers to use longer trains. The carrier may then decide to split the train when crossing the border into a country where tariffs are set per gross ton-km. Splitting trains clearly increases system costs.

The different structures are particularly problematic when track access tariffs are high because they must recover total costs. Widely different structures also make it difficult for customers and freight forwarders to understand what tariffs would apply for particular movements.

The discussion above has concerned the largest component of infrastructure tariffs, those for track. In addition, tariffs may also be imposed for access to a number of other services or facilities:

- (i) power and fuel,
- (ii) freight terminals,
- (iii) marshaling yards,
- (iv) train formation facilities,

- (v) storage sidings, and
- (vi) maintenance and other technical facilities.¹⁴

Kazakhstan

Kazakhstan is gradually replacing regulation by market mechanisms.¹⁵ However, the incumbent carrier, Kazakhstan Railways (KTZ), has a market share of more than 35% in locomotives and wagons, so it is still counted as a monopoly. All KTZ customer tariffs are, therefore, still regulated.¹⁶

The calculation of railway tariffs for freight transported in Kazakhstan is also based on the tariffs stipulated in Price List 10-01. In response to the planned separation of railway infrastructure and the provision for private locomotives and wagons and open access operations, the Price List 10-01 has been divided into four elements:

- (i) infrastructure services,
- (ii) locomotive services,
- (iii) wagon services, and
- (iv) other freight-related activities.

The multisector regulator, the Agency for the Regulation of Natural Monopolies (AREM), is responsible for regulating tariffs for infrastructure services. The Agency for Protection of Competition is responsible for the assessment of dominance and the application of retail tariff regulation.

The process for determining tariffs in 2006 was as follows. KTZ, JSC Locomotive, and JSC Kaztemirtrans (which own wagons) produce traffic, revenue, and cost forecasts. If there is a gap between projected revenue and cost, KTZ applies to AREM for increases in tariff coefficients for the four elements. This process provides scope for KTZ to manipulate costs, which determine tariffs. For example, it can reduce the potentially competitive non-infrastructure elements (locomotive services, wagon services, and other freight-related activities) and increase the infrastructure part in order to make it uneconomical for the private sector to compete.¹⁷

Infrastructure tariff increases are approved for a period of at least 1 year. If KTZ finds that it is overspending, it must therefore wait for a year after the last increase to obtain an increase in tariffs to redress these losses. If KTZ underspends its budget, this tends to lead to a lower tariff increase the following year. There is therefore little incentive for KTZ to reduce its costs since it is unlikely to continue benefiting from its efficiency gain after the next tariff review.¹⁸

Unlike in the Russian Federation, there is provision in the tariff system to recover investment costs. The approach uses a standard rate of return to be applied to the regulatory asset base (RAB).¹⁹ Depreciation too, also reflected in tariffs, is based on the RAB. The RAB is valued on a replacement or current cost

¹⁴ EU Directive 2001/14. http://ec.europa.eu/transport/rail/packages/2001_en.htm

¹⁵ The section on Kazakhstan is based largely on data obtained during 2006 when the author undertook some work on this subject for the European Bank for Reconstruction and Development. This has been updated, where possible.

¹⁶ Kazakh Railways Investor presentation, September 2010. <http://www.railways.kz/en/taxonomy/term/60>

¹⁷ So far the reverse has happened: non-infrastructure tariffs have increased by more than infrastructure tariffs. This is because infrastructure tariffs are subject to greater regulatory scrutiny.

¹⁸ This is a common problem when tariffs are agreed for only a short period. It is why tariffs are usually agreed for 5 years in some railways in Europe.

¹⁹ The RAB is the value of the assets used by regulators to determine what the monopoly provider should be paid to provide a return on its capital investment. Social assets are listed separately in KTZ's balance sheet and are excluded from the RAB.

rather than a historic cost basis, thereby better reflecting the value of assets. AREM must approve all infrastructure projects through a process of discussion with the Ministry of Transport and KTZ. The cost of these projects is then added to the RAB.

There have also been discounts granted (for all components of rail tariffs) to shippers of certain commodities to reflect government macroeconomic policy. To obtain a discount, shippers apply to KTZ, which then forwards the application to AREM, the relevant ministries, and the Tax Committee. These applications are then discussed, and a final decision is made by AREM. The customer must guarantee that the discount will lead to more traffic being carried by rail (if this does not happen, it pays the full tariff).

Discounts may be granted for traffic for which transport represents a high proportion of overall cost. The only freight commodities that received discounts in 2006, both of 50%, were sulfuric acid and perishables (for social reasons). Since these discounts are made to tariffs that are based on average rather than variable costs, and since international research indicates that variable costs of infrastructure are far less than 50% of average costs, we conclude that infrastructure tariffs more than cover variable costs for these commodities. These discounts do not therefore represent cross-subsidies.

Passenger fares are also regulated by AREM. Infrastructure tariffs for passenger services are discounted by 99%. The tariffs do not therefore cover the variable cost caused by these services, and this represents a clear cross-subsidy from freight customers to passenger operations. The government intends that these cross-subsidies will be eliminated and replaced by direct subsidies from central and local governments. It is intended that the level of direct subsidy will be determined by competitive tenders for 3-year contracts.²⁰

The existing infrastructure charging system will be inadequate with vertical separation and open access since, as in the Russian Federation, tariff tables are still largely based on 1989 data and were calculated for a full transportation service for average USSR railway system conditions at that time.

North America

For North American freight railways, which are all privately owned and vertically integrated, encouraging competition between train carriers and greater use of rail is a secondary issue to ensuring cost recovery. As a result, differentiating freight tariffs to customers in different market segments is used to recover fixed (mainly infrastructure) costs and to ensure the financial viability of railways.

The terms of access, including infrastructure tariffs, are usually negotiated between the railways buying and selling access rights, and they remain confidential. The companies selling train paths have a wide margin of freedom and responsibility in setting access tariffs. Most access agreements are private contracts but are quite standardized. The charges are typically based on the number of trains, train-miles, and ton-miles. Because the major railways all have detailed cost accounting systems, a contract is usually preceded by an inspection of the cost accounting system of each party and an agreement on what costs will be included in the various contract components.

Sometimes, access tariffs may be imposed by the regulator, for example, as a condition of a merger or if a shipper complains about abuse of monopoly power (they are rarely successful). Light-touch regulation, based on intervention on appeal, has proved largely satisfactory although some shippers have complained about high tariffs. A code, which was negotiated between the railways and approved by the regulator, sets out the system for determining access tariffs.

²⁰ Footnote 20, p. 15.

The experience in Canada and the United States (US) may be relevant to Mongolia as it minimizes the need for regulation, relying on negotiation between railways for access. However, there is a question as to whether an industry structure can be developed that would make access charges fair and equitable to all parties: UBTZ, investors in other main lines (basic structure), and short (branch) lines.

In Mexico, each of the four private railways must allow access to a competing railway over part of its network—this is to ensure that there is a competitive service to major industries or areas of production. The access charging system is similar to that in the US. However, there have been complications arising from vagueness of the access charging regime and these have undermined the extent of competition in the sector.²¹

The Russian Federation

All tariffs charged by Russian Railways (RZD) are regulated, whether they are tariffs paid by final customers or track access and locomotive tariffs paid by operators. There are two tariff books in the Russian Federation. The first, known as Tariff 10-01, or Tariffs for Railway Freight Services, was established in 1989 for the Soviet Union. This system is used for domestic, export, and import traffic. These tariffs are regulated by a government agency (the Federal Tariff Service), which reports directly to the Russian Prime Minister. The Federal Tariff Service is responsible for overseeing all natural monopolies.

The second book is for transit traffic and is based on an international agreement between the railway administrations of CIS and some other countries (including Mongolia).

The indexes in these books are based on regression analyses of cost and traffic, mixed with the consideration of political-economic and regional development issues. Both sets of tables are extremely complex and opaque, and each table runs to over 100 pages. To get an idea of the likely tariffs for a particular shipment, shippers or freight forwarders often use computer software to make the calculations.

The books cover all operating costs associated with rail transportation: access to rail track, signaling services, dispatching and other related services, the locomotives used (including shunting locomotives) and their drivers, and freight wagons. This does not include the costs of loading and unloading of wagons (which usually occurs on tracks and yards belonging to industrial companies), freight forwarding costs, the costs of moving the wagons from private industrial tracks to RZD main line tracks, the costs of keeping the wagons idle on RZD sidings when waiting for the freight to be loaded (demurrage costs), or insurance costs.

One important omission is the cost of investment in infrastructure. RZD wants to introduce an investment component into the infrastructure tariff in 2012 which would be used by RZD to construct new lines, but the government so far prefers to make separate provision for investment in the state budget.

Tariff structure

The tables set out, by commodity, the tariffs per ton for a range of distances by wagon type, weight loaded in each wagon, number of wagons shipped, wagon ownership (whether private or not), speed, whether there is a guard, whether the shipment is in a block train,²² and other factors.

The charge per ton increases with distance shipped. This is tapered (i.e., the tariff increases less than in proportion to distance). The *base tariff* = $A + (B \times L)$ where A is a fixed delivery charge per wagon, per ton, or per container (depending on the type of traffic); B is the transport charge per “delivery km” per wagon, ton, or container; and L is “distance transported.” Distance transported is defined according to

²¹ R. Sharp. 2006. *Results of Railway Privatization in Latin America*. World Bank.

²² Block trains are trains that run from origin to destination without passing through marshaling yards at which wagons would otherwise be reorganized into new trains.

bands across the country. The same formulas apply irrespective of location. This is a weakness since unit costs vary considerably, for example, between the west and east of the country.

Differentiation of tariffs between commodities

Shipments are separated into three commodity groups, based roughly on transportation's share of the delivered cost of the good:

- (i) Class 1 commodities have high transport costs as a share of total delivered cost (>15%). Rates are adjusted by a class index that ranges from 0.75 for distances under 1,200 km to 0.55 for distances over 5,000 km. Examples of Class 1 commodities are coal, iron ore, and cement.
- (ii) Class 2 commodities have medium transport costs as a share of delivered cost (10%–15%). Rates receive no adjustment (i.e., Class Index is 1.0). Examples of Class 2 commodities are grain, crude oil, and fertilizer.
- (iii) Class 3 commodities have low transport costs as a share of delivered cost (<10%). Rates are adjusted by a Class Index of 1.74. Examples of Class 3 commodities are paper, beer, cotton, inorganic chemicals, and steel.

In addition to these general adjustments, certain commodities receive additional commodity adjustments using product indexes.

Because the tariff classes are largely value-based, Class 1 tariffs are lower than for the other two classes. The difference between classes may be seen by comparing the indexes used to determine tariffs for each class of commodity. Table 1 illustrates how final indexes are calculated for different commodities.

Table 1: Illustration of Calculation of Tariff Indexes
(2009 Russian Federation domestic, export, and import tariffs)

| Class | Transport as % of Delivered Cost | Commodities | Class Index (a) | Product Index (b) | Final Index (c) = (a)*(b) |
|----------------|----------------------------------|-------------|----------------------|-------------------|---------------------------|
| 1 Low value | >15% | Coal | 0.75 | 0.97 | 0.73 |
| | | Iron ore | (0.55 over 5,000 km) | 0.95 | 0.71 |
| 2 Medium value | 10%–15% | Cast iron | 1.00 | 1.39 | 1.39 |
| 3 High value | <10% | Copper | 1.74 | 1.60 | 2.78 |

Note: The class index is applied to all commodities in a particular class whereas the product index is applied separately to each commodity.

Source: ADB estimates.

Table 1 shows that, when combining commodity group and product indexes, tariffs for copper are almost four times higher than those for coal. This may be sound practice in some circumstances, as low-value commodities, such as coal, are likely to be the most sensitive to tariff levels since the rail tariff represents a high proportion of its value, especially over very long distances. However, in areas such as Western Russia, where there is competition from roads that is likely to be strongest for higher-value products, this policy may have the effect of diverting high-value products to road transport.

Exceptional rail tariffs

In addition, exceptional rail tariffs are sometimes allowed. These can be divided into three categories:

- (i) **Exceptional tariffs provided to support certain industries**, which are usually based on a commodity. In the coal industry, exceptional rail tariffs are given first to exported coal and coke to make Russian coal products competitive in international markets, but also for some domestic routes and for some types of imported coal and coke. These exceptional tariffs usually last at least 1 year, but are often automatically renewed for the next year (with some changes).
- (ii) **Volume-related discounts provided for specific Russian producers**, and usually for export commodities and for imported parts for international producers who have assembling facilities in the Russian Federation. They are applied only if the market situation justifies it and the shipper meets a minimum volume requirement. There are several discounts for international producers who have manufacturing facilities in the Russian Federation and require reduced rates for imported parts and components. These discounts usually last from a few months to 1 year, but can be extended if the market situation does not improve for this company.
- (iii) **Discounts related to distances**, usually for those commodities that are shipped from somewhere in the middle of the country (Siberia) over distances of 3,500 km or more, usually to either western or far eastern seaports. These are given to some commodities where the distance to the seaport would otherwise make them uncompetitive.

Separation of tariffs

In response to the provision for private wagons and, possibly, locomotives, the Price List 10-01 has been divided into infrastructure, locomotive, and wagon components. If a shipper or forwarder uses its own wagons, it does not pay the wagon component of the tariff. Instead of basing tariffs paid for use of infrastructure on infrastructure costs as is the practice outside the CIS, total regulated tariffs have been separated into their component parts and shippers only pay the components for the services they use. The wagon component has been determined by what is required to compensate a private company for its costs of wagon provision. The tariff components for wagons (and locomotives, where permitted) are therefore intended to broadly reflect their costs.

The combined infrastructure and traction tariff is the difference between the total tariff, which is partly politically determined, and an estimate of wagon costs. It also allocates to infrastructure many costs, such as station services, which do not belong there. In 2003, an Organisation for Economic Co-operation and Development (OECD) mission to the Russian Federation found that infrastructure represented 70% of total tariffs and suggested that this was far above infrastructure's share of cost. Since then, the proportion has fallen to about 55%. This is an improvement, but it is probably still higher than the share of RZD's costs represented by genuine infrastructure costs.

The separation of the component parts of tariffs by simple percentages makes no allowance for the fact that the proportion of costs that vary with distance is quite different for infrastructure than for other services. Therefore, the infrastructure component of the published tariffs is unlikely to bear much relationship to costs. This reduces the efficiency of the railway system since customers who pay more than the cost may reduce the amount of traffic they send by rail while those who pay too little cause the railway to lose money.

The average proportion of total tariffs represented by the wagon component varies widely with a number of factors and tends to be higher for universal wagons such as gondolas (used for coal) than it is for specialized wagons such as tank wagons (used for oil and oil products). This is because RZD's full coal tariffs, including the wagon component, are far lower than its oil tariffs; therefore, a larger percentage

discount is required to provide an incentive to private operators to invest in gondolas. For some coal traffic in gondolas, the wagon component is almost 50% of the total tariff.

RZD does not charge for returns of empty wagons since RZD includes the cost of empty returns in its tariffs for loaded wagons.²³ However, RZD does charge private wagon owners for empty returns. If private wagon owners are unable to fill empty wagons, the net discount for using their own wagons can be quite low and sometimes private wagon owners pay more than if they had used RZD wagons. They nevertheless have an incentive to buy their own wagons as it guarantees availability when RZD is short of wagons. Private wagon owners also have an incentive to fill empty wagons for backhauls (although their waiting for full wagons can cause blockages at ports and major terminals).

Private wagon owner tariffs are not regulated: they can charge as much as the market can bear. RZD's freight operations subsidiaries also own their own wagons and, like private wagon owners, do not pay the wagon component of the tariff. After the RZD fleet is transferred to RZD daughter companies (expected to be completed in 2011), the full Tariff 10-01 will be paid only for the fleets of other CIS railways. For most rail shipments, final tariffs to customers will be determined not by regulation, but by the market. Only the tariffs for infrastructure and locomotives, some or all of which will still be provided by RZD, will be regulated.

Infrastructure tariffs for passenger services

Passenger services in the Russian Federation have traditionally been cross-subsidized by freight services. To subsidize passenger services, freight charges must necessarily be higher than they otherwise might be. This is gradually being phased out, partly because it makes rail less competitive for freight and partly because it makes it difficult for RZD to compete with new operators. There is currently no competition in passenger services and no separation of tariffs into infrastructure and other components.

Transit traffic

The second tariff book is based on the Tariff Policy of CIS Railways and is applied to all transit traffic. Traffic through ports is treated in the same way as traffic across land borders so traffic from Mongolia to Russian Pacific ports is treated as transit traffic. Transit tariffs are often lower than equivalent export and import tariffs.

Each railway council member can apply various coefficients for transit traffic to adjust for currency and policy differences. The coefficients are discussed and agreed annually (sometimes semiannually when inflation is high) by the Council of CIS Railways. Countries can change their transit rates outside this agreement, but no more than twice a year, by informing all participants in the agreement at least 1 month in advance.

Tariffs for transit traffic are therefore determined in a different way from other tariffs: essentially through international negotiation, which determines maximum permitted tariffs, and competition, which determines the discounts to individual customers. Transit tariffs are expressed in Swiss francs.

Harmonization

Tariffs have traditionally been different for domestic, export, import, and transit traffic. However, they are gradually being harmonized. First, tariffs for exports and imports through Russian ports were harmonized with those for domestic traffic. Then, in 2006, there began a process for harmonizing tariffs for exports and imports through Russian land borders with those for domestic traffic. This process is expected to be completed by 2013 for normal Tariff 10-01 charges. By 2015, exceptional tariffs are expected to be abolished and replaced by direct subsidy to industry. There are plans to harmonize transit tariffs with domestic ones to meet World Trade Organization requirements.

²³ The charge for private wagons is intended to allow all wagon owners to recover the costs of buying wagons and to optimize wagon use. The charge for empty wagons is intended to stimulate universal wagon owners to find return freight.

Conclusions

The Russian system has the advantage of building on a preexisting system that people are used to, and changes have been made gradually and carefully, without causing major disruption. However, it does have some weaknesses:

- (i) The tariff structure is partly politically determined, with the aim of creating balanced economic development in a vast country, meaning that coal is particularly favored and that tariffs are particularly low in relation to cost over very long distances.
- (ii) The tariffs are based on average system costs and take no account of differences between regions.
- (iii) The system is complex and is even more so now that it has been separated.

The system can therefore lead to choices being made by shippers that are not in the national economic interest.

Ukraine

The system of rail tariffs in Ukraine is largely unchanged from the Soviet era. As in the Russian Federation, Tariff 10-01 applies to all domestic, export, and import traffic.

Domestic, import, and export tariffs

Within Ukraine, rail tariff changes take into account country inflation, Ukrainian Railways' (UZ) investment needs and the need to provide sufficient returns to cover passenger losses and a return on assets. Changes are developed and proposed by UZ, first to the Ministry of Infrastructure and then to others, including the ministries of finance and economy. Objections are most often made by the Ministry of Economy because of its wider responsibility for the economy. Changes must be approved by the cabinet. There are also ad hoc interventions by the cabinet to reduce tariffs on certain commodities.

This system therefore creates some uncertainty for private carriers, particularly regarding the timing of increases.

The current tariff code divides UZ's tariffs into three parts:

- (i) infrastructure charges, which depend on the particular infrastructure involved and whether the wagons used have heavy loads;
- (ii) traction charges, which include locomotives, drivers, and energy costs; and
- (iii) wagon charges, which private wagon owners do not pay as they receive this as a discount from the full tariff.

Discounts for private wagons

When the new tariff structure was introduced in 2000, the discounts for private wagons were set at 30% of the full tariffs for the most common wagon types. This discount was intended to reflect wagon ownership costs. Because private owners must pay for empty movements, the net discount for using their own wagons can be quite low if private wagon owners are unable to fill backhaul wagons. Sometimes private wagon owners even pay more than if they had used UZ wagons since UZ does not charge for empty returns. Private wagon owners nevertheless still have an incentive to buy wagons as this guarantees availability when UZ is short of wagons and customers may be willing to pay for that guarantee.

In recent years, the discounts for use of private wagons have been reduced to only 22% on average. Also, because too many private wagons were returning empty, charges for return of empty wagons have been doubled. Both these changes discourage private ownership of wagons. Despite these difficulties, private wagon operators have survived by charging above the UZ tariff and sometimes making customers pay for the empty return. Customers accept this as UZ's wagons are in short supply and are of poor quality.

There are now 153 private wagon owners in Ukraine. In November 2010, private wagons, excluding those owned by UZ subsidiaries, made up 26% of Ukraine's rail freight wagon fleet.

However, UZ and the relevant ministries are aware that the current rates of discount provide inadequate incentives to the private sector to buy more wagons (urgently needed as UZ has no money) and to ensure that wagons do not spend too much time in the Russian Federation (where they can go for 45 days at a time and earn higher returns than in Ukraine). UZ and the Ministry of Infrastructure therefore plan to raise the discount.

Recommendations for Mongolia

Based on the international review, the following approach to infrastructure tariffs (access charges) for Mongolia is recommended:

- (i) The objectives of the infrastructure tariff system must be clear. The two key objectives are usually to achieve optimum traffic levels, which requires tariffs based on marginal costs (the basis of the EU requirements) and the full recovery of costs (the North American approach). It is not possible to achieve both these objectives.
- (ii) Infrastructure tariffs should cover at least marginal costs (the costs of maintenance and renewal of existing infrastructure, operations, and scarcity).
- (iii) For passenger services, infrastructure tariffs do not necessarily need to make a contribution toward the costs of infrastructure, which is used in common with freight—these common costs can be paid for by freight services if freight is sufficiently profitable.
- (iv) To pay for and provide incentives for investment in new lines, tariffs should also cover the costs of these new investments.
- (v) The infrastructure tariff system should be fair and promote competition between rail carriers on the same or different lines.
- (vi) The infrastructure tariff system should be simple and easy for shippers to understand and for the authorities to regulate.
- (vii) There is an issue as to whether infrastructure tariffs should make a distinction between domestic, export, import, and transit traffic.

The Russian tariff system should not be adopted in Mongolia for the following reasons:

- (i) It is designed to achieve different objectives, particularly economic development objectives aimed at assisting industry and ports in remote locations.
- (ii) It is only loosely based on costs, which leads to major inefficiencies.

- (iii) The separation of tariffs into infrastructure and other components allocates too high a percentage to infrastructure.
- (iv) It currently provides no funding for investment and is not designed for private sector participation in infrastructure development, both of which are required in Mongolia.
- (v) It is complex and difficult to understand.

3 Infrastructure Tariffs for Mongolia

This chapter considers the specific features of the Mongolian transport system and then discusses what form of tariffs would best suit the current and proposed system. The optimal approach to tariffs will depend on decisions to be made on the future railway network, and on the structure, ownership, and funding of the industry. The key uncertainty is the future role of the private sector, both as infrastructure manager and carrier or operator, and the contractual relationships between the private and public sectors.

Mongolian Railway Sector

Industry structure

Ulaanbaatar Tumor Zam

Ulaanbaatar Railways (UBTZ), which owns the main railway in Mongolia, is a joint-stock company owned 50% by the Government of Mongolia and 50% by the Russian Railways joint-stock company (RZD). Senior management positions are also divided between the two shareholders. This structure weakens decision making and, to strengthen its control, the government is seeking to increase its share of ownership to 51%.

The infrastructure of UBTZ consists of 1,815 kilometers (km) of broad (Russian) gauge lines in two main parts (Figure 8):

- (i) The main line Sukhbaatar–Zamyn-Uud, connecting the northern (Russian Federation) and southern (People's Republic of China [PRC]) borders of Mongolia (1,110 km).
- (ii) The eastern line Ereentsav–Choibalsan, connecting the Dornod *aimag* (province) to the Russian Federation (238 km).

There are also several branch lines of the main line, including four connecting to the major industrial areas of Erdenet (copper, 164 km), Baganuur (coal, 95 km), Bor-Uundur (fluorspar, 60 km), and Zuunbayan (previously a major military unit, 50 km).

UBTZ is both infrastructure manager and the only transporter (carrier) operating on this infrastructure. UBTZ employs 14,046 people; it owns a total of 110 locomotives and about 3,000 wagons.

UBTZ's rolling stock is old: for example, 80% of its locomotives are older than their design life of 20 years. About 18% of its wagons are more than 35 years old. UBTZ does not have sufficient wagons and leases or rents about 450 wagons from RZD and more from private wagon owners in the Russian Federation.

Mongolian Railway Company

The Mongolian Railway Company (MTZ) is a joint-stock company 100% owned by the state. It was established in 2008 to act as a recipient of foreign aid, which until now has not been available to UBTZ because of its ownership. MTZ was to take responsibility for new railway construction and new rolling stock. It acquired three locomotives using funds from the state budget and rents these to UBTZ. It

plans to purchase more using a soft loan from the Government of the People's Republic of China. The Government of Mongolia intends for MTZ to become a transporter and eventually an infrastructure owner taking the government shares in new railways once concessions are terminated.

Infrastructure Development Company

Infrastructure Development, like UBTZ, is a joint-stock company 50% owned by the Mongolian government and 50% by RZD. It owns a locomotive and a terminal at Zamyn-Uud on the PRC border. It rents both these to UBTZ. Its current plans are to acquire new rolling stock and to carry out infrastructure repair work.

Despite its name, Infrastructure Development is unlikely to be allowed to build major construction projects because of its ownership.

Boroo Tumur Eruu Gol

Boroo Tumur Eruu Gol (BTEG) is a private company which was founded in 2001 and has an exploitation license for iron ore deposits located in Yoroo *soum* (district) in the Selenge *aimag*, north of Ulaanbaatar. BTEG has built 85 km of railway line connecting its mine to the UBTZ railway line at Dulaanhaan. The company purchased 3 locomotives and 1,000 open-top wagons from the Russian Federation in 2009 and 2,000 wagons from the PRC in 2010. It therefore owns more wagons than UBTZ. It planned to purchase 30 more locomotives in 2011 and, by August 2011, nine had already been delivered and were operating on an experimental basis, four on the main UBTZ line and five on its own line.

When BTEG wagons are hauled by UBTZ on the UBTZ network, BTEG receives only a 15% discount off normal UBTZ tariffs for using its own wagons, whether loaded or empty. UBTZ does not charge customers for empty returns so BTEG usually pays more overall.

Two more private companies obtained permission to build their own private railway lines in 2008: Energy Resources obtained approval to build a railway from Tavantolgoi to Gashusuhait on the PRC border and MAK to build a railway from Nariin Sukhait to Shivee Khuren, also on the PRC border. According to government railway policy, they will be built as a part of the second stage of the National Railway Plan.

Current freight traffic

Figure 4 shows the flow of traffic on UBTZ's network over the period 2000–2010.

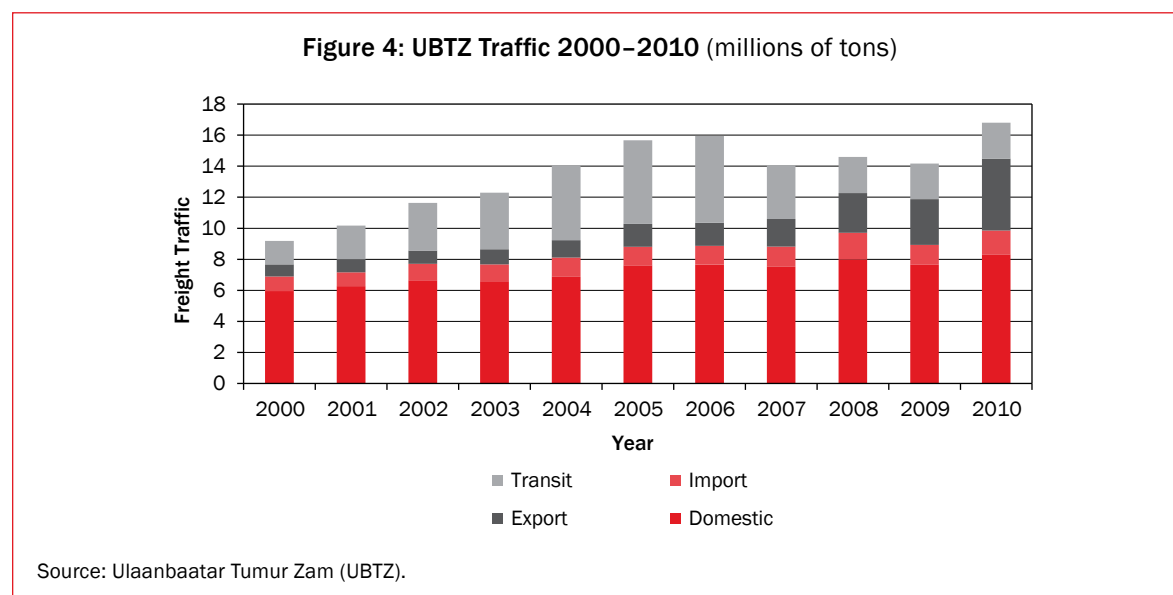
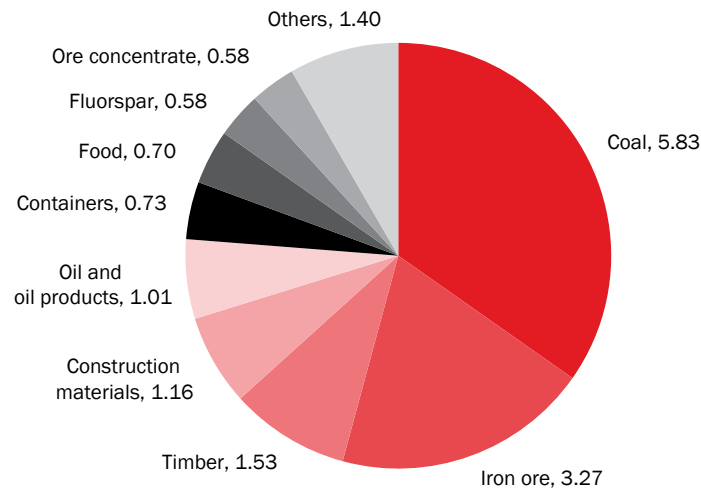


Figure 5: UBTZ Traffic by Commodity, 2010 (millions of tons)

Source: Ulaanbaatar Tumor Zam (UBTZ).

Figure 4 shows that exports have grown by about 400% over the period and by more than 50% between 2009 and 2010. This is mainly iron ore and copper concentrate exported to the PRC. Transit traffic grew during the early 2000s but fell back around 2007 due to the diversion of oil and oil products traffic to a direct route between the Russian Federation and the PRC via Manzhouli to the east. This leaves timber as the main transit commodity, also flowing from the Russian Federation to the PRC. Traffic is quite unbalanced with most flowing north to south.

Figure 5 shows the breakdown in traffic by commodity. It can be seen that coal (domestic), iron ore (export), and timber (transit) represent over 60% of traffic.

Potential rail freight traffic

UBTZ expects that export traffic on its network will continue to grow rapidly. This reflects the massive expansion of the mining sector in Mongolia. It is unclear, however, where these products will be sold and what new lines will be used to export these mining products.

The Ministry of Transport estimated that 16–20 million tons would be shipped to the PRC by road in 2011. The mining sector would prefer to transport its products by rail, as it is cheaper and less environmentally damaging. The State Policy on Railway Transport 2010 intends that exports by rail (coal, copper, tungsten, zinc, and fluoride) will reach 50 million tons per year (no year is given).

Passenger traffic

UBTZ also carries passengers, although these services account for only about 30% of train-km. Most passengers are carried over quite long distances (average of 339 km for domestic trips and 526 km for international trips).

Competition

UBTZ currently faces almost no competition from roads in freight transport, although it faces some competition in passenger transport. UBTZ's transit route for freight faces competition from the rail corridor via Manzhouli to the east. As a result, it provides discounts on the internationally agreed tariffs.

These discounts are especially large on south–north traffic in order to try to correct the imbalance in traffic. Competition will increase as road and rail systems in Mongolia and neighboring countries are developed. In particular, the north–south road is expected to be completed in 2014. There may therefore be limited scope in the future for charging higher infrastructure tariffs for freight transit and certain commodities.

UBTZ's financial performance

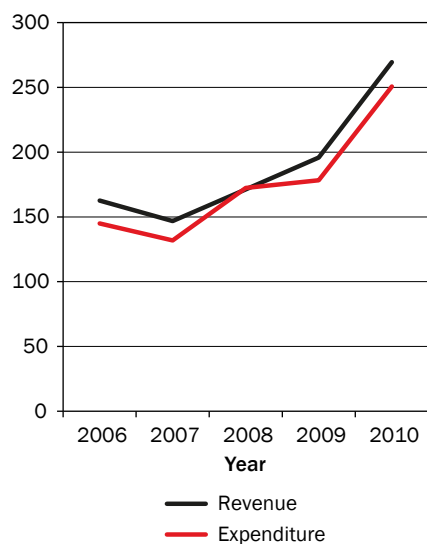
Figure 6 shows the reported financial performance of UBTZ freight over the period 2006–2010. In most years, revenue exceeded expenditure by a small margin. The average annual profit on freight services over the period was 13.6 billion Mongolian togrog (MNT).²⁴

Figure 7 shows the financial performance of UBTZ passenger services over the same period. In most years, revenue fell short of expenditure by a considerable margin. The average annual loss over the period was MNT11.8 billion and cost recovery was about 70% (even excluding infrastructure costs, cost recovery is only about 90%²⁵).

This loss on passenger services largely offset the profits on freight services. UBTZ, therefore, made a small profit of only MNT1.8 billion per year. Even excluding 2008, when there was no profit from freight to offset passenger losses, UBTZ's average annual profit was only MNT6.6 billion, about 3% of expenditure. This is too little to fund investment.

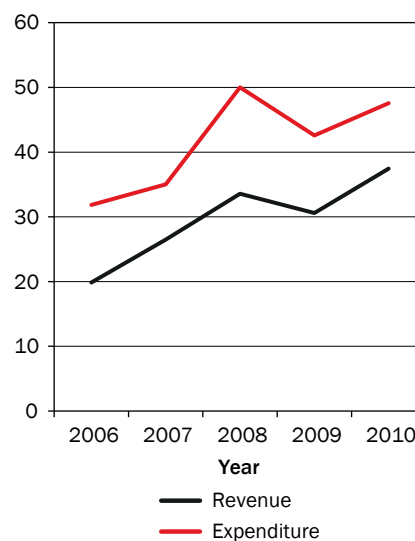
UBTZ provides many social services such as schools and hospitals on which it loses money (their costs are included in transportation costs). The costs of social services are partly offset by UBTZ being largely tax exempt.

Figure 6: Financial Performance of UBTZ Freight Services (MNT billion)



Source: Ulaanbaatar Tumur Zam (UBTZ).

Figure 7: Financial Performance of UBTZ Passenger Services (MNT billion)



Source: Ulaanbaatar Tumur Zam (UBTZ).

²⁴ \$1 = MNT1,350 in 2010.

²⁵ ADB analysis of UBTZ expenditure breakdown.

The railways in Mongolia essentially exist for freight (only 30% of train-km are for passengers and there are no passenger-only lines). Most infrastructure and infrastructure costs are common to freight and passengers and, therefore, the incremental cost caused by passenger trains is minimal. Further, passenger trains are much lighter than freight trains, which bolsters the case that passenger trains do not impose significant incremental infrastructure costs. However, it has already been noted that passenger services do not even cover their operating costs. So, even accepting that passenger trains do not need to make a contribution to common costs of infrastructure, there is still currently a small cross-subsidy from freight.²⁶

Policy Framework

Railway and Maritime Transportation Policy Implementation Coordination Department

The Railway and Maritime Transportation Policy Implementation Coordination Department (RMTPICD) is a government implementation agency of the Ministry of Roads and Transportation. RMTPICD carries out the railway-related policy of the Mongolian government and acts as the rail regulator (see Chapter 4 for legal basis). RMTPICD has only two people with responsibility for economic regulation, and it may be difficult to supplement these given the limited pool of people with the relevant skills to draw on. This is a further reason that the infrastructure tariff system should be relatively simple.

State policy on railways

The state policy on railways was adopted by the Great Hural (Parliament) of Mongolia in 2010. The key elements are to

- (i) improve the legal environment and structure of the sector through the introduction of competition;
- (ii) construct new lines which would either be majority state owned or under some form of concession (with ownership transferring back to the state after a certain period), their general alignment to be established by the state;²⁷ and
- (iii) upgrade the capacity and technology of the existing UBTZ main line.

The state policy is based on the Railway Transportation Law, which has important provisions concerning structure and competition in the railway sector:

- (i) a distinction between infrastructure managers (holder of rail infrastructure) and rail transporters (Articles 3.1.16–7);
- (ii) the creation of conditions for competition (Article 5.1.5); and
- (iii) the infrastructure manager to use the infrastructure itself or provide for its use by a rail transporter (Article 19.1.1).

In brief, the infrastructure manager must provide access to other rail transporters but can also operate on the infrastructure itself. Legal matters related to infrastructure tariffs are discussed in Chapter 4.

²⁶ Subsidy is defined here to occur only where revenue from the service does not cover its incremental costs. Views differ as to whether this is the correct interpretation.

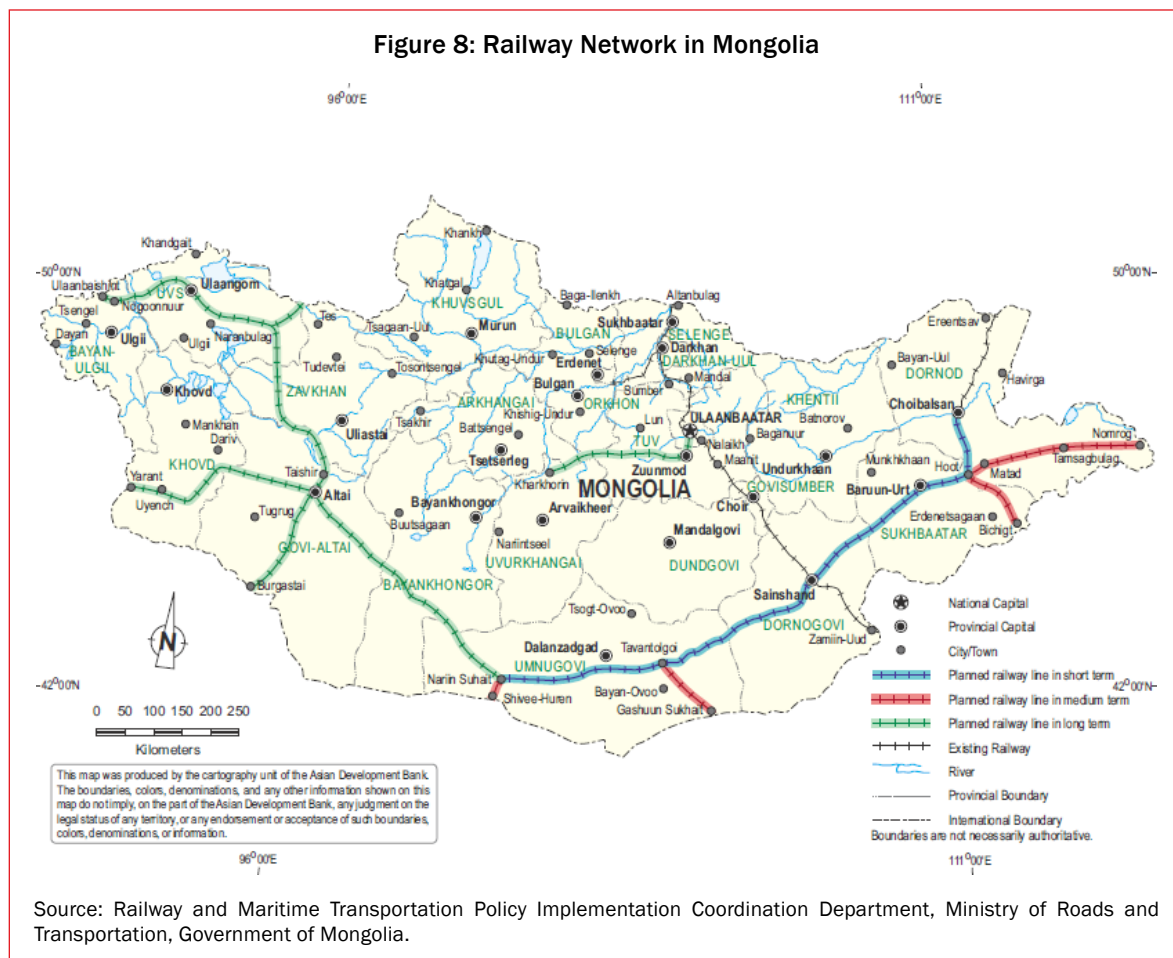
²⁷ In line with Article 6.2 of the Railway Transportation Law.

The restructuring of UBTZ is under discussion. We understand the intention is either to adopt a holding company structure for UBTZ, as in Germany, the Russian Federation, and some other European countries,²⁸ or to establish a divisional structure. In our view, a holding company is more likely to ensure that other carriers have fair and equal access to the infrastructure as the infrastructure manager is more likely to be independent of the operator. Under a holding company, each would have separate accounts and an independent board. This is the argument that determines European Union (EU) law on vertical separation.

Government development plans

A key objective of the government’s development plans for rail is to ensure that Mongolia is not dependent on a single country market for its mining exports. It therefore seeks to develop rail routes to both the Russian Federation and the PRC. Figure 8 shows the government’s plans for development of the rail network.

- (i) The first stage (1,100 km) of the plan would be a line connecting the main mineral deposits in the Gobi Desert to Sainshand on the existing Trans-Mongolian line and Choibalsan on the Eastern line, which goes to the Russian Federation.



²⁸ The structures of subsidiaries vary substantially between countries.

- (ii) The second stage would be to provide several links to the PRC.
- (iii) The third stage would cover various other *aimags* (provinces) in the country, particularly in the less developed western regions.²⁹

All these lines would be interconnected and main lines would be 1,520-millimeter (mm) gauge. However, there is nothing in the policy that prevents lines to the PRC being built with its gauge (1,435 mm), and this is being considered by the government. It is envisaged that new lines would be built to accommodate heavier axle loads.

The government hopes that the private sector will be able to build these lines under some form of concession arrangement as it does not have the funds to finance them. Construction of the first phase is expected to cost at least \$2 million/km, depending on specifications, bringing the cost of the first stage to well over \$2 billion.

International experience suggests that the private sector is unlikely to make major investments of this size until it is satisfied that state policies in Mongolia and neighboring countries will not prevent continued profitable use of the line throughout the period of the concession. Even if a mining company builds a railway, it is likely to rely on other mining companies to pay infrastructure tariffs to share its use. A key issue for any investor is therefore whether infrastructure tariffs paid by other carriers will be high enough to provide adequate returns on its investment.

Infrastructure Tariffs

Objectives

Rail infrastructure tariffs are designed with a variety of objectives in mind. In railways requiring expansion under market conditions, the key objective is to encourage the efficient development of the network and provide for its financing by ensuring that revenues from infrastructure tariffs (and any other sources) cover costs and provide an adequate return on new investments and incentives to prospective private investors. This objective is achieved by setting tariffs equal to average cost (including a return on capital invested).

Another important objective is to encourage efficient use of the network—this is achieved by setting the variable part of tariffs equal to marginal or variable cost. Variable cost includes the cost incurred by the infrastructure manager and also any costs imposed on other carriers (e.g., scarcity costs such as “opportunity costs” arising because use by one carrier means that other carriers cannot use the train path). Another objective is to facilitate competition by ensuring no discrimination between tariffs for different carriers serving the same market.

The government may also wish to charge lower infrastructure tariffs for domestic passenger services and even some domestic freight trains. For passenger services on railways that exist mainly for freight, infrastructure tariffs often make little or no contribution toward the costs of common infrastructure and sometimes do not even cover marginal or variable costs. The system also should be designed to be easy for shippers and regulators to understand.

²⁹ Not all the links under consideration are shown on the map as no decision has yet been made on them.

Fixed and variable costs

International experience indicates that at least 70% of infrastructure costs are fixed (i.e., they do not vary with traffic levels).

To optimize efficient use of the network, the variable charge must equal the variable cost (the second objective). To achieve cost recovery as well (the first objective) would then require a two-part tariff with both fixed and variable charges. However, two-part tariffs with a large fixed component are a barrier to entry for smaller carriers with less traffic over which to spread the fixed charge. In addition, a study by the European Conference of Ministers of Transport finds that one-part tariffs are most appropriate for relatively simple railway networks with fewer users, where capacity is not constrained, and where there may be international operators that would be facing fixed charges in multiple countries.³⁰ These conditions are fairly close to the situation in Mongolia. A one-part unit tariff is therefore recommended.

The drivers of variable costs are

- train-km, which determines operations, planning, and scarcity costs; and
- gross ton-km, which determines the cost of maintenance and repair of track.

Either of these may be used as the factor for calculating infrastructure charges. International practice is generally to use a charge per train-km, often with an added charge per gross ton-km. Charges are sometimes differentiated by train type and type of track.

Current customer tariffs

UBTZ's system of freight customer tariffs is not adequately based on costs or the market. The system is also complicated with goods divided into 18 categories. It therefore provides a poor basis for infrastructure charging.

Differentiation in tariffs between freight markets reflects ability to pay and social objectives:

- (i) High tariff: transit, iron ore, and copper (~35% of tons)
- (ii) Medium tariff: all freight except iron ore, copper, and domestic coal (~30% of tons)
- (iii) Low tariff: domestic coal (~35% of tons)

Coal tariffs for export are 67% more than those for domestic transportation. Domestic coal tariffs averaged about MNT1,200/wagon-km (about \$0.86/wagon-km) in 2010. Assuming an average load per wagon of 60 tons, this gives a tariff of MNT20/ton-km (\$0.015/ton-km), a very low tariff by international standards. Overall, freight barely covers its allocated costs (Figure 6). Lower rates for domestic coal may be justified in the short term as the variable cost of infrastructure in the short term is quite small (it is estimated to be about 30% of average costs in the EU). However, in the longer term, most costs are variable, and domestic coal tariffs should be increased over time.

Issues and recommended approach

Marginal or average costs

Once the railway infrastructure for a country is constructed and paid for, the key objective of the infrastructure charging system is usually to encourage efficient use of the network. Infrastructure

³⁰ European Conference of Ministers of Transport. 2005. *Railway Reform and Charges for the Use of Infrastructure*. Paris: Organisation for Economic Co-operation and Development.

charges are then set on the basis of marginal cost. However, as noted by the European Conference of Ministers of Transport,³¹ there are several reasons why marginal cost may not be the appropriate basis.

First, in many countries, the state is unable or unwilling to provide financing for infrastructure investment. This is the case in Mongolia at present. Research in the EU indicates that about 30% of the maintenance and renewal costs of rail infrastructure (which are its main costs) vary with traffic volume.³² This means that charges based on marginal cost will fall a long way short of covering total cost. Without two-part tariffs (rejected earlier), the only way to combine charges based on marginal costs with recovery of investment costs is to have a high degree of differentiation of tariffs between markets. This is the principle behind EU policy, but international experience shows that this is very difficult to apply to infrastructure tariffs since the infrastructure manager does not interact with the final customers.

Second, there are different views on how marginal cost should be estimated and also wide variations in their levels in Europe and Australia, where marginal cost approach is used. One difficulty is deciding the period over which costs are considered. In the very short term, almost no costs are variable or marginal, but in the longer run nearly all are. Also basing infrastructure tariffs on marginal costs requires a sophisticated costing system.

A particular issue arises when there is a scarcity of capacity so that each train prevents another from running or reduces the reliability of the system. These costs should be included in marginal costs, but they are very difficult to estimate.

In view of the need to ensure infrastructure tariffs generate sufficient funding for new investment by UBTZ and to provide an adequate return on any private investment in new lines, we believe the overall approach adopted in Mongolia should be based on average costs, not marginal costs, although tariffs in some markets should be based on marginal costs.

Factors to calculate infrastructure tariffs

As noted earlier, charges should be based on either gross ton-km or train-km as these are the factors that determine variable costs. In practice, it will make little difference to infrastructure tariffs for different freight trains chosen, as most costs are fixed and do not vary with either. Also, in Mongolia, the weight of a freight train does not vary much between commodities, most of which are—and are likely to remain—coal or minerals. We therefore recommend that train mileage (train-km) be used as this is simpler to measure. Use of train-km also provides an incentive to run longer and heavier trains, thereby making best use of capacity, which may be increasingly constrained.

Social services

Not all rail services can generate sufficient revenue to cover their full cost, yet the government may wish to retain these as social services. The services in this category are passenger services (which are subsidized in most countries) and possibly in the short-term domestic coal transport, for which tariffs are low now because they meet a social need.

As noted earlier, there are good reasons for charging low infrastructure tariffs for passenger services. A similar argument could be applied to domestic coal services. These operate on the lines used for exported coal (the Baganuur line and the main north–south line as far as Ulaanbaatar, where most coal is consumed), and so exports could cover the common costs of these lines, thereby allowing lower infrastructure tariffs for domestic coal.

³¹ European Conference of Ministers of Transport. 2003. *Regulatory Reform of Railways in Russia*. Paris: Organisation for Economic Co-operation and Development.

³² Footnote 8, p. 10.

However, it should be noted that this is not normal practice internationally as coal is usually captive to rail and can be charged to cover the common costs of infrastructure. In the UK, for example, coal is one of two commodities paying above variable costs for the use of infrastructure. If the government wishes to keep coal prices low for social reasons, it would be simpler and more transparent to charge undiscounted infrastructure tariffs for domestic coal and for the government to subsidize coal consumption directly.

Methodology for setting infrastructure tariffs

Infrastructure tariffs in Mongolia should be based on average costs (total cost per unit traffic). The total cost has three components: operation and maintenance (O&M) cost, return on capital invested, and depreciation. It should be relatively straightforward to determine the O&M component as long as the infrastructure manager is established with only infrastructure activities under its management or separate accounts are established for infrastructure. This is not now the case for UBTZ.

Determining the required return on capital invested is not straightforward. However, in principle, the revenue that the infrastructure manager earns on its investment should be determined by multiplying the regulatory asset base (RAB) by the cost of capital.

The first issue to consider about the RAB is whether the value of assets should be based on what was actually paid for the assets (historic cost) or what it would cost to replace them (replacement cost). The UK's regulatory regime is based on replacement costs. However, the US Interstate Commerce Commission considered that replacement costs are "impractical, extremely expensive and subjected to great differences of opinion regarding the value."³³ A simpler approach would therefore be to use historic cost, together with some form of indexing to allow for inflation.

The second issue to consider is whether the RAB should be adjusted to reflect technological change and the optimum mix of assets needed to meet current needs. The rail freight industry in Mongolia has not experienced rapid technological change that would dramatically affect asset valuations or the optimum mix of assets. Therefore, we recommend that no such adjustments be made.

For investors other than UBTZ or MTZ, the cost of capital may be difficult to establish as there may be little guidance from the market in Mongolia. The principle is that the cost of capital should reflect the weighted average cost of capital (combining equity and debt). The costs of capital used by the energy and telecommunications regulators may provide guidance, although these may need to be adjusted to reflect the different levels of risk.

The government's policy is to attract private sector investment in new lines, so infrastructure tariffs should be high enough on these lines to provide a commercial rate of return on investment and no more. This should determine the cost of capital, taking into account investors' perceived level of legal, political, and financial risks in investing in a railway with a long life. This perception of risk may be increased by Mongolia's dependence on two large neighboring countries for export routes.

The RAB also determines depreciation costs. The objective of allowing revenue to cover depreciation is to ensure that assets can be replaced when this is necessary. For new lines, straight-line depreciation of the RAB over the life of the assets is the simplest way of achieving this objective. However, this approach would not produce reasonable results for UBTZ. UBTZ has made little capital expenditure in the last 20 years and so the remaining value of its assets after depreciation is small. Using a RAB based on historic cost would therefore result in a depreciation fund that is insufficient to replace UBTZ's assets in the future.

³³ Quoted in Pardina, M., R. Rapti, and E. Groom. 2008. *Accounting for Infrastructure Regulation: An Introduction*. Washington, DC: World Bank. The US Interstate Commerce Commission has since been replaced by the Surface Transportation Board but the policy has not changed.

If it is legally possible to have a different approach for UBTZ to other infrastructure managers, we recommend that, until a more realistic value can be established for the RAB, the value of budgeted investment be used rather than a depreciation approach. This investment plan would need to be reviewed by RMTPICD to ensure that it is justified. Although not ideal, as it would lead to rates fluctuating with the rate of investment, it would at least ensure UBTZ has enough funds for investment. Also, most of UBTZ's investment in the near future will be for asset replacement rather than enhancement or expansion, so investment costs would be a reasonable proxy for the depreciation costs on existing assets.

Once a realistic value is established for UBTZ's RAB, perhaps using indexing based on the consumer or other price index, this value should be used for determining both depreciation costs (based on straight-line depreciation) and the required return on capital invested. This would allow investment costs to be recovered over the life of assets (which is important for any new assets built in the longer term) and lead to more stable infrastructure tariffs.

For other infrastructure managers, it might be simpler to have infrastructure tariffs defined in the concession agreement rather than through independent regulation by RMTPICD. In this case, RMTPICD or the Competition Commission would simply need to set the charging principles and approve the parts of these contracts concerning infrastructure tariffs to ensure they are not anticompetitive.

It is desirable that infrastructure tariffs be set for several years into the future in order to allow infrastructure managers, carriers, and customers to plan their activities. Adjustments could be made (but on a predefined basis), possibly each year, to reflect revised expectations about traffic levels since this could have a major effect on average costs per train-km. Infrastructure managers would bear the risk that traffic in a particular year is less than predicted, and would need to retain funds in a bank account or borrowing facilities adequate to cover fluctuations in O&M expenses. In determining tariffs, assumptions should also be made about how quickly the infrastructure manager's efficiency should improve over time, though these should be made infrequently (say every 5 years) to minimize uncertainty for carriers and provide incentives for infrastructure managers to improve efficiency.

Illustration for UBTZ

Applying the principles set out above to UBTZ raises some important issues. Firstly, with regard to the RAB, UBTZ needs to replace many of its old assets, many of which either have low historic values or are entirely written off. According to UBTZ accounts, the value of UBTZ's infrastructure assets as of 31 December 2010 was MNT68 billion (about \$48.5 million). For illustrative purposes we will use that figure although we do not know its precise basis (it was not within the scope of this project to investigate this).

Secondly, it is not easy to estimate the cost of capital for UBTZ. UBTZ pays varying rates of interest on its debt, with an average of about 7%, which is well below the rate of inflation in Mongolia. To invest at a more adequate level, it might have to pay higher rates. UBTZ's cost of equity is also unclear; its average profit over the last 5 years has only been MNT1.8 billion/year, which indicates a low 2.6% return even on the capital value reflected in the accounts (this implies low return on equity).³⁴ This may be considered to be an implicit subsidy from the government. In the absence of other evidence, we therefore recommend that a cost of capital of 18% be assumed for UBTZ (this is slightly above the current level of MNT inflation of 15%). A much higher cost of capital would be needed for privately financed lines. Bank loans to businesses in Mongolia are often at nearly 30% interest, or 15% net of inflation.

³⁴ It is still under 10% if 2008 (a loss-making year) is excluded.

Thirdly, as previously noted, depreciation along the principles set out is unlikely to provide adequate revenue for the much-needed replacement of UBTZ's assets. It is therefore recommended that UBTZ's actual infrastructure investment plan be used instead of depreciation.

This study describes below how infrastructure tariffs for UBTZ should be calculated and the data requirements for this purpose. The following equations are used in the calculation:

$$AIT = TRR / Tkm \quad (1)$$

where: AIT – average infrastructure tariff per train-km;
TRR – total revenue required; and
Tkm – total distance traveled in train-km.

$$TRR = O\&M + ROC + CAP \text{ REPLACE} \quad (2)$$

where: TRR – total revenue required for infrastructure;
O&M – operation and maintenance cost of infrastructure;
ROC – return on capital invested in infrastructure; and
CAP REPLACE – depreciation allowance for capital expenditure in infrastructure.

$$ROC = RAB \times CC \quad (3)$$

where: ROC – return on capital invested in infrastructure;
RAB – regulatory asset base; and
CC – cost of capital, %.

The study estimates below what revenue would have been required for 2010.

O&M = MNT80 billion. This excludes investment, depreciation, and interest payments. Once it is decided what non-transportation services should remain with the infrastructure business, this should be adjusted to include the net cost (cost less any revenue) of these non-transportation services to the infrastructure business.

$$ROC = RAB \times CC = \text{MNT68 billion} \times 18\% = \text{MNT12.2 billion}.$$

CAP REPLACE = MNT14.3 billion in 2010. We have used this in preference to depreciation (MNT1.2 billion), which is not adequate to provide for replacement of assets. Actual capital expenditure or depreciation, but not both, should be used. Even MNT14.3 billion is likely to be far too low to retain assets in an adequate state. For future years, CAP REPLACE should be based on UBTZ's investment plan in that year, which would probably be much higher than MNT14.3 billion.

Total revenue required for infrastructure in 2010 = O&M + ROC + CAP REPLACE = MNT80 billion + MNT12.2 billion + MNT14.3 billion = MNT106.5 billion.

No adjustment is made for other revenue as no data was available on this. It is therefore assumed that infrastructure tariffs are the only source of revenue for UBTZ. When data is available on other revenue, the cash flow surplus on these activities should be deducted from the required revenue from transportation.

Table 2 calculates the average infrastructure tariff per train-km that would have been required for 2010 on this basis.

Table 2: Average Infrastructure Tariff per Train-Kilometer, 2010

| | Total Revenue Required | Millions of Train-Kilometers | Infrastructure Tariff/Train-Kilometer |
|-----------------|------------------------|---------------------------------|---------------------------------------|
| Togrog (MNT) | MNT106.5 billion | 9.1 | MNT11,700 |
| US dollars (\$) | \$79 million | | \$8.7 |

Source: ADB estimates.

Variation in infrastructure tariffs between markets

The variable infrastructure cost per train-km may differ between freight and passenger trains.³⁵ On the one hand, freight trains are about three times heavier than passenger trains in Mongolia (and have higher axle loads) and may therefore be expected to cause more damage to the track. On the other hand, passenger trains usually require higher standards of track maintenance than freight trains and use more capacity because they travel at a different speed. As most infrastructure costs are fixed, however, these variable costs are not the key issue.

There is another reason to charge less for passenger trains than for freight trains in Mongolia. The basic reason for having a rail network in Mongolia is to carry freight, and so freight should pay for the common costs of providing infrastructure. Passenger services should pay only the incremental or variable cost of their services, as in many other countries with freight-dominated railways.³⁶

EU data³⁷ indicate that the variable cost of infrastructure is about 30% of average cost, so the charge per passenger train-km should be MNT3,600 (30% x MNT11,700). As passenger trains represent 30% of train-km in Mongolia, the charge per train-km for freight trains would then need to be increased to MNT15,000 to provide the required total revenue (assuming domestic coal trains do not receive a discount).

International comparisons

The average infrastructure tariff per train-km for UBTZ would be \$8.70 using these preliminary figures (\$11.00 per train-km for freight trains). The average gross weight of a freight train in Mongolia is about 2,750 tons, so the charge for freight trains would be the equivalent of about \$4.00 per thousand gross ton-km.³⁸ Figure 3 in Chapter 2 shows that the average infrastructure tariff per train-km for a 2,000-ton train in the EU is about €5.00 (\$7.00) and for the largely unsubsidized central European railways, about €6.50 (\$9.00). In Australia, the average infrastructure tariff per train-km in 2006 for a 2,750-ton train on the Australian Rail Track Corporation track was about \$10.00.³⁹ Average infrastructure tariffs per train-km for UBTZ would therefore be similar to those for freight trains in these countries (more if freight trains paid more than passenger trains).

³⁵ The variable infrastructure cost per train-km may also differ between domestic coal and other freight trains, though this is ignored in this illustration.

³⁶ In the EU, infrastructure charges must be based on direct (variable) costs. This is controversial, not least because, in the long run, most costs are variable (although some costs, such as those for embankments, bridges, and tunnels, may not be). However, the argument for charging passenger services only incremental cost is based on uncontroversial economic principles that charges should be based on cost, and since the railway exists for freight, it should therefore pay for common costs.

³⁷ P. Wheat, A. Smith, and C. Nash. 2009. *Deliverable 8—Rail Cost Allocation for Europe*. Cost Allocation of TRansport INfrastructure cost (CATRIN) project. European Commission.

³⁸ 17.6 gross ton-km divided by 6.4 million freight train-km.

³⁹ Productivity Commission. 2006. Road and Rail Freight Infrastructure Pricing. *Productivity Commission Inquiry Report*. No. 41; and author's calculations.

This raises the question as to whether infrastructure tariffs charged by UBTZ should be higher or lower than in the EU or Australia. UBTZ assets are old and in very poor condition so charges for their use should be less. On the other hand, using more realistic assumptions for the RAB and annual replacement costs, the UBTZ tariffs would be higher. This indicates that UBTZ has higher costs, which may be partly explained by the generally high costs of inputs (except labor and land) in Mongolia, and the noncommercial services UBTZ provides. A detailed study would be required to assess the revenue requirements of UBTZ if it were rehabilitated and made efficient.

2012 tariffs

To calculate the infrastructure tariff/train-km for 2012, the following steps should be taken:

- (i) Estimate train-km for 2012.
- (ii) Take UBTZ budget for infrastructure excluding capital expenditure, depreciation, and interest (O&M) from budget (including any accepted losses from non-transportation activities needed to manage the infrastructure and any additional taxes).
- (iii) Deduct any income from other sources (e.g., property).
- (iv) Add planned capital expenditure for asset replacement (CAP REPLACE) from the investment plan.⁴⁰
- (v) Add return on capital as for 2010 (ROC).
- (vi) Calculate total revenue requirement.
- (vii) Divide total revenue requirement by train-km.
- (viii) Adjust to reduce passenger (and, possibly, domestic coal) train tariffs.

Infrastructure tariffs in 2012 are likely to be about 30% higher than those in 2010 because of price inflation and other factors.

Future Tariffs

It is not possible to be definitive about future tariffs until decisions are made on the future of the railway network, and on the structure, ownership, and funding of the industry. The key uncertainty is the future role of the private sector, both as infrastructure manager and carrier or operator, and the contractual relationships between the private and public sectors. Infrastructure tariffs would have to increase to reflect the costs of investment in new infrastructure. The return on capital allowed by the regulator would depend on the way in which the capital for such investment is raised and the cost to raise capital in this manner.

Although upgrading of existing lines may also lead to higher charges, they are unlikely to be as high as those for new lines. If new lines are developed by the private sector (or even by a public sector body other than UBTZ), and the new lines compete with existing ones, traffic would tend to be carried on the cheaper existing UBTZ lines. The simplest solution would be to impose infrastructure charges on UBTZ that are comparable to those on new lines. However, a means would need to be found to ensure that the proceeds from these higher UBTZ tariffs stay within Mongolia.

⁴⁰ The government may wish to increase this substantially over the 2010 figure given the growth in traffic and the need to increase capacity and reliability on the UBTZ network. In the UK, by comparison, the allowance for depreciation and the return on capital together exceed the O&M cost of infrastructure.

4 Legal Background Analysis and Recommendations

This chapter reviews the recommendations for railway sector reform; outlines existing laws and regulations; and identifies some legislative, regulatory changes, and organizational changes that will be required before the recommendations in this study of infrastructure tariffs can be implemented.

Present-Day Ulaanbaatar Railways

The Ulaanbaatar Railways (UBTZ) Joint-Stock Company consists of 9 divisions and 23 units for traffic control, communication, rail units, rolling stock, and electricity necessary for operations, and secondary non-transportation branches that provide social services for employees such as construction units, hospitals, primary schools, colleges, security units, etc.

The main issues UBTZ faces that require immediate action concern the separation of the main activities of the railways from non-transportation activities, improving the quality of transportation services (the main business of the railway), and reducing costs and increasing revenue.

Legal Framework of the Mongolian Railway Sector

The changing situation in the railway transportation sector necessitates

- (i) a change of the 1949 agreement between governments of the former Soviet Union and Mongolian People's Republic that currently regulates the activities of UBTZ, in accordance with the principles of market economy, the Constitution of Mongolia, and other related laws and regulations;
- (ii) implementation of the Railway Transportation Law, approved by the State Great Khural in 2007; and
- (iii) determination of future plans and policies.

The 1949 agreement contradicts the following provisions and principles of the Mongolian Constitution approved on 13 January 1992:

Article 1 paragraph 6.5 of the Constitution: *"Government can lend land to foreign citizens, legal bodies and non-citizens for a certain period of time for a certain fee and with other conditions set forth in the law."* This means UBTZ no longer has a monopoly in railways.

Article 1 paragraph 10.4: *"Mongolia will not abide by international agreements and other official documents that contradict this Constitution."*

Article 2 paragraph 17.1.3: *"Payment of taxes and fees are set by law."* This means UBTZ must pay taxes from which it is currently exempt.

Moreover, the 1949 agreement contradicts Article 6 paragraph 3 of the Addendum to the Constitution approved on 16 January 1992, which states, “*if international agreements of the former Mongolian People’s Republic contradict the Constitution of Mongolia, the agreements need to be amended in accordance with internationally accepted methods, conditions and guidelines of that agreement before the end of 1993.*”

Since 1991, these two new railway laws have been passed:

- (i) The Railway Transportation Safety Law, approved by Parliament in 1996, legalized the roles and obligations of public administration organizations in the railway transportation sector. This law was approved in order to regulate traffic safety.
- (ii) The Railway Transportation Law, approved in 2007, encourages competition and accepts all forms of ownership, thereby enabling new approaches to the development of the sector. For example,
 - Article 4 paragraph 4.1: “*This law regulates all railway transportation activities whatever the type and form of ownership.*”
 - Article 5 paragraph 5.1.5: “*Create conditions for market competition.*”

These provisions created important opportunities and brought change in the development of the railway transportation sector. This law has some limitations, but it is good in terms of its scope and the items regulated. Appendix 1 contains the specific provisions about tariffs in the Railway Transportation Law and comparisons to the railway tariff practices of surrounding countries.

Developing Competition in the Railway Transportation Sector

The following changes in the law are required to implement the proposed infrastructure tariff regime:

- (i) The government needs to regulate infrastructure service tariffs through the Railway and Maritime Transportation Policy Implementation Coordination Department (RMTPICD), determine the conditions of the infrastructure service contract, restrict denial of provision of infrastructure services without substantial grounds, and ensure transparent and equal access to the infrastructure. Article 7.1 of the Railway Transportation Law should make it clear that RMTPICD (or failing that, the minister responsible for transportation based on recommendations from RMTPICD), not an infrastructure manager like UBTZ, must approve tariffs based on proposals from the infrastructure manager.
- (ii) The law does not state who should approve tariff increases. The law should be changed to clarify that RMTPICD would approve tariffs.
- (iii) RMTPICD should ideally be independent of the ministry responsible for transportation, possibly along the lines of the Energy Regulatory Commission of Mongolia.
- (iv) The current way of regulating tariffs in competitive sectors must be replaced in phases by tariffs contained in long-term contracts, which reflect the needs and ability to pay of different carriers.

Recommendations for Establishing a Tariff Unit

To implement the tariff regulations, we propose to establish a tariff unit (full time) and a working group (meeting on an ad hoc basis) within RMTPICD. Consideration should be given to expanding the tariff unit

once new lines are built. Below are the study's recommendations for the internal regulations of these units and guidelines for tariff review.

Tariff working group

A working group with advisory status should be created by the chair of the RMTPICD comprising 6–8 representatives from the line ministry, carriers, infrastructure managers, and private sector as per the provisions of the Railway Transportation Law of Mongolia. The chair of RMTPICD would also chair the working group's meetings.

The main objectives of the working group are to provide advice to RMTPICD management on decisions that will affect infrastructure managers and carriers and to represent the interests of consumers.

Tariff unit

It is important to create a strong team to work on the tariff regulation issues. The tariff unit will have the following main responsibilities:

- (i) develop the tariff calculation methodology, determine tariff structure by the type of license, submit the tariff to the regulator for a decision, revise the tariff, and develop a regulation on this account;
- (ii) analyze the financial status and operational expenditures of license holders and develop a methodology to determine cost structure;
- (iii) create a database of the financial performance and operational expenditures of license holders for the use of tariff calculation methodology, and regularly update the database; and
- (iv) ensure that rail costs are minimized through the tariff regulation activities.

The unit is currently financed from the state budget. In most countries, the financing of the regulatory organization is collected as a charge from railway organizations. This report recommends that this method of financing be adopted for RMTPICD, in compliance with Article 12.1 of the Railway Transportation Law.

Organizational structure of tariff unit

The tariff unit will comprise two specialists but, if the network is extended, this is likely to need expansion. Initially, support will be required from the Competition Commission and, possibly, other regulatory agencies. The tariff unit will receive financial statements from licensed infrastructure managers on a monthly, quarterly, and annual basis for the purposes of monitoring, evaluation, and analysis of their financial performance and activities.

The unit will receive tariff proposals from infrastructure managers, analyze and conduct related research and calculation, and present the findings to the working group for a decision.

The tariff unit will also (i) conduct impact analysis of the infrastructure tariff change on the paying capacity of carriers and consumers; (ii) carry out research on price changes of other goods (coal, oil products, etc.) and equipment and on currency exchange rates and price index changes; and (iii) regularly conduct prognoses of price increases.

Appendix 3 sets out guidelines for reviewing tariff proposals.

Appendix 1

Tariff Regulation Provisions in Mongolia and Other Countries

Tariff and Tariff Regulation Provisions of the Railway Transportation Law

Mongolia's Railway Transportation Law contains the following specific provisions about tariffs and how to regulate them:

Railway transport tariffs and fees

7.1. *“The railway organization (e.g. UBTZ) shall set the railway transportation service charges and tariffs related to the legal monopoly in accordance with this law and the Law on Unfair Competition.”*

7.2. *“International railway transportation tariffs are to be set in consistency with Mongolian international agreements.”*

7.3. *“Changes in tariffs are to be publicly announced 10 days prior to effectiveness.”*

Article 15 of the general set of regulations for railway transportation states that the “guidelines of infrastructure access, methodology for tariff calculation” are the responsibility of the central public administration organization responsible for railway transportation (Railway and Maritime Transportation Policy Implementation Coordination Department [RMTPICD]) and must be approved and implemented by it.

Article 12 paragraph 12.4.3 requires RMTPICD to “monitor changes of tariffs, products and services in order to avoid unfair competition in the railway transportation sector, and to produce comments and recommendations.” Although it is not required by the Railway Transportation Law, the Competition Commission needs to be involved as RMTPICD lacks the necessary skills.

Organizations and individuals involved in transportation activities (stakeholders)—Article 18 paragraph 18.3.3 states that “Railway transportation service tariffs are to be set so as to ensure sustainable development of Mongolian economy, reflect interests of consumers and in accordance with this law and other related laws and regulations.” Also the tariffs set in accordance with the methodology are to become effective after being monitored and reviewed in accordance with Article 12 paragraph 12.4.3.

Obligations of the owner of the infrastructure and transporter are set in provisions below and are consistent with Article 5 paragraph 5.1.5 on “creation of market competition.”

According to Article 19 paragraph 19.2.3, “the infrastructure owner should, taking into account the capacity of the infrastructure, conclude contracts for the use of that infrastructure with transporters, including those in which it has invested, with the same terms and conditions and ensure their normal operation.” This ensures equal access to infrastructure.

According to Article 19 paragraph 19.3, “if the owner of the infrastructure is also providing transportation services, the financial statements of the infrastructure and transportation activities must be separate.”

According to Article 20 paragraph 20.2.1, “no discounts or privileges can be granted to any transporter, including own subsidiary transporters, in order to avoid unfair competition.”

Comparison with Legal Provisions of Other Countries

Article 25 of the People’s Republic of China’s Railway Law

Passenger ticket prices and tariffs are proposed by the organization responsible for railway transportation and approved by the government committee. Different fees and commissions for freight and passenger transportation are set by the public organization responsible for railway transportation in accordance with recommendations of the government committee. Governments of states and autonomous regions set the passenger ticket prices and freight transportation tariffs in their respective regions, as agreed with the central public organization responsible for railway transportation. That organization also regulates implementation. Article 26 states that the fees, tariffs, and commissions are to be published before they go into effect.

Article 10 of the Kazakhstan Transportation Law

The tariffs of freight, passenger, and luggage transportation services are generally open for negotiation in order to encourage activities of the transporting organizations.

For some types of transportation services, regulatory tariffs can be set to avoid a monopoly in the transportation sector and ensure implementation of the government’s social policies. For example:

- (i) Infrastructure access fees for main railway network services and railway structures that operate under concession contracts are to be determined in accordance with the laws and regulations of Kazakhstan.
- (ii) The Government of Kazakhstan can provide discounts for international and interstate passenger transportation.
- (iii) Local governments can provide discounts for intercity and local passenger transportation.

Losses by the carrier that provides passenger transportation services to socially significant locations are to be covered by the government in accordance with the Budget Law of Kazakhstan.

Article 8 of the Russian Federation Railway Transportation Law

Provisions of railway transportation tariffs, fees, and commissions in the Russian Federation.

- (i) Fees and tariffs of services in places of both public and nonpublic use that fall under legal monopoly are set in accordance with the Legal Monopoly Law and other related laws of the Russian Federation. These tariffs, fees, and commissions for public use are set to cover the operational costs and a surplus that is enough to interest the companies in staying engaged.
- (ii) Tariffs and fees of services other than the ones outlined in paragraph 1 are discussed and monitored by the government in accordance with the competition law and the law on limitation of monopoly on the market.
- (iii) Losses by the owner of the infrastructure and transporters due to discounts and privileges outlined in Russian Federation laws and regulations are to be fully compensated by the Government of the Russian Federation. Guidelines for compensation of the aforementioned losses by the federation

budget are developed by the federation government; guidelines for compensation from regional budgets are to be developed by the governments of the respective regions.

- (iv) Railway transportation tariffs for international relations are to be set by the international agreement made by the federation. The regulations of use of such tariffs are to be developed by the government of the federation.
- (v) Information about the changes in public railway freight transportation tariffs are to be publicly announced by the federation's implementing organization responsible for the railway sector no less than 10 days before the change becomes effective. Information about changes in fees and tariffs of passenger and luggage transportation must be publicly announced no less than 5 days prior to the effective date.

According to the laws of these countries, the provisions for railway tariffs are similar and the government is involved in regulation. The provisions for tariff regulations set out in the Mongolian Railway Transportation Law are also similar. There is a risk of transporters bearing losses as a result of government involvement, and this must be avoided.

The Law on Concessions and Public-Private Partnerships

The Law on Concessions (2010) has created an opportunity to develop this form of public-private partnership (PPP). PPPs concern infrastructure or services that are funded and operated through a partnership between government and the private sector. Concessions are when the government retains ownership of assets and transfers the right to use those assets to the private sector for a defined period. The concessionaire carries most commercial risks, although demand risks are sometimes shared with government.

The Law on Concessions was approved by the Grand Khural on 28 January 2010. The purpose of this law is to "regulate relations concerning the organization of tenders for granting to investors the rights of possession, operation, creation and renovation of state and locally own properties under concession agreements, the modification and termination of these agreements and the settlement of disputes." According to Anderson & Anderson LLP, this law is "very close to international standards," its principal weakness being its failure to provide for international arbitration for the settlement of disputes.¹

Article 21 of the Concessions Law concerns the right of the concessionaire to receive payment for allowing third parties to use the concession assets (21.1.3) and the obligation of the concessionaire to provide nondiscriminatory access, i.e., equal access to infrastructure for the same class of customers (21.1.11).

Between them, the Railway Transportation Law and the Law on Concessions have sufficient provisions to establish a legal environment for construction of future railway infrastructure with private sector funding. They are crucial in creating an opportunity for the future development of the railway network to enable mining products to reach the market by rail.

¹ Anderson & Anderson LLP, Mongolia Lex. 2010. *New Mongolian Law on Concessions*. Vol. 1. <http://www.anallp.com/new-mongolian-law-on-concessions>

Legal Basis for Regulation

The Railway Transportation Law of Mongolia contains the following provisions related to tariffs:

7.1. The organization responsible for railway transportation (currently RMTPICD) is obligated to set the railway transportation service fees and tariffs connected to legal monopoly in accordance with this law and the Law Against Unfair Competition.

7.2. International railway transportation tariffs are to be set in consistency with Mongolian international agreements.

10.1.6. RMTPICD must show priority for some types of transportation (passenger, mail, and goods that have significance in the economy and society).

12.1. RMTPICD is a self-financing implementing agency responsible for implementing government policies in the railway transportation sector.

12.4.3. RMTPICD is to monitor changes of tariffs, products, and service amounts in order to avoid unfair competition in the railway transportation sector, and to provide comments and recommendations.

18.3.3 Railway transportation service tariffs are to be set so as to ensure sustainable development of the Mongolian economy, to reflect the interests of consumers, and to comply with this law and other related laws and regulations.

Appendix 2

Orders on Access Passed by the Ministry of Transport and Communications in 2011

Introduction

In late 2011, Mongolia's Ministry of Transport and Communications (MTC) passed two orders affecting the railways:

- (i) Order 138 included guidelines for using railway infrastructure, a subject that is important but was not covered by the main report.
- (ii) Order 252 described the methodology for tariff setting for railway infrastructure use, which was the focus of the main report.

These orders were needed to establish the basis for providing other operators with access to Ulaanbaatar Railways (UBTZ) infrastructure, and the government was unable to wait for the final results of this study. The orders are reproduced in this appendix.

Differences from Recommendations in the Main Report

While the Order on Tariff Methodology has elements in common with the approach and methodology proposed in the main section of this report, there are three key differences:

- (i) how capital employed is calculated and used to determine the return on capital invested and depreciation,
- (ii) the structure of charges, and
- (iii) discounts for certain categories of traffic.

Capital and depreciation

The approach taken in the Ministerial Order on Tariff Methodology contains items for interest payments on loans and depreciation. However, the order does not explain how depreciation should be calculated. Nor does it include provision for recovering the return on capital invested if this investment is made with equity (the infrastructure manager's own capital). While this should meet the objective of providing the basis for separating UBTZ infrastructure, at least in the short term, it will not provide an adequate return to attract private investment in infrastructure.

The report, in contrast, recommends the use of the regulatory asset base (RAB) as a measure of capital invested (including both debt and equity) and a return on that investment (based on the cost of capital). The RAB should also determine depreciation costs. For new lines, straight-line depreciation of the RAB over the life of the assets is the simplest method of calculation, and this is recommended as the long-term solution. However, for UBTZ, the RAB is a poor guide to the cost of depreciation because assets are undervalued in its accounts and the RAB would provide too little money for replacement of assets. In the report, it is therefore recommended that, initially, UBTZ's investment plan values be used instead of depreciation. Later, the RAB should be calculated, possibly by applying inflation indexes to the historic costs of assets.

Structure of charges

The order suggests that fixed costs be recovered through a charge per train-kilometer (train-km) booked in advance and variable costs through a charge per gross ton-kilometer (ton-km) actually run. Recovering fixed costs through a charge per train-km would give the operator an incentive to book only the capacity it needs. Since fixed costs make up about 70% of total cost, the fixed charge would be large, which will discourage operators from booking. Under the order, it is unclear how unbooked capacity on the infrastructure (common for freight in a market economy) would be made available and charged for. This two-part tariff proposal is also quite complex.

The report recommends a simple one-part tariff with all costs recovered through a charge per train-km (in preference to gross ton-km). The reason for recommending a one-variable unit tariff, rather than a two-part tariff (fixed and variable), is simplicity. This report recommends that all tariffs be set per train-km because it is easier to measure than gross ton-km (although both are drivers of costs). It also provides an incentive to run longer and heavier trains, thereby making best use of infrastructure capacity. Although UBTZ already measures ton-km, new private railways may not wish to do so.

Discounts for social services

The order makes no distinction between the infrastructure tariffs for different types of services. The report suggests that discounts to infrastructure tariffs for passenger and domestic coal services may be necessary to ensure that these customers do not experience major increases in tariffs.

Other observations

Prioritization between types of train was not covered in the main report. However, the Order on Tariff Methodology appears to give priority to international over domestic trains in the allocation of infrastructure capacity. It is common practice to prioritize longer-distance trains because of the system-wide effects, but it may become less acceptable politically once the network becomes more congested since it will lead to domestic services experiencing delays.

Order of the Minister for Roads, Transportation, Construction and Urban Development # 138

October 5, 2011

RAILWAY INFRASTRUCTURE UTILIZATION GUIDELINES

1. General background

1.1. Objective

- 1.1.1. These guidelines regulate relations between infrastructure managers and train operators with regard to the utilization of railway infrastructure.
- 1.1.2. These guidelines are equally applicable to the regulation of all types of relations arising from the utilization of railway infrastructure, irrespective of ownership, type of infrastructure manager, type of transport operator or the operator's affiliation with the infrastructure manager.
- 1.1.3. Infrastructure managers and operators shall abide by international treaties, the civil code of Mongolia, laws on railway transportation, laws on competition, and related legislation, when concluding contracts and operating the transportation system.
- 1.1.4. Disputes arising from negotiation, rejection or implementation of the transport operator's applications for train paths, due to lack of infrastructure capacity, shall be regulated by the "guidelines of infrastructure access, methodology for tariff calculation" approved by the state central administration organization responsible for railway transportation (RMTPICD).

1.2. Definitions

- 1.2.1. The terms used in these guidelines shall use the same definitions as the "Law on Railway Transportation" and as stated below.
 - 1.2.1.1. "Leaser"—process of leasing rolling stock (locomotive and wagons) in one's ownership to an organization/company holding the necessary licenses to conduct transportation activities under contract terms.
"Infrastructure tariff"—service fee set using the methodology for determination of railway infrastructure tariffs and charged to operators.

2. Requirements for providing services and utilizing railway infrastructure

- 2.1. Service fees for utilization of railway infrastructure shall be based on the tariffs, fees and charges approved by the Authority of Fair Competition and Consumer Protection.

3. Railway Infrastructure Utilization Contract

- 3.1. Railway infrastructure utilization services shall be implemented in accordance with the contract (hereinafter referred to as the Contract) mutually agreed and concluded in writing between the infrastructure manager and the transport operator in compliance with the Civil Law of Mongolia, the Law on Railway Transportation and the requirements set by these guidelines.
 - 3.1.1. The railway infrastructure utilization contract shall be made in a written form using a template approved by the state central administration organization responsible for railway transportation (RMTPICD) and in accordance with the Articles 12.4.3, 12.4.10 and 15.1.15 of the Law on Railway Transportation. The contract is to be registered at the state central administration organization responsible for railway transportation.

- 3.2. The infrastructure manager does not have the right to refuse to conclude an infrastructure utilization contract with an authorized operator without proper justification. In case of a failure to agree on terms and conditions of a contract, the infrastructure manager shall use terms and conditions set forth in contracts with other operators, including the operators owned by the manager.
- 3.3. Operators shall submit to the infrastructure manager proposals to conclude the infrastructure utilization contract and comments on the terms and conditions not less than 2 months prior to November 10th of each year as set forth in the Paragraph 3.1 of Article 3 of “Regulations of Railway Freight Transportation.”
- 3.4. The Contract shall include following conditions:
 - 3.4.1. Passenger train travel schedule (to be amended semiannually)
 - 3.4.2. Amount of freight, duration for freight transportation
 - 3.4.3. Schedule for freight transportation on monthly, quarterly and annual plan basis (or number of wagons and weight for the month)
 - 3.4.4. Conditions for tariff application, fees for additional services listed in section 4.4 of this guideline
 - 3.4.5. Transportation technology, guideline and timeframe for agreeing the transportation orders
 - 3.4.6. Accountability clauses
- 3.5. The infrastructure manager has the right to refuse to conclude a contract if an operator is not licensed or does not hold safety certificates for their rolling stock.
- 3.6. In case of a dispute over compliance with the contract, the parties will aim to resolve the dispute and, if this attempt fails, the dispute can be solved through arbitration of a relevant jurisdiction.

4. Rights and Obligations of the Infrastructure Manager

- 4.1. The infrastructure manager is obligated to provide information on their technical capability to operators with whom they are bonded by the infrastructure utilization contract.
- 4.2. The infrastructure manager is obligated to coordinate train traffic and set up an environment that ensures continuous transportation in consultation with other infrastructure managers.
- 4.3. Under its obligation to coordinate train traffic and ensure continuous operations, the infrastructure manager shall conduct following activities:
 - 4.3.1. Grant usage of infrastructure and common use branch lines.
 - 4.3.2. Grant usage of other facilities required to undertake passenger, freight, luggage and container transportation.
 - 4.3.3. In order to provide access to railway transportation services on common use lines to its customers, the infrastructure manager should make decisions on technical issues for planning and constructing non common use lines or branch lines for the operator or customer in line with future transportation perspectives.
 - 4.3.4. The infrastructure manager has an obligation to provide freight transportation and unified dispatcher’s control on traffic on customers’ non common lines, which branch from its common use railway line.
 - 4.3.5. To set the possible shortest routing from origin station to destination station.

- 4.3.6. In cases where the transport operator has no transportation capacity, the infrastructure manager should transport the transport operator's rolling stock by receiving, dispatching and transiting them on common use lines.
 - 4.3.7. In cases where the transport operator has no transportation capacity, the infrastructure manager should handle the train formation and shunting of the transport operator's rolling stock and locomotive by using the station facilities and shunting locomotive on its own common use railway lines.
 - 4.3.8. To agree on technical and technological issues concerning transportation operation with other infrastructure managers and foreign railway organizations.
 - 4.3.9. To organize prompt traffic management activities that would let transport operator's rolling stock provide transportation according to contract conditions over common use railway lines belonging to the infrastructure manager.
 - 4.3.10. To provide with dispatcher's prompt decision on transportation operations.
 - 4.3.11. To undertake maintenance of the operator's rolling stock in transit in cases where the transport operator lacks capacity to perform the maintenance itself.
 - 4.3.12. To provide related information on rolling stock movement or location upon the transport operator's request.
 - 4.3.13. To provide a supply of electricity to the transport operator, in cases where the infrastructure is electrified and the transport operator uses electrical locomotives to carry out the transportation operation.
 - 4.3.14. To provide train sorting or humping a car at hump yards and shunting trains at stations belonging to the infrastructure manager, in cases where transport operator has no capacity to do so itself.
- 4.4. The infrastructure manager may provide the following services in addition to those indicated in Section 4.3:
- 4.4.1. To determine the locations of empty wagons belonging to or rented by the transport operator which are not being used for transportation.
 - 4.4.2. To conclude a contract on behalf of the operator for using the branch lines, placing the trains on branch lines and dispatching trains from branch lines.
 - 4.4.3. To handle transport operator's rolling stock by receiving, dispatching and transiting them on common use lines.
 - 4.4.4. To carry out shunting or train formation of transport operator's rolling stock and trains at common use line stations using the facilities and shunting locomotives.
 - 4.4.5. To undertake maintenance of rolling stock belonging to the transport operator in transit.
- 4.5. In case transport operator requests any other service not listed in Section 4.3, this may be included in the Contract for use of basic infrastructure.
- 4.6. The infrastructure manager has no right to force the transport operator to accept or include in contract conditions any type of service not listed in Section 4.3 of this procedure.
- 4.7. The infrastructure manager has the right to refuse to carry out transportation, in cases where the transport operator has severely violated traffic safety requirements and is overloading the trains.

5. Rights and Obligations of Transport Operator

- 5.1. By concluding the contract for use of infrastructure, the transport operator will exercise following rights:
 - 5.1.1. To make use of the infrastructure manager's common use railway lines.
 - 5.1.2. To carry out transportation operations under the traffic management and control of the infrastructure manager.
 - 5.1.3. To make use of other facilities required to undertake passenger, freight, luggage and container transportation.
 - 5.1.4. When providing the transportation services to the customer's premises, it is also allowed to carry out transportation of customer's freight from non-common railway lines or branch lines off infrastructure manager's common use lines.
 - 5.1.5. To select and agree on routes from origin station to destination station.
 - 5.1.6. The transport operator has an obligation to make payments for using the infrastructure on time and to carry out the transportation operation without causing any harm to the smooth operation of the infrastructure.
 - 5.1.7. The transport operator has an obligation to have sufficient rolling stock, equipment and human resources to organize the transportation and to take measures to assess or prevent any risks that might arise from transportation operation to customers or third parties.

6. Implementation of Transportation Operation

- 6.1. Any transport operator who concludes a Contract for the use of basic railway infrastructure should submit their special order: for domestic freight transportation no less than 8 days prior to the planned transportation date; for international freight transportation no less than 13 days prior to the planned transportation date; for international passenger service no less than 400 calendar days prior to setting and agreeing on a schedule for the service.
- 6.2. The order for infrastructure service should be verified by a proper signature and the stamp of transport operator's authorized personnel and this should be submitted in duplicate to the infrastructure manager.
- 6.3. The infrastructure manager has the right to reject any incomplete, incorrect orders as well as orders which violated the procedure on compiling the order and must reply within 1 day of accepting the order through an official stating the reasons for rejection.
- 6.4. The infrastructure manager should keep a log book dated by order acceptance date and should issue a registration number to the transport operator.
- 6.5. The infrastructure manager, on its own or if necessary in consultation with other infrastructure managers, should review orders. Orders for domestic freight transportation should be reviewed within 5 days; orders for international freight transportation should be reviewed within 10 days. The reply letter stating the reasons for acceptance or rejection of orders should be sent back to the transport operator.
- 6.6. In the following cases, the infrastructure manager should clearly state in writing the reasons for refusing to continue negotiations and orders should be returned:
 - 6.6.1. The third party in transportation stepped out of the negotiation.
 - 6.6.2. A foreign railway stepped out of the negotiation.
 - 6.6.3. Other infrastructure managers stepped out of the negotiation.

- 6.6.4. The transportation over the route has been suspended or limited under the decision of an authorized body.
- 6.6.5. The infrastructure manager has a contractual obligation to another transport operator.
- 6.6.6. There is insufficient technical and technological capacity to physically implement the transportation.
- 6.7. The infrastructure manager can submit proposals of change to a transport operator's order based on Sections 6.6.2–6.6.4 and 6.6.6 of this procedure.
- 6.8. Unless indicated otherwise in the contract, the physical performance of transportation should be verified after each of transportation movement.
- 6.9. The infrastructure manager has the right to monitor the train weight and compliance with safety requirements. In the case of a failure to comply with the safety requirements, it has the right to refuse to continue the transportation.
- 6.10. The transport operator has an obligation to fulfill the reasonable requirements of the infrastructure manager.
- 6.11. If a dispute arises over the infrastructure manager's requirements, the dispute should be settled according to the regulations set forth in contract.

Order of the Minister for Road, Transport, Construction and Urban Development # 252

September 22, 2011

METHODOLOGY FOR TARIFF SETTING FOR RAILWAY INFRASTRUCTURE USE

1. General background

- 1.1. This methodology will be used in relations between infrastructure managers and train operators in connection with the utilization of railway infrastructure as per the "Railway Infrastructure Utilization Guidelines" approved by the Ministerial order No. 138 of 2011.
- 1.2. The term "railway basic infrastructure," which carries the railway transportation operation, includes the complex described in the "Law on railway transport"—railway line upper and lower structure, engineering facility, station, junction, energy, water supply, communication and information facilities to ensure normal operation of railway transportation as well as buildings, constructions, passages and prohibition fences.
- 1.3. According to Paragraph 12.4.3 of Article 12 of the "Law on railway transport," a working group will be designated by the State Central Administrative Organization in charge of Railway Transportation Issues (now RMTPICD) whose role will be to review tariffs, products and services, as well as changes to contracts. It will submit proposals and recommendations.
- 1.4. The following criteria should be considered in the calculation of infrastructure tariffs:
 - 1.4.1. Market conditions of transportation, need for optimum utilization of infrastructure throughout the capacity of the network and improvement of infrastructure service quality.

- 1.4.2. Speed, frequency, headway/freight delivery time limit/and characteristic of transportation service.
- 1.4.3. Technical specifications and characteristics of infrastructure.
- 1.4.4. Technical specifications of rolling stock, such as travel speed, total weight, and axle load.
- 1.4.5. Train length, weight and type.
- 1.4.6. Wear and tear of railway infrastructure.
- 1.5. Rail infrastructure tariffs should be based on the maintenance cost of infrastructure, gross ton-km of rolling stock carrying freight over the infrastructure network or train-km as ordered for service by transport operators.
- 1.6. The railway operator should pay charges to the infrastructure manager for the service provided for the use of infrastructure and this charge will consist of the following components:
 - Fixed cost component based on the train-km as ordered for service.
 - Variable cost component based on gross ton-km performance/train weight multiplied by train-km.
 - 1.6.1. In providing the use of infrastructure on the railway network, the distribution of fixed and variable cost should be handled according to the following principle: 70% of annual cost should be accounted as fixed and 30% as variable cost.
 - 1.6.1.1. Fixed cost means cost that will not be changed in relation to amount or size of services provided. The railway operator must pay for the fixed cost component to the infrastructure manager, irrespective of whether they use the allocated network capacity.
 - 1.6.1.2. Variable cost means cost that changes in relation to the amount or size of services provided. If the railway operator does not make use of network capacity allocated to them, they should not pay for the variable cost.
 - 1.6.1.3. The infrastructure manager should firstly allocate the infrastructure network capacity to international transportation operations (transit and export) and secondly it should allocate capacity to domestic or import transportation.
- 1.7. The following services will not be included under the infrastructure tariff but can be provided by the infrastructure manager on their own equipment and these will be the subject of a further bill:
 - 1.7.1. Shunting maneuvering at stations/train formation at freight or technical stations, re-formation of trains.
 - 1.7.2. Preparation of trains for transportation.
 - 1.7.3. All types of planned maintenance to wagon or routine maintenance.
 - 1.7.4. Preparation of locomotives, technical service and maintenance, wiper and lubricator materials.

2. Costs

- 2.1. Operational and maintenance cost, 3_{06} , of infrastructure is determined by the following formula:

$$3_{06} = 3_1 + 3_2 + 3_3 + 3_4 + 3_5 + 3_6 + 3_7 + 3_8 + 3_9$$

- 3_1 – Servicing, routine and capital maintenance works and depreciation charges for this infrastructure
- 3_2 – Transportation operation control/coordination of traffic, safety of railway transport etc./ and operational cost of infrastructure

- 3_3 – Works related to start-up and end-up operations, for example shunting works
- 3_4 – Maintenance of pilot engine for shunting, servicing, routine and capital maintenance works and depreciation charges for these engines
- 3_5 – Overall industrial or business activity costs for the organizational subsidiary that carries out the servicing, routine and capital maintenance works on infrastructure objects
- 3_6 – Overall industrial or business activity costs related to shunting, servicing, routine and capital maintenance works by pilot engine
- 3_7 – Management cost of the infrastructure manager
- 3_8 – Loan interest rate payment for the period until it returns to State property
- 3_9 – Costs related to safeguarding/protection of infrastructure objects

2.2. Cost for infrastructure objects, 3_1 , is determined by following direct calculation method:

$$3_1 = 3_3 + 3_4 + 3_{ta} + 3_{ax} + 3_{cr} + 3_7$$

- 3_3 – Railway maintenance/operational cost
- 3_4 – Electricity supply and costs related to electrification
- 3_{ta} – Cost related to technology operational facilities, water supply and sewerage
- 3_{ax} – Cost related to communication and information
- 3_{cr} – Cost related to rescue locomotive train
- 3_7 – Cost related to transportation operations

2.2.1. Cost for railway maintenance/operations, 3_3 , is determined by the following formula:

$$3_3 = 3_{3ac} + 3_y + 3_{3u} + 3_{xt} + 3_3 + 3_T + 3_{yx} + 3_{ax}$$

- 3_{3ac} – Material cost for planned maintenance for railway
- 3_y – Material cost part for servicing of rail tracks and permanent facilities
- 3_{3u} – Material cost for the removal of sand and snowfall
- 3_{xt} – Servicing cost of built-up equipment
- 3_3 – Depreciation cost of rail tracks and permanent facilities
- 3_T – Operational/technical costs/depreciation, material cost, fuel, other costs
- 3_{yx} – Servicing cost of railway fixed assets
- 3_{ax} – Cost related to railway personnel in railway operations

Types of railway maintenance works and the intervention intervals will be set by norms based on the technical specification, and classified on the basis of traffic volume and travel speed.

Servicing and maintenance of track and junction are classified in following main types:

- a. Extended maintenance of track and junction
- b. Replacement of metal pieces of junction or direct replacement of track which are works associated with periodic maintenance of railway
- c. Maintenance work of track and junction
- d. Extended periodic maintenance of track
- e. Periodic maintenance of railway
- f. Track leveling maintenance
- g. Planned or preventive alignment of rail track

- h. Other maintenance works reflected in capital maintenance and alignment works under technical specification
- i. Servicing of rail track

2.2.2. Cost related to Electricity supply and electrification, $3_{\text{ц}}$, is determined by the following formula:

$$3_{\text{ц}} = 3_{\text{эж}} + 3_{\text{yx}}^{\text{ц}} + 3_{\text{аж}}^{\text{ц}}$$

$3_{\text{эж}}$ – Consumed electricity

$3_{\text{yx}}^{\text{ц}}$ – Servicing cost of electric supply and electrification fixed assets

$3_{\text{аж}}^{\text{ц}}$ – Cost related to personnel who manage the electric supply and electrification

2.2.3. Cost related to technology operational facilities, water supply and sewerage, $3_{\text{та}}$, is determined by following formula:

$$3_{\text{та}} = 3_{\text{бб}} + 3_{\text{yc}} + 3_{\text{бож}} + 3_{\text{аул}} + 3_{\text{yx}}^{\text{та}} + 3_{\text{аж}}^{\text{та}}$$

$3_{\text{бб}}$ – Repair cost for buildings and facilities /stations, junction, apartment buildings for railway workers

3_{yc} – Water consumption

$3_{\text{бож}}$ – Discharge of sewerage

$3_{\text{yx}}^{\text{та}}$ – Servicing cost of technology operational facilities, water supply and sewerage fixed asset

$3_{\text{аж}}^{\text{та}}$ – Cost related to personnel who manage the technology operational facilities, water supply and sewerage

2.2.4. Cost related to communication and information, $3_{\text{дх}}$, is determined by following formula:

$$3_{\text{дх}} = 3_{\text{хол}} + 3_{\text{тн}} + 3_{\text{бож}} + 3_{\text{yx}}^{\text{дх}} + 3_{\text{аж}}^{\text{дх}}$$

$3_{\text{хол}}$ – Fees for communication services

$3_{\text{тн}}$ – Operational cost of technical units of communication

$3_{\text{yx}}^{\text{дх}}$ – Servicing costs of communication and information fixed assets

$3_{\text{аж}}^{\text{дх}}$ – Costs related to personnel who manage the communication and information

Spare parts and material costs required for the maintenance of mechanical and automation equipment would be determined based on norms and technical unit specifications

2.2.5. Rescue trains

Rescue trains will be used in the elimination of damage caused by derailling during rolling stock collisions and in the provision of assistance during natural disasters. The train should be ready for any of these scenarios.

Rescue trains will be stationed at major stations where there are operational locomotives. The operations of the rescue train should be regulated by instructions and regulations for organizing the rescue work on the railway.

Cost for rescue train, 3_{cr} , is determined by the following formula:

$$3_{\text{cr}} = 3_{\text{yx}}^{\text{сб}} + 3_{\text{бз}}^{\text{сб}} + 3_{\text{аж}}^{\text{сб}}$$

$3_{\text{yx}}^{\text{сб}}$ – Servicing cost of rescue train fixed assets

$3_{\text{бз}}^{\text{сб}}$ – Other operational costs of the rescue train

$3_{\text{аж}}^{\text{сб}}$ – Cost related to personnel who manage the rescue train

- 2.2.6. Cost for the transportation and freight handling, 3_{τ} , is determined by costs related to personnel of the entity providing the service.

3. Tariff calculation

- 3.1. Fixed cost component based on the train-km as ordered for service.

- 3.1.1. The tariff is calculated in a way that amounts to 70% of total annual cost of infrastructure, which, as indicated in section 1.5.1 of this methodology, is divided into train-km as ordered and an added profit margin.

$$T_{\text{сбтз}} = 3_{\text{сб}} \times 0.7 / NS + A$$

$T_{\text{сбтз}}$ – Fixed cost of infrastructure

$3_{\text{сб}}$ – Maintenance/operational cost of infrastructure

NS – Amount of train-km ordered

A – Profit norm for railway infrastructure use

- 3.2. Variable cost component based on gross ton-km performance/train weight multiplied by train-km.

- 3.2.1. The variable tariff is calculated in a way that amounts to 30% of total annual cost of infrastructure, which, as indicated in section 1.2.2 of this methodology, is divided into total gross ton freight expected during certain period and an added profit margin:

$$T_{\text{сбхз}} = 3_{\text{сб}} \times 0.3 / PL_{\text{БР тѳл}} + A$$

$T_{\text{сбхз}}$ – Variable cost of infrastructure

$3_{\text{сб}}$ – Maintenance / operational cost of infrastructure

$PL_{\text{БР тѳл}}$ – Gross ton-km performance (train weight multiplied by train-km)

A – Profit norm for railway infrastructure use

- 3.3. The calculated tariff mentioned above is used to determine the infrastructure use fee, as its use is ordered for a certain period and as it is performed:

$$T_{\text{сб}} = PL_{\text{БР тѳл}} \times T_{\text{сбхз}} + NS \times T_{\text{сбтз}}$$

$T_{\text{сб}}$ – Infrastructure use fee

$PL_{\text{БР тѳл}}$ – Gross ton-km performance of certain period /train weight multiplied by train-km

$T_{\text{сбхз}}$ – Variable cost of infrastructure

NS – Amount of train-km ordered

A – The profit norm for infrastructure use should not exceed Weighed Average Capital cost /WACC/ and is determined by following formula:

$$WACC = r_e \times E / (D+E) + r_d \times D / (D+E)$$

r_e – Weighed Average Capital cost of own capital, %

r_d – Weighed Average Capital cost of loaned capital, % interest to be paid

E – Monetary value of own capital

D – Monetary value of loaned capital

- 3.4. The infrastructure manager can set an increased tariff for infrastructure use in cases of capacity overloading (congestion) of network.

- 3.5. The manager of the railway infrastructure has the right to allow economically justified discounts within the tariff range. They can use a discount that might impact on efficient use of the network for a certain period of time. This discount should be set in certain areas of infrastructure and applied according to the principle that the same discount be applied to the same services.



Appendix 3

Guidelines for Reviewing Tariff Proposals

1. General background

- 1.1. Guidelines for reviewing tariff proposals (hereinafter referred to as “Guidelines”) should be in line with the authority assigned to the Railway and Maritime Transportation Policy Implementation Coordination Department (RMTPICD) by the Railway Transportation Law of Mongolia, as well as orders and decisions made by RMTPICD.
- 1.2. These guidelines are to be abided by when reviewing and analyzing tariff proposals to be effective on infrastructures regulated by RMTPICD.
- 1.3. The guidelines will consist of requirements for submission of tariff proposals and revision of proposals.
- 1.4. These guidelines apply to infrastructure managers (hereinafter referred to as Manager), carriers, RMTPICD, and other parties interested in being involved in the process of reviewing proposals.
- 1.5. The purpose of these guidelines is to ensure transparency of the revision process, ensure participation, and reflect proposals of the public in approving tariffs that protect the interests of all the sides involved.

2. Submitting tariff proposal

- 2.1. Manager shall submit a proposal to change the tariff in accordance with the Railway Transportation Law, guidelines, and regulations approved by the MRTAUD and RMTPICD.
- 2.2. Manager shall notify RMTPICD about its intention to request a tariff change 30 days prior to the submission of the proposal. The proposal shall include the proposed tariff change and grounds for the change. The working group can postpone the request on special occasions.
- 2.3. The structure of the proposal shall be the following:
 - Brief introduction of the company, proposal, main reason for proposing a tariff change, impact of the tariff change on the company’s financial condition and other users.
 - Comparative table of current and proposed tariffs.
 - Background for proposing a tariff change, related information and documents submitted in accordance with the regulations and template approved by RMTPICD.
 - Policies, summary of the program, strategic and short term plan, business development and organizational issues, necessity for investment, financial status, monitoring of customer satisfaction.
 - Financial report validated by an audit report, report for shareholders, performance statistics of that year.

- Copies of consulting, legal, audit services contracts and contracts of sale and purchase of goods.
 - Revenue, costs, system losses, revenue estimation calculated based on current tariff, the performance of revenue plan included in the revision terms or last year's statistical data.
 - For the next year's estimation, include cost estimations by type, estimated cost of required fuel and energy, sale amount expressed in kWh, losses, financial and economic conditions, and proposed tariff.
 - Information on factors that can affect the activities of the company, such as changes and possible changes in the legal framework, economic conditions, and changes in the foreign exchange market.
 - Related reports, introductions, documents, information on measures taken by the administration to decrease and stabilize the costs, increase effectiveness, etc.
- 2.4. All required information must be in Mongolian with due reference to the source. Information should be submitted both in soft and hard copies.

3. Receiving manager's proposal

- 3.1. Within 15 days of the receipt of the tariff proposal, specialists in the tariff unit of RMTPICD should review the completeness and compliance of the submitted documents and send one of the following communications in an official letter to the manager who submitted the request:
- Tariff proposal has been officially received as the submitted documents are in compliance with the regulations.
 - Tariff proposal cannot be received due to noncompliance of certain documents.
 - The manager's proposal has been rejected because it has violated the regulations approved by RMTPICD (quarterly reporting each year). In these cases the proposal will not be registered as received and the manager who has requested it should be officially informed. The holder of the special license can resubmit documents after the violation has been corrected. RMTPICD should be able to prove that the submitted proposal is noncompliant.

If RMTPICD does not officially inform the requesting manager about rejecting the proposal within 15 days after submission, the proposal is considered as officially received. This does not mean that the RMTPICD will not request additional information if necessary.

4. Monitoring

- 4.1. RMTPICD shall review and analyze documents and statistical data submitted by the manager. The time required for the revision, analysis, and final decision on the proposed tariff change is up to 60 days. For interim duration tariff (impact of external factors that directly affect tariff) it is up to 30 days. In certain cases, RMTPICD can extend the time by up to 15 days: for example, when the additional information needs to be reviewed, the conclusions of an external expert are necessary, new data and documents need to be reviewed, etc.
- 4.2. If it finds it necessary, RMTPICD can request the manager to submit copies of its general ledger, secondary ledgers, contracts, invoices, and other reports. Requested documents must be submitted within 5 days.
- 4.3. If the requested documents are not submitted, the regulatory committee can suspend the revision of the proposal. This decision must be made based on a realistic evaluation of the situation.

- 4.4. During the revision, representatives of the Infrastructure manager can meet with RMTPICD specialists and provide further detail on the revenue, costs, financial data, and costs for purchase of fuel and energy, losses, etc.
- 4.5. Representatives of any consumer can obtain access to the submitted tariff proposal. All information is provided to the representative free of charge, except for those approved as confidential by RMTPICD.
- 4.6. The main objective of the revision is to check the validity and correctness of the claims, and review any arithmetical errors in the calculation of the proposed tariff change. RMTPICD is encouraged to cooperate with the manager whose interests are being considered, exchange data, and resolve any conflict.

5. Final decision making

- 5.1. The RMTPICD working group will make the final decision based on the revision, monitoring, discussions, proposals and recommendations by different stakeholders.
- 5.2. The tariff unit will prepare the draft decision and submit to the working group. An introduction, the main issues, the views of different sides, the tariff proposal, and the legal grounds for decision making must be included in the draft decision. The draft decision will be approved by the regulatory committee meeting.
- 5.3. The tariff unit of RMTPICD must present a summary of the issue, proposals, and recommendations from different stakeholders and the draft decision to the working group.
- 5.4. The tariff proposals, documents, reports, material collected during the revision, log of the decisions, etc., must be filed and archived. The archive should be easily accessed.

Glossary

Average cost is the total cost divided by the number of units carried.

Block trains are trains that run from origin to destination without passing through marshaling yards at which wagons would otherwise be reorganized into new trains.

Carriers generally operate their own locomotives using their own drivers whereas operators only have their own wagons. In some jurisdictions, a carrier must be a “common carrier” (see below).

Common carrier refers to a carrier offering transport services at published rates to all persons.

Common costs refer to the costs of assets that are used by more than one group of services (in the context of this paper, common costs refer to the costs of infrastructure used by both freight and passenger services).

Cost of capital is a weighted average reflecting the costs of equity and the interest paid on debt or borrowing.

Cross-subsidies occur when part of a business subsidizes another part, such as where profits from freight operations are used to subsidize loss-making passenger operations. As long as a service covers its variable cost, it is not receiving cross-subsidies, merely making low contributions to fixed or common costs.

Depreciation refers to the reduction in value of an asset through wear and tear. An allowance for depreciation is made in the profit and loss accounts of a company.

Discrimination occurs when an entity with market power charges different amounts to different customers. This is not normally acceptable if discrimination occurs between customers in the same market, for example, between the national railways and private companies transporting containers. It is, however, acceptable to charge different amounts in different markets.

Economies of density refer to the decline in average cost that occurs on railways when the density of traffic increases on a particular line or group of lines.

Fixed cost is the cost that does not vary with the amount of traffic carried. **Variable cost** does vary with the amount of traffic carried.

Gross ton-km is gross tons (including the weight of locomotives and wagons as well as that of the freight itself) multiplied by the distance they are carried.

Infrastructure manager is the term used in the European Union for the company that manages railway infrastructure.

Marginal cost is the cost of carrying one extra unit of traffic. This term is used instead of variable cost.

Open access is where the infrastructure provides access to all railway undertakings that meet certain standards. In contrast, **third party access** (or trackage rights in North America) may be provided on a voluntary basis or may only be required in certain circumstances.

Rail infrastructure tariffs are what the infrastructure manager charges carriers to use the track, stations, depots, and other facilities. In Commonwealth of Independent States countries that have separated tariffs, it is the total tariff less the locomotives and wagon components.

Regulatory asset base is the value of the assets used by regulators to determine what the monopoly provider should be paid to provide a return on capital invested.

Source competition occurs when two railway companies serve the same location, so that they may compete for traffic to or from that location even if they do not serve additional common locations. For example, farmers in the US midwest may ship their crops on one railway to Pacific coast ports for export and on another railway to the Gulf of Mexico ports for export, and those two railways compete for the traffic at its midwest origins, even though neither may serve both ports.

Transporters: see **Carriers**.

Variable cost is the cost that vary with the amount of traffic carried.

Vertical separation of infrastructure is where the management of infrastructure is separate from the management of any rail carrier. **Vertical integration** is where infrastructure and operations are managed by the same entity.

Wagon operators are transportation companies that provide wagons for their customers but not traction (locomotives and drivers).

Rail Infrastructure Tariffs

Enabling Private Sector Development in Mongolia's Railway Sector

Railways are essential for the development and diversification of Mongolia's economy. The Government of Mongolia recognizes that structural changes will be required to improve the efficiency of the rail sector and to provide incentives for private sector investment. A key step toward rail sector reform is to institute a tariff system for the use of rail infrastructure that provides "open access" to the rail network. This report proposes a system of rail infrastructure tariffs to enable liberalization of the freight market and spur private sector investment in Mongolia's rail sector.

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