PEER REVIEW OF

RAILWAY FREIGHT DEVELOPMENT IN MEXICO

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THE INTERNATIONAL TRANSPORT FORUM

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In this report the term tons means metric tons unless otherwise specified.

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Executive Summary

1. Mexico's rail freight industry structure, adopted in 1995, conforms to sound policy principles with regard to its commercial and privately managed orientation, tariff freedoms, market competition between modes, prescribed competition between railway concessions, and vertical integration of infrastructure and train operations.

2. The performance of the industry has shown continuous improvement since 1995. The quality of management, technical quality of railway infrastructure and rolling-stock, capital and labour productivity, traffic levels and market shares have all improved markedly, a transformation in industry prospects that hardly seemed possible prior to the reforms.

3. Traffic has doubled since the reforms, whilst GDP increased 56%, and modal share has improved by more than a third. Mexico's railways now carry more freight than any railway in the European Union apart from Germany, and more than those of France, Spain, Italy and Austria combined, and as much general freight as Brazil.

4. The performance of Mexico's three (now two) main rail freight concessions compares favourably with many of the busiest freight railway systems in the world and they are the most productive freight railways (if the mining sector is excluded) in all of Latin America.

5. Freight tariffs have increased somewhat in real terms over the last three years as they have in the USA and Canada, with which the Mexican system is integrated. Road trucking rates in Mexico have increased to a similar degree. Tariffs nevertheless remain much lower in real terms than before the reforms, especially when subsidies to rail prior to reform are taken into account. Tariff freedom inevitably involves fluctuations and we see no evidence of misuse of railway market power.

6. The industry framework was specifically designed for Mexico's geographic and market circumstances and in our view remains appropriate. This is borne out by the successful performance of the freight railway system.

7. The ITF review team supports the policy of prescribed competition between rail concessions established by the 1995 reforms but we note that not all aspects of the policy have been implemented in the way that was originally expected. This applies specifically to the issue of mandatory trackage rights between concessionaires.

8. The review team recommends that regulatory institutions and capacity be strengthened to address the pricing and capacity issues associated with trackage rights. More systematic data should be captured to allow the regulator to make determinations on these in an informed and objective way as regards risks, costs and benefits. This also applies to system structure and potential access and tariff regulation.

9. Under the terms of concession agreements the guarantee of exclusive operation of trains expires in the main concessions in 13 years, though the concessions will remain in place 20 years thereafter for infrastructure management. A number of policy options present themselves for the end of the exclusivity period, but uncertainty prior to that will impact investment and industry performance in ways that are more likely to be deleterious to the public interest than otherwise. There is an opportunity to counter this by embarking on a thorough consultation and analysis of the post-2027 options early and agreeing what the regulatory framework will be well ahead of when it will take effect.

10. The state remains owner of Mexico's railway infrastructure and retains important stewardship functions with regard to its development. We submit a number of ideas for partnership between the government, railway companies and other stakeholders to build rail 'short-cuts', new feeder lines and by-passes and we provide illustrations of some of the programs used in other countries to increase the volume of traffic carried by railways vis–a-vis road transport.

11. Government and railway companies are aligned in their interests to increase rail market share and should work together, including on implementation of national logistics plan initiatives. Indeed they must work together if programs are to be successful.

12. The reliability that a well-functioning railway industry offers to supply chain management in Mexico has been instrumental in attracting this investment. Prospects for growth are strong and an effective rail transport system will be fundamental to realising the potential.

1. Introduction and background

The International Transport Forum at the OECD provides a platform for Member governments to exchange experience on the development of key transport policies with the aim of enhancing the performance and sustainability of transport systems and their contribution to economic growth and social welfare. Cooperation includes collaborative projects to review good practice, research on innovative policies, international benchmarking of performance and peer reviews of national policies in critical sectors. The present report summarises a peer review of rail freight policy in Mexico. This is part of the program of strengthening the development of policy-making in key sectors of Member country governments under the organization's current program of work.

Performance of the rail freight sector is critical to development of the Mexican economy. It provides the backbone for the development of efficient supply chains for the industrial sector and carries the bulk of the country's vital grain imports. The rail system is now a key driver in the cross-border integration of the manufacturing sector that has developed under the North American Free Trade Agreement (NAFTA) and the productivity benefits this generates for the region as a whole. To give one example, the rapid growth of the automobile industry along the U.S.-Mexico east coast corridor is highly dependent on reliable rail services to support the just-in-time operations that characterize the industry. The performance of the Mexican rail system is therefore of strategic importance not only to Mexico but to North America as a whole.

Mexico has seen a transformation of its railway in the last fifteen years, from a declining operation increasingly dependent on large government subsidies to what we have found to be a very productive and technologically improved system that operates profitably without public subsidy. This performance has lessons for other countries and it is a suitable time to take stock of developments and review the potential for further improvement.

There will inevitably be some aspects of coordination, planning and regulation of a system as complex as railways that could be improved. In fostering improvement, policies will need to ensure that the success of the last fifteen years is maintained and built upon. This report aims to provide a basis for understanding the strengths and weaknesses of the current system, in comparison to rail systems elsewhere in the world, and provide an analytical basis for identification of opportunities for further improvement. It also discusses risks in relation to regulatory reform and the policy making process for managing those risks.

The report summarizes a review of policy undertaken in January 2014 and was prepared by staff of the International Transport Form and three leading rail policy experts: Paul Amos, Jorge Kohon and Louis Thompson. The report is published under the authority of the International Transport Forum

2. Policy aims and principles for rail freight

2.1 Policy aims in the rail freight sector

Mexico has a number of suitable high-volume freight markets and corridors where rail freight services can provide the 'heavy lifting' of surface transport, contributing to national economic development by giving producers, importers and exporters access to high-capacity transport at a cost potentially lower than road transport. Its developmental significance makes the performance of the rail freight industry a matter of public interest in Mexico as in many other countries.

There is general agreement that the rail freight industry should be: efficient and market-responsive in serving the transport needs of shippers; financially sustainable, generating revenue for reinvestment and not imposing an unsustainable burden on the public purse; be safe and meet prevailing environmental standards. Many countries have gone further, aspiring to an increase in the proportion of freight that is carried by railways compared to road transport, for a number of reasons: better safety performance; less road congestion; less damage to roads; better energy efficiency and lower greenhouse gas emissions per tonne hauled. These aims seem to us to be a sound starting-point from which to assess rail freight policy in Mexico.

2.2 Competitive advantage of freight railways

To be effective, public policy must also recognize the economic characteristics of rail freight transport and the sources of its competitive advantage. Railways must target markets for which they have comparative economic advantage, or can create it, rather than chase markets which are more efficiently handled by other modes. In a country like Mexico, with nearly 370 000 km of roads and a vibrant and competitive 'door-to-door' road haulage industry, freight railways cannot either practically or economically be the best mode to meet all haulage demands.

To be successful, freight transport companies in Mexico, and internationally, must strategically target specific markets which best suit their modal capabilities and then adapt performance to meet customer needs. For Mexican railways this challenge is sharpened by the fact that it has limited sources of the most favourable types of railway traffic, coal and mineral ores, which are a high proportion of traffic on the world's busiest freight railways (China, USA, Russia, India, Australia, Brazil).

Having the capacity to move large consignments reliably at a lower cost than road transport is the most compelling potential source of rail freight's competitive advantage over road transport. Competitive advantage doesn't just happen but has to be created. The business model that delivers it targets dense traffic corridors and attains well-loaded trains of high net/tare weight and well-utilized rollingstock. The corresponding operating and investment priorities of a successful freight railway therefore typically aim at higher train loadings through longer trains and (in the case of containers) double-stacking, heavier axle weights to increase the ratio of payload to metal and improved rollingstock capital utilization through faster end-to-end train speeds and faster wagon turnaround times. Investment in track infrastructure must be prioritized to similar ends: ability to handle longer and heavier trains safely and reliably through good quality and high availability track, heavier rails, longer crossing loops, better train control and so on. The

alignment of and synergies between track investment and rollingstock investment programs is crucial to optimizing competitive advantage.

Because of the high level of fixed costs represented in track infrastructure, and the impact of volume on the ability to minimise train operating costs, railways exhibit strong economies of scope and density. These are technical terms but can be understood simply as meaning that average costs go down and the competitive advantage of rail goes up when traffic levels in a particular rail corridor increase. This technical relationship is enormously significant for public policy in Mexico as elsewhere. It means that the interests of a commercial freight railway company seeking to maximize the long-term commercial value of the business are well-aligned with those of a government whose public policies favour greater use of rail.

2.3 Policy Principles

The market and technical challenges, and international experience, imply that the policy aims for rail freight outlined earlier will be best furthered by applying the following principles to the rail freight sector[1].

- Freight railways should be organized as a **commercial business**. Market forces and commercial incentives are most likely to deliver efficient and effective rail services essential to increasing the role of rail freight in surface transportation and its contribution to economic development.

- They are best provided by **the private sector**. Success in winning market share depends on the sustained commercial focus and agility of a private company to confront and prevail against a highly decentralized, competitive and entrepreneurial private road haulage industry that faces minimal barriers to entry and has freedom of door-to-door movement over the whole country.

- Governments should cede to freight railway companies a high degree of **freedom to agree tariffs with shippers** according to individual market circumstances. Tariff freedom underpins: (a) the ability to compete with road transport; (b) the ability to match rail service offered to shipper willingness to pay; and (c) to recover the fixed costs of railway infrastructure from a diverse customer base. Only in specific markets where railways have decisive market power and in which that power can be shown to have been abused against independently assessed regulatory criteria, can intervention in tariff formation serve the public interests better than tariff freedom. Few of Mexico's traffics are technically captive to rail and there is effective competition in nearly all markets.

- **Effective competition** between railways and other modes of transport has a strong positive influence on cost efficiency, tariffs and service quality. Competition with road transport creates incentives to railway managers to meet freight market needs at the lowest cost; and it encourages them to innovate in service to obtain market advantage. Mexican rail freight providers already mainly operate in freight transport markets that are subject to effective competition as evidenced by the considerable mix of general commodities they carry which are not captive to rail and the fact that road transport carries nearly three times the ton-kms of railways.

- Competition among rail freight operators for specific markets can also be beneficial but must also be weighed against **economic risks**. The nature of railway cost structures suggest that unconstrained head-to head competition between operators on the same tracks can lead to some loss of operational economies of scale and scope, make it harder to recover the costs of fixed infrastructure, and reduce the incentives to invest in long-term assets. New entrants are likely to 'cherry-pick' the most lucrative contracts of incumbent operators, so weakening the ability of the

incumbent to offer service to less attractive areas of the network or to earn the surpluses necessary to maintain and renew the fixed infrastructure. This is not a sufficient reason to rule out new entrants but does mean that if open access competition were to be considered it would be necessary to assess whether on balance it would offer any overall advantage over existing competitive structures.

- A compromise of **'prescribed competition'** between rail freight companies is therefore implied. The legitimacy of customer choice and a presumption in favour of contestability in corridors with a sufficiently high density of traffic flow was acknowledged by the designers of Mexico's railway concessions and regulations. The allocation of routes to regional railways provides for two or more railways to serve some key industrial and logistics centres and the regulations allow some competition between service providers in key markets through use of interchanging and trackage rights. Such rights exist in the U.S. and to a lesser extent Canada. The other countries with major freight railways, Russia, China and India, have been less liberal than Mexico in fostering competition.

- **Vertically integrated commercial management** of freight train operations and freight railway infrastructure offers positive benefits to asset productivity and infrastructure cost recovery. The importance of a freight rail business model that aligns track and train operations and investment has been described and this is more difficult and costly to achieve with separate management. It is therefore not surprising that more than 95 percent of global railway traffic is carried on the infrastructure of vertically integrated railways, including freight carried via trackage rights. Separation is a complex process certainly imposing a heavy administrative and regulatory burden. It is also a risky policy, presaging the likelihood of a sub-optimal matching of infrastructure and operational investment programs, and need for increasing public funding of infrastructure costs. It should be avoided unless it can be demonstrated to be a practical answer to a serious market failure. We have not identified any such market failure in Mexico[2].

Some divergences between the commercial interests of freight rail companies and the wider public interests are normal and manageable. Such divergences do not weaken the overwhelming case for adopting a commercial model for the rail freight industry. They do imply the adoption of mechanisms by which commercial interests can be aligned to specific public aims through partnering or incentive mechanisms to promote specific railway developments that would not otherwise be sufficiently commercially attractive to the industry. Positive approaches that Mexico may consider are discussed further in Section 5.

2.4 Application of the policy principles in Mexico

We have presented what we consider to be sound principles for structuring a freight railway sector in general terms and have concluded that such principles were adopted by Mexico in its re-organization of the sector in 1995. We now turn in Section 3 to the question of how the sector, having been reorganized in conformity with these principles, has performed in practice.

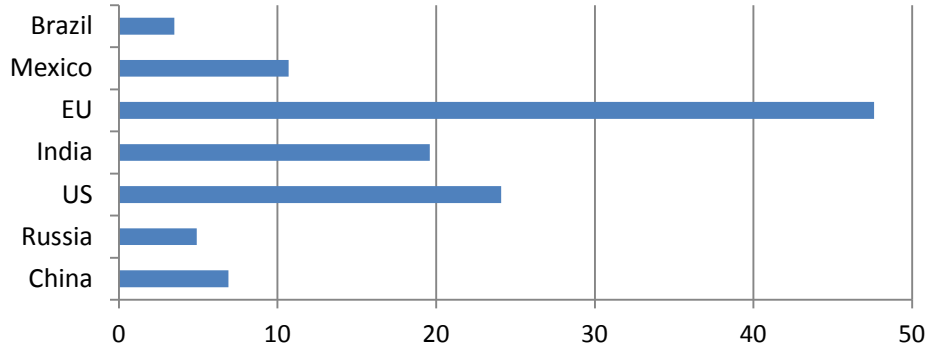
3. Mexico's rail freight sector: trends and comparisons

3.1 Mexico's rail freight sector: overview

The Mexican rail system has an operational railway network of about 18 000 route-kms. In 1995 the system was split into three large regionally distinct companies (KCSM, Ferromex and Ferrosur), a number of small companies, mostly short lines with very low traffic levels, and a terminal company for interconnection among them at the Mexico City metropolitan area. More details on the origins and implementation of this program are given in Section 4.

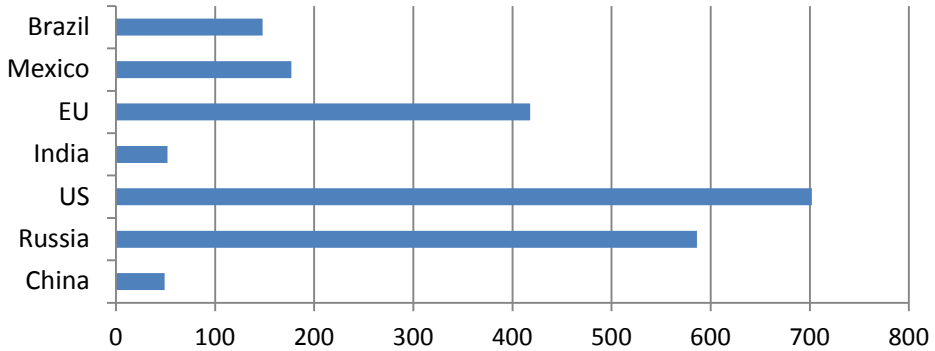
In terms of physical network density (route-kms/land area) the Mexican network is denser than Russia and China, which are two of the four busiest freight railways in the world, and denser than Brazil, the busiest freight railway in Latin America (Figure 3.1). In terms of density per head of population, it is denser than these railways and also India, another of the world's four busiest freight railway systems. (Figure 3.2)

Figure 3.1. **Physical route density, Mexican and large freight carrying railways** (route-km/million km^2)



Source: UIC, 2013.

Figure 3.2. **Route density, relative to population** (route-km/million population)

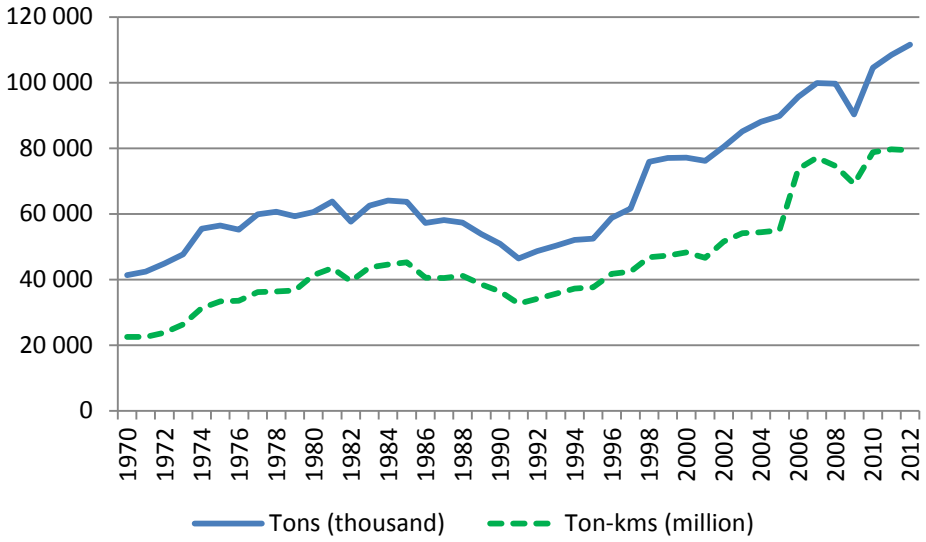


Source: UIC, 2013.

3.2 Traffic levels and trends

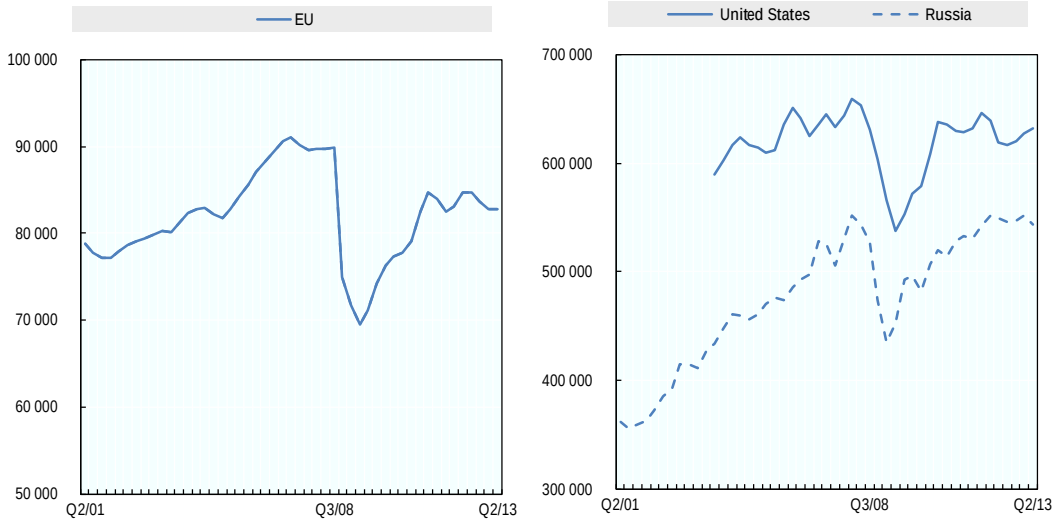
The demand served by Mexico's railways has grown substantially. Between 1996 and 2012, tonnage transported by the system as a whole increased 90 percent (from 58.8 to 106.7 millions) while ton-kms, a better measure of the intensity of the transport task, grew by 92 percent (from 41.7 to 79.4 billons)[3]. In the same period of time, the economy of Mexico grew 56 percent[4]. The railway system also increased its participation in total land freight transport vis-a-vis trucking growing from 18.8 percent of the total in 1995, to 25.4 percent in 2012. Figure 3.3 shows the trends for the rail freight system since 2001. The recovery after the financial crisis of 2008 is has been similar railways in other parts of the world (figure 3.4).

Figure 3.3. **Rail freight traffic in Mexico** 1970-2012



Source: SCT, 2014.

Figure 3.4. **Rail freight traffic in selected countries** (Million t-km, trend, seasonally adjusted)



Source: ITF, 2013.

Mexico's railways have steadily gained modal share and reached a level comparable with many of the large railway systems on the American continent. The U.S. railway system is an exception in that it carries about 63 percent of the surface ton-km (truck plus rail)[5], higher than most economies. This high share is based on a long average length of haul (1 556 km), and a high share of "natural" railway traffic, such as coal in the total tonnage moved by rail (coal is about 41 percent)[6] traffic in which trucks cannot compete effectively because of the massive volumes and the long distances involved.

Brazil has the most rail freight tonnage of countries in Latin America. In 2012, it moved 465 million tons[7]. However, if iron ore and coal traffic are excluded (traffic flows which are not available in significant quantities to Mexico's railways) the remaining Brazilian rail freight traffic task is similar to the Mexican railway system: 116 million tons in Brazil against 107 million tons in Mexico and 73 billion ton-km in Brazil against 79 billion ton-km in Mexico. Both systems have similar average haul lengths: 628 km in Mexico and 711 km in Brazil.

Comparisons of the traffic densities, modal shares and cost levels of freight railway systems should always distinguish between those that serve heavy concentrated mining flows (like coal and iron ore) and those that do not have such favourable base-load traffics but must rely on general industrial and agricultural cargoes. The general cargo freight railway systems must rely on diverse products with multiple origins and destinations and not the heavy bulk flows from mining for which railways have highest competitive advantage and lowest operating costs. The Mexican railway system is predominantly a general cargo railway, a characteristic that must be considered when reviewing the different aspects of its performance.

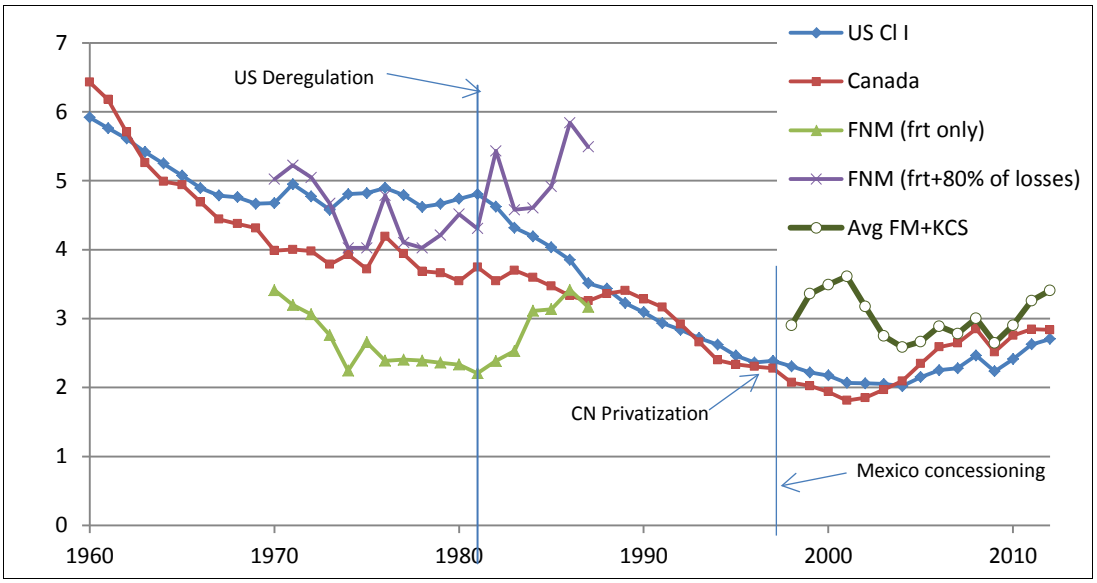
3.3 Tariffs

Figure 3.5 shows the evolution of tariffs in the railway systems of North America between 1960 and 2012, in 2012 constant dollar prices. It is clear that the U.S. railway deregulation in 1980 generated dramatic reductions in the average tariff of the U.S. Class I railways from 5 U.S. cents per ton-km to around 2 U.S. cents in 2005. A similar pattern occurred in Canada where railway tariffs went down from 3.5 U.S. cents to less than 2 cents in 2005.

Figure 3.5 also provides information on freight tariff trends in Mexico. The average freight tariffs to shippers of Ferrocarriles Nacionales de Mexico (FNM) were, in most of the years between 1970 and 1990, below 3 U.S. cents per ton-kilometer. However, Figure 3.5 clearly shows the total cost of freight carriage in many years of that period was around 5 U.S. cents per ton-km and close to 6 cents in some years. In other words, only half of the cost of moving FNM traffic between 1970 and 1990 was paid by the shipper, while the other half was paid by the Government of Mexico, so the nominal tariff was subsidized.

Figure 3.5 also shows that all of the railway systems in North America have increased their average tariff since 2005 due primarily to increasing system congestion and higher fuel costs. Even so, after these increases the U.S. and Canadian railways still have tariffs below 3 U.S. cents per ton-km and Mexico has average tariffs that are only slightly above 3 U.S. cents. Taking account of the longer length of haul of railway traffic in the U.S. and Canada, and their higher proportions of coal and ore markets, the slightly higher average Mexican tariff is to be expected. Moreover, in the period since concessioning, the Mexican tariffs have enabled a financially viable railway industry that has not required additional financial support from the Federal government.

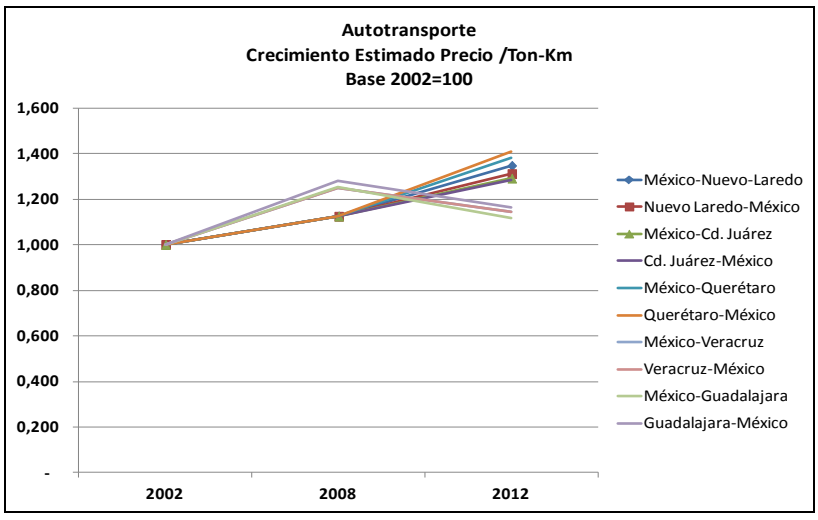
Figure 3.5. **Tariffs in the North American Railways (Constant U.S. 2012 cents)**



Source: Louis Thompson for this report, 2014.

In terms of recent real increases in rail freight tariffs (figures 3.5 and 3.6 are corrected for inflation), the available data indicates that, taking 2002 as the base, road transport freight tariffs have also grown by 40% in some relevant corridors of the country where both modes compete (Figure 3.6).

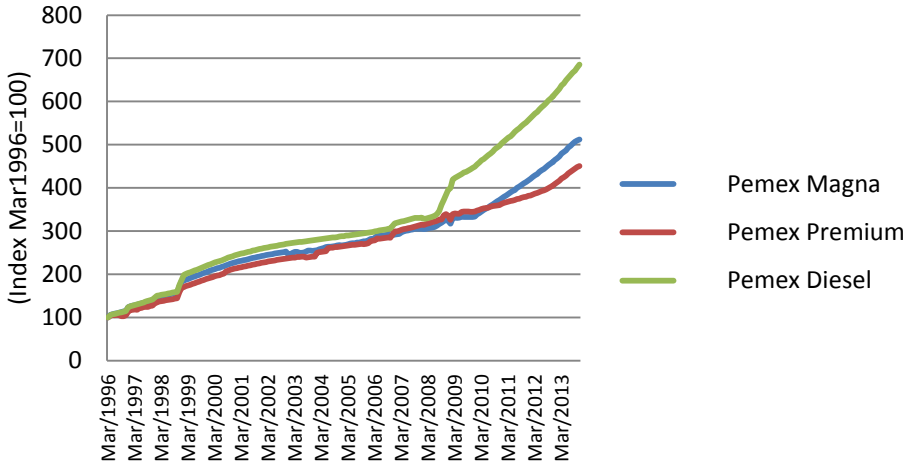
Figure 3.6. **Road transport tariffs in relevant corridors**



Source: IMT, 2014.

Fuel is a key component of transport costs affecting both trucks and railways. Figure 3.7 indicates the evolution, in real terms, of gasoline and diesel in Mexico. Diesel has experienced the highest increase: in the March 1996-August 2013 period it saw an increase of about 600 percent, much steeper than in the US as this reflects both changes in the market price of crude oil and the progressive phasing out of subsidies for oil products in Mexico.

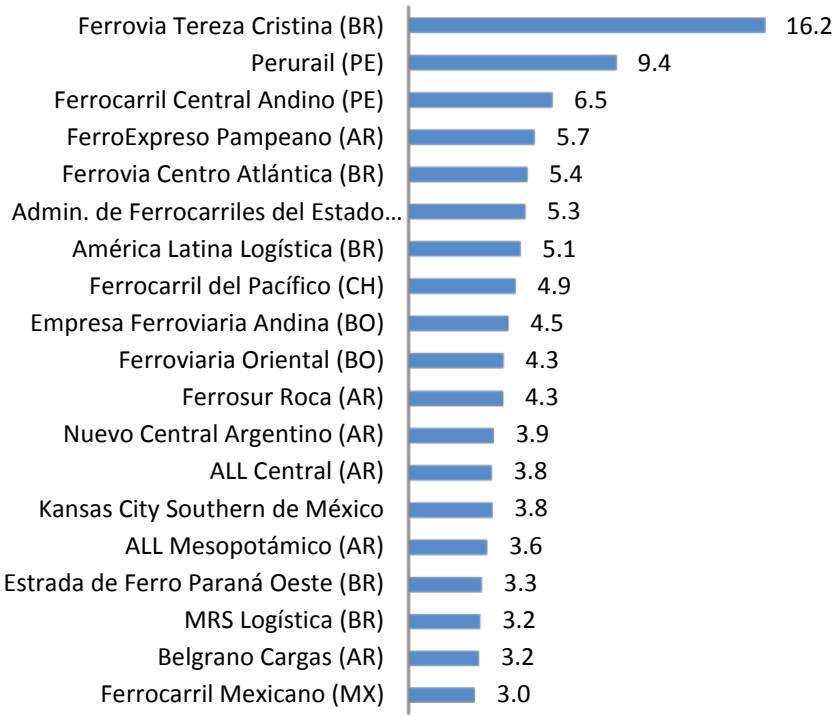
Figure 3.7. **Evolution of fuel prices in Mexico (**real price index)



Source: SENER, 2014.

Finally, Figure 3.8 compares the average railway freight tariff of 18 railways of different countries of Latin America for which public information is available. Figure 3.8 indicates that Ferromex charges an average 3 U.S. cents per ton-km, the lowest tariff in the group (KCSM charges an average of about 3.8 cents per ton-km). All railways included in Figure 3.8 move general cargo traffic with the exception of MRS in Brazil, the only big mining railway (130 million tons in 2011) in the sample. Even so, MRS has higher average tariffs than Ferromex.

Figure 3.8. **Average tariff of different railways in Latin America 2011-12** (US cents per ton-km)



Source: IDB, 2013.

3.4 Productivity

Four main productivity indicators are used to analyse the performance of railway companies and support benchmarking comparisons with other railways. Table 3.1 indicates the performance against these four indicators for Mexican railways in 1996, under FNM management, and in 2006 and 2012 under concessioned management. The efficiency improvements are large. Increases in the productivity of locomotives and freight cars exceed 50%. Labour productivity has improved by 6 times as a result of the changes in operational practices, better management and investments made. Fourty five percent more ton-km are carried with each litre of fuel consumed.

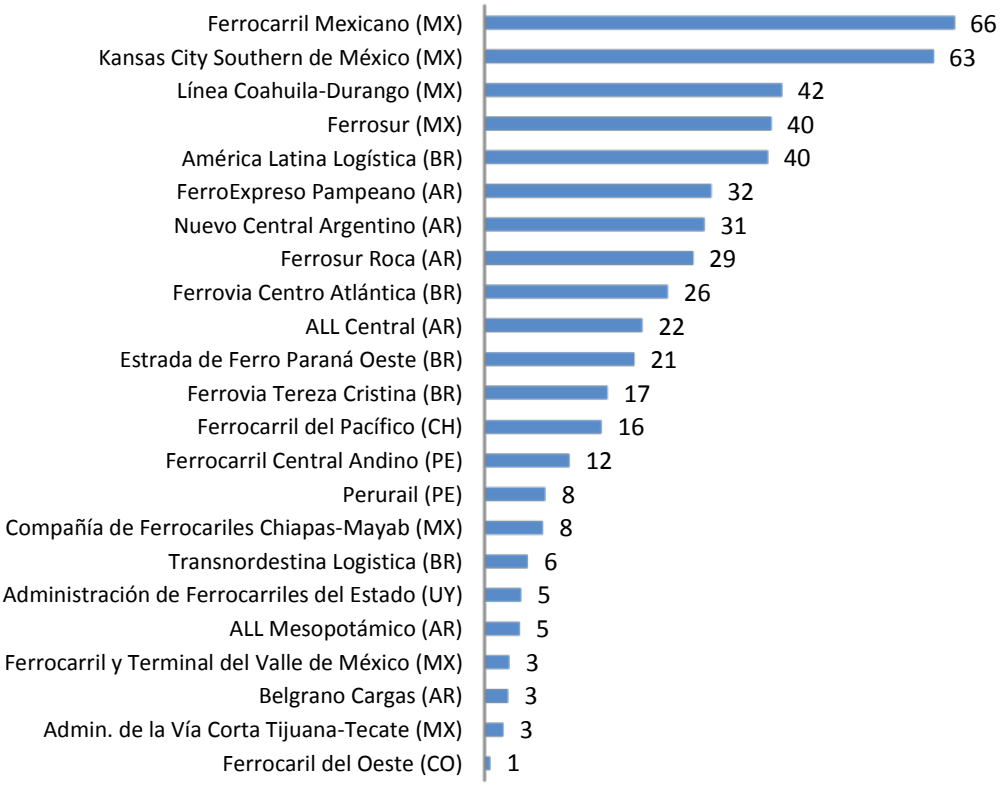
Table 3.1. **Performance evolution of the Mexican railway system 1996-2012**

Indicator	1996	2006	2012
Ton-kms per locomotive (million)	26.9	59.8	59.9
Ton-kms per freight car (million)	1.56	2.30	2.71
Ton-kms per employee (million)	0.81	5.43	5.33
Ton-kms per litre of fuel	80	107	116

Source: IMT, 2014.

Figure 3.9 shows that Mexican railways head the field under locomotive productivity benchmarking analysis. Ferromex and KCSM, the largest Mexican railways, have the highest locomotive productivity among 23 non-mining railways of Latin America by a clear margin.

Figure 3.9: **Locomotive productivity of Latin American Railways** (million t-km per fleet locomotive)

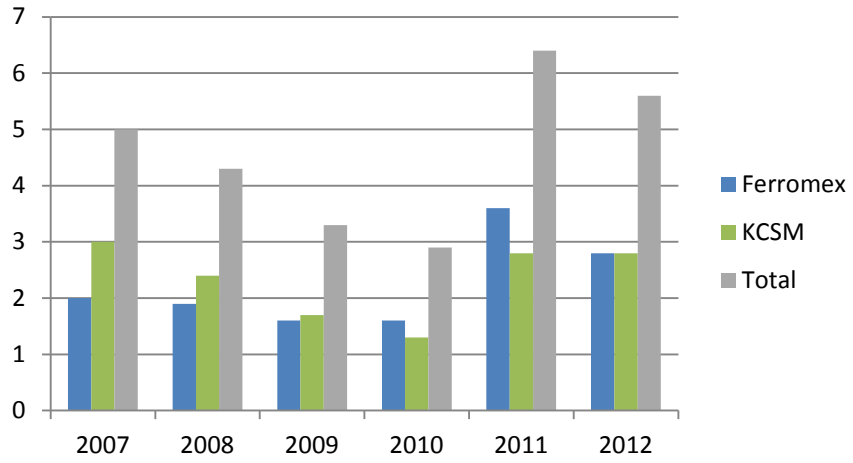


Source: IDB, 2013.

3.5 Investments

Figure 3.10 shows the investments, in millions of current pesos, of the two main railway operators of Mexico. It shows that 5 thousand million pesos were invested in 2007, then a decrease in 2009 and 2010 due to the international recession (3300 and 2900 million, respectively), and the strong growth in 2011 (6400 millions) and 2012 (5600 millions).

Figure 3.10: **Investment by main concessionaires** (billion pesos)



Source: IMT, 2014.

A substantial part of the investment between 2007 and 2012 was allocated to track (12 600 million pesos, 46 percent of the total). More than half of the Ferromex network can now carry 32.5 tons per axle. This permits the use of cars with a gross weight of 130 tons and a payload of more than 100 tons allowing the operation of unit grain trains of more than 100 cars and hauling 10 thousand net tons.

The track improvements have also permitted the movement of double stack containers in key international trade corridors and an increase of the average commercial speed of trains from 22 to 29 km/h[8] for the system as a whole[9].

The locomotive investments in the same period reached 4 900 million pesos (15 percent the total), which permitted an increase in the average locomotive power (2 730 HP to 3 350 HP per unit).[10] This allowed operators to run longer and heavier trains. Although the available HP (horsepower) only increased 15 percent between 1996 and 2012[11], the locomotive availability ratio grew from around 60 percent at the beginning of the 1990s to more than 90 percent in 2010, permitting the concessions to satisfy the growing demand and even increase their share in the transport market.

4. Implementing the competitive framework

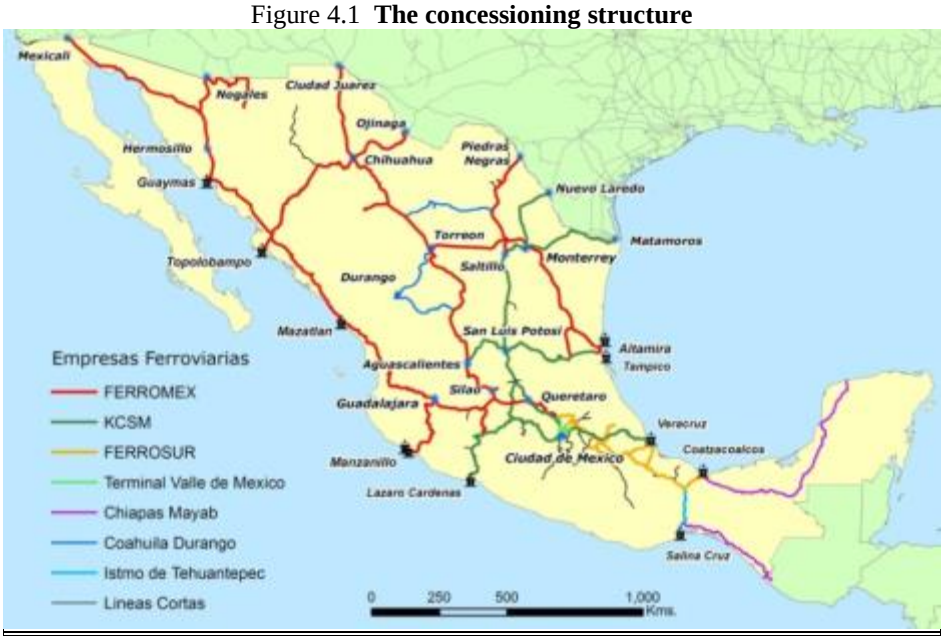
4.1 Background to the current policy framework

To understand the performance of the Mexican rail system of today, it is important to look back at the broad objectives of reform adopted in 1995 and at the competition plans embedded in that reform. By 1995, the old Ferronales de Mexico (FNM) was failing operationally and financially. The government concluded that a system rescue required a transfer of managerial responsibility from the public to the private sector and a breakup of the monolithic FNM system into smaller and more manageable rail companies.

A number of potential system structures were investigated at the time, ranging from retention of a single company (but operated by the private sector) that would have been in control of all infrastructure and train operations, to fully open access competition in which infrastructure would have been concessioned separately from train operators and all concessioned train operators would have been able to operate and compete throughout the network.

The solution adopted was a hybrid approach adapted to Mexican geography and freight markets, in which the system was split into three large, regionally distinct companies, and a shared terminal railway in the Mexico City metropolitan region. There are also a number of smaller companies, mostly short lines, with very low traffic levels (Figure 4.1). An important influence was consistency with the structure in the U.S. and Canada rail freight markets where the commercially successful major railways are distinct geographic entities, with vertically integrated infrastructure and train operations.

Figure 4.1 **The concessioning structure**



Source: SCT.

The Mexican approach relied for competitive forces not only on stiff competition with other modes of transport (principally road transport) but on competition between railways operating on separate lines. This was intended to yield two types of rail-versus-rail competition:

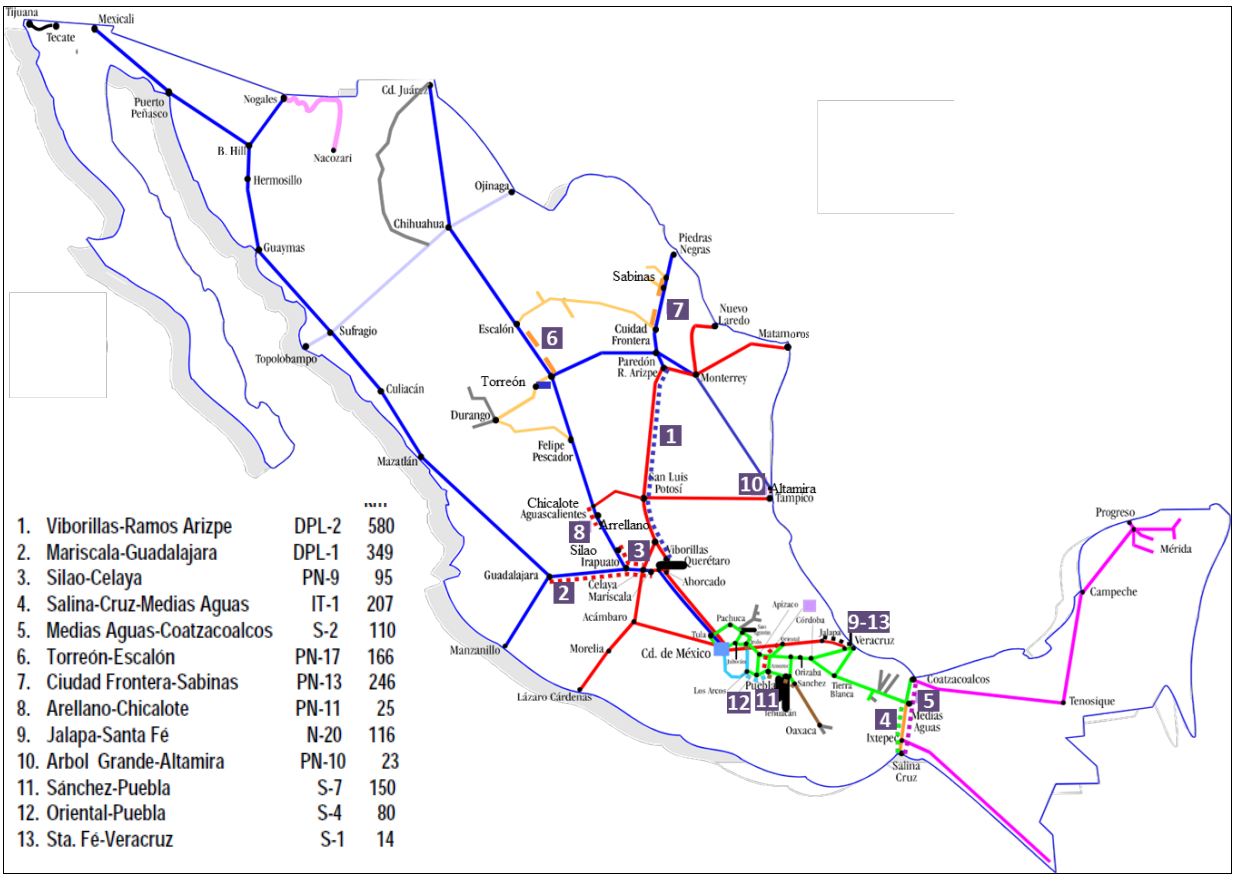
- **Direct competition,** with alternative routes to key locations (e.g. Monterrey) by two principal competing concessions.

- **Side-by-side (parallel) competition,** for example by Ferromex and KCSM from the U.S. border to Mexico City, or by Ferromex from the port of Manzanillo versus KCSM from the port of Lazaro Cardenas to Queretaro (and to Mexico City); plus

- **Alternative source competition,** for example by KCSM from the port of Lazaro Cardenas versus Ferrosur (now part of Ferromex) from the port of Veracruz, both to Mexico City.

In addition, the system structure mandated the granting of trackage or haulage rights (where one railway operates over the tracks of another and pays a fee for doing so) in very specific markets where traffic was high enough to support two operators. About 2 161 kms of trackage rights were identified of which the most important – Viborillas to Ramos Arizpe and Mariscala to Guadalajara (see Figure 4.2) – amounted to 929 kms. The route length subject to trackage rights would have amounted to 12 percent of the total of 17 776 kms concessioned (Figure 4.2). Expressed differently, the aim was to have at least 88 percent of the network with exclusive operators and only a minor portion of the network with more than one operator. Overall, the system design relied for effective competition on intermodal direct competition in key locations, parallel and source competition, supplemented by trackage rights in specific situations.

Figure 4.2 **Mandatory trackage rights specified in 1995 railway reforms**



Source: SCT.

The structure included the creation of a joint terminal concession in the Mexico City region that provided competitively-neutral access to all operators into the large Mexico City market. Each of the three freight operators owned 25 percent of the company with a fourth 25 percent share remaining with government in order to provide for access by the planned commuter passenger operators. The joint terminal company appears to have been fully satisfactory in allowing neutral access at a reasonable cost for all three main operators and in supporting operation of at least one commuter operator.

The structure was implemented by competitive award of 50 year concessions to operate trains and manage the infrastructure. Each of the concessions included the right of exclusive train operation on the infrastructure for the first 30 years.

The system structure and competition model (which in section 2 we refer to as prescribed competition) were carefully developed taking into account national circumstances and international practices. Competitive bids were received on all the major concessions and the transition to the new system went relatively smoothly. As discussed in Section 3, the system has subsequently performed well by comparison both with the situation before and with international peers.

4.2 Implementation of trackage rights

One element of the system design experienced implementation problems - the trackage rights. Although the concessioning law mandated the award of trackage rights, and each concession contract

affirmed this mandate, it did not specify the terms to be applied to the trackage rights. The operators were required to negotiate terms (charges, types of service allowed, permissible volumes of traffic, dispatching priority, etc.) but they were not required to reach any specific agreement. If agreement was not reached within 90 days of the start of negotiations, the Ministry of Transport (Secretaría de Comunicaciones y Transportes (SCT)) was given authority to impose the terms of access, but the basis on which the imposed terms could be established lacked clarity.

The difficulty in developing the terms of trackage rights reflects the core issues of railway cost structures and pricing policy. Railways are a classic example of an industry with high fixed costs and low marginal costs, leading to prices that can range from just above marginal cost to well above that level. Following well-established principles (often called "Ramsey Pricing") this implies that prices be market-based and differentiated to reflect the value of the service to the customer subject to the limit imposed by competitive alternatives.[12] Customers who are highly sensitive to transport costs (such as sand and gravel producers) will be charged low prices while customers who are less sensitive to transport costs (such as containers or auto parts shippers) will pay higher prices. This principle is fundamental to U.S. and Canadian rail regulation. In these jurisdictions prices are allowed to be differentiated in this way so long as overall income generated does not exceed that needed to recover total costs and earn an acceptable rate of return on investment. Prices are also subject to ensuring there is no abuse of market power in individual cases. The principle promotes efficient operations by railways and helps recover the fixed costs of infrastructure in the most economically efficient way.

Therefore, Mexican concessions differentiate their freight tariffs, as was clearly provided for in the regulation of the railways by the requirement that the concession companies file a table of maximum tariffs to prevent individual abuse. But tariffs below this maximum are unregulated and agreed in commercial contracts (that are voluntary and confidential). This was also the principle employed in the successful deregulation of the U.S. railways in 1980 (the "Staggers Act") and in Canadian tariff regulation.

The principle also has implications for charges for using trackage rights. Although exclusivity of train operations reduces rail-versus-rail competition it does not reduce intermodal competition and it gives an operator a somewhat better chance of recovering fixed costs. Trackage rights can erode this opportunity if they are not well designed and efficiently priced. If a tenant train operator does not pay enough, or if the terms of access do not permit the tenant's traffic to be efficiently integrated with the existing operator, the existing operator will be damaged. If this occurs in a major market, the financial and operational viability of the concessionaire will be eroded.

Very shortly after the concessions were initiated, the concessionaires commenced negotiations on trackage rights. Until 2010, however, negotiations remained unproductive because the stakes were high for the concessionaires and because the basis on which to formulate them was undefined. In 2010, Ferromex and KCSM finally reached agreement on the most important segments: access by KCSM to Guadalajara and Silao, and access by Ferromex to the main KCSM line from Viborillas to Ramos Arizpe. These agreements will expand competitive access for domestic traffic. However, the companies agreed not to use these trackage rights for export/import traffic.

In broad terms, the original policy objectives of the concessioning have been met, both for efficiency and competition. The system is more efficient, traffic has grown rapidly, and tariffs are lower than before concessioning. The government no longer has to fund annual deficits that were previously measured in the equivalent of some hundreds of millions of U.S. dollars. The railway companies have played a key role in integrating Mexico into the Mexican, U.S. and Canadian rail networks. With this

said the regulatory oversight of the system could be improved while taking care to minimize the risk of undermining the success that Mexico's railway policies have delivered.

4.3 Economic regulatory strengthening

A key part of the success of the other railways in North America is the existence of an economic regulator with a more clearly defined responsibility, adequate resources and expertise, and access to all necessary information needed to carry out its role. SCT in principle has a role vis-à-vis establishing the terms of the trackage rights but would need to develop its capabilities to be more effective in regulatory functions[13].

Effective regulation requires adequate and accurate information. Moreover, much of this information should be public to ensure the credibility and transparency of regulatory decisions. The Mexican regulatory data set could be improved by adopting a suitably adapted version of the regulatory information reported to U.S. and Canadian authorities. For example, U.S. Surface Transportation Board (STB) form R-1, filed by every Class I (large) U.S. freight railway, has existed in essentially the same format for many years. The R-1 forms provide a wealth of information for detailed comparisons among railroads and for analysis of changes over time. The R-1 forms are sworn statements that are also prepared in support of filings before the Securities and Exchange Commission (SEC), so they are reliable. They include a wide range of financial information as well as employment, wage and salary, tariff, commodity and operational indicators. Since the major Mexican concession companies have U.S. railroads as investors, preparing and filing the required information should be well understood and within their capability and resources.

U.S. Class I railroads also file an electronic copy of all freight waybills. The freight waybill contains a wide range of information including commodity type, number of carloads, shipment weight, shipment distance, origin and destination stations by railroad, tariff revenue and tariff type (contract versus public tariff), among other data. The waybills permit the STB to analyze commodity flows by route, commodity flows by origin and destination pair, tariffs by commodity and a virtually unlimited range of other questions. The STB also can combine the waybill data with the R-1 data to estimate the cost of a shipment in order to assess the relationship between revenue and cost for a particular shipment, or for a particular commodity, or for particular railways. Waybill data also identify export and import traffic in fully usable detail.

More comprehensive analysis of Mexico's waybill data would allow assessment of the degree of interchanging and trackage rights usage to determine the extent of national network and service integration. Equally importantly, it would allow informed decisions to be made about any proposed changes in industry structure or regulation.

4.4 Safety regulation

There is one limitation of the current system that does appear to justify near-term change - safety regulation. Most modern rail networks have a safety regulator that is politically independent and separated from economic regulation so that safety risks can be identified and transparently decided rather than being subsumed in internal agency or corporate financial decisions. Decisions on the cost effectiveness of safety measures have be made, but they should be made with open trade-offs of benefits and costs.

The Mexican rail system should consider the merits of a safety regulator comparable to the U.S. or Canada. Comparability is important because locomotives and wagons have to meet the same safety standards, including inspection, in order to support full interchange across all networks.

Safety statistics developed and published by an independent regulator are also important. For example, accurate data on accidents can serve as a critical indicator of system performance. If derailments are low and falling, it can be inferred that the system is probably being effectively managed and that investment in equipment and track is producing the desired effect on safety and security as well as on earnings. For example, data from SCT reports and provided by the Asociacion Mexicana de Ferrocarriles (AMF 2011) indicate that, while the average speed on the system has been slowly increasing, the overall accident rate has been stable or falling since concessioning and is far below that of FNM before concessioning. By itself, this comparison is only fragmentary and lacks the detail to determine the cause or seriousness of the accidents, although it does support an overall picture of positive change. More detailed safety data would provide a better picture of the performance of the system.

Rail safety is not just a cost issue for rail operators, but is also an economic and social issue for the nation at large. Rail operators are, and should be, motivated primarily by commercial goals whereas public policy and public resources need to be focused on public interests; the essential bridge between them is independent reporting and regulation. This is the only way to develop objectives and data that are accepted by all as fair and unbiased.

If there were to be any fundamental change in access to the railway system to allow new operators, the safety implications would need careful analysis so that appropriate changes in the rail safety regime to handle the new situation and to monitor compliance could be established. A strong safety regulatory capability would be an essential component of policies to change the structure of the industry.

4.5 Meeting future regulatory challenges

Much of this report focuses on the near-term challenges faced by the Government as it considers ways to improve the system. There is also a need to improve regulation and regulatory information to shape the system further in the future.

Railway systems need to adapt to changing markets and opportunities. The current structure has done well so far, but it is very likely that new opportunities such as connections to new industrial facilities, or a changing traffic balance in the Mexican ports or at connections with the U.S. and Canada will arise, requiring continuing analysis of how the system is adapting, and how the concessions can evolve to provide the service that the nation requires. Policy cannot be well formulated without improved techniques for planning and regulation.

For example, the concessions will lose their exclusive access rights at the end of 30 years—13 years from now. The railway reform law[14] of 1995 established 50 year, regional concessions[15] to operate sections of the national, government-owned rail infrastructure system. For each of the main infrastructure concessions a 30 year concession[16] for the exclusive right to operate train services was awarded to the holder of the infrastructure contract. KCSM began operations in 1997 on the North East corridor, Ferromex was awarded the Pacific North corridor concession in 1997, Ferrosur was awarded two concessions in 1998, merged in 2011, on the corridor running south east from Mexico City. Ferrosur and Ferromex merged in 2013. The jointly-owned Mexico City Region concession was awarded in 1996 with exclusive rights to operate trains for 50 years.

There are now two main rail freight concessions in Mexico, with exclusive rights to operate trains on their infrastructure concessions expiring in 2027. The infrastructure concessions expire in 2047 and are renewable. Regulations providing details of the conditions for operating concessions were issued in 2000. They set out grounds for ending concessions prematurely in case of deficient operation and they provide for renewal of the infrastructure leases for a further 50 years but leave options open for how concessions will be re-let in 2027. A number of small concessions, mainly for coal and mineral ore

traffic, were awarded for shorter periods, 30 year infrastructure and 18 year exclusive train operating concessions. The first of these to expire is Coahuila-Durango, serving AHMSA Steel, in 2015. A decision on how to organize traffic on this line in the future is therefore imminent.

Developing railway policy and regulatory capacity will become increasingly important as concessions mature. Concession periods will inevitably influence investment. Appraising investments that may endure longer than 13 years becomes increasingly challenging for concessionaires, and factoring in policy uncertainty to revenue forecasts might indicate a need for higher returns to offset risk or reduce appetite to invest. There is an opportunity to mitigate this by embarking on a thorough consultation and analysis of the post 2027 options early and agreeing what the legal and regulatory framework will be, well ahead of when it will take effect.

Any change to the rail freight policy at the end of the exclusivity period (or indeed at any other time) should be made under a framework of a long term vision for the development of freight and logistics in Mexico and not as a piecemeal change to technical regulations. So while regulatory strengthening is justified for dealing with the continuing issues of trackage rights and maximum tariffs that exist under current concession agreements, examination of long-term policy options will become increasingly important. The traffic data and performance information that regulatory improvement would provide will also facilitate objective analysis of long-term alternatives. This will require data that has not so far been systematically collected and market analysis of a kind that has not so far been undertaken.

5. Enhancing rail freight role and services in Mexico

5.1 Introduction

The success of Mexico's rail freight policies over the last fifteen years creates opportunities for strengthening the railways' pivotal role in the development of Mexico's manufacturing and logistics industries, opportunities that in the early 1990s might have appeared singularly unlikely given the condition of the rail industry at that time.

Realizing this opportunity is partly a matter of the freight rail companies taking specific commercial initiatives in the normal course of business. But it is also an appropriate sphere for government involvement. Under the concession arrangements in Mexico the State is the long-term owner of the railway network and government has the ultimate responsibility of stewardship over public assets.

5.2 New railway lines

Based on some of the benchmarks presented in Section 3, there is no evidence that Mexico is significantly deficient in the density of its rail network. It is likely that increasing capacity in some existing corridors will become more important for Mexico's economy than extending into less favourable corridors. Major ports, border-crossings and key industrial centres are generally already well connected. Existing networks have coverage of ports, border exchange points While a few of Mexico's lines are very intensively used, a considerable portion of the network carries low levels of traffic which would not justify construction if they were not already there. But while there is no general deficiency in network density, there will be specific cases arising when new line construction is justified on social or developmental grounds, for example:

a. '**short-cut' lines** that reduce transit distance and so reduce train operating costs and improve rail transit times;
b. railway **by-passes** of urban areas to allow faster speeds and reduce the environmental impact and road traffic disruption of the transit of large trains through urban areas;
c. **feeder lines** to industrial zones, seaports, logistics centres, etc, looking for markets where a rail connection will improve service and/or reduce costs for potential customers and provide additional traffic to railways.

Under the 1995 Railway Law, the government is responsible for developing new lines. Some new rail links that may have wider justifications may not provide sufficient commercial returns to be attractive to existing rail concessionaires, at least in the short-term. Some financially attractive potential links may exists, but the rights granted to concessionaires do not include building significant extensions for exclusive use (a new concession would need to be tendered) so are unlikely to take the initiative. To fulfill its responsibilities as owner of the railway network the government might devise an administrative and financing framework for progressing such projects.

In the case of 'short-cuts' within the existing network, the main beneficiaries will be the government in enhancement of its network and railway companies in terms of service improvement and cost saving. A formula for cost sharing between the two seems appropriate with the new short-cut line being absorbed into the territory of the concessionaire that contributes to its funding.

In the case of by-passes, funding contributions could be shared by federal, state or city governments and the railway concerned in proportions depending on the perceived benefits to each (taking into account that by-pass routes may also offer the city administration the possibility of rail-connected industrial development).

In the case of new feeder lines, such funding partnerships could extended to include private companies seeking connection to the main railway network, and entities such as ports or terminal operators. Alternatively if there are private development companies willing to take the investment risk alone, such lines could be separately concessioned or permitted as 'short-lines' with the developer charging customers a tariff to deliver wagons to exchange sidings on the main line from which the main concessionaires would provide the onward transit.

All of these options for system development should be led in the first instance by the government as network owner and progressed in partnership with railways and other stakeholders involved. None of these approaches to network extensions need impinge on the rights and obligations of the private railway concessionaires with regard to their existing lines.

One example of such a program is in Canada, which has a partnership program between the Government of Canada, provincial governments, private-sector transport leaders and other stakeholders to promote an integrated package of investment and policy measures to advance the capacity and efficiency of Canada's transport network and improve competitiveness across the entire supply chain. The program is supported by a CAD 2.1 billion Gateways and Border Crossings Fund[17] administered by Transport Canada, which will enhance infrastructure at key locations. A recent example was the CAD 15 million towards the modernization of the Port of Saguenay, which plans to create a 13 km rail connection between marine terminal facilities and Quebec's rail network, together with associated intermodal yard, storage and handling areas.

5.3 Encouragement of mode switching

Mode switching from road transport to rail usage may often require investment by industrial companies themselves in rail sidings and terminal equipment. Switching can be encouraged by government grants covering some of the cost.

In the **European Union,** to help shift the balance away from road transport the EU has introduced the so-called 'Marco Polo' program[18]. Companies with viable projects to shift freight from roads to rail can apply for grants, related to the volume of traffic that will be transferred to help fund the costs of the conversion (sidings, loading points etc.). More than 500 companies have already switched successfully since the programme was launched in 2003. A Marco Polo grant gives financial support in the start-up phase of a project before it pays its way to viability. Projects should be commercially viable by the time the funding stops. For example, 70 projects were selected for grants in the period 2007-2009. Subsidies approved were up to €7.5 million/project. The projects aimed to take a total of 54 billion ton-kms of freight off the roads each year.

Individual EU countries have a range of grant and other programs with similar aims. For example, in **Germany** as part of its Freight Transport and Logistics Action Plan[19], the Federal Ministry of Transport, Building and Urban offers grants towards the construction or expansion of private terminals for combined

transport (containers and swap body vehicles etc.) to reduce the distance by which cargoes are transported by road, transferring part of the supply chain to railways or waterways to relieve road congestion and emissions.

Scotland similarly provides grants through the Scottish Government to help companies move goods by rail and water, including both freight facilities grants to help companies with capital costs, and a mode-shift revenue support scheme[20].

5.4 Railway logistics centres

In Mexico, the government is evolving a national transport and logistics strategy to enhance major trade corridors that will involve encouraging investment in intermodal and multi-modal logistics centres and improving the connectivity of its railway system. Freight railways will have a strong interest in such plans. Development of inter-modal and multi-modal traffic are ways that railways can increase market 'reach' without increasing network length. Mexico's railways have a particular logistics advantage in cross-border trade as they facilitate efficient pre-clearance, with minimal delays to trains of sealed wagons and containers at the border itself.

The traffic flows generated by a logistics centre that is part of a plan to promote national or international multi-modal supply chains must be sufficient to ensure economical and high frequency rail services. The generation of small numbers of rail wagons at large numbers of logistics centres remote from main lines is unlikely to support effective rail services. We therefore suggest that Mexico's railway companies should be brought into the planning and assessment of optimum numbers, sites and roles for multi-modal logistics centres. Depending upon the institutional arrangements envisaged some of the best-conceived centres might be suitable for joint ventures between railways and other companies or entities, such as city governments. There are many different types of railway logistics centres and modes of delivery.

In the **United States**, where the integration of railways into logistics supply chains is highly developed, CSX offers intermodal rail services between forty partner-operated intermodal terminals across the country[21]. However, logistics centres are not just about intermodal traffic. In one of many examples from the US, BNSF Railway Company (BNSF) announced in 2013 the USD 28 million development of a new BNSF Logistics Centre in Sweetwater, **Texas**, to be opened in 2014. The new Logistics Centre is 'designed to meet the growing supply chain needs of a strong energy corridor across Texas for many energy-related commodities such as fracking sand, aggregates, pipe, clay, barite and other drilling materials' utilizing an obsolete75-acre BNSF rail yard[22]. The Sweetwater project will also enhance the area's agricultural transport capacity through a collaboration with Cape & Son, which is expanding operations to accommodate grain unit trains as part of the new development.

Sub-national governments and private shippers can also lead in development of logistics centres. In China, the city of Lanzhou plans to build a USD 338 million railway Logistics Centre with an annual throughput capacity of 17 million tons by 2015 to handle containers, bulk and outsized rail cargos. The City is investing as it believes the railway logistics centre will help to enhance Lanzhou's status in the national railway network and promote the economic development of western China. A private Chinese coal company, Winsway Coking Coal, has invested in its own rail logistics centre at the Ceke border between Mongolia and China. It has an annual handling capacity of up 10 million tons. The logistics centre has reduced the number of damaging coal trucks on China's roads and has also reduced the cost of transporting Mongolian Coal to Chinese markets[23].

5.5 Transport infrastructure development leadership

The development and implementation of national logistics plans is by definition not restricted to railways but to all modes and companies that contribute to supply chains. To provide the necessary coordination it is probably necessary for Governments to take the lead, treating railway companies and other entities as stakeholders and partners in policy planning and implementation. This is sometimes best done not by a government department but by a more independent specialised cross-modal agency.

In **Australia**, a statutory body, Infrastructure Australia, was set-up in 2008 to advise Federal and State governments, investors and infrastructure owners on a wide range of issues including: Australia's current and future infrastructure needs; mechanisms for financing infrastructure investments; and policy, pricing and regulation and their impacts on investment and on the efficiency of the delivery, operation and use of national infrastructure networks. Infrastructure Australia sponsored the introduction of a tax loss incentive for designated infrastructure projects that came into effect in 2013 and aims to encourage private investment in nationally significant infrastructure by providing eligible entities investing in infrastructure the benefits of tax concessions[24]. These measures are designed to remove impediments in the tax systems that discourage private investment in infrastructure. Access to the tax loss incentive is intended to help support up to AUD25 billion in new private sector infrastructure investment. Infrastructure Australia is developing a national land freight network strategy aimed at achieving an integrated national freight network that will try to focus public and private capital resources on projects of greatest strategic important. Some of the key projects will include railway development projects.

5.6 Application in Mexico

The range of examples is cited not to recommend any particular program but to illustrate that governments can adopt a wide range of different measures to develop the railway system, better integrate railways into logistics supply chains and encourage the transfer of traffic from roads to railways, all compatible with the current structure of regional rail concessions in Mexico. We recommend the Government investigate international experience further for relevance to its own national logistics development policy and consult with rail companies on how their joint interest in increasing the role of railways in land transportation can most effectively be realized.

6. Conclusions

The review team of the International Transport Forum at the OECD concludes as follows:

The performance of Mexico's rail freight system since restructuring in 1995 compares favourably with that of other major railways. Growth in rail freight traffic has been sustained and recovered quickly in the wake of the 2008 financial crisis, returning rapidly to the pre-crisis growth trend in contrast to railways elsewhere where volumes have stagnated. The share of freight carried on rail has grown in relation to that carried by road, rising from 19% to 25% of the combined market in the period since reform. This is in marked contrast to railways in Europe, China, India and Russia where rail freight modal share has fallen.

US railways significantly out-perform Mexican railways in terms of modal share but this is largely accounted for by the exceptionally long average length of haul and the high proportion of "natural" railway traffic (where trucks cannot compete), such as coal, only carried in small quantities in Mexico. Excluding coal and ore traffic, Mexican railways carry roughly the same quantity of freight as Brazil and far more than any other network in Latin America.

Investment in the main railway concessions in Mexico since reform has transformed a declining and unreliable system into a reliable and technologically competent railway, with improved track and signaling systems permitting the use of heavier, more productive trains. The productivity of Ferromex and Kansas City Southern Mexico railways is higher by a large margin than any other general freight rail carrier in Latin America.

Rail freight tariffs are close to those of the world's most efficient railways in the USA and Canada, and once adjusted for traffic mix (excluding coal and ores), Ferromex and KCSM tariffs are almost identical to US Class 1 railway tariffs. Tariffs have risen in the last three years, but have tracked increases in the USA and Canada. Much of the increase is accounted for by fuel price rises and these have been more pronounced in Mexico with the gradual phasing out of fuel subsidies. Mexico has also seen increases in road haulage tariffs in this period.

The railways have been transformed financially, from a system heavily dependent on support from the public budget to a system of financially sustainable concessions operating the main lines that make normal returns on investment.

The reforms adopted in 1995 achieved their objectives of creating the conditions for private investment in the freight railways to drive improvement in productivity and reliability in order to achieve both growth and profitability. The structural model adopted uses a combination of exclusive concessions to preserve incentives for investment with competition to promote efficiency and protect shippers from potential abuse of market power (against an overall background of strong competition from road haulage in almost all markets). Competition operates through key industrial areas being served by lines operated by both main concessions and through access rights for any concession holder to run trains on key parts of the network. The use of access rights has, however, developed more slowly than expected.

The 1995 reforms have produced a railway that provides efficient services on which key sectors of the economy depend. Incentives for both investment and efficiency need to be maintained. Improvements are possible in a number of directions and the potential in following areas should be investigated.

Recommendations of the review team:

Extensions to the network and capacity enhancements (such as rail links to logistics centres, urban by-passes, loading gauge enhancements, grade separations) are likely to show significant socio-economic returns in a number of locations. Where the financial case shows returns insufficient to justify the full amount of investment by concessions themselves there can be a role for government to share investment costs. Examples of practice in a selection of countries are provided in the report.

Investment in relation to safety is a key priority and more generally institutional capacity for safety regulation should be enhanced. Establishment of an independent rail safety agency is recommended.

Institutional capacity to address the pricing and capacity issues associated with trackage rights should be strengthened. This requires the collection of systematic data (analogous to the information routinely collected from Class 1 railways in the USA) in order to inform regulatory determinations in relation to risks, costs and benefits. By contrast, freight tariff regulation carries significant risk of deterring investment. All decisions on rights of access or exclusivity will benefit greatly from the understanding of how competition operates in the market that only this kind of data provides.

Under the terms of the concessions awarded in 1995, the guarantee of exclusive train operation expires for the major concessions in 2027. To minimize the deleterious impact on investment of uncertainty over the post 2027 regulatory regime, consultation with all stakeholders and analysis of the options should start early, so that agreement can be reached well ahead of when the new regulatory arrangements take effect.

Notes

1 See for example World Bank, 2011.

2 Vertical separation was adopted in the European Union as a route to foster competition because the more straightforward route to competition between vertically integrated freight companies is impracticable. Passenger services are the priority user of the infrastructure and creating the economies of scale necessary for competitive freight railways would require merging across national boundaries whereas governments are reluctant to pool ownership of infrastructure.

3 Anuario Estadístico Ferroviario, Dirección de Transporte Ferroviario y Multimodal, SCT 2012.

4 World Economic database, October 2013, www.imf.org

5 AAR 2013.

6 IMF 2013.

7 ANTF 2012.

8 AMF 2011.

9 The average commercial speed of the US Class I Railroads is 33 km/h. STB 2013.

10 SCT 2012.

11 Source as above.

12 Expressed in economists' terms, the railway should add a mark-up to the marginal costs of individual customers to cover fixed costs and overheads in inverse proportion to price elasticity of demand.

13 There is also a case for increasing the independence of the regulatory agency.

14 Ley Reglamentaria Del Servicio Ferroviario, 12 May 1995.

15 Known as Vigencias.

16 Known as Exclusivas.

17 Details of the Fund and the infrastructure that it may support can be accessed at: http://www.tc.gc.ca/eng/policy/acg-acgd-menu-infrastructure-2170.htm

18 Details of which can be found at: http://ec.europa.eu/transport/marcopolo/

19 More details can be found at: http://www.bmvi.de/DE/VerkehrUndMobilitaet

20 Details on the grants and how they are accessed at:
http://www.transportscotland.gov.uk/road/policy/freight/Freight-Grants

21 See http://www.intermodal.com/index.cfm/todays-intermodal/

22 See http://www.bnsf.com/media/news-releases/2013/october/2013-10-22a.html

23 See http://www.winsway.com/html/bus_transport.php

24 More information at: http://www.infrastructureaustralia.gov.au/

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