



# Establishing Mexico's Regulatory Agency for Rail Transport

Peer Review of Regulatory Capacity



Case-Specific Policy Analysis

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## Glossary

<b>AAR</b>	American Association of Railroads
<b>AMF</b>	Asociación Mexicana de Ferrocarriles
<b>ARTF</b>	Agencia Reguladora del Transporte Ferroviario de Mexico
<b>COFECE</b>	Federal Competition Commission, Mexico (formerly CFC)
<b>CLR</b>	Competitive line rate
<b>CMP</b>	Constrained market pricing
<b>CN</b>	Canadian National railway
<b>CP</b>	Canadian Pacific railway
<b>CTA</b>	Canadian Transportation Agency
<b>DoJ</b>	US Department of Justice
<b>EU</b>	European Union
<b>FCCM</b>	Ferrocarriles Chiapas-Mayab
<b>FMN</b>	Ferrocarriles Nacionales de Mexico
<b>FRA</b>	US Federal Railroad Administration
<b>FY</b>	Financial year
<b>ICC</b>	Interstate Commerce Commission
<b>ITF</b>	International Transport Forum
<b>KCSM</b>	Kansas City Southern de Mexico
<b>MP&amp;E</b>	Motive power and equipment
<b>NIP</b>	National Inspection Plan
<b>NTSB</b>	US National Transportation Safety Board
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>OP</b>	Operating practice
<b>RA</b>	Regional Administrator
<b>RAC</b>	Railway Association of Canada
<b>RSAC</b>	US Railroad Safety Advisory Committee
<b>SAC</b>	Stand-alone costs
<b>S&amp;TC</b>	Signal and train control systems
<b>SCT</b>	Ministry of Transport and Communication, Mexico
<b>SEC</b>	US Securities and Exchange Commission
<b>STB</b>	US Surface Transportation Board
<b>TFM</b>	Transportación Ferroviaria Mexicana
<b>TFVM</b>	Transportación Ferroviaria del Valle de Mexico
<b>URCS</b>	US STB Uniform Rail Cost System
<b>USC</b>	US Code of Federal Regulations

*Note:* In this report the term tons means metric tons unless otherwise specified

## Executive summary

### Background

Mexico's highly efficient freight railways are operated by privately owned concessions. The system adopted for the concessions by the 1995 Railway Law provides exclusive rights to manage vertically integrated track and train companies over specified sections of the network and was designed to create competition between the companies in key markets. Competition is provided for in several ways; through parallel tracks, through alternate routes and through rights to use each other's tracks on specific sections of the network.

Overall the system has worked well but a deficit in regulatory capacity in government has proved an obstacle to settling disputes over the use of trackage rights and, in some markets, disputes over the access conditions for certain shippers. The Railway Law was amended in January 2015 to address this shortcoming through measures that include establishment of a new Agency for the Regulation of Rail Transport (ARTF). In this report, preparations for the establishment of the new rail regulatory agency are reviewed and compared to comparable regulatory arrangements in other OECD countries to ensure effective implementation of the new institutional arrangements.

### Findings

The key to the success of the new agency will be its capacity, in terms of economic expertise, to make judgements on issues of access to rail services. To be robust to legal challenge, the decisions of the agency will need to be well-argued in economic terms and effectively communicated to provide all parties concerned, including the courts, with the confidence that judgements are sound. The agency will need resourcing sufficient for this task.

### Recommendations

#### **Any reform of the rail concessioning system must preserve the current high level of performance**

Under the concessioning system adopted in 1995, the performance of freight railways in Mexico has become world class in terms of both efficiency and profitability. Tariffs are essentially equal to those in the United States once average US tariffs are adjusted to account for the extremely low rates charged for coal (which accounts for a large share of traffic in the United States and only a very small share of traffic in Mexico). Any reform of the concessioning system should recognise this and aim to preserve the conditions that have fostered this overall result whilst seeking to improve performance in any specific areas identified as clearly deficient.

#### **Accept price discrimination to ensure efficiency, with the regulatory agency to adjudicate what prices are reasonable**

Price discrimination in the form of Ramsey Pricing, also known as "value pricing", should be accepted as a cornerstone of efficiency. This means charging shippers according to the ability of their traffic to contribute to the fixed costs of the system over and above the marginal costs of carrying the

traffic, to the extent that business is not priced off the railway. Trying to impose uniform tariffs or an arbitrary average contribution to fixed costs would seriously undermine efficiency. Regulatory intervention to protect competition should be focused on ensuring that railways do not set prices to make unreasonably high returns over total costs or set unreasonably high rates for any particular shipper. Making such determinations is challenging.

### **Focus regulation on cases where effective competition does not already exist**

Both the US and Canadian governments have adopted an approach to regulation that accepts Ramsey Pricing and confines regulatory effort to focusing on markets at risk. In the United States, 90% of rail traffic, including any traffic where road provides a viable alternative, is outside the scope of regulatory intervention. In general, Mexican railway concessions face more competition from trucking than US or Canadian railways. This narrows the range of situations in which there is likely to be no effective competition. The revised Railway Law rightly centres on identifying cases where effective competition does not exist, relying on the expertise of the competition authority, COFECE, to confirm where such conditions prevail.

### **Collect adequate financial and operating data on the rail companies as the basis for effective regulatory decisions**

In the United States, the regulatory focus is to limit abuse of market power in circumstances where it can be shown to exist. Rates may be prescribed for the carriage of specific traffic if the price offered is found to exceed “revenue adequacy” and if three other conditions are satisfied: a demonstrated absence of competition from rail, road or barges; revenues from a proposed rate exceed 180% of variable costs attributable to the traffic; and the proposed rate exceeds the stand-alone cost (which is the theoretical cost of creating an entirely separate railway to serve the shipper). These tests set a high hurdle and require a lot of data. The basic data needed is provided through obligatory annual submissions of financial and operating statistics; additional data may be collected depending on the specific issues under examination in a proceeding. The Canadian regulator collects similar data in support of its decisions, although it does not make it public. COFECE’s ability to measure effective competition and the regulatory agency’s ability to prescribe a response will be limited unless they possess equivalent information on Mexican conditions. A set of Mexican information requirements derived from US and Canadian reporting requirements (eliminating excessive detail not relevant to Mexico) will be fully within the capabilities of the concession holders to provide.

### **Consider cutting the cost of regulation by including an arbitration mechanism in any further regulatory reform**

Arbitration can cut the cost of regulation. Under final offer arbitration, as practiced in Canada, a shipper dissatisfied with the rates offered by a railway can ask for the dispute to be arbitrated. Both railway and shipper must submit proposals along with supporting documentation. After examining if the shipper has viable alternative transport options, the arbitrator must choose between the proposals in a binding and final decision without having to provide reasons. This provides the incentive for both sides to make proposals that are reasonable and likely to be accepted by the arbitrator. The system transfers much of the burden in terms of data and analysis, and hence costs, from the regulator to the parties to the dispute. This approach might be an attractive option for Mexico, at least until the regulatory agency has accumulated enough data and expertise. However, an additional explicit provision in the Railway Law might be required to make final offers binding and immune from appeal in the courts in Mexico.

**Consider inter-switching rules in any further regulatory reform**

Canadian law also provides for regulated inter-switching. Under an inter-switching provision, a shipper has the right to require a railway to haul its traffic to a competing railway inter-switching point if it is less than 30 kilometres away (either at origin or destination, or both). This movement is subject to rates prescribed by regulation, which must at least cover the variable costs of the movement. The potential value of this kind of intervention might be examined in Mexico in any future amendment to the Railway Law.

**Interchange traffic rights should not be expected to be used for shippers to specify routes**

In both the United States and Canada, if a railway cannot provide end-to-end service it must agree to interchange traffic with a railway that can deliver to the final destination. Railways often require such traffic to be billed separately so that information on what is being charged is not disclosed to other railways. Mexico's amended Railway Law introduces a similar provision, extending the right to require separate tariffs also to shippers. This may increase the options available to shippers but does not confer the right to select the route over which goods will be carried. The same is true in the United States. Disputes over the rates offered will have to be arbitrated by the regulatory agency.

**Resource the new regulator with sufficient expertise to convince the courts that its decisions are sound**

The US and Canadian regulatory agencies charged with the functions of Mexico's new railway agency (the Surface Transportation Board and the Canadian Transportation Agency) dispose of annual budgets of USD 31 million and USD 4 million respectively for rail sector duties. They have staff of 140 and around 45 respectively, including attorneys, economists, engineers, accountants and administrators. Mexico's new regulator will require similar breadth and depth of expertise and funding commensurate with its task. Some of the cost associated with the data-intensive and highly adversarial nature of US regulation might be avoided, but a full range of skills will be required. Persuading judges of the soundness of the agency's determinations will require sufficient effort, in terms of communication as well as analysis, if decisions are to stand when challenged in court, particularly on constitutional grounds against confiscation of property rights.



## Chapter 1. Introduction

Freight railways in Mexico are operated by privately owned concessions governed by the 1995 Railway Law (Ley Reglamentaria del Servicio Ferroviario), amended in January 2015.<sup>1</sup> The concessions were designed to create competition between vertically integrated railroads in key markets through parallel tracks, through alternative routes from ports and borders to key markets, and through the designation of trackage rights on certain sections of line. The concessions were designed to be commercially viable and run as profitable businesses. In part the design reflected a decision to maximize the prices achieved for sale of the concessions. The system has worked very well overall but the main rail companies failed to agree on conditions for the use of trackage rights on a voluntary basis and the Ministry of Transport and Communication (SCT) lacked the regulatory expertise necessary to impose conditions for access in the way foreseen under the 1995 law. Some of the unresolved requests for access were eventually agreed in order to facilitate acquisition by Grupo Mexico of a second major rail concession in 2011. Others remain outstanding and shippers, particularly in the steel, minerals and cereals markets, contest rates where they have access to service by only one rail company.

The 2015 amendment to the Railway Law requires SCT to establish a regulatory agency to create the economic regulatory capacity to resolve rate and service disputes and establish conditions for access in the exercise of the trackage rights where concessions are unable to agree conditions voluntarily.

On May 12 and 13, 2015, the Ministry of Communications and Transport of Mexico and the International Transport Forum (ITF) at the OECD convened a conference in Mexico City on rail regulatory issues and regulatory capacity. The purpose of the conference was to review preparations for the establishment of the new rail regulatory agency, the Agencia Reguladora del Transporte Ferroviario de Mexico (ARTF), and implementation of the revised railway law with a view to ensuring effective implementation of the new institutional arrangements.

The conference was organised around a series of presentations by Mexican officials and US and Canadian experts on economic and safety regulation in railways. The conference was opened by Guillermo Nevarez, Director General for Rail and Multimodal Transport of SCT who laid out the general issues as seen by SCT. One set of questions dealt with regulatory duties: 1) conditions for use of access rights; 2) tariffs in the absence of effective competition; 3) settling disputes between shippers and concession holders; and, 4) safety oversight. The other set of questions dealt with the expertise and human resources required and with the analysis and data reporting requirements for rail regulation outside Mexico.

The experts covered a number of topics:

- William J. Brennan, Deputy Director of the Office of Economics, US Surface Transportation Board (STB) discussed issues in US rail regulation, including constrained market pricing and data collected or reported to the STB.
- Russell Pittman, Director of Economic Research, Antitrust Division of the US Department of Justice (US DoJ) discussed approaches for protecting “captive shippers” within the framework of the US Staggers Act of 1980.

- Ghislain Blanchard, Director General of Industry Determination and Analysis, Canadian Transportation Agency (CTA) discussed the CTA's role in regulation of the Canadian Rail Transport Network.
- Louis S. (Lou) Thompson, Principal, Thompson, Galenson and Associates, discussed challenges in implementing rail regulation in Mexico in the context of the similarities and differences between the US and Canadian approaches to regulating competition and the conditions specific to Mexico, as well as experience elsewhere in the world.
- Victor Aragonés, Staff Director, Safety Regulatory Analysis Division, Federal Railroad Administration (FRA), US Department of Transportation (US DoT), discussed the development and implementation of rail safety regulations in the US and the role of the FRA and US DoT in setting overall rail and transport policy.

### Note

1. Ley Reglamentaria del Servicio Ferroviario, January, 2015, [http://www.diputados.gob.mx/LeyesBiblio/pdf/209\\_260115.pdf](http://www.diputados.gob.mx/LeyesBiblio/pdf/209_260115.pdf)

## Chapter 2. Current organisation of the Mexican rail industry

Railroads in Mexico have a long history, originally rooted in serving mining and industrial traffic by various private rail ventures, then nationalized in a general movement in the country of bringing what were seen as critical activities under the control of the state. By the early 1990s, Mexico was experiencing a railroad problem similar to other major countries in Latin America: the national railway, Ferrocarriles Nacionales de México (FNM or Ferronales) offered poor service, was not highly productive and had a deficit of more than a half-billion US dollars annually.

The government's response was similar to that followed in Argentina and Brazil – break the railway into separate pieces and offer them as concessions to be operated by the private sector. Planning for concessioning began in 1995 with passage of the Law on the regulation of rail services<sup>1</sup> and concessions were awarded between 1996 and 1999. Transfer to new operators began in 1997 and was completed in 1999. Three major concessions were awarded (TFM, now Kansas City Southern de Mexico (KCSM), Ferromex and Ferrosur) along with a number of smaller concessions (including FCCM, Coahuila-Durango and Tijuana-Tecate). For these concessions the government received compensation of approximately USD 3 billion (2014 prices). Access to Mexico City is provided by a neutral track access and terminal company (TFVM), jointly owned by KCSM, Ferromex, Ferrosur and the government that also accommodates a commuter passenger operator.

The government explicitly sought to generate revenue from selling the concessions. As a consequence, the concessions were offered with mostly exclusive rights to serve their territories, with only some well-defined and limited exceptions where concessions were required to negotiate conditions for access by another concession. The most important of these access rights were for KCSM to use Ferromex tracks from Mariscal (near Queretaro) to Guadalajara (Mexico's second city) and Ferromex access to KCSM's Viborillas to Ramos Arizpe segment on the main line north to the industrial and commercial centres of Saltillo and Monterrey. Negotiations over implementation of these rights were protracted and were not settled until 2011.

In 2002, Grupo Mexico, owner of Ferromex, proposed to acquire Ferrosur but the take-over was rejected by the Federal Competition Commission (then CFC, now COFECE). In 2005, Grupo Mexico purchased Ferrosur for USD 300 million, but the acquisition was opposed by KCSM and COFECE rejected the purchase in 2006. The decision was appealed and the acquisition was permitted to go ahead by a Tribunal in 2011, with Ferromex and KCSM agreeing to terms for the exercise of access rights on critical sections of track to pave the way for approval. During the same period, KCSM was permitted to buy out the other investors in the old TFM and is now the primary owner. As a result, Mexico now effectively has two large rail concessions – KCSM and Ferromex/Ferrosur – along with the remaining small concessions.

## Note

1. Ley Reglamentaria del Servicio Ferroviario, May 1995, <http://www.sct.gob.mx/informacion-general/normatividad/transporte-ferroviario-y-multimodal/leyes-federales/>.

## Chapter 3. Defining the purpose of regulatory change: Developments after implementing the concessions

In short, the concessioning system has worked well. Since transfer to private operators in 1998, rail tonne-kilometres have grown by over 50 percent, faster than Mexican GDP (up 45 percent) or US Class I freight railways (up 26 percent) (Figure 3.1). Traffic density has grown in line with traffic and labour productivity is over six times higher. By a rough estimate, average Mexican rail freight costs have fallen by about 20 percent since concessioning (Figure 3.2). Along with the US and Canada, Mexican average rail freight tariffs are among the very lowest in the world. Significantly, if the US average tariffs are adjusted for the extremely low rates charged for coal, the Mexican tariffs and the US tariffs would be essentially equal. Earnings data filed by Ferromex and KCSM with the US Association of American Railroads (AAR) indicate that the performance of the Mexican concessions falls within the range of US and Canadian Class I freight railroads (Table 3.1). Without question, the Mexican concessions have become world class performers.

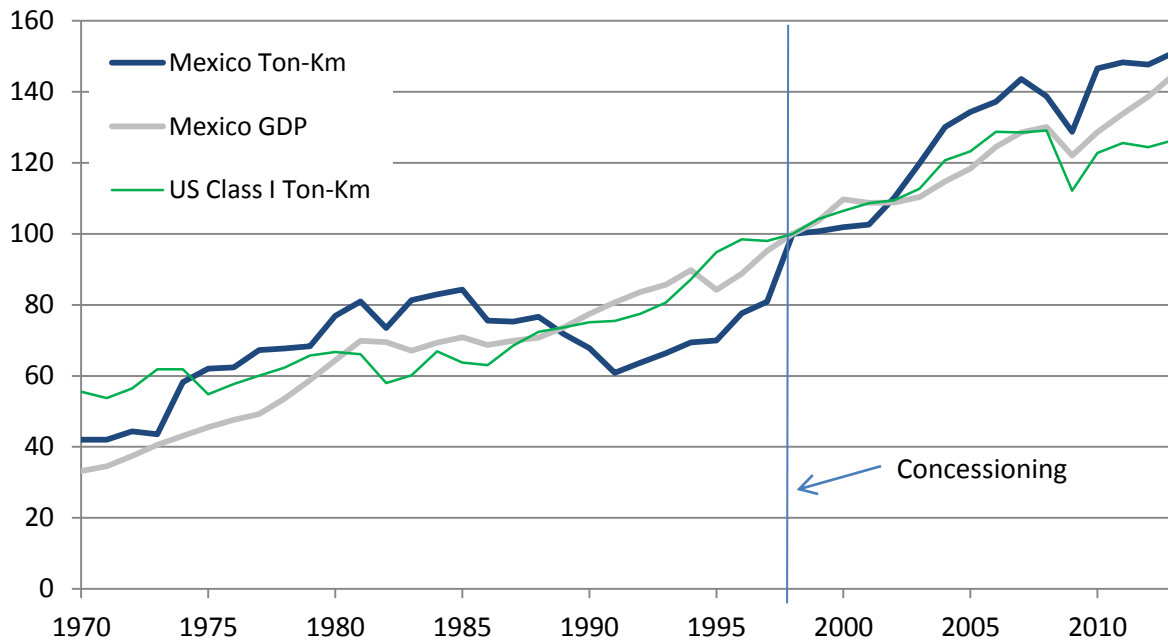
Table 3.1. **Operating ratios of AAR members**

<b>Class I average</b>	<b>70.8</b>
<b>CN</b>	63.3
<b>KCSM</b>	64.0
<b>GTW</b>	65.4
<b>UP</b>	67.3
<b>BNSF</b>	70.2
<b>SOO</b>	70.6
<b>NS</b>	73.0
<b>KCS</b>	74.2
<b>Ferromex</b>	75.4
<b>CP</b>	76.9
<b>CSX</b>	77.3

*Note:* Operating ratio is the ratio of operating expenses to operating revenues.

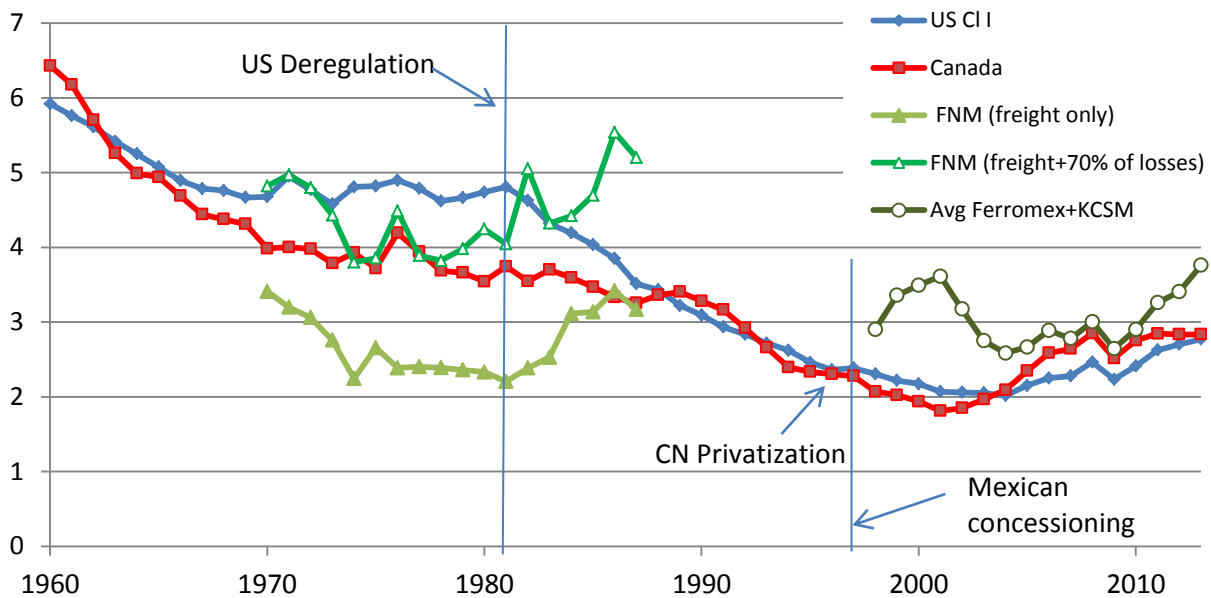
*Source:* AAR, "Railroad Facts, 2014 edition, pages 69-81.

Figure 3.1. Mexico: Rail tonne-km vs GDP (index 1998=100)



Source: STB, Statistics of Class I Railroads, various years; and SCT, Anuario Estadístico 2013.

Figure 3.2. Average rail freight tariffs (2012 US cents/tonne-km)



Note: Ferronacionales Nacionales de Mexico (FNM) was composed of three railways: Nacionales de Mexico (NdeM), Chihuahua al Pacifico (Chepe) and Ferrocarril del Pacifico (Fdelp). The data reported here is for NdeM only but representative of FNM given the small scale of Fdelp and Chepe operations.

Source: ITF, *Freight Railway Development in Mexico*, 2014, corrected and updated.

Within the good overall performance picture there have been issues with the concessions. In some cases, individual shippers have complained about service levels and tariffs. The concessions took too long to negotiate the track-age rights established in the original concession agreements and there has been a long-standing concern that the degree of implementation of those rights has been less than the government expected when the concessions were awarded. Thus, even though the performance of the concessions appears to be well within the bounds of excellence overall, it is valid to ask whether there are individual cases of abuse that deserve regulatory attention and whether the concessionaires have truly lived up to all of their commitments under the terms of their concession. As discussed in detail below, both US and Canadian regulators review the performance of their carriers and are also mandated under their respective legislation to administer measures aimed at addressing the possibility of abuse of market power in individual cases.

### The revised regulatory law

A series of revisions to the original 1995 rail regulatory law were adopted in 2014 resulting in publication of an amended law in January 2015. The conference did not attempt to review all of its provisions but focused on Articles 35, 36, 36 bis, 36 ter, 46 and 47, which deal with issues of interconnection and issues of tariff setting.

- Article 35 requires that concessionaires provide to other concessionaires interconnection, haulage and terminal services in return for agreed compensation. If negotiations between the concessionaires are not successful within 60 days, ARTF must hear the arguments of the parties and then within 30 days determine the conditions and compensation. The basis for the terms should be “internationally recognized criteria and principles.” ARTF may (but is not required to) consult with COFECE. It deserves emphasis that “internationally recognized criteria and principles” may not exist as such. Compensation could range from variable cost in some cases up to stand alone cost in other cases and setting compensation is, as the discussions showed, a continuing challenge for regulators.
- Article 36 requires concessions to allow interconnections for the exercise of mandatory trackage rights that are: 1) established under the original concession titles; 2) mutually agreed among concessionaires; or, 3) mandated by ARTF if (and only if) COFECE has previously determined that there is a lack of effective competition. For this third case it establishes a two-step process wherein COFECE first determines a lack of effective competition and ARTF determines the remedy.
- Article 36 bis provides that once COFECE makes a finding of a lack of effective competition ARTF must hear the parties and set terms and conditions for mandated trackage rights within 30 days. In prescribing conditions for trackage rights, ARTF must consider “internationally recognized criteria and principles for trackage rights,” and it may consult with COFECE in doing so. ARTF is not required to consult with COFECE on the remedy, if it thinks there should be a remedy, but may do so.
- Article 36 ter provides that if a service requested by a user involves a route involving more than one concessionaire, “the user shall have the right to choose either to agree an independent tariff with each concessionaire on its respective stretch or to agree a tariff for the whole route with the concessionaire of the track at either the origin or destination point.” This article appears similar to a provision of US regulation (Rule 11 rates) and Canadian regulation, giving a shipper the

right to demand joint service when one carrier cannot provide the entire service. It does not appear to give the user the right to demand a specific route (the situation is the same in the USA). Unlike the US rule it only appears to give rights to shippers. In the US the railroads can also demand a Rule 11 rate in order to keep charges secret from the other carrier.

- Article 46 provides that concessionaires shall file maximum tariffs with ARTF and published by electronic means. Mutually agreed tariffs (lower than the maximum tariffs) are not public, but must be made available to ARTF upon request. ARTF may issue recommendations with respect to any changes and may seek the opinion of COFECE in making its recommendations.
- Article 47 provides that when COFECE makes a determination that there is an absence of effective competition ARTF should determine the basis for regulated tariffs, at its own initiative or at the request of an affected party. Within 30 days of COFECE's determination ARTF must arrange a hearing of the affected parties and establish a tariff and conditions for service.

These six articles establish the circumstances in which ARTF is responsible for setting tariffs and conditions of service and the role of COFECE in identifying circumstances where there is a lack of effective competition and a regulated tariff should be determined. ARTF has the responsibility of setting the tariff rate and the conditions of service that it judges consistent with its duty of ensuring efficient connectivity.

The challenge posed to the discussants was how to ensure effective implementation of the law's broad objectives, drawing on the experience of addressing similar issues in the US, Canada and elsewhere. The major points, discussed in detail below, were as follows.

The existing relationship between government and concessionaires is contractual rather than regulatory. In applying the amendments to the law on railway services, contract rights will need to be respected (or renegotiated) in accord with Mexican law. It is important to emphasise that the concessioning process in Mexico created a market and competitive structure that formed the basis of the bid values. Changing that now without compensation in some form could potentially, depending on the significance of the proposed changes, have a major impact on the business of the concessions and might trigger serious legal challenges.

The basic economic characteristic of railways (relatively high fixed costs, and relatively low marginal costs) tend to force concentration rather than atomisation of competition, and the need to recover fixed costs naturally (and correctly) leads to some form of "Ramsey pricing" where shippers pay rates that reflect in part their elasticity of demand.<sup>1</sup>

Because the Mexican, Canadian and US railways form a network operating across borders and ownership also crosses boundaries, there are opportunities for Mexican regulators to benefit from the familiarity of Mexican concessionaires with regulatory compliance structures and reporting requirements elsewhere in North America.

The structure and roles of the Mexican, US and Canadian rail systems differ in a number of significant ways that should be reflected in the approach to what is regulated and in the relative emphasis of regulatory intervention.

## The impact of a distinct Mexican rail industry structure

Mexican railways are operated by concessions awarded by contract while the US and Canada have privately owned and operated vertically integrated railroads. This can be a critical difference for two reasons. The competitive structure and the initial tariff structure of the Mexican system were defined in the concession contracts, including rights of exclusive operation over the network except where trackage rights were defined in the original contracts. The concessionaires paid nearly USD 3 billion for those rights. A significant change in access rights might become a matter of negotiation and compensation and not solely regulation. Understanding the limitations that the contractual right negotiated with the government place on the ability to regulate railway behaviour is a critical consideration in the implementation of the regulatory regime in Mexico.

In addition, the asset structure of a concession is different from that of a vertically integrated railroad because the concessionaire does not carry the value of the infrastructure on its books (though it will carry the value of the purchase price of the concession). This may well change the way in which costs are calculated.

US and Canadian regulators have no contracts with specific definition of the rights of the railroads and can implement regulatory remedies independently of any such considerations. Mexican regulation will have to strike a balance between enforcing contract rights and obligations and the ability to regulate behaviour on other grounds.

### Defining effective competition

The revised law centres on identifying cases where “effective competition” does not exist. The primary tools to be used to achieve enhanced competition where existing competition is not effective are mandatory trackage rights and/or mandated interconnection at points where carriers do not currently exchange traffic (Article 35 and 36). The ARTF would have the right to set access terms if the carriers cannot agree among themselves as to the terms of compensation. As discussed above, these tools are closer to those relied on in Canada than the US but the underlying issues are very similar.

The revised law provides for a two-step process wherein a shipper (or ARTF) applies to COFECE for a finding that no effective competition exists. If (and only if) COFECE finds that no effective competition exists, then ARTF may undertake a proceeding to develop competitive access, either through the use of trackage rights or enhanced interconnections. COFECE also has jurisdiction over rail mergers.

This differs from the US case where the STB enjoys essentially total control over proceedings covering both rail mergers and determination of effective competition. The US DoJ can, of course, appear at any STB proceeding on its own initiative, but its arguments do not necessarily decide the issue. In Canada, CTA also has the ability to adjudicate issues where more competitive access is requested. Specifically, CTA can determine running rights (which appear to correspond more or less to the trackage rights contemplated in Mexico, but have not been used outside of commercial agreements) and competitive line or inter-switching rates (which appear to correspond to the mandated interconnection points).

Mexico has adopted a two-step process for addressing issues of effective competition, relying on the expertise of COFECE, which is responsible for assessing issues of effective competition in most sectors of the economy. ARTF should benefit from this support as it builds capacity but it will be worth assessing how the separated process works after a year or so to see if it creates unnecessary delays or any duplication of responsibilities.

### Box 3.1. Ramsey Pricing

“Ramsey Pricing” was first formulated by economist Frank Ramsey in 1927. Although the formal definition of Ramsey Pricing is complex, applying the concept to railway tariff-making is simple. A railway marketing manager knows that the railway has high fixed costs that do not vary with operations – e.g. track investment, locomotive investment, management, etc. At the same time, the railway usually also has very low incremental costs for any particular activity. For example, adding an extra wagonload, or an extra train, adds very little to total costs. This poses an interesting problem: how to set prices so that the **variable costs** (economists would say marginal costs) are recovered on each piece of traffic and, added across all traffic, the **total fixed costs** (including return on investment) are also recovered. While it clearly makes no sense to charge less than variable costs for any movement, how should the manager decide what share of the fixed costs should be recovered from any specific piece of traffic?

The manager is keenly aware that in a market economy like Mexico there is both intermodal competition (from trucking, shipping, and barges) and intra-modal competition (from other railways) and that some commodities can only pay low rates because the value of the commodity is low (sand and gravel, coal) while other commodities (automobiles or steel) can pay higher rates. This means that there is an infinite range of pricing questions depending on commodity type, shipper location, service requirements, etc.

The manager could charge each shipment its short-run variable costs. This would please the shipper but the rail company would go broke because it must cover its full costs. The manager could charge each shipment variable costs plus an averaged part of fixed costs allocated on an arbitrary basis such as percentage of tonnes or tonne-km. The result would be that those shippers who can only pay a small amount over variable costs would no longer use rail, and the shippers that remained would have to pay even more if total fixed costs are to be recovered. Having lost the low value shippers, recovering all the fixed costs from the remainder of the shippers would then price more shippers out of rail service and the railway would lose even more business.

Put another way, an attempt to charge a higher-tariff shipper less than the amount the shipper could pay may imply charging another shipper more, and that would suppress traffic that could otherwise carry some portion of fixed costs. A better way (Ramsey Pricing) is to charge each shipper a mark-up over variable cost that varies with (is inversely proportional to) the shipper’s responsiveness to a higher tariff. If the shipper is sensitive to a price above variable cost, the shipper pays a small markup. If the shipper is not sensitive to higher prices (for whatever reason), the markup is higher. The overall result is: 1) no traffic is priced off the railway as long as it can pay at least its variable costs; 2) each shipper’s traffic makes the greatest contribution it can (and should) to fixed costs but without being priced out of rail service; and 3) the railway collects its fixed costs in the most efficient way for the railway and for the economy. It is critical to understand that this price “discrimination” works both ways: there is exactly as much discrimination in favour of lower tariff shippers as there is against higher tariff shippers, and the railway, shippers and the economy are all better off. Some shippers would, of course, prefer to pay less, but that would actually be harmful to the overall economic performance of the railway and the economy. To avoid the pejorative connotations of discrimination the term “value-pricing” is often employed.

Clearly, misallocation of fixed costs using arbitrary averages will not work or, at least, both the railway and many of the people who should be using the railway will lose (and so will the economy since transportation costs will be higher than they need to be). Attempts to equalize tariffs for apparently similar shipments have the same detrimental effect of distorting the contribution that each shipment should be making to fixed costs. There are two *caveats*. First, the railway should not set prices so as to recover significantly more than its total costs and it should not set an unreasonably high tariff for any particular shipper. The challenge of regulation in the US and Canada<sup>2</sup>, and in Mexico, is to ensure that these two tests are met – total revenues are adequate (but not too high) to cover total costs and no individual shipper faces unreasonably high tariffs due to market power exercised by the railway. When these tests are met, Ramsey Pricing is the most efficient approach and, most would argue, also the fairest when all shippers are considered. In applying these tests tariffs must be compared with costs. Railway tariffs vary widely because costs also are quite different for different movements and commodities. It is not possible to regulate knowing only the proposed tariff: the related costs must also be known.

## Notes

1. Ramsey pricing” is a term used to describe a discriminatory but efficient pricing system that can be used by firms with high fixed costs and low variable costs to achieve financial sustainability. For any particular service, it is rational for the firm to lower its prices as far toward variable (or marginal) costs as competitive conditions require. Pricing all services close to variable costs would obviously not permit recovery of fixed costs. Such firms recover their full fixed costs by charging each service or customer a rate that is as far above variable cost as possible, which generally depends on the customer’s price elasticity of demand. Summed over the full set of customers, the contributions to fixed costs should be sufficient to recover total fixed costs.
2. Note that Canada has no revenue adequacy test but relies on a series of shipper protection measures that are aimed at balancing the relationships between shippers and railways.

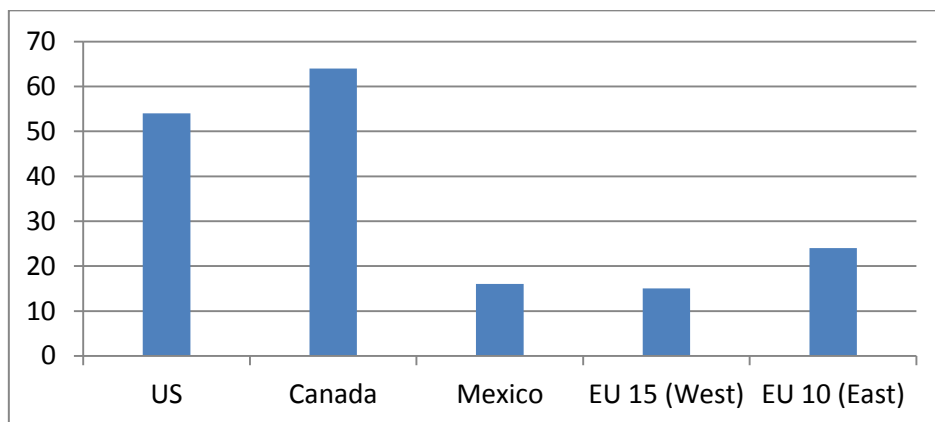


## Chapter 4. Issues and potential approaches to regulation

The group discussions focused on defining in detail the problem the legislation is intended to address. Because the US and Canadian approaches are rooted in their respective histories and economic conditions, neither can be directly translated into Mexican practice.

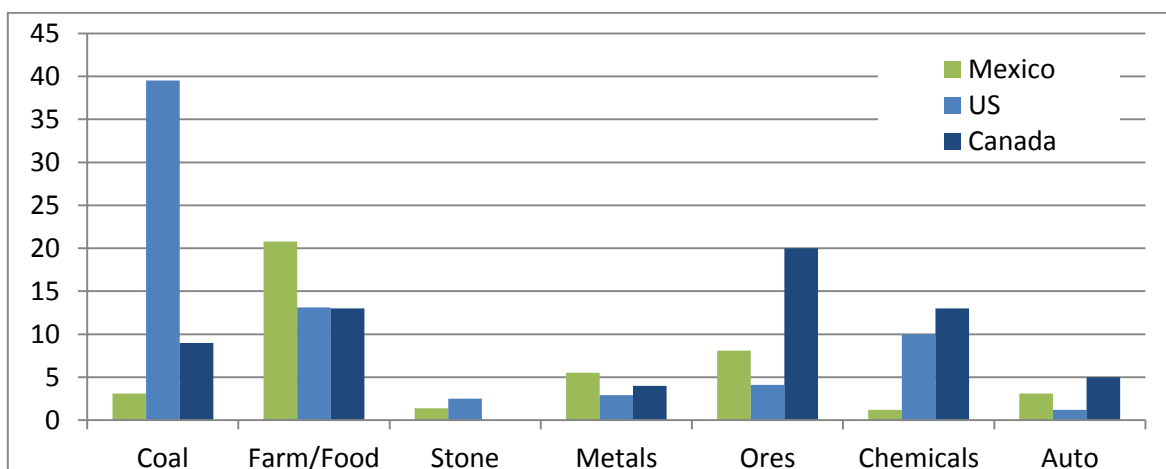
A primary difference is that the existing modal balance in Mexico is much more heavily weighted toward trucks than in the US and Canada. (Figure 4.1) This means that, across the board, the Mexican concessions face more truck competition than US or Canadian railways, immediately narrowing the range of situations in which there is likely to be no effective competition. The mix of commodities in Mexico is much more susceptible to truck competition than in the US or Canada. (Figure 4.2) For these reasons, the approach and emphasis in regulation will inherently be different in Mexico because the initial presumption of effective competition might be even more valid in Mexico than the US or Canada.

Figure 4.1. Rail share of rail + truck ton-km (%)



Source: AAR, Railroad Facts, 2014; RAC, Rail Trends, 2014; SCT, Anuario Estadístico; ITF, Transport Statistics.

Figure 4.2. Rail commodity distribution



*Note:* Mexico and US are % of tones, Canada is % of carloads.

*Source:* STB, Statistics of Class I Railroads; RAC, Rail Trends 2014; and SCT, Anuario Estadístico 2013.

A critical question is the degree to which Mexico will follow the US and Canadian regulators in emphasizing the implications of relatively high fixed costs and low marginal costs. If railways are to recover their fixed costs they must be able to charge tariffs that, in total, depart sufficiently from marginal costs to generate the difference between marginal and fixed costs. This has resulted in a Ramsey pricing approach to rail tariffs in the US and Canada, which means that every shipper pays prices that are as far above marginal costs as its price elasticity of demand permits (limited by the potential for regulators to intervene to prevent abuse of market power and undue discrimination for non-market reasons). This is often a difficult approach to explain to elected officials and (especially) shippers, but it is universally recognized to lead to efficient prices if it is implemented effectively and without undue discrimination.

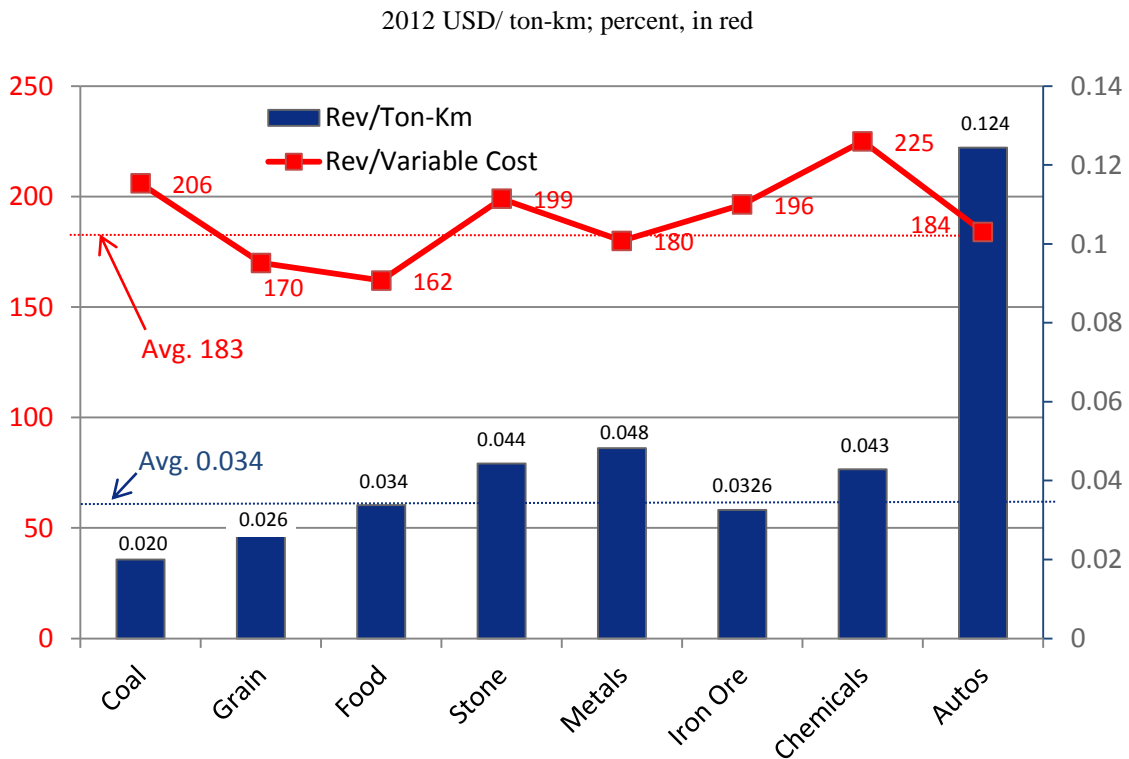
It might appear that the European Union approach of separating train operations from infrastructure management to foster competition among operators, and charging train operators regulated user charges for track access offers an alternative. Indeed, this approach has been considered in Mexico. Unfortunately, such an access charging regime works best if the government pays all fixed costs and the infrastructure operator only recovers marginal costs from operators (this is the recommended policy of the European Commission for freight operations). As soon as governments have added an objective that their infrastructure providers recover some part (or all) of fixed costs from operators, which is permitted under the European Union rules, the problem of developing acceptable and efficient access charges has proven to be as difficult as regulation of Ramsey pricing on integrated railways.

US regulation accepts Ramsey pricing and focuses instead on identifying and rectifying cases in which market power has been abused. US law and related regulations contain reasonably detailed definitions of what might constitute abuse: total revenues that are more than those required to recover costs including a reasonable return on investment; prices for a shipment that exceed stand-alone costs; a revenue to marginal cost ratio greater than 180 %; inefficient operating costs; or abrupt changes in tariffs that would cause disruption. The US definition of effective competition combined with exemptions from any regulation for contract rates and exempt services means that only about 10 percent of traffic is even eligible for regulation. The US approach has led to a wide range of average tariffs by commodity and of ratios of revenue to variable cost. (Figure 4.3)

Canadian regulation has a less clearly defined set of parameters for delimiting the circumstances in which tariffs can be regulated, but the governing concept is roughly the same. Under the Canadian National Transportation Policy, competition and market forces, both within and among the various modes of transportation, are the prime agents for ensuring viable and effective transportation services. Regulation and strategic public intervention are used to achieve economic, safety, security, environmental or social outcomes that cannot be achieved by competition and market forces alone. These forms of intervention should not unduly favour, or reduce the inherent advantages of any particular mode of transportation. Canadian regulatory remedies (inter-switching, final offer arbitration, level of service adjudication and arbitration) are available independently of the financial health of rail carriers and are fundamentally designed to provide shippers with additional leverage in their negotiations with railways or with more competitive rail options.

The tools of intervention are also somewhat different in the US and Canada, at least in emphasis. The STB usually reacts only to issues that are brought before it by a complainant (STB is only rarely proactive) and prescribes rates as a remedy. As in the US, CTA also essentially acts mostly on complaints, however, a significant portion of the disputes brought forward to the Agency are resolved by mediation or arbitration, not by adjudication.

Figure 4.3. US freight railway tariff structure and revenue-to-variable-cost ratio



Source: Calculation by Lou Thompson based on STB, *Public Access Carload Waybill Sample*.

### Implications of the 30 year transition point in the Mexican concessions.

The Mexican concessions contain a provision that could modify the exclusive territorial service rights of the concessions at end of the 30<sup>th</sup> year. The presumption is, as with concessions awarded by government in other sectors of the Mexican economy, that the concessions will be renewed under existing conditions if the concession holders so wish. Nevertheless, the 30 year mark is a break point in the existing concession system and the natural point at which to make any further changes to law regulating railway services.

Experience in Canada and in the European Union suggests that the industry might react to any change in service exclusivity with a distinct lack of enthusiasm. Left alone, the concessions are likely to be very slow in “invading each other’s territory” as, indeed they have been slow in implementing the originally required track age rights. Experience also suggests that the ARTF will be faced with an extremely difficult and contentious set of issues if it attempts to enforce a system-wide, or concession-wide, set of access charges for exactly the same reason that it has been difficult in the European Union; notably the fact that any recovery of fixed costs in access charges opens up the same Ramsey pricing issues that tariff-setting raises. The ARTF might initially prefer to continue a case-by-case approach of setting access rights and charges, but shippers are likely to force the pace of opening competitive access.

The 30<sup>th</sup> year of the concessions will be in 2027, only 12 years away, and 12 years is a very short time in transport planning terms. Given that rail asset lives are usually quite long, the concessions are already encountering asset life and investment issues that extend well beyond the break point. Not only does the ARTF face a short-term set of regulatory issues in regulating individual access disputes but it (and COFECE and the SCT) will soon need to assess a broader set of issues dealing with the future structure and operations of the national rail system.

## Chapter 5. US and Canadian approaches to railway regulation

Because there is no contractual relationship between the US and Canadian governments and their railways, the two countries have adopted an approach to regulation that accepts the tenets of Ramsey pricing and focuses on attempting to limit abuse of market power in circumstances where market power exists (in the US) or on providing regulatory tools to shippers (final offer arbitration, inter-switching, level of service complaints) to balance the relationships between shippers and railways.

In the US, this is done by limiting excess overall earnings (excess over “revenue adequacy”) or by regulating specific rates where there is found to be abuse of a particular captive shipper. In other words railways are allowed, and indeed expected to, adjust their prices (“discriminate”)<sup>1</sup> among shippers in the tariffs applied, including for transport of the same commodities, in order to be able to cover costs and operate at a profit overall.

The US approach to rail regulation originated in 1887 with the creation of the Interstate Commerce Commission (ICC). Based on populist reaction to abuses by the “Rail Barons” in the mid-1800s, rail prices and charging practices were controlled in many ways that were intended partly to punish the railroad owners, protect other modes, protect certain shippers or classes of shippers, and to force railroads to absorb social burdens within their commercial activities. US regulation expanded over the years to cover trucks and barges and attempted, mostly without success, to adjust to the new competitive conditions that emerged after World War II. As a result, by the 1970s, the entire US railroad system was in bad financial condition. The government took two steps to change the situation: first, Amtrak was created in 1971 to shift the burden of passenger losses onto Federal and state hands; and, second, US railways were deregulated through the “Staggers Act” (trucking and airlines were deregulated at nearly the same time) in order to allow transportation markets to respond to market forces. The US Congress further reinforced this trend toward deregulation in 1995 when it abolished the old ICC and created a new regulator, the Surface Transportation Board (STB), with a narrower scope of regulation to enforce.

In addition to easing abandonments and making mergers easier, the STB has totally exempted from regulation all rail tariffs for voluntary contracts between shippers and railroads. Voluntary contracts often include tariffs as well as conditions on investment by railway and shipper, service quality commitments, minimum volumes to be shipped and ancillary services such as packaging and warehousing that reflect a complex balance of interests for which regulation is inappropriate. A number of specific commodities or groups of commodities (most agricultural products) and some types of services (intermodal and boxcar) have also been exempted because highway and/or barge competition is presumed to be a powerful restraint on rail pricing. The decision of what to exempt is only partly based on the STB’s need to prioritize its internal resources; a more important concern is simply that in these cases regulation often does more harm than good as many years of adverse regulation clearly showed.

Rates for non-exempt commodities and services that might potentially be regulated are subject to a number of tests that have been called “constrained market pricing” (CMP), which is intended to strike a balance between market forces and the potential for abuse of market power where it exists.

The STB starts from the need for adequate revenues (“revenue adequacy”), which is a fundamental condition of regulation. Then, the STB may prescribe a rate for the service if the following conditions are met:

- There is shown to be an absence of effective competition from other railroads or from trucks or barges.
- The tariff for the traffic in question has an existing or proposed ratio of revenue to variable cost that is greater than 180 percent.
- The proposed rate exceeds its stand-alone costs (SAC), where SAC means (in theory) the cost of creating an entirely separate railway to serve just the shipper’s traffic.

Unlike the emphasis in the revised Mexican law and in Canada (see below), STB does not usually prescribe competitive access. The philosophy of the Staggers Act was that adequate competition should be presumed to exist and that regulation should be used only to correct cases of abuse of market power. Overall, STB estimates that only 10 percent of all US railroad freight traffic is subject to any form of regulation (though this might rise to 30 % if existing confidential contracts were converted to published tariffs).

The STB normally does not act on its own volition, but rather acts only when a shipper complains. Much of US regulation ultimately relies on adversarial proceedings with the STB deciding after hearing argument from all parties. STB proceedings are open to all, and any party wishing to be heard can ask to appear or can file any materials it considers relevant. Although the focus is necessarily on the questions that would establish revenue adequacy and constrained market pricing, all other potentially relevant issues can be raised and considered.

STB decisions can be appealed if they can be shown to violate agency procedures or other federal law, but the agency’s findings of fact are generally accepted by courts as correct. There is a presumption in the courts that the agency is best qualified to make decisions based on economic judgment, as is the case with regulators and expert agencies in other sectors of the US economy. STB is mindful of the opportunity for discussion and mediation as a way to forestall formal regulation and provides technical support for shipper/railway discussion and mediation if that is requested by both sides. For this it uses a separate team of experts from those involved in making regulatory determinations.

It is also notable in this context that the STB (the surface transport regulator), and not the US DoJ (the competition regulator) rules on rail merger applications. The US DoJ may appear as a witness before the STB in merger application cases, but the STB has often ruled differently from the US DoJ recommendations. The Canadian Competition Authority rules on rail mergers, but may receive evidence and recommendations from the Canadian Transportation Agency (CTA), the rail regulator.

The STB approach to regulation is heavily dependent on detailed and verifiable information about specific tariffs and costs for the particular traffic in question as well as calculations of revenue adequacy that include detailed calculations of the cost of capital. The basis of the STB’s information is sworn filings of financial and operating statistics (“Form R-1”) and a sample of freight waybills that is then processed by STB. In addition, in any particular case, the parties are allowed to file such additional information as the STB requests or as they consider relevant. The STB’s information base has been accumulated over many years and is critical to their ability to measure impacts and make quantitative decisions.

Canadian rail regulation is somewhat different. Canada does not use explicit numerical standards for revenue/cost ratios. Canada does collect detailed cost and revenue information but cannot make the information available to the public. Data filed with the Minister of Transport by all transportation undertakings in Canada are held in confidence, reflecting a concern to protect commercially sensitive information. Furthermore, since the Canadian rail system is essentially a duopoly, each carrier could estimate the other's confidential information by simple subtraction if the total information for the two carriers is combined. The CTA does require that the unit costs and costing manuals used in regulatory proceedings be approved by the CTA.

The CTA relies much more heavily on alternative dispute resolution mechanisms (facilitation, mediation and arbitration). The CTA has a broad range of alternative dispute resolution mechanisms including:

- **Mediation**, where an Agency mediator helps parties resolve their differences through negotiation (face-to-face or by teleconference). Mediation is offered as an alternative to adjudication on any matter when both parties agree to pursue this approach.
- **Final offer arbitration**, where a shipper dissatisfied with the rates offered by a railway can ask that the dispute be arbitrated. Both the railway and the shipper must submit their final proposal along with justifying material. The arbitrator must consider whether the shipper has “an alternative, effective, adequate and competitive means of transporting the goods” as well as any other considerations believed to be relevant. The arbitrator must then choose between the two proposals and does not have to provide reasons for the decision, which is final and binding. This creates strong incentives for both shipper and railroad to make reasonable proposals as the less reasonable the proposal the less likely it is to be adopted by the arbitrator.
- **Final offer arbitration for rail level of service**, where a shipper cannot agree on the terms of a service contract with the railway. The arbitrator is not limited in this instance to selecting either the offer of the railway or the shipper and can set its own conditions.

With the exception of the movement of western Canadian grain to certain destinations, where both Canadian National (CN) and Canadian Pacific (CP) are subject to a maximum revenue entitlement under the law (essentially by fixing an average rate per ton, adjusted by the volume of grain being moved), the CTA has limited power to impose rates.

The Canada Transportation Act offers three provisions to deal with the market power of railways by facilitating competitive access, namely: Regulated Inter-switching and Extended Inter-switching (sections 127-128); Competitive Line Rates (sections 129-136); and, Running Rights (section 138).

- The inter-switching provision has existed in law since the turn of the last century and is the only competitive access provision with any significant use. Under these provisions, a shipper has the right to require a railway to haul its traffic to a competing railway inter-switching point if the inter-switching point is less than 30 kilometres away (either at origin or destination or both). This movement is subject to rates prescribed by regulation, which must at least cover the variable costs of the movement. Recently, as a result of the bumper crop in Western Canada, this limit has been increased to 160 kilometres in the Prairies, a regime that could disappear two years after the coming into force of this new provision.

- The competitive line rate (CLR) was established in 1987 to allow a shipper to get two railways to move its traffic at a rate to be specified by the Agency over distances greater than the inter-switching limits (CLR cannot be applied for more than 50 percent of the total distance or 1 200 kilometres, whichever is greater). This provision has had very limited use. The requirement for the competing connecting railway to formally agree to move the traffic of the captive shipper beyond the interchange to which the CLR is to be established is seen as a major roadblock.
- The running rights provision has been in place since 1967 and can be granted by the Agency on a case-by-case basis. Running rights allow a federal railway to operate its trains and crews over the line(s) of another federal railway at a regulated rate but not to solicit traffic along the rail lines of the host railway. There has, however, never been a successful application granting such rights by the Agency. It should be noted that there are many examples of railways successfully negotiating running rights on a voluntary, commercial basis (e.g. the arrangement in the Vancouver area).

In addition, the Agency can establish the conditions, and rates to be paid, by public passenger service providers (Via Rail, urban transit authorities) for the use of railway facilities. The Agency has had three relatively recent cases (all involving Via Rail), including two where it did set the rates for the use of railway tracks by Via Rail.

In both the US and Canada, if a railway cannot provide end-to-end service, it must agree to **interchange** the traffic with a railway (or railways) that can deliver the traffic. In many cases, railroads have required interchanged traffic to be billed separately (so-called “Rule 11” rates) so that no railway has information about what the other is charging. In the event of a protest by a shipper, it would be possible for the STB to find that the total rate or any portion thereof is too high.

In the US an essential condition of being a common carrier is that the railway must carry all traffic that is on offer on reasonable terms and that the railway must offer a reasonable tariff for doing so. If a railway cannot carry the traffic from origin to destination (estimates of the traffic interchanged among US railways range between 20 and 40 percent), then it must offer the shipper an opportunity to use a connection to another railway or railways, again on reasonable terms. If there is more than one routing possible, however, the shipper does not have the right to require a preferred route while, at the same time, demanding a lower tariff because this might severely complicate the route planning of all the railways involved. If the tariff offered is reasonable, that is sufficient. There can be limited exceptions to this rule if there are “essential facilities” involved and when the railway denies the use of the facilities or demands a price for use of the essential facilities that is unreasonably high.

In Canada, if the traffic is to move over a continuous route and portions of it are operated by two or more railway companies, the companies shall at the request of the shipper either agree on a joint tariff and the apportionment of the joint tariff, or enter into a confidential contract. If the railways cannot come to an agreement, a shipper may request that the CTA settle the matter. The Agency has not had any such request in years, if ever.

In both the US and Canada, construction of a new line must be approved by the regulator but permission is routinely granted if the proposal is made by a responsible party and if the proposal does not harm local interests including environmental issues. Railways, as common carriers, also have the right of “eminent domain” in which they can acquire property for transportation use over the objections of the owner so long as they pay fair compensation. Since passage of US deregulation, permission to abandon

lines that are no longer economic has also been routine as has transfer of the line to a short line operator when that is possible. Note that in the US it is the Department of State is the lead agency in approving presidential permits for new international ports of entry (rail or any other mode). Table 5.1 contains a summary comparison of the regulatory activity and authorities in Canada and the US

Table 5.1. **Summary comparison of US and Canadian rail economic regulation**

Subject Regulated	Covered by Regulation	
	Canada	US
<b>National Policy Statement</b>	Yes	Yes
<b>Entry and Exit (new lines/abandonments)</b>	Yes	Limited
<b>Level of Services</b>	Yes	Limited
<b>Prices and Tariffs</b>	Yes (access)	Yes
<b>Confidential Contracts</b>	Yes	Yes
<b>Competitive Access</b>	Yes	Yes but limited
<b>Mediation and Arbitration</b>	Major tool	Yes but limited
<b>Cost of Capital</b>	Yes, for rates set by Agency	Yes, for revenue adequacy
<b>Revenue Adequacy</b>	No	Yes
<b>Authority to exempt from regulation</b>	No	Yes

Source: Railway Association of Canada, *Comparison of Canadian and United States Rail Economic Regulations*, prepared by CPCS, January, 2015.

The full picture of the rail sector in both countries goes well beyond the rail regulators. Both countries have the equivalent of the Mexican SCT – the US DoT and Transport Canada – where overall transport policy is formulated and where funding for passenger services (and on a smaller scale freight investments) is provided. Both agencies play an important role in the strategic planning of the transport sector and in promoting intermodal coordination and competition.

Rail safety is regulated by Transport Canada. US rail safety is regulated by the FRA, which is a part of the US DoT but carries out its safety regulatory role mostly independently. In addition, FRA participates actively in a set of joint government/industry groups that establish technical and safety standards for the industry, partly to ensure interchange of equipment and partly to ensure that public as well as commercial safety objectives are met. FRA also funds basic research into safety technology at the Transport Technology Center in Pueblo, Colorado (which is managed under contract by the AAR).

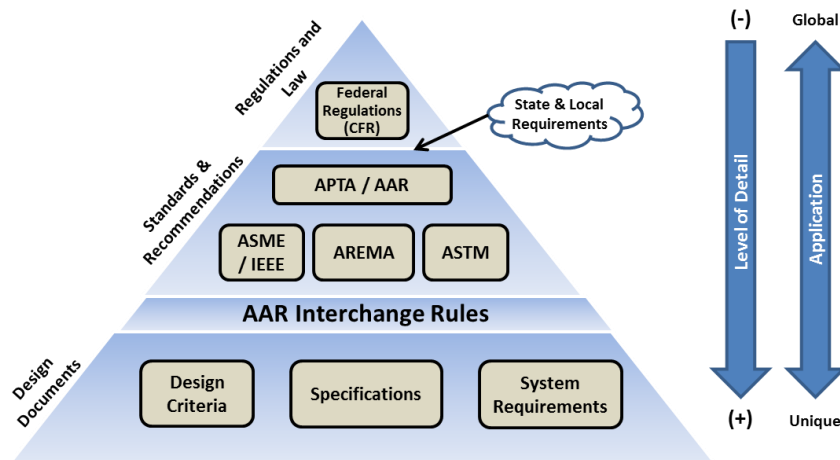
Since the railway systems are privately operated, railroads in the US and Canada have formed industry associations that handle representation of the industry before government (lobbying) as well as establishing technical standards for interchange, managing demurrage and per-diem settlements, wagon location and control and collection of industry statistics including the processing of waybill data. The US agency is the AAR, in Canada it is the Railway Association of Canada (RAC). The Asociación Mexicana de Ferrocarriles (AMF) is establishing itself in Mexico to perform a role similar to that of the AAR

and RAC. Mexico’s main concessions are members of the AAR, and publish some key data on Ferromex and KCSM in the AAR’s “Railroad Facts” handbook, for example. CN and CP are members of the AAR, and the US Class I railroads are members of the RAC.

Figure 5.1 provides a somewhat more detailed picture of the interactions among the various participants in the US rail system as related to setting of safety standards and common standards for the interchange of traffic among railways (since all locomotives and most freight wagons are interchangeable across all railways). The US Congress enacts rail safety laws. US rail safety regulations are established because they are required by law, they are required to apply the law, or established by the FRA as a result of compelling public need. Railroad safety regulations are contained in the US Code of Federal Regulations (USC) generally overseen by FRA in the rail area. In some cases, there are also state and even local regulatory requirements to deal with problems that do not impact on interstate commerce (speeds at local level crossings, for example). Standards and recommendations are typically developed by US DoT and FRA working in conjunction with industry associations (AAR and the American Public Transportation Association) and supported by various special groups with special expertise in mechanical engineering, electrical engineering, rail operations and engineering and testing. These lead to a number of outputs including the AAR interchange rules that are supported by agreed design criteria, specifications and system requirements.

The overall institutional mixture reflects partly the inherent complexity of the problems posed and partly the underlying policy of relying for solutions on that participant that has the best expertise. FRA is involved when it needs to be (STB is not involved in rail safety) but the system has the flexibility for shippers to participate when they are affected and it brings in expertise from industry and academia when needed. The final authority in developing regulations is FRA, but regulations are normally the end of a long process of consultation and response to comments.

Figure 5.1. Interaction between US rail sector participants



Source: FRA. Provided for discussion purposes only.

### The critical importance of information

The STB has available to it a very complete set of information sources. These begin with the accounting and operational information submitted to the STB in a form that is sworn to be true. The accounting information is also included in the information filed by the railroads to the US Securities and

Exchange Commission (SEC), so is as accurate as lawyers and accountants will permit it to be. The STB receives information through the waybills submitted by all US railroads concerning specific shipments: revenue, tons, computed ton-miles, carloads, and commodity, along with a number of items such as originating and terminating stations, wagon type and railroads handling the traffic. Using its cost formulae, the STB is also able to compute an estimated variable cost for a shipment. In any particular case, STB is also empowered to require much more detailed information and transparent calculations of costs (including SAC) that are subject to full examination by all parties.

CTA has available similarly detailed information, though it does not release as much of the information to the public as the STB. CTA can also require the use of standardised costing formulae developed by CTA and can require added information specific to a case if final adjudication is needed.

In both cases, the reporting format has been developed over a number of years to fit the needs of specific purposes such as individual proceedings or industry-wide analyses. Form R-1 (and its predecessor Form A), which is the basis for the common accounting and operational information, has existed in essentially the same format since the beginning of the 20<sup>th</sup> century in the US. The STB has authority to set the format and content of information provided by railroads and can require its accurate production under penalty of law. The relevant provisions are in the US Code of Federal Regulations (USC) as 49 USC § 11142, 49 USC § 11144, and 49 USC § 11145.

It is fair to say that neither STB nor CTA could carry out their duties without access to their information base. COFECE's ability to actually measure effective competition or ARTF's ability to prescribe a response will similarly be limited unless they possess or can obtain equivalent information appropriate to Mexican conditions.

With this acknowledged, ARTF and COFECE should take into consideration the fact that the extreme complexity of rail operations and economics means that calculated variable costs, or stand-alone costs, are not nearly as precise as they appear to be, especially when fixed costs are allocated to a particular activity; nor, arguably, is there any result in the economics literature that renders SAC an optimum limitation on Ramsey pricing. There is a great deal of debate in the US academic community about the actual utility of the STB's Uniform Rail Cost Systems (URCS). This is not to argue that the costing systems are not useful; rather, they should be acknowledged as yielding approximate results. The efforts to collect voluminous and detailed input information should be conducted in the light of the inevitable limits to the accuracy of the resulting cost-estimate models.

### **Implications of connections to the North American rail network**

Nearly half of the Mexican rail tonnage is interchanged with the US and some may eventually originate or terminate in Canada. It would certainly be difficult for Mexico to adopt incompatible technical standards that impede the flow of traffic and it could also be risky for Mexico to depart in a major way from the regulatory approaches in the US and Canada. The interconnection is strengthened by the fact that US railroads are major investors in KCSM and Ferromex, which is likely to reinforce a desire for common technology, operating methods and management objectives.

By the same token, of course, the US investors are fully familiar with STB and CTA regulatory procedures and with the information required to be filed by STB and CTA. A set of Mexican information requirements derived from US and Canadian reporting requirements (eliminating some of the excessive detail and historically derived information not relevant to Mexico) should be fully within the capabilities of the concessions to provide.

## The structural and institutional framework for the regulation of competition and safety

In both the US and Canada the freight railroads are vertically integrated, private sector companies. The Canadian industry is dominated by two major companies, CN (which was privatised in 1997 after years of Government ownership) and CP that, together, carry the vast majority of rail traffic in Canada. There are also a number (~70) of smaller, short line carriers that connect with CN and CP. The US has 7 Class I freight companies, 21 “regional” companies and 546 smaller companies. In total, the Class I railroads generate about 95 percent of the total US railroad industry revenues.

In both countries, the railroad companies have formed industry associations. In the US, the AAR represents the interests of its members and coordinates the development of common industry standards, as well as managing the Transportation Test Center in Pueblo, Colorado. It also manages inter-company wagon location and control through RAILINC (a subsidiary formed for the purpose). The Railway Association of Canada (RAC) performs some of the same functions in Canada.

It is important to add, though, that the railroad companies in the US and Canada (and Mexico) are **competitors**, and competition can sometimes conflict with the need for cooperation. This intra-modal competition is inherent in the structure of the US rail industry (arguably less so in Canada) and is a significant component in the overall competitive balances within the transport sector. The combination of inter-modal competition and rail versus rail competition (both from parallel lines and competitive track access) is fundamental to the regulatory approaches adopted in each country.

The FRA and its parent agency, the US DoT, are responsible for the development of overall transport policy, including policy towards freight and passenger rail transport. The FRA regulates railroad safety in cooperation with a number of state-level rail safety inspection agencies. In support of its safety role, FRA works with AAR and a number of industry-level technical committees to plan and implement common technology to support traffic interchange. Finally, FRA funds a significant R&D program aimed at improving rail safety: the rationale for funding safety R&D is partly that the Federal Government is better placed to conduct basic research that has a long payoff horizon and partly because purely market-driven operation might not produce the level and types of safety practices that public health and safety policies require – in part because of the potential free-rider problems once a particular company engages in R&D activity. The FRA safety regulatory function does consider economic trade-offs in safety issues in its decisions. A separate agency, the US National Transportation Safety Board (NTSB), investigates all significant transportation accidents and reports to Congress on causes of each accident and on potential preventative measures without necessarily considering costs and benefits of the measures.

Regulation of railway safety is the largest part of FRA’s function. In addition to its staff in Washington, D.C., FRA has eight regions. Oversight of these regions requires development of a National Inspection Plan (NIP) that furnishes a uniform approach with priorities and a set of goals that can be evaluated. Details of the NIP are attached as Appendix A. In developing safety regulations, FRA established a Rail Safety Advisory Committee (RSAC) that functions as an overall forum for discussing rulemakings and other safety program issues. The RSAC includes nearly 40 members (including SCT as an associate member) that can be assembled to deal with any particular issue at FRA’s request. In a specific case, RSAC assembles a working group that provides a report to RSAC that, if it accepts the report, is presented to FRA. RSAC reports are advisory and FRA is not bound to accept the results but, since FRA is an active participant in working groups, reports will receive a careful and usually favourable reception. See Appendix B for a more detailed discussion of RSAC membership and procedures. Transport Canada performs a similar policy and broad oversight role through its internal

organization is somewhat different than in the US The Canadian rail safety regulator is housed within the Department of Transportation.

The US Surface Transportation Board (STB) is administratively housed within the US DoT, but is otherwise independent. STB has an annual budget of around USD 31 million and has about 140 employees, including attorneys, economists and engineers as well as administrators. STB is led by three Board Members appointed by the President of the USA and confirmed by the US Senate.

The Canadian Transportation Agency (CTA) is an independent administrative tribunal and regulatory agency with five full time governing members appointed by the Canadian Government. It covers transport regulatory issues as a whole (STB only covers surface modes) and has a total budget of about USD 25 million of which the rail function has a budget of around USD 4 million. The agency has a total employment of about 225 staff including attorneys, economists, engineers and accountants as well as administrators: employment numbers specific to rail are not available.

### **Note**

1. In economic terminology, as in everyday English, the term discrimination is not necessarily pejorative (discriminating between right and wrong is, of course, virtuous). Discrimination in economic terms usually means simply making a distinction. In the case in point this means adjusting prices in accord with the price elasticity of demand. This should not be confused with the pejorative term discriminatory pricing employed to indicate abusive pricing that exploits monopoly power. Indeed one of the functions of ARTF will be to distinguish between the two.

## Chapter 6. Priorities for the Mexican rail regulatory agency

The US and Canadian regulatory regimes reflect a basic policy that the system should be owned and operated in the private sector and that inter-modal and intra-modal competitive forces should be relied on to make the system efficient overall. Both systems recognise that individual abuse of the market power inherent in the economics of railways and Ramsey pricing may need to be limited by a range of regulatory interventions in specific cases. There is a fundamental premise that regulatory intervention is the exception, not the rule, and where there is intervention it should be limited.

Both regulatory systems rest on access to a wide range of the rail industry's operational and financial information: the US essentially makes all but the most confidential company and shipper-sensitive information public (which fosters public and academic analysis external to the regulator) whereas Canada makes very little publicly available.

In its actions, the STB relies on adversarial proceedings and tends to act by prescribing rates and tariffs. The Canada Transportation Act relies much more on negotiation and arbitration and relies more on competitive access remedies such as inter-switching rights.

Mexico will not be able to duplicate the regulatory capabilities of the STB or CTA immediately, nor will Mexico necessarily want to adopt either approach directly without considerable adaptation to Mexican conditions. With this said, there are a number of measures that Mexico can adopt immediately to get the process started and that will be necessary under any approach:

### Mediation/negotiation

The structures of the Canadian and Mexican rail industries are similar in that there are two major rail players along with large shippers who can effectively defend their positions. Mediation/negotiation imposes a lighter burden on the regulator than adversarial proceedings because the parties can be expected to do most of the work in arriving at an agreed solution and the regulator can avoid the need for at least some of the detailed information and expertise required to be able to prescribe and defend an imposed solution. Final offer arbitration appears to be a particularly appealing approach for ARTF in its initial operations as it would require ARTF only to ensure that the parties make credible and coherent offers after which ARTF could choose one or the other. It would not need to define terms that neither party might find acceptable.

It is important to note, however, that the ability of a shipper to argue its case is also dependent on the availability of railway information in the public domain. It should also be understood that although alternative dispute resolution mechanisms have been actively encouraged by successive governments in Mexico since 2006, there are currently no legal provisions for dispute resolution mechanisms for commercial cases falling under federal jurisdiction. The lack of specific legal statutes implies that should ARTM choose to adopt a final offer arbitration system the party to the dispute that deems its interests harmed would remain entitled to seek remedy before the courts. The government might consider making provision in the law for arbitration to reduce the cost of regulation.

## The information base

It will take years to develop the full database needed for COFECE and ARTF are to go beyond dependence on negotiation/arbitration among the parties and define effective competition and prescribe answers. The process must therefore start as soon as possible and be given priority. ARTF should initiate near-term discussions with STB, CTA, SCT and the Mexican concessions to adapt and then prescribe the necessary financial and operational data to be reported for Mexico. ARTF should also work with STB to determine how to begin collecting appropriate waybill data, if possible linking it to cross-border flows.

In parallel, ARTF may wish to adapt the US and/or Canadian costing models to Mexican data and conditions and develop the capability to estimate long run variable costs for railway activities involved in track-age rights and interconnection issues. Finally, though the priority is slightly lower, ARTF and SCT should build a GIS based model of the Mexican rail network tagged to the waybill origination and destination data so that accurate flow analyses will be possible. These tools and techniques will also be even more critical as SCT and ARTF begin to look forward to the 30 year point.

## A critical mass of skills and resources

ARTF will need to regulate an industry that includes 7 concessions generating nearly USD 3 billion annually. The Mexican rail system has 27 000 Km of lines, with 16 000 employees, more than 1 200 locomotives and around 32 000 freight wagons.

The system occupies a central place in the Mexican economy and is a key link with the US and Canadian networks. It carries more ton-km than any European Union railway other than Germany and more than any Latin American railway outside the iron-ore railways of Brazil. It is one of the more efficient railways in the world and offers very low average tariffs. This argues for a careful approach lest the minor issues posed by the current structure be converted (as they were by bad regulation in the US prior to 1980) into major problems that damage the industry. It also argues for ensuring that ARTF has the critical mass of human skills and management resources needed to regulate effectively. In their steady state, STB has a staff of around 140 people and with a budget of USD 31 million whereas CTA, with an industry that is about 1/5<sup>th</sup> that of the US has a rail regulatory budget of around USD 4 million. Both agencies have the requisite set of skills spread across law, economics, accounting and engineering.

While it is not possible to scale directly from Canada or the US to Mexico, especially because ARTF will face a start-up challenge that both STB and CTA have overcome and because ARTF may not perform all the same functions of STB and CTA, it is clear that there is a risk to the system and the nation in having an understaffed or underfunded ARTF.

## Continuity in safety regulation

Development of safety regulations by ARTF will be required in the long-run but the agency can promote cross-border rail efficiency and safety in the short-term by ensuring the foundation of the regulatory framework for safety in Mexico is compatible with existing AAR standards and FRA regulations. Mexican railroads already operate under AAR standards that are compliant with existing US and Canadian safety regulations. Maintaining this approach will simplify future efforts by the three North American rail systems to harmonise regulations and expedite train operations across the borders.

At the same time, it would be desirable for Mexican safety regulators to base any new regulations on performance criteria, rather than specific behaviour and design prescriptions, as this will enable the application of new technologies for the improvement of safety and productivity. US rail safety

regulations are still heavily influenced by history and by the results of litigation and often are far more rigid (and less effective) than a focus on performance alone would produce. Subject to conformity with the standards required for interchange, ARTF can take full advantage of this approach as new regulations are published, including on issues such as hours of service that do not impinge on interchanged traffic.

## Annex

### US National Inspection Plan (NIP)

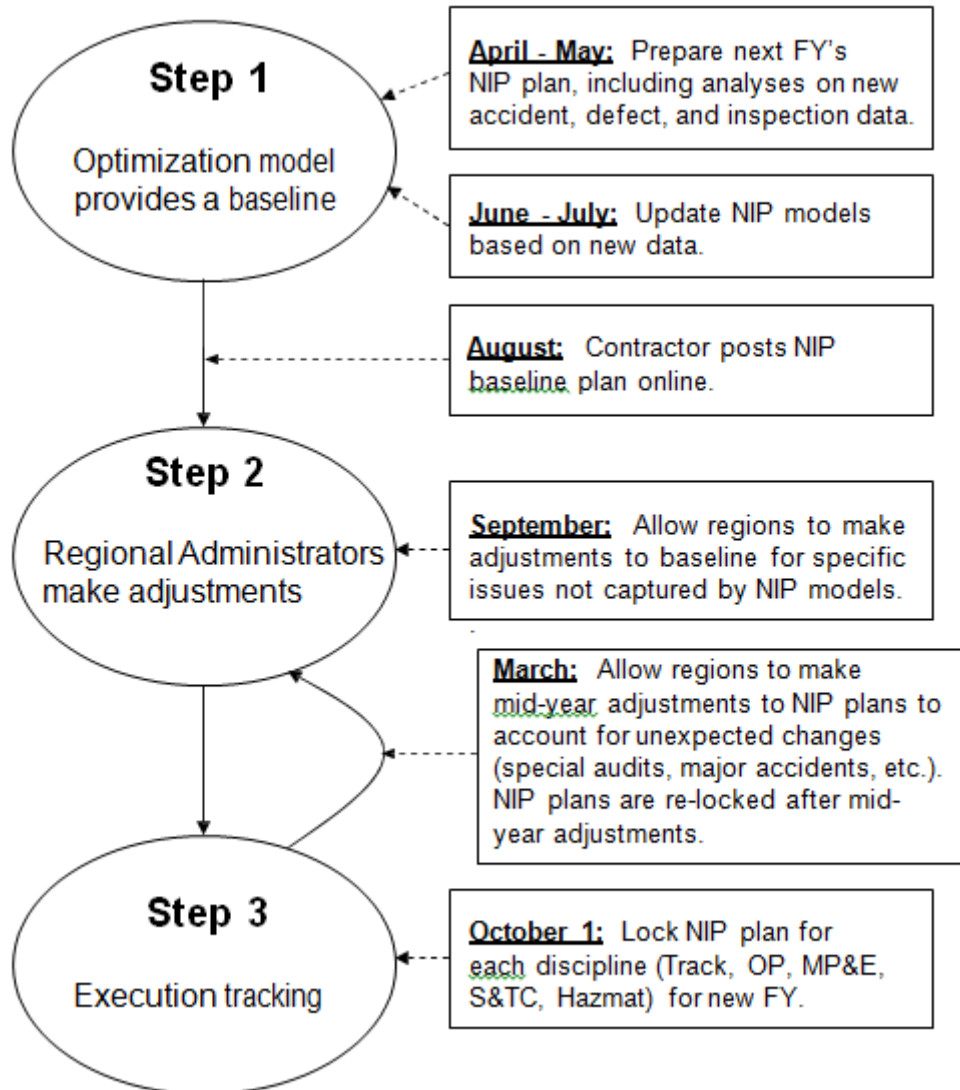
The NIP allows FRA to use its inspectors more effectively and better target the greatest safety risks. This data-driven model allows FRA inspectors to focus their efforts on locations that are more likely to have safety problems. The purpose of the NIP is to optimize FRA's ability to reduce the rates of various types of train accidents as well as releases of hazardous materials.<sup>1</sup> The plan provides guidance to each regional office on how its inspectors should divide up their work by railroad and state.<sup>2</sup>

The NIP is a process which involves three steps (Figure A.1). In the first step, FRA headquarters produces an initial baseline plan for each of the agency's eight regions. The initial plan sets goals for the level of inspection activity to be allocated to each railroad by state and by inspection discipline. These numeric goals are derived from models-based on trend analyses of accident, inspection, and other data – that predict, by inspection discipline, locations where train accidents and incidents are likely to occur within each region and provide the optimal allocation of inspection resources to prevent accidents.<sup>3</sup>

In the second step, the regional administrators (RAs) are allowed to adjust the goals for their respective regions on the basis of local knowledge and emerging issues.<sup>4</sup> The initial adjustments typically take place in September before the new fiscal year starts. The RAs have another opportunity to make adjustments after six months into the fiscal year. The intent of the mid-year adjustments, if deemed necessary, is to allow regions to properly respond to new and/or unexpected events such as major accidents that would require shifting inspection resources on a short-term basis.

In Step 3, once a new fiscal year starts, FRA monitors how the regions are meeting their inspection goals. The NIP is implemented through a web-based interface which allows both the headquarters and the regions to monitor the progress in field inspections during a fiscal year. Approximately, two months after a fiscal year ends, the regions are required to submit explanations for missed NIP goals.<sup>5</sup> Each region will be evaluated based on how well it met the NIP goals as part of regions' annual performance review.

Figure A.1. National Inspection Plan Process



Source: FRA.

### Overview of the Railroad Safety Advisory Committee (RSAC)

FRA established the RSAC in March 1996, to serve as a forum for developing consensus recommendations on rulemakings and other safety program issues. The RSAC includes representation from all of the agency's major stakeholders, including railroads, labour organisations, suppliers and manufacturers, and other interested parties. A list of member groups follows:

- American Association of Private Railroad Car Owners (AAPRCO)
- American Association of State Highway and Transportation Officials (AASHTO)
- American Chemistry Council
- American Petroleum Institute

- American Public Transportation Association (APTA)
- American Short Line and Regional Railroad Association (ASLRRA)
- American Train Dispatchers Association (ATDA)
- Association of American Railroads (AAR)
- Association of Railway Museums
- Association of State Rail Safety Managers (ASRSM)
- Brotherhood of Locomotive Engineers and Trainmen (BLET)
- Brotherhood of Maintenance of Way Employees Division (BMWED)
- Brotherhood of Railroad Signalmen (BRS)
- Chlorine Institute
- Federal Transit Administration (FTA) – Associate member
- Fertilizer Institute
- High Speed Ground Transportation Association (HSGTA)
- Institute of Makers of Explosives
- International Association of Machinists and Aerospace Workers
- International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART), including the Sheet Metal Workers' International Association (SMWIA) and United Transportation Union (UTU)
- International Brotherhood of Electrical Workers (IBEW)
- Labor Council for Latin American Advancement (LCLAA) – Associate member
- League of Railway Industry Women– Associate member
- National Association of Railroad Passengers (NARP)
- National Association of Railway Business Women– Associate member
- National Conference of Firemen & Oilers
- National Railroad Construction and Maintenance Association (NRCMA)
- National Railroad Passenger Corporation (Amtrak)
- National Transportation Safety Board (NTSB) – Associate member
- Railway Supply Institute (RSI)
- Safe Travel America (STA)
- Secretaria de Comunicaciones y Transporte (Mexico) – Associate member
- Tourist Railway Association, Inc.
- Transport Canada– Associate member
- Transport Workers Union of America (TWU)

- Transportation Communications International Union/BRC (TCIU/BRC); and
- Transportation Security Administration (TSA) – Associate member.

When appropriate, FRA assigns a task to the RSAC, and after consideration and debate, RSAC may accept or reject the task. If the task is accepted, the RSAC establishes a working group that possesses the appropriate expertise and representation of interests to develop recommendations to FRA for action on the task. These recommendations are developed by consensus. FRA staff members play an active role at the working group level in discussing the issues and options and in drafting the language of the consensus proposal. A working group may establish one or more task forces to develop facts and options on a particular aspect of a given task. The individual task force then provides that information to the working group for consideration.

When a working group comes to unanimous consensus on recommendations for action, the package is presented to the full RSAC for a vote. If the proposal is accepted by a simple majority of RSAC members, the proposal is formally recommended to the Administrator of FRA. FRA then determines what action to take on the recommendation.

FRA, though, is in no way bound to follow the recommendation, and the agency exercises its independent judgment on whether a recommended rule achieves the agency's regulatory goal(s), is soundly supported, and is in accordance with policy and legal requirements. Often, FRA varies in some respects from the RSAC recommendation in developing the actual regulatory proposal or final rule. Any such variations would be noted and explained in the rulemaking document issued by FRA. However, to the maximum extent practicable, FRA utilises RSAC to provide consensus recommendations with respect to both proposed and final agency action. If RSAC is unable to reach consensus on a recommendation for action, the task is withdrawn and FRA determines the best course of action.

## Notes

1. The NIP Operating Practices model also includes consideration of railroad worker casualties (fatalities and injuries).
2. The five FRA disciplines considered are: Hazardous Materials (Hazmat), Motive Power and Equipment (MP&E), Operating Practices (OP), Signal and Train Control (S&TC), and Track.
3. FRA defines train incidents as events involving the movement of railroad equipment that results in a casualty but does not cause damage above the reporting threshold established for train accidents, which is USG 8 200 in 2007
4. In practice, the regional administrators typically designate their deputy regional administrators (DRAs) in evaluating and adjusting, as necessary, the NIP goals, often with assistance from the specialists.
5. A NIP goal is considered being met for each railroad/discipline if the actual inspection activities at the end of a fiscal year are within 2.5 % of the NIP plan target.

## **Establishing Mexico's Regulatory Agency for Rail Transport**

### **Peer Review of Regulatory Capacity**

Mexico's highly efficient freight railways are operated by privately owned concessions. These were designed to create competition between vertically integrated railways in key markets through parallel tracks, alternate routes and through rights to use each other's tracks on specific sections of the network. Overall the system has worked well but a deficit in regulatory capacity has proved an obstacle to settling disputes over the use of trackage rights and access conditions for certain shippers. The Railway Law was amended in January 2015 to address this shortcoming through measures that include establishment of a new Agency for the Regulation of Rail Transport.

The key to the success of the new Agency will be its capacity in terms of economic expertise to make judgements on issues of access to rail services. To be robust to legal challenge the decisions of the Agency will need to be well-argued in economic terms and effectively communicated to provide all parties concerned, including the courts, with confidence that judgements are sound. The Agency will need resourcing sufficient to this task. To assist in building the regulatory capacity needed, the International Transport Forum and the Ministry of Transport and Communications organized a consultation for Mexican regulators with the key rail regulatory institutions in Canada and the United States of America to review the practice of regulation and resources allocated to it in these jurisdictions. The report summarises the findings of the consultation.

This report is part of the International Transport Forum's Case-Specific Policy Analysis series. These are topical studies on specific issues carried out by the ITF in agreement with local institutions.

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