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16. Abstract

The North American Free Trade Agreement (NAFTA) has increased truck traffic and infrastructure needs on the Texas highway network, which carried more than 70 percent of the total incoming U.S.-Mexico truck traffic due to trade in 1997. An opportunity to alleviate highway congestion on main highway corridors in Texas and the U.S. is through the encouragement of rail intermodal facilities that could divert freight from the highways. U.S. and Mexican railroad companies, created from the recent privatization of the Mexican Railroad System, are building intermodal facilities and rail yards and upgrading railroad infrastructure accessing Texas-Mexico rail border crossings, which could handle increasing amounts of transboundary freight via rail and/or intermodal, thus reducing the rates of deterioration of the highway systems in Texas and Mexico.

The purpose of this project is to provide Texas Department of Transportation (TxDOT) with information on current and future infrastructure and operational plans conducted by the U.S. and Mexican railroad private sectors and their impact on TxDOT's highway infrastructure needs.

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THE IMPACT OF MEXICAN RAIL PRIVATIZATION ON THE TEXAS TRANSPORTATION SYSTEM

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DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the Federal Highway Administration or the Texas Department of Transportation. This report does not constitute a standard, specification, or regulation.

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IMT researchers who participated and contributed to the study were:

- Ing. Roberto Aguerrebere Salido, Coordinator, Coordination of Transport Integration;
- Dr. Alberto Mendoza Díaz, Coordinator, Coordination of Transport Safety and Operation;
- Ing. Antonio García Chávez, Chief of the Promotion Unit, Coordination of Transport Safety and Operation; Ing. Eric Moreno Quintero, Senior Researcher, Coordination of Transport Integration;
- Ing. Luis Fernando Miranda-Moreno, Associate Researcher, Coordination of Transport Integration; and
- Ing. José Alfonso Balbuena, Associate Researcher, Coordination of Transport Integration.

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- Lic. Eduardo Escamilla Castillo, Associate Director for Coordination and Multimodal Transport, General Directorate of Tariffs, Rail and Multimodal Transport.

From Transportación Ferroviaria Mexicana (TFM):

- Ing. Jorge A. Licón Avila, Chief Operations Officer,
- Lic. Oscar del Cueto Cuevas, Projects and Liaison, and
- Lic. Martín Quinzaños, Public Relations Manager.

From Ferrocarril Mexicano (Ferromex):

- Ing. Lorenzo Reyes Retana, Director of Operations, and
- Ing. Juan Carlos Miranda Hernández, Subdirector of Planning and Operation Systems.

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CHAPTER 1 – INTRODUCTION

BACKGROUND

U.S.-Mexico trade grew at an average annual rate of 17 percent during the first five years of the North American Free Trade Agreement (NAFTA), reaching a record high of almost $190 billion in 1998. As a result, Mexico has become the United States' second largest trading partner, only behind Canada (Japan has been displaced to third place). NAFTA has also directly benefited Texas, which is exporting more to Mexico than any other state. For the first three quarters of 1998, Texas' exports to Mexico amounted to $26.6 billion, a 19 percent increase compared to the first three quarters of 1997. However, for all of the positive impacts of increased trade, NAFTA has also greatly increased truck traffic. The growth in truck traffic carries with it a corresponding increase in the demands placed on the highway infrastructure over which much of this trade is transported. The Texas highway network, which carries approximately 70 percent of the total incoming truck traffic from Mexico, is in jeopardy of being overwhelmed.

Rail also plays a substantial role in the movement of goods between the two countries. Five of the eight U.S.-Mexico rail border crossings are located in Texas, handling more than 80 percent of the total rail traffic between the two countries. Figure 1 shows the U.S. railroads operating in Texas along with the Mexican rail network.

Rail traffic across the Texas-Mexico border is expected to increase due to substantial capital investments and operational improvements being made by U.S. and Mexican private railroad companies. Some of these activities include:

- Transportación Ferroviaria Mexicana (TFM), Union Pacific (UP), and Texas Mexican Railway (TM) invested $95 million in border infrastructure projects that will help expedite transborder movement of goods across the Laredo-Nuevo Laredo border crossing.

- TFM invested $15 million for the construction of a new rail yard in Nuevo Laredo, Mexico.

- TM invested $60 million for the construction of a new rail yard in Laredo and an extension of sidings, which will increase its current capacity by 350 railcars.

- UP invested $20 million to expand the capacity of its current rail yard and to relocate the U.S. Department of Agriculture sanitary inspection facilities. The relocation will alleviate congestion on the international railroad bridge.

- UP invested $25 million to install a Centralized Traffic Control system (CTC) on its trackage from San Antonio to Laredo.

- Ferrocarril Mexicano (Ferromex) invested $25 million to establish a second rail yard in Rio Escondido, Coahuila, located approximately 10 miles south from Piedras Negras, to compete with TFM's Nuevo Laredo border crossing.

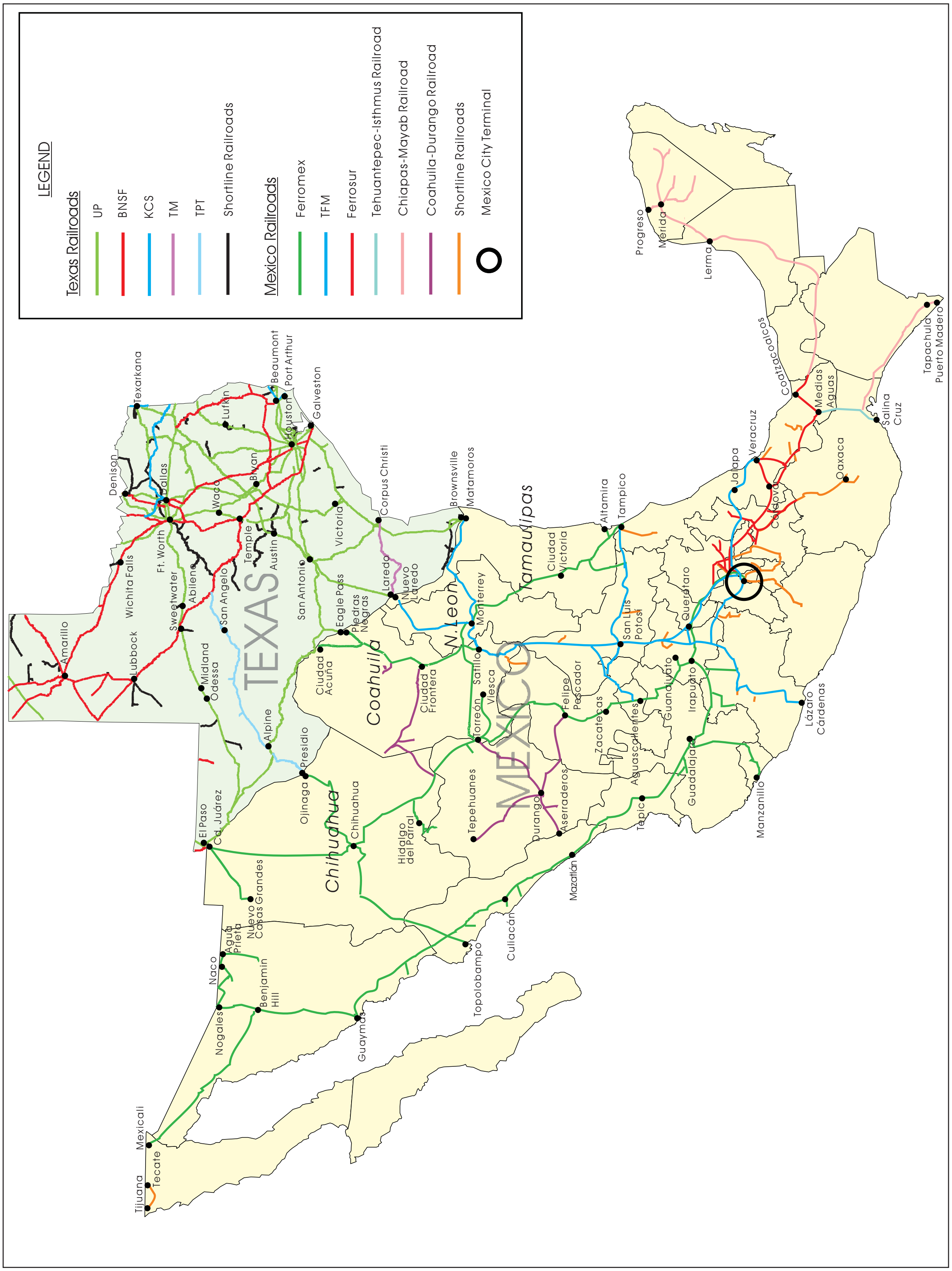


Figure 1. Texas and Mexico Railroad Networks.

- The railroads are implementing a program to end U.S. Customs and Border Patrol operations on the Laredo railroad bridge by monitoring shipments via Electronic Data Interchange (EDI).

- The railroads eliminated the directional window system in Laredo to allow traffic across the border on a first-come, first-served basis, with no directional restrictions. Directional windows are four six-hour periods, two for northbound traffic and two for southbound traffic, and are used to handle railcar interchanges on the railroad international bridge.

- In July 1998, TFM finalized an agreement with UP, Burlington Northern Santa Fe (BNSF), TM, Gateway Western, and I&M Rail Link to facilitate cargo transportation arrangements between Mexico and the U.S.

These railroad improvements will expedite the border-crossing process and increase the amount of freight that can be moved by rail or by rail-to-truck intermodal shipment. Put in very simple terms, any increase in railroad modal share will reduce the demand placed on the highway system in Texas. Consequently, rail is being recognized as an important element in the overall transportation equation and a critical component to monitor and understand within the context of the state's transportation planning process.

STUDY OBJECTIVES

The purpose of this research project is to provide TxDOT with information on the current and future infrastructure and operational plans of U.S. and Mexican railroads. This information will assist TxDOT in evaluating the impact of rail transportation on state highway needs and on its plans to provide an efficient and safe transportation system.

The study objectives will be met by:

- identifying existing and emerging rail trade corridors between Texas and Mexico,

- evaluating the performance of the Mexican Pacific-North and Northeastern Corridors and assessing the prospects for increased interlining with U.S. carriers along the Texas-Mexico border crossings,

- evaluating the potential benefits of increased traffic through the Presidio-Ojinaga rail border on the South Orient,

- assessing the future performance potential of U.S. railroads, considering facilities and trends impacting Texas-Mexico trade, and

- determining the impact on mode choice and infrastructure needs in Texas and Mexico from the Mexican rail privatization.

RESEARCH APPROACH

The research approach of the Texas Transportation Institute (TTI) was to employ its unique contacts with U.S. and Mexican railroads to facilitate the collection of information on investments, traffic projections, and emerging trends in U.S.- Mexico cooperation. In addition, TTI used its collaborative relationship with the Mexican Transportation Institute (IMT-Instituto Mexicano del Transporte), the official transportation agency of the Mexican federal government, to garner insights into the Mexican government's policy initiatives as they pertain to rail transportation. The relationship between TTI and IMT provided the research team beneficial insights of IMT research staff through its work on the Mexican rail privatization.

The analytical approach that results from timely access to the appropriate data will begin with a characterization of current levels of rail-based trade at rail border crossing locations along the Texas-Mexico border. These levels are examined in light of the potential for growth in trade between the Texas and Mexico. Corresponding evaluations of the rail systems of Texas and Mexico, both in their current form with current capacities and as projected by investment plans, will suggest the degree to which rail transportation will be able to accommodate the growth in trade projected between the two countries. An increase in trade that is not shipped by rail will impact existing highway corridors. The research team developed policy priorities from this analysis, and suggested discrete recommendations about methods to facilitate rail transportation and thus alleviate highway congestion.

ORGANIZATION OF REPORT

The report is organized into nine chapters, including this introduction and statement of research objectives. The chapters correspond to the major research areas.

In Chapter 2, the researchers identify trade levels and growth since the beginning of NAFTA in 1993. Chapter 2 includes a summary of the dramatic increase in trade, which is summarized to establish the background for the transportation concerns driving this evaluation (i.e., Mexican freight rail capabilities and the potential impact of rail as a mitigating factor in truck traffic). Chapter 2 presents four potential scenarios to be evaluated. These scenarios form the basis of this study and represent the degree to which rail transportation may assist in slowing or reversing the trend in truck traffic growth on Texas highways.

In Chapter 3 we examine the Mexican railroad's efforts to improve system operations and infrastructure since privatization of the Mexican railroad network. The chapter includes a review of the history and evolution of Mexico's rail system from its nationalized origins until the time it was divided into three independently operated segments in late 1996. The changes since privatization are examined, and the prospects for future growth are discussed.

In Chapter 4 we discuss the performance of the U.S. railroads as they attempt to improve capacity and operations in Texas and on a system-wide basis. Also included within this chapter is an overview of the railroad industry's outlook pertaining to revenue, cost, and modal competition.

In Chapter 5 we examine the trade flows between the U.S. and Mexico by examining the data related to trade through five transportation corridors representing the five Texas-Mexico rail gateways. We analyze both Mexican and U.S. trade data with an emphasis on north and south movement of goods.

In Chapter 6 we examine the trade corridors and rail gateways in Texas. The characteristics of the border crossings are reviewed along with continuing impediments to the movement of freight by rail across the border.

In Chapter 7 we evaluate the Presidio-Ojinaga border crossing in detail. The increasing transportation needs created from NAFTA, along with the small number of rail border crossings between the U.S. and Mexico, make this mostly inactive border crossing potentially important to Texas' statewide transportation system.

In Chapter 8, the research team develops a model of international truck and rail traffic through the Texas-Mexico trade corridors to provide a forecast of the future truck and rail traffic. This model serves as a metric against which rail and truck modal share can be evaluated.

Finally, in Chapter 9 we conclude the information presented in this research and provide recommendations for TxDOT activities.

CHAPTER 2 – THE IMPACT OF NAFTA

NAFTA ANALYSIS

In the first five years of NAFTA, U.S. exports to Mexico grew by 91percent ($38 billion in absolute terms). This growth represents the largest increase recorded by the U.S. with one of its trading partners during that five-year period. As shown in Figure 2, total U.S.-Mexico trade reached $196.6 billion in 1999, up more than 141 percent from its 1993 pre-NAFTA level of $81.5 billion *(1)*.

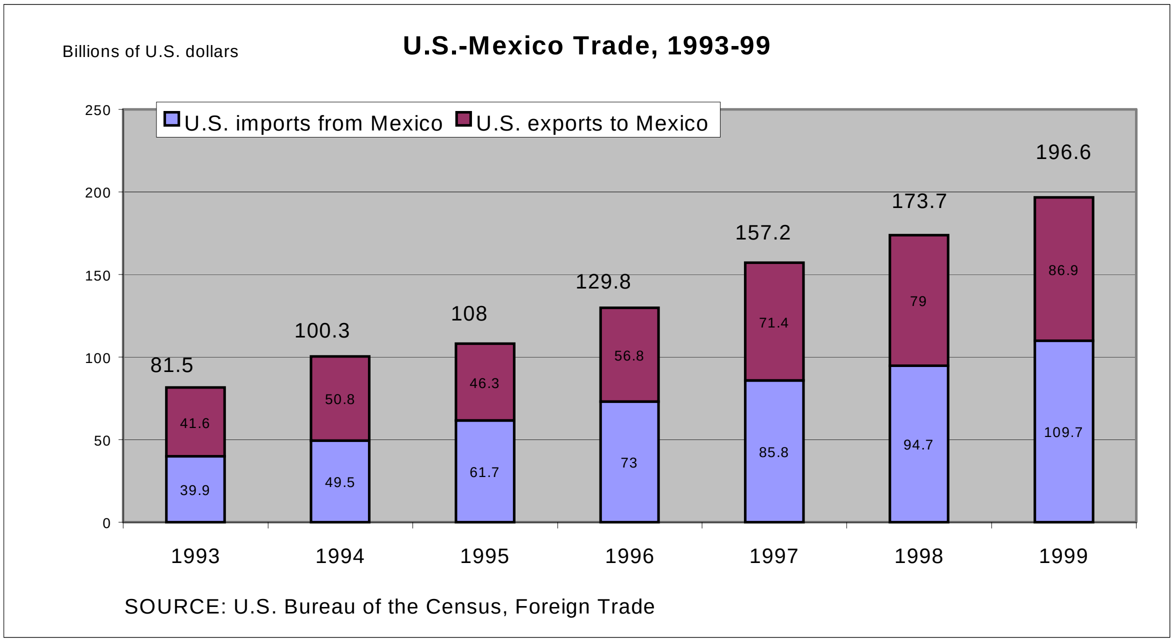


Figure 2. U.S.-Mexico Trade, 1993-1999.

Before the mid 1980s, Mexico had a policy of import substitution that included high tariff barriers, difficult-to-obtain import permits, and severe restrictions on foreign investment. Since then, as a result of several trade liberalizing measures, there has been dramatic growth in trade between the United States and Mexico. In addition to NAFTA, this growth in trade had two other major drivers: Mexico joining the General Agreement on Tariffs and Trade (GATT), now called the World Trade Organization (WTO), and the growth of maquiladora factories in Mexico. These factories primarily use U.S. components that are exported from the United States and produce products that are imported back into the United States. Eighty percent of maquiladora manufacturing is located in the northern border states of Mexico, close to the U.S. highway infrastructure and U.S. markets. Approximately one-half of the U.S.-Mexico trade trucks are transporting products to or from maquiladora factories in Mexico. Maquiladora shipments dominate the cross-border movement of trucks in most U.S.-Mexico border ports, except Laredo, Texas *(2)*.

Essentially, U.S.-Mexico trade has grown due to the elimination of tariffs, which was a key element of NAFTA. Figure 3 shows the 15-year tariff elimination schedule, where 100 percent of the trade will be duty-free by 2008. The pre-NAFTA levels consisted of only 13.9 percent of U.S. imports from Mexico and 17.9 percent of U.S. exports to Mexico.

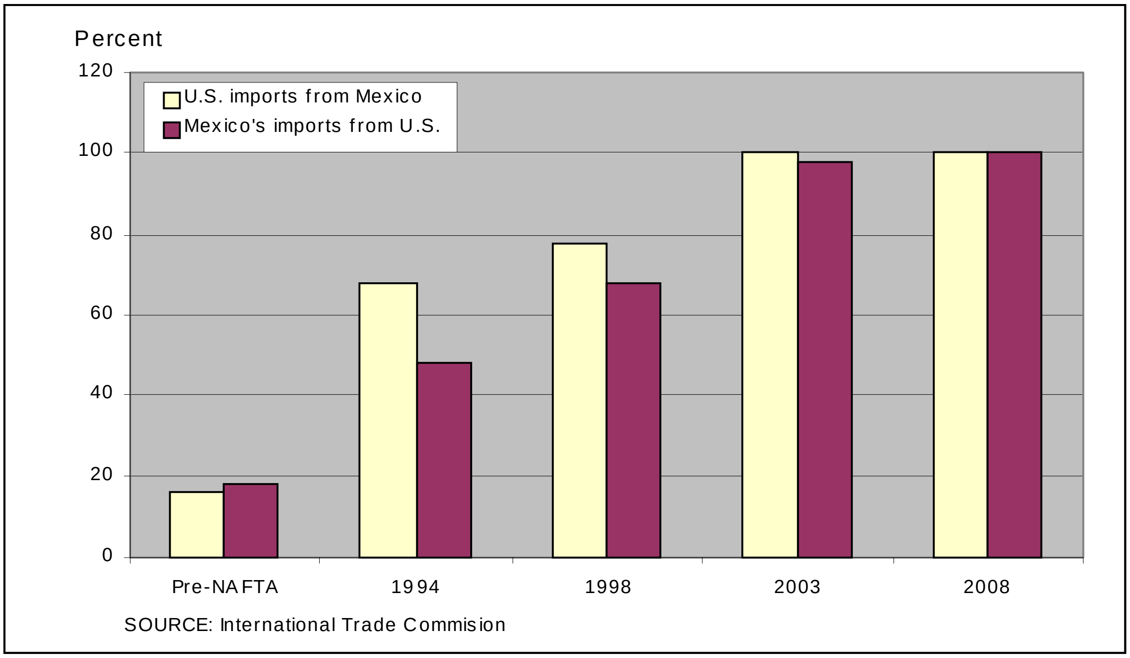


Figure 3. NAFTA Tariff Elimination.

Impact of NAFTA-Related Truck Traffic

Most goods moving between the U.S. and Mexico are transported by highways through Texas, California, New Mexico, and Arizona. Specifically, about 90 percent of U.S. exports to Mexico and 83 percent of U.S. imports from Mexico are transported by truck across land ports of entry. Much of this trade uses Texas border locations. The U.S.-Mexico Binational Transportation Planning and Programming Study estimates that 79 percent of all U.S.-Mexico trucks crossed at Texas ports of entry, many of which pass through the state to other U.S. states. In 1996 NAFTA truck traffic comprised 16.5 percent of all truck traffic on Texas highways. The number of trucks continues to increase. Truck traffic through Brownsville, Laredo, and Eagle Pass increased over 90 percent from 1993 to 1999 *(3)*.

Costs to Texas

Border locations represent choke points for NAFTA trade. Existing infrastructure at the border is often located in congested downtown areas where infrastructure expansion is limited. In order to improve the infrastructure along the border, $398,700,000 is needed for the 22 active and six proposed vehicular international bridges examined by TxDOT *(3)*.

One of the proposed bridges discussed above opened April 15, 2000, in Laredo for a total cost of $128 million, of which Mexico paid $33 million. The eight-lane World Trade Bridge, Laredo's fourth international bridge, is located several miles north of town and may only be used by truck and commercial vehicles, allowing the two downtown bridges to handle only cars. The Columbia Solidarity Bridge, located 17 miles northwest of Laredo, also handles international commercial traffic.

Since the opening of the World Trade Bridge, Laredo's truck crossings have increased 50 percent, hitting a local record 8000 crossings in one day *(4)*. The new bridge will benefit truckers greatly as northbound afternoon crossings that took three to six hours can now be done in 90 minutes, and southbound crossings that averaged three hours can be done in 45 minutes. This reduction will allow drayage truckers to make four crossings per day instead of two (*5*).

In a TxDOT report titled *Effect of the North American Free Trade Agreement on the Texas Highway System*, TxDOT examined costs related to impacts on Texas citizens and Texas highways due to NAFTA-related traffic (*3*). There are two general categories of impacts for these costs: social costs, which include congestion, accidents, air pollution, and noise pollution; and capital costs, which include preservation, mobility, and safety.

The components of the social costs each generate an impact to which costs can be assigned. Congestion causes time loss and increases wear and tear on cars and trucks. Accidents result in personal injury, loss of life, and damage to property. Air pollution makes people sick and keeps them from being productive. Traffic noise reduces the value of adjacent real estate. Table 1 shows the cost associated with each of these factors and indicates total estimated social costs of $510.8 million for 1996.

Table 1. Annual Costs Imposed on Texas by NAFTA Truck Traffic for 1996 (Millions of Dollars).

Types of Impact	Annual Cost
Congestion	213.2
Accidents	158.7
Air Pollution	89.7
Noise	49.2
Total Annual Cost	**510.8**

*Table reproduced from TxDOT's *Effect of NAFTA on the Texas Highway System*, p..20 (*3*).

The capital costs for NAFTA-utilized infrastructure are great and are needed to mitigate the impacts of NAFTA trucks on the state highway system. To identify capital improvement needs related to NAFTA truck traffic, TxDOT's analysis focused on three major highway needs categories described below.

1. *Preservation:* Restore highways through resurfacing and repair that extends the life of the roadway, bridge repairs, and other improvements to ensure that infrastructure continues to function as initially designed.

2. *Mobility:* Add capacity by increasing the number of lanes or reduce congestion by providing more direct routes.

3. *Safety:* Increase highway safety through widening highway lanes or shoulders.

The 1997 TxDOT needs assessment estimated revenue improvement needs by analyzing four scenarios. These scenarios were called: “Losing Ground,” which indicates what need could be met with current revenues; “Holding the Line,” which raises sufficient revenues to keep conditions from deteriorating further from what they are now; “Gaining Ground,” which improves current conditions; and “Optimal Needs,” which addresses needs at the highest level. Table 2 shows these needs on an annual basis and indicates the annual capital improvement costs on project needs generated by NAFTA trucks are estimated at $349.8 million to meet optimal needs.

Table 2. Annual NAFTA Highway Needs Estimates (Millions of Dollars).

Needs Category	Losing Ground	Holding the Line	Gaining Ground	Optimal Needs
Preservation	70.3	105.5	204.5	257.6
Mobility	26.5	44.2	52.2	88.8
Safety	1.0	1.2	2.8	3.4
Total Annual Needs	**97.8**	**150.9**	**259.5**	**349.8**

*Table reproduced from TxDOT’s *Effect of NAFTA on the Texas Highway System*, p. 6 (*3*).

RESEARCH FOCUS

The key question posed for the current research effort is this, “will the privatization of Mexico’s railroad system and closer operational ties to U.S. railroads serve to offset the increase in the amount of international truck trade passing between the U.S. and Mexico?”

The research team poses four scenarios similar in concept to those developed by TxDOT. Each scenario examines the ability of rail operations to offset the growth in NAFTA-related trade through a review of U.S. and Mexican railroad capabilities and projected traffic levels.

The four scenarios are:

> **Scenario 1** - Combined U.S. and Mexican railroad traffic loads, due to improvements in infrastructure, equipment, and operations, will grow sufficiently to *exceed* the overall growth in NAFTA-related trade and thereby reduce the demand for, and number of, trucks on Texas highways.

Scenario 2 - Combined U.S. and Mexican railroad traffic loads, due to improvements in infrastructure, equipment, and operations, will grow sufficiently to *keep pace with* the overall growth in NAFTA-related trade and thereby maintain the current modal split seen between rail and truck transport.

Scenario 3 - Combined U.S. and Mexican railroad traffic loads will *grow*, but at a rate slower than the increase in the growth in NAFTA-related trade and will, therefore, lose market share relative to the trucking industry.

Scenario 4 - Combined U.S. and Mexican railroad traffic loads will *retain* their current absolute volume, but, due to continued growth in trade, will decline in terms of the percent of international traffic carried by railroads.

The four possibilities are evaluated by examining the projected performance of the railroad industry as a whole and by looking at specific improvements initiated in Texas. The following section of this chapter describes, in general terms, the actions that railroads may undertake to improve system capacity.

RAIL NETWORK CAPACITY FACTORS

Capacity on any rail network is affected by a combination of factors, which the railroads are attempting to address in order to improve operations at the border. These factors include the following:

Track Availability

Track availability refers to having the physical space to accommodate trains and cargo on the railroad system. Several factors can impact the availability of track infrastructure, including:

- Double tracking of mainline segments of the railroad increases capacity by allowing trains to operate without using sidings to pass or allow other trains to pass. Often there is a significant delay involved as one train waits for the other. In addition, as has been the case with UP's acquisition of Southern Pacific, double track operations can set the stage for "directional operations," where one line is designated for traffic moving in a particular direction and the other line is designated for traffic moving in the opposite direction. This strategy greatly increases not only capacity, but safety as well. Train speeds can be increased and the need for passing sidings reduced.

- Added passing siding has an impact similar to that of double tracking, increasing the number and frequency of trains that can be moved through a segment of track. As the distance between sidings is decreased, track sections begin to have capacity characteristics approaching a double-tracked segment of line. Also relating passing sidings to capacity is the length of the siding. Longer passing sidings allow the railroad to build longer trains. The industry is currently running trains up to 7,000 feet in length.

- Train control systems such as CTC add to the capacity of a track segment by allowing centralized dispatchers to monitor train movements from a control center. This centralized control improves both capacity and safety.

- Track class according to the Federal Railroad Administration (FRA) track class standards, refers to the quality of the track and, hence, the operating speeds at which the railroads may run trains. Higher speeds mean greater train throughput and greater capacity. The class of a track is achieved by constructing the track to a certain standard and maintaining it at a certain level of repair. This level pertains to the engineering and maintenance of both track geometry, for track gage, alignment, and curvature, and the track structure, for ballast, ties, rail, and switches. The FRA track classes and related operating speeds, as presented in the code of federal regulations, part 213.9, are:

Class	Operating Speed
Class 1	10 mph
Class 2	25 mph
Class 3	40 mph
Class 4	60 mph
Class 5	80 mph
Class 6	110 mph

Classification and Intermodal Yards

Railroad capacity and throughput is determined in large measure by the ability of terminals – classification and intermodal yards – to organize and move freight in and out. The point on a railroad where congestion nearly always begins can usually be traced to yard facilities and the inability to move out as much freight as is brought in. The role of a classification yard is to take apart trains that have material being shipped to multiple destinations and reconstruct trains for which most of the cars in each train are destined to the same region.

Intermodal yards are slightly different in that they focus on the handling of TOFC and COFC shipments and must have the infrastructure available to position and remove trailers and containers, moving shipments from trucks to railcars or vice versa. The railroads can improve intermodal yard performance by increasing the size of the yard and improving the ramps used to load trailers, and by upgrading the equipment that lifts containers and places them on trains and trucks.

Improved Equipment

Capacity can be increased by employing improved equipment, such as double-stack cars for carrying two stacked containers, or the use of lightweight grain cars that allow the railroads to increase the commodity carried by each car. Maintaining a sufficient locomotive fleet is also critical to capacity on the railroad, and balancing "power" (i.e., locomotive horsepower) required for varying locations is a difficult and continually managed process. New, higher horsepower locomotives, which are a very significant investment for the railroads, may ease the challenge in balancing power due to the fact that two new locomotives may replace three older, lower-powered models.

Crew Availability

In terms of its impact on capacity, crew availability is similar to the availability of locomotives. A shortage of ready, trained, and usable crews is as damaging to railroad operations as a shortage of power. There are other similarities in the logistical challenges associated with having the right crews in the proper place when they are needed to operate a train. FRA work rules limit the number of hours a crew can be on the job to 12 consecutive hours. This period must be followed by 10 consecutive hours of rest. If a crew is only halfway to its destination when their 12-hour shift lapses, they must cease operations immediately. This requirement can mean that they are forced to stop a train in the middle of a single-track line and block traffic until another crew can be brought in to relieve them.

It is readily apparent that, under conditions of substantial business growth, a railroad could become service constrained by a lack of rested or properly dispersed crews. It is, therefore, important for the railroad to plan carefully regarding how many crews are hired and trained and where they are stationed.

CHAPTER 3 – PRIVATIZATION OF THE MEXICAN RAILROAD SYSTEM

INTRODUCTION

Ferrocarriles Nacionales de Mexico (FNM-National Railroads of Mexico) was a state-owned railroad company that played a major role in the transborder movement of goods between the United States and Mexico before 1997. In 1992, the FNM went under an intensive structural and privatization process that resulted in the segmentation of the Mexican railroad system. A significant activity in the structural and privatization process was the 1995 amendment of the Mexican legal framework for the rail industry, which established new regulations and guidelines for the construction, operation, commercialization, and maintenance of Mexican railways under national and foreign private investment. The legal changes undertaken at this time set the stage for U.S. railroad investment and, ultimately, the granting of concessions for rail operations under a streamlined, competitive system of private rail companies.

The current Mexican railroad system has 16,639 miles of rail, with 12,929 miles of main line track (or concession track), 2,738 miles of secondary track, and 972 miles of private track (which is different from the concession track) *(6)*.

Currently, approximately 10 percent of U.S.-Mexico trade (measured by both value and tonnage of transported product) is conducted by rail through eight railroad border crossings, more than half of which are located in the state of Texas *(7)*. Figure 4 shows U.S.-Mexico railway border crossing facilities. Table 3 shows the corresponding railroad companies that operate in each border crossing location *(8)*.

Table 3. U.S.-Mexico Railway Border Crossings.

<table>
<tr><th colspan="2">State</th><th colspan="2">Border Crossing</th><th colspan="2">Connecting Railroad Companies</th></tr>
<tr><th>United States</th><th>Mexico</th><th>United States</th><th>Mexico</th><th>United States</th><th>Mexico</th></tr>
<tr><td rowspan="5">Texas</td><td rowspan="2">Tamaulipas</td><td>Brownsville</td><td>Matamoros</td><td>UP, BNSF</td><td>TFM</td></tr>
<tr><td>Laredo</td><td>Nuevo Laredo</td><td>UP, TM</td><td>TFM</td></tr>
<tr><td>Coahuila</td><td>Eagle Pass</td><td>Piedras Negras</td><td>UP, BNSF</td><td>Ferromex</td></tr>
<tr><td rowspan="2">Chihuahua</td><td>Presidio</td><td>Ojinaga</td><td>South Orient</td><td>Ferromex</td></tr>
<tr><td>El Paso</td><td>Cd. Juarez</td><td>UP, BNSF</td><td>Ferromex</td></tr>
<tr><td>Arizona</td><td>Sonora</td><td>Nogales</td><td>Nogales</td><td>UP</td><td>Ferromex</td></tr>
<tr><td rowspan="2">California</td><td rowspan="2">Baja California</td><td>Calexico</td><td>Mexicali</td><td>UP</td><td>Ferromex</td></tr>
<tr><td>San Ysidro</td><td>Tijuana</td><td>San Diego
Imperial Valley</td><td>FNM*</td></tr>
</table>

* The Tijuana-Tecate Shortline Railroad is expected to be transferred to the State Government of Baja California by the end of 2000 *(9)*.

Sources: Instituto Mexicano del Transporte and Texas Transportation Institute, 2000.

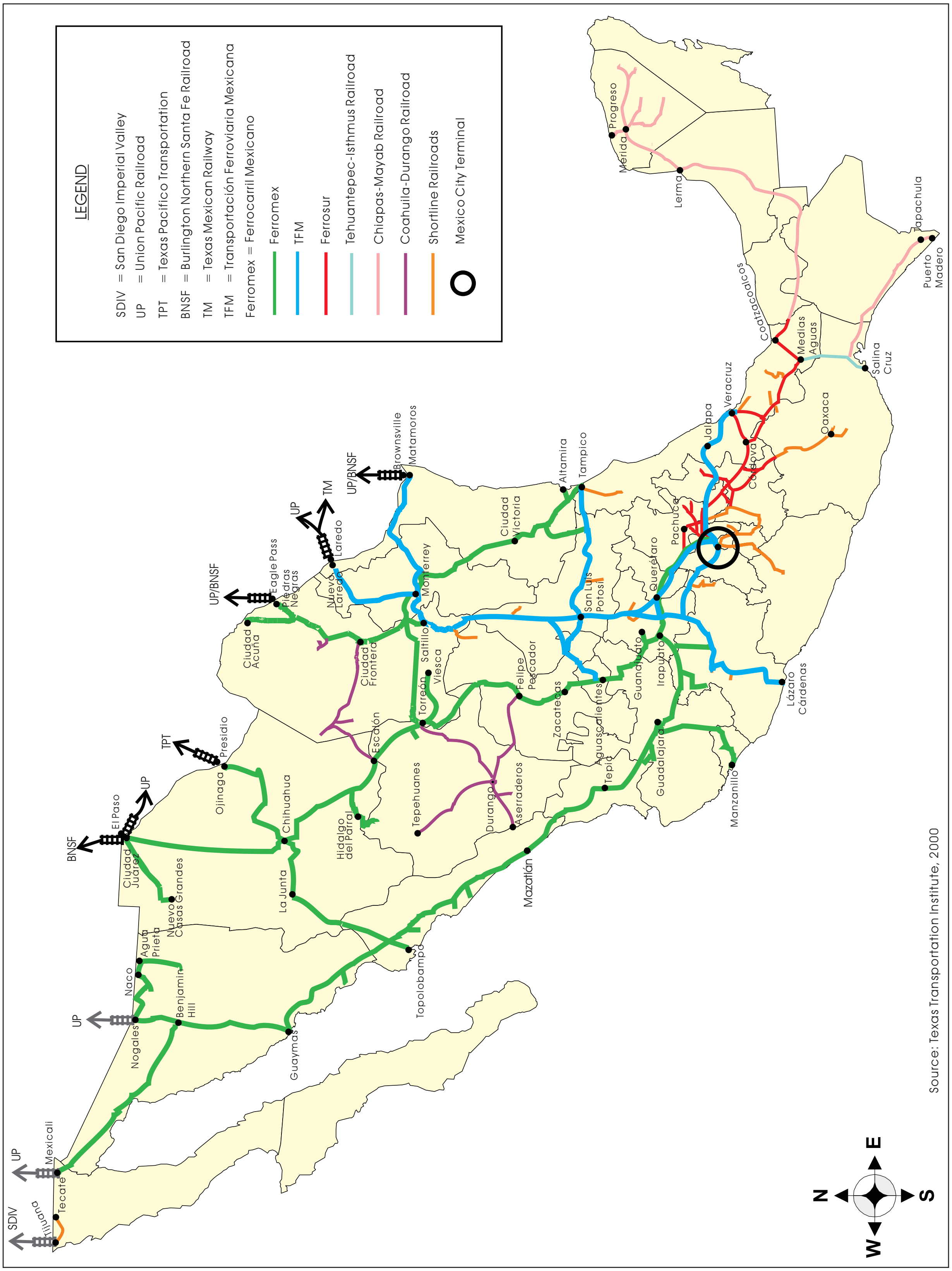


Figure 4. Location of U.S.-Mexico Railway Border Crossings.

DEVELOPMENT OF THE MEXICAN RAILROAD SYSTEM: 1824-1994

Development of the Mexican railroad system began in the 1820s after the creation of the Republic of Mexico. Since that time, Mexico has granted several concessions for the construction and operation of railroads to the private sector, including Mexican and foreign firms. The development of the Mexican railroad system from its origin up to the present, like most national railways, has focused on the growth of the economy and on promoting international trade. With the growth of population, the Mexican railroad worked to integrate the main population centers and provided logistical support for the military. The railroad system has been important to Mexico by providing for both national security and political stability.

Development of the Mexican Railroad System: 1824-1987 *(10, 11)*

Mexico was formally established as a Republic in 1823. A brief description of some of the main events that took place during the development of the Mexican Railroad System for the 1824 to 1987 period is provided below:

1824 The Mexican Congress passed a decree that authorized the construction of an "interoceanic" railroad in the Tehuantepec Isthmus, with the purpose of increasing international commerce. Although various concessions were granted to carry out this project in the following years, the project was not completed until 1894. The project joined the Port of Coatzacoalcos (in the Gulf of Mexico) to the Port of Salina Cruz (in the Pacific Ocean), and had a total length of 193 miles.

1837 The Federal Government granted approval to build the first railway in the country, known as the *Camino de Hierro* (Iron Road), which was to link Mexico City with the Port of Veracruz. This 265-mile project was completed in 1873, and service was provided by a Mexican-English company called Compañía Limitada del Ferrocarril Mexicano (Mexican Railroad Company, Limited).

1884 The 1,231-mile railway between Mexico City and the city of Paso del Norte (now called Ciudad Juárez) was completed. The railway also connected the cities of Querétaro, León, Aguascalientes, Zacatecas, Torreón, and Chihuahua and was constructed and operated by a U.S.-based company, Ferrocarril Central Mexicano.

1888 A narrow-gauge railway between Mexico City and the city of Nuevo Laredo was completed. The railway was 844 miles in total length and connected the cities of Toluca, San Luis Potosí, Saltillo, and Monterrey. This railway was constructed and operated by another U.S.-based company, Constructora Nacional Mexicana.

1908 On February 29, 1908, two railroad companies, Ferrocarril Central Mexicano and Constructora Nacional Mexicana, were consolidated to form Ferrocarriles Nacionales de Mexico, with the Mexican Federal Government retaining control of 51 percent of FNM's capital stock.

1948 On December 11, 1948, the Ley Orgánica de los Ferrocarriles Nacionales de México (Organic Law of FNM) was passed, which established FNM as a decentralized public entity.

1981 On May 21, 1981, the Ferrocarriles Unidos del Sureste (Southeast United Railroads) were consolidated within FNM.

1983 On March 2, 1983, Article 28 of the Mexican Constitution was amended to read that railroad service was a national strategic area to be performed exclusively by the Federal Government through FNM.

1986 On November 6, 1986, the consolidation within FNM of Ferrocarril del Pacífico (Pacific Railroad), Ferrocarril Chihuahua-Pacífico (Chihuahua-Pacific Railroad), and Ferrocarril Sonora-Baja California (Sonora-Baja California Railroad) began.

Modernization of the Mexican Railroad System: 1988-1994

In 1988, FNM developed its 1988 to 1994 program and a long-term plan that included railroad policies up to the year 2010 *(11)*. However, the modernization of the Mexican railroad system did not fully begin until 1992 when the Mexican Federal Government implemented the 1992-1994 Structural Change Program for the FNM *(12)*. The program included policies and goals to increase FNM's productivity and competitiveness by improving its administrative, operational, technological, commercial, and financial operations.

A steady decline in the freight market share with respect to the trucking industry prompted the modernization of FNM. This decline in market share relative to trucks was attributed to poor quality service, noncompetitive pricing, and poorly maintained track and equipment. At the time, FNM estimated that a total investment of approximately $2.3 billion would be required for modernizing the railroad network over the next five years, and it anticipated that almost 50 percent of that investment would come from the private sector. Several areas, including the implementation of a reliable signal system, track maintenance, operation of intermodal facilities, and maintenance of locomotives and rolling stock, were opened to private participation *(13)*. Highlights of FNM's improvements during 1992 to 1994 include the following:

Number of Employees

On October 1, 1992, FNM's labor union agreement was reviewed and modified to reduce the number of FNM employees from 83,290 in 1990 to 49,323 in 1994, approximately a 41 percent decrease *(6, 12)*. This measure increased productivity by an estimated 52 percent, paving the way for the introduction of modern operations technology *(12)*.

Infrastructure

In 1993, the private sector became actively involved in track maintenance, and by the end of 1994 over 1,600 miles of high-specification tracks were privately maintained. After 1994, FNM used the private sector for maintaining approximately 2,500 miles of tracks annually *(14)*.

Locomotives and Rolling Stock

Approximately 21 percent of the total number of locomotives were replaced or reconditioned through the acquisition of 134 locomotives and the rehabilitation and reconstruction of another 173 locomotives. Regarding railcars, approximately 13.5 percent of the fleet was renewed by acquiring and rehabilitating 677 and 4,748 railcars, respectively. In addition, the number of repair workshops was reduced from 34 to 12, of which seven were leased to the private sector *(14)*.

Passenger Service

Railroad passenger service was reduced by almost 40 percent during the 1988 to 1994 period. The only remaining passenger service allowed to remain was service that provided a necessary social function of linking communities without other transportation options (*14*).

Operations

Between 1988 and 1994, operations were also completely restructured. A direct traffic control (DTC) system and a CTC system were implemented on 3,153 miles and 1,216 miles of tracks, respectively. The DCT system is based on direct radio communication between dispatcher and engineer and is designed to monitor stretches of main track for movement of trains and other rail vehicles. The CTC system is based on remote control of vehicle movement through signal lights and track switches controlled from a central office. The rest of the rail system, approximately 8,400 miles, operates under a standard order train (OT) system that requires delivery of written orders to each train crew, which are sent by the train dispatcher to the route stations by radio, selective telephone, or telegraph *(15)*.

Cargo Handling

The FNM implemented commercial policies that included the liberation of tariffs, increase of service quality, modernization of the operations technology, and the participation of the private sector in the construction and operation of intermodal terminal facilities *(12)*. These policies encouraged an increase in the transport of containers by approximately 160 percent between 1990 and 1994 *(6)*.

PRIVATIZATION PROCESS OF THE MEXICAN RAILROAD SYSTEM: 1995-1998

The Mexican government primarily designed the privatization of the Mexican railroad system to:

- increase its efficiency and productivity,
- implement a more market-based strategy,
- concentrate on freight transportation as a core business, and
- eliminate inefficient and unprofitable passenger transportation services *(12)*.

The *Plan Nacional de Desarrollo 1995-2000* (PND-1995-2000 National Development Plan) included a second phase for the 1992 FNM modernization program *(16)*. The new program included a revised legal framework that allowed private sector participation in railway service. The plan's goal was to recognize the importance of private sector participation in the development of a modern, efficient, and competitive railroad system. Deregulation, privatization, competition, and liberalization became the key concepts within this restructuring program.

The New Legal Framework

During 1995, three main legislative events, described in the 1995-2000 National Development Plan, promoted participation of the private sector in the modernization efforts of FNM through:

1. amendment of Article 28 of the Mexican Constitution,
2. enactment of the *Ley Reglamentaria del Servicio Ferroviario* (Law Regulating Railway Services), and
3. amendment of the *Ley de Inversion Extranjera* (Foreign Investment Law).

The amendment of Article 28 of the Mexican Constitution in 1995 was the main piece of legislation that permitted and promoted participation of the private sector and foreign investment in the Mexican railroad system. A brief discussion of the three legislative events is included below.

Mexican Constitution

On March 2, 1995, the Mexican Congress approved an amendment to Article 28, which reclassified the Mexican railroad system as a priority activity (as opposed to a "strategic activity") for the development of the nation. This reclassification opened opportunities through concessions and permits for private sector investment in the rail industry *(17)*. The opening of the Mexican railroad system to private investment, which remained consistent with the goals of the Federal Government, sought to:

- preserve national security and sovereignty (government will retain track ownership);
- provide a safe, competitive, and efficient railroad service that fosters foreign trade and competition within the sector;

- guarantee the rights of the railway workers and retirees;
- promote the development of multimodal transportation systems; and
- carry out a vigorous and transparent bidding process *(18)*.

The amendment of Article 28 promoted the creation of the Law Regulating Railway Services to define guidelines for granting concessions and permits to the private sector and promoted an amendment to the Foreign Investment Law to define limits of foreign investment in the Mexican railroad system.

Law Regulating Railway Services

On May 12, 1995, the *Ley Reglamentaria del Servicio Ferroviario* (Law Regulating Railway Services) was passed, defining the mechanisms, measures, and regulations that would govern the granting of concessions and permits to private investors *(19)*. Concessions are related to the construction, operation, commercialization, and maintenance of railways, while permits provide for auxiliary railroad services such as repair workshops and passenger and freight terminals. The main rules this legislation established for providing public rail transportation service were the following:

- Public rail transportation service may be for passengers and freight.
- Concessions and permits will only be granted to Mexican legal entities.
- Railroad service can be provided by the private sector through concessions. Concessions will be granted through a public bidding process for a maximum of 50 years, and may be extended for up to an additional term of 50 years.
- Concessionaires may freely set tariffs.
- Traffic control centers must be located within the national territory.
- Concessionaires of public rail passenger and freight transportation services are responsible for loss of and damage to passengers, passenger luggage, goods, or products that they transport and for damage to the right-of-way and installations within.
- Permits will be required for auxiliary rail services. Authorization from *the Secretaría de Comunicaciones y Transportes* (SCT-Secretariat of Communications and Transportation) is required for the installation of electric power lines, fiber-optic cable, or other surface or aerial work within the right-of-way.

On September 30, 1996, the *Reglamento del Servicio Ferroviario* (Regulation of the Railway Service) was passed and provided a more detailed description on how to implement the Law Regulating Railway Services *(20)*.

Foreign Investment Law

Under the 1988 to 1994 privatization program, most state-owned companies were transferred to the private sector. From a total of 1,155 state-owned companies at the beginning of 1989, only 215 remained in the Mexican government's hands by the end of 1994. It is estimated that public enterprise privatization accounted for a total of $23.7 billion during the 1988 to 1994 period, which was approximately 12 percent of the country's Gross Domestic Product (GDP) in 1992 *(21)*. In addition, on December 23, 1993, the *Ley de Inversion Extranjera* (Foreign Investment Law) was amended to further liberalize the regulation of foreign investment in Mexico and conform to current privatization initiatives *(22)*. However, no private or foreign investment was allowed for the construction, operation, commercialization, and maintenance of railways. The amendment to Article 28 of the Mexican Constitution in 1995 allowed participation of foreign investment of up to 49 percent in the equity of the concessions. A greater percentage of foreign ownership would require approval by the *Comisión Nacional de Inversiones Extranjeras* (National Commission for Foreign Investment).

Restructuring Strategy of the Mexican Railroad System

In 1994, the Mexican railroad system had an estimated 15 percent market share of freight land transportation *(16)*. However, the Mexican railroad system has the potential to become the base of the Mexican land transportation. Its railway network links the main cities, industrial development zones, maritime ports, and the U.S.-Mexico border crossings of the country. In 1995, the Mexican Federal Government decided to restructure the Mexican railroad system according to a regional segmentation, with vertically integrated regional companies responsible for providing all public railway transportation services such as maintenance, construction, operation, and commercialization. These regional railroads were planned to be interconnected and included mandatory track access rights and haulage agreements for specific route portions. The restructuring model focused the service on market needs. As a result, it was expected to reduce the regulatory and operational factors and conduct them according to the needs of the region served, increase response to structural economic or market change, and promote competition within the domestic land-transportation system *(9)*.

Original Regional Segmentation

The original regional segmentation framework for restructuring the Mexican railroad system included:

- three regional railroad trunk lines: *Ferrocarril del Noreste* (Northeastern Railroad), *Ferrocarril Pacífico-Norte* (Pacific-North Railroad), and *Ferrocarril del Sureste* (Southeast Railroad);
- one interconnection railroad terminal called *Terminal Ferroviaria del Valle de México* (Valle de Mexico Interconnection Railroad Terminal); and
- several smaller individual railroad lines called *Líneas Cortas* (Shortlines), of which *Ferrocarril Chihuahua al Pacífico* (Chihuahua-Pacific Railroad) was considered the most important.

The main highlights of the three regional railroad trunk lines are provided in Table 4 *(15)*.

Shortlines

In addition to the three main regional railroad concessions, the Mexican railroad system included approximately 4,969 miles of track classified as "Shortlines." Shortline Railroads are classified as shown in Table 5, and those lines located in the northern part of Mexico comprised:

- Chihuahua-Pacific with a 811-mile length,
- Coahuila-Durango with a 608-mile length, which included railway segments located in the states of Durango, Coahuila, Chihuahua, and Zacatecas,
- Nacozari (in the state of Sonora) with a 200-mile length, and
- Tijuana-Tecate (in the state of Baja California) with a 44-mile length.

Table 4. Highlights of the Original Regional Railroad Trunk Lines.

Railroad Trunk Line	Track Length (mi)	Principal Routes Included	Access to: Principal Maritime Ports (*Mexican State*)	Access to: Intermodal Terminals (*Mexican State*)	Access to: Automobile Manufacturing Facilities (*Mexican State*)	Access to: U.S.-Mexico Border Crossings (*U.S. State-Mexican State*)
Pacific-North	3,875	• Benjamín Hill-Mexicali • Guadalajara-Nogales • Irapuato-Ciudad Juárez • Querétaro-Guadalajara-Manzanillo • Saltillo-Piedras Negras • Tampico-Monterrey-Torreón	• Altamira (*Tamaulipas*) • Manzanillo (*Colima*) • Tampico (*Tamaulipas*)	• Aguascalientes (*Aguascalientes*) • Guadalajara (*Jalisco*) • Pantaco (*State of Mexico*) • Querétaro (*Querétaro*) • Ramos Arizpe (*Coahuila*) • Saltillo (*Coahuila*)	• Hermosillo (*Sonora*) • La Encantada (*Coahuila*) • Ramos Arizpe (*Coahuila*) • Silao (*Guanajuato*)	• Eagle Pass-Piedras Negras (*Texas-Coahuila*) • El Paso-Ciudad Juárez (*Texas-Chihuahua*) • Nogales-Nogales (*Arizona-Sonora*) • Calexico-Mexicali (*California-Baja California*)
Northeastern	2,475	• Aguascalientes-Tampico • Mexico City-Lázaro Cárdenas • Mexico City-Veracruz (via Jalapa) • Monterrey-Matamoros • Querétaro-Nuevo Laredo	• Lázaro Cárdenas (*Michoacán*) • Tampico (*Tamaulipas*) • Veracruz (*Veracruz*)	• Monterrey (*Nuevo León*) • Pantaco (*State of Mexico*) • Ramos Arizpe (*Coahuila*)	• Monterrey (*Nuevo León*) • Ramos Arizpe (*Coahuila*)	• Brownsville-Matamoros (*Texas-Tamaulipas*) • Laredo-Nuevo Laredo (*Texas-Tamaulipas*)
Southeast	1,375	• Apizaco-Puebla • Coatzacoalcos-Mérida • Coatzacoalcos-Salina Cruz • Córdoba-Medias Aguas • Mexico City-Veracruz (via Orizaba) • Tehuacán-Esperanza • Veracruz-Tierra Blanca	• Coatzacoalcos (*Veracruz*) • Salina Cruz (*Oaxaca*) • Veracruz (*Veracruz*)	• Pantaco (*State of Mexico*)	• Puebla (*Puebla*)	

Sources: Texas Transportation Institute, 2000, and Task 2 of the Binational Border Transportation Planning and Programming Study, 1998.

Table 5. Classification of Shortline Railroads.

Shortlines	Definition	Characteristic
Local Railroad	Covers local markets	Shortlines have the potential to increase traffic and income
Shortlines integrated to the large regional lines	Group of shortlines suitable to be added to any of the regional concessions	These lines usually carry high volumes over short distances
Independent Shortlines	Group of shortlines that operates independently of the main routes	These lines have an independent economic return

Source: Embassy of Mexico in Canada, 1998.

Valle de Mexico Interconnection Railroad Terminal

All three regional railroad trunk lines converge in Mexico City, the hub being the Valle de Mexico Interconnection Railroad Terminal. This terminal consists of approximately 186 miles of mainline track and nearly as many miles of branch lines, connecting tracks, and industrial spurs. The railroad provides service to more than 300 customers and represents an independent business that will handle local switching and interchange traffic for all connecting railroads after privatization is complete. Each of the concessionaires of the Northeastern, Pacific-North, and Southeast railroads will be granted 25 percent of Valle de Mexico Interconnection Railroad Terminal shares as a part of their concession, with the government retaining the remaining 25 percent for a future commuter passenger entity *(9)*.

The original regional segmentation of the Mexican railroad system is summarized and illustrated in Figure 5.

Modifications to the Original Regional Segmentation

Chihuahua-Pacific Shortline Railroad

In 1996, the Chihuahua-Pacific Shortline Railroad was the first railway line to be auctioned under FNM's 1995-2000 modernization program *(23)*. However, the concession was not awarded to the single participating entity since the amount bid did not meet the government's minimum estimated value. Instead of conducting another bidding process for the privatization of this railroad line, the Mexican government decided to include it as optional within the concession of the Pacific-North Railroad Line.

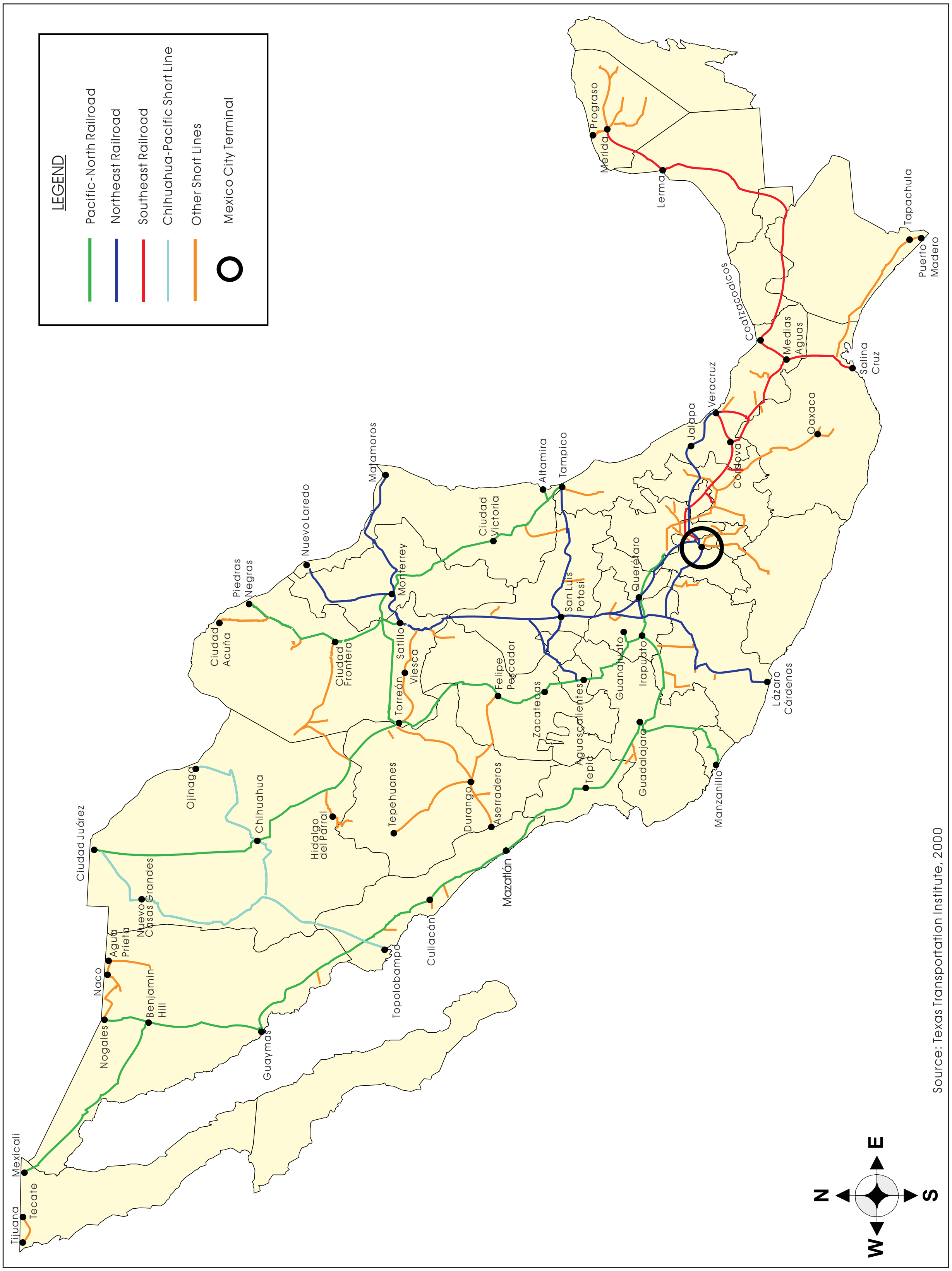


Figure 5. Original Segmentation for the Privatization of the Mexican Railroad System.

Southeast Railroad Line

Because of sovereignty issues, there was a strong resistance from the Mexican Congress to privatize the Tehuantepec Isthmus segment included in the concession of the Southeast Railroad Line *(24)*. The Tehuantepec Isthmus links the port of Salina Cruz in the Pacific Ocean and the port of Coatzacoalcos in the Gulf of Mexico. Therefore, the Mexican government decided to divide this railroad line into the following three entities:

- Southeast Railroad with a length of 977.5 miles,
- Chiapas-Mayab Railroad with a total length of 1,123 miles, and
- Tehuantepec Isthmus Railroad with a length of 225 miles *(25)*.

Nevertheless, the Tehuantepec Isthmus Railroad will remain a state-owned entity to be administered and operated by the Mexican government and will provide lease trackage and right-of-ways rights to the three regional railroad trunk line concessionaires *(9)*.

Shortline Railroads

In 1997, the SCT published the guidelines for the concession of some Shortline Railroads, which were awarded as follows:

- Coahuila-Durango Railroad Line to *Grupo Acerero del Norte* and *Industrias Peñoles*, and
- Tijuana-Tecate Railroad Line to *Medios de Comunicación y Transporte de Tijuana* (*26*).

However, in July 1998, the Mexican government announced that *Medios de Comunicación y Transporte de Tijuana* did not meet its financial obligations to purchase the concession of the Tijuana-Tecate Line, and the concession was revoked *(27)*. The SCT expects to have auctioned all Shortline Railroads before the end of the year 2000 *(9)*.

Final Bidding Process

Concessions to the Northeastern Railroad, Pacific-North Railroad, and Southeast Railroad were awarded to TFM, Ferromex, and *Grupo Triturados Basálticos y Derivados* (TRIBASA), which integrated a railroad company called *Ferrocarril del Sureste* (Ferrosur) *(9)*. The next sections provide more detailed information on TFM and Ferromex, the rail systems interfacing with U.S. railroads and affecting international trade. The privatization process is summarized in Table 6 and illustrated in Figure 6 *(9)*.

Table 6. Summary of the Mexican Railroad System Privatization Process.

Concept	Railroad Line					
	Northeast	**Pacific-North**	**Coahuila-Durango**	**Southeast**	**Nacozari**	**Chiapas-Mayab**
Length (miles)	2,677	5,067	609	924	200	969
Bid	Aug. 9, 1996	March 7, 1997	July 31, 1997	Feb. 18, 1998	March 24, 1999	March 24, 1999
Terms of Concession	50 years	50 years	30 years	50 years	30 years	30 years
Winner	TFM	Ferromex	Grupo Acerero del Norte-Industrias Peñoles	TRIBASA	Ferromex	Compañía de Ferrocarriles Chiapas-Mayab
Offer Presented (in Millions of U.S. Dollars)	$1,400*	$527**	$23	$322	$2	$15
Investment Commitments for the 2000-2004 Period (in Millions of U.S. Dollars)	$731.8	$703	$19	$187	$31	$8
Beginning of Operations	June 23, 1997	Feb. 18, 1998	April 26, 1998	Dec. 17, 1998	Aug. 31, 1999	Aug. 31, 1999

* Offer included only 80 percent of the stock shares.
** Offer included the Chihuahua-Pacific Shortline Railroads from Ojinaga to Topolobampo for $32 million.
Source: Secretaría de Comunicaciones y Transportes, 2000.

ACCOMPLISHMENTS OF THE MEXICAN RAILROAD SYSTEM PRIVATIZATION

Privatization of the Mexican railroad system has allowed granting concessions and permits to the private sector, as well as promoting foreign investment, in a transportation activity that used to be carried out solely by the Mexican government. This privatization process has also contributed to the economic development of the country by providing a safer and more efficient and competitive railroad system. Some of the key accomplishments are summarized below *(9)*.

Amount of Railway System Under Concession

In terms of main railway track or tons-mile of railway traffic, 86.5 percent and 99 percent, respectively, has been leased to the private sector or has been transferred to state governments by 2000 *(9)*.

Capital Investment

Railroad concessionaires have invested more than $800 million in capital expenditures and improvement programs between 1997 and1999 and are committed to invest more than $1.35 billion for the 2000-2004 period *(9)*.

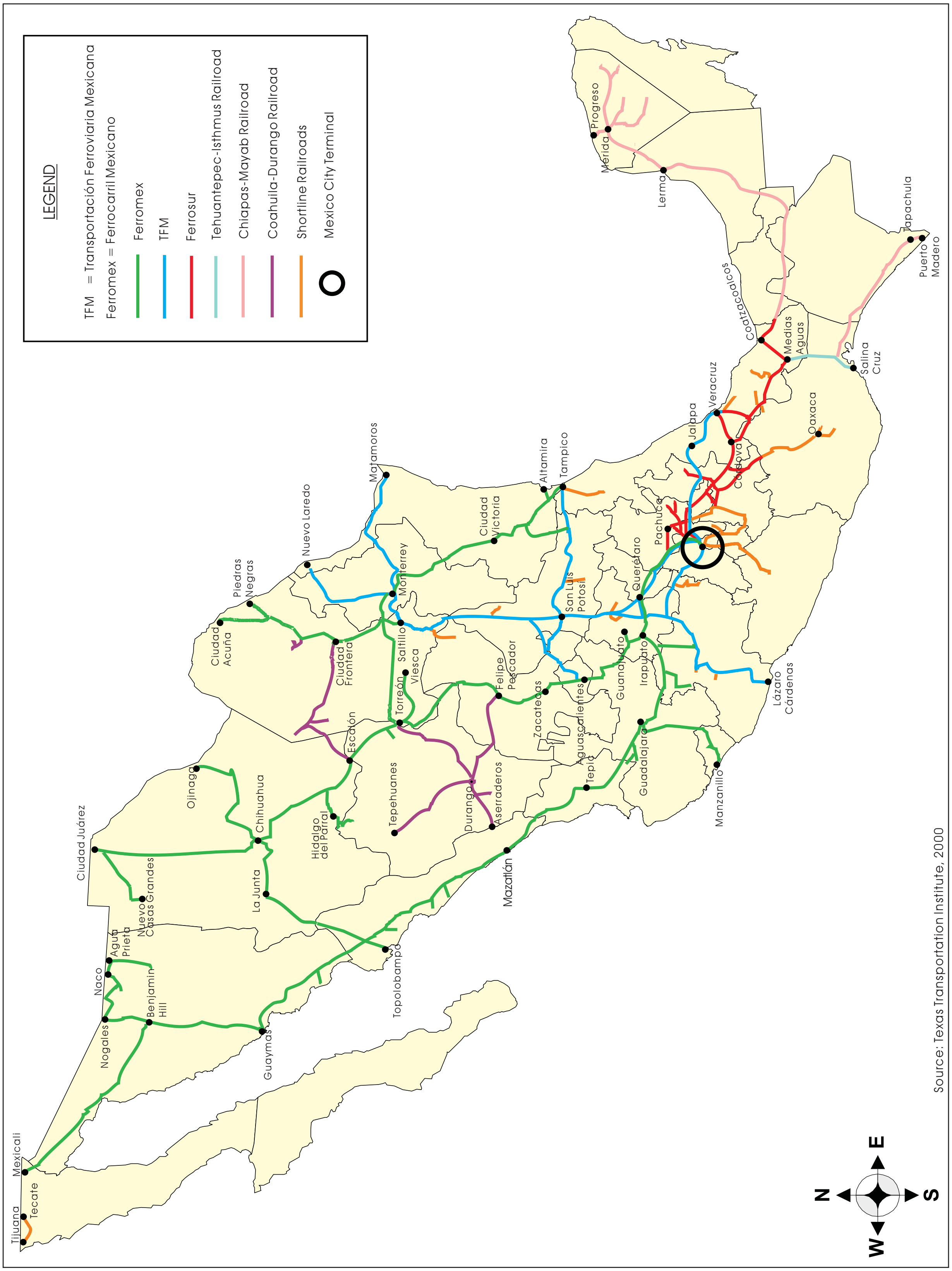


Figure 6. Current Status of the Mexican Railroad System.

Cargo Handling

Before the privatization process, the maximum amount of cargo transported by the Mexican railroad system was 70.6 million tons in 1984 *(9)*. This historical maximum was surpassed by 18.4 percent in 1998, and is projected to be exceeded by approximately 22 percent in 2000 *(6)*. Similarly, the maximum cargo traffic was reached in 1985 with 79,841 million tons-miles, which was surpassed by 3.5 percent in 1997 and is estimated to be surpassed by 8 percent in 2000 *(6, 9)*. In addition, better intermodal terminal facilities and better customer service policies increased the transport of containers by more than 100 percent between 1997 and 2000. Table 7 summarizes the total cargo and types of commodities transported by the Mexican railroad system for the 1990 to 2000 period *(6)*.

Table 7. Cargo Transported by the Mexican Railroad System for the 1990-2000 Period (Thousands of Tons).

Year	Commodities								Total
	Steel Products	Agricultural Products	Containers	Cement and Derivatives	Oil and Petrochemical Products	Paper and Derivatives	Heavy and Industrial Products	Other Products	
1990	1,079	12,663	523	8,080	4,859	2,207	26,073	652	56,136
1991	1,105	11,948	899	7,335	4,689	2,209	22,291	642	51,118
1992	1,399	14,352	1,027	8,234	5,216	2,405	20,389	630	53,652
1993	1,076	14,872	1,442	9,359	5,458	2,266	20,472	549	55,494
1994	1,422	16,441	1,361	9,189	5,055	2,443	20,764	664	57,339
1995	1,786	14,660	1,684	8,477	5,209	2,740	22,523	731	57,810
1996	2,515	16,298	2,092	10,314	4,656	2,566	25,522	843	64,806
1997	2,582	16,208	1,262	10,964	5,863	2,610	27,550	890	67,929
1998	2,967	21,810	2,384	12,823	8,227	3,292	30,809	1,314	83,624
1999[p]	3,294	21,348	2,740	13,510	8,302	3,362	30,899	1,434	84,889
2000[e]	3,340	21,493	2,778	13,778	8,492	3,442	31,361	1,393	86,077

p = Preliminary
e = Estimated
Source: Presidencia de México, Sexto Informe de Gobierno, 2000.

Share of Railroads in Land Transportation

The maximum historical participation of railroads in land transportation was achieved in 1973 with a 25 percent share, reaching a historical minimum of 12 percent in 1993 *(6)*. Even though motor carrier transportation continues with dynamic growth, it is estimated that the Mexican railroad system will reach a 14.7 percent share of land transportation cargo by the end of 2000 *(28)*.

Safety

Modernization of infrastructure, locomotives and rolling stock, and traffic control systems contributed to decreasing the number of incidents involving casualties from 38 in 1995 to nine in 1999. This represents a 76 percent reduction *(9)*.

Number of Employees

The number of railroad employees has decreased from 83,290 in 1990 to 16,980 in 2000, down approximately 80 percent, as shown in Figure 7 *(6)*.

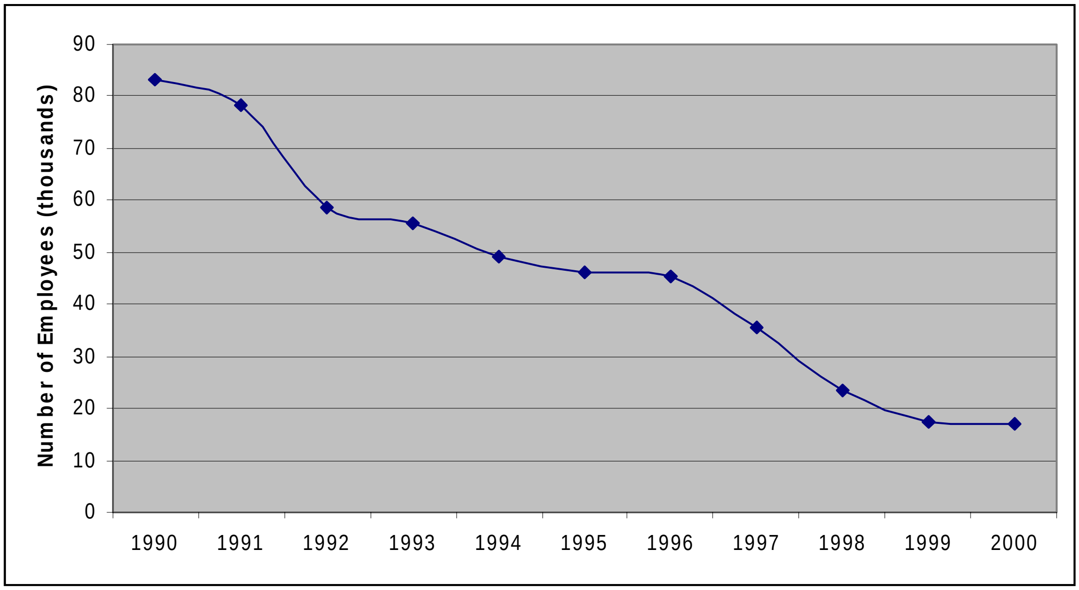


Figure 7. Number of Railroad Employees for the 1990-2000 Period.

Productivity

The number of tons-mile per employee has increased from 771 in 1990 to 5,077 in 2000, increasing more than 550 percent, as depicted in Figure 8 *(6)*.

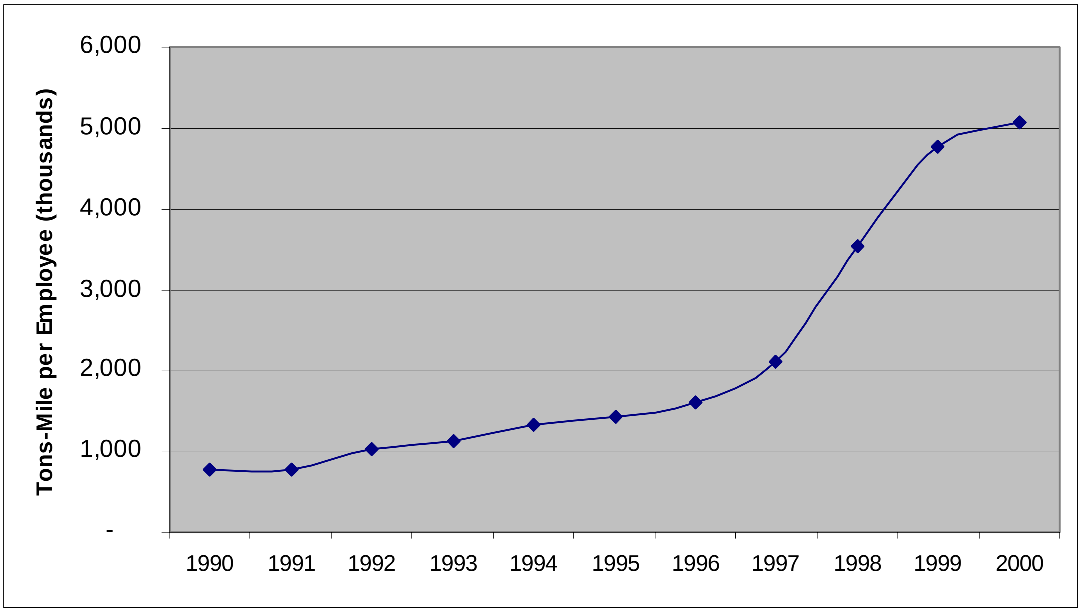


Figure 8. Number of Ton-Miles per Employee for the 1990-2000 Period (Thousands).

EXPECTED ACTIVITIES BY THE MEXICAN GOVERNMENT AFTER 2000

FNM ceased operations on August 31, 1999, but continues performing some administrative activities to complete the privatization process of the Mexican railroad system *(9)*. There exists a legislative initiative to formally end FNM's activities and create an *Unidad Liquidadora* (Liquidation Unit) to carry out any pending activity in the privatization process. This activity includes the concession or the transfer to state or local governments of approximately 1,551 miles of short railways, as well as the supervision of environmental audits and restoration programs *(6, 9)*.

Railroad regulatory and supervisory functions will be transferred to the SCT, which will include supervising the fulfillment of the economic conditions, business plans, and investment programs established in the concessions. In addition, the SCT will be responsible for functions that are related to railroad passenger services linking communities without an alternative public transportation service. Even though railroad passenger service decreased almost 99 percent between 1990 and 2000, the SCT will continue regulating and supervising railroad concessionaires that provide this type of service through subsidies. In 2000, the following eight passenger service routes provided passenger transportation *(6, 9)*:

- Chihuahua-Los Mochis and Aguascalientes-Torreón serviced by Ferromex,
- Mexico City-Querétaro serviced by TFM,
- Ciudad Frontera-Sierra Mojada serviced by Coahuila-Durango Railroad,
- Mexico City-Apizaco and Tehuacán-Oaxaca serviced by Ferrosur, and
- Coatzacualcos-Campeche serviced by Chiapas-Mayab Railroad.

Figure 9 depicts the decreasing trend in railroad passenger transportation (in millions of passenger-miles) for the 1990 to 2000 period *(6)*.

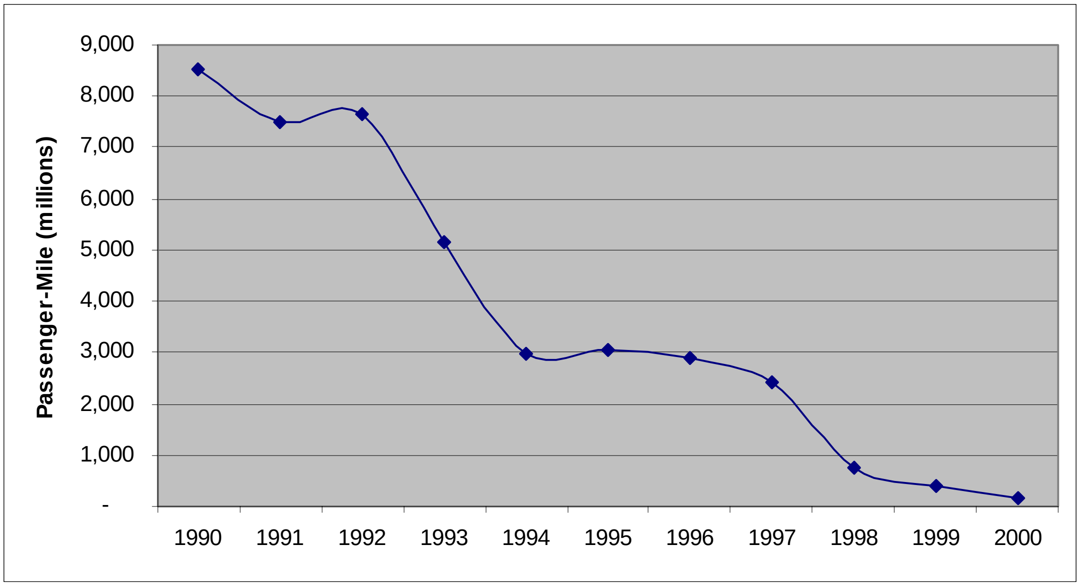


Figure 9. Number of Passengers Transported by Rail for the 1990-2000 Period (Millions of Passenger Miles).

The following sections provide detailed information on TFM and Ferromex, which are the principal rail systems that interface with U.S. railroads and affect international trade.

TRANSPORTATION FERROVIARIA MEXICANA (TFM)

Background

On December 6, 1996, TFM was awarded with the concession to operate *Ferrocarril del Noreste* (Northeastern Railroad Line) *(29)*. TFM is a joint venture of *Transportación Marítima Mexicana* (TMM) and Kansas City Southern Industries (KCSI), in which TMM and KCSI own 80 percent of TFM's stock shares with the Mexican government retaining the remaining 20 percent *(9)*.

The Bidding Process

TMM and KCSI began their relationship in 1995 when the companies joined forces to assess the market potential of the Northeastern Railroad Line. This relationship was consolidated later by forming a joint venture company named TFM and making a $1.4 billion bid on the concession of the Northeastern Railroad Line, which was awarded in December 1996 *(29)*.

The purchase included a 50-year concession, with the option of an additional 50-year extension, and included the transfer of all related equipment and other assets, as well as 25 percent of the shares of the Valle de Mexico Interconnection Railroad Terminal. TFM assumed complete operational control of the Northeastern Railroad Line on June 24, 1997, after meeting its financial obligations *(29)*. However, the Mexican Federal Government decided to keep 20 percent of the shares to secure the operational feasibility of TFM *(9)*.

TFM Locations

TFM has two main activity centers: one located in Mexico City (the corporate headquarters for executive, accounting, and marketing functions) and the other in Monterrey (housing customer service, transportation, mechanical/engineering, and revenue accounting departments). Contact information for TFM's locations is available through the Internet at www.gtfm.com.mx.

Importance of the Northeastern Railway Corridor Served by TFM

The northeastern railroad corridor is the most actively traveled corridor in northern Mexico, linking Mexico City with Laredo, Texas, where approximately 60 percent of the total U.S.-Mexico railway traffic cargo crosses the border *(2)*. The northeastern railway corridor has 2,677 miles of track, comprising 20.7 percent of the nation's main line track network, and handles approximately 40 percent of all rail cargo traffic in Mexico *(30)*. TFM serves the major Mexican industrial cities, maritime ports, and intermodal and automobile manufacturing facilities along the northeastern railway corridor, as shown in Table 8.

Table 8. Major Locations and Facilities Served by TFM.

Major Industrial Cities	Maritime Ports	Intermodal Facilities	Automobile Manufacturing Facilities
• Aguascalientes • Guadalajara***** • Mexico City • Monterrey • San Luis Potosí	• Altamira • Lázaro Cárdenas • Tampico • Veracruz	• Monterrey • Nuevo Laredo • Pantaco • Ramos Arizpe	• Monterrey • Ramos Arizpe

* With trackage rights over Ferromex railway
Sources: Tranportación Ferroviaria Mexicana, 1999.

U.S. – Mexico Border Crossings

TFM also has access to two U.S.-Mexico railway border crossings, located in the state of Texas on the U.S. side and the state of Tamaulipas on the Mexican side (see Table 9). TFM interchanges with Union Pacific (UP) and Texas Mexican Railway (TM) at the Laredo and Brownsville gateways and with UP and Burlington Northern Santa Fe Railway (BNSF), respectively. Figure 10 depicts TFM's rail border crossings with the corresponding railroad connections on the U.S. side.

Table 9. U.S.-Mexico Railway Border Crossings Accessed by TFM.

U.S. Border Crossing Location		Mexican Border Crossing Location		Connecting U.S. Railroad Company
City	State	City	State	
Laredo	Texas	Nuevo Laredo	Tamaulipas	UP, TM
Brownsville	Texas	Matamoros	Tamaulipas	UP, BNSF

Source: Transportación Ferroviaria Mexicana, 1999.

Principal Commodities Hauled

The principal commodities hauled by TFM along the northeastern railway corridor are classified into the following six product categories: (1) agricultural, (2) automotive, (3) industrial, (4) metals and minerals, (5) chemicals, and (6) intermodal.

Table 10 provides a description of the commodities within each of the above product categories *(31)*.

Table 10. Commodity Classification and Railcar Type Used by TFM.

Classification	Description	Railcar Type Used
Agricultural	Corn, sorghum, beans, wheat, rice, flour, oil, honey, sugar, molasses, tallow, beer, rapeseed, cotton, barley, dairy products, and cured or preserved products among others.	Hoppers and boxcars.
Automotive	New vehicles, join material for vehicles, motor vehicles, and chassis among others.	Multilevel, platforms, boxcars, and containers.
Industrial	Paper, pulpboard, wood, machinery, oversized equipment, electric motors, containers, cellulose, and iron pipes among others.	Boxcars, gondolas, and platforms.
Metals and Minerals	Cement, iron or steel sheets, wire cable, iron or steel pipes, stone, sand, clay, kaolin, lead bars, and zinc bars among others.	Multilevel, boxcars, hoppers, gondolas, and containers.
Chemicals	Soda ash, petroleum, diesel, oil, gasoline, chlorine, ammonia, manure, polystyrene, polypropylene, synthetic resins, acids, zinc, and fertilizers among others.	Tank cars.
Intermodal	Containerized cargo, and single or double stack.	Platforms and containers of 20, 40, 48, and 60 ft.

Source: Tranportación Ferroviaria Mexicana, 2000.

Railway Characteristics

TFM's railway infrastructure is in compliance with the FRA Class 4 or 5 standards and is capable of supporting railcars weighing 143 tons in gross weight over its entire system with the exception of the Valle de Mexico-Acambaro via Toluca branch. In addition, 71 percent of the main line track has 115 lb/yd rails, 75 percent is continuously welded, 72 percent has concrete ties, and 71 percent supports average speeds of 40 to 60 mph *(30)*.

Achievements of TFM during the First Three Years of Operation (June 1997- June 2000)

After taking over operations of the Northeastern Railroad, TFM planned to make substantial capital investments and improvements to all aspects of operations during its first five years of operation, with the goal of recapturing a large percentage of the land transportation market share by the end of 2002. During the first three years of operations, TFM's business and improvement plans focused on providing reliable service, faster transit times, high quality rolling stock, consistent and comprehensive customer service, and improved safety. Following is a summary of the main actions implemented by TFM between June 1997 and June 2000.

Capital Expenses and Improvement Programs

The original 1997-2002 TFM Master Investment Plan included capital investment of $731.8 million during the first five years of operation: $300 million to acquire 150 AC4400 locomotives and $431.8 million to modernize infrastructure and install new rail technology *(29)*. Figure 11 shows the initial TFMs annual commitment for investing $431.8 million on infrastructure modernization and rail technology during the 1997 to 2002 period *(29)*.

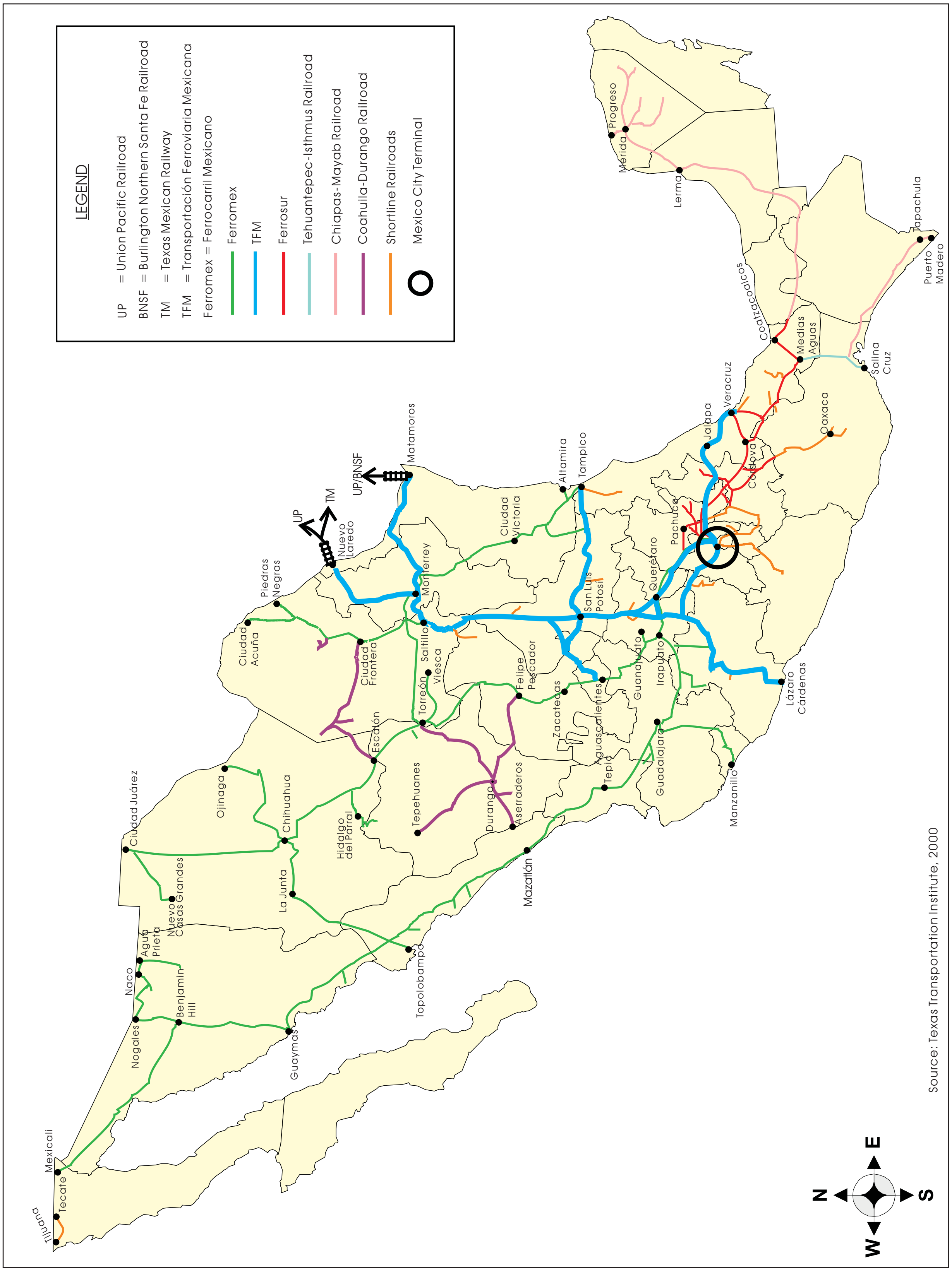
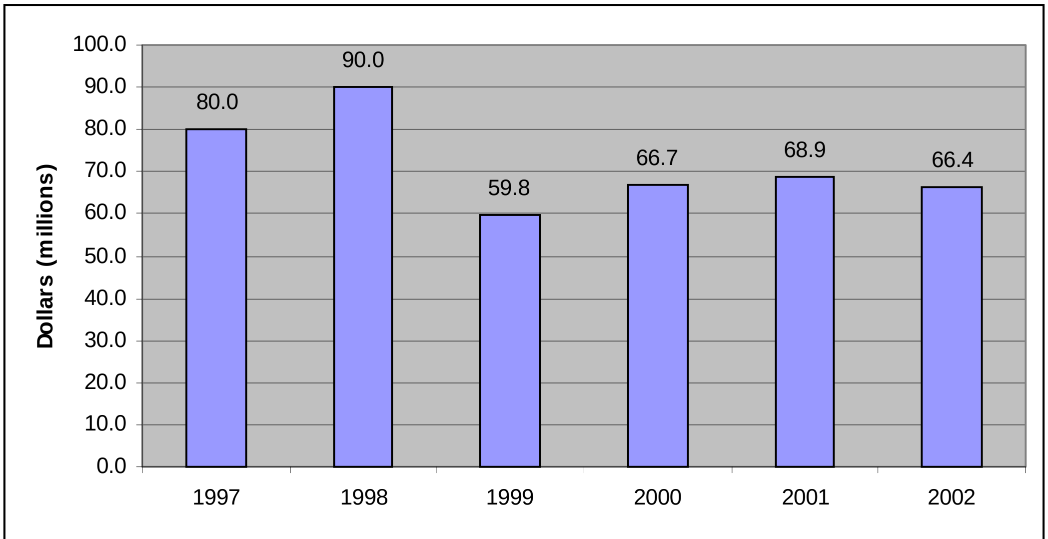


Figure 10. Railroad Network Operated by TFM.



Note: Does not include a $300 million investment for acquiring 150 AC4400 locomotives.
Source: Transportación Ferroviaria Mexicana, Public Relations Office, 1998.

Figure 11. Master Investment Plan for the 1997-2002 Period (Millions of Dollars).

However, TFM has exceeded the original five-year investment by more than $187 million in the first three years of operation. That is, TFM invested approximately $919 million in infrastructure, equipment, telecommunication systems, and operational improvements among others between June 1997 and June 2000 *(32)*. For 2000, TFM planned a $47.4 million capital investment, as itemized in Table 11 *(33)*.

Table 11. TFM's Planned Capital Investment for 2000.

Concept	Investment (in Millions)
Infrastructure	$27.5
Signaling	$ 2.6
Mechanical	$16.0
Security	$ 0.1
Operations Support	$ 1.1
Other	$ 0.1
TOTAL	**$47.4**

Source: Transportación Ferroviaria Mexicana, 2000.

Revenue and Operating Ratio

TFM's revenues have nearly tripled those generated by the Northeastern Railroad Line under FNM operation in 1996 *(32)*. In 1999, TFM's revenue increased by 21.5 percent compared with that of 1998, while the operating ratio, the relation of a railroad's operating expenses to operating revenues, decreased from 85.5 percent in 1998 to 76.6 percent in 1999 *(30)*. Table 12 shows TFM's revenue and operating ratio for 1998 and 1999.

Table 12. TFM's Revenue and Operating Ratio for 1998 and 1999.

Concept	Year	
	1998	1999
Revenue (in Millions)	$431	$524.5
Operating Ratio (Percent)	85.5	76.6

Source: Kansas City Southern Industries, 2000.

Locomotive Fleet

From the privatization of the Northeastern Railroad Line, 371 locomotives were transferred to TFM. The average age of the locomotive fleet transferred to TFM was just over 13 years and in relatively good condition. During the first year of operation, all TFM's locomotive fleet was upgraded to meet U.S. Federal Railroad Administration standards and the number was increased from 371 to 420 units *(29)*.

In 1997, TFM began investing $300 million in the purchase of 150 new AC4400 locomotives to be incorporated into its fleet in a three-year period (1998-2000): 175 locomotives from General Electric and 75 from General Motors and Bombardier Concarril *(29)*. By June 2000, TFM had received 83 of those locomotives, thereby increasing its horsepower capacity by 30 percent. TFM expected to receive the remainder of the locomotives by the end of 2000, thereby increasing its capacity by approximately 60 percent compared with that of the original fleet in 1997 *(32)*.

New and More Versatile Fleet of Railcars

Approximately 6,573 railcars were transferred to TFM after it acquired the concession of the Northeastern railway. However, there was a need for a more versatile fleet of railcars. During the first year of operation, TFM acquired 1,000 grain hopper railcars and 160 specialized flatcars, converted 146 gondola railcars to allow transport of steel rolls, and rented 300 100-ton gondola railcars *(29)*.

In addition, TFM began an aggressive short- and medium-term leasing program for railcars in 1997 to substantially increase equipment availability. By 2000, TFM had leased 6,392 railcars, increasing its capacity by 87 percent, and decreasing bad-order cars from 20 percent in 1997 to 5 percent *(32, 34)*. Moreover, on June 1, 1998, TFM implemented a car-hire agreement with the Association of American Railroads (AAR), increasing foreign equipment availability and strengthening its relationships with U.S. and Canadian railroad companies *(35)*.

Efficient and Reliable Customer Service

In March 1998, TFM began the installation of a $7.9 million computer-aided dispatching system supplied by Alston Signaling for the operations control center in Monterrey *(36)*. The system featured a computerized railcar-scheduling program to manage the entire TFM railway network. New systems and procedures were incorporated to control and expedite operations. This system enabled TFM to provide reliable service and keep the accuracy of train schedules at 85 percent by the end of 1999 *(34)*.

TFM has also made important investments in car signaling and car tracing equipment, hotbox detectors, Automatic Equipment Identification (AEI) readers, and Electronic Data Interchange (EDI) computer systems to improve accuracy of equipment location and make the operation of trains more efficient. Four detectors of wide and tall cargo and 35 AEI readers have been installed at key points to automatically upgrade TFM's SICOTRA car tracing and billing system by 2000 *(34)*. Finally, new and upgraded rolling stock contributed to reliable service by reducing locomotive breakdowns, decreasing transit times, and decreasing equipment shortages *(29)*.

Train Speed

Average train speed has increased from 11.2 mph to 16.2 mph (44.6 percent) by extending 17 sidings from 3,000 ft to 10,000 ft to allow for longer trains, adding hotbox detectors to detect wheel bearing failure, and installing advanced communication systems *(35)*. As a result, average transit times from Mexico City to Nuevo Laredo have decreased by 34.7 percent *(34)*. Table 13 provides average transit times for different types of trains along the Mexico City-Nuevo Laredo main line during the 1997 and 2000 time period *(32, 34)*.

Table 13. Mexico City-Nuevo Laredo Average Transit Times during the 1997 and 2000 Time Period.

Type of Train	Average Transit Time		Improvement (Percent)
	1997	2000	
Intermodal	60.0 hrs	34.0 hrs	43.3
Automotive	60.0 hrs	40.0 hrs	33.3
Other	60.0 hrs	41.5 hrs	30.8

Source: Transportación Ferroviaria Mexicana, 2000.

Infrastructure

TFM invested more than $15 million in the construction of a new rail yard in the Sanchez siding, approximately 12.5 miles southwest of Nuevo Laredo. The new 1,500-acre facility began operations in 1999 and is equipped to handle all Mexican customs and agricultural inspections. Northbound trains are precleared, preblocked, and inspected at Sanchez to allow traffic to move across the border on a first-come, first-served basis, with no directional restriction. Directional windows are four six-hour periods, two for northbound traffic and two for southbound traffic. These periods were previously used to handle railcar interchanges on the railroad international bridge. The rail yard also includes an intermodal terminal capable of handling 1,500 trucks per day and comprises 14 miles of track with an operating capacity of 950 containers per day *(34, 35)*.

By the end of 1999, TFM completed the installation of a $10.5 million CTC system between Monterrey and Nuevo Laredo. This installation, along with a similar project carried out by Union Pacific from San Antonio to Laredo, will create an operating system from San Antonio to Mexico City, becoming the most efficient U.S.-Mexico railroad corridor *(37)*.

TFM continues to enlarge tunnels and raise cantenaries to permit double-stack intermodal traffic from Querétaro into Mexico City. Meanwhile, double-stack railcars will access Mexico City via trackage rights over Ferromex. This project is expected to be complete by 2000 *(29)*.

Security

In 1997, TFM created a Police and Special Services Department within its organizational structure to be responsible for ensuring the safety of cargo, equipment, and employees. By 2000, TFM reduced cargo burglaries by approximately 80 percent on merchandise trains and by eight percent on automotive trains, so that burglaries are now close to U.S. railroad levels *(34)*. Deployment of security forces includes four security officers per train and officers at all crew change, stopping points, and predetermined problem areas.

FERROCARRIL MEXICANO (FERROMEX)

Background

On June 27, 1997, Ferromex was awarded the concession to operate the *Ferrocarril Pacífico-Norte* (North-Pacific Railroad), which also included the Chihuahua-Pacific Railroad. Initially, Ferromex was a consortium consisting of *Grupo Mexico*, *Ingenieros Civiles Associados* (ICA), and UP, in which *Grupo Mexico*, ICA, and UP owned 74 percent, 13 percent, and 13 percent of the stock shares, respectively *(38)*. However, on February 3, 1998, UP announced it had agreed to purchase all of ICA's ownership in Ferromex, increasing its ownership to 26 percent *(39)*.

The Bidding Process

On June 19, 1997, Ferromex submitted a $527 million bid for the concession to operate the Pacific-North Railroad Line, and on June 27, 1997, the Mexican government awarded Ferromex the right to purchase 80 percent of the North-Pacific Railroad Line shares, while the government would retain the remaining 20 percent. The purchase included:

- a 50-year concession, with the option of an additional 50-year extension;
- the transfer of all related equipment and other assets;
- 25 percent of the shares of the Valle de Mexico Terminal Railroad, which allows access into Mexico City; and
- the option to buy the Chihuahua-Pacific Railroad line that runs from Ojinaga, Chihuahua, to Topolobampo, Sinaloa. This railroad had not been awarded to any entity during its own bidding process.

Ferromex decided to acquire the Chihuahua-Pacific Railroad Line, as well as the remaining government-owned 20 percent of the Pacific-North Railroad Line shares. Ferromex met its financial obligations to acquire 100 percent of the Pacific-North and the Chihuahua-Pacific Railroad Line's shares on February 19, 1998, and assumed complete operational control for the railroad lines the following day *(40)*.

Importance of the Pacific-North Railway Corridor Served by Ferromex

The importance of Pacific-North Railroad network lies primarily in the track length and the number of U.S.-Mexico border crossings accessed. The railway network operated by Ferromex has 6,538 total miles of track, comprising 50.5 percent of the nation's main line track network *(40)*. It also has access to the major Mexican industrial cities, maritime ports, and intermodal and automobile manufacturing facilities, as shown in Table 14.

Table 14. Major Locations and Facilities Served by Ferromex.

Major Industrial Cities	Maritime Ports	Intermodal Facilities	Automobile Manufacturing Facilities
• Mexico City • Guadalajara • Monterrey • Ciudad Juárez • Torreón • San Luis Potosí* • Aguascalientes	• Altamira • Tampico • Manzanillo • Topolobampo • Guaymas • Mazatlán	• Saltillo • Ramos Arizpe • Guadalajara • Aguascalientes • Querétaro • Pantaco	• Hermosillo • Ramos Arizpe • La Encantada • Silao

* With trackage rights over TFM railway
Sources: Ferrocarril Mexicano, 2000.

The Ferromex railway network has access to five of the eight U.S.-Mexico railway border crossings, including the Eagle Pass-Piedras Negras crossing, which handles approximately 16 percent of the U.S.-Mexico rail traffic and is considered to be the second busiest rail border crossing after the Laredo-Nuevo Laredo crossing *(30)*. Table 15 shows the U.S.-Mexico border crossings accessed by Ferromex and the connecting U.S. railroads. Figure 12 provides a schematic representation of the railway network operated by Ferromex.

Table 15. U.S.-Mexico Railway Border Crossings Accessed by Ferromex.

U.S. Border Crossing Location		Mexican Border Crossing Location		Connecting U.S. Railroad Company
City	State	City	State	
Calexico	California	Mexicali	Baja	UP
Nogales	Arizona	Nogales	Sonora	UP
El Paso	Texas	Ciudad Juárez	Chihuahua	UP, BNSF
Presidio		Ojinaga		TPT
Piedras		Eagle Pass	Coahuila	UP, BSNF

Source: Ferrocarril Mexicano, 2000.

Principal Commodities Hauled

The Pacific-North corridor handles approximately 50 percent of all rail cargo traffic in Mexico. In 1999, Ferromex hauled 41,771 million ton-miles of freight on the Pacific-North corridor, a 35 percent increase from 1997. The main railway segments on which most of the cargo was carried were the Mexico City-Piedras Negras and the Guadalajara-Manzanillo segments. Figure 13 provides a schematic representation of the gross tonnage transported over the Pacific-North corridor in 1999 *(40)*.

Approximately 70 percent of traffic on the Pacific-North corridor is domestic. Agricultural products are the biggest segment of commodities hauled, accounting for 25 percent. Table 16 shows the percentages of commodity classifications transported by Ferromex on the Pacific-North corridor in 1998 *(36)*.

Table 16. Classification of Commodities Transported by Ferromex in 1998.

Commodity Classification	Percentage
Agricultural products	25
Chemicals, industrial products, and intermodal	21
Minerals	17
Cement	16
Automotive	8
Iron and steel	5
Fertilizers and petroleum	4
Coal, coke, diesel and, other products	4

Source: Railway Age, October 1998.

Railway Characteristics

Ferromex's railway infrastructure is capable of supporting railcars weighing above 135 tons in gross weight over approximately 60 percent of its 6,538 miles of the main line track *(40)*. In addition, 63 percent of the track is continuously welded and 32 percent is laid on concrete ties *(36)*. Figure 14 provides a schematic representation of the cargo capacity over the Pacific-North corridor *(40)*.

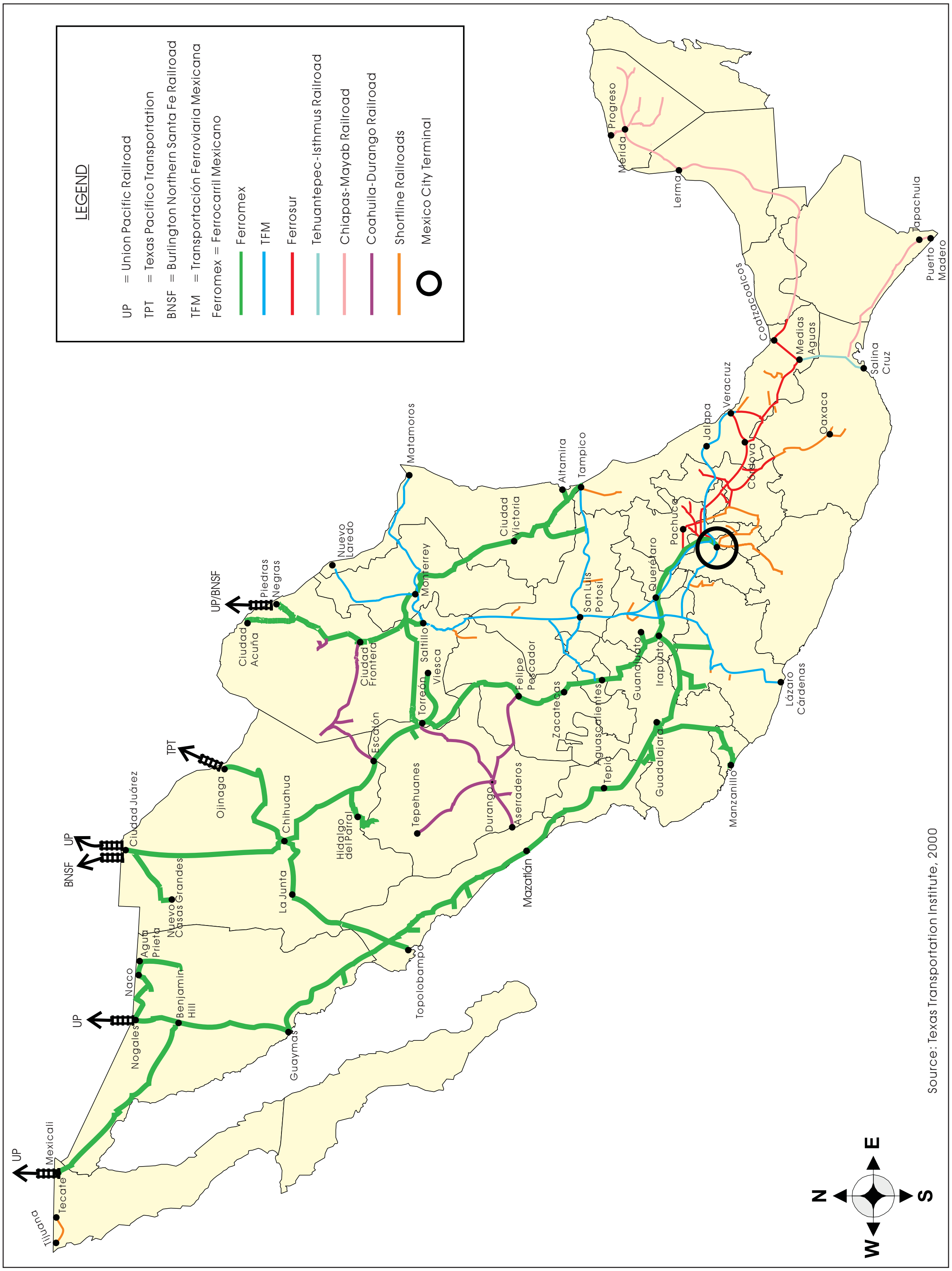


Figure 12. Railroad Network Operated by Ferromex.

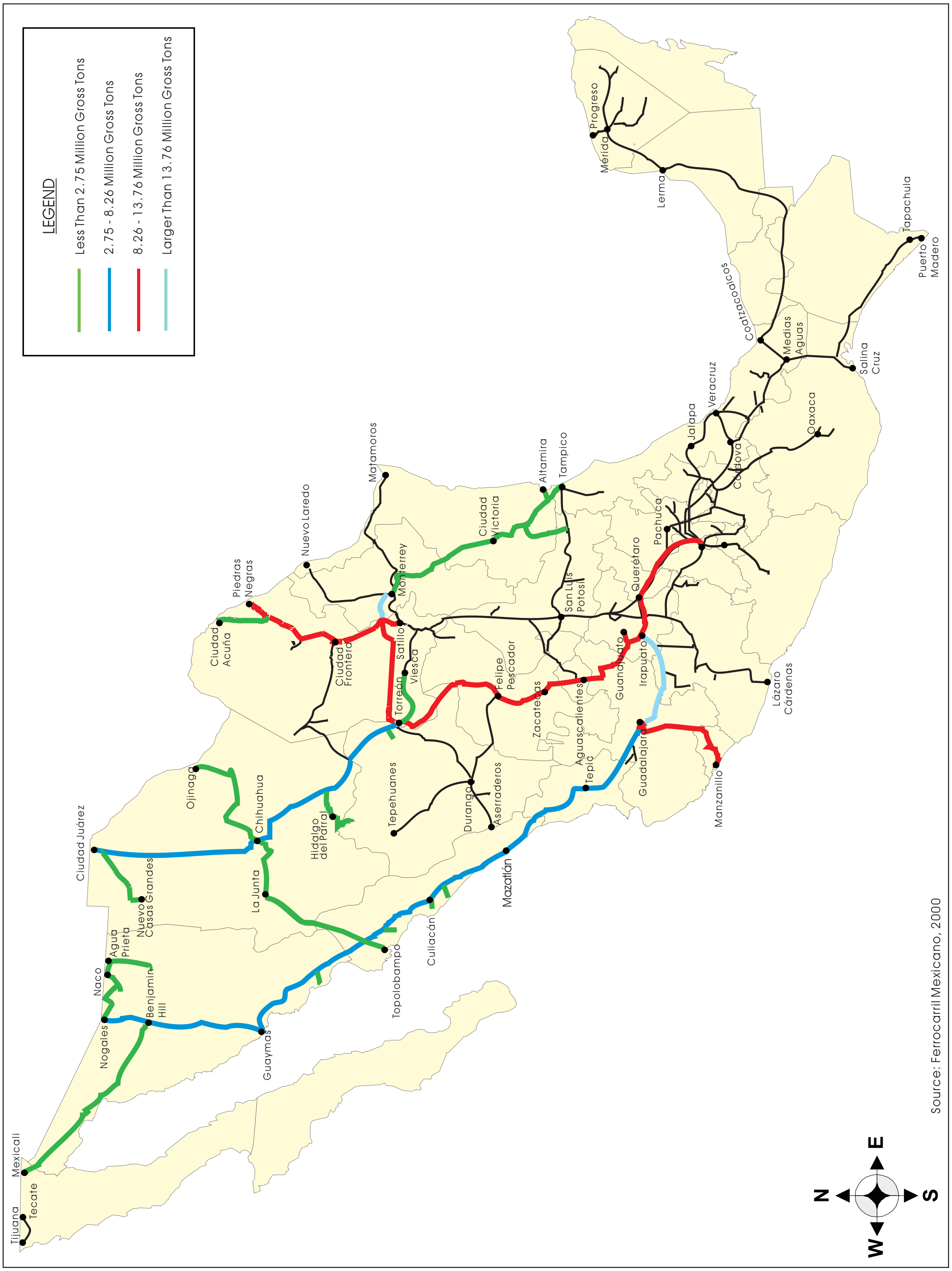


Figure 13. Gross Tonnage Transported on the Ferromex Railway System in 1999.

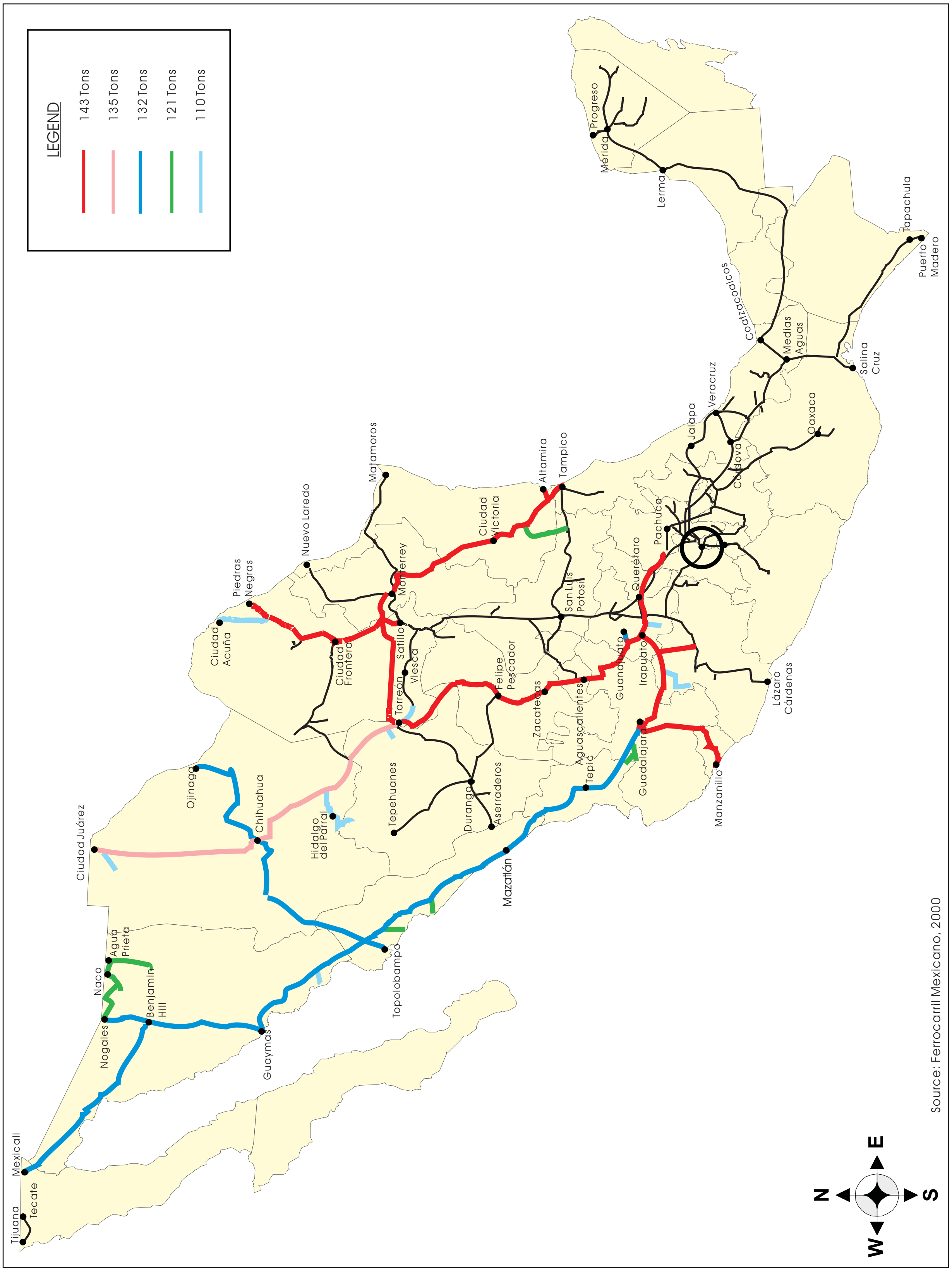


Figure 14. Railway Cargo Capacity on the Ferromex Railway Network System.

Achievements of Ferromex during the First Two Years of Operation (February 1998-February 2000)

Ferromex has concentrated most of its capital investment plans on modernizing its rolling stock, railway infrastructure, and telecommunication system. The following material presents a summary of the main actions implemented by Ferromex between February 1998 and February 1999.

Capital Investment and Improvement Programs

Ferromex's five-year master investment plan includes capital investments of over $700 million *(9)*. During the first two years of operation combined (1998 – 1999), Ferromex invested over $300 million on the Pacific-North Railroad Line, compared with $99 million during the last two years combined of operations under FNM administration (1996 – 1997), as shown in Figure 15. The single biggest mechanical capital expense for 1999 was the acquisition of 50 AC4400 locomotives from GE Capital. For 2000, Ferromex planned to invest $118.7 million, with emphasis on infrastructure-related improvements *(40)*.

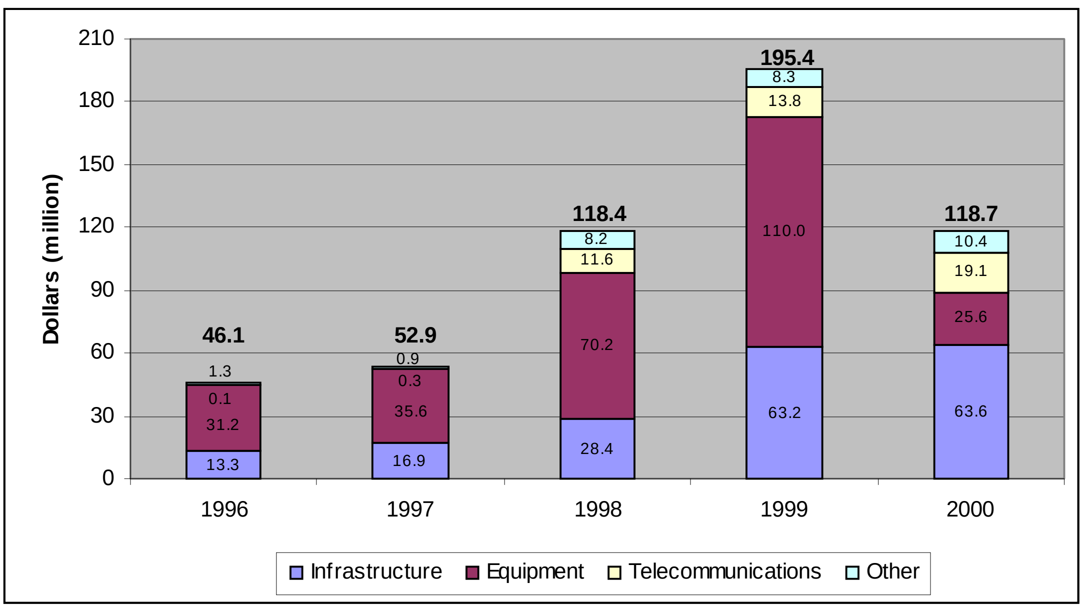


Figure 15. Ferromex's Capital Investment Plan for the 1998-2000 Period.

Operating Ratio

In 1998, Ferromex's operating ratio and return on investment were 77.5 percent and 14 percent, respectively *(41)*. In May 2000, Ferromex reported an operating ratio of 83 percent and expected an 80 percent operating ratio at the end of the year *(42)*.

Locomotive Fleet

Much of the locomotive fleet was in poor condition when Ferromex acquired it from FNM. Between 50 and 70 locomotives were in poor repair and about 35 were on bad-ordered status. During the first years of operation, Ferromex repaired, overhauled, and upgraded most of its locomotive fleet to meet U.S. FRA standards. It also leased 20 locomotives from MPI and GE Capital, acquired 50 new AC4400 locomotives, and acquired 50 new rail yard locomotives to increase power and availability *(36)*. Currently, Ferromex has 519 locomotives in its fleet and is expected to complete the construction of a new locomotive shop in Guadalajara by the end of 2000 *(36, 43)*.

Railcar Fleet

To strengthen the freight car fleet, Ferromex acquired 1,139 freight cars and leased about 2,200 freight cars, mostly covered hoppers and boxcars, through Helm and GE Capital *(36, 43)*. It expanded its double-stack and 89-ft flatcar fleet and repaired railcars in bad condition, reducing the number of bad units from 20 percent in 1997 to 8 percent in 1998. This number was further reduced to 5 percent during the first six months of 1999 *(42)*. Ferromex performs all programmed maintenance in-house, but contracts out most upgrading. Ferromex's railcar fleet has about 13,000 freight cars, and their planning for 2000 included implementing a standardized preventive maintenance program across repair and modernizing railcar shops located in the cities of Torreón, Ciudad Juárez, and Nogales *(40)*.

Efficient and Reliable Customer Service

The consolidation of dispatching centers and the modernization of telecommunications and signaling systems allowed Ferromex to provide more reliable customer service and maintain train schedules at 81 percent of accuracy by the end of 1999 *(40)*. To improve the accuracy of equipment locations, 50 AEI readers were installed by the end of 1999. Further, the railroad added 61 hotbox detectors for bearing diagnostics and, to improve operations, made end-of-train devices more available. Figures 16 and 17 show the installation of hotbox detectors and AEI readers, respectively. Plans for 2000 included the additional installation of 45 hotbox detectors and four AEI readers *(40)*.

Regarding train control systems, Ferromex completed the installation of a CTC system on the high-density segment between Guadalajara and Mexico City and the installation of a DTC system between Guadalajara and Nogales in 1999. They also upgraded the DTC system between Torreón and Tampico and between Piedras Negras and Ramos Arizpe *(40)*.

Infrastructure

Ferromex closed railway segments for which repair was not economically feasible, such as the Nuevo Casas Grandes-La Junta segment in the state of Chihuahua. Railway infrastructure was rehabilitated along the Mexico City-Piedras Negras, Mexico City-Ciudad Juárez, and Guadalajara-Nogales segments. Ferromex also expanded rail yard facilities at Piedras Negras and Ciudad Frontera (located in the state of Coahuila), installed 12 miles of siding extensions, reinforced 78 bridges, and acquired 56 maintenance-of-way machines *(36, 43)*. Main infrastructure plans for 2000 included rehabilitation of 44 miles of track, installation of 21 miles of sidings, and the rehabilitation of 48 bridges *(40)*.

Intermodal Facilities

According to Ferromex, one of its biggest traffic growth opportunities is in intermodal freight, with several locations for new intermodal facilities being considered. Potential locations include sites near Mexico City to supplement the Pantaco intermodal facility, Piedras Negras to better compete with TFM's Nuevo Laredo border crossing, and Ciudad Juárez to attract intermodal traffic originating in southern California that currently moves by truck *(36, 44)*.

Ferromex believes that railroad transportation can be competitive with motor carrier transportation for distances greater than 250 miles. To capture some of the trucking market share, it is forming intermodal partnerships with large Mexican trucking firms such as Transportes Nuevo Laredo and Transportes Bravo *(36)*.

Commodities considered by Ferromex for shifting northbound truck cargo to rail include finished domestic motor vehicles from Ford Motor Company engine plants in Chihuahua and Hermosillo, as well as perishable produce originating in the state of Sinaloa *(36)*. Finally, intermodal capacity has been increased at the Altamira, Ciudad Frontera, Guadalajara, and Manzanillo terminals *(43)*.

Security

By the end of 1999, general cargo and automotive theft have been reduced by 95 percent and 100 percent, respectively *(40)*.

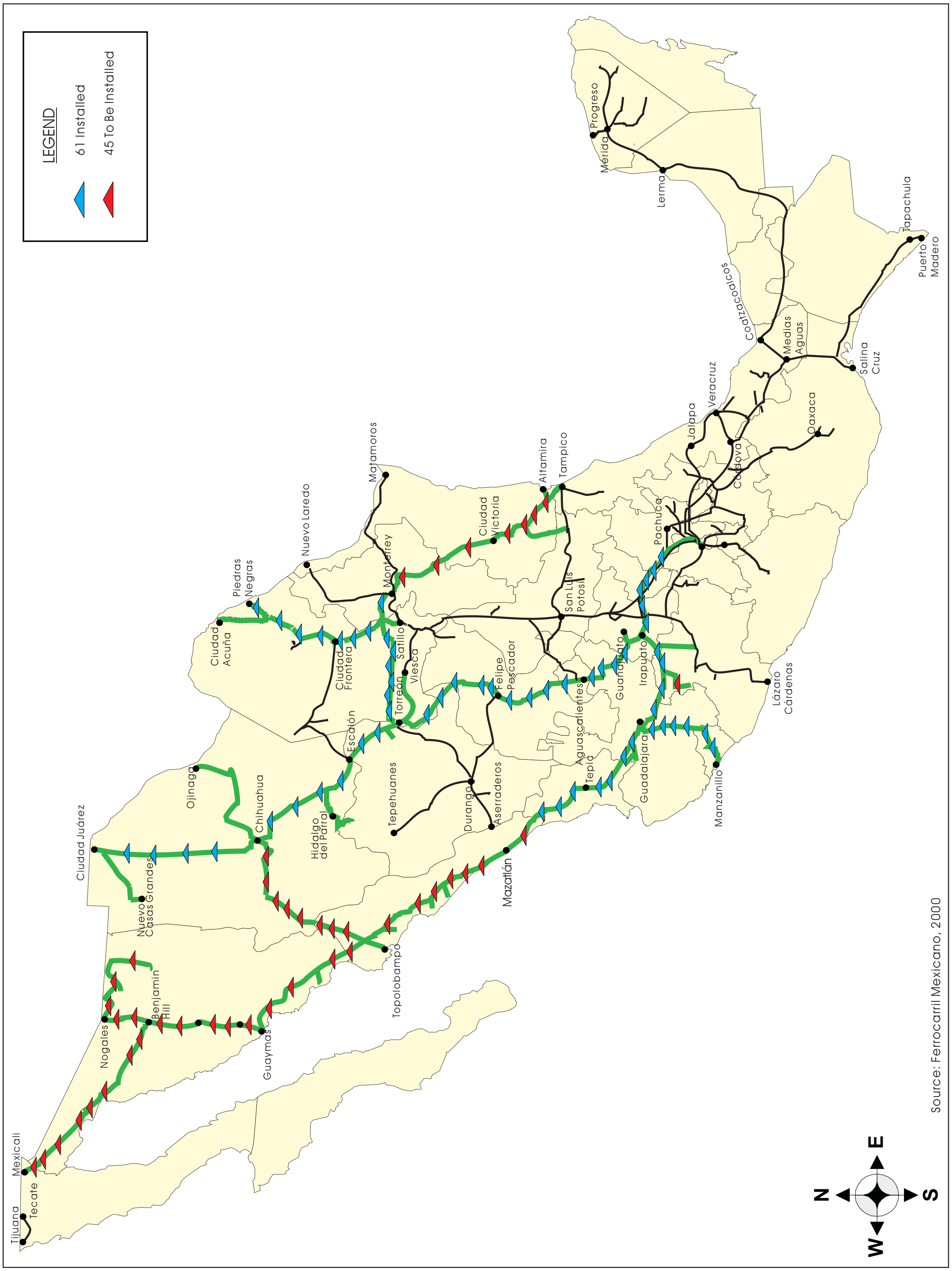


Figure 16. Installation of Hot-Box Detectors.

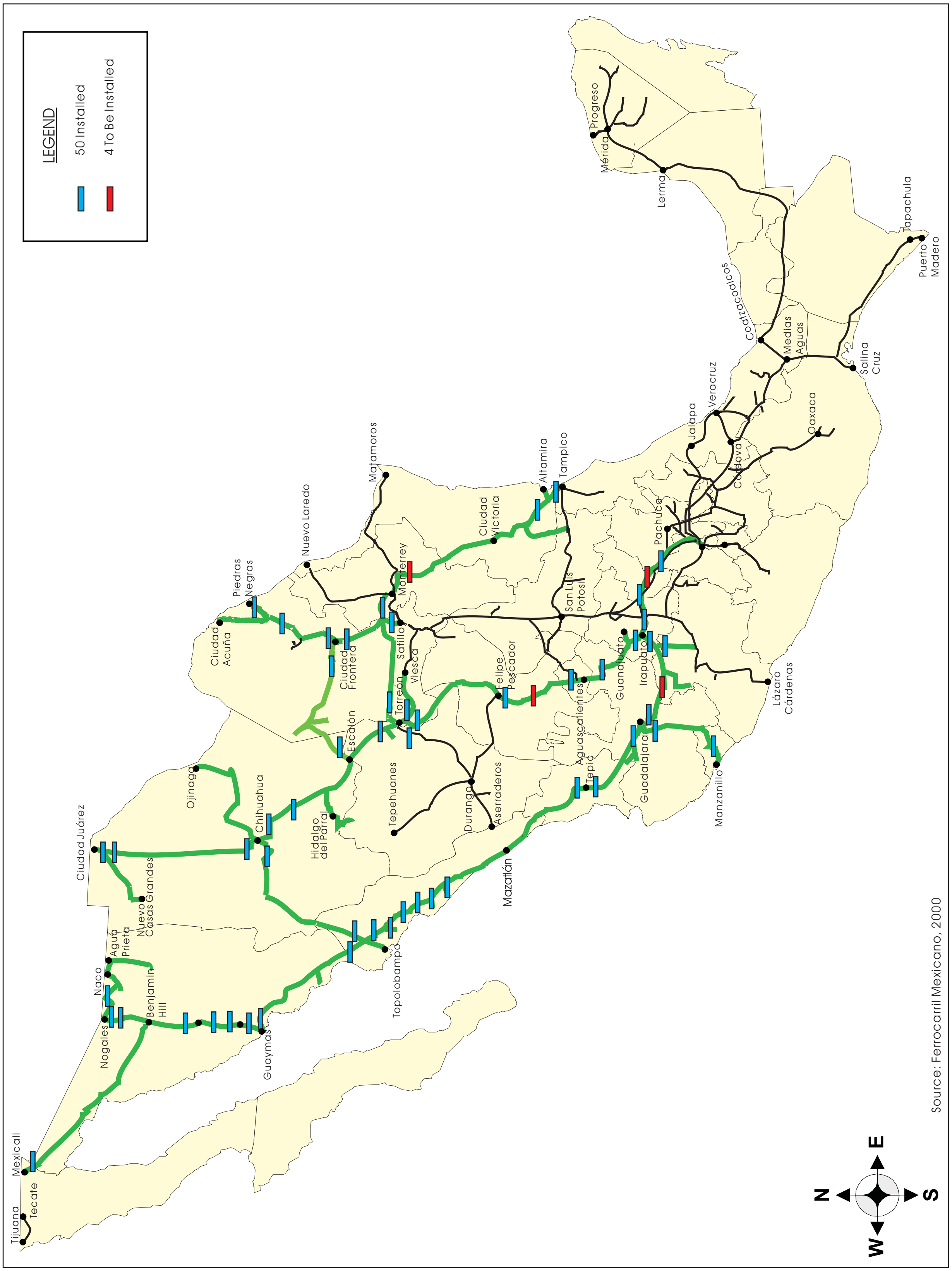


Figure 17. Installation of Automatic Equipment Identification Readers.

CHAPTER 4 – PERFORMANCE OF THE U.S. RAILROADS

INTRODUCTION

U.S. railroads continue to compete with trucks for freight traffic market share. Currently, railroads move 12 percent of the total freight movements and 40 percent of the intercity freight ton-miles on a national basis. At the U.S. border, railroads handle 25 percent of transborder goods movements. In 1998, the railroads hauled 27 million tons and 600,000 carloads across the border. UP, BNSF, and TM are the major U.S. carriers active at the border gateways. UP owns the greatest presence along the Texas-Mexico border with direct access to El Paso, Eagle Pass, Laredo, and Brownsville. BNSF greatly increased its presence with trackage and haulage rights gained from the Union Pacific-Southern Pacific merger. It now has direct access to three gateways, including El Paso, Eagle Pass, and Brownsville. TM maintains activities solely at Laredo. All the U.S. carriers continue to increase operations and improve infrastructure to and from the border.

It becomes apparent in studying the border that railroad performance can be measured on a system-wide basis or on a regional basis. Certain decisions, operational changes, or infrastructure improvements at specific locations will affect the system as a whole. Railroad performance at the border is an example of how local conditions impact the operations of the railroad at a national level. This impact becomes especially noticeable at Laredo, where several companies squeeze the majority of international rail freight movements over one bridge. The resulting metered flow of traffic across the border requires that railroads gear their operations to deliver a slow, steady stream of trains to switching facilities adjacent to crossings. Careful scheduling is required to avoid an unwanted buildup of equipment at the border since too many incoming trains can result in a restriction of track access for northbound movements. The ensuing congestion would, through a ripple-effect, adversely impact the entire network.

The emphasis on steady traffic levels accounts, in part, for the moderate but steady growth in rail traffic in and out of Mexico. As operational strategies, equipment, and infrastructure enhancements improve the linkage between U.S. carriers and their Mexican counterparts, traffic levels should steadily increase.

As background, a review of a recent comprehensive forecast for U.S. railroads is presented below.

RAILROAD INDUSTRY OUTLOOK

The following section comes from a report from the Transportation Technology Center, Inc. (TTCI) that provides forecasts for the railroad industry from 2001 to 2005 *(45)*.

Revenues: Status and Outlook

The following observations are highlights taken from recent reports prepared by Standard & Poor's DRI (U.S. Freight Transportation Forecast to 2007), ENO Transportation Foundation (Transportation America, 1998), and AAR data as presented in the TTCI report:

- In 1998, railroads handled about 40 percent of intercity freight ton-miles, but their share of intercity freight revenues was only about 10 percent (Table 17).

- From 1997 to 2007, total tonnage of primary freight shipments (excluding local distribution) in the U.S. is estimated to increase by 21.2 percent and total freight revenue by 27.6 percent, on an inflation-adjusted basis.

- Rail carload revenues will grow at an estimated 2.3 percent annual average rate.

- Rail intermodal revenues will grow at a 2 percent annual average rate, with slower growth in the initial five-year period and stronger growth in the second five years, driven primarily by growth in imports.

- Combined railcar and rail intermodal revenues will increase 25 percent between 1997 and 2007.

- Both railcar and rail intermodal share of freight volume (in tons) and share of freight revenues were forecasted to remain approximately level over that period.

- Of the increased tonnage between 1997 and 2007, DRI estimated trucks would capture 55.7 percent, railroads 20.9 percent, and waterborne 20.1 percent.

- Of the new freight revenues over this period, trucks would capture 76.5 percent, airfreight 12.6 percent, and rail 7.3 percent.

Table 17. Modal Comparisons, 1998 Data.

Mode	% Ton-Miles	% Revenues	Cents/Ton-Mile
Truck	28.7%	79.8%	29¢
Rail	40.3%	10.0%	2.5¢
Water	13.5%	1.0%	0.7¢
Oil Pipelines	17.2%	2.4%	1.5¢
Air	0.4%	5.1%	134¢

Growth in international trade is expected to result in increased rail traffic for the foreseeable future given continued economic growth as realized during the 1990s. Over the next five years, trade growth between Canada and the U.S. is projected to average 11 percent each year, and trade growth between the U.S. and Mexico is expected to average 11.7 percent each year. Much of this growth will be the result of NAFTA. Agricultural trade with Canada and Mexico grew by 38 percent in the first three years of NAFTA. Challenges to facilitate this growth include continuing efforts to remove the congestion and capacity problems at the Mexican border. These efforts include infrastructure improvements and streamlining paperwork and inspection procedures.

Revenues: Some Key Commodities

In 1998, the top five revenue-generating commodities for railroads, in order, were coal, chemicals, motor vehicles and parts, grain, and pulp and paper. These five accounted for over half (56.2 percent) of gross freight revenues for Class I railroads (Table 18). The top four of these were also the leaders with respect to carloads originated, accounting for almost half (44.6 percent) of the 25.7 million carloads originated in 1998.

Table 18. Top 10 Rail Revenue Commodities, 1998.

Commodity	% Gross Revenue	% Carloads Originated
Coal	22.92	27.3
Chemicals	13.34	6.5
Motor Vehicles & Parts	9.16	6.0
Grain	6.52	4.8
Pulp, Paper, Etc.	4.22	2.1
Food & Products	4.07	2.7
Metals & Products	3.84	2.6
Lumber & Products	3.54	1.3
Stone, Clay, Glass, Etc.	3.02	1.8
Grain Mill Products	2.74	2.3
Other	26.63	42.6
Total	**73.37**	**57.4**

The following sections provide some additional observations regarding current and future rail transportation for motor vehicles and parts and for grain.

Motor Vehicles and Parts

The forecasts for production of motor vehicles and parts indicate growth in this industrial sector. Moreover, NAFTA has provided a significant new stimulus for this traffic, with vehicle assembly plants in Mexico receiving U.S. parts and returning finished products. Railroads get mixed reviews in the transport of finished vehicles from the automobile manufacturers, ranging from compliments for improvements in ride quality and damage prevention, to disappointment over problems with some interline service. New tri-level cars have significantly increased capacity and should help railroads maintain their dominance of the finished vehicle transport market. Trucks currently dominate the parts market, with 83 percent of this traffic. Challenges for railroads include further improvements in service quality through continued efforts to improve ride quality and transit time, and improved asset utilization to help improve profitability.

Grain

Grain production fluctuates widely in response to such variables as weather and government policies. Consequently, demand for grain transportation is extremely unpredictable, and the grain transportation planning process involves enormous uncertainty. The volume of grain transported by rail varies considerably from week to week and year to year. From 1990 through June 1999, U.S. railroads averaged 24,043 carloads of grain per week, but the peak week was 63 percent higher than the lowest week. This information and the following highlights are from a recent discussion paper on railroad grain transport published by AAR's Policy and Communications Department:

- For the past five years, global wheat exports hovered near 100 million tons; during this time, the U.S. share ranged from 27 to 34 percent.

- The U.S. accounted for 60 percent of total global corn exports. The primary competitor for corn exports is Argentina.

- The truck share of tons of grain transported is 40.6 percent, with 40 percent for rail and 19.4 percent for barges.

- Rail revenue per ton-mile for grain dropped 52 percent from 1981 to 1998 on an inflation-adjusted basis.

Overall, these trends and forecasts paint a fairly optimistic picture with respect to the potential for railroads to increase their business in this commodity. NAFTA is expected to continue to stimulate growth in north-south traffic and economic growth in Europe and Asia to stimulate east-west traffic. Domestic production of such key railroad commodities as coal, chemicals, motor vehicles, and grain is also forecasted to have steady growth over the foreseeable future.

Revenues: Intermodal

Intermodal is the fastest growing major segment of the U.S. freight railroad industry. Intermodal accounts for approximately 17 percent of rail revenues, second only to coal. U.S. intermodal traffic grew from 3.1 million trailers and containers in 1980 to 8.8 million in 1998. Today, containers account for more than 62 percent of intermodal unit volume, up from 42 percent 10 years ago.

Intermodal combines the door-to-door convenience of trucks with the long-haul economy of rail service. As a result, railroads, trucking companies, and intermodal marketing companies are forming productive partnerships to combine the best of both modes.

Costs: Overview

In 1998, operating expenses for all Class I railroads totaled $27.9 billion. Operating expenses include labor, materials and supplies, fuel, depreciation, and purchased services. They do not include fixed charges and income taxes. Transportation expenses (e.g., train crews and fuel) account for 43.2 percent of the $27.9 billion, followed by equipment (25.4 percent), way and structures (16.9 percent), and general and administrative (14.5 percent).

Railroad Capital Intensity

The level of investment required in railroading is uncommonly high compared to other transportation modes and is necessitated by facilities such as track, signals, and bridges, which are privately funded and not publicly subsidized. These facilities are used for locomotives and freight cars, for communications and data processing, and for technology research, development, and implementation.

Consequently, freight railroads must maintain a level of capital assets that is typically many times greater than other transportation and production industries. The capital intensity of railroads means that rail revenues must be sufficient not only to cover operating expenses, but also to support a return on these heavy investments and to provide capital for additional investments that promote productivity gains and capacity expansion.

Challenges and Issues

The statements and comments of most industry observers, strategic planners, and other senior railroad officers interviewed were generally in agreement with regard to the major challenges, issues, and opportunities expected to confront railroads in the coming years. The recurrent theme was the need to grow the business, improve service, and earn an adequate return on investment. Obviously, these three needs are closely interrelated. The dilemma, or challenge, is that growing the business requires improving service, which requires capital investment, which requires increased profitability, which requires improved service.

At the heart of these challenges is the need to increase capacity. Downsizing efforts coupled with success in growing some parts of the business left railroads with capacity constraints on certain key lines and terminals. Railroads are taking steps to address the capacity issue. These steps include the removal of line haul and terminal bottlenecks, reactivation of underutilized routes, partnerships with connecting shortlines and regional carriers to increase capacity, and improving train productivity.

Railroad Productivity Improvements

Opportunities to improve railroad productivity include:

- improved signal and train control systems to increase track utilization and service reliability,
- improved information systems to monitor system performance and provide more efficient ordering and better shipment information to customers,
- increased use of the Internet to interface with customers and service providers,
- improved port operations,
- increased use of double-stack intermodal trains,
- more efficient terminal operations, and
- continued redesign of operations to remove capacity constraints.

Truck Productivity Improvements

The trucking industry is confronted with issues that include severe driver shortages, productivity problems, increased fuel and labor costs, reduced profits, and poor stock performance. A major breakthrough in truck productivity could occur if current limits on truck size and weight are increased. A 1998 Truck Size and Weight Study by the U.S. Department of Transportation (US DOT) developed estimates of the impact of lifting the current size and weight limitations. One scenario studied assumed nationwide operations on most major highway networks of longer, combination vehicles with increased gross vehicle weights (GVW). This scenario included Rocky Mountain Double trailer combinations with 120,000 pounds GVW, Turnpike Doubles with 148,000 pounds GVW, and triple trailer combinations with 132,000 pounds GVW. In this scenario, truck costs were reduced by 38 cents per vehicle mile traveled. The study estimated that the impact on the railroad industry, given these conditions, would be a 19.6 percent reduction in railroad car miles, a $6.7 billion reduction in annual revenues, and a 46 percent reduction in return on equity.

Technology Implications

For railroads to continue and expand economic growth, they will have to address improvements in a variety of areas. Equipment, technology, or operational improvement opportunities can be classified within the 10 categories listed below:

Equipment

- Improved, customer-oriented equipment is needed to retain existing customers and attract new customers.

- Locomotives with higher horsepower ratings, lower emissions, and lower operating costs are also sought by the industry.

Track and Structures

- Continued improvement of track and bridges and more efficient yard operations are critically important.

- Improvements in maintenance technologies, such as rail-flaw detection, are needed.

Grade Crossing Safety

- Industry support of grade crossing improvements and innovations in traffic control at grade crossings are very important to reducing the cost of accidents, settlements, and railroad liability, which accounts for $500 million in costs to the industry each year.

Signal and Train Control Systems

- Improved signal and train control systems are needed to improve safety and productivity.

Terminals

- According to many railroads, capacity constraints are primarily in yards and terminals. Possible roles for technology include improved data and control systems for more effective management of terminal assets.

Ports

- The estimated growth in imports and exports will require more effective integration of port transportation operations and electronic data systems among rail, truck, and marine cargo carriers.

Communications and Information Technology

- Real-time tracing systems using global positioning satellite (GPS) and sensor systems are needed for monitoring status and temperature of perishable or high-value shipments.

- Continued improvements in systems such as Interline Service Management, AEI, and customer car ordering are needed to improve service quality and make it easier to do business with railroads.

E-Business

- Internet technology will improve railroad-customer and railroad-supplier communications. Applications include customer car ordering, shipment status updates, billing, and soliciting competitive bids from suppliers.

Intermodal

- Double-stack trains, with one container atop another, increase productivity and reduce costs.

- RoadRailers look like conventional trailers but come with both rubber tires and detachable steel wheels so they can ride directly on the rails or on a highway.

Training

- More cost-effective computer-based training techniques, including simulators, will enhance the training of railroad employees.

TEXAS CLASS I RAILROADS

Texas currently has three Class I railroads operating within its borders; Union Pacific Railroad, Burlington Northern Santa Fe Railway, and Kansas City Southern Railway (KCS).

Recent consolidations in the rail industry, specifically the Burlington Northern-Santa Fe merger and the acquisition of Southern Pacific (SP) by Union Pacific, have reduced the number of railroads operating in Texas, but not the demand for rail freight service. Texas experienced a 13 percent increase in exports in 1997 and the demand for rail transportation is currently at an all-time high. Class I railroads carry large volumes of freight in Texas and provide an important link in the state's transportation system. Industry and port activity in Texas would be seriously curtailed without the freight capacity provided by rail. Several industries, most notably the petrochemical, coal, and aggregate industry, rely on rail and the relatively low rates provided by the railroads for an economic and efficient transportation alternative. Figure 18 shows the current rail network in Texas.

Railroads excel at moving bulk materials and heavy freight. Table 19 shows the amount of freight moved by Texas Class I railroads across standard commodity classifications. The quantities represent traffic levels originating and terminating in Texas. Were it not for rail transportation in Texas, these volumes would represent the equivalent of 30 to 40 million additional truckloads on Texas' roadways.

Importantly, Texas serves as a major crossroads for national and international rail freight movements. The state's geographic location adjacent to Mexico means that north-south movements intersect with significant east-west trade to make Texas a major junction for national and international trade. NAFTA is serving to increase the volume of both rail and truck traffic moving between Mexico and U.S. markets in the Midwest creating significant policy questions within TxDOT regarding how best to accommodate commercial traffic on Texas-financed roadways. The traffic-mitigating role of freight movement by rail is therefore of increasing importance to the Department, and planning efforts must be construed to effectively consider the role of railroads.

Table 19. Class I Railroad Revenue Freight, 1998.

Originating Freight			
Commodity	**Carloads**	**Tons**	**% of Total**
Chemicals or allied products	293,396	25,873,700	32
Nonmetallic minerals, excluding fuels	179,731	17,237,127	21
Miscellaneous mixed shipments	338,049	5,706,020	7
Petroleum or coal products	74,668	5,356,168	7
Food and kindred minerals	64,680	4,166,128	5
All Other	525,918	23,015,102	28
Total	1,476,442	81,354,245	100
Terminating Freight			
Commodity	**Carloads**	**Tons**	**% of Total**
Coal	480,868	44,295,771	28
Farm products	244,293	23,763,458	15
Nonmetallic minerals, excluding fuels	235,851	22,519,699	14
Chemicals or allied products	202,957	17,673,538	11
Food and kindred minerals	136,272	9,430,924	6
All Other	1,087,956	38,062,309	24
Total	2,388,197	155,745,699	100

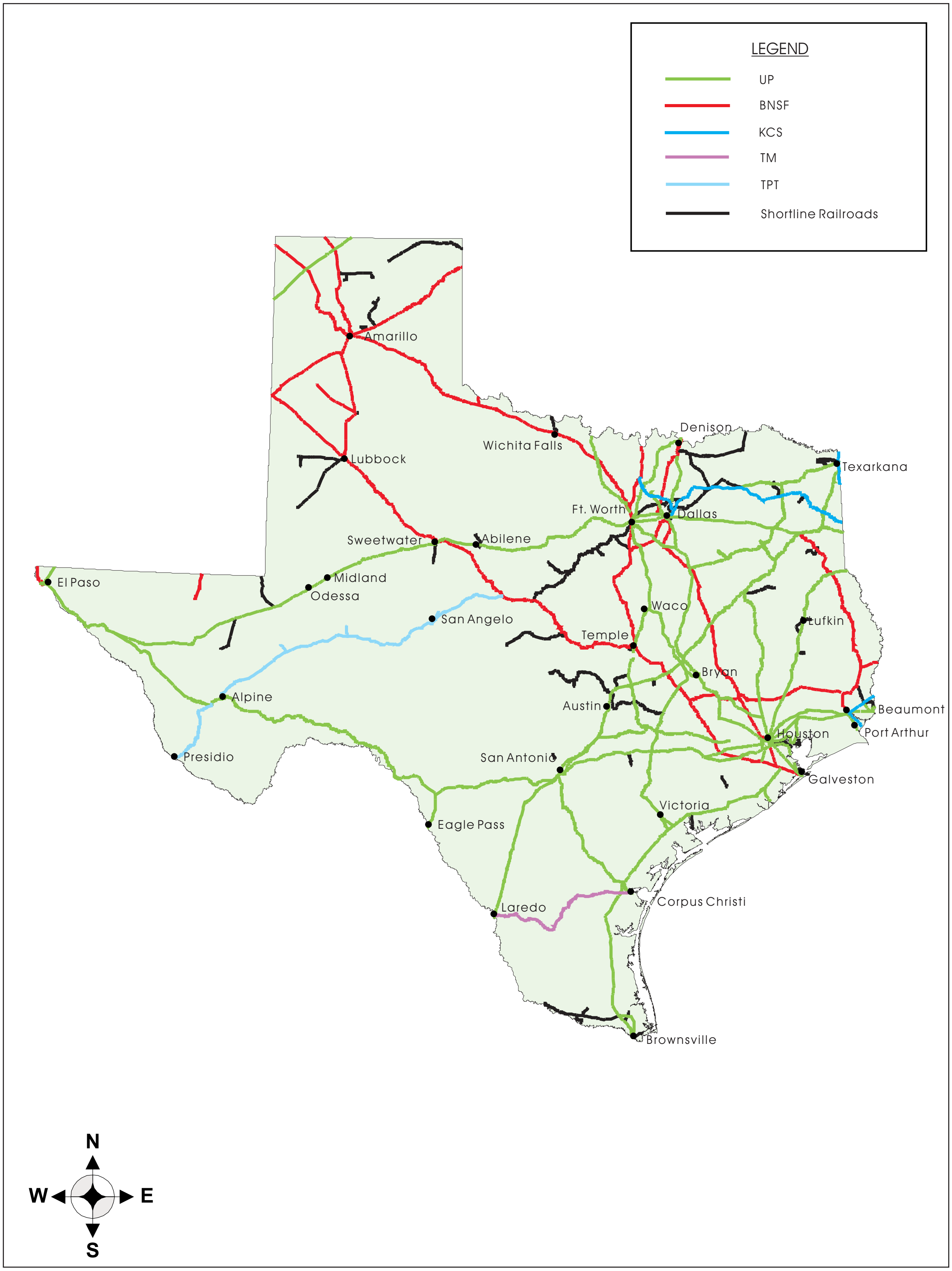


Figure 18. Texas Railroad Network.

Since the merger of the UP and SP in 1996, UP has dominated Texas rail service. The combination of these two railroads formed the largest rail network in the state, with more than 6,300 miles of track. UP, also by virtue of this merger, became the largest railroad in the country with more than 38,000 miles of track spanning the western U.S. from the Mississippi River to the Pacific Ocean. In 1997, service problems encountered by UP following the SP acquisition served to highlight the importance of rail freight transportation in Texas and to the nation as a whole.

Like the merger of UP and SP, the merger of Burlington Northern and Santa Fe in 1995 led to the formation of a large, contiguous rail system. BNSF owns approximately 2,700 miles of line in Texas and operates over an additional 1,970 miles of track under trackage rights agreements with UP. Nationwide, BNSF operates in 28 states over 34,000 route miles in much the same territory as UP - west of the Mississippi to the Pacific Ocean.

The dominance of UP in route miles within Texas translates into dominance of the business statistics that describe the Class Is in the state. In 1995, the combined operating revenues for UP-SP exceeded $1.5 billion, more than twice that of KCS. UP-SP's gross profit during the same time period more than doubled the combined in-state profit of BNSF and KCS.

Union Pacific Railroad

Company Profile

Union Pacific Railroad was founded in 1862 and was one of the first railroads to link eastern markets to the growing western part of the nation. Its route structure as of 1930 was restricted to the mid-continent region of the U.S. with eastern termini in Chicago and St. Louis. Providing east-west shipping in Kansas, Nebraska, Colorado, and Wyoming, UP reached to Los Angeles, San Francisco, and north to Washington State. Historically considered a relatively small western railroad, UP has thrived on the shipping of coal and has survived by timely acquisitions to become a dominant, rail transportation provider.

Other than a short-lived appearance in Texas in the 1880s with the acquisition of the Denver and Gulf Coast Railroad, UP made its permanent appearance in Texas with the 1983 acquisition of the Missouri Pacific (MOPAC). The MOPAC added markets in Texas, Oklahoma, Kansas, Arkansas, and Louisiana, significantly expanding the reach, resiliency, and profitability of the system. UP established a larger presence in Texas when it acquired the Missouri-Kansas-Texas Railroad (MKT) in 1988. Following this addition, UP operated in most major Texas markets including Houston, Dallas-Ft. Worth, Austin, San Antonio, and El Paso.

Today, UP is the largest railroad in the U.S., with operations in 23 states. Recent reorganization of the company, partially in response to service problems encountered following the merger with

Southern Pacific Railroad, has split UP into three operating regions. These regions, headquartered in Houston, Omaha, and Los Angeles, will decentralize operations and maintenance and place day-to-day decision-making closer to field units.

Since the merger, UP has invested over $1.25 billion in system improvements along with equipment upgrades and acquisitions in an effort to improve system-wide operations. In 2000, UP expects to invest $192.7 million to upgrade rail lines and $72.9 million to expand capacity in Texas and Louisiana. Including the 2000 figures, UP expects to have spent a total of $607.8 million in this region with additional projects planned beyond 2000 *(46)*.

At the time of the service problems in 1997, UP experienced severe congestion resulting in numerous bottlenecks over the entire system. At one point, average train speeds dropped from around 20 mph to 12 mph. As a result of UP's diligent efforts to improve infrastructure and operations, train speeds today are again in the 20 mph range. Other performance indices also indicate greatly improved service.

In the "Fourth Annual Report on Merger and Condition Implementation" released by the Surface Transportation Board (STB), UP indicates improvements in several performance indicators including locomotive productivity, freight car dwell time, and origin train departing performance. The locomotive productivity, measured in gross ton-miles per horsepower-day, increased from 93.7 to 127.7 in 1999. The freight car dwell times reached a record low of 26.2 hours in April 2000 compared to over 43 hours during the service crisis. Another record was reached when UP's origin train departing performance reached 82 percent in May 2000.

As a result of the system-wide performance improvements by UP, the STB has, for the second consecutive year, ruled that the UP service crisis is over and that the merger has not hindered competition.

Route Characteristics and Commodity Movements. UP's principal route structure blankets the eastern one-third of Texas, with major lines along the Gulf Coast. UP also has a significant presence in Dallas and Houston. Figure 18 shows the current UP route structure from a statewide perspective.

The commodities moved by UP in Texas are displayed in Table 20 and show a combined 145 million tons originating and terminating in the state of Texas. A review of the table also confirms the role UP plays in many markets, particularly the Gulf Coast petrochemical market. This sector of the Texas economy, perhaps more than any other, is dependent on rail transportation for economic viability. In 1998, UP moved more than 33 million tons of chemicals to and from Texas markets. Coupled with more than 32 million tons of non-metallic minerals (sand, crushed rock) and the delivery of coal to the Texas utility industry, UP provides an irreplaceable transportation fixture in the state.

Table 20. UP Revenue Freight, 1998.

Originating Freight			
Commodity	**Carloads**	**Tons**	**% of Total**
Chemicals or allied products	224,756	19,726,112	36
Nonmetallic minerals, excluding fuels	160,691	15,498,271	28
Petroleum or coal products	43,552	3,023,032	5
Miscellaneous mixed shipments	169,140	3,007,400	5
Transportation equipment	127,020	2,447,562	4
All Other	261,790	11,613,660	21
Total	986,949	55,316,037	100
Terminating Freight			
Commodity	**Carloads**	**Tons**	**% of Total**
Coal	186,462	19,977,048	22
Nonmetallic minerals, excluding fuels	177,267	16,929,191	19
Chemicals or allied products	155,444	13,553,856	15
Farm products	98,250	9,431,678	11
Food and kindred minerals	68,320	4,462,848	5
All Other	718,633	25,457,938	28
Total	1,404,376	89,812,559	100

Facilities

UP currently maintains facilities in the following locations:

Major Terminals:

- El Paso
- Fort Worth
- Houston

Other Terminals:

- Angleton
- Baytown
- Beaumont
- Bloomington
- Brownsville
- Corpus Christi
- Dalhart
- Dallas
- Dayton
- Eagle Pass
- Freeport
- Galveston
- Harlingen
- Hearne
- Laredo
- Longview
- Odem
- Orange
- San Antonio
- Taylor
- Texarkana
- Tyler
- Victoria
- Waco

Intermodal Facilities:

- Dallas (Miller Yard & Mesquite)
- El Paso

- Houston (Settegast, Englewood, & Barbour's Cut - Strang Yard)
- Laredo
- San Antonio (SoSan & East Yard)

Storage-in-transit (SIT) Facilities:

- Baytown
- Beaumont (Amelia)
- Dayton
- Houston (Spring - Lloyd Yard)

Automotive Facilities:

- Houston (Spring - Lloyd Yard)
- Midlothian

Port Access:

- Beaumont
- Brownsville
- Freeport
- Corpus Christi
- Galveston
- Houston
- Orange
- Port Arthur
- Port Lavaca

UP Performance Characteristics

The following material is drawn from recent STB filings by UP in compliance with the STB's oversight of UP operations following the merger with SP *(47)*.

During 1997 and 1998, UP reported a number of service measurements to the STB each week. These measurements of UP performance in 2000 reflect UP's full recovery and the quality of its transportation services. (Note that UP provides measurements to the AAR that it calculates differently from the following measurements; the two sets of data are not comparable.)

- UP's system-wide average train speed, which fell as low as 12 mph during the service crisis, stood at 18.7 mph when we filed our annual oversight report last July. During April and May of this year, UP's average train speed reached 20.0 mph, the fastest average speed since September 1996.

- UP's locomotive productivity, measured in gross ton-miles per horsepower-day, had climbed from 93.7 to 127.7 last year. In March, locomotive productivity reached a record level of 133.5.

- Freight car dwell time at UP yards – the amount of time freight cars spend in a defined geographic terminal area – approached a record low in April at only 26.2 hours. Dwell time stood at 31.3 hours last July 1 from a high of 43.9 hours during the service crisis.

- Early in 1998, UP used a second crew on 20 to 25 percent of its trains. Last year we reported that this "recrew rate" had fallen to about 10 percent. This year UP's recrew rate has dropped below 5 percent.

- In May, trains were held for power for an average of only 418 hours per day, and UP held trains for crews only 79 hours per day.

Other performance measures underscore UP's focus on service. UP's origin train performance, which reflects the percentage of trains departing on time, reached 82 percent in May, a record. Locomotive terminal dwell time dropped to 13.5 hours, and there are no car shortages on UP. In fact, UP has over 6,500 grain cars in storage due to weak demand for grain transportation. UP has made its greatest progress in handling western coal. During March and April, UP delivered virtually every coal train within service parameters. Through May, UP moved an average of 10 to 11 coal trains per day from Colorado and Utah mines. This volume should increase significantly as the West Elk mine in Colorado resumes production.

Capital Expenses and Improvement Programs. Based on current projections, UP estimates that it will have spent approximately $1.25 billion to implement the UP-SP merger by the end of 2000. This investment by UP includes over $400 million in capacity expansion, almost $500 million in rail line upgrades, over $100 million in information technology, and almost $45 million to upgrade SP locomotives. According to UP, it spent $143.5 million on merger projects in 2000 (through May 31) and expected to spend a total of over $260 million by December 31, 2000. In its report to the STB, UP outlined its recent infrastructure upgrades in the Kansas City-Denver Corridor, the Golden State and Sunset Routes, and specific terminals throughout its system.

Mexico Service. Cooperative arrangements among UP, TM, TFM, and the U.S. and Mexican governments are allowing traffic through the Laredo Gateway to grow. UP's northbound traffic is running approximately 30 percent above volumes during the comparable period of 1999. Southbound volumes have increased by approximately 15 to 20 percent.

UP is working with U.S. Customs to develop improved preclearance procedures for export traffic. Procedure implementation will first take place on the Canadian border at Eastport, Idaho. After these procedures are tested, they will be applied at gateways to Mexico to reduce staging of shipments for customs clearance.

TFM, UP, and Norfolk Southern Railroad (NS) are working together to provide expedited service from automotive plants in Mexico to the northern half of the NS system. TFM prepares a through block of traffic for the TRRA yard in St. Louis. UP incorporates that block in a new through train at Laredo that uses directionally operated lines to pick up traffic from other auto plants in Texas and Louisiana. UP delivers the train to TRRA, which distributes the shipments among NS trains to destinations beyond.

At two Texas terminals, UP has implemented operating plans from two mergers, UP-SP and UP-MKT, to speed shipments to Mexico. As predicted in the UP-SP operating plan, UP's SoSan Yard in San Antonio is now used to stage cars destined to Mexico that have not precleared customs. As this yard is much closer to the Mexican border than the former storage facility at Ft. Worth, it allows faster service when cars are released. Meanwhile, UP uses Ney Yard in Ft. Worth to clean and repair empty grain cars and assemble them into unit trains for movement to loading facilities, as originally planned in the UP-MKT merger operating plan (this step was delayed because traffic to Mexico grew faster than expected). Using Ney Yard to assemble grain trains allows UP to move those trains over the most efficient route north of Ft. Worth to Midwestern loading points.

Houston and Gulf Coast Infrastructure. UP continues to improve and expand its facilities in Texas and Louisiana, two states where the service crisis arose in 1997. UP expected to invest $192.7 million during 2000 to upgrade rail lines and $72.9 million to expand capacity in this region. UP planned to have spent a total of $607.8 million for the three-year period between 1998 and 2000, and plans additional projects for 2001 and beyond.

UP is upgrading the Englewood Yard in Houston, including a new hump computer and scale. UP completed CTC on the Sunset Route between Tower 26 in central Houston and West Junction. On Houston's south side, UP and BNSF are adding a critical segment of second main track between Double Track Junction and Texas & New Orleans (T&NO) Junction. With this track in place, BNSF can switch its South Yard without blocking through trains on the Houston Belt Terminal (HBT) West Belt line. UP also upgraded its Harrisburg Line and installed CTC from West Junction through T&NO Junction to Tower 30. UP is completing the interlocking and a new connection at Tower 30, and installed power switches at Pierce Junction on the Harrisburg Line.

North of Houston, UP's expanded Spring SIT yard entered service July 2000. This expansion allows UP to store more plastics shipments awaiting sale by chemical producers to their customers. UP has noticed a significant increase in plastics shipments going into storage in recent weeks.

Northeast of Houston, UP completed construction of additional yard tracks at Dayton Yard and, with BNSF participation, relocated the Sunset Route mainline to eliminate conflicts between through trains and switching. South of the Dayton yard on the Baytown Branch that serves many chemical producers, UP is seeking permits to build a new storage yard and is investing $9.1 million this year (with BNSF help) in additional double track. At Mont Belvieu on the Branch, UP is extending yard tracks.

Southeast of Houston, UP contributed to the cost of adding a second mainline to the former SP route between Strang and the Port of Houston's Barbours Cut container facility. This year the Port and UP are extending double track from Strang westward to Deer Park and adding CTC. UP completed new receiving and departure tracks at Strang Yard, which serves chemical customers on the Bayport Loop. UP plans to expand the classification yard at Strang, after a lease of property needed for the expansion expires. Further east, UP completed design work for and is now constructing a new SIT yard in the vicinity of Lake Charles, which will enter service next year. It also relocated the mainline through Lake Charles to eliminate conflicts between switching and through trains, and expanded the Lake Charles Yard. A new connection is under construction at Mallard Junction near Lake Charles. UP is upgrading the retarders at Beaumont Yard and has relocated control of Tower 74 to the joint dispatching center at Spring.

South of Houston on the line to Brownsville, UP extended yard tracks at Bloomington. It completed the important new siding at Angleton, Texas, allowing trains on the Brownsville line to operate through that busy terminal without interrupting switching. Furthermore, UP is rebuilding Brownsville Yard in cooperation with local agencies.

West of Houston, UP added industry support tracks at Jama, Texas, to support rock shipments, and has completed run-through tracks at SoSan Yard in San Antonio. It is upgrading the service track and fueling facilities at Kirby Yard in San Antonio and is expanding the Kirby automotive facility. UP has also completed CTC between Eagle Lake and Flatonia on the Sunset Route.

Several projects that UP had originally proposed will not be required due to changes in operations. For example, joint dispatching of the Houston terminal has been so successful that it has effectively generated capacity. As a result, UP no longer needs several projects, such as adding powered switches and signals on the GH&H line. The decision to adopt directional running between Houston and Beaumont eliminated the need to build additional capacity on the BNSF-UP joint line east of Houston and on UP's parallel line further north. UP had also planned to add a siding at Taft, Louisiana, but has instead constructed a major line relocation in the area.

UP continues to evaluate the need for capacity in Houston and throughout the Gulf Coast region and seeks to identify ways of improving operations to serve its customers.

Burlington Northern Santa Fe Railroad

Company Profile

Burlington Northern (BN), prior to its merger with the Santa Fe, had a relatively minor role in Texas. Its lines were restricted to the northwestern portion of the state; Amarillo to Fort Worth being one segment of the line, and Fort Worth to Houston and on to Galveston being the other. In addition, there was a major connection from Tulsa, Oklahoma, into Dallas. BN had a significant role in moving agricultural products to and from the north and northwestern portion of the state to the port facilities on the Gulf Coast and, as BNSF, continues to have a major portion of the coal traffic into the Houston area.

The merger of BN and the Santa Fe brought significant new lines under one "umbrella" in Texas. The new BNSF was, at the time of the merger, the largest rail system in the country, having more than 34,000 route miles. Santa Fe added capacity and routes to BN in the Texas Panhandle via connections in Oklahoma. It also added routes into the Dallas-Ft. Worth Metroplex and a route from Lubbock to Galveston. It provided a north-south line from Longview to the Orange-Beaumont region of the state, plus connections east from Navasota to Conroe and Conroe to Orange. The new markets, capacity, locomotives, and personnel made BNSF a formidable transportation force in Texas and played a key role in encouraging UP to merge with SP the following year.

Route Characteristics and Commodity Movements. A review of the major BNSF corridors in Texas, presented in Table 21, along with daily train activity, reveals six main segments carrying significant traffic.

BNSF transported over 81 million tons of originating or terminating freight in Texas in 1998. They play a principal role in the transport of coal to Texas utilities. As can be seen in Table 22, BNSF delivered approximately 24 million tons of coal from the Powder River Basin in Wyoming, and from other suppliers, to Texas. The railroad also plays a key role in the movement of agricultural commodities, as evidenced by the delivery of more than 13 million tons of farm products to the state in 1998. An additional three million tons of originating agricultural products was transported by BNSF.

Table 21. BNSF Major Corridors in Texas.

BNSF Corridor	Trains Per Day
From Clovis, New Mexico (NM) through Amarillo toward Kansas City	73
From Clovis, NM through Lubbock to Temple	24
From Denver, through Amarillo and Wichita Falls to Ft. Worth	24
From Ft. Worth through Teague to Houston	14
From Gainsville, through Ft. Worth to Temple	36
From Temple, through Sealy to Galveston	34

Facilities

BNSF currently maintains facilities in the following locations:

Terminals:

- Amarillo
- Beaumont
- Bellville
- Borger
- Brownwood
- Caldwell
- Conroe
- El Paso
- Fort Worth (Ft. Worth, Alliance & Saginaw)
- Gainsville
- Galveston
- Hereford
- Houston
- Longview
- Plainview
- Silsbee

- Somerville
- Sweetwater
- Teague
- Temple
- Wichita Falls

Intermodal Facilities:

- Amarillo
- Borger
- El Paso
- Fort Worth (Alliance)
- Houston (Houston & Pearland)

Storage-in-transit Facilities:

- Fort Worth
- Houston (Pearland)

Automotive Facilities:

- Fort Worth (Alliance)
- Houston

Port Access:

- Beaumont
- Corpus Christi
- Galveston
- Houston
- Orange

Table 22. BNSF Revenue Freight, 1998.

Originating Freight			
Commodity	**Carloads**	**Tons**	**% of Total**
Chemicals or allied products	65,400	5,858,588	29
Farm Products	33,377	3,017,687	15
Miscellaneous mixed shipments	133,829	2,161,180	11
Food and kindred minerals	28,560	2,088,172	10
Nonmetallic minerals, excluding fuels	19,040	1,738,856	8
All Other	111,523	5,687,008	28
Total	391,729	20,551,491	100
Terminating Freight			
Commodity	**Carloads**	**Tons**	**% of Total**
Coal	224,257	23,569,379	39
Farm products	139,157	13,804,494	23
Nonmetallic minerals, excluding fuels	58,268	5,568,380	9
Food and kindred minerals	61,508	4,603,720	8
Chemicals or allied products	38,329	3,496,078	6
All Other	294,900	9,487,638	16
Total	816,419	60,529,689	100

BNSF Performance Characteristics

The following section describes BNSF's performance characteristics in 1999 as described by the company in the *1999 Annual Report to Shareholders (48).*

Commodity Movements. Throughout 1999, BNSF achieved system-wide on-time performance levels averaging 91 percent for the year compared with 82 percent and 79 percent, respectively, in 1998 and 1997.

From 1995 to 1999, BNSF's intermodal traffic across selected major routes and new routes has grown by 40 percent to upward of 170 percent. During the 28-day period preceding Christmas, 35,101 trailers, or about 53 million packages were handled without a single service failure for United Parcel Service (UPS), BNSF's largest intermodal customer. This amount was the largest peak volume ever handled by a railroad and was a 10 percent increase over the BNSF's 1998 27-day peak volume. This was also the fourth consecutive year of providing 100 percent on-time service during the UPS peak season. BNSF continued operating failure free for UPS until February 23, 2000, a 96-day period during which more than 103,000 trailers were handled.

BNSF met all of its coal customer requirements in 1999, amounting to about 236 million tons of delivered coal, with a virtual 100 percent on-time performance. At the same time, coal cycle performance improved for the first time since 1994, even with a 34 percent increase in the number of unit trains in operation.

Since 1997, loads to and from Mexico have increased to almost 120,000 units annually, as a result of the trackage rights agreement with UP-SP and an earlier agreement with SP in BNSF's merger case. Volumes over UP-SP lines are now approaching 30,000 carloads a month, with revenue exceeding $400 million in 1999, and these volumes are still growing.

Operating Income and Expenses. Operating expense per 1,000 gross ton-miles (GTMs) has steadily decreased since 1994, and was about 20 and 25 percent lower in current and in inflation-adjusted terms, respectively, in 1999. At $7.90, BNSF has the lowest operating expense per 1,000 GTMs in the industry, a result of implementing $1.29 billion of efficiency initiatives since 1994. BNSF's operating ratio is approximately nine points lower than in 1994 at 75.4 percent. This reduction has added about $800 million to operating income, based on 1999 revenues of $9.1 billion.

BNSF's road locomotive fleet has grown 22 percent, or about 900 units, and available horsepower has increased by 40 percent since 1994. As a result, there were many days during the second half of 1999 when BNSF was virtually free of power delays. During the last four years, BNSF has acquired or overhauled 3,250 road locomotives, about 75 percent of their fleet.

Operating income, which grew to a record $2.24 billion in 1999, on an adjusted basis, has increased at a compounded 14 percent rate since 1994.

Capital Investments. Between 1996 and 1999, BNSF's capital spending of $9.4 billion was about two times the combined amount spent in the 1992 to 1995 period by both former railroads. Since 1996, almost $1.6 billion has been spent on expansion projects across the BNSF network.

Capital investment for 1999 totaled $2.27 billion, including locomotives acquired through purchases and long-term leases. About $1.3 billion was spent on maintaining their network, locomotives, freight cars, and information systems at the highest level to provide customers with more reliable, consistent service.

Another $233 million was spent in 1999 on terminal and line expansion projects, including adding about 53 miles of double track in New Mexico and Texas on BNSF's transcontinental route between Chicago and California; adding about 12 miles of double track on the Nebraska coal route; adding 18 miles of triple track and six miles of double track at different locations along the Wyoming coal route; continued expansion of the Los Angeles (Hobart) International facility, which set an annual record of 988,00 lifts; expanding the Palos, Alabama, yard; and opening in May a coordinated dispatch center in San Bernardino, California.

In addition, $738 million was used to acquire 476 new road locomotives, the largest single-year acquisition in railroad history. As a result, total invested capital reached $16.3 billion at the end of 1999 and has increased 44 percent since 1995. Return on invested capital, has remained in the 9+ percent range since then, up from 7.2 percent in 1994.

Kansas City Southern

Company Profile

The Kansas City Southern, Texas' third Class I carrier, operates a system of 2,756 track miles in 11 central and southeastern states. One of only two small, independent Class Is left in the U.S. (Illinois Central being the other), KCS still operates the shortest route from Kansas City to the Gulf of Mexico.

Despite limited trackage in Texas, connections, coordinated operations, and financial ties with other railroad entities have allowed KCS to form the NAFTA Railway stretching from Canada to Mexico City. The other railroads forming the NAFTA Railway include Canadian National, Illinois Central, Gateway Western, TM, and TFM. This relationship allows KCS to be a major player in the increased traffic levels produced by NAFTA and benefits shippers by providing one rate over the entire system.

In Texas, the purchase of a 49 percent share of the 157-mile Texas Mexican Railway and with an additional 400 miles of trackage rights granted during the UP-SP merger for TM to operate to Beaumont, KCS established southern access to Laredo and the Mexican markets.

Route Characteristics and Commodity Movements. The major KCS routes in Texas represent only a small portion of the total trackage in the state. The major areas served include the Dallas-Fort Worth area in north Texas and the Beaumont-Port Arthur area along the Texas Gulf Coast. Additional areas served by TM include Corpus Christi and Laredo. Trackage rights allow TM to travel from Corpus Christi through Houston and connect with KCS in Beaumont.

Table 23 displays the commodity movement figures for KCS in Texas. In 1998, KCS hauled almost 11 million tons of originating or terminating traffic. With trackage to the Gulf Coast petroleum industries in Beaumont and Port Arthur, they transported over three million tons of petroleum traffic. Coal also represented a major commodity with approximately 2.8 million tons transported to Texas markets.

Table 23 does not include traffic carried by TM, which hauled 73,000 carloads in 1998 and almost 81,000 carloads in 1999 with revenues approaching $50.5 million in 1999 *(49)*.

Table 23. KCS Revenue Freight, 1998.

Originating Freight			
Commodity	**Carloads**	**Tons**	**% of Total**
Coal	21,597	2,156,460	39
Petroleum or coal products	21,644	1,729,764	32
Miscellaneous mixed shipments	35,080	537,440	10
Pulp, paper or allied products	6,040	345,540	6
Chemicals or allied products	3,240	289,000	5
All Other	10,163	428,513	8
Total	97,764	5,486,717	100
Terminating Freight			
Commodity	**Carloads**	**Tons**	**% of Total**
Petroleum or coal products	19,768	1,582,400	29
Coal	70,149	749,344	14
Chemicals or allied products	9,184	623,604	12
Farm products	6,886	527,286	10
Miscellaneous mixed shipments	34,000	499,480	9
All Other	27,415	1,421,337	26
Total	167,402	5,403,451	100

Facilities

KCS currently maintains facilities in the following locations:

Terminals

- Dallas
- Beaumont
- Port Arthur
- Corpus Christi (TM)
- Laredo (TM)

Intermodal Facilities

- Dallas
- Port Arthur
- Laredo (TM)

Port Access

- Port Arthur
- Corpus Christi (TM)

Maintenance Facilities

- Dallas
- Beaumont
- Port Arthur
- Laredo (TM)

International Gateways

- Laredo (TM)

The Texas – Mexican Railway (TM)

The Texas – Mexican Railway has 240 employees and supports traffic levels of about 80,000 cars per year (1999). Its revenues of $50 million in 1998 were up from $25 million during the previous four years. The TM operates in conjunction with the KCS and Mexico's TFM. TM and TFM are integrated from a management perspective with administrative functions now moved to Mexico. Locomotives are provided by TFM and cars are provided or absorbed on an as-needed basis to balance TM operations to the border.

Since the UP-SP merger and the granting of trackage rights by the Surface Transportation Board, TM has operated a total of 2,280 through freight trains on UP track (through May 2000). In the period from June 1999 through May 2000, TM has averaged 63 trains per month, or about two per day. The STB's purpose in granting trackage rights to TM in the UP-SP merger was to "address the possible loss of competition at the Laredo gateway into Mexico and to protect the essential services provided by TM to its shippers." The available data suggests that competition has remained strong at Laredo and TM has remained viable subsequent to the UP-SP merger.

The volume of traffic handled by TM to and from Laredo has more than doubled since the UP-SP merger. TM's southbound traffic through Laredo, which has traditionally made up virtually all of its Laredo business, was 59,976 carloads in the June 1999 to May 2000 period compared with 24,953 carloads in the same period prior to the merger (June 1995-May 1996). TMs much smaller northbound volumes have increased even more dramatically, from 492 carloads in the June 1995-May 1996 period to 13,511 carloads in the June 1999 to May 2000 period.

The postmerger growth in TM's volumes and share of Laredo traffic has occurred because of the growth in the volume of traffic that TM interchanges with BNSF at Corpus Christi-Robstown. When added to the amount it handle using trackage rights between Beaumont and Corpus Christi-Robstown, the total exceeds the volume of traffic that TM interchanged with UP and SP.

TM has filed with the STB to have the Rosenberg line designated as a railroad line (i.e., not abandoned) and qualified for rehabilitation. They have completed arbitration with UP and settled on a price of $9.5 million for the right of way. UP has agreed to support the STB filing and will grant trackage rights over approximately five miles of its lines at the terminal ends of the Rosenberg line to allow access. The Rosenberg line is 72 miles shorter than TM's current trackage right access to the UP through Flatonia to Corpus Christi. They will finance the $72 million construction job over 85 miles from Rosenberg to Victoria, and UP will benefit by freeing up its congested Flatonia subdivision *(47)*.

CHAPTER 5 – TRADE FLOWS BY RAIL BETWEEN TEXAS AND MEXICO

COMMERCIAL TRADE BETWEEN TEXAS AND MEXICO

The trade between the United States, Mexico, and Canada has increased since the North American Free Trade Agreement went into effect on January 1, 1994. This agreement has directly resulted in higher traffic levels of truck, rail, and waterborne transportation systems, with truck traffic having been impacted the most. Increased volumes of commercial vehicles have been recorded in all of the major Mexican-trade highway corridors, resulting in accelerated rates of infrastructure deterioration, accidents, and capacity utilization.

As a result, the Texas Department of Transportation is faced with the monumental task of maintaining the existing roadway system and providing for additional capacity to support the ever-increasing volumes of truck traffic. This dual challenge threatens to strain the resources of the Department, and planning activities are considering every alternative as a means to reduce or control highway-user demands. One of the solutions considered to alleviate the demand being placed on highway infrastructure is to encourage additional freight movement by rail.

As a first step, TxDOT is evaluating the capabilities of the newly privatized Mexican rail system and its U.S. counterparts to assess the degree to which international rail transportation growth may offset demands placed on the highway system. The preceding chapters have described the growth in NAFTA trade, have examined the expanded and modernized rail network operating in Mexico, and summarized the state of the major U.S. railroad companies.

This chapter documents recent commodity flow from Mexico to the U.S. (through Texas gateways) and from the U.S. to Mexico. Based on this information the baseline volumes and predominant rail corridors are established allowing subsequent chapters to address the likelihood of expanded levels of NAFTA-related rail activity. This chapter also identifies those products currently moved by truck that are most amenable to future movement by rail. To accomplish this task, Mexican exports currently moved by truck were documented according to commodity type, origin, destination, volume, and value.

Trade across the Texas-Mexico Border

Texas-Mexico border trade occurs along nine gateways. All gateways support truck traffic, but only five support railroad traffic. Table 24 summarizes the Texas-Mexico gateways.

Table 24. Modes of Transportation at the Texas-Mexico Gateways.

Gateway	Mexican State	Mode of Transportation	Rail Company
Brownsville-Matamoros	Tamaulipas	Truck and Rail	TFM
McAllen-Reynosa	Tamaulipas	Truck	----
Roma-Cd. Miguel Aleman	Tamaulipas	Truck	----
Laredo-Nuevo Laredo	Tamaulipas	Truck and Rail	TFM
Laredo 3-Nuevo Laredo	Nuevo León	Truck	----
Eagle Pass-Piedras Negras	Coahuila	Truck and Rail	Ferromex
Del Rio-Ciudad Acuña	Coahuila	Truck	----
Presidio-Ojinaga	Chihuahua	Truck and Rail	Ferromex
El Paso-Cd. Juárez	Chihuahua	Truck and Rail	Ferromex

Source: Mexican Transportation Institute, 2000.

Dollar Value of Northbound Trade through the Texas Gateways in 1996 and 1998

The importance of trade between Texas and Mexico is emphasized by the high volume of goods and material moved across the border and the corresponding transportation activities. In 1996, 50 percent of the value of northbound trade from Mexico crossed the Texas gateways. By 1998, the value had increased to almost 51 percent.

The total dollar amount of northbound activity in each of the particular Texas gateways showed some changes between 1996 and 1998. Laredo continued to be the most important gateway, even though its activity level relative to the total showed a reduction from 19.8 percent in 1996 to 13.5 percent in 1998. The recently opened Laredo 3 gateway is showing increased activity, up from 3.2 percent of total northbound trade across the Texas border in 1996 to 10.0 percent in 1998. The El Paso gateway, which is second in order of importance, had an increase in activity, from 13.1 percent in 1996 to 13.5 percent of the total northbound trade.

Gateways such as Brownsville, McAllen, and Eagle Pass experienced similar activity in relation to the total northbound activity. This increase places them within a second-tier group of importance. Also, they showed a relatively low margin of variation in numbers when compared to the gateways previously mentioned. The Del Rio gateway did not see any important changes. Finally, the Roma and Presidio gateways are characterized by their low northbound activity.

Table 25 shows the continued growth in northbound trade through Brownsville, McAllen, Laredo 3, Del Rio, Presidio, and El Paso gateways from 1996 to 1998. The Laredo 3 gateway featured the greatest increase. In contrast, dollar amounts decreased at the other Laredo, Eagle Pass, and Roma gateways within the same period. In total, northbound trade from Mexico across the Texas border increased by 24 percent from $47 billion in 1996 to $58 billion in 1998.

Table 25. Northbound Texas-Mexico Trade.

Gateway	1996		1998	
	Millions of Dollars	Total Percentage	Millions of Dollars	Total Percentage
Brownsville	3,961	4	4,792	4
McAllen	3,806	4	5,369	4
Roma	100	0	58	0
Laredo	19,022	19	16,191	13
Laredo 3	3,098	3	11,702	10
Eagle Pass	4,311	4	3,957	3
Del Rio	1,011	1	1,369	1
Presidio	47	0	144	0
El Paso	12,574	13	15,889	13
Texas Border	47,933	49	59,474	50
U.S. – Mexican Border	65,904	68	84,959	72
Other Borders	30,095	31	32,377	27
Total	95,999	100	117,336	100

Source: Mexican Transportation Institute, 2000.

Dollar Value of Southbound Trade through the Texas Gateways in 1996 and 1998

Southbound activity through the Texas gateways also contained to increase following passage of NAFTA. Approximately 52 percent of the total southbound dollar value of U.S.-Mexico trade passed through Texas during the 1996 to 1998 time period. The gateway of greatest importance in this time period was Laredo, with a share of the southbound trade of almost 23 percent in 1996 and 18 percent in 1998. The decrease in relative share does not correspond to a decrease in southbound trade value at Laredo, which increased from $20 billion in 1996 to $22 billion in 1998.

The second most important gateway, in terms of export activity, is El Paso. This border location showed a 13.5 percent trade share in 1996 and approximately 12 percent in 1998. The Brownsville, McAllen, and Eagle Pass gateways were noted in the same two-year period as having between 3 and 6 percent.

Table 26 shows the value of southbound trade, in millions of dollars, at each Texas gateway. Trade increased at all gateways with the exception of the Roma gateway. The relative share of trade activity along the Texas border remained constant in the two-year period at 52 percent of the total southbound U.S.-Mexico trade, corresponding to $46 billion in 1996 and almost $65 billion in 1998.

Table 26. Southbound Texas-Mexico Trade.

Entry Point	1996		1998	
	Millions of dollars	Percent of the total	Millions of dollars	Percent of the total
Brownsville	5,007	5	7,122	5
McAllen	3,501	3	5,294	4
Roma	156	0	90	0
Laredo	20,291	22	22,146	17
Laredo 3	1,295	1	7,259	5
Eagle Pass	3,037	3	6,422	5
Del Rio	917	1	1,181	0
Presidio	56	0	81	0
El Paso	12,057	13	15,318	12
Texas Border	46,324	51	64,922	51
U.S. – Mexican Border	61,153	68	86,177	68
Other Borders	28,311	31	39,064	31
Total	89,464	100	125,242	100

Source: Mexican Transportation Institute, 2000.

Classification of Foreign Trade in Mexico Based on Customs Regulations

Both exports and imports are classified according to customs regulations as follows:

Exports: Northbound U.S.-Mexico Trade

Permanent – goods that exit Mexico to remain in foreign land for an unlimited amount of time.

Temporary – goods that exit the country or goods that are nationalized and remain in foreign soil for a specified period of time as long as they return without any modifications.

Maquilador – a tool that supports those companies responsible for modification, manufacturing, or repair of foreign goods, which are imported temporarily into Mexico with the purpose of being exported at a future time.

Imports: Southbound U.S.-Mexico Trade

Permanent – goods of foreign origin that enter Mexico to remain for an unspecified amount of time.

Temporary – goods that enter Mexico and remain for a specified period of time as long as they return without any modifications.

Maquiladora – twin plants and companies (with export agreements that are authorized by Secretariat of Communications and Transportation) will be able to carry out temporary import of goods into Mexico to be returned to a foreign country after having incurred a manufacturing, transformation, or repair process.

Northbound U. S.-Mexico Trade, 1996 to 1998

Of the billions of dollars in northbound trade transported across the U.S.-Mexico borders, the permanent trade was the least in percentage of total in 1996 and 1998. Northbound maquiladora trade represents the class with the greatest share of the total northbound trade, with approximately 42 percent in 1996 and 45 percent in 1998. At Texas gateways, northbound maquiladora trade experienced an increase from 45 percent to almost 50 percent of the total value for this period.

Table 27 shows a comparison between Texas gateways and other gateways of the northbound trade activity.

Northbound temporary trade took second place in order of importance in Mexico, reaching 36 percent in 1996 and 38 percent in 1998. For northbound U.S.-Mexico trade, the temporary type was proportionally greater than that of the permanent type, but lower than the maquiladora type.

Southbound U. S.-Mexico Trade, 1996 to 1998

In contrast to northbound trade activity, the level of the southbound permanent type trade (in terms of dollars), represented a greater percentage share of total U.S.-Mexico trade, approximately 43 percent in 1996 and 45 percent in 1998. Maquiladora trade represented approximately 47 percent of the southbound activity in 1996 and 1998. Across Texas gateways the percentage of permanent southbound activity was approximately the same as that of the maquiladoras for the same period, at approximately 40 percent. Temporary trade held a smaller share of the total compared with permanent and Maquila trade.

Table 27. Northbound Trade Identified by Trade Classification.

Points of Entry		1996			1998		
		Permanent	**Maquiladora**	**Temporary**	**Permanent**	**Maquiladora**	**Temporary**
Brownsville	Millions of dollars	454.6	2,986.0	520.5	328.9	3,782.2	681.6
	Percentage	11.5	75.4	13.1	6.9	78.9	14.2
McAllen	Millions of dollars	443.3	3,157.8	205.0	434.2	4,517.3	418.1
	Percentage	11.6	83.0	5.4	8.1	84.1	7.8
Laredo	Millions of dollars	3,069.8	1,957.6	13,995.1	2,035.1	1,721.6	12,434.4
	Percentage	16.1	10.3	73.6	12.6	10.6	76.8
Laredo 3	Millions of dollars	431.8	990.8	1,675.6	1,159.4	2,735.0	7,808.1
	Percentage	13.9	32.0	54.1	9.9	23.4	66.7
Roma	Millions of dollars	20.1	74.5	5.4	8.8	47.8	1.5
	Percentage	20.1	74.5	5.4	15.2	82.3	2.5
Eagle Pass	Millions of dollars	278.2	937.4	3,096.0	212.5	1,278.1	2,467.1
	Percentage	6.5	21.7	71.8	5.4	32.3	62.3
Del Rio	Millions of dollars	21.5	988.5	2.0	33.1	1,330.0	6.2
	Percentage	2.1	97.7	0.2	2.4	97.1	0.5
El Paso	Millions of dollars	467.0	10,527.8	1,579.5	619.8	13,581.1	1,688.3
	Percentage	3.7	83.7	12.6	3.9	85.5	10.6
Presidio	Millions of dollars	29.8	17.5	0.1	61.0	82.7	0.4
	Percentage	62.9	37.0	0.2	42.3	57.4	0.3
Texas Gateways	Millions of dollars	5,216.1	21,638.0	21,079.3	4,892.9	29,075.8	25,505.5
	Percentage	10.9	45.1	44.0	8.3	48.9	42.9
U.S.-Mexican Gateway	Millions of dollars	7,487.0	34,975.9	23,441.5	6,492.5	48,724.5	29741.9
	Percentage	11.4	53.1	35.6	7.6	57.4	35.0
Other Gateways*	Millions of dollars	12,723.1	2,713.2	9,117.5	13,400.3	4,050.2	14,926.5
	Percentage	51.8	11.0	37.1	41.4	12.5	46.1
TOTAL	Millions of dollars	20,210	37,689	32,559	19,893	52,775	44,668
	Percentage	22.3	41.7	36.0	17.0	45.0	38.1

Other gateways include those located in cities in the interior of Mexico, in major ports of entry, and in the southern Mexican border.

Table 28 shows a comparison between Texas gateways and other gateways of the southbound trade activity.

Table 28. Southbound Trade Identified by Trade Classification.

Points of Entry		1996			1998		
		Permanent	Maquiladora	Temporary	Permanent	Maquiladora	Temporary
Brownsville	Millions of Dollars	1926.6	2672.2	408.9	2272.0	4237.0	613.1
	Percentage	38.5	53.4	8.2	31.9	59.5	8.6
McAllen	Millions of Dollars	745.6	2,596.0	159.8	1,235.7	3,852.6	205.8
	Percentage	21.3	74.1	4.6	23.3	72.8	3.9
Laredo	Millions of Dollars	12,193.2	2,403.4	5,694.4	14,455.8	2,321.1	5,369.8
	Percentage	60.1	11.8	28.1	65.3	10.5	24.2
Laredo 3	Millions of Dollars	799.1	225.0	271.1	3,687.3	1,731.0	1,841.6
	Percentage	61.7	17.4	20.9	50.8	23.8	25.4
Roma	Millions of Dollars	71.7	75.0	9.5	54.1	35.4	0.8
	Percentage	45.9	48.0	6.1	59.9	39.2	0.8
Eagle Pass	Millions of Dollars	955.2	815.8	1,266.6	1,342.1	1,066.2	4,014.4
	Percentage	31.4	26.9	41.7	20.9	16.6	62.5
Del Rio	Millions of Dollars	70.7	843.3	3.0	101.1	1,071.2	9.1
	Percentage	7.7	92.0	0.3	8.6	90.7	0.8
El Paso	Millions of Dollars	1,866.6	8,977.1	1,214.0	2,376.4	11,596.0	1,345.8
	Percentage	15.5	74.5	10.1	15.5	75.7	8.8
Presidio	Millions of Dollars	30.1	11.2	15.6	24.9	43.9	12.2
	Percentage	52.9	19.7	27.4	30.8	54.1	15.1
Texas Gateways	Millions of Dollars	18,658.6	18,619.0	9,043.0	25,549.4	25,954.4	13,412.5
	Percentage	40.3	40.2	19.5	39.4	40.0	20.7
U.S.-Mexico Gateway	Millions of Dollars	21,828.0	28,978.1	10,347.1	29,964.5	40,328.2	15,885.0
	Percentage	35.7	47.4	16.9	34.8	46.8	18.4
Other Gateways	Millions of Dollars	16,924.1	1,526.6	9,861.0	26,262.2	2,228.5	10,573.9
	Percentage	59.8	5.4	34.8	67.2	5.7	27.1
TOTAL	Millions of Dollars	38,752.1	30,504.7	20,208.1	56,226.8	42,556.7	26,458.9
	Percentage	43.3	34.1	22.6	44.9	34.0	21.1

Source: Mexican Transportation Institute.

Conclusions from the Northbound-Southbound Flows

The following conclusions can be drawn from the available data:

Of the nine gateways on the Texas border, six of them (Laredo, El Paso, Laredo 3, McAllen, Brownsville and Eagle Pass) accounted for more than 97 percent of the total trade value in 1996 as well as 1998.

Maquiladora activity represented a large portion of the overall trade between the U.S. and Mexico, with 53 percent of the northbound trade in 1996 and increasing to 57 percent in 1998. Similarly, Texas gateways experienced high maquiladora levels, where, in 1998, 49 percent of the northbound U.S.-Mexico trade and 40 percent of the southbound U.S.-Mexico trade was of the maquiladora type. For the majority of these goods, the points of origin and destination were the Mexican border-states of Tamaulipas, Nuevo Leon, Coahuila, and Chihuahua.

The Mexican maquiladora industry, located for the most part on the Mexican border-states, commonly uses truck transport for shipping purposes. The niche for rail transportation of maquiladora trade may be the southern and central states of Mexico with maquiladora industries.

The Brownsville, McAllen, and El Paso gateways account for the greatest concentration of maquiladora flow in both directions in the state of Texas. In the two-year period of study, it was found that between 75 percent and 77 percent of the total maquiladora trade enters or exits the Mexican territory through these three gateways.

The Del Rio gateway also specializes in maquiladora trade. However, its importance is not as great due to the lower magnitude of its flows in each direction.

At the Laredo gateway, temporary northbound trade was most important in the two-year evaluation period. However, in the case of southbound movements, permanent trade was predominant. A similar situation occurred in the Laredo 3 gateway.

The Eagle Pass gateway specialized in temporary type goods, both northbound and southbound, during the two-year period under study. The Roma entry point experienced mostly maquiladora class northbound activity.

MEXICAN RAILROAD ANALYSIS

Traffic across the Texas-Mexico Gateway

Data Source: Secretariat of Communications and Transportation

Table 29 is presented as the first element in the following analysis and evaluation of rail transportation and traffic levels. It shows the history of cargo movement by rail in Mexico from

1988 to 1998 *(50)*. The table shows a decrease in tonnage between 1988 and 1991, followed by an increase starting in 1992. Following the Mexican railroad privatization process initiated in 1996, there was an average yearly increase of 13.4 percent in tonnage from 1996 to 1998. This growth has affected the modal split between rail and truck transport, which was 12.5 and 87.5 percent, in 1995, and 16.6 and 83.4 percent in 1998, respectively.

Table 29. Trade Cargo Moved within the Mexican Rail System.

Year	Net Tons (thousands)	Ton-Miles (thousands)	Median Distance (miles)	Number of Cargo Cars
1988	63,204	28,315	446.1	48,968
1989	59,387	26,523	444.7	47,186
1990	56,158	25,042	444.1	46,602
1991	51,138	22,485	437.8	44,003
1992	53,673	23,515	436.3	42,198
1993	55,515	24,530	440.0	38,839
1994	57,361	25,660	445.5	36,222
1995	57,833	25,865	445.4	35,042
1996	64,832	28,691	440.7	29,438
1997	67,956	29,185	427.7	28,314
1998	83,657	32,233	383.7	29,363

[1] Value was modified by the agencies that generated the information.

Source: National Railroads of Mexico (1988-1996), National Railroads of México and Mexican Rail Transportation, S.A. de C.V. (1997), and Rail Concesionaries with National Railroads of Mexico (1998).

Table 30 shows northbound and southbound rail cargo movements in tons registered from 1993 to 1998 across the seven most important rail gateways between the U.S. and Mexico. Average yearly increase for this type of transportation is approximately 10.1 percent (9.6 percent for exports and 14.7 percent for imports). It is important to note that tonnage of rail transport through the U.S.-Mexico border represents between 60 and 70 percent of the cargo tonnage moved across all the gateways, land and sea, in Mexico *(51)*.

Table 30. Northbound and Southbound Cargo Movements within the Mexican Rail System in Thousands of Tons.

	1993	1994	1995	1996	1997	1998
Northbound	14,540	16,262	16,241	21,512	19,855	27,191
Southbound	5,291	5,360	7,715	10,061	9,040	10,449
Total	19,830	21,622	23,956	31,573	28,894	37,640

Source: Mexican Transportation Institute, 2000.

This increase is further analyzed for each gateway and direction as indicated in Table 31. Trade values for the Mexicali, Presidio, San Isidro, and Calexico gateways are not shown since low trade flows for these gateways produce inconsistent results. The information in the table indicates that, although the average increase of rail transport through U.S.-Mexico gateways is 10.5 percent, in some of the most important gateways the increase reaches more than 15 percent.

Table 31. Percentage Increase Values of Rail Tonnage Flows per Gateway.

Gateway	Percent Increase (1990 – 1997)		Total Increase in Both Directions
	Northbound	Southbound	
Brownsville	19.6	9.5	10.9
Laredo	21.4	11.0	11.7
Eagle Pass	22.6	12.9	14.9
Presidio	-	-	-
El Paso	9.3	9.7	6.1
Nogales	8.6	7.6	8.0
Calexico	-	-	-
Total	14.7	9.6	10.1

Note: - Insignificant
Source: Mexican Transportation Institute

Data Source: Secretariat of Commerce and Industrial Development (SECOFI)

The following information is provided by the Secretariat of Commerce and Industrial Development (SECOFI) *(52)*.

The amount of goods traded by Mexico with the rest of the world in 1997 is shown in Table 32. Both weight (in millions of tons) and economic value (in millions of dollars) is included. We can see that, in terms of these parameters, Mexico established a favorable trade balance during 1997. The same table shows that most of Mexico's total imports and exports take place with the United States (74.7 percent and 85.7 percent, respectively, in terms of value). It also shows the distributions of weight and dollar value between the truck and rail modes. It can be observed that truck transportation is imperative for both imports and exports in terms of the value of the transported merchandise, but it is considerably less significant in terms of merchandise weight, an aspect for which rail transport is better suited.

Table 32. U.S. Export and Import Activity between Mexico and the World in 1997.

	Weight (thousands of tons)	Value (millions of dollars)
Exports		
U.S. exports to Mexico	86,298	82,166
- By truck	23,155	59,136
- By rail	16,610	6,021
From other countries	32,472	27,804
Total	118,769	109,970
Imports		
U.S. Imports from Mexico	125,680	95,345
- By truck	20,626	66,247
- By rail	5,246	13,004
From other countries	41,267	15,924
Total	166,947	111,269

Source: Mexican Transportation Institute, 2000.

Tables 33 and 34 show the exported (southbound) trade flow values, for the two land modes through all the Texas and Mexico gateways using weight and dollar value of goods. It is evident from these data that the most active gateway for southbound activity, in terms of dollar value and weight, is Laredo. This ranking is true for both modes of land transportation.

Table 33. Southbound U.S.-Mexico Trade by Rail in 1997.

Gateway	Weight (thousands of tons)	Value (millions of dollars)
Brownsville, Texas	1,565	515
Laredo, Texas	8,468	3,095
Eagle Pass, Texas	3,104	535
Presidio, Texas	51	28
El Paso, Texas	701	214
Total	13,889	4,387
All Gateways	16,610	6,021

Source: Mexican Transportation Institute, 2000.

Table 34. Southbound U.S.-Mexico Trade by Truck in 1997.

Gateway	Weight (thousands of tons)	Value (millions of dollars)
Brownsville, Texas	2,608	4,990
McAllen, Texas	1,461	4,313
Laredo, Texas	5,478	15,248
Roma, Texas	175	121
Eagle Pass, Texas	635	1,633
Presidio, Texas	25	41
Del Rio, Texas	425	1,003
El Paso, Texas	3,373	4,999
Total	14,182	32,348
All Gateways	23,155	59,136

Source: Mexican Transportation Institute, 2000.

Similarly, Tables 35 and 36 show the imported (northbound) trade flow values for the two land modes through the gateways between Texas and Mexico. In these tables, as with the southbound movements, the predominant gateway is Laredo. Note in this case that, although the values for truck transport for El Paso and McAllen are significant, Laredo shows an even amount of activity for better truck and rail transport.

Table 35. Northbound U.S.-Mexico Trade by Rail in 1997.

Gateway	Weight (thousands of tons)	Value (millions of dollars)
Brownsville, Texas	398	251
Laredo, Texas	2,137	8,240
Eagle Pass, Texas	991	2,333
Presidio, Texas	20	5
El Paso, Texas	201	24
Total	3,746	10,853
All Gateways	5,246	13,004

Source: Mexican Transportation Institute, 2000.

Table 36. Northbound U.S.-Mexico Trade by Truck in 1997.

Gateway	Weight (thousands of tons)	Value (millions of dollars)
Brownsville, Texas	1,173	4,914
McAllen, Texas	1,487	4,273
Laredo, Texas	2,932	7,793
Roma, Texas	108	85
Eagle Pass, Texas	464	1,509
Del Rio, Texas	190	1,239
Presidio, Texas	47	80
El Paso, Texas	1,944	4,698
Total	8,344	24,591
All Gateways	20,627	66,248

Source: Mexican Transportation Institute, 2000.

Opportunities for Shifting Trade from Truck to Rail

The research team analyzed the opportunities to shift cargo from truck to rail in Mexico by identifying the traditional commodity categories, based on geographical location, currently moved by rail. The commodity categories where rail plays a dominant role are those characterized by large product volumes of low economic density, long-distance movements, and products that are not particularly fragile.

Below is a list of the steps that the researchers undertook to identify the trade flow most likely to shift to an alternate mode of transportation:

Step 1:

The first step was to identify, for each Texas-Mexican gateway, the types of products that are moved by truck. For each product the dollar value and unit volume was determined over a defined period of time.

Step 2:

Once the products that are currently moved by truck were identified, it was determined that those types that meet the following criteria had the greater possibility of shifting to rail:

- ***Product tonnage* –** This criterion consists of classifying the goods by tonnage. Then, products with greater tonnage are selected based on the assumption that the tendency to shift the goods to rail would be more likely if the flows, in tonnage, are greater.

- ***Economic density* –** Economic density, in this report, is defined as the dollar value per tonnage of goods. This criterion was useful for grouping the products into low, medium, and high economic density. It is assumed that the likelihood of modal shifting increases as the economic density decreases.

- ***Type of product*** **–** This criterion was useful in determining the fragility of the product. The classification was made for goods of high, medium, and low fragility. It is assumed that the likelihood of shifting goods decreases as fragility increases.

After we identified the goods based on the criteria, we further classified each commodity class that we considered a good candidate for modal shift geographically (by the main originating state in the case of northbound movements and destination state in the case of southbound movements). This classification was developed based on the understanding that the possibilities for shifting to rail are greater at a greater distance. Therefore, the distance covered in Mexican territory for each product was established from the originating state or the destination state. The states were divided into three groups: border states, central states, and southern states. The assumption was that the probability of modal shift for the first group is low, while in the second and third groups, the probability increases accordingly.

For each gateway, a general analysis of the parameters was carried out determining the flows in each direction and the activity for each mode of transportation. The assessment for the most important gateways on the border – Laredo, Tamaulipas and Ciudad Juarez, Chihuahua – are presented below. It is important to mention that the preparation of this analysis utilizes data from January to November 1996.

Laredo Gateway

Rail activity at Laredo was found to be lower for foreign trade in both directions. Approximately 55 percent of the northbound activity, as expressed in dollars, was moved by truck and 45 percent by rail. In contrast, 81 percent of the dollar amount of the southbound activity was moved by truck, 13 percent by rail, and 6 percent by other modes of transport.

The northbound commercial flow expressed in terms of weight shows a similar pattern. Truck transport was greater than rail by more than a 2.5-to-1 margin, that is 3,529 to 1,312 thousand tons, respectively. Regarding the southbound tonnage, it was difficult to draw conclusions as to whether the truck activity was greater than the rail activity since one of the important aspects of commercial trade by truck was expressed in terms of pieces.

Main Mexican States of Origin or Destination of the Commercial Flow by Truck. The Mexican states shipping the greatest tonnage to the U.S. through this gateway are: Federal District, Nuevo Leon Tamaulipas, State of Mexico, Jalisco, Chihuahua, Coahuila, Veracruz, and Queretaro. Those states with lesser activity were Puebla, Durango, Hidalgo, and Guanajuato. Some of the most important Mexican destination states for southbound commodity movements were: Distrito Federal, Nuevo Leon, State of Mexico, Tamaulipas, Jalisco, Queretaro, Coahuila, and, secondly, Puebla, Guanajuato, and San Luis Potosi.

Main Countries of Destination or Origin of Commercial Flows for Truck Transport. The United States is the main destination for Mexican exports, receiving approximately 92 percent of their dollar value. A similar dominance was found with Mexican imports, with approximately 83 percent of goods and material originating from the U.S. Trading partners of lesser importance were Canada and France receiving Mexican exports and Japan, Canada, Germany, China, and Taiwan shipping Mexican imports.

Main Mexican States of Origin or Destination Using Truck Transport across the Laredo Entry Point. Based on the analysis methodology, those northbound commodities with the greatest potential for modal shift from track to rail are: coffee, automotive parts and accessories, motors, steel or iron-plated products, motor parts, metal screens, synthetic fabrics, electric accumulators, and pneumatics. The highest potential for modal shift is for commodities from the Mexican states of Chihuahua, Federal District, Durango, Jalisco, Mexico, and Veracruz. Table 37 summarizes this information for northbound trade.

Table 37. Potential for Modal Shift of Northbound Commodities in Tons at Laredo by the Main Mexican State of Origin.

Commodity Description	Key	Chih.	D.F.	Durango	Jalisco	México	Ver.
Coffee, to include toasted or decaffeinated	0901	-	14,035	-	-	-	72,859
Automobile parts and accessories	8708	-	17,349	-	2,924	13,557	-
Motors (kick type and alternating piston type)	8407	-	47,870	17,815	-	-	-
Flat laminated iron or steel products	7210	38,210	134	-	-	-	-
Identifiable parts destined for motors that fall under classifications 84.07 or 84.08 (motors and parts)	8409	-	18,197	647	-	185	-
Domestic use paper products to include tissue, hygienic, etc.	4803	-	30	-	41,629	-	-
Wire mesh, nets and bars, made of iron or steel wire	7314	-	20,308	-	-	1,402	-
Non alloy iron or steel bars	7214	-	725	-	217	22,253	-
Synthetic filament spinnings	5402	-	21,350	-	-	1,434	-
Storage batteries	8507	-	22,699	-	-	266	-
Rubber tires, pneumatics	4011	-	31,019	-	-	-	-

Source: Mexican Transportation Institute.

The most common trucks for the northbound commodity movements are the three-axle tractors with either tandem (T3-S2) or tridem (T3-S3) axle trailers, with an estimated average capacity of 22 and 30 tons, respectively. It is estimated that the products most likely to shift from truck to rail at the Laredo gateway represent more than 1,500 T3-S2 type vehicles per month or more than 1,100 T3-S3 vehicles per month, a significant reduction in highway traffic.

Southbound Products Most Likely to be Moved by Rail. Based on the analysis methodology, those southbound commodities with the greatest potential for modal shift from truck to rail at Laredo are polymers, leather, paper, and cartons. These results are shown in Table 38.

Table 38. Potential Modal Shift of Southbound Commodities in Tons to Mexico at Laredo and the Main Mexican State of Origin.

Commodity Description	Key	D.F.	Guanajuato	Edo. Méx.
Primary forms of ethylene polymers	3901	32,701	14,147	52,928
Leather in all its forms	4101	1,300	28,105	-
Paper and carton not coated, for printing and graphic purposes.	4802	25,684	-	4,690
Paper and carton coated on one or both sides with Kaolin or other inorganic substance with or without binding material	4810	28,973	1,586	2,210

Source: Mexican Transportation Institute.

As with the northbound movements, the southbound trucks most commonly used were the T3-S2 and T3-S3 with an estimated average cargo capacity of 22 and 30 tons, respectively. It is estimated that almost 700 T3-S2 type vehicles or approximately 500 T3-S3 type vehicles could be shifted from truck to rail at the Laredo gateway each month.

El Paso Gateway

The dollar amount of the southbound activity at this gateway for the period under study was slightly greater than the amount of the northbound activity. Southbound trade totaled $11.3 billion, and northbound trade totaled $11.1 billion, respectively. At El Paso, $75.1 million in rail activity was observed of $252 million. This represents less than 1.0 percent of the total southbound activity during the period under study.

Similarly, northbound rail activity was only 2.3 percent of the total northbound trade. Truck transportation activity carried 97.5 percent of the northbound freight value at this location, totaling $10.8 billion. The remaining percentage was attributed to other modes of transportation (postal, pipeline, etc.).

Main Countries of Origin and Destination for Commercial Truck Transportation. The main country of origin of Mexican exports, in terms of dollar amount, was the U.S., which accounted for 99 percent of the total. The same is found with Mexican import activity, with 98.7 percent originating in the U.S.

Main Mexican States of Origin or Destination for Commercial Truck Transport. The Mexican states with the greatest northbound activity to the U.S. by truck, in terms of dollar value, were Chihuahua, Durango, and Coahuila. Those states with greatest southbound activity were Chihuahua, Durango, Coahuila, and the Federal District.

Northbound Movements that Could be Moved by Rail to the U.S. at El Paso. The El Paso gateway is characterized by the circulation of maquiladora flows originating in the states of Chihuahua, Coahuila, and Durango. Based on the analysis methodology, it was found that there was very little northbound trade with the potential to be moved by rail to the U.S. This conclusion is due to the fact that travel distance from commodity origin to the border is not far enough to result in significant cost savings if the product was transported by Mexican rail. The only product identified with some possibility of movement by rail was lumber, originating mainly from the state of Durango.

As shown in Table 39, it is estimated that nearly 170 vehicles, type T3-S2, and more than 120 vehicles, type T3-S3, were utilized to transport the 40,670 tons of northbound lumber during the period from January to November of 1996.

Table 39. Potential Modal Shift of Northbound Commodities in Tons to the U.S. at El Paso and the Main Mexican State of Origin.

Commodity Description	Key	Chihuahua	Durango	Michoacán
Lumber, maximum thickness of 6 mm	4407	15,697	40,670	2,907

Analysis of southbound movements at the El Paso gateway found that some goods were likely to be moved by rail based on their characteristics. However, because the border states were the main destinations and, based on travel distances, it has been determined that the shift of these goods to rail is not likely unless the originating states in the U.S. are distant.

Brownsville Gateway

Northbound Trade with a Potential for Shift to Rail. It was determined that several northbound commodities at Brownsville have the possibility of being moved by rail based on their physical characteristics, tonnage, and destination. As shown in Table 40, these commodities are scrap metal, steel or iron-laminated products, ethylene polymers, and natural sand, which originate mainly in the states of Coahuila, Chihuahua, Federal District, and State of Mexico.

Table 40. Potential Modal Shift of Northbound Commodities from Mexico at Brownsville and the Main Mexican State of Origin.

Commodity Description	Key	Coahuila	Chihuahua	D.F.	Edo. De Méx.
Scrap metal of cast iron or steel	7204	36,903	-	15,335	-
Flat laminated iron or steel non-alloy products of 600 mm or more thickness, hot rolled without plating or coating	7208	-	-	26,873	-
Flat laminated iron or steel non alloy products of 600 mm or thicker, cold rolled without plating or coating	7209	-	35,522	9,543	-
Flat laminated products of stainless steel of 600 mm thick or more	7219	-	-	44,748	-
Primary forms of ethylene polymers	3901	-	-	18,819	7,258
Natural sands of any type to include tinted ones	2503	-	-	21,443	-

Source: Mexican Transportation Institute.

The commodity flows shown in the table above are equivalent to nearly 800 type T3-S2 vehicles or more than 609 type T3-S3 vehicles.

Eagle Pass Gateway

Southbound Commodities Most Likely to be Moved by Rail at Eagle Pass. At Eagle Pass, a number of commodities were identified as most likely to be shifted from truck to rail based on their type, tonnage, and origin. These commodities are shown in Table 41 and include ingots and preformed shapes of alloy steel, fertilizers, leathers, non-alloy iron ingots, cable, cements and similar preparations, paper containers, and salt.

Table 41. Potential Modal Shift of Northbound Commodities from Mexico at Eagle Pass and the Main Mexican State of Origin.

Commodity Description	Key	Jalisco	Edo. de México
Steel alloy ingots and rolled shapes hollow ingots for perforation of steel alloy or non alloy.	7228	2,147	60,616
Fertilizers: mineral or chemically nitrogenated.	3102	14,229	-

Source: Mexican Transportation Institute.

Commodities at Eagle Pass with probabilities of deviation from track to rail are equivalent to approximately 300 T3-S2 vehicles or more than 200 T3-S3 vehicles.

Presidio Gateway

The value of northbound and southbound commodity movements at Presidio, were $31.5 million and $41.5 million, respectively, over the study time period. This value corresponds to northbound and southbound tonnages of 27,902 and 75,360 tons, respectively. Eighty-three percent by value of northbound commodities were moved by truck and 16 percent were moved by rail. In comparison, 42 percent by value of southbound commodities were moved by truck and 58 percent was moved by rail.

U.S. RAILROAD ANALYSIS

Trade flow analysis through Texas railroad gateways was performed using the Carload Waybill Sample for years 1993 to 1998. The Waybill Sample is a “one percent” sample of the annual waybills that provides very detailed commodity movements by the railroads. Waybill data provide a major source of information for transportation planning.

Interpreting statistics derived from the Waybill Sample must be performed with an awareness of certain practices that characterize the collection of railroad waybill data. One area of concern is intermodal carloadings. The Waybill Sample tends to overstate the number of intermodal cars moved, due to the one box/one car billing of single unit prices that characterize most intermodal traffic. These one box/one car statistics are present in the waybill records even if the car has multiple platforms. Another concern is an accounting rule that allows the rail industry to rebill deregulated traffic. This rule may result in two waybills for one shipment. For example, a shipment from New York to Los Angeles via Chicago may appear in the sample as two waybills due to the shipment being rebilled in Chicago.

Two major railroad mergers occurred during the evaluation time period. In order to represent the current railroads, UP and BNSF totals represent the combined totals for the railroads that make up the current companies. For example, BNSF's totals for the years prior to the merger between Burlington Northern with Santa Fe include the combined totals of both BN and ATSF.

This section provides analysis of traffic flows through the Texas-Mexican railroad gateways using the Waybill Sample data. Yearly analyses of traffic levels are presented along with commodity movements. An evaluation of the intermodal traffic through the gateways is also provided.

Yearly Characteristics

Figure 19 and Table 42 show the total carloads and tonnages, respectively, transported by rail through Texas-Mexico gateways from 1993 to 1998. Both tons and carloads transported increased over the period. For northbound movements, the data show a 121 percent increase (20 percent average annually) in tonnage and 163 percent increase (27 percent average annually) for carloads. For southbound movements, there was a 67 percent increase (11 percent average annually) in tonnage and 65 percent increase (11 percent average annually) for carloads.

It should be noted that both tonnage and number of cars in the southbound direction declined in 1995 from the 1994 levels. This decline corresponds to the devaluation of the Mexican peso, which reduced the quantity of manufactured products shipped to Mexico. A reduction in northbound traffic levels in 1997 is believed to correspond to the poor condition of the Mexican railroad system and service prior to privatization.

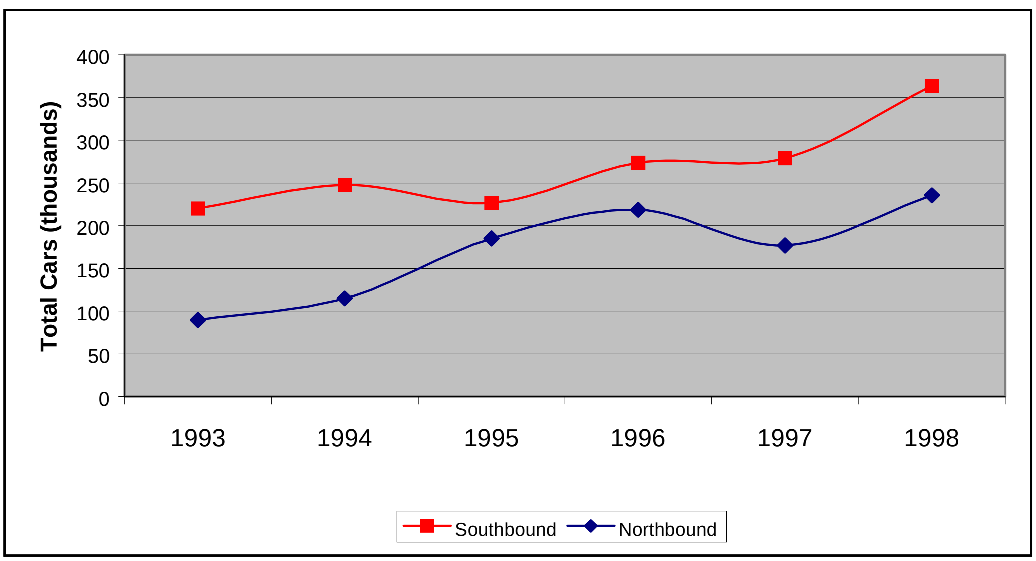


Figure 19. Total Railcars at the Texas-Mexico Border.

Table 42. Total Tons and Cars at the Texas-Mexico Border.

Direction	Year	Tons	Cars
Northbound	1993	2,882,062	89,454
	1994	3,647,160	114,872
	1995	5,140,579	184,870
	1996	6,025,457	218,523
	1997	5,499,990	177,018
	1998	6,380,896	235,456
Southbound	1993	12,511,300	220,342
	1994	13,565,447	247,522
	1995	11,911,291	226,618
	1996	14,840,045	273,504
	1997	16,716,387	278,882
	1998	20,940,747	363,455

Figures 20 and 21 show the annual carloads transported by the different U.S. railroads through all the Texas gateways. UP is the only one of the three railroads with a consistent increase in cars moved, with the exception of 1997. The reduction in carloads for UP in 1997 corresponds to merger-related traffic problems. The major increases occurred in the northbound direction with an increase of over 260 percent from 1993 to 1998, averaging almost 44 percent per year. In the southbound direction, the carloads increased 80 percent over the same time period, averaging 13 percent annually.

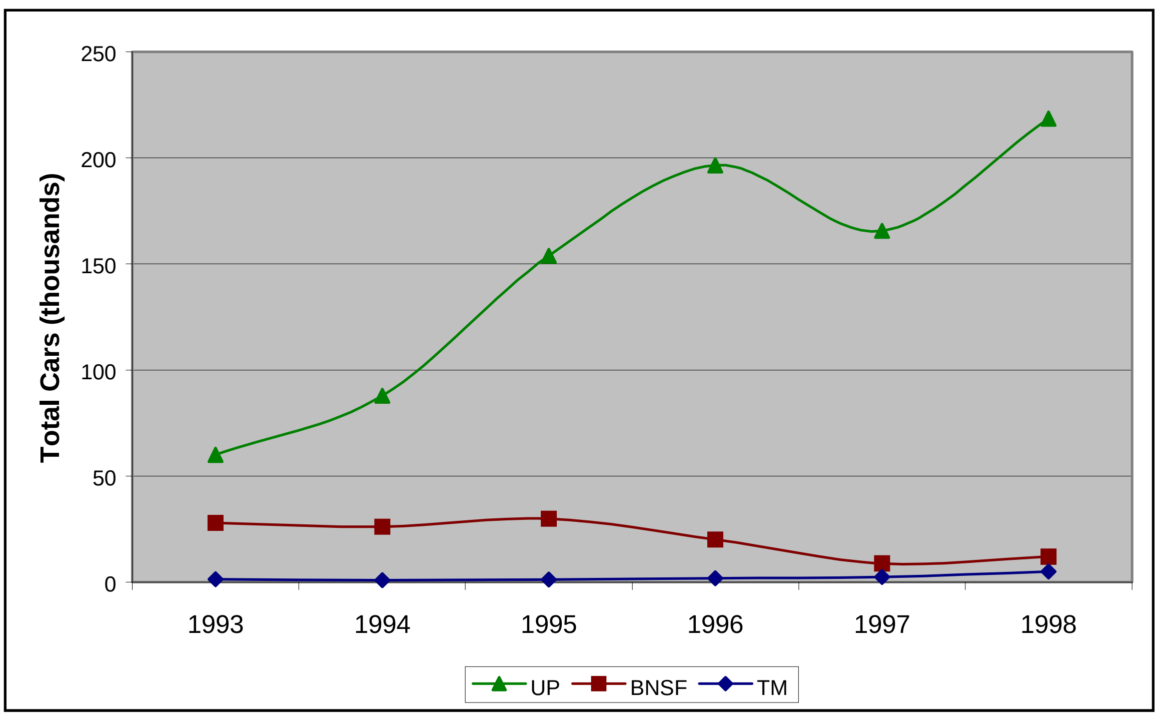


Figure 20. Total Northbound Cars by Railroad.

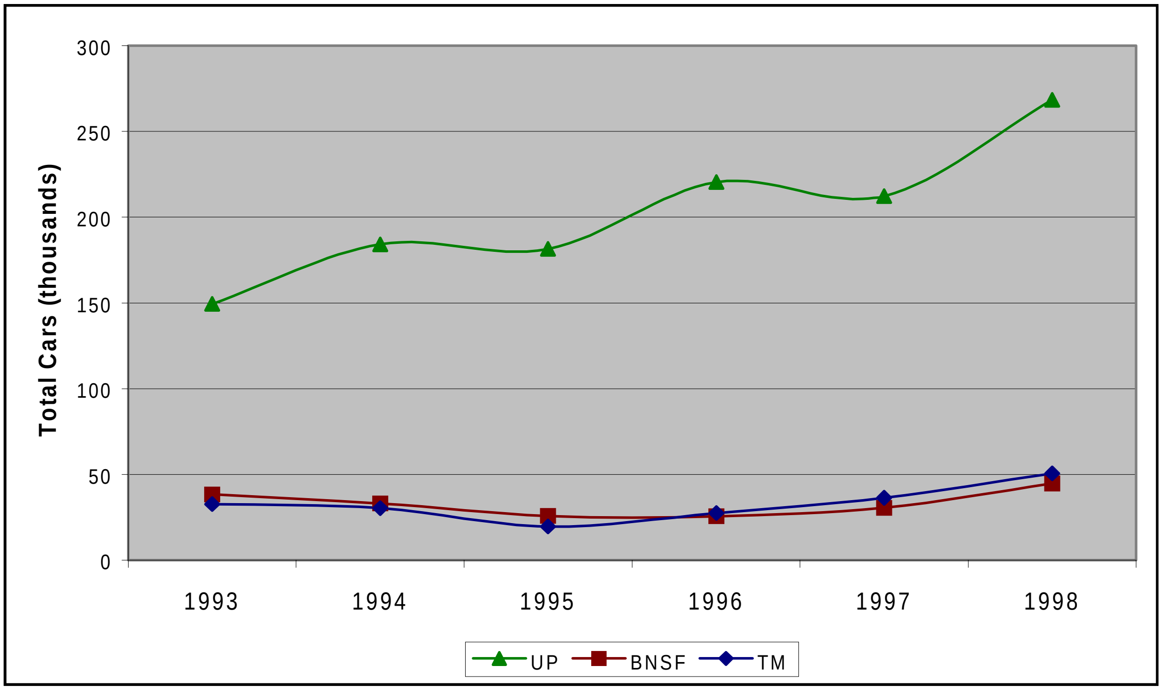


Figure 21. Total Southbound Cars by Railroad.

The most significant growth for BNSF occurred in the southbound direction. The number of carloads moved by BNSF increased to over 44,500 in 1998 from 38,000 in 1993, an increase of 16 percent from 1993. Northbound movements for BNSF declined in 1996 and 1997 before rebounding in 1998.

TM experienced a 250 percent increase in northbound traffic from 1993 to 1998, reaching almost 5,000 carloads in 1998. Southbound movements increased consistently from 1995 to 1998 after declining from the 1994 levels. In 1998, TM transported over 50,000 carloads to Laredo for import into Mexico.

Table 43 presents the top 10 northbound and southbound commodities by carloads for 1993 to 1998 (top commodities by cars totaled from 1993 to 1998).

Table 43. Comprehensive Top 10 Northbound and Southbound Commodities by Number of Cars, 1993-1998.

Direction	Code	Commodity Description	Tons	Cars
Northbound	37	TRANSPORTATION EQUIPMENT	8,188,236	431,448
	46	MISCELLANEOUS MIXED SHIPMENTS	2,067,276	128,016
	33	PRIMARY METAL PRODUCTS	6,048,216	74,508
	20	FOOD OR KINDRED PRODUCTS	3,601,100	68,612
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	671,826	66,526
	41	MISCELLANEOUS FREIGHT SHIPMENTS	577,011	63,626
	36	ELECTRICAL MACHINERY, EQUIPMENT OR SUPPLIES	513,680	44,000
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	1,515,984	27,036
	28	CHEMICALS OR ALLIED PRODUCTS	1,407,484	19,656
	11	COAL	1,524,404	16,385
Southbound	01	FARM PRODUCTS	29,050,064	318,627
	37	TRANSPORTATION EQUIPMENT	5,040,640	316,759
	46	MISCELLANEOUS MIXED SHIPMENTS	2,628,136	171,888
	20	FOOD OR KINDRED PRODUCTS	9,569,366	134,575
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	7,080,836	120,060
	26	PULP, PAPER OR ALLIED PRODUCTS	5,570,864	90,900
	33	PRIMARY METAL PRODUCTS	7,127,883	89,486
	28	CHEMICALS OR ALLIED PRODUCTS	7,046,588	85,508
	29	PETROLEUM OR COAL PRODUCTS	3,191,312	40,116
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	2,940,304	40,032

Table 44 shows the top 10 commodities ranked by tonnage for northbound and southbound directions in 1998.

Table 45 shows the top 10 commodities ranked by carloads in 1998. The categories are shown for broad commodity groups. The top three northbound commodities by tonnage made up a significant percentage of the total commodity totals.

Over 1.6 million tons of transportation equipment moved through Texas rail gateways from Mexico, while over 1.1 million tons of food or kindred products and primary metals each traversed the border. The major southbound commodities were farm products, chemicals and allied products, food or kindred products, and coal. Farm products consisted of over 6.8 million tons and over 73,000 cars.

Table 44. Top 10 Commodities (2-digit) Ranked by Tons, 1998.

Direction	Comm. Code	Commodity Description	Tons	Cars
Northbound	37	TRANSPORTATION EQUIPMENT	1,640,328	87,400
	20	FOOD OR KINDRED PRODUCTS	1,117,840	21,324
	33	PRIMARY METAL PRODUCTS	1,115,500	13,948
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	467,244	7,280
	46	MISCELLANEOUS MIXED SHIPMENTS	432,800	28,720
	28	CHEMICALS OR ALLIED PRODUCTS	356,080	4,656
	41	MISCELLANEOUS FREIGHT SHIPMENTS	293,400	28,840
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	191,560	20,520
	11	COAL	138,728	1,528
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	112,344	2,188
Southbound	01	FARM PRODUCTS	6,837,995	73,241
	28	CHEMICALS OR ALLIED PRODUCTS	1,802,124	20,788
	20	FOOD OR KINDRED PRODUCTS	1,793,212	23,239
	11	COAL	1,712,016	16,874
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	1,465,668	23,936
	33	PRIMARY METAL PRODUCTS	1,355,920	17,436
	37	TRANSPORTATION EQUIPMENT	1,279,784	82,388
	26	PULP, PAPER OR ALLIED PRODUCTS	1,126,956	18,432
	29	PETROLEUM OR COAL PRODUCTS	850,300	10,488
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	678,280	9,080

Table 45. Top 10 Commodities (2-digit) Ranked by Number of Cars, 1998.

Direction	Comm. Code	Commodity Description	Tons	Cars
Northbound	37	TRANSPORTATION EQUIPMENT	1,640,328	87,400
	41	MISCELLANEOUS FREIGHT SHIPMENTS	293,400	28,840
	46	MISCELLANEOUS MIXED SHIPMENTS	432,800	28,720
	20	FOOD OR KINDRED PRODUCTS	1,117,840	21,324
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	191,560	20,520
	33	PRIMARY METAL PRODUCTS	1,115,500	13,948
	36	ELECTRICAL MACHINERY, EQUIPMENT OR SUPPLIES	89,400	7,400
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	467,244	7,280
	28	CHEMICALS OR ALLIED PRODUCTS	356,080	4,656
	47	SMALL PACKAGED FREIGHT SHIPMENTS	25,440	2,320
Southbound	37	TRANSPORTATION EQUIPMENT	1,279,784	82,388
	01	FARM PRODUCTS	6,837,995	73,241
	46	MISCELLANEOUS MIXED SHIPMENTS	561,240	36,040
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	1,465,668	23,936
	20	FOOD OR KINDRED PRODUCTS	1,793,212	23,239
	28	CHEMICALS OR ALLIED PRODUCTS	1,802,124	20,788
	26	PULP, PAPER OR ALLIED PRODUCTS	1,126,956	18,432
	33	PRIMARY METAL PRODUCTS	1,355,920	17,436
	11	COAL	1,712,016	16,874
	29	PETROLEUM OR COAL PRODUCTS	850,300	10,488

Examining the commodities at a more detailed level, as shown in Table 46 and Table 47, motor vehicle accessories or parts, primary copper, beer, and TOFC shipments not identified by commodity represent the major portion of the northbound traffic. Southbound movements have greater levels of farm products including soybeans, corn, sorghum, and wheat. Other major southbound commodities include coal, paper waste, and motor vehicle accessories or parts.

Table 46. Top 10 Commodities (5-digit) Ranked by Tons, 1998.

Direction	Comm. Code	Commodity Description	Tons	Cars
Northbound	20821	BEER, ALE, PORTER, STOUT OR OTHER FERMENTED MALT LIQUORS, IN BARRELS, BOTTLES, CANS, OR KEGS	1,014,164	17,616
	37111	MOTOR PASSENGER OR AIR CARS, ASSEMBLED	1,003,000	49,240
	33311	PRIMARY COPPER OR COPPER BASE ALLOY PIG, SLAB OR INGOTS, ETC.	406,028	4,676
	37149	MOTOR VEHICLE ACCESSORIES OR PARTS, NEC, INCLUDING MIXED LOADS	394,880	29,080
	32411	HYDRAULIC CEMENT, NATURAL, PORTLAND OR MASONRY	359,964	4,200
	46111	ALL FREIGHT RATE SHIPMENTS, NEC, OR TRAILER-ON-FLAT-CAR (TOFC) SHIPMENTS EXC. WHERE IDENTIFIED BY COMMODITIES, THEN CODE BY COMMODITY	336,560	20,080
	33123	IRON OR STEEL SHEET OR STRIP	301,400	4,036
	41114	ARTICLES, USED EXC. FOR REPAIR OR RECONDITIONING, RETURNED EMPTY OR REMELTING	293,400	28,840
	42211	TRAILERS, SEMI-TRAILERS, OR CONTAINERS, RETURNED EMPTY	191,560	20,520
	33511	COPPER, BRASS OR BRONZE OR OTHER COPPER BASE ALLOY RODS OR BARS	185,520	2,240
Southbound	01144	SOYBEANS (SOYA BEANS)	2,099,557	21,403
	01132	CORN EXC. POPCORN	1,842,343	18,693
	11212	PREPARED BITUMINOUS COAL EXC. GROUND OR PULVERIZED OTHER THAN FOR FUEL OR STEAM	1,712,016	16,874
	01136	SORGHUM GRAINS	1,299,349	13,207
	40241	PAPER WASTE OR SCRAP	1,110,720	19,280
	37149	MOTOR VEHICLE ACCESSORIES OR PARTS, NEC, INCLUDING MIXED LOADS	877,600	62,640
	28123	SODIUM COMPOUNDS EXC. SODIUM ALKALIES	797,232	8,148
	26111	PULP	598,116	8,232
	01137	WHEAT EXC. BUCKWHEAT	573,050	5,830
	33311	PRIMARY COPPER OR COPPER BASE ALLOY PIG, SLAB OR INGOTS, ETC.	488,368	5,188

Table 47. Top 10 Commodities (5-digit) Ranked by Cars, 1998.

Direction	Comm. Code	Commodity Description	Tons	Cars
Northbound	37111	MOTOR PASSENGER OR AIR CARS, ASSEMBLED	1,003,000	49,240
	37149	MOTOR VEHICLE ACCESSORIES OR PARTS, NEC, INCLUDING MIXED LOADS	394,880	29,080
	41114	ARTICLES, USED EXC. FOR REPAIR OR RECONDITIONING, RETURNED EMPTY OR REMELTING	293,400	28,840
	42211	TRAILERS, SEMI-TRAILERS, OR CONTAINERS, RETURNED EMPTY	191,560	20,520
	46111	ALL FREIGHT RATE SHIPMENTS, NEC, OR TRAILER-ON-FLAT-CAR (TOFC) SHIPMENTS EXC. WHERE IDENTIFIED BY COMMODITIES, THEN CODE BY COMMODITY	336,560	20,080
	20821	BEER, ALE, PORTER, STOUT OR OTHER FERMENTED MALT LIQUORS, IN BARRELS, BOTTLES, CANS, OR KEGS	1,014,164	17,616
	46211	MIXED SHIPMENTS, 2 OR MORE MAJOR GROUPS VIZ. COMMODITIES REPRESENTING TWO OR MORE	96,240	8,640
	33311	PRIMARY COPPER OR COPPER BASE ALLOY PIG, SLAB OR INGOTS, ETC.	406,028	4,676
	32411	HYDRAULIC CEMENT, NATURAL, PORTLAND OR MASONRY	359,964	4,200
	33123	IRON OR STEEL SHEET OR STRIP	301,400	4,036
Southbound	37149	MOTOR VEHICLE ACCESSORIES OR PARTS, NEC, INCLUDING MIXED LOADS	877,600	62,640
	46111	ALL FREIGHT RATE SHIPMENTS, NEC, OR TRAILER-ON-FLAT-CAR (TOFC) SHIPMENTS EXC. WHERE IDENTIFIED BY COMMODITIES, THEN CODE BY COMMODITY	447,680	29,680
	01144	SOYBEANS (SOYA BEANS)	2,099,557	21,403
	40241	PAPER WASTE OR SCRAP	1,110,720	19,280
	01132	CORN EXC. POPCORN	1,842,343	18,693
	11212	PREPARED BITUMINOUS COAL EXC. GROUND OR PULVERIZED OTHER THAN FOR FUEL OR STEAM	1,712,016	16,874
	01136	SORGHUM GRAINS	1,299,349	13,207
	26111	PULP	598,116	8,232
	28123	SODIUM COMPOUNDS EXC. SODIUM ALKALIES	797,232	8,148
	41114	ARTICLES, USED EXC. FOR REPAIR OR RECONDITIONING, RETURNED EMPTY OR REMELTING	80,000	7,560

Railroad Analysis

The following discussion identifies the U.S. railroad's 1998 shipments to the Texas border gateways. With access to El Paso, Eagle Pass, Laredo, and Brownsville, UP moves the major portion of the Texas-Mexico rail traffic. BNSF has access to El Paso, Eagle Pass, and Brownsville, and TM has access to Laredo. The railcar levels through the gateways are shown in Figure 22 and Figure 23.

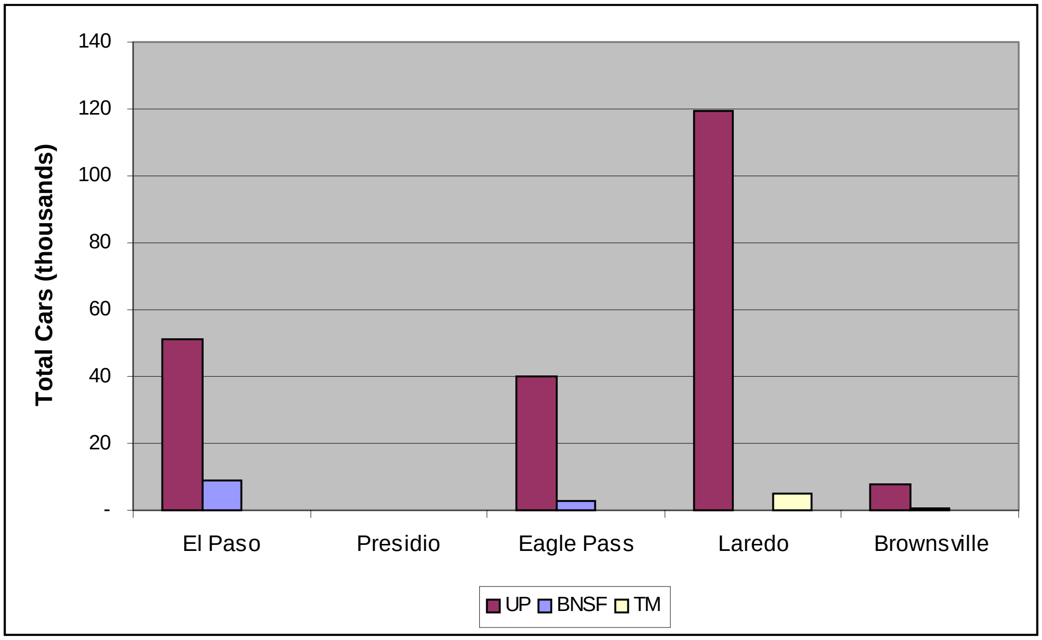


Figure 22. Total Northbound Cars by Railroad by Gateway, 1998.

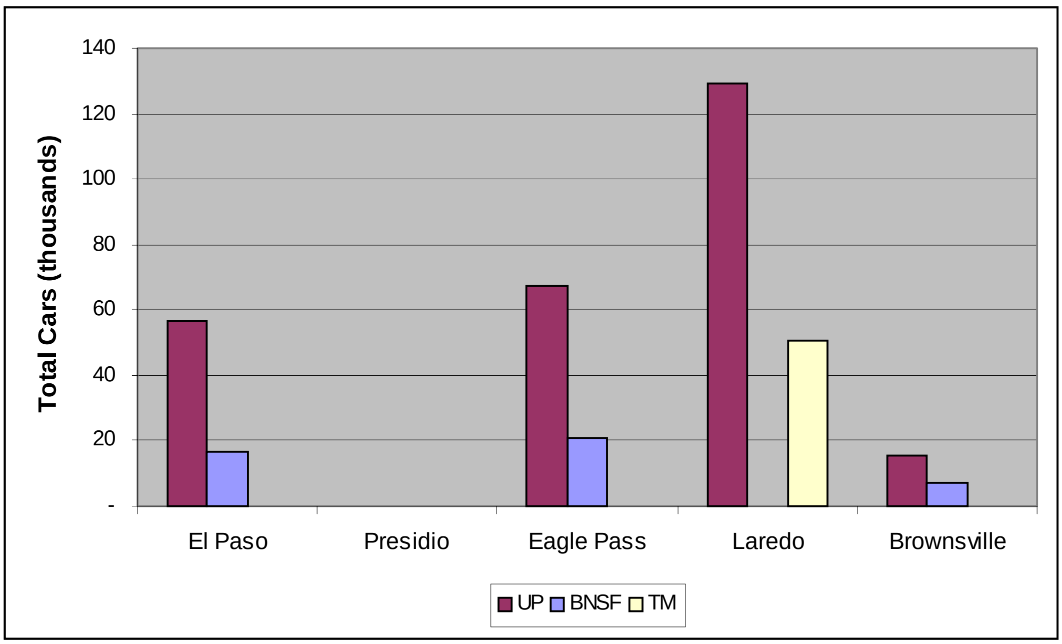


Figure 23. Total Southbound Cars by Railroad by Gateway, 1998.

Tables 48 and 49 show the top commodities ranked by tons transported by the railroads between Texas and Mexico in 1998. The major commodity moved by the railroads northbound was transportation equipment, which ranked first on the list transported by UP with over 1.5 million tons and 86,000 carloads. TM also transported over 40,000 tons and 800 carloads of transportation equipment in 1998.

In the southbound direction, the major commodities hauled by UP included farm products, coal, and transportation equipment. BNSF's major commodities included farm products, chemicals, and food products. Farm products, food products, and pulp, paper, or allied products were the top commodities moved southbound by TM.

Table 48. Top 10 Northbound Commodities (2-digit) by Railroad Ranked by Tons, 1998.

Railroad	Comm. Code	Commodity Description	Tons	Cars
UP	37	TRANSPORTATION EQUIPMENT	1,590,088	86,480
	20	FOOD OR KINDRED PRODUCTS	972,160	19,060
	33	PRIMARY METAL PRODUCTS	754,160	9,556
	46	MISCELLANEOUS MIXED SHIPMENTS	420,720	28,000
	41	MISCELLANEOUS FREIGHT SHIPMENTS	293,400	28,840
	28	CHEMICALS OR ALLIED PRODUCTS	237,720	3,336
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	221,168	4,552
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	187,840	19,600
	36	ELECTRICAL MACHINERY, EQUIPMENT OR SUPPLIES	88,240	7,280
	11	COAL	80,008	864
BNSF	33	PRIMARY METAL PRODUCTS	300,340	3,552
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	244,076	2,688
	20	FOOD OR KINDRED PRODUCTS	99,396	1,588
	29	PETROLEUM OR COAL PRODUCTS	28,852	372
	24	LUMBER OR WOOD PRODUCTS EXC. FURNITURE	27,320	360
	30	RUBBER OR MISCELLANEOUS PLASTICS PRODUCTS	25,840	720
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	25,816	356
	28	CHEMICALS OR ALLIED PRODUCTS	14,560	160
	46	MISCELLANEOUS MIXED SHIPMENTS	12,080	720
	26	PULP, PAPER OR ALLIED PRODUCTS	8,812	140
TM	28	CHEMICALS OR ALLIED PRODUCTS	103,800	1,160
	33	PRIMARY METAL PRODUCTS	61,000	840
	11	COAL	58,720	664
	20	FOOD OR KINDRED PRODUCTS	46,284	676
	37	TRANSPORTATION EQUIPMENT	44,160	800
	29	PETROLEUM OR COAL PRODUCTS	30,040	400
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	16,240	200
	26	PULP, PAPER OR ALLIED PRODUCTS	8,200	120
	50	COMMODITY UNKNOWN	3,920	40
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	2,000	40

Table 49. Top 10 Southbound Commodities (2-digit) by Railroad Ranked by Tons, 1998.

Railroad	Comm. Code	Commodity Description	Tons	Cars
UP	01	FARM PRODUCTS	2,364,151	26,449
	11	COAL	1,605,012	15,772
	37	TRANSPORTATION EQUIPMENT	1,256,548	81,548
	28	CHEMICALS OR ALLIED PRODUCTS	1,251,368	14,760
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	1,080,988	17,496
	33	PRIMARY METAL PRODUCTS	1,018,720	13,480
	20	FOOD OR KINDRED PRODUCTS	965,352	13,744
	26	PULP, PAPER OR ALLIED PRODUCTS	689,160	11,840
	29	PETROLEUM OR COAL PRODUCTS	530,716	6,460
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	515,360	7,000
BNSF	01	FARM PRODUCTS	2,109,820	21,779
	28	CHEMICALS OR ALLIED PRODUCTS	293,832	3,248
	20	FOOD OR KINDRED PRODUCTS	225,952	2,748
	33	PRIMARY METAL PRODUCTS	223,080	2,476
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	214,760	3,680
	26	PULP, PAPER OR ALLIED PRODUCTS	134,200	2,120
	14	NONMETALLIC MINERALS EXC. FUELS	107,516	1,084
	11	COAL	107,004	1,102
	29	PETROLEUM OR COAL PRODUCTS	70,760	1,040
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	53,400	640
TM	01	FARM PRODUCTS	2,364,024	25,013
	20	FOOD OR KINDRED PRODUCTS	601,908	6,747
	26	PULP, PAPER OR ALLIED PRODUCTS	303,596	4,472
	28	CHEMICALS OR ALLIED PRODUCTS	256,924	2,780
	29	PETROLEUM OR COAL PRODUCTS	248,824	2,988
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	169,920	2,760
	33	PRIMARY METAL PRODUCTS	114,120	1,480
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	109,520	1,440
	14	NONMETALLIC MINERALS EXC. FUELS	89,232	904
	48	WASTE HAZARDOUS MATERIALS OR WASTE HAZARDOUS SUBSTANCES	82,280	880

Texas-Mexico Rail Gateways

Figure 24 shows the total number of carloads for each of the five Texas-Mexico gateways in 1998. Laredo is the major gateway, with approximately twice as many carloads as any other gateway. Southbound movements represented almost 180,000 carloads at Laredo, compared to 124,000 northbound carloads. Both Eagle Pass and El Paso were also prominent gateways with 88,000 and 73,000 southbound carloads and 43,000 and 60,000 northbound carloads, respectively. Brownsville traffic totals were approximately 23,000 southbound and 8,000 northbound carloads. Presidio traffic levels with only 80 total cars in 1998. Table 50 shows the totals associated with Figure 24.

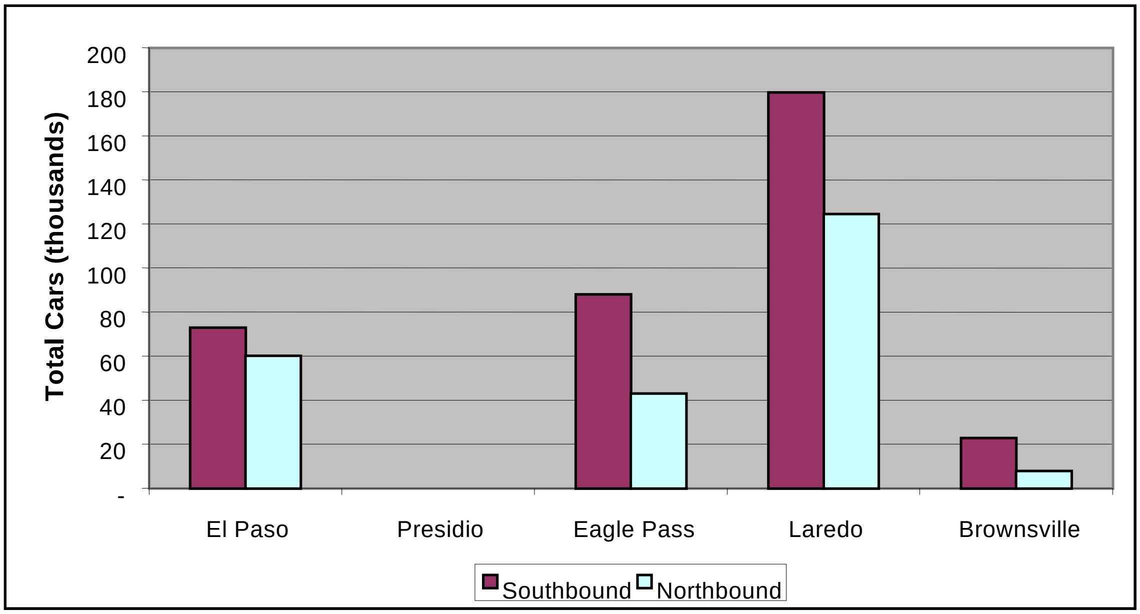


Figure 24. Total Cars by Gateway, 1998.

Table 50. Total Tons and Cars by Gateway, 1998.

Direction	Gateway	Tons	Cars
Northbound	El Paso	1,681,140	60,192
	Presidio	3,120	40
	Eagle Pass	1,179,396	42,924
	Laredo	3,225,996	124,412
	Brownsville	291,244	7,888
Southbound	El Paso	3,052,486	72,913
	Presidio	3,640	40
	Eagle Pass	5,295,794	87,943
	Laredo	10,569,139	179,731
	Brownsville	2,019,688	22,828

The following section describes the commodity movements through the separate Texas-Mexico gateways.

El Paso

El Paso is one of the prominent railroad gateways between the U.S. and Mexico. Both UP and BNSF transport goods through two international bridges at El Paso. In 1998, over three million southbound and 1.7 million northbound tons and 73,000 southbound and 60,000 northbound carloads crossed through El Paso. Of the northbound traffic levels, 441,000 tons and 9,200 carloads terminated in Texas. Thus, 74 percent of the tonnage terminated outside Texas. Further, only 15 percent of the southbound tonnage originated in Texas.

Figure 25 shows the annual carloads through El Paso from 1993 to 1998. The traffic levels through El Paso experienced declines in 1994 and 1997 due to the peso crisis in Mexico and UP's merger-related problems. Traffic levels greatly improved to the 1998 levels. Over the six-year period, traffic through El Paso increased around 31 percent for southbound railcar movement and over 60 percent for northbound railcar movements.

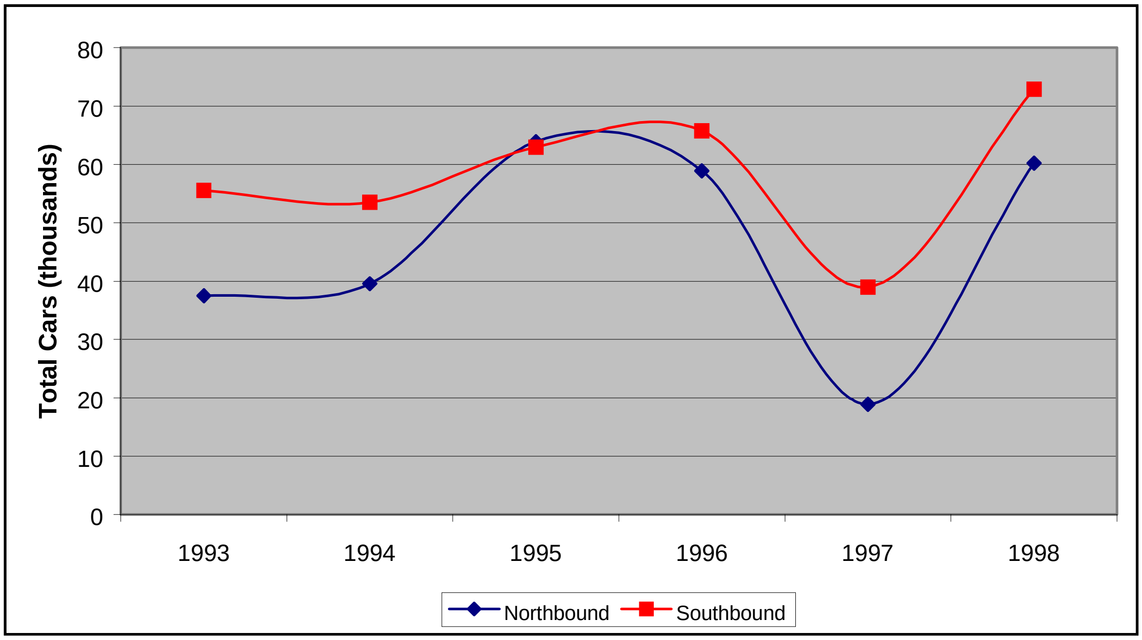


Figure 25. Total Cars at El Paso.

Table 51 shows the major northbound commodities crossing through El Paso in 1998. The top commodity, based on tonnage, was primarily metal products, more specifically copper, with over one million tons. This commodity was followed by clay, concrete, glass, or stone products (hydraulic cement), miscellaneous mixed shipments (TOFC shipments not identified by commodity), and transportation equipment (motor vehicle accessories or parts). Based on the number of carloads, transportation equipment and miscellaneous mixed shipments were the top commodities.

As shown in Table 52, over 1.5 million tons and 16,000 carloads of farm products moved southbound through El Paso in 1998. The next highest total was for primary metal products (1.1 million tons and 13,000 cars) and miscellaneous mixed shipments (800,000 tons and 54,000 cars). More specifically, the major farm products were sorghum grains, soybeans, and wheat; the major primary metal products were copper and iron; and the major miscellaneous mixed shipments were the TOFC shipments not identified by commodity. Table 52 also shows the top commodities ranked by the number of carloads. Miscellaneous mixed shipments comprised the highest number of carloads, followed by farm products and primary metal products.

Table 51. Top 10 Northbound Commodities (2-digit) at El Paso, 1998.

Ranked By	Comm. Code	Commodity Description	Tons	Cars
Tons	33	PRIMARY METAL PRODUCTS	1,169,224	13,608
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	533,752	6,744
	46	MISCELLANEOUS MIXED SHIPMENTS	346,880	26,320
	37	TRANSPORTATION EQUIPMENT	345,712	27,432
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	152,560	18,240
	29	PETROLEUM OR COAL PRODUCTS	133,640	1,704
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	133,008	2,936
	28	CHEMICALS OR ALLIED PRODUCTS	126,336	1,440
	20	FOOD OR KINDRED PRODUCTS	117,592	4,376
	36	ELECTRICAL MACHINERY, EQUIPMENT OR SUPPLIES	70,080	6,400
Cars	37	TRANSPORTATION EQUIPMENT	345,712	27,432
	46	MISCELLANEOUS MIXED SHIPMENTS	346,880	26,320
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	152,560	18,240
	33	PRIMARY METAL PRODUCTS	1,169,224	13,608
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	533,752	6,744
	36	ELECTRICAL MACHINERY, EQUIPMENT OR SUPPLIES	70,080	6,400
	47	SMALL PACKAGED FREIGHT SHIPMENTS	50,880	4,640
	20	FOOD OR KINDRED PRODUCTS	117,592	4,376
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	133,008	2,936
	23	APPAREL OR OTHER FINISHED TEXTILE PRODUCT OR KNIT APPAREL	23,440	2,160

Table 52. Top 10 Southbound Commodities (2-digit) at El Paso, 1998.

Ranked by	Comm. Code	Commodity Description	Tons	Cars
Tons	01	FARM PRODUCTS	1,539,108	16,136
	33	PRIMARY METAL PRODUCTS	1,151,216	13,256
	46	MISCELLANEOUS MIXED SHIPMENTS	808,400	54,240
	28	CHEMICALS OR ALLIED PRODUCTS	542,944	6,640
	20	FOOD OR KINDRED PRODUCTS	422,376	6,856
	26	PULP, PAPER OR ALLIED PRODUCTS	378,000	6,720
	10	METALLIC ORES	282,768	3,018
	24	LUMBER OR WOOD PRODUCTS EXCLUDING FURNITURE	211,760	4,800
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	207,760	3,760
	29	PETROLEUM OR COAL PRODUCTS	121,448	1,624
Cars	46	MISCELLANEOUS MIXED SHIPMENTS	808,400	54,240
	01	FARM PRODUCTS	1,539,108	16,136
	33	PRIMARY METAL PRODUCTS	1,151,216	13,256
	41	MISCELLANEOUS FREIGHT SHIPMENTS	118,160	11,040
	20	FOOD OR KINDRED PRODUCTS	422,376	6,856
	26	PULP, PAPER OR ALLIED PRODUCTS	378,000	6,720
	28	CHEMICALS OR ALLIED PRODUCTS	542,944	6,640
	24	LUMBER OR WOOD PRODUCTS EXC. FURNITURE	211,760	4,800
	37	TRANSPORTATION EQUIPMENT	57,832	4,056
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	207,760	3,760

Presidio

The years 1994 and 1995 were the only ones with Waybill Sample traffic through the Presidio-Ojinaga border crossing. In 1994, northbound and southbound traffic included 2,120 tons and 40 cars and 2,400 tons and 48 cars, respectively. The 1998 northbound and southbound values were 3,120 tons and 40 cars and 3,640 tons and 40 cars, respectively. The only northbound commodity in 1994 was frozen vegetables. In 1998, the only northbound commodities were gum and wood chemicals. The southbound commodities for 1994 and 1998 were sawed railroad ties and primary aluminum smelter products.

Eagle Pass

The Eagle Pass gateway has experienced a considerable increase in traffic levels from 1993 to 1998. It is now the second-most used rail gateway in Texas behind Laredo. Figure 26 shows the total annual cars through Eagle Pass from 1993 to 1998. Significant increases occurred in both the northbound and southbound directions. Northbound movements increased over 400 percent, while southbound movements soared over 950 percent. One significant reason for this increase was the UP merger with SP. Prior to the merger in 1996, only UP had access to Eagle Pass, but as a result of the merger, BNSF was granted trackage rights over UP lines to this border gateway.

Operational problems caused by the UP merger created stagnant operations to the border, but in 1998 both UP and BNSF began to increasingly utilize Eagle Pass.

In 1998, approximately 1.2 million tons and 43,000 carloads moved north from Mexico through Eagle Pass, and approximately 5.3 million tons and 88,000 carloads moved south. Of the total tonnage, 11 percent of the northbound traffic terminated in Texas and 11 percent of the southbound traffic originated in Texas.

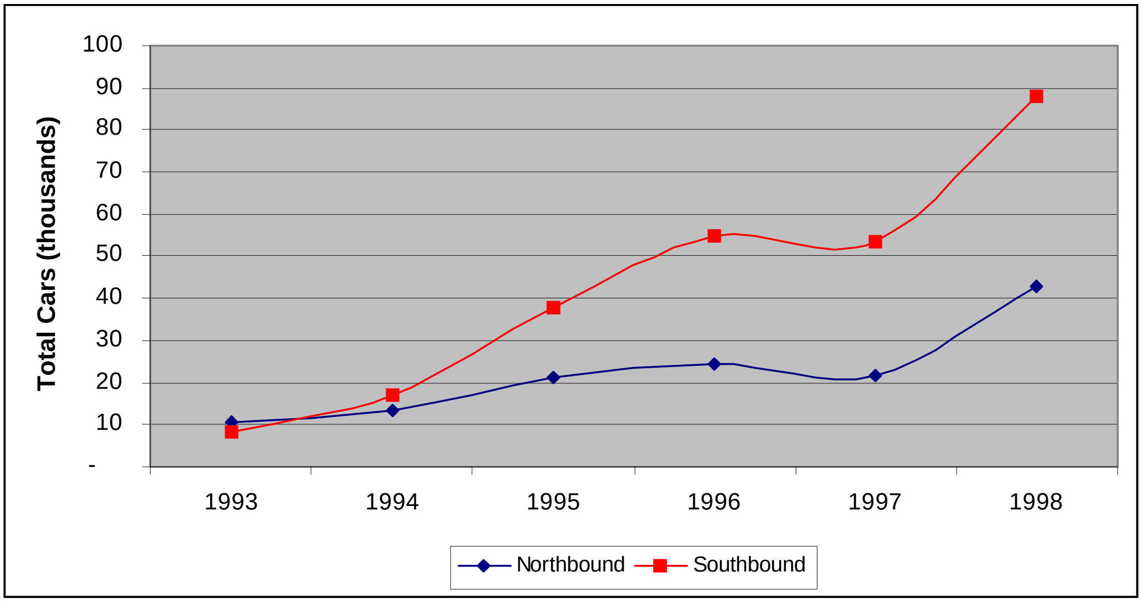


Figure 26. Total Cars at Eagle Pass.

Table 53 shows the top northbound commodities at Eagle Pass in 1998. Food or kindred products and transportation equipment were the top two commodities with over 300,000 tons each. Beer and related goods made up the entire quantity of the food or kindred products, while assembled motor passenger cars and motor car engines made up a large portion of the transportation equipment. Other specific commodities included iron or steel metal products and hydraulic cement.

Table 53. Top 10 Northbound Commodities (2-digit) at Eagle Pass, 1998.

Ranked by	Comm. Code	Commodity Description	Tons	Cars
Tons	20	FOOD OR KINDRED PRODUCTS	315,840	6,040
	37	TRANSPORTATION EQUIPMENT	313,968	13,524
	33	PRIMARY METAL PRODUCTS	212,968	2,784
	41	MISCELLANEOUS FREIGHT SHIPMENTS	128,720	12,640
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	82,888	1,076
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	54,560	5,480
	30	RUBBER OR MISCELLANEOUS PLASTICS PRODUCTS	25,840	720
	26	PULP, PAPER OR ALLIED PRODUCTS	16,372	260
	28	CHEMICALS OR ALLIED PRODUCTS	13,920	160
	14	NONMETALLIC MINERALS EXC. FUELS	7,600	120
Cars	37	TRANSPORTATION EQUIPMENT	313,968	13,524
	41	MISCELLANEOUS FREIGHT SHIPMENTS	128,720	12,640
	20	FOOD OR KINDRED PRODUCTS	315,840	6,040
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	54,560	5,480
	33	PRIMARY METAL PRODUCTS	212,968	2,784
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	82,888	1,076
	30	RUBBER OR MISCELLANEOUS PLASTICS PRODUCTS	25,840	720
	26	PULP, PAPER OR ALLIED PRODUCTS	16,372	260
	28	CHEMICALS OR ALLIED PRODUCTS	13,920	160
	14	NONMETALLIC MINERALS EXC. FUELS	7,600	120

Table 54 presents the major southbound commodities, including coal and farm products. Over 1.7 million tons and 16,800 cars of coal and over 1.3 million tons and 13,900 cars of farm products moved south through Eagle Pass in 1998. A more detailed examination of the farm products category indicates that the major items included are soybeans, corn, sorghum, barley, wheat, and rice. Other major commodities were waste or scrap materials (paper waste and iron or steel scrap) and transportation equipment (motor vehicle accessories or parts).

Table 54. Top 10 Southbound Commodities (2-digit) at Eagle Pass, 1998.

Ranked by	Comm. Code	Commodity Description	Tons	Cars
Tons	11	COAL	1,712,016	16,874
	01	FARM PRODUCTS	1,308,278	13,929
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	555,980	8,560
	37	TRANSPORTATION EQUIPMENT	502,164	34,024
	29	PETROLEUM OR COAL PRODUCTS	298,836	3,784
	33	PRIMARY METAL PRODUCTS	239,832	2,848
	20	FOOD OR KINDRED PRODUCTS	237,240	2,844
	14	NONMETALLIC MINERALS EXC. FUELS	147,676	1,484
	26	PULP, PAPER OR ALLIED PRODUCTS	112,720	1,520
	28	CHEMICALS OR ALLIED PRODUCTS	87,452	956
Cars	37	TRANSPORTATION EQUIPMENT	502,164	34,024
	11	COAL	1,712,016	16,874
	01	FARM PRODUCTS	1,308,278	13,929
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	555,980	8,560
	29	PETROLEUM OR COAL PRODUCTS	298,836	3,784
	33	PRIMARY METAL PRODUCTS	239,832	2,848
	20	FOOD OR KINDRED PRODUCTS	237,240	2,844
	26	PULP, PAPER OR ALLIED PRODUCTS	112,720	1,520
	14	NONMETALLIC MINERALS EXC. FUELS	147,676	1,484
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	83,680	1,000

Laredo

Laredo handles the majority of the international rail traffic between the U.S. and Mexico. From 1993 to 1998 traffic levels have increased 240 percent for northbound traffic and 29 percent for southbound traffic. In 1998, northbound traffic levels reached three million tons and 124,000 cars, and the southbound levels exceeded 10.5 million tons and 180,000 cars. Of the northbound traffic that passed through Laredo in 1998, only 15 percent terminated in Texas. Twenty percent of the 10.5 million southbound tons originated in Texas.

Figure 27 shows the annual carloads through Laredo from 1993 to 1998. Southbound movements through Laredo dropped sharply in 1995 before experiencing considerable growth from 1996 to 1998.

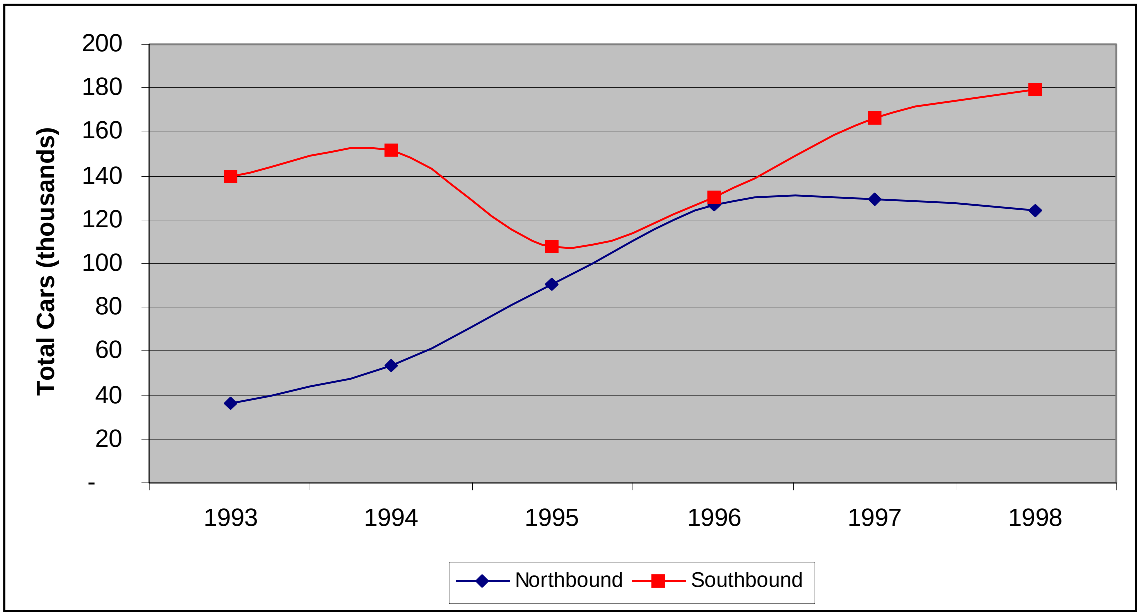


Figure 27. Total Cars at Laredo.

Table 55 shows the major commodities transported through the Laredo gateway in 1998. Transportation equipment and food or kindred products were the two major northbound commodities. Within the transportation equipment category, assembled motor passenger cars, motor vehicle accessories or parts, and motor car engines were the principal items. Beer comprised the major portion of the food or kindred products category. Other commodities included primary metal products, miscellaneous mixed shipments, and chemicals or allied products.

Table 55. Top 10 Northbound Commodities (2-digit) at Laredo, 1998.

Ranked by	Comm. Code	Commodity Description	Tons	Cars
Tons	37	TRANSPORTATION EQUIPMENT	1,099,664	55,296
	20	FOOD OR KINDRED PRODUCTS	700,444	12,496
	33	PRIMARY METAL PRODUCTS	298,400	4,120
	46	MISCELLANEOUS MIXED SHIPMENTS	258,520	15,520
	28	CHEMICALS OR ALLIED PRODUCTS	170,480	2,460
	41	MISCELLANEOUS FREIGHT SHIPMENTS	159,800	15,760
	11	COAL	138,728	1,528
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	104,240	2,632
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	60,720	5,920
	36	ELECTRICAL MACHINERY, EQUIPMENT OR SUPPLIES	54,360	4,200
Cars	37	TRANSPORTATION EQUIPMENT	1,099,664	55,296
	41	MISCELLANEOUS FREIGHT SHIPMENTS	159,800	15,760
	46	MISCELLANEOUS MIXED SHIPMENTS	258,520	15,520
	20	FOOD OR KINDRED PRODUCTS	700,444	12,496
	42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	60,720	5,920
	36	ELECTRICAL MACHINERY, EQUIPMENT OR SUPPLIES	54,360	4,200
	33	PRIMARY METAL PRODUCTS	298,400	4,120
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	104,240	2,632
	28	CHEMICALS OR ALLIED PRODUCTS	170,480	2,460
	11	COAL	138,728	1,528

The southbound commodity movements through Laredo in 1998 are presented in Table 56. Southbound movements comprised over 75 percent of the total movements through Laredo in 1998. The major commodities included farm products, food or kindred products, and chemicals or allied products. Farm products included corn, sorghum, soybeans, wheat, and rice. The major food or kindred products included flour or other grain mill products and corn syrup. The major chemicals included sodium compounds and plastic materials or synthetic resins.

Table 56. Top 10 Southbound Commodities (2-digit) at Laredo, 1998.

Ranked by	Comm. Code	Commodity Description	Tons	Cars
Tons	01	FARM PRODUCTS	3,706,959	40,260
	20	FOOD OR KINDRED PRODUCTS	1,303,464	16,411
	28	CHEMICALS OR ALLIED PRODUCTS	985,336	11,480
	26	PULP, PAPER OR ALLIED PRODUCTS	792,676	12,992
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	775,328	12,936
	37	TRANSPORTATION EQUIPMENT	735,332	45,824
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	543,400	6,720
	33	PRIMARY METAL PRODUCTS	485,920	7,280
	14	NONMETALLIC MINERALS EXC. FUELS	403,312	4,224
	29	PETROLEUM OR COAL PRODUCTS	301,468	3,676
Cars	37	TRANSPORTATION EQUIPMENT	735,332	45,824
	01	FARM PRODUCTS	3,706,959	40,260
	20	FOOD OR KINDRED PRODUCTS	1,303,464	16,411
	26	PULP, PAPER OR ALLIED PRODUCTS	792,676	12,992
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	775,328	12,936
	28	CHEMICALS OR ALLIED PRODUCTS	985,336	11,480
	46	MISCELLANEOUS MIXED SHIPMENTS	157,040	8,920
	33	PRIMARY METAL PRODUCTS	485,920	7,280
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	543,400	6,720
	14	NONMETALLIC MINERALS EXC. FUELS	403,312	4,224

Brownsville

Figure 28 shows railcar movements through Brownsville from 1993 to 1998. Brownsville experienced fluctuating southbound traffic levels from 1993 to 1998, with increases in 1994, 1996, and 1998 and decreases in 1995 and 1997. Northbound levels remained relatively static over the time period. Eighty-two percent of the northbound tonnage through Brownsville terminated outside the state of Texas. The southbound level of traffic originating in Texas was 23 percent.

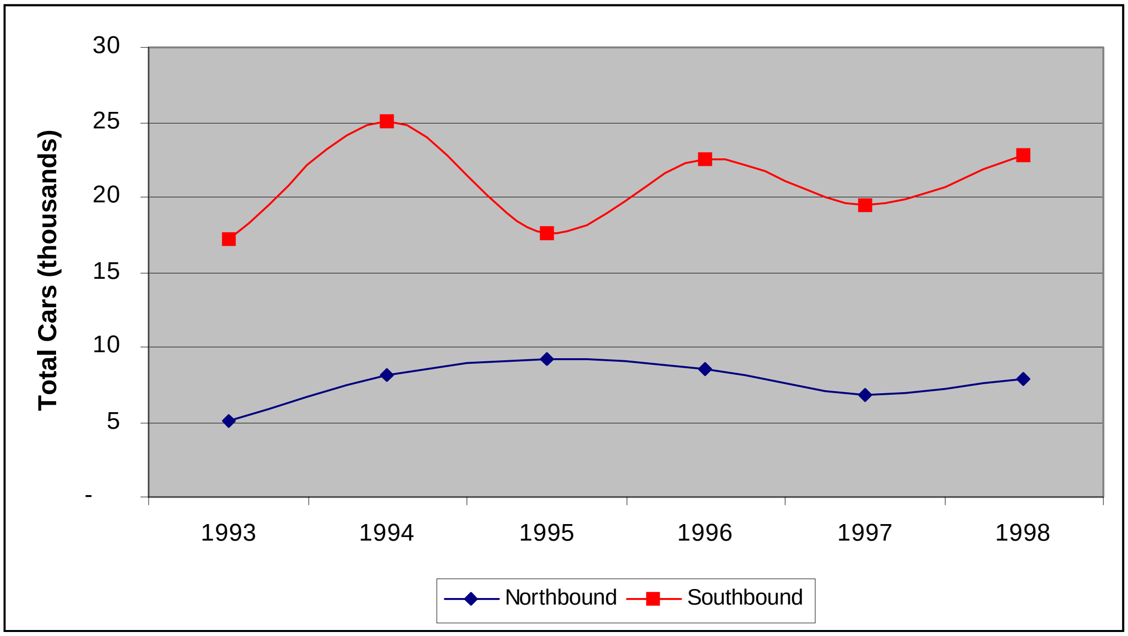


Figure 28. Total Cars at Brownsville.

Tables 57 and 58 present the top commodities transported through Brownsville in 1998. The predominant northbound commodity by tonnage was chemicals or allied products. Specific chemical categories included industrial inorganic chemicals and chlorine. Other major commodities included transportation equipment (motor vehicle accessories or parts), food or kindred products (beer), and farm products (oats).

The predominant southbound commodity transported through Brownsville was farm products, including soybeans, corn, and sorghum, with over a million tons and 10,900 cars in 1998. Other major commodities included chemical products and petroleum products with 450,000 tons and 5,000 cars and 189,000 tons and 2,216 cars, respectively.

Table 57. Top 10 Northbound Commodities (2-digit) at Brownsville, 1998.

Ranked by	Comm. Code	Commodity Description	Tons	Cars
Tons	28	CHEMICALS OR ALLIED PRODUCTS	105,392	1,276
	37	TRANSPORTATION EQUIPMENT	53,840	4,864
	20	FOOD OR KINDRED PRODUCTS	42,760	600
	01	FARM PRODUCTS	25,144	280
	33	PRIMARY METAL PRODUCTS	19,520	240
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	13,240	200
	14	NONMETALLIC MINERALS EXC. FUELS	12,268	188
	29	PETROLEUM OR COAL PRODUCTS	8,720	120
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	7,720	80
	26	PULP, PAPER OR ALLIED PRODUCTS	2,640	40
Cars	37	TRANSPORTATION EQUIPMENT	53,840	4,864
	28	CHEMICALS OR ALLIED PRODUCTS	105,392	1,276
	20	FOOD OR KINDRED PRODUCTS	42,760	600
	01	FARM PRODUCTS	25,144	280
	33	PRIMARY METAL PRODUCTS	19,520	240
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	13,240	200
	14	NONMETALLIC MINERALS EXC. FUELS	12,268	188
	29	PETROLEUM OR COAL PRODUCTS	8,720	120
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	7,720	80
	26	PULP, PAPER OR ALLIED PRODUCTS	2,640	40

Table 58. Top 10 Southbound Commodities (2-digit) at Brownsville, 1998.

Ranked by	Comm. Code	Commodity Description	Tons	Cars
Tons	01	FARM PRODUCTS	1,053,204	10,984
	28	CHEMICALS OR ALLIED PRODUCTS	457,864	5,032
	29	PETROLEUM OR COAL PRODUCTS	189,272	2,216
	14	NONMETALLIC MINERALS EXC. FUELS	76,936	848
	33	PRIMARY METAL PRODUCTS	50,920	640
	20	FOOD OR KINDRED PRODUCTS	41,320	556
	10	METALLIC ORES	35,400	360
	26	PULP, PAPER OR ALLIED PRODUCTS	32,560	560
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	30,480	560
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	27,840	400
Cars	01	FARM PRODUCTS	1,053,204	10,984
	28	CHEMICALS OR ALLIED PRODUCTS	457,864	5,032
	29	PETROLEUM OR COAL PRODUCTS	189,272	2,216
	14	NONMETALLIC MINERALS EXC. FUELS	76,936	848
	33	PRIMARY METAL PRODUCTS	50,920	640
	40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	30,480	560
	26	PULP, PAPER OR ALLIED PRODUCTS	32,560	560
	20	FOOD OR KINDRED PRODUCTS	41,320	556
	37	TRANSPORTATION EQUIPMENT	13,372	512
	32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	27,840	400

Intermodal

Intermodal movements consist of commodities shipped by either trailer-on-flat-car or container-on-flat-car. The following discussion explains traffic movements by TOFC/COFC through Texas gateways. Intermodal movements and the potential for growth in intermodal transportation are of particular importance to the planning functions of TxDOT and will be examined in more detail in subsequent sections of this report.

Intermodal volumes through Texas-Mexico gateways increased over 62 percent from 1993 to 1998. Northbound levels increased 96 percent for tonnage and 146 percent for carloads. The southbound direction experienced a 40 percent increase in tonnage and a 60 percent increase in carloads. The annual northbound increase was 16 percent in tons and 24 percent for cars while the annual southbound increase was 7 percent for tonnage and 10 percent for the carloads. The annual intemodal traffic levels are presented in Table 59.

Table 59. Total Intermodal Tons and Cars at Border.

Direction	Year	Tons			Cars		
		Overall	Intermodal	% Intermodal	Overall	Intermodal	% Intermodal
Northbound	1993	2,882,062	807,344	28.0	89,454	50,140	56.1
	1994	3,647,160	824,378	22.6	114,872	60,522	52.7
	1995	5,140,579	1,291,808	25.1	184,870	95,184	51.5
	1996	6,025,457	1,277,440	21.2	218,523	99,820	45.7
	1997	5,499,990	845,720	15.4	177,018	62,720	35.4
	1998	6,380,896	1,582,960	24.8	235,456	123,520	52.5
Southbound	1993	12,511,300	1,258,096	10.1	220,342	73,796	33.5
	1994	13,565,447	1,351,316	10.0	247,522	88,604	35.8
	1995	11,911,291	1,164,276	9.8	226,618	89,060	39.3
	1996	14,840,045	1,219,988	8.2	273,504	91,928	33.6
	1997	16,716,387	956,880	5.7	278,882	69,120	24.8
	1998	20,940,747	1,756,400	8.4	363,455	118,360	32.6

Despite a considerable overall increase in intermodal traffic levels from 1993 to 1998, intermodal levels were inconsistent over the period, as shown in Figure 29. In the southbound direction, intermodal levels consistently declined from 1993 to 1997 from 1.2 million tons to 950,000 tons before rebounding to 1.7 million tons in 1998. Northbound levels increased from 1994 to 1995 but declined significantly in 1997. The decline in intermodal levels also resulted in declines in the percentage of the overall traffic utilizing intermodal. From 1993 to 1997 the northbound intermodal share declined to 15 percent from 28 percent of the total volume. The 1998 levels increased to almost 25 percent. Southbound share reduced from 10 percent to 5 percent in 1997 before increasing to 8 percent in 1998.

Table 60 shows the top commodities according to total tonnage transported and the percentage of the traffic shipped intermodally. In the northbound direction, transportation equipment represents the highest volume of goods shipped. Of the total volume of transportation equipment, 21 percent was shipped intermodally. Several of the northbound commodities were moved solely by intermodal, including miscellaneous mixed shipments (46), miscellaneous freight shipments (41), and containers, carriers or devices, shipping returned empty (42).

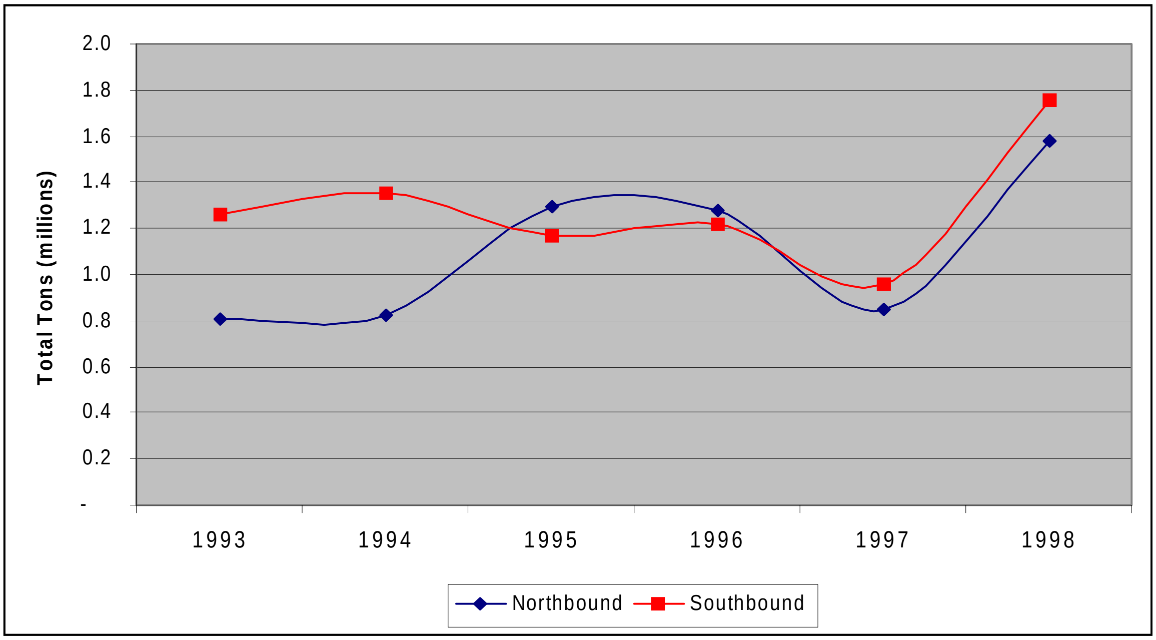


Figure 29. Yearly Intermodal Traffic.

Table 60 also shows the top commodities transported in the southbound direction. The majority of the southbound commodities were bulk commodities, which are not conducive to intermodal shipping. The one exception on the list is transportation equipment of which approximately 60 percent of the total volume is shipped intermodally. The high percentage for transportation equipment supports the high importance of transportation equipment moved intermodally, as indicated by the U.S. railroads.

Intermodal levels for UP, BNSF, and TM are provided in Table 61. Intermodal traffic represents approximately 18 percent of UP's international traffic through Texas but less than 2 percent of BNSF's and TM's traffic. In 1998, UP transported approximately 98 percent of the total intermodal volume through Texas gateways.

Table 60. Intermodal Levels for Top 10 Commodities (2-digit), 1998.

Comm. Code	Commodity Description	Tons			Cars		
		Overall	Int.	% Int.	Overall	Int.	% Int.
Northbound							
37	TRANSPORTATION EQUIPMENT	1,640,328	346,600	21.1	87,400	26,320	30.1
20	FOOD OR KINDRED PRODUCTS	1,117,840	103,480	9.3	21,324	4,840	22.7
33	PRIMARY METAL PRODUCTS	1,115,500	7,120	0.6	13,948	320	2.3
32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	467,244	39,000	8.3	7,280	2,080	28.6
46	MISCELLANEOUS MIXED SHIPMENTS	432,800	432,800	100.0	28,720	28,720	100.0
28	CHEMICALS OR ALLIED PRODUCTS	356,080	10,600	3.0	4,656	640	13.7
41	MISCELLANEOUS FREIGHT SHIPMENTS	293,400	293,200	99.9	28,840	28,800	99.9
42	CONTAINERS, CARRIERS OR DEVICES, SHIPPING RETURNED EMPTY	191,560	191,560	100.0	20,520	20,520	100.0
11	COAL	138,728	-	-	1,528	-	-
40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	112,344	23,040	20.5	2,188	1,160	53.0
Southbound							
01	FARM PRODUCTS	6,837,995	2,240	0.0	73,241	120	0.2
28	CHEMICALS OR ALLIED PRODUCTS	1,802,124	34,480	1.9	20,788	1,640	7.9
20	FOOD OR KINDRED PRODUCTS	1,793,212	54,200	3.0	23,239	2,600	11.2
11	COAL	1,712,016	-	-	16,874	-	-
40	WASTE OR SCRAP MATERIALS NOT IDENTIFIED BY PRODUCING INDUSTRY	1,465,668	5,880	0.4	23,936	320	1.3
33	PRIMARY METAL PRODUCTS	1,355,920	38,200	2.8	17,436	2,040	11.7
37	TRANSPORTATION EQUIPMENT	1,279,784	742,960	58.1	82,388	54,600	66.3
26	PULP, PAPER OR ALLIED PRODUCTS	1,126,956	50,880	4.5	18,432	2,400	13.0
29	PETROLEUM OR COAL PRODUCTS	850,300	800	0.1	10,488	40	0.4
32	CLAY, CONCRETE, GLASS OR STONE PRODUCTS	678,280	21,800	3.2	9,080	1,080	11.9

Table 61. 1998 Intermodal Total Tons and Cars by Railroads.

Direction	Railroad	Tons			Cars		
		Overall	Intermodal	% Int.	Overall	Intermodal	% Int.
Northbound	UP	5,197,212	1,563,280	30.1	218,468	121,560	55.6
	TM	374,364	-	-	4,940	-	-
	BNSF	809,320	19,680	2.4	12,048	1,960	16.3
Southbound	UP	12,884,279	1,701,480	13.2	268,386	114,840	42.8
	TM	4,398,428	880	0.0	50,472	40	0.1
	BNSF	3,658,040	54,040	1.5	44,597	3,480	7.8

Of the five Texas gateways, the highest volume of intermodal activity passes through Laredo, with over 1.5 million tons in 1998, representing 11.6 percent of the total volume. El Paso and Eagle Pass both had significant intermodal traffic, with over 1.2 million tons and 457,000 cars, respectively. Intermodal traffic represented over 26 percent of the total traffic in El Paso, while Eagle Pass experienced 7 percent intermodal traffic. Table 62 shows the gateways and the intermodal traffic levels by direction. No intermodal traffic occurred at Presidio or Brownsville in 1998.

Table 62. Total Intermodal Tons and Cars by Gateway, 1998.

Direction	Gateway	Tons			Cars		
		Overall	Intermodal	% Int.	Overall	Intermodal	% Int.
Northbound	El Paso	1,681,140	581,640	34.6	60,192	47,480	78.9
	Presidio	3,120	-	-	40	-	-
	Eagle Pass	1,179,396	205,720	17.4	42,924	20,080	46.8
	Laredo	3,225,996	795,600	24.7	124,412	55,960	45.0
	Brownsville	291,244	-	-	7,888	-	-
Southbound	El Paso	3,052,486	685,920	22.5	72,913	45,480	62.4
	Presidio	3,640	-	-	40	-	-
	Eagle Pass	5,295,794	269,600	5.1	87,943	20,840	23.7
	Laredo	10,569,139	800,880	7.6	179,731	52,040	29.0
	Brownsville	2,019,688	-	-	22,828	-	-

Table 63 shows railroad intermodal traffic levels through the different Texas gateways. UP handled intermodal traffic through El Paso, Eagle Pass, and Laredo. Laredo experienced the greatest level with over 1.5 million tons, followed by El Paso (1.2 million tons) and Eagle Pass

(475,000 tons). El Paso represents the only gateway with any intermodal activity for BNSF, with over 73,000 tons. TM transported less than 1,000 tons of intermodal traffic through Laredo.

Table 63. Total Intermodal Tons and Cars by Railroad by Gateway, 1998.

Direction	Gateway	Railroad	Tons			Cars		
			Overall	Intermodal	% Int.	Overall	Intermodal	% Int.
Northbound	El Paso	UP	1,056,560	561,960	53.2	51,272	45,520	88.8
		BNSF	624,580	19,680	3.2	8,920	1,960	22.0
	Eagle Pass	UP	1,021,016	205,720	20.1	40,156	20,080	50.0
		BNSF	158,380	-	-	2,768	-	-
	Laredo	UP	2,851,632	795,600	27.9	119,472	55,960	46.8
		TM	374,364	-	-	4,940	-	-
Southbound	El Paso	UP	1,848,200	631,880	34.2	56,417	42,000	74.4
		BNSF	1,204,286	54,040	4.5	16,496	3,480	21.1
	Eagle Pass	UP	3,530,196	269,600	7.6	67,162	20,840	31.0
		BNSF	1,765,598	-	-	20,781	-	-
	Laredo	UP	6,170,711	800,000	13.0	129,259	52,000	40.2
		TM	4,398,428	880	0.0	50,472	40	0.1

CHAPTER 6 – TEXAS GATEWAYS AND CORRIDORS

INTRODUCTION

Trade between the U.S. and Mexico increased at an annual rate of 17 percent since the beginning of NAFTA. As trade continues to increase, the ability of the rail infrastructure to handle the traffic will be tested. This ability relates not only to capacity on the rail network, but also customs clearance activities and the relationships between the interlining railroads.

This chapter describes the capacity and regulatory procedural improvements at the five Texas-Mexico rail gateways. Continuing constraints and impediments to border operations conclude the chapter.

BORDER GATEWAYS

Operations at the border continue to improve as the railroads implement capacity improvement plans, work with regulatory agencies to streamline border procedures, and pursue interlining agreements with other railroad and transportation entities.

El Paso–Ciudad Juarez

With over 4.6 million tons and 133,000 carloads of rail traffic, the El Paso-Ciudad Juarez international gateway is the third-most used Texas-Mexico rail gateway and is the only Texas gateway with two rail bridges. One bridge is owned and operated by BNSF and the government of Mexico and the other by UP and the government of Mexico. In addition to the two international bridges, both UP and BNSF operate yard and intermodal facilities in El Paso. The U.S. railroads interchange with Ferromex at the border.

The intermodal facility operated by UP is located on five acres of land off of Interstate 10 and provides 800 parking slots for trucks. The facility has 16 tracks and a 420-car capacity. Two side-lift cranes transfer the intermodal units and provide a lift capacity of 96,000 units per year. The intermodal facility handles both TOFC and COFC traffic *(53)*.

For UP, the El Paso gateway provides a link to Fort Worth, connecting with other major corridors north to Kansas City and Chicago. Currently, UP's Chicago intermodal service (for Ford) goes to El Paso bound for Chihuahua but is deramped in El Paso and trucked to Chihuahua. UP has also begun analyzing the possibilities of creating a Mexico City-Guadalajara-Los Angeles route with Ferromex through El Paso.

BNSF track out of El Paso travels north, providing linkages with major corridors to Denver, Fort Worth, and Kansas City. The BNSF intermodal facility in El Paso is a 10-track facility with a 313-car capacity and an annual lift capacity of 109,000 units. It is located on 14 acres of land

and provides 280 parking slots for trucks. The facility has two overhead cranes and the ability to handle both TOFC and COFC traffic *(53)*.

For Ferromex, the Mexico City-Ciudad Juarez corridor represents a critical component of their rail system. Connections include the major industrial cities of Chihuahua and Torreon. Ferromex has undertaken a full rehabilitation and upgrade project for this line in anticipation of additional international traffic. Ferromex also indicates the potential costs for an intermodal facility in Ciudad Juarez to attract intermodal truck traffic that originates in southern California.

The interchange between UP and Ferromex would be improved by the realization of the proposed "Santa Teresa" interchange project supported by the State of New Mexico. Tony Chacon of UP indicates that the El Paso-Ciudad Juarez gateway is currently a poor interchange for all the connecting railroads. UP interchanges with Ferromex in Downtown Juarez and to alleviate some of the problems currently occurring, the proposed "Santa Teresa" interchange project would bypass Juarez and create a connection at the New Mexico-Mexico border. The construction of a 70-mile line by Ferromex in Mexico would be required to create this connection *(54)*.

Presidio-Ojinaga

As one of eight U.S.-Mexico rail gateways, Presidio-Ojinaga is a critical component to both international trade and the Texas transportation system that handles international traffic. Chapter 7 presents a detailed history of the Presidio-Ojinaga gateway and discusses the potential for this crossing to move international rail traffic.

Eagle Pass–Piedras Negras

Eagle Pass is the second-most used rail gateway in Texas after Laredo. This level of use only began occurring in the past several years. Traffic levels at Eagle Pass increased over 550 percent from 1993 to 1998, reaching 6.5 million tons and 131,000 carloads in 1998. The traffic levels are heaviest in the southbound direction, as both UP and BNSF have access to the gateway where they interchange with Ferromex.

BNSF gained access to Eagle Pass from San Antonio as part of UP's merger with SP in 1996. They began fully utilizing this access in 1998, when approximately 30 percent of the total tonnage was transported by BNSF. The merger also prompted UP to increasingly utilize Eagle Pass after operations at Laredo became stagnant as a result of merger-related operational problems. They began using Eagle Pass as a relief valve for traffic not able to pass through Laredo.

UP continues to use Eagle Pass and has begun running a unit shuttle grain train into Mexico's interior, the first such shuttle between the two countries. The loaded, 75-car unit train passes through the Eagle Pass-Piedras Negras gateway to its final destination outside Mexico City before returning empty. UP will handle the train in the U.S., and Ferromex will transport it in Mexico. In the future, UP plans to run one continuous cycle train between the U.S. Midwest and Mexico *(55)*.

The Piedras Negras gateway is a major corridor used by Ferromex to run traffic from the U.S. to Mexico City through Saltillo and Monterrey. Rehabilitation projects have upgraded the line to Piedras Negras, and the installation of a DTC system has improved train operations to the border.

Ferromex currently maintains a yard in Piedras Negras. This facility was recently expanded to handle the increasing amounts of traffic coming through the gateway. Ferromex also views Piedras Negras as a candidate location for an intermodal facility. This facility would supplement the Pantaco intermodal facility and compete with Laredo intermodal activities.

Laredo–Nuevo Laredo

According to one UP official, the capacity of Laredo's international rail bridge is approximately 30,000 carloads per month. In June 1999, UP crossed 35,000 carloads for a new monthly record. The demands on the gateway continue to strain the operational capabilities, but infrastructure and procedural improvements by all the railroads operating at Laredo continue to increase capacity and improve cross-border productivity.

Laredo is the most-used rail gateway between the U.S. and Mexico, handling over 50 percent of all the international rail traffic. Laredo is the favored gateway because it is both the closest border crossing to the industrial center of Monterrey and it is on the main trade corridor that links population centers in Mexico and the U.S.

International intermodal activity is centered at the Laredo-Nuevo Laredo gateway where UP, TM, and TFM all have new or upgraded intermodal facilities.

Union Pacific Railroad

The demand created by the increasing international trade between the U.S. and Mexico has driven UP to improve operations along the border, particularly at Laredo where they have undertaken several major infrastructure improvement projects and worked with regulatory officials and the other border railroads to streamline border procedures.

Operational Improvements. After the UP merger with Southern Pacific, operations at Laredo were at a standstill. As a result, UP implemented local and regional plans to correct this problem and improve operations. In coordination with the newly acquired SP lines, UP began directional running throughout the system. This approach results in better, more efficient system-wide operations over the major corridors.

Moving Mexico staging activities to San Antonio's SoSan Yard has improved operations to the border. This yard is better situated geographically and recently was upgraded by the addition of two new departure tracks and the extension of four yard tracks. However, UP feels additional capacity improvements and investments would improve service to the border *(54)*.

In order to improve operations between Laredo and San Antonio, UP recently completed a $15.2 million CTC project from San Antonio to Laredo. UP now has the CTC system in place between Chicago and Laredo. The installation of the CTC system, along with a new siding at Yarbrough, has reduced train transit time in the San Antonio-Laredo corridor from about nine hours to 4.5 hours.

From 1996 to 1998, UP made more than $9 million in capital improvements to the Laredo area, including $3.4 million for capacity expansion. The $1.5 million Henry Bonilla Federal Services Facility at Port Laredo has allowed U.S. Customs and the U.S. Department of Agriculture (USDA) to move inspections off the TM rail bridge and into UP's Port Laredo facility, greatly reducing bridge delays, which could reach three to four hours per train. UP chose to develop the Port Laredo facility instead of building a new international bridge with a projected cost of $40 million. This decision has reduced institutional delays significantly and has provided UP with an important intermodal facility at the border.

The facility's many features include:

- a secure location for federal agency personnel to inspect up to 16 railcars and eight over-the-road trailers at a time;
- a 300-foot covered loading dock that enables federal agencies to safely and efficiently inspect eight over-the-road trailers and up to five railcars at a time under cover;
- a support building with offices for Customs, USDA, Border Patrol, and UP Railroad Police personnel;
- five dog kennels for federal and UP canine units; and
- a lunch/conference room for use by all agencies and railroad personnel *(56)*.

The intermodal facility is located on 50 acres of land and has an annual lift capacity of 130,000 units. The facility has 25 tracks, 1,100-car capacity, and trailer-on-flatcar facilities with two overhead container and trailer cranes *(53)*.

UP has also improved customer service with the addition of the International Customer Service Center (ICSC) in Laredo for those customers engaged in U.S.-Mexico trade. The center provides bilingual service 24 hours a day and serves the Laredo, El Paso, and Brownsville gateways.

Coordination with Regulatory Agencies. In addition to capital improvements, rail operations to the border have also benefited from improvements in institutional practices. The first is Despacho Previo, which was originally implemented for southbound rail traffic at Laredo but has now been expanded to include the northbound movements. Despacho Previo is an agreement with Mexican Customs and involves the railroad providing advanced notification that a shipment is en route. The notification goes to a customs broker who then has 72 hours to pre-file for customs clearance. UP fines or penalizes the broker $50 per day for delays beyond the 72 hours (*54*). The prefiling process includes payment of import duties, receipt of Mexican customs authority, and the Mexican railroad of authority to cross. Implementation of Despacho Previo reduced, by a full day, the time between when a car is received to when it is delivered to the Mexican railroad system for UP traffic moving south from Laredo *(57)*.

UP has worked toward launching the Automated Manifest System (AMS) by the end of 2000. UP will use AMS to collect advance rail car information from shippers, compile it into an electronic manifest, and then send it to Customs, where it will be compared against information sent simultaneously from freight brokers. It will help Customs decide which cars to inspect before the cars actually reach the border. As a northbound train moves in, they can switch out the cars designated for inspection, instead of stopping the entire train on the bridge.

UP has also shown leadership in dealing with other complexities unique to the border by helping U.S. and Mexican Customs cope with rail drug trafficking and ongoing problems with undocumented aliens boarding trains. In their efforts to curtail drug trafficking, UP signed a "Carrier Initiative Agreement" with U.S. Customs, the only Class I railroad to do so. The agreement means that UP will do everything it can to stop drug trafficking. In exchange, Customs will mitigate fines in the event drugs are found aboard UP's equipment. The agreement has helped to improve the UP-Customs relationship and saved UP $1 million in fines during the first year *(56)*.

In addition, U.S. Customs has refined their inspection methods by using a Gamma Ray process to inspect railcars. This method reduces the number of 100 percent inspections and stores data from the last time the car went through so that a before-after analysis can detect physical alterations to the car.

Intermodal Services. UP offers an intermodal service through Laredo called Aztec Eagle that enables containers and trailers on flatcars to clear customs at the destination rail terminal, thus expediting border crossing. The service combines simplified border logistics with seamless shipment tracking for an easy-to-use rail direct intermodal service *(58)*. Some of the features of the service include:

- loads move in-bond and clear Customs at rail destination with minimized border delays,
- rates include border crossing fees and border broker fees,
- truck competitive transit time, with greater cargo security, and
- bilingual customer service team in Mexico *(58)*.

Another intermodal service through Laredo is called the Passport service. The service uses rail in the U.S. and truck in Mexico. Some of the features of this service include:

- one price, one bill for transportation,
- highway service to/from door in Mexico,
- competitive pricing compared to all-truck service,
- truck competitive transit times, and
- bilingual customer service.

Texas-Mexican Railway (TM)

TM owns and operates 157 miles of rail line extending from Laredo through Robstown to Corpus Christi. They plan to rehabilitate and operate over an additional 85 miles between Victoria and Rosenberg, a line segment purchased from UP in December 2000. Currently, trackage rights granted by the UP-SP merger allow TM to operate over UP lines from Robstown to Beaumont. TM connects with TFM at Laredo and with KCS in Beaumont.

TM has begun a four-phase rehabilitation project on its line from Corpus Christi to Laredo. The $42.5 million project will consist of the following phases:

- Phase 1 – The rehabilitation of the nine-mile line segment between the Serrano Yard in Laredo and the International Bridge. The rehabilitation will consist of new rail, ties, and crossing improvements.
- Phase 2 – The rehabilitation and rail replacement on the 46 miles north of Serrano Yard. This phase is aimed at increasing train speeds from the current 30 mph to 45 mph.
- Phase 3 – The increasing of intermodal track capacity at Serrano Yard from two tracks to five. Additional lighting and fencing at the yard will be added to accommodate U.S. Customs and USDA activities.
- Phase 4 – The implementation of general capacity improvements along the line including adding two sidings and replacing #10 turnouts with #14 turnouts on three existing sidings.

TM also plans to add a mainline fueling facility at the Serrano Yard in Laredo, increasing the total capital investment on its line between Laredo and Corpus Christi to $65 million.

In 2000, TM began participating in an intermodal service involving RoadRailer trains. The service will involve several railroads, including Norfolk Southern (NS), BNSF, TM, and TFM, stretching from the Midwest to Mexico. NS will transfer the trains to BNSF in Kansas City, who will next interchange with TM in Robstown, Texas. The final component of the service involves TM interchanging with TFM in Laredo, where the trains then move to Mexico City. Instead of reviewing the trains to stop at the border for inspection, customs inspections for the service occur at drop-off terminals in Mexico and the U.S., thus allowing for faster transit times. The RoadRailer equipment, which operates as highway trailers when off the rails, and agreements between the participating railroads allow customers to have one-invoice pricing, door-to-terminal cargo insurance, and enhanced security en route *(59)*.

In addition to the RoadRailer intermodal service, TM is participating in a new intermodal service called the NAFTA Express. Introduced by KCS, the service will involve affiliates TM and TFM, and will provide reliable intermodal service both in Mexico and to the U.S.-Mexico gateway at Laredo. With NAFTA Express, truckload shippers who previously relied on trucks for service in Mexico can move their time-sensitive intermodal freight by railroad throughout North America. Shippers who want to continue to deramp in Laredo can take advantage of the NAFTA Express service provided through TM's new intermodal facility, which is located near the U.S.-Mexico border *(60)*.

Transportation Ferroviaria Mexicana (TFM)

TFM invested more than $15 million in the construction of the new 1,500-acre Sanchez yard, which is approximately 12.5 miles southwest of Nuevo Laredo. The facility is equipped to handle all Mexican customs and agricultural inspections. Northbound trains are precleared, preblocked, and inspected at Sanchez to allow traffic to move across the border on a first-come, first-served basis, with no directional restriction. This rail yard also includes an intermodal terminal capable of handling 1,500 trucks per day and is comprised of 14 miles of track with an operating capacity of 950 units *(34, 35)*.

TFM completed the installation of a $10.5 million CTC system between Monterrey and Nuevo Laredo. This installation, along with a similar project carried out by Union Pacific from San Antonio to Laredo to extend CTC from Chicago to Laredo, will provide efficient operations from Chicago to Mexico City.

Brownsville-Matamoros

Traffic levels through the Brownsville-Matamoros gateway showed little increase between 1993 and 1998. In 1998, northbound traffic levels of 291,000 tons and 7,800 cars and southbound levels of two million tons and 22,800 cars were recorded. The majority of the traffic was hauled by UP, who states that the one major use of the gateway is the transport of two empty, multilevel auto-rack trains per day *(54)*. Moving empty trains through the lesser-used Brownsville gateway frees up capacity in the other, more heavily used gateways and helps balance power and train crew destination.

There are currently efforts by Brownsville area transportation agencies to create a rail loop around Brownsville that would serve the Port of Brownsville and remove rail infrastructure from the downtown area. The Port of Brownsville is a major shipping port that facilitates the movement of goods between the U.S. and Mexico. With the removal of the rail infrastructure in downtown Brownsville, international traffic will have to cross at a new bridge location at the Port of Brownsville. According to TxDOT, the proposed Port of Brownsville Bridge would be a four-lane vehicular, single-track railroad bridge jointly owned by the Port of Brownsville and the government of Mexico. The Presidential Permit application was submitted on October 16, 1991 *(57)*. Along with a new international bridge at the Port of Brownsville, additional trackage would be constructed by TFM from Matamoros east to the new bridge.

The loop that extends east to the Port of Brownsville will also extend west from Brownsville and create an additional international bridge. New rail infrastructure on the U.S. side would consist of 5.7 miles of track constructed by the City of Brownsville and Cameron County. On the Mexico side, approximately 6.5 miles of new track would be constructed to make the connection *(61)*.

CONSTRAINTS AND IMPEDIMENTS TO BORDER OPERATIONS

Infrastructure

The Mexican railroads are just starting to develop their intermodal ramps. This development has been a slow process. The ramp that the TFM opened in Toluca late last year is already being expanded and still will not be able to handle the forecasted volume growth. The Toluca ramp has taken some of the pressure off of the ramp at Pantaco, which will be at capacity very soon and has little room for expansion.

Terms of Sale

A large portion of the traffic moving to and from Mexico is sold free on board (FOB) mid-bridge. The U.S. shipper/receiver pays the U.S. portion and the Mexican shipper/receiver pays the Mexican portion. Trucking rates are very low in Mexico, which makes it very difficult for the Mexican railroad to compete intermodally. Since the automotive companies pay the freight for both sides, they are able to benefit from the long-haul intermodal economics. One strategy being employed by the railroads is to target customers that are shipping to themselves or, alternatively, to get customers to change the terms of sale. Mid-bridge terms of sale are one of the main reasons that most of UP's Mexico intermodal business deramps at the border and is trucked into Mexico.

Equipment

Most of the railroad controlled trailers are 45 or 48 feet in length. Many of the trucking companies are offering 53-foot equipment. To overcome this limitation, the railroads are planning to introduce a new product that uses railroad-owned 48- and 53-foot containers. The economics of this service are further improved because trailers can be double-stacked.

Mexican Intermodal Marketing Companies (IMC)

In the U.S., the railroads depend on the Intermodal Marketing Companies for a large portion of their intermodal business. In Mexico, the IMCs are just getting started and do not have a strong sales network.

Customs Brokers

In terms of impediments to rail, it is understood that the brokers who arrange for transportation services in their respective countries largely favor truck traffic over rail. The reason for this favoritism is economic, since their fees are tied to the volume of traffic moving across the border. With a conversion rate of three trucks per boxcar, a broker supporting truck transport has the opportunity to charge three fees rather than one. This attitude is a major obstacle and is another reason why most of the U.S. railroad's intermodal business deramps at the border and is trucked into Mexico.

Mexican Policy

Mexican laws are different than those governing the behavior of the U.S. railroads. For example, while price collusion, predeal discussions between carriers to divide business, is legal in Mexico, it is strictly forbidden in the U.S. Also, Mexican railroads are not held to common carrier requirements, as is the case in the U.S. Therefore, a customer who does not pay his bill may receive no service until he does.

CHAPTER 7 – POTENTIAL OF THE PRESIDIO-OJINAGA BORDER CROSSING

INTRODUCTION

The creation of NAFTA has exerted considerable demand on existing transportation infrastructure in the border region. The Presidio-Ojinaga gateway to Mexico is one of only eight rail gateways serving the two countries and one of five located in Texas. The potential loss of any existing rail gateway will only contribute to further increases in demand for limited capacity facilities serving this important economic sector.

The line is an integral part of a potentially very important through route that extends from the Dallas/Fort Worth region to the city of Chihuahua to the Mexican port of Topolobompo, which in the future may prove to be an uncongested alternative to the ports of Los Angeles/Long Beach and Oakland/San Francisco. Ferromex has shown confidence in the potential of the Ojinaga/Presidio gateway for the movement of Mexico-U.S. traffic by its decision to acquire the Topolobompo-Chihuahua-Ojinaga line.

The railroad facilities at the Presidio gateway represent a valuable transportation resource that, once lost, would be extremely difficult to replace.

This chapter examines the history of the South Orient line, including the present-day situation.

HISTORY OF LINE

The Orient Line was named after and originally owned and operated by the Kansas City, Mexico, and Orient Rail Company (KCMO). The original line operated between Wichita, Kansas, and Presidio, Texas. It was established in 1908 as a short rail route for export and import traffic moving between the midwestern United States and the Far East via the port of Topolabampo on the west coast of Mexico. The KCMO merged with Santa Fe Railroad in 1941.

In 1982, the ATSF abandoned a 53.4-mile segment of the Orient Line between Maryneal and San Angelo, resulting in a splitting of the line into two parts: (1) the North Orient Line between Cherokee, Oklahoma, and Maryneal, Texas; and (2) the South Orient Line between San Angelo Junction (near the town of Santa Ana) and Presidio. A portion of ATSF's main line then connected the two parts. While prior to the abandonment it was approximately 72 rail miles from Orient Junction (Sweetwater) to San Angelo via the Orient Line, it became 183 miles after the abandonment.

In 1988, the ATSF solicited bids for the sale of that portion of the Orient Line in Texas, receiving one bid for the entire portion and another for only a segment. Both bids were rejected because they were below what ATSF estimated to be the portions and segment's liquidations value, and the bidders had not shown that the purchases could be successfully financed. In May 1989, ATSF filed an application to abandon that portion of the North Orient Line in Texas between Ranchland, at the Texas-Oklahoma border, and Orient Junction (ATSF would retain the line between Shaufler and Maryneal). After protests were received, including several shippers and communities located along the line, ATSF was permitted to withdraw its application without prejudice to its ability to file a subsequent application.

In November 1990, ATSF announced that an agreement had been reached for the sale of the North and South Orient Lines to Orient Railcorp (ORC), a corporation, based in Conroe, Texas. Before a notice of exemption for the acquisition could be filed, a large number of protests were filed by local interests, some of which objected to the potential owner's possible affiliation with a company that specializes in scrapping and marketing dismantled rail lines. The protesters believed that the application exhibited intent on the part of ORC to abandon and scrap much of the line.

The South Orient Line

In response to ATSF plans to sell the South Orient Line to Orient Railcorp, concerned government officials and business people from West Texas began discussing the formation of a rural transportation district. By May 1991, the South Orient Rural Rail Transportation District had been officially organized with all 11 counties along the South Orient Line supporting its charter. The district board initially adopted bylaws that emphasized that the counties and the taxpayers would not be responsible for the district's debt. If the district failed financially, the counties would lose ownership of the line but would not suffer other monetary loss.

Assured by the ATSF's verbal agreement not to sell the line before early summer, district representatives immediately began soliciting financial support. Investors from both Dallas and Mexico expressed an interest in purchasing the tax-free revenue bonds when or if issued by the rail district to purchase the 385.3-mile line.

Representatives of the district, a Dallas investment group, and a shortline operator began negotiating with ATSF officials for the purchase of the rail line. To meet the ATSF's purchase deadline in early July, the district submitted a contract on the rail line to the ATSF. The initial funding came from a group of local businessmen who made the deposit in order to buy more time for the district to complete a deal with the actual investors. The temporary investors were not seeking a part in the final investment.

In late August, the South Orient Rural Rail Transportation District received a $3 million authorization of state funds from the State Department of Highways and Public Transportation, now the Texas Department of Transportation. The state funding became available after local legislators sponsored a budget rider to House Bill 1, which the Texas Legislature approved during a special session. This monetary encouragement from the state combined with funding promised by investors equaled ATSF's asking price for the track, right-of-way, and property. By mid-October, the district had signed a letter of intent to buy the line. By the end of November, the transportation department finalized its decision to allocate the $3 million to the South Orient Rural Rail Transportation District. The finalized sales contract was signed December 31, 1991.

The conclusive arrangement gave the Texas Department of Transportation the title to the 385.3-mile line and other rights and interests in it. The state agency will also receive an interest valued at $2.5 million in other district assets. The South Orient Rural Rail Transportation District leased the line to an investment group called the South Orient Railroad Company Limited (SORC). The group signed a 50-year lease with an option for an additional 50 years and an obligation to operate the line for at least two years.

Discontinuance of Service

At the start of operations, SORC hoped to work deals out with the major railroads in the state to move traffic to the border. However, the changing scene of the rail industry during the 1990s left SORC without the revenue expected in the beginning. They sought a partnership with Burlington Northern Railroad, but BN merged with Santa Fe. Union Pacific was also a target, but UP merged with Southern Pacific. Kansas City Southern was the next major player, but KCS became partners with TM and TFM. After seven years of operation, SORC believed abandonment was the only way to recoup the losses accrued during operations of the line. On June 18, 1998, SORC filed an application seeking authority to discontinue service over and abandon approximately 296 miles of track between Mertzon Station south of San Angelo to Alpine Junction and from Paisano Junction to the end of the line at the International Bridge near Presidio. An additional 11.4 miles of trackage rights over the Union Pacific line extending from Alpine Junction to Paisano Junction would be discontinued for a total distance of approximately 307 miles.

The full text of the STB's decision, STB Docket No. AB-545, released October 6, 1998, is provided in Appendix A. The following discussion highlights several of the areas detailed in the STB document *(62)*.

Traffic, Operations, and Revenues

SORC states that only three of the seven shippers located on the line are active. Traffic for these shippers during 1997, the base year, amounted to 276 carloads, consisting predominantly of sand and sodium hydroxide. SORC also handled 857 carloads of overhead or bridge traffic during this period. In addition, 20 UP trains containing a total of 865 carloads were moved over the line in detour service.

SORC's estimate of revenues and costs for the forecast year is based on the movement of 280 carloads originating or terminating on the line, as well as 1,132 carloads of overhead traffic (984 for other rail carriers and 148 for SORC stations not on the line subject to abandonment). SORC estimates forecast year revenues of $815,474, based on those traffic levels plus a small amount of other demurrage revenue and other miscellaneous revenue.

Avoidable Costs

As reflected in the first column of figures in Table 64, SORC shows an avoidable loss from operations of $720,043, based on its estimate of avoidable costs totaling $1,535,517, which are all on-branch avoidable costs. Avoidable costs are costs that applicant will cease to incur if it abandons and discontinues service over the line. On-branch avoidable costs are shown for: (1) maintenance of way and structures; (2) transportation expenses (consisting of trackage rights fees to UP, crew costs, and fuel and communications expenses); and (3) maintenance of equipment, general and administrative expense, car hire costs, return on value and holding gains for locomotives, and deadheading expenses.

Line Condition and Rehabilitation

The condition of the line is generally good. However, the track at the south end contains 70 miles of 90-pound rail rolled in 1919 and 75 miles of 70-pound rail rolled in 1912. According to SORC, the rail would not be adequate to handle the type and volume of heavy overhead carload traffic necessary to justify retention of the line. SORC estimates that it would cost approximately $37 million ($19 million and $18 million, respectively) to replace the existing 70- and 90-pound rail with more suitable, new rail of a higher weight.

SORC states that there has been no significant tie replacement or surface work done on the line since 1982, and, thus, the ties on the line are in uniformly poor condition. Moreover, at least half of the ties on the southern segment of the line are the original ties from that segment's 1929 to 1930 construction. According to SORC, only 9 percent of the ties would be suitable for reuse. The line currently has 11 speed restrictions to 10 mph because of the poor tie and track surface conditions, and SORC anticipates that there will be more slow orders in the future without tie renewals.

There are many bridges on the line, most of which are old, short timber trestles. SORC estimates that the repair and maintenance work required in the next two years will be approximately $60,000 to $100,000.

The STB indicates there is no evidence that the condition of the rail is limiting traffic on the line. Because SORC admits that the lightweight rail can support the line's current traffic and speeds, the STB sees no need to upgrade the entire line. They agree with SORC that additional ties and surfacing would help in prolonging the rail's life. They accept SORC's bridge repair estimate that $60,000 to $100,000 will need to be spent in the next two years. Because SORC did not finalize a cost, the STB accepts its most conservative estimate of $120,000 ($60,000 a year for two years).

Summary of Cost and Revenue Evidence

The analysis of the evidence indicates that for the forecast year, total revenue attributable to the line would be $815,474. Total avoidable costs would be $1,535,517, resulting in a forecast year operating loss of $720,043. The record also shows that rehabilitation costs of $120,000 are required to bring the line into conformity with FRA Class 1 standards. A complete summary of the revenue and cost data is set forth in Table 64.

Table 64. STB Cost and Revenue Data for SORC.

	Applicant's Opening Forecast Year Figures	Protestant's Forecast Year Figures	Applicant's Rebuttal Forecast Year Figures	STB Restatement Forecast Year Figures
1. Freight Orig. and/or Term. on Branch	$199,529	$238,017	$199,529	$199,529
2. Bridge Traffic	579,960	691,831	579,960	579,960
3. All Other Revenue and Income	35,985	181,987	35,985	35,985
4. Total Attributable Revenue (Ls. 1 thru 3)	$815,474	$1,111,835	$815,474	$815,474
5. On-branch Costs:				
a. Maintenance-of-Way and Structures	$748,776	$194,604	$748,776	$748,776
b. Maintenance-of-Equipment (Including Depreciation)	105,252	37,910	105,252	105,252
c. Transportation	382,400	275,759	382,400	382,400
d. General & Administrative	185,464	66,511	185,464	185,464
e. Deadheading, Taxi and Hotel	12,480	12,480	12,480	12,480
f. Overhead Movement	0	0	0	0
g. Freight Car Costs (Other Than Return)	71,600	71,600	71,600	71,600
h. Return on Value - Locomotives	35,658	23,772	35,658	35,658
i. Return on Value - Freight Cars	0	0	0	0
j. Revenue Taxes	0	0	0	0
k. Property Taxes	0	0	0	0
l. Total (Ls. 5a thru 5k)	$1,541,630	$682,636	$1,541,630	$1,541,630
m. Holding Gains - Locomotives	6,113	3,493	6,113	6,113
n. Holding Gains (Loss) - Freight Cars	0	0	0	0
o. Net On-br Costs (Ls. 5l - 5m & 5n)	$1,535,517	$679,143	$1,535,517	$1,535,517
6. Off-branch Costs:				
a. Off-Branch Costs (Other Than Return)	$0	$0	$0	$0
b. Return on Value - Freight Cars	0	0	0	0
c. Holding Gains - Freight Cars	0	0	0	0
d. Net Off-br Costs (Ls. 6a+6b - 6c)	$0	$0	$0	$0
7. Total Avoidable Costs (L. 5o + L. 6d)	$1,535,517	$679,143	$1,535,517	$1,535,517
8. Rehabilitation	$0	$0	$0	$120,000

Decision

1. The present or future public convenience and necessity permit the discontinuance of service over the San Angelo-Presidio line and the discontinuance of trackage rights over the UP line, as described above, subject to the employee protective conditions in Oregon Short Line R. Co. Abandonment Goshen, 360 I.C.C. 91 (1979).

2. Discontinuance of service over the line and the discontinuance of trackage rights will not have a serious, adverse impact on rural and community development.

3. As conditioned, this action will not significantly affect either the quality of the human environment or the conservation of energy resources.

CURRENT STATUS OF LINE

With abandonment denied for the South Orient line in 1998, SORC began looking for financial options for the line. One of these options was to buy the track from the state for $2.5 million and then scrap the line, selling the material for an estimated $15 million *(63)*. Even though this was a remote possibility when the deal was made in 1991, the state's expectations were that the line could become economically viable. Having failed as a shortline, Texas is once again faced with the loss of a potentially valuable gateway to Mexico.

Understanding the potential future importance of the crossing into Mexico, Texas, in 1999, allocated $6 million from state appropriations to acquire the line, which was valued by the SORC at $9.5 million. TxDOT has been in negotiations with Grupo Mexico, majority owner of Ferromex, for a lease agreement to operate over the line. As part of the agreement, Grupo Mexico would pay the additional $3.5 million to SORC to finalize the deal. The company created by Grupo Mexico to operate the line is named Texas Pacifico Transportation Co (TPT). Final negotiations are still underway, but the form of the agreement has taken shape and offers both parties, Texas and Grupo Mexico, the possibility of a positive outcome.

The term of the agreement is a 40-year lease with five 10-year extensions. TPT, as an operator aligned with Ferromex, offers what everyone hopes is a viable scenario for development of traffic through the corridor. The fact that TPT can receive overhead traffic directly from Ferromex and deliver similar traffic received from others suggests that volumes may increase enough to warrant investment in the supporting infrastructure. Traffic generated on the line may also grow given the long-term nature of the agreement and prospects for improved service.

The agreement between Grupo Mexico and TxDOT does not contain explicit performance or investment goals. The operator and parent company maintain that they will evaluate the need for investment according to their internal, "standard business practices." This standing suggests that minimal investments will be made to bring the line up to operational condition and, as revenues increase, additional capital may be expended to improve the performance achievable over segments in need of improvement *(64, 65)*.

CHAPTER 8 – BORDER CROSSING FORECAST MODEL

INTRODUCTION

The key question posed for the current research effort is this, "will the privatization of Mexico's railroad system and closer operational ties to U.S. railroads serve to offset the increase in the amount of international truck trade passing between the U.S. and Mexico?"

The research team poses four scenarios similar to those developed by TxDOT but dealing with the ability of rail operations to offset the growth in NAFTA-related trade. Each scenario will be examined through a review of U.S. and Mexican railroad capabilities and projected traffic levels.

The four scenarios are:

Scenario 1 – Combined U.S. and Mexican railroad traffic loads, due to improvements in infrastructure, equipment, and operations will grow sufficiently to *exceed* the overall growth in NAFTA-related trade and thereby reduce the demand for, and number of trucks on, Texas highways.

Scenario 2 – Combined U.S. and Mexican railroad traffic loads, due to improvements in infrastructure, equipment, and operations will grow sufficiently to *keep pace with* the overall growth in NAFTA-related trade and thereby maintain the current modal split seen between rail and truck transport.

Scenario 3 – Combined U.S. and Mexican railroad traffic loads will *grow*, but at a rate slower than the increase in the growth in NAFTA-related trade and will, therefore, lose market share relative to the trucking industry.

Scenario 4 – Combined U.S. and Mexican railroad traffic loads will *retain* their current absolute volume, but, due to continued growth in trade, will decline in terms of the percent of international traffic carried by railroads.

The four possibilities will be evaluated by examining the projected performance of the railroad industry as a whole and by looking at specific improvements initiated in Texas.

BORDER CROSSING FORECAST MODEL

Purpose

This section of the report discusses the methods used for forecasting truck-rail modal share as a function of NAFTA-related trade. One key objective of the study is to explore how a modal split will change with the projected increases in NAFTA-related trade. In other words, how much of the projected NAFTA-related commodity flow will be carried by railcars and how much by trucks? Significant growth in the number of railcars will serve to offset truck traffic congestion and related highway damage in Texas, but the question remains-to what extent?

The econometric models that have been used for forecasting describe the relationship between quantity of trucks and railcars and the factors influencing this quantity. These factors include personal disposable income in the U.S., personal disposable income in Mexico, pesos per U.S. dollar (exchange rate), U.S. imports from Mexico, and U.S. exports to Mexico. The model, which utilizes time-series data, does not require a detailed representation of the transportation system network in order to model behavior. Instead, the model is used as a tool to determine how the trade growth brought about by NAFTA affects the quantity of each mode used in the transportation process.

Description of Model Explanatory Variables

Among the model's explanatory variables are personal disposable income in the U.S. and Mexico, peso/dollar real exchange rate, U.S. exports to Mexico, and U.S. imports from Mexico. The model was constructed in this manner since two important factors that affect trade are each country's income (ability to purchase goods from the other country) and the price at which the goods are traded, expressed in the other country's currency (the exchange rate). When a country's income or gross domestic product (GDP) falls, its ability to purchase goods from another country also falls. The opposite holds true as well: if a country's GDP rises, purchases from another country are likely to rise as well.

Figure 30 shows Mexico's GDP growth and the change in U.S. exports to Mexico (or change in the volume of goods Mexico buys from the United States). When Mexico's GDP falls, as it did sharply in 1995, U.S. exports to Mexico also decline.

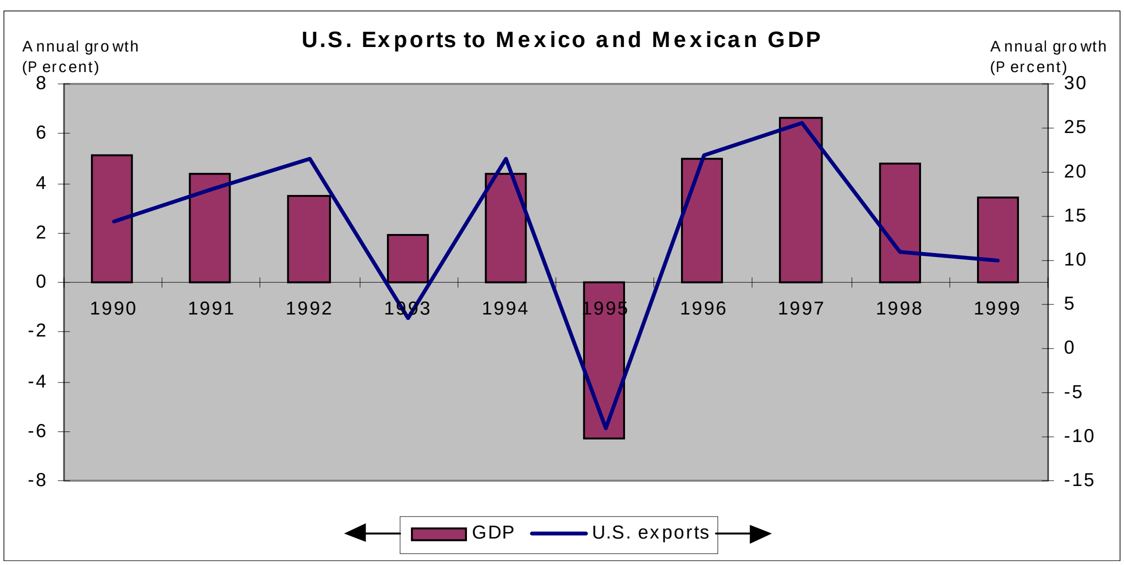


Figure 30. U.S. Exports to Mexico and Mexican GDP.

The price at which goods are traded, as expressed in another (export) country's currency, impacts trade in a similar fashion. The export country's goods become more expensive to the import country if its currency appreciates. Whenever this occurs, foreign demand for the export country's goods tends to go down. Conversely, an export country's goods become less expensive when its currency depreciates or when their price, as expressed in another country's currency, falls. This decline usually raises demand for the less expensive goods abroad.

When the exchange rate fell in December 1994, U.S. exports to Mexico also fell, while U.S. imports from Mexico rose. The exchange rate drop meant the peso had depreciated in relation to the dollar. This depreciation made Mexican goods less expensive to acquire in the United States, raising the demand for them, but it also made U.S. goods more expensive in Mexico, thereby suppressing demand.

The findings of a study conducted by the Dallas Federal Reserve Board show that overall U.S.-Mexico trade is significantly higher with NAFTA than it would have been without it. Without NAFTA, U.S. exports to Mexico would have declined by 3.4 percent per year on average during 1994 to 1998, rather than growing by 13.8 percent per year, as occurred with NAFTA. Moreover, U.S. imports from Mexico would have recorded an average annual increase of only 1.5 percent without NAFTA, rather than the 18.5 percent increase experienced with NAFTA.

In terms of dollar amounts, without the current trade agreement, U.S. exports to Mexico in 1998 would have been $44 billion lower than the $79 billion reached that year; U.S. imports from Mexico would have been $43 billion, or $51.7 billion less than their 1998 level. Considering total trade, both exports and imports, in 1999 Mexico replaced Japan as the United States' second-largest trading partner. Furthermore, a considerable majority of Mexico's foreign trade is with the United States. Exports to the U.S. represented 87.6 percent of Mexico's total foreign export trade in 1998, up from 82.7 percent in 1993. Imports from the United States were 74.3 percent of the country's total foreign export, up from 69.3 percent *(66)*.

Regression Model

Regression models attempt to capture any causal or correlative relationship existing between the independent variables and the dependent variable. Advantages of this modeling approach include the ability of regression to assess the power of independent variables in explaining the behavior of the dependent variable. In our case, the dependent variable evaluated is the number of transportation units crossing the border (trucks or railcars). The independent (i.e., explanatory) variables are disposable income in the U.S., disposable income in Mexico, peso/dollar real exchange rate, U.S. imports from Mexico, U.S. exports to Mexico, and a factor for whether or not NAFTA was in effect.

The model appears as follows:

$$BRRN = \beta_0 + \beta_1 DNAFTA + \beta_2 DINUS + \beta_3 DINMX + \beta_4 REALXR + \beta_5 USM + \beta_6 USX + u$$

Where:

BRRN	= number of railcars in Brownsville's northbound direction
DNAFTA	= factor for NAFTA (i.e., 0 for year 1993 and 1 for 1994, 1995, etc.)
DINUS	= U.S. personal disposable income
DINMX	= Mexican personal disposable income
REALXR	= peso/U.S. dollar real exchange rate
USM	= U.S. imports from Mexico
USX	= U.S. exports from Mexico
u	= error term

There were three gateways examined in the model: Brownsville, Eagle Pass, and Laredo. Initial plans included El Paso and Presidio, but the lack of monthly data for trucks and railcars for these locations restricted the analysis to the three locations cited. In total there were 12 regression equations developed: one each for mode (truck or rail); one each for direction of travel (north or south); and one each for the three gateways (2x2x3=12).

Data Description

Monthly time-series data from 1993 to 1999 capturing 84 observations were used in the regressions. The original data set was received from the Texas A&M International University at Laredo. It should be noted that it became apparent during the data analysis that there was no institution either in the U.S. or in Mexico that collects data on the number of trucks and railcars separately for each gateway. The data used in this analysis, the best available, include some counts of drayage vehicles and, thus, overstate the number of trucks.

Model Types

The research team used four models used in the analysis. The first model had only four explanatory variables, which included personal disposable income in the U.S., personal disposable income in Mexico, peso/dollar real exchange rate, and a factor for NAFTA. A very low R-square, adjusted R-square, and Durbin-Watson statistic indicated that something important was missing in the model.

The second model was similar to the first except for the introduction of 11 factors to capture the seasonal effects in each gateway. As a result, a very high R-square, adjusted R-square, and Durbin-Watson suggested the model provided a good fit. Personal disposable income in Mexico, real exchange rate, and the factor for NAFTA were found not to be statistically significant for Brownsville in the truck/northbound model. Personal disposable income in the U.S. was found to be significant, meaning that increase in the U.S. personal disposable income will positively affect the number of trucks in this direction, since more income will boost the trade between two countries.

The third model was logarithmic, with two more explanatory variables, namely U.S. imports from Mexico and the U.S. exports to Mexico. These variables were introduced to give an even better economic explanation of the trade growth effects on the quantity of transportation modes and get better model fit (i.e., higher R-square, adjusted R-square).

The fourth model was introduced to forecast the number of trucks and railcars for the next five years based on the expanded data set (i.e., seven years of historical data and five years of predicted data, yielding 144 observations). This forecast was accomplished using the simple ordinary least squares (OLS) regression technique and the SHAZAM software package. Again, high R-square and adjusted R-square showed that the model was providing a very good fit even though NAFTA has been in effect for a relatively short period of time.

The lack of data for the forecasting time period (five years) for each explanatory variable required independent forecasts for each factor in order to run the simple OLS regression. While there is much economic literature on the positive effects of NAFTA on trade between the participating countries (U.S., Canada and Mexico), there was no sound prediction on how much trade would increase in the near future. To overcome this problem, a forecast for every independent variable for the next five years, based on a trend analysis, was performed. The results were placed into the OLS model, which in turn allowed a forecast of the quantity of trucks and railcars at each gateway.

Model Results

Trade growth between the U.S. and Mexico continues to grow at a record pace resulting in record numbers of trucks and railcars moving between the two countries. Overall truck crossings increased 93 percent from 1993 to 1999 and overall railcar crossings increased 115 percent over the same period. The forecast model predicts additional increases in the number of truck and rail crossings over the next five years. Table 65 shows the predicted number of crossings by truck and rail and provides a total increase over the 12-year period from 1993 to 2004. According to the model, truck crossings will increase by 173 percent (14.4 percent annually) and rail crossings will increase 210 percent (17.5 percent annually) over the first 12 years of NAFTA.

Table 65. Percent Increase of Truck and Rail Crossings.

	North		South		Overall	
	Truck	**Rail**	**Truck**	**Rail**	**Truck**	**Rail**
Actual (1993 to 1999)	145	194	55	83	93	115
Forecast (2000 to 2004)	37	38	25	28	32	33
Total (1993 to 2004)	269	362	104	149	173	210

The forecast model examined the number of truck and rail crossings at Brownsville, Laredo, and Eagle Pass, with the actual data including years 1993 to 1999 and the forecast data including years 2000 to 2004. The entire set of numbers associated with the actual and forecasting data is presented in Appendix B. The northbound truck crossings are shown in Figure 31. Brownsville experienced only moderate growth from 1993 to 1999 with an average yearly increase of 3.5 percent. The growth in truck traffic through Brownsville is expected to increase an additional 11 percent from 2000 to 2004 for a total growth of 38 percent (3.2 percent annually). Eagle Pass is expected to see increased traffic levels of just over 200 percent from 1993 to 2004, which represents a 17 percent annual increase. Laredo experienced the greatest increase in truck traffic over the 1993 to 1999 period with a 204 percent increase. In 2004, Laredo is expected to have over 2.3 million truck crossings, which correlates to a 384 percent increase from 1993.

The southbound truck traffic from 1993 to the forecast levels in 2004, shown in Figure 32, is expected to result in increases of 109 percent in Laredo, 174 percent in Eagle Pass, and 62 percent in Brownsville. Truck crossings in Laredo increased 61 percent from 1993 to 1999 and are expected to increase an additional 25 percent from 2000 to 2004. Eagle Pass experienced a 93 percent increase in truck traffic from 1993 to 1999. The forecast period shows a 31 percent increase. Southbound Brownsville traffic is projected to increase 62 percent from 2000 to 2004. This projection is after a 19 percent increase in truck crossings from 1993 to 1999.

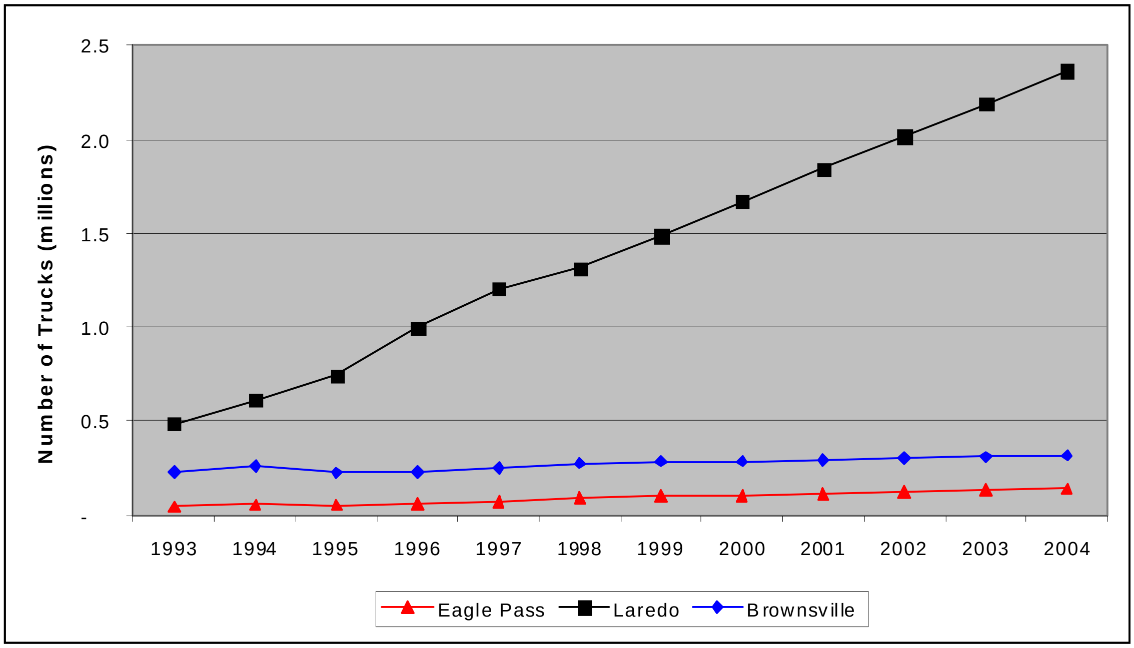


Figure 31. Annual Northbound Truck Forecast for Brownsville, Eagle Pass, and Laredo.

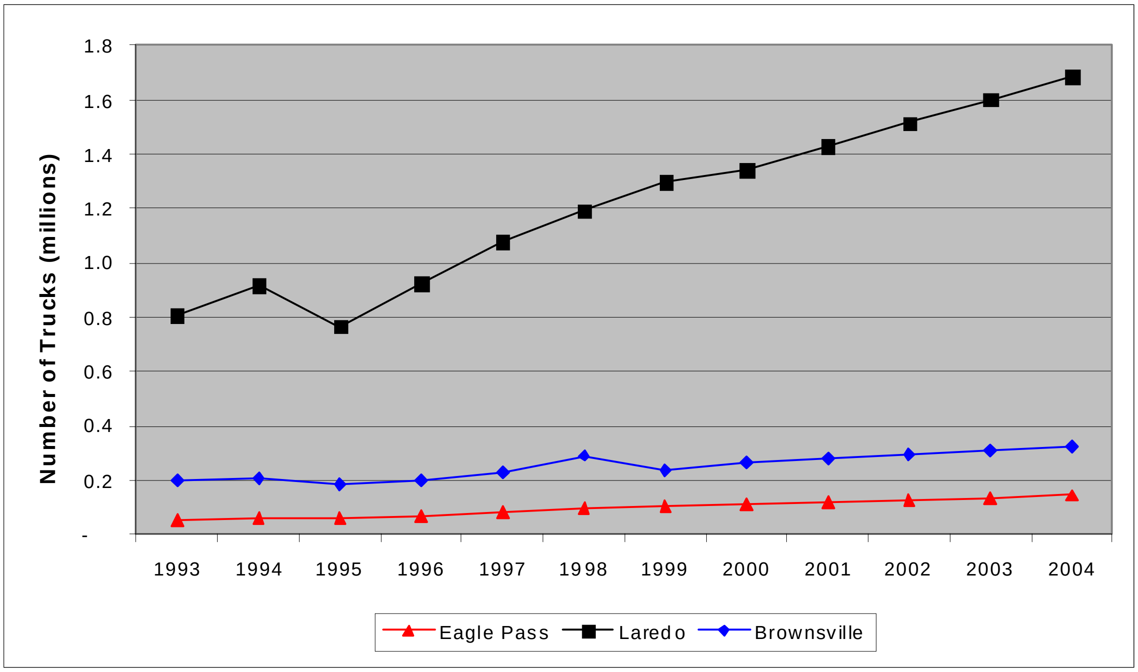


Figure 32. Annual Southbound Truck Forecast for Brownsville, Eagle Pass, and Laredo.

The annual number of railcars crossing at Brownsville, Laredo, and Eagle Pass are shown in Figure 33 and Figure 34. Figure 33 shows the northbound rail car movements. The greatest increases occurred in Laredo, with almost a 220 percent increase from 1993 to 1999. Laredo is also expected to see increases of over 40 percent from 2000 to 2004 for a total increase of 398 percent from 1993. Eagle Pass also experienced significant growth from 1993 to 1999. Northbound rail movements through Eagle Pass increased 186 percent and are expected to increase an additional 41 percent by 2004, resulting in an approximate 400 percent increase in total railcar crossings from 1993. Brownsville growth from the 1993 levels is expected to be 130 percent by 2004. Rail traffic increased over 90 percent from 1993 to 1999 and will increase an additional 15 percent by 2004.

The southbound railcar crossings through the three gateways are presented in Figure 34. Rail traffic levels are not expected to increase as much as predicted for northbound traffic. Laredo rail crossings increased from 109,000 to 168,000 from 1993 to 1999, which represents a 53 percent increase. Rail growth through Laredo is expected to be 93 percent over the 12-year forecast period. Eagle Pass experienced the greatest increase in railcars from 1993, with a 308 percent increase to 1999. An additional 47 percent increase is expected to occur from 2000 to 2004, which relates to a total growth of 564 percent from the 1993 levels. The actual and forecasted growth at Brownsville is 95 percent and 15 percent, respectively. The 1993 to 2004 growth rate through Brownsville in the south direction is expected to be almost 100 percent (98.5 percent).

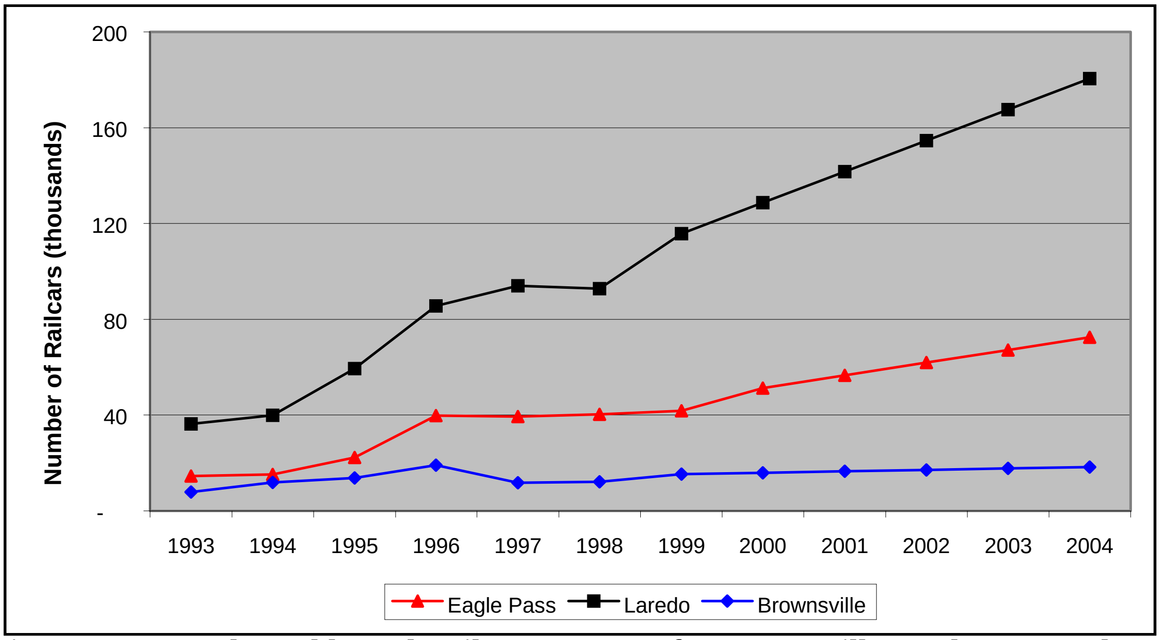


Figure 33. Annual Northbound Railcars Forecast for Brownsville, Eagle Pass, and Laredo.

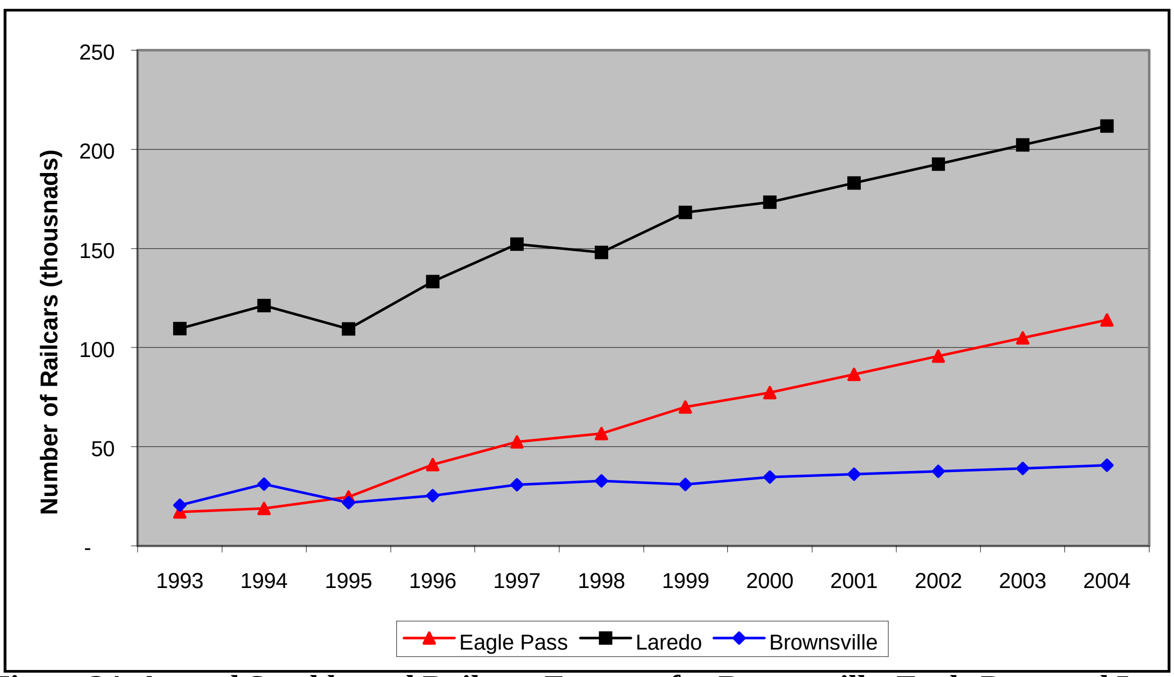


Figure 34. Annual Southbound Railcars Forecast for Brownsville, Eagle Pass, and Laredo.

Model Conclusions

Currently, all commodities transported across the U.S.-Mexico border by truck are handled by short-haul, drayage companies. Goods moving to Mexico are off-loaded on the U.S. side of the border to a drayage company that transfers the goods to the Mexican side of the border for delivery to a Mexican trucking company. The short-haul truck then returns empty to the U.S. to pick up another load. This transfer is repeated for goods heading north. The extra handling, as well as the extra trucks passing customs, will be gradually eliminated as cross-border aspects of NAFTA are carried out. The extra handling and the delays caused by the current system add significantly to the cost of trade between the U.S. and Mexico.

Many analysts say it is too early to judge NAFTA's impact on U.S.-Mexico trade, in part because many of its provisions have yet to take effect. While some tariffs and non-tariff barriers were eliminated immediately, others phase out gradually through 2008. A clear-cut assessment of NAFTA also is difficult because many of Mexico's trade liberalization policies were in effect before NAFTA began, prompted by Mexico's membership in the GATT and its ongoing domestic reforms *(67)*.

The weakness of the model is that its estimates rely almost entirely on a trend line analysis, projecting future trade, and traffic volumes from aggregated figures of past activity. This assumption implies that the factors that caused growth in trade from 1993 to 1999 would be capable of creating a similar growth rate in trade in future years, which may not be the case. NAFTA alters the structure of the economic relationship between participating nations, changing capital formation, industrial production, and distribution patterns. NAFTA is eliminating many of the existing tariffs thereby positively affecting the trade growth. Consequently, it would be imprudent to presume that NAFTA trade patterns would closely mimic those observed between 1994 and 1999.

CHAPTER 9 – CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The data collected in this research and their subsequent analysis indicate that the privatization of the Mexican railroad system will clearly have a positive impact on the quantity of freight transported by railroads in the U.S. and Mexico. Further, the linkage of Mexican railroads to U.S. railroad systems, both in terms of corporate ties and in terms of physical connections, will enhance their ability to compete effectively in a transportation market dominated, as it is to a lesser extent in this country, by the trucking industry.

The Mexican rail privatization has resulted in remarkable changes to an industry that was characterized as little as 10 years ago by poor performance, deteriorating infrastructure, single-digit market share, and extremely high employment rates. Emerging from decades as a nationalized industry, with political appointees rather than railroad expertise in key operating roles, the new operating concessions offer some degree of price and performance competition and streamlined corporate structures. Employment is down 80 percent in the Mexican railroads from 83,000 in 1990 to only 17,000 today. Quality track miles are up, as are train speeds and on-time performance. Thefts of property are down, accidents are down, and the industry appears to be well positioned to continue the growth started with restructuring and propelled forward by NAFTA.

On the U.S. side of the border, American railroads are investing in infrastructure along the Texas-Mexican border in response to growth in business. The Union Pacific dominates international trade with Mexico and has responded in Texas by investing millions of dollars in new track, locomotives, yards, and signaling systems. The prospect for continued growth in rail transportation seems excellent.

This being said, the growth in trade between the U.S. and Mexico is on pace to exceed even optimistic forecasts. With documented growth on the order of 17 percent per year, NAFTA has apparently opened the door to a linkage in economies that may result in over $250 billion in trade between the countries by the end of 2000 – three times the amount of commerce in 1993. Transportation obviously plays a critical role in effecting this trade. The current research has attempted to assess the prospect for a significant shift in the relative modal share between rail and truck as a function of Mexican rail privatization to gain insight into the challenge facing the Texas Department of Transportation and their quest to provide safe and efficient highways within Texas.

It has been estimated that between 80 and 85 percent of U.S.-Mexican trade is moved by truck through Texas, New Mexico, Arizona, or California by value and 75 percent by weight. Due to the simple geographic reality of a long common border, 80 percent of this total is transported through Texas, suggesting that more than 60 percent of all trade between the two countries goes by truck through the state. Of notable concern is the fact that much of the material traded neither originates nor terminates in Texas; by one estimate as much as 40 percent is transported to destinations outside of Texas. This estimate is a dubious distinction and one that creates very real physical and financial burdens for Texas in providing transportation infrastructure sufficient to keep pace with the swelling numbers of trucks traveling through Texas in route to and from markets elsewhere in the U.S.

The Texas Department of Transportation, in planning for future construction and maintenance activities on major NAFTA corridors, has, through this research, expressed an interest in the degree to which a more robust rail network in Mexico working in concert with a vibrant and engaged rail industry in the U.S., can offset the continued increase in truck traffic on Texas highways. TxDOT recognizes that, as a private industry, railroads are not subject to the same considerations as public transportation providers relative to serving the needs of the public. Further, railroads are not explicitly included in planning functions, do not generally receive public money for infrastructure or operational needs, and seek business opportunities that maximize revenue and minimize cost. The activities that public-sector planners may wish were emphasized by railroads, such as providing intermodal services, may not be of principal concern to the railroads due to factors such as low profit margins, large capital requirements, or priorities elsewhere on their system.

These issues, coupled with the fact that the railroads are in direct competition with the trucking industry, mean that public subsidy of the trucking industry through improved highway infrastructure indirectly erodes the market share of the railroads. Paradoxically, the mode that could do the most to limit the growth in truck traffic is hurt the most by the infrastructure put in place to accommodate the growth in truck traffic. Since the railroads receive no public money and have no direct public obligation, there seems at times little to do but passively observe the changes in the rail industry as it attempts to maximize its potential revenue stream stemming from NAFTA trade.

With Texas constitutionally limited to investments in highways, an understanding of the potential for rail to carry a larger share of the freight load is only a first step toward facilitating greater trade volumes on these heavy-haul systems and thereby reducing the demand for highway infrastructure. Subsequently, new financing options with greater flexibility are clearly needed to give TxDOT the tools required to get the job done. The statement, “if all you have is a hammer, then everything looks like a nail,” may apply to TxDOT’s constitutionally mandated, uni-modal approach to transportation. Ultimately, real questions about the best-use of public money need to be addressed.

This research proposed to evaluate four scenarios relating to the growth in trade-related transportation and truck-rail modal share. These scenarios are:

Scenario 1 – Combined U.S. and Mexican railroad traffic loads, due to improvements in infrastructure, equipment, and operations, will grow sufficiently to *exceed* the overall growth in NAFTA-related trade and thereby reduce the demand for, and number of, trucks on Texas highways.

Scenario 2 – Combined U.S. and Mexican railroad traffic loads, due to improvements in infrastructure, equipment, and operations, will grow sufficiently to *keep pace with* the overall growth in NAFTA-related trade and thereby maintain the current modal split seen between rail and truck transport.

Scenario 3 – Combined U.S. and Mexican railroad traffic loads will *grow*, but at a rate slower than the increase in the growth in NAFTA-related trade and will, therefore, lose market share relative to the trucking industry.

Scenario 4 – Combined U.S. and Mexican railroad traffic loads will *retain* their current absolute volume, but, due to continued growth in trade, will decline in terms of the percent of international traffic carried by railroads.

The free trade agreement has provided a rich environment within which improved rail transportation has taken root and grown quickly. When we consider the current strong points of rail, favorable long-haul economics is among those at the top of the list. It is not unreasonable to contend then that NAFTA has provided the context for revitalization of a Mexican rail system that was not competing well against the inexpensive Mexican trucking industry.

Privatization of the Mexican railroads, with its provisions for competing rail systems within Mexico, plus the alliances formed with their respective U.S. carriers, has allowed rail to take better advantage of its long-haul superiority relative to trucking, at least for some commodities. Thus, three factors – NAFTA, Mexican rail privatization, and more direct linkage to American rail networks (and hence, North American markets) – have operated in concert to make rail transportation a viable transportation mode for international trade between the U.S., Mexico, and Canada. In a very real sense, these same three factors have saved a transportation mode in Mexico that otherwise seemed doomed to insignificance. Further, without any one of these three factors present, it is doubtful that the rate of rail traffic growth would have been as great over the last several years as it has been.

Referring back to the four scenarios of interest, it is clear that Scenario 4, that combined U.S. and Mexican railroad traffic loads will merely *retain* their current absolute volume, can be eliminated from consideration. The growth in rail traffic has been clearly shown on both sides of the U.S.-Mexican border and the prospects appear very good that a steady growth will continue.

Railroad Performance

The evaluation to date, based on interviews with railroad resources, examination of commodity flow data, and a trend analysis of NAFTA trade growth, suggests that railroads are increasing their share of international trade transportation and will continue to grow. The business plans developed by the railroads will attempt to add infrastructure and capacity at strategic locations where sustained commercial activity is likely. The railroad's key consideration of *sustained* growth must be emphasized here.

Railroad infrastructure is inherently expensive. The railroads must provide that infrastructure out of capital borrowed against future earnings. Railroad management simply cannot afford to build added capacity into a system if the long-term business will not support it. Further, for an industry that annually struggles to earn the cost of capital, (i.e., is profits greater than or equal to the interest expense they must pay on the funds borrowed for capital improvements) only a limited amount of new infrastructure can be built each year. This limitation is more readily understood when we consider the magnitude of the maintenance challenge, which is expensive in its own right, across multistate railroad networks many thousands of miles in length. This problem is the reality of a privately owned, for-profit rail industry and a stringent business requirement placed on no other transportation mode.

Even so, the railroads have performed remarkably well. It is estimated by some within the industry that the railroad's U.S.-Mexican trade volume will grow at a double-digit rate – perhaps 10 to 12 percent per year. IMT has calculated that the Mexican rail systems have grown, on average, 10.1 percent annually since the privatization and under the favorable conditions brought about by NAFTA. Northbound shipments, or exports to the U.S., have grown 14.7 percent and southbound movements have grown by 9.6 percent. The disparity in these numbers is due, as has been stated before, to the very inexpensive trucking alternative available within Mexico and the fact that many southbound rail shipments from the U.S. are transferred to Mexican trucks once inside of Mexico.

The projections developed by TTI for this research suggest that rail traffic (carloads) in Texas will grow at a 7 percent annual rate over the 2000 to 2004 timeframe. Over the same period, truck traffic is forecast to grow at a 6 percent annual rate. These conservative projections are based solely on historical trends and may not reflect the array of complex factors currently at play nor do they consider the potential impact of trade barrier removal. Nonetheless, given the available information, it appears that both rail and truck traffic will continue to increase within Texas at roughly the same rate.

There is a logical link between trade and transportation. They are, by definition, highly interdependent and correlated. Unless the commodity being traded is information-based, such as stocks or futures, there can be neither trade nor trade growth without the physical mechanism to effect the transfer of goods and material. It is also logical to assume that, as correlated entities in a free, responsive market, NAFTA trade and transportation will grow at approximately the same rate. If transportation is not available, trade cannot occur and, conversely, if there is no trade, there will be no market for transportation services. Thus, we can expect that as NAFTA trade-growth continues, it will be closely paralleled by a corresponding growth in transportation services. Said another way, if NAFTA trade grows at a 10 percent annual rate, then transportation services will also grow at a 10 percent annual rate.

The privatization of the Mexican rail system has helped position railroads on both sides of the border to be a larger part of the growth in trade between the U.S. and Mexico than would have otherwise been the case. This fact means that of the four scenarios presented for evaluation, three remain under consideration. The research performed on this topic was undertaken, from the outset, with an emphasis on what rail transportation's impact would be on the number of trucks moving on Texas roadways. However, the railroad's key consideration of *sustainable* growth means that the rapid addition of capacity necessary to grow at a rate faster than NAFTA is not likely. This fact effectively eliminates Scenario 1 from consideration – sufficient growth to *exceed* the overall growth in NAFTA-related trade and thereby reduce the demand for, and number of, trucks on Texas highways.

Figure 35 summarizes the findings of this research effort and suggests that the rail industry, through the growth that has already taken place, has effectively slowed the rate of growth in the numbers of trucks on Texas highways.

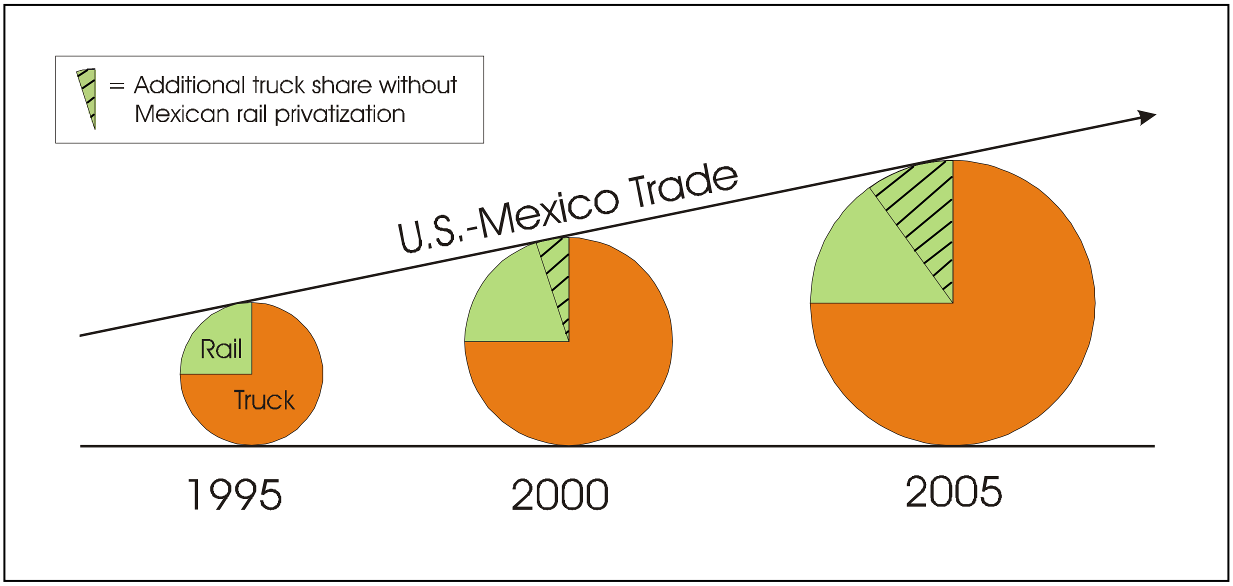


Figure 35. Rail-Truck Modal Share under Conditions of NAFTA Trade Growth.

The ever-increasing volume of NAFTA trade, as depicted by the increasing size of the pie-charts in Figure 35, shows how modal share can potentially decrease even as capacity and traffic levels increase for a given mode. For rail transportation to offset the growth in trucks, the Mexican and American industries would have to expand at a rate that exceeds the rate of growth in trade. This possibility is not indicated by the available data. What is shown by the data included in the report is a significant increase in rail traffic that serves to *partially* offset the growth in truck traffic. Without this improvement in rail transportation, characterized by better performance and coordination between U.S. and Mexican carriers, the rate of increase in trucks on Texas highways would be even greater.

The railroads operating in Texas and Mexico will continue to enhance their business position relative to international trade by adding capacity, improving service, and marketing their services more effectively. The growth in the key intermodal sector, which impacts the number of trucks most directly, will be accomplished as a function of two changes. The first is more intensive marketing of this service by U.S. railroads and the second is more widespread adoption of intermodal transportation within Mexico, where a shortage of facilities and equipment plus a relative lack of experience with intermodal movements hampers its use.

Texas' First Railroad – The South Orient

Texas and Grupo Mexico have negotiated a long-term arrangement allowing the latter to operate along the South Orient line, which is now a Texas-owned railroad. The term of the agreement is a 40-year lease with five, 10-year extensions. Texas Pacifico Transportation, Ltd., as an operator aligned with Ferromex through Grupo Mexico, S.A. de C.V., offers what everyone hopes is a viable scenario for development of traffic through the corridor. The fact that TPT can receive overhead traffic directly from Ferromex and deliver similar traffic received from others suggests that volumes may increase enough to warrant investment in the supporting infrastructure. Traffic generated on the line may also grow given the long-term nature of the agreement and prospects for improved service.

The agreement between Grupo Mexico and TxDOT does not contain explicit performance or investment goals. The operator and parent company maintain that they will evaluate the need for investment according to their internal, "standard business practices." This standing suggests that minimal investments will be made to bring the line up to operational condition and, as revenues increase, additional capital *may* be expended to improve the performance achievable over segments in need of improvement.

Texas has, by virtue of this agreement, successfully saved a gateway to Mexico that was in jeopardy of being lost. By saving the line and negotiating a long-term agreement with an established carrier network, TxDOT has taken steps that could pay large dividends in the future as NAFTA traffic congests the other four railroad gateways into Mexico. At a minimum, the agreement that is now in place prevents abandonment of the line and its subsequent salvage for scrap material. At best, it sets the stage for the revival of a route that at previous levels of commerce, never quite achieved a critical level of traffic and profit under which renewal and improvement could be financed.

It may be that with other routes supporting increasing amounts of international trade, a sustaining level of activity will result on the former South Orient and culminate in tangible improvements to the infrastructure, level of service, and perceived stability of this route. This result could in turn lead to businesses actually locating along the route to take advantage of the region's economic opportunities and stimulate still greater growth and rail line utilization – only time will tell.

RECOMMENDATIONS

Texas is in a difficult spot relative to encouraging alternate modes of transport to offset the ever-increasing numbers of trucks on our state's highways. The constitutional prohibition against spending from the highway trust fund for anything but highways has provided TxDOT with but one tool – more highway lanes. Roadway maintenance and construction undertaken in response to traffic growth on major corridors benefits the trucking industry by providing better infrastructure and indirectly hurts the rail industry by providing public subsidy to its principal competition. No amount of traffic growth on the railroads can overcome this competitive advantage enjoyed by truckers.

Some actions that the state can take include the following:

1. Integrate rail planning into the state and border planning activities underway at TxDOT. The Multimodal Section of TP&P is very well suited to guide the integration of rail into the transportation system of Texas. Projects in support of rail and intermodal transportation, such as improving roadway access into or connectivity to intermodal facilities, can create direct benefits by facilitating the use of TOFC or COFC movements.
2. Whenever possible, make provisions within new transportation corridors for the inclusion of rail. TxDOT has recently initiated the practice of allowing a 100-foot median between opposing lanes on U.S. and Interstate highways with the notion that rail may be able to operate within this median, benefiting from the grade separated corridor. Problems may exist with the practice, however, since railroad design characteristics are not fully followed. For instance, double-stack container operations require a minimum vertical clearance of 23 feet, however most overpasses are less than 20 feet high. More critically, vertical and horizontal curves on railroads are less severe than those found with highways. Grades shall not exceed two percent, and horizontal curves with a radius of 574 feet or more are preferred, with a minimum acceptable radius of 459 feet *(68)*.
3. Work with federal officials and Mexican authorities to streamline the institutional procedures affecting (slowing) international railroad operations, including USDA and U.S. Customs procedures.

REFERENCES

1. Federal Reserve Bank of Dallas. El Paso Branch. "NAFTA's First Five Years (Part 1)." *Business Frontier,* Issue 2, 1999.

2. McCray, John P., and Robert Harrison. "North American Free Trade Agreement Trucks on U.S. Highway Corridors." *Transportation Research Record 1653*. 1999.

3. Texas Department of Transportation. *Effect of the North American Free Trade Agreement on the Texas Highway System*. December 1998.

4. Gonzalez, John. "Bush, Mexican President Christen New Border Bridge." *Houston Chronicle*, April 24, 2000.

5. McCosh, Daniel J. "Truckers Welcome New Laredo Bridge." *Journal of Commerce*, April 26, 2000. Online. Available: http://www.joc.com.

6. Presidencia de la República. *Sexto Informe de Gobierno.* Mexico City/Mexico, September 1, 2000. Online. Available: http://www.presidencia.gob.mx/pages/f_archivo_gral.html.

7. Secretaría de Comercio y Fomento Industrial. *Información de Flujos Comerciales 1996-1998*. Mexico City, Mexico, January 2000.

8. "Task 2 Summary Report: Mexican Inventory of Existing and Programmed Binational Transportation Facilities." *Binational Border Transportation Planning and Programming Study*. Barton & Ashman-La Empresa, March 13, 1998. Online. Available: http://www.fhwa.dot.gov/binational/.

9. Secretaría de Comunicaciones y Transportes. *Proceso de Reestructuración del Sistema Ferroviario Mexicano*. Presented at the 2000 Railtec Mexico Expo, Monterrey, Nuevo León, Mexico, February 2000.

10. Ferrocarriles Nacionales de México. *Los Ferrocarriles de México 1837-1987*, Primera Edición. Mexico City, Mexico, 1987.

11. Ortiz-Hernán, Sergio. *Los Ferrocarriles de México: Una Visión Social y Económica*. Tomo II: La Rueda Rumorosa, Primera Edición en dos Tomos, Ferrocarriles Nacionales de México, Mexico City, Mexico, 1988.

12. Tamayo, Jorge. *The Structural Change Program of the National Railways of Mexico and its Impact in the Commercial Area*. The Transporte Internacional Conference, Railroad Panel, San Antonio, Texas, March 11, 1994.

13. Boske, Leigh B., Robert Harrison, Chandler Stolp, and Sidney Weintraub. *Texas-Mexico Multimodal Transportation*. Research Report 104, Lyndon B. Johnson School of Public Affairs, The University of Texas at Austin, 1993.

14. Secretaría de Comunicaciones y Transportes. *Sector Comunicaciones y Transportes: Memoria 1988-1994.* Mexico City, Mexico, October 1994.

15. "Task 2 Final Report: Mexican Inventory of Existing and Programmed Binational Transportation Facilities." *Binational Border Transportation Planning and Programming*. Barton & Ashman-La Empresa, March 13, 1998. Online. Available: http://www.fhwa.dot.gov/binational.

16. Secretaría de Comunicaciones y Transportes. *Programa de Desarrollo del Sector Comunicaciones y Transportes 1995-2000.* Mexico City, Mexico, 1995. Online. Available: http://www.presidencia.gob.mx/pages/f_archivo_gral.html.

17. Constitución Política de los Estados Unidos Mexicanos. H. Congreso de la Unión. Online. Available: http://www.cddhcu.gob.mx/.

18. Diario Oficial de la Federación. *Los Lineamientos Generales para la Apertura a la Inversión en el Sistema Ferroviario Mexicano.* Mexico City, Mexico, November 13, 1995.

19. Diario Oficial de la Federación. *Ley Reglamentaria del Servicio Ferroviario.* Mexico City, Mexico, May 12, 1995.

20. Diario Oficial de la Federación. *Reglamento del Servicio Ferroviario*. Mexico City, Mexico, September 30, 1996.

21. Mexican Embassy to the United Kingdom. *Mexico's Privatisation Programme*. Online. Available: http://www.demon.co.uk/mexuk/sept/privprog.html.

22. Diario Oficial de la Federación. *Ley de Inversión Extranjera.* Mexico City, Mexico, December 23, 1993.

23. Diario Oficial de la Federación. *Convocatoria para la Adquisición de los Títulos de Representativos del Capital Social de Ferrocarril Chihuahua al Pacífico, S.A. de C.V*. Mexico City, Mexico, June 10, 1996.

24. *Mantiene el Gobierno Vía ferrea de Salina Cruz a Coatzacoalcos*. El Financiero Newspaper, Mexico City, Mexico, July 10, 1998.

25. Ferromex. *Railtec México 2000*. Monterrey, Nuevo León/México, February 2000.

26. Riza, Arantzatzu. "Ganan Peñóles y GAN Ruta Corta Coahuila-Durango, MCT se Queda con Tijuana-Tecate y Nacozari se Declara Desierta." *El Economista Newspaper*. Mexico City, Mexico, October 16, 1997.

27. Flores, Renato. “Licita SCT las Ultimas Líneas Cortas del Ferrocarril.” *El Economista Newspaper*. Mexico City, Mexico, March 25, 1999.

28. Secretaría de Comunicaciones y Transportes. *La SCT ante la Opinión Pública*. Mexico City, Mexico, News Summary from November 1-15, 2000.

29. Transportación Ferroviaria Mexicana. Information provided by TFM’s Public Relations Office, Mexico City, Mexico, August 1998.

30. Kansas City Southern Industries. *Facts about TFM*. Online. Available: http://www.kcsi.com/tfm_f.html.

31. Transportación Ferroviaria Mexicana. *Who is TFM*. Online. Available: http://www.gtfm.com.mx.

32. Transportación Ferroviaria Mexicana. *Third Report to Our Clients*. Online. Available: http://www.gtfm.com.mx.

33. Transportación Ferroviaria Mexicana. *Railtec México 2000*. Monterrey, Nuevo León, Mexico, January 24, 2000.

34. Transportación Ferroviaria Mexicana. Information provided by TFM’s Operations Division. Monterrey, Nuevo León, Mexico, February 28, 2000.

35. Transportación Ferroviaria Mexicana. *Second Report to Our Clients*. Mexico City, Mexico, June 24, 1999.

36. Vantuono, William C. “A Railroad Renaissance South of the Border.” *Railway Age*, October 1998.

37. Transportación Ferroviaria Mexicana. *Report to Our Clients*. Mexico City, Mexico, June 24, 1998.

38. “No se Descuida el Capital Humano en Ferrocarriles, Afirma Luis de Pablo.” *Excelsior Newspaper*. Mexico City, Mexico, April 4, 1998.

39. Union Pacific Railroad. *UP Expands Interest in Ferromex*. Online. Available: http://uprr.com/uprr/notes/corpcomm/319e.shtml.

40. Ferrocarril Mexicano. *Railtec México 2000*. Monterrey, Nuevo León, Mexico, January 24, 2000.

41. Vantuono, William C. “Mexico: Pesos for Progress.” *Railway Age*, October 1999.

42. Information provided by the Instituto Mexicano de Transporte. Sanfandila, Querétaro, Mexico, September 2000.

43. Ferrocarril Mexicano. *Bienvenidos a Ferrocarril Mexicano*. Online. Available: http://www.ferromex.com.mx.

44. Quezada, Manuel. "Modernizará Ferromex Siete Estaciones en la Tarahumara." *El Diario de Chihuahua Newspaper*. Chihuahua, Chihuahua/Mexico, June 28, 1998.

45. Transportation Technology Center, Inc. *Industry Outlook – The Next Five Years: 2001-2005*, February 21, 2000.

46. United States Department of Transportation. Surface Transportation Board. *Union Pacific Railroad - Fourth Annual General Oversight Proceedings*. STB Finance Docket No. 32760 (Sub-No. 21). Decided: December 13, 2000.

47. Union Pacific Railroad. *UP's Fourth Annual Report on Merger and Condition Implementation*. Filed on July 3, 2000.

48. Burlington Northern Santa Fe Corporation. *1999 Annual Report to Shareholders*. Online. Available: http://www.bnsf.com.

49. Kansas City Southern Industries. *Facts about TM*. Online. Available: http://www.kcsi.com.

50. Secretariat of Commerce and Industrial Development (SECOFI), Information on Trade Flows, 1996-1998.

51. Secretariat of Communications and Transportation. Online. Available: http://www.sct.gob.mx/indicadores/ind_ferr_2.htm**.**

52. Secretariat of Communications and Transportation. *Structural Changes Program under National Railroads of Mexico*, 1995.

53. "Recommended Corridor Investment." *I-35 Trade Corridor Study*. HNTB Corporation, et al., September 30, 1999.

54. Chacon, Tony. Assistant Vice President of Mexico Markets, Union Pacific. Interview, May 23, 2000.

55. Union Pacific Railroad. "Unit Train to Mexico Will Be the First." *INFO Online*, May/June 1999. Online. Available: http://www.uprr.com.

56. Walsh, Anne. "Laredo 'Grows Out of Its Socks.'" *INFO Online*, Fall 1999. Online. Available: http://www.uprr.com.

57. Roop, Stephen, Jeffery Warner, Duane Rosa, and Richard Dickinson. *The Railroad System of Texas: A Component of the State and National Transportation Infrastructure*. Research Report FHWA/TX-99/1703-3. Texas Transportation Institute, College Station, Texas, November 1998.

58. Union Pacific Railroad. *Aztec Eagle*. Online. Available: http://www.uprr.com.

59. Kaufman, Lawrence H. "Triple Crown to Use Equipment in Mexico." *Journal of Commerce*, April 17, 2000. Online. Available: http://www.joc.com.

60. Kansas City Southern Industries. *Kansas City Southern Introduces Time-Definite Intermodal Service in Mexico*, April 21, 1999. Online. Available: http://www.kcsi.com.

61. Brownsville Metropolitan Planning Organization. *West Rail Plan*. Map.

62. United States Department of Transportation. Surface Transportation Board. *South Orient Railroad Company, LTD. – Abandonment and Discontinuance of Trackage Rights – Between San Angelo and Presidio, TX*. STB Docket No. AB-545. Decided: October 5, 1998.

63. Ward, Mike. "State May Rescue Line – Again." *Austin American-Statesman*, August 31, 1999.

64. Texas Department of Transportation. *Purchase Agreement for South Orient Railroad Completed*. News Release, February 5, 2001. Online. Available: http://www.dot.state.tx.us/tdotnews/newsrel/010202.htm.

65. Dennis, Wayne, Paul Douglas, and Joe Holland. Transportation Planning and Policy, Texas Department of Transportation. Telephone interview, January 26, 2001.

66. Federal Reserve Bank of Dallas. El Paso Branch. "NAFTA's First Five Years (Part 2)." *Business Frontier*, Issue 1, 2000.

67. "NAFTA – The Mexico Factor." *The Cargill Bulletin*, April 1997. Online. Available: http://www.cargill.com.

68. Union Pacific Railroad. *Technical Specifications for Construction of Industrial Tracks*. Omaha, Nebraska, February 1997.

APPENDIX A – SOUTH ORIENT ABANDONMENT APPLICATION DECISION

DECISION

STB Docket No. AB-545

SOUTH ORIENT RAILROAD COMPANY, LTD.
ABANDONMENT AND DISCONTINUANCE OF TRACKAGE RIGHTS
BETWEEN SAN ANGELO AND PRESIDIO, TX

Decided: October 5, 1998

On June 18, 1998, South Orient Railroad Company, Ltd. (SORC), filed an application under 49 U.S.C. 10903 seeking authority to discontinue service over and abandon the San Angelo-Presidio line (the line) extending from milepost 722 near Mertzon station south of San Angelo to milepost 945.3 at Alpine Junction and from milepost 956.7 at Paisano Junction to the end of the line at milepost 1029.1 on the International Bridge near Presidio, a distance of approximately 296.4 miles; and to discontinue its trackage rights over the Union Pacific Railroad Company's (UP) line extending from milepost 945.3 at Alpine Junction to milepost 956.7 at Paisano Junction, a distance of 11.4 miles, for a total distance of approximately 307 miles in Brewster, Crane, Crockett, Irion, Pecos, Presidio, Reagan, Tom Green, and Upton Counties, TX. Notice of the filing of the application was served and published in the Federal Register (63 FR 36989) on July 8, 1998.

The South Orient Rural Rail Transportation District (SORRTD), a political subdivision of the State of Texas responsible for preserving essential rail transportation services, filed a motion to dismiss the application and, in the alternative, a protest. Protests also were filed by the Texas Department of Transportation (TxDOT); the Texas Comptroller of Public Accounts, John Sharp (Comptroller); the Railroad Commission of Texas (RCT); Ferrocarril Mexicano, S.A. de C.V. (Ferromex); Mining Hard Rock Inc. (Hard Rock); and jointly by DinoSoil, Inc. (DinoSoil) and Geronimo Properties, Inc. (Geronimo). Comments opposing the abandonment were filed by the Texas Department of Economic Development (TDED); Ferrocarriles Nacionales De Mexico (Ferrocarriles); the City of Presidio (City); Congressman Henry Bonilla; Congressman Charles W. Stenholm; Texas State Senator Jeff Wentworth; Presidio Appraisal District (Appraisal District); Presidio Independent School District (Independent School District); Garl Boyd Latham; and Elizabeth R. Covos. A request for issuance of a certificate of interim trail use (CITU) was filed by Rails to Trails Conservancy (RTC), and a protest opposing the imposition of a public use or trail use condition was filed by Walter D. Noelke. SORC filed a reply. In addition, waiver requests to file rebuttal to SORC's reply, along with rebuttal statements, were filed by Ferromex and SORRTD. SORC replied to each of these rebuttal statements.

Upon review of the record, we conclude that the motion to dismiss should be denied and that the public convenience and necessity is best met by not granting an abandonment but rather approving the discontinuance of SORC's service over the San Angelo-Presidio line and the discontinuance of SORC's trackage rights over the UP line, subject to standard employee protective conditions.

PRELIMINARY MATTERS

Motion to Dismiss. SORRTD argues that the abandonment application should be dismissed because SORC does not own the line, and, therefore, lacks standing to abandon it. Although SORRTD acknowledges that, on December 30, 1991, it entered into a lease arrangement with SORC that contained an option that would allow SORC to purchase SORRTD's interest in the line after 2 years, SORRTD argues that SORC never exercised the option, and, in any event, the option could not be exercised without SORRTD's Board of Directors adopting an order declaring the property "surplus" and "not needed." Therefore, SORRTD asserts that, at best, SORC holds an unexercised option to purchase the track and related materials in order to preserve rail operations over the line. SORRTD cites Southern Pacific Transp. Co.–Abandonment, 8 I.C.C.2d 495 (1992) (Southern Pacific), to support its contention that SORC lacks standing to abandon the line.

In Southern Pacific, the Los Angeles County Transportation Commission (LACTC), the state entity that acquired the fixed assets to the rail lines in that case, possessed the unrestricted right to terminate Southern Pacific Transportation Company's (SP) leasehold interest and limit SP's access to trackage rights subordinate to LACTC's mass transit operations. Consequently, LACTC was found to have incurred the common carrier obligation to operate the lines and LACTC, not SP, was the proper party to abandon them.

The motion to dismiss will be denied. The San Angelo-Presidio line was originally part of a 381.9-mile line that was transferred from The Atchison, Topeka, and Santa Fe Railway Company (ATSF) in two parts: (1) the right-of-way and other fixed assets were sold to SORRTD; and (2) an exclusive permanent easement and all rights to operate over the line were granted to SORC. In South Orient Railroad Company, Ltd.– Acquisition and Operation Exemption – Line of The Atchison, Topeka, and Santa Fe Railway Company, Finance Docket No. 31971 (ICC served Sept. 2, 1992) (South Orient), SORRTD's acquisition of the fixed assets of the 381.9-mile line was found not subject to the Interstate Commerce Commission's (ICC) jurisdiction under 49 U.S.C. 10901 because, unlike SP in Southern Pacific, SORC would retain sufficient ability to provide unrestricted freight service as a rail common carrier and would not be subject to restrictions on abandonment or operational control. Thus, we conclude that SORC is the proper party to seek abandonment or discontinuance authority to extinguish its common carrier obligation to operate the line and also to discontinue its trackage rights operation over the UP line.

Petitions for Waiver. On August 24 and August 25, 1998, Ferromex and SORRTD, respectively, filed petitions pursuant to 49 CFR 1117.1 seeking leave to file rebuttal to SORC's August 17, 1998, reply statement. On September 4, 1998, SORC replied in opposition to the petitions for leave to file and also replied to the rebuttal statements, arguing that, if we grant the petitions and allow Ferromex's and SORRTD's rebuttal filings, we should also accept SORC's reply to those filings.

The submissions constitute replies to a reply and are not permitted under our rules. 49 CFR 1104.13(c). When good cause is shown or when additional information is necessary to develop a more complete record, we may waive the rule. 49 CFR 1100.3. Because no matters were raised that we have not adequately considered in our analysis, Ferromex's and SORRTD's petitions for leave to file replies to SORC's reply will be denied, and their replies tendered on August 24 and August 25 (as well as SORC's further reply tendered on September 4) will be rejected.

TRAFFIC, OPERATIONS, AND REVENUES

SORC states that only three of the seven shippers located on the line are active. Traffic for these shippers during 1997, the base year, amounted to 276 carloads, consisting predominately of sand and sodium hydroxide. SORC also handled 857 carloads of overhead or bridge traffic during this period. In addition, 20 UP trains containing a total of 865 carloads were moved over the line in detour service.

Traffic Levels, Revenues, and Cost of Operations. SORC's estimate of revenues and costs for the forecast year is based on the movement of 280 carloads originating or terminating on the line, as well as 1,132 carloads of overhead traffic (984 for other rail carriers and 148 for SORC stations not on the line subject to abandonment). SORC estimates forecast year revenues of $815,474, based on those traffic levels plus a small amount of other demurrage revenue and other miscellaneous revenue. The forecast year figures do not include any detour traffic from UP. Our restatement of the revenue and cost estimates is based on the following analysis of the evidence.

Expected Traffic Volume and Revenues. The applicant's estimate of forecast year revenues of $815,474 is based on the traffic levels noted above plus a small amount of other demurrage revenue and other miscellaneous revenue. As previously indicated, the forecast year figures do not include any detour traffic from UP. Ferromex estimates forecast year revenues of $1,111,835 but includes $151,536 in revenue for UP detour trains in its forecast year figure of $181,987 under the revenue item consisting of all other revenue and income, which was SORC's base year figure for that revenue item. Ferromex also increases freight revenue originated or terminated on the line, plus bridge traffic (other than UP detour trains) from $779,489 to $929,848. This increase is based on the difference between actual freight revenues and the unaudited income statement for SORC during 1997. In its reply, SORC contends that the actual freight revenue figures are correct because the income statement includes approximately $700,000 of revenue from prior years that was not correctly invoiced until 1997.

We find that Ferromex has overstated the revenues for the forecast year by including both revenues from traffic moved in prior years but recorded in 1997 and revenues from UP detour trains, even though no detour traffic is currently moving over the line. Therefore, we accept SORC's revenue projections for the forecast year.

Protests regarding the line's potential to transport significant shipments of humate, a natural fertilizer, were filed by Hard Rock, DinoSoil, and Geronimo. SORC did not include estimates for any of these protestants in its forecast year traffic.

Hard Rock states that it owns extensive, recently discovered deposits of humate, bentonite, and zeolite in Brewster and Presidio Counties, and has invested over $1 million in preparation of mining and distributing these products domestically and internationally. It anticipates tendering approximately 40 carloads a day, or over 10,000 carloads a year, of humate to SORC at Alpine. Assertedly, Hard Rock has entered into lease agreements with SORC, and its affiliate, Bristol Real Estate, covering spur track and other rail property, to handle these shipments. Specifically, Hard Rock states that it has leased a spur line from SORC at Alpine, purchased 15 acres of rail front property on the Fort Davis highway, and leased a spur track extending from SORC's main line to Hard Rock's facility at Plata in Presidio County. Hard Rock projects that its 1999 income for the Alpine plant will be approximately $10 million and that it expects to transport 100,000 tons of material from its plant. Hard Rock asserts that UP has refused its request to provide rates and service at Alpine.

Geronimo, a property holding company, states that it has acquired title to and leases on certain properties containing large deposits of humate in Brewster County and that DinoSoil, the company created to market and distribute the humate, has leased a rail site on SORC's line in Alpine. Assertedly, DinoSoil has spent in excess of $400,000 to develop domestic and international markets for humate during the past 2 years. It is apparently ready to begin shipping traffic and, based on its current contracts, DinoSoil anticipates that by May 1999, it will be shipping 76 covered hopper cars via SORC every other day, which would amount to 13,680 carloads annually. Both Geronimo and DinoSoil state that they also have obtained leases on a UP rail site at Alpine, but have been unable to negotiate rates or car pick-up schedules with UP. Due to the lack of dependable forecasting by UP, DinoSoil submits that it intends to conduct most, if not all, of its rail shipping via the SORC rail site.

In reply, SORC states that the protestants identify only six specific sources of new traffic on the line. SORC asserts that these traffic prospects are speculative: four of the six future shippers – Hirschfield, Texas Tank, Twin Mountain, and Kasberg – were unable to provide any estimate of anticipated rail movements via the line; two other future shippers – DinoSoil and Hard Rock – provide carload estimates but have not made any commitments to ship via the line, and it is not clear to SORC that their traffic would move south over the Presidio gateway. Furthermore, with respect to DinoSoil and Hard Rock, SORC states that their statements indicate that both companies intend to truck their product to Alpine, where they have direct rail access to UP. We agree with SORC that, in these circumstances, this new traffic projected to begin moving over the line in the future should not be included in our restatement of forecast year revenues and costs.

AVOIDABLE COSTS

As reflected in the first column of figures in the attached appendix, SORC shows an avoidable loss from operations of $720,043, based on its estimate of avoidable costs totaling $1,535,517, which are all on-branch avoidable costs. Avoidable costs are costs that applicant will cease to incur if it abandons and discontinues service over the line. On-branch avoidable costs are shown for: (1) maintenance of way and structures; (2) transportation expenses (consisting of trackage rights fees to UP, crew costs, and fuel and communications expenses); and (3) maintenance of equipment, general and administrative expense, car hire costs, return on value and holding gains for locomotives, and deadheading expenses. No off-branch avoidable costs are shown.

Maintenance-of-Way and Structures (MOW). SORC did not provide specific normalized maintenance costs, and rather relied instead on an estimate of approximately $2,500 per mile for a total of $748,776, which represents the normalized maintenance levels necessary to maintain the line at Federal Railroad Administration (FRA) Class 1 safety standards. SORC submits that this is a very conservative estimate because the track is Class 2 or 3 and is maintained at that level. While we agree with SORC that normalized maintenance costs at FRA Class 2 or 3 might be somewhat higher depending on the traffic density of the line, for the purposes of this proceeding, we will accept SORC's estimate of $748,776.

The figures in the second column of the attached appendix reflect Ferromex's restatement of costs for the line. In general, these are based on an allocation of 15 percent of SORC's total expenses from the line and its other operations. Ferromex justifies this adjustment by citing an internal letter, written in 1996, from SORC's chief operating officer to its president which suggested allocation of 15 percent of expenses to the line due to the fact that 15 percent of SORC's total revenues came from that line.

We do not accept Ferromex's restatement. Actual expenses during the base year, and projected expenses for the forecast year, belie this overly simplistic cost allocation scheme, which is based on a ratio of expenses to revenues. This is especially true of the MOW, which accounts for approximately half of SORC's total expense projection, but less than one-third of Ferromex's. Ferromex claims MOW costs should be 15 percent of the railroad's total MOW expense. At this level of cost allocation to the line, only $650 per mile would be allocated to MOW expenses.

We find SORC's estimate to be the better one. We agree with SORC that $2,500 per mile is the minimum amount needed to keep the line open using minimal maintenance.

Other On-branch Costs. SORC argues that other expenses are also higher than those projected by Ferromex. We agree. Ferromex significantly reduced SORC's projected costs for maintenance of equipment, transportation, and general and administrative (G&A) expenses. G&A expense, as calculated by Ferromex, is based on the 15 percent allocation factor, and fails to take into account actual costs. Absent cost data based on actual train runs and mileage, we cannot accept Ferromex's figures. SORC appears to have followed acceptable procedures for allocating these expenses. SORC's calculation of maintenance of locomotives and transportation expenses is reasonable given the number of trips planned for the forecast year. Thus, we accept SORC's estimates for these cost items.

LINE CONDITION AND REHABILITATION

SORC states that the line is presently classified as FRA Class 2 and 3 track, with most of the FRA Class 3 track on the north end of the line and most of the FRA Class 2 track on the south end of the line. Speed limits are 25 mph and 30 mph, respectively. The condition of the line is generally good. However, the track at the south end contains 70 miles of 90-pound rail rolled in 1919 and 75 miles of 70-pound rail rolled in 1912. According to SORC, the rail would not be adequate to handle the type and volume of heavy overhead carload traffic necessary to justify retention of the line. SORC estimates that it would cost approximately $37 million ($19 million and $18 million, respectively) to replace the existing 70- and 90-pound rail with more suitable, new rail of a higher weight.

SORC states that there has been no significant tie replacement or surface work done on the line since 1982, and, thus, the ties on the line are in uniformly poor condition. Moreover, at least half of the ties on the southern segment of the line are the original ties from that segment's 1929-1930 construction. According to SORC, only 9 percent of the ties would be suitable for reuse. The line currently has 11 speed restrictions to 10 mph because of the poor tie and track surface conditions and SORC anticipates that there will be more slow orders in the future without tie renewals.

There are many bridges on the line, most of which are old, short timber trestles. SORC estimates that the repair and maintenance work required in the next 2 years will be approximately $60,000 to $100,000.

Although SORC does not show any rehabilitation expenses in its revenue and cost data, it does discuss rehabilitation in its application. It contends that a minimal program to replace one of every five ties (624 ties per mile for a total of 185,000) and perform associated surfacing would cost approximately $11 million and that, without rehabilitation, operation of the line would likely cease by the year 2000 or shortly thereafter.

We reject SORC's claim that replacement of all 70-pound and 90-pound rail is a necessary part of rehabilitation. We do not accept SORC's replacement of light rail based on its assumption that heavier rail is needed should additional traffic develop. There is no evidence that the condition of the rail is limiting traffic on the line. Because SORC admits that the light weight rail can support the line's current traffic and speeds, we see no need to upgrade the entire line. We agree with SORC that additional ties and surfacing would help in prolonging the rail's life. However, SORC has not provided data to support its figure of $11 million for ties and surfacing. Without detailed data showing costs and the rationale for replacing one in every five ties, we reject SORC's rehabilitation estimate. We accept SORC's bridge repair estimate that $60,000 to $100,000 will be needed to be spent in the next 2 years. Because SORC did not finalize a cost, we accept its most conservative estimate of $120,000 ($60,000 a year for 2 years). In our restatement of the revenue and cost data, we have placed this expense under rehabilitation because it is not a recurring item.

SUMMARY OF COST AND REVENUE EVIDENCE

Our analysis of the evidence indicates that for the forecast year, total revenue attributable to the line would be $815,474. Total avoidable costs would be $1,535,517, resulting in a forecast year operating loss of $720,043. The record also shows that rehabilitation costs of $120,000 are required to bring the line into conformity with FRA Class 1 standards. A complete summary of the revenue and cost data is set forth in the appendix.

SHIPPER AND COMMUNITY INTERESTS

As noted above, applicant identifies seven shippers as significant users on the line, but of these, only three are active users – Belding, Big Lake, and Unimin. None of these shippers has filed a protest to the abandonment and discontinuance.

SORRTD argues that SORC's application for abandonment should be denied on the ground that abandonment of the line is not required or permitted by the future public convenience and necessity. According to SORRTD, SORC's portrayal of the line as incapable of generating sufficient local and overhead traffic to permit it to earn a profit, is baseless and misleading. SORRTD contends that SORC is aware of several potential sources of traffic that would cause operations over the line to be profitable, e.g. DinoSoil, Geronimo, and Hard Rock. In addition, SORRTD cites other sources of potential traffic, namely Hirschfeld, Texas Tank, Twin Mountain, and Kasberg.

SORRTD also argues that authorization of the abandonment of the line and the resultant closure of the Presidio gateway would violate the North American Free Trade Agreement's (NAFTA) goal of facilitating the cross-border movement of goods, because the Presidio gateway is the only rail crossing for almost 500 miles along the U.S-Mexico border. SORRTD avers that, given the advantages that the Presidio gateway offers over the other four rail gateways between Mexico and Texas, it makes no sense to permit the abandonment of this vital rail link. Even though this link may have been underutilized in the past, SORRTD argues that this fact has no bearing on the future potential of the line. SORRTD submits that Ferromex is one of two entities that are ready and able to negotiate an arrangement with SORC and SORRTD to guarantee future rail operations over the line. If we were to grant the abandonment, Ferromex (or presumably another carrier) would have to rebuild the entire line, which would compromise its ability to provide cross-border service.

While it opposes abandonment, SORRTD states that it does not object to SORC being authorized to discontinue service. However, because the trackage rights over UP's line between Alpine Junction and Paisano Junction are crucial to any future operations over the line, SORRTD objects to SORC being authorized to discontinue service over that segment.

TxDOT argues that the line is important not only to rural and sparsely populated areas through which the line runs, but also to the commerce between Mexico and the United States. It states that the line serves as a critical link between the Mexican railroad lines to the south and the United States railroad system to the north and that it is interested in preserving this rail gateway as a means of serving the future transportation needs of the state. TxDOT, like SORRTD, is not opposed to SORC's discontinuance of service on the line.

The Comptroller, who is the chief fiscal and revenue official for Texas, states that research and analysis conducted by staff members indicate that the proposed abandonment will have a negative economic impact in the region served by the line. According to the results of a survey of 34 shippers along SORC's line from Presidio to Fort Worth that was conducted between July 17 and July 24, 1998, five employers indicated that they would reduce employment because of the proposed abandonment, eliminating 73 jobs. Other possible impacts include: the relocation of 15 to 20 jobs; the diversion of 150,000 pounds of scrap into local landfills as a result of a San Angelo scrap processor declining business because of the additional cost of shipping its low value, high bulk commodity; and generally increased operating costs that could result in local companies losing business.

The RCT states that the line is an integral part of a potentially very important through route that extends from the Dallas/Fort Worth areas to the Mexican port of Topolobompo, which in the future may prove to be an uncongested alternative to the ports of Los Angeles/Long Beach and Oakland/San Francisco. According to the RCT, Presidio is a future gateway that holds significant promise for efficient routing of cross-border rail traffic as the northwestern part of Mexico becomes heavily industrialized over the next 20 years and begins to ship huge volumes of manufactured goods to the United States. The RCT asserts that the line proposed for abandonment is a valuable segment of the North American rail system that must be preserved and that to allow the Presidio gateway to be closed would be economically short-sighted and contrary to NAFTA.

Hard Rock, Geronimo, and DinoSoil express concern that the proposed abandonment will greatly affect the future of their businesses and the Brewster County economy. They state that they recently established facilities in Alpine and that the line was an integral factor in determining the location of these facilities. They state that the growth of their businesses will benefit the economics of the counties and create jobs.

Ferromex is a newly privatized Mexican railroad that is owned and controlled by Grupo Ferroviario Mexicano, S.A. de C.V. Ferromex connects with SORC at Ojinaga/Presidio and is opposed to the proposed abandonment for the reason that the line provides a vital link between Ferromex and the rail system in the United States and thus is an important means for moving burgeoning commerce between the two countries fostered by NAFTA. It states that the interchange between Ferromex and SORC ended on June 23, 1998, when SORC's bridge 1003.9 was damaged by fire. Ferromex claims that SORC has refused to make repairs and, as a result, it has had to reroute 85 cars to other less direct gateways and presumably, an equal number of southbound cars have had to be rerouted. Ferromex claims that SORC cites the mishap as a further justification for the abandonment of the line. It argues that such bootstrapping should not be countenanced, citing Northwestern Pac. R. Co. Abandonment, 320 I.C.C. 19 (1963), aff'd, Northwestern Pac. R. Co. v. United States, 228 F. Supp. 690 (N.D. Cal. 1964), aff'd mem., Northwestern Pac. R. Co. v. I.C.C., 379 U.S. 132 (1964), to support its contention that damage to a railroad will not permit its abandonment where there is a continuing requirement for its use.

Ferromex states that it is confident of the growth of traffic on the line, especially because of NAFTA. It first began serving the Ojinaga/Presidio gateway in late February 1998, and during its first 3 months of operations, it interchanged with SORC 217 carloads of freight and nearly equal the number of empty cars. The company's confidence in the potential of the Ojinaga/Presidio gateway for the movement of Mexico-U.S. traffic is reflected in its decision to acquire the Topolobompo-Chihuahua-Ojinaga line. Ferromex's planning staff made a projection of the traffic potential on the Chihuahua-Ojinaga line for movement via the Ojinaga/Presidio gateway, which shows that approximately 2,250 additional cars annually originating on the Chihuahua-Ojinaga line would move via Ojinaga/Presidio annually. It states that the Presidio-San Angelo line provides the most direct route between the port of Topolobompo and the city of Chihuahua to Dallas/Fort Worth, and points beyond. Ferromex states that it is ready, willing, and able to operate the line or arrange for a third party to conduct service and is prepared to negotiate with SORRTD to become the line's new operator.

TDED is a Texas agency charged with the responsibility for planning and implementing the state's business development and tourism programs. Its duties include assistance with exporting products and services to international markets, assistance with business and community economic development programs, and promotion and development of tourism within the State. According to TDED, the abandonment of the line would be detrimental to the economic interests of the State of Texas and the potential for future growth of trade and tourism between Mexico and the United States, as NAFTA becomes fully operational. TDED states that in addition to alleviating the strain on cross-border traffic, the San Angelo-Presidio line could eventually open a new gateway to the Pacific for Texas by providing train service to the Mexican port city of Los Mochis on the Gulf of Cortez. Finally, TDED opines that there may be the potential for passenger service transportation, including tourism, particularly between Alpine and Presidio.

The City acknowledges the financial situation of SORC and that traffic on the line is not sufficient to continue operations. The City states that, although the line is unprofitable now, it may become profitable in the future as rail and motor carrier traffic pick up through the Presidio/Ojinaga area. The City expresses its concern about the future of the line and the physical track and states that, if the line is sold for scrap, there is no future for the line.

The Independent School District submits a resolution on behalf of the Board of Trustees of the Presidio Independent School District opposing the proposed abandonment. It states that Presidio County is one of the poorest and most geographically isolated counties in Texas and that the abandonment would have a devastating economic impact on an already improvished economy for Presidio and its residents, especially the children and their future in this community.

The Appraisal District submits a resolution on behalf of the local taxing entities of Presidio County opposing the proposed abandonment. It states that Presidio County is one of the poorest and geographically isolated counties in Texas and that the abandonment would have a devastating economic impact on an already impoverished area.

Ferrocarriles, on behalf of the Mexican government, opposes the abandonment. It expresses concern that, if economic relationships between Mexico and the United States are to thrive under the NAFTA regime, it is critical that rail transportation, as well as other modes of transportation, be maintained at levels that can meet the demands of shippers in both countries. It states that it would be adverse to the interest of both nations to permit the abandonment of the Presidio/Ojinaga interchange point and the scrapping of a line that forms an essential link between the Mexican and the United States railroad systems.

General comments in opposition to the abandonment were filed by Congressmen Henry Bonilla and Charles W. Stenholm. They state that the Presidio/Ojinaga gateway is one of only five rail gateways along the Texas-Mexico border and that preservation of the line is essential to the economic stability of Presidio and west Texas. They also state that, in recent years with the passage of NAFTA, the line has served as a critical facilitator of cross-border trade.

State Senator Jeff Wentworth opposes the proposed abandonment and states that continued service on the line is important not only to the economy of the region, but also to the commerce between Mexico and the United States that NAFTA intended to facilitate.

Garl Boyd Latham is a private citizen who asserts that the abandonment of the line would be a mistake. He states that, if after considering the record, the Board allows the removal of track between San Angelo and Alpine, it should retain the route from Paisano Junction to the Mexican border. Mr. Latham states that, with the continued interest in Texas/Mexico trade, we should not allow abandonment of one of only three trans-Texas railroad routes at the same time that there are serious ongoing discussions about building a new interstate freeway (69 through east Texas) to help handle NAFTA traffic.

Elizabeth R. Covos is a resident of the area served by SORC and states that she is opposed to the proposed abandonment. She contends that continued service on the line is important not only to the economy of the region, but also to the commerce between Mexico and the United States that NAFTA was intended to facilitate.

ALTERNATIVE TRANSPORTATION

According to SORC, shippers who use its services for the movement of overhead traffic to and from Mexico will have numerous other options, including service from UP and The Burlington Northern and Santa Fe Railway Company via the El Paso gateway, and, to a lesser extent, via the Eagle Pass, Laredo, and Brownsville gateways. Shippers on the line will continue to have access to rail service from SORC at San Angelo and from UP at Alpine. SORC submits that local shippers also have effective motor carrier service available because U.S. Route 67 parallels the entire length of the line, Interstate 10 bisects the line and provides direct access to Fort Stockton, as does U.S. Route 285, and Alpine is located on U.S. Route 90. All other locations on the line are served by at least one additional U.S. or Texas state route.

DISCUSSION AND CONCLUSIONS

The statutory standard governing an abandonment or discontinuance is whether the present or future public convenience and necessity permit the proposed abandonment or discontinuance. 49 U.S.C. 10903(d). In implementing this standard, we must balance the potential harm to affected shippers and communities against the present and future burden that continued operations could impose on the railroad and on interstate commerce. Colorado v. United States, 271 U.S. 153 (1926).

The Board must determine whether the burden on the railroad from continued operation is outweighed by the burden on the shippers and public parties from the loss of rail service. This involves a question of whether, and to what degree, shippers will be harmed if rail service is no longer available. The fact that shippers are likely to incur some inconvenience and added expense is insufficient by itself to outweigh the detriment to the public interest of continued operation of uneconomic and excess facilities. Protestants must show that the harm to shippers and communities outweighs the demonstrated harm to the railroad and interstate commerce by continued operation of the line. See Chicago and North Western Transp. Co. - Abandonment, 354 I.C.C. 1, 7 (1977).

In determining whether to grant or deny an abandonment or discontinuance application, we consider a number of factors, including operating profit or loss, other costs the carrier may experience (including opportunity/economic cost), and the effect on shippers and communities. No one factor is conclusive. See Cartersville Elevator, Inc. v. ICC, 724 F.2d 668, aff'd on reh'g, en banc, 735 F.2d 1059 (8th Cir. 1984).

As we discussed in connection with the motion to dismiss, there is some question about whether SORC's option to purchase the track is viable. While the question does not affect our jurisdiction to consider the application, it does impact opportunity costs, which the parties have addressed at length. If there is no state law impediment to SORC's exercise of the option, then it is extremely valuable, giving SORC the right to acquire, at minimal cost, track materials which it values at over $15 million. If it has no such right, then it has no opportunity costs. While opportunity costs are important when forecast year operating losses are marginal, the record here shows that continued operation of the line will impose a substantial economic burden on SORC, involving a forecast year operating loss of $720,043. Thus, it is obvious that, even without considering opportunity costs, SORC cannot continue to operate the line without incurring heavy losses.

In deciding to grant a discontinuance and deny abandonment, we have considered a number of factors, including the potential harm to shippers. We note that none of the three active users of the line has appeared in opposition. However, two potential shippers, Hard Rock and DinoSoil, have presented evidence of possible substantial future traffic for the line. Hard Rock estimates that it would ship 40 carloads a day via SORC; DinoSoil projects shipping 76 carloads every other day. Although they have made no firm commitment of a specific amount of traffic they would ship over SORC, Hard Rock and DinoSoil both have made investments in rail facilities at Alpine, which they state they intend to use to tender traffic to SORC. In addition, SORRTD has submitted verified statements from four additional shippers who state that their businesses are expanding and that they would tender traffic to SORC. While this evidence falls short of assuring us that substantial traffic will be shipped over the line in the near future, it weighs in favor of keeping the track in place.

We have also considered the legitimate concerns of protestants about the effect of an abandonment on the local communities, the larger region, and the free trade objectives of NAFTA. We are extremely concerned about maintaining adequate rail facilities and infrastructure. We are also mindful of our responsibility to ensure that our actions foster the goal of North American economic integration embodied in NAFTA. See Union Pacific Corporation, Union Pacific Railroad Company, and Missouri Pacific Railroad Company--Control and Merger--Southern Pacific Rail Corporation, Southern Pacific Transportation Company, St. Louis Southwestern Railway Company, SPCSL Corp., and the Denver and Rio Grande Western Railroad Company, Decision No. 44, Finance Docket No. 32760, slip op. at 147 (STB served Aug. 12, 1996).

In light of the shippers' evidence of potential traffic, the protestants' concerns that the line remain intact, and Ferromex's willingness to operate the line, we have decided that the public convenience and necessity is best met by approving discontinuance of SORC's service over the San Angelo-Presidio line and the discontinuance of SORC's trackage rights over UP's line. This will permit SORC to curtail the avoidable losses projected by continued operation, while allowing SORRTD to continue to explore the possibility of substituting Ferromex or another carrier as operator of the line. See Chicago and North Western, supra. If traffic projections do not come to fruition, SORC can of course seek abandonment in the future. By contrast, if the abandonment were approved and consummated and were the line to be salvaged, there would be no possibility (without incurring the costs of reconstructing the line) that SORC or a new operator could serve the shippers if the forecasted need for service proves accurate. In these circumstances, approval of abandonment of the San Angelo-Presidio line is not warranted at this time.

We note that 49 U.S.C. 10904 provides a mechanism for those who want to continue rail service that the Board has authorized to be discontinued or abandoned. Under section 10904, any financially responsible person (and all government agencies are deemed to be financially responsible) may file an offer of financial assistance (OFA) to subsidize the losses of the existing operator. In permitting SORC to discontinue operations over the line, including its trackage rights operations over the 11.4-mile segment owned by UP, we recognize that, unless service is continued by virtue of an OFA, there is a potential issue of access by a new service operator over the UP-owned segment. Should a replacement operator be found, we expect UP to be cooperative in facilitating the necessary access so that service over the entire line at issue in this proceeding is possible.

LABOR PROTECTION

In approving discontinuance of service, we must ensure that rail employees are protected, 49 U.S.C. 10903(b)(2). We have found that the conditions imposed in Oregon Short Line R. Co. – Abandonment – Goshen, 360 I.C.C. 91 (1979), satisfy the statutory requirements, and we will impose those conditions here.

ENVIRONMENTAL ISSUES

We are also required to consider the environmental and energy impacts of the proposal. SORC has submitted an environmental report with its application and has notified the appropriate Federal, state, and local agencies of the opportunity to submit information concerning the energy and environmental impacts of the proposal. See 49 CFR 1105.11. Our Section of Environmental Analysis (SEA) has examined the environmental report, verified the data it contains, analyzed the probable effects of the proposed action on the quality of the human environment, and served an environmental assessment (EA) on July 24, 1998. In the EA, SEA indicated: (1) that the U.S. Department of Commerce, National Geodetic Survey (NGS) has identified 172 geodetic station markers along the rail line that may be affected by abandonment and requests that it be notified 90 days in advance of any activities that may disturb or destroy these markers so that plans can be made for their relocation; and (2) that, based on information available at this time, it appears that the Texas Historical Commission (SHPO) and the U.S. Army Corps of Engineers, Fort Worth District, (the Corps) have not completed their review. Therefore, SEA recommends that we impose conditions on any grant of abandonment authority requiring that SORC shall: (1) notify NGS and provide it with 90 days notice prior to disturbing or destroying any geodetic markers so that plans can be made for their relocation; (2) retain its interest in and take no steps to alter any sites and structures on the line that are 50 years old or older until completion of the section 106 process of the National Historic Preservation Act, 16 U.S.C. 470f; and (3) not undertake any salvage activities until the Corps has completed its review and the Board has modified or removed this condition as a result of the Corps' review.

No comments to the EA were filed by the August 20, 1998, due date. Because we are authorizing only the discontinuance of service and the discontinuance of trackage rights, it is unnecessary to impose the conditions recommended by SEA. We conclude, therefore, that the discontinuance of service and trackage rights will not significantly affect either the quality of the human environment or the conservation of energy resources.

PUBLIC USE

SEA has indicated that, following abandonment and salvage of the rail line, the right-of-way may be suitable for other public use. No one has sought a public use condition here. We note, however, that under 49 U.S.C. 10905, we can only prohibit a railroad from disposing of whatever interest it has in the right-of-way. If the railroad does not retain a transferable interest, then a public use condition under section 10905 cannot be imposed. See Boston and Maine Corporation – Exemption – Discontinuance of Service in Essex County, MA, Docket No. AB-32 (Sub-No. 37X) (ICC served June 27, 1988). Here, SORC has no transferable interest because TxDOT owns the right-of-way. Therefore, a public use condition is unavailable.

TRAIL USE

RTC requests issuance of a CITU pursuant to section 8(d) of the National Trails System Act, 16 U.S.C. 1247(d) (Trails Act), to enable it to acquire that portion of the right-of-way between milepost 722 south of San Angelo near Mertzon Station and milepost 945.3 at Alpine Junction and between milepost 956.7 at Paisano Junction and milepost 1029+767 feet at the end of the line near Presidio Station for interim trail use as recreation and transportation facilities. RTC has submitted a statement of willingness to assume financial responsibility for the right-of-way and acknowledged that use of the right-of-way is subject to possible future reconstruction and reactivation for rail service as required under 49 CFR 1152.29. While the right-of-way may be suitable for other public purposes, we have approved only discontinuance of service and discontinuance of trackage rights. The potential use of the right-of-way for rail purposes will preclude other public uses, including use as a trail.

We find:

1. The present or future public convenience and necessity permit the discontinuance of service over the San Angelo-Presidio line and the discontinuance of trackage rights over the UP line, as described above, subject to the employee protective conditions in Oregon Short Line R. Co. – Abandonment – Goshen, 360 I.C.C. 91 (1979).

2. Discontinuance of service over the line and the discontinuance of trackage rights will not have a serious, adverse impact on rural and community development.

3. As conditioned, this action will not significantly affect either the quality of the human environment or the conservation of energy resources.

It is ordered:

1. SORRTD's motion to dismiss the application is denied.

2. Ferromex's and SORRTD's petitions for leave to file replies to SORC's reply are denied and their tendered replies and SORC's further reply are rejected.

3. The discontinuance of service and the discontinuance of trackage rights over the above-described lines is granted subject to the conditions specified above.

4. The request for issuance of a CITU is denied.

5. An OFA under 49 CFR 1152.27(c)(1) to allow rail service to continue must be received by SORC and the Board by October 16, 1998, subject to time extensions authorized under 49 CFR 1152.27(c)(1)(i)(C). Each OFA must be accompanied by the $1,000 filing fee. See 49 CFR 1002.2(f)(25). The offeror must comply with 49 U.S.C. 10904 and 49 CFR 1152.27(c)(1).

6. OFAs and related correspondence to the Board must refer to this proceeding. The following notation must be typed in bold face on the lower left-hand corner of the envelope: Office of Proceedings, "AB-OFA."

7. Provided no OFA has been received, this decision will be effective November 5, 1998. Petitions to stay must be filed by October 16, 1998, and petitions to reopen must be filed by October 26, 1998.

By the Board, Chairman Morgan and Vice Chairman Owen.

Vernon A. Williams
Secretary

Table A-1. Cost and Revenue Data.

	Applicant's Opening Forecast Year Figures	Protestant's Forecast Year Figures	Applicant's Rebuttal Forecast Year Figures	STB Restatement Forecast Year Figures
1. Freight Orig. and/or Term. on Branch	$199,529	$238,017	$199,529	$199,529
2. Bridge Traffic	579,960	691,831	579,960	579,960
3. All Other Revenue and Income	35,985	181,987	35,985	35,985
4. Total Attributable Revenue (Ls. 1 thru 3)	$815,474	$1,111,835	$815,474	$815,474
5. On-branch Costs:				
a. Maintenance-of-Way and Structures	$748,776	$194,604	$748,776	$748,776
b. Maintenance-of-Equipment (Including Depreciation)	105,252	37,910	105,252	105,252
c. Transportation	382,400	275,759	382,400	382,400
d. General & Administrative	185,464	66,511	185,464	185,464
e. Deadheading, Taxi and Hotel	12,480	12,480	12,480	12,480
f. Overhead Movement	0	0	0	0
g. Freight Car Costs (Other Than Return)	71,600	71,600	71,600	71,600
h. Return on Value - Locomotives	35,658	23,772	35,658	35,658
i. Return on Value - Freight Cars	0	0	0	0
j. Revenue Taxes	0	0	0	0
k. Property Taxes	0	0	0	0
l. Total (Ls. 5a thru 5k)	$1,541,630	$682,636	$1,541,630	$1,541,630
m. Holding Gains - Locomotives	6,113	3,493	6,113	6,113
n. Holding Gains (Loss) - Freight Cars	0	0	0	0
o. Net On-br Costs (Ls. 5l - 5m & 5n)	$1,535,517	$679,143	$1,535,517	$1,535,517
6. Off-branch Costs:				
a. Off-Branch Costs (Other Than Return)	$0	$0	$0	$0
b. Return on Value - Freight Cars	0	0	0	0
c. Holding Gains - Freight Cars	0	0	0	0
d. Net Off-br Costs (Ls. 6a+6b - 6c)	$0	$0	$0	$0
7. Total Avoidable Costs (L. 5o + L. 6d)	$1,535,517	$679,143	$1,535,517	$1,535,517
8. Rehabilitation	$0	$0	$0	$120,000

APPENDIX B – ANNUAL TRUCK AND RAIL CROSSINGS

Table B-1. Annual Truck and Rail Crossings.

Years	Brownsville				Eagle Pass				Laredo			
	Truck		Rail		Truck		Rail		Truck		Rail	
	North	South	North	South	North	South	North	South	North	South	North	South
1993	230,262	199,331	7,882	20,531	46,402	52,585	14,571	17,171	488,403	805,503	36,286	109,574
1994	260,751	204,794	11,854	31,119	57,010	60,416	15,177	18,818	614,696	914,421	39,871	121,166
1995	224,642	184,848	13,789	21,820	53,021	59,279	22,331	24,713	744,276	765,425	59,377	109,385
1996	228,776	197,617	19,158	25,389	57,569	68,467	39,795	40,929	999,412	924,724	85,592	133,314
1997	249,881	229,788	11,707	30,842	71,656	83,715	39,438	52,443	1,207,555	1,078,540	93,967	152,230
1998	275,661	290,746	12,134	32,717	90,822	96,474	40,314	56,669	1,315,069	1,192,354	92,829	148,009
1999	287,962	237,189	15,354	31,054	101,242	101,704	41,749	70,069	1,486,511	1,296,779	115,771	168,139
2000	*285,654*	*266,402*	*15,952*	*34,771*	*104,122*	*109,485*	*51,335*	*77,278*	*1,671,240*	*1,342,900*	*128,674*	*173,397*
2001	*293,697*	*280,643*	*16,545*	*36,226*	*113,421*	*118,141*	*56,627*	*86,466*	*1,844,950*	*1,428,910*	*141,648*	*183,000*
2002	*301,743*	*294,913*	*17,140*	*37,674*	*122,721*	*126,795*	*61,917*	*95,646*	*2,018,540*	*1,514,870*	*154,604*	*192,601*
2003	*309,817*	*309,152*	*17,731*	*39,124*	*132,019*	*135,447*	*67,191*	*104,842*	*2,191,870*	*1,600,830*	*167,577*	*202,194*
2004	*317,844*	*323,418*	*18,327*	*40,750*	*141,320*	*144,102*	*72,490*	*114,018*	*2,365,640*	*1,686,820*	*180,537*	*211,800*

Note: Italicized years represent projected values.