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16. Abstract <p>As U.S.-Mexico trade experiences growth after the 1993 ratification of the North American Free Trade Agreement (NAFTA) with considerable economic benefits to the State of Texas, a look at the efficiency of transportation services and linkages at border ports-of-entry is a natural step in planning for future infrastructure. Even before the ratification of NAFTA, many ports-of-entry experienced the problem of congestion. The move toward trade expansion amplifies the problem. These inefficiency problems, witnessed by producers and shippers, are found in fuel consumption (from waiting at the border or transferring goods at the border), substandard transportation infrastructures, dissimilar business practices between Mexico and the U.S., and regulatory practices.</p> <p>This report evaluates the efficiency of moving cargo at the Laredo gateway. The surface transportation modes investigated were motor carriers and railroads. Using two case studies, Contract Freighters, Inc., (CFI) and Union Pacific (UP), this investigation contrasts several border crossing schemes used in the transportation industry.</p> <p>A desirable goal for moving cargo across the border is to eliminate the multi-stage process which sometimes takes a day or two. This study concludes that fuel consumption used in this transborder process increases substantially.</p>					
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**COMMERCIAL SURFACE TRANSPORTATION EFFICIENCY AT THE
TEXAS/MEXICO BORDER: A LOOK AT THE LAREDO GATEWAY**

by

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Research Report SWUTC/95/465640-1

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EXECUTIVE SUMMARY

The Laredo gateway to Mexico is the most important of all major U. S. land gateways with Mexico. This fact holds true for Texas as well. In 1993, nearly 70 percent of the value of all of the United States' surface exports to Mexico went through Laredo. Of the \$37 billion total exports for 1993, \$23 billion went through the Laredo gateway. Fifty-one percent of all U.S. exports into Mexico came from Texas. Of that percentage, approximately two-thirds went specifically through the Laredo gateway. In dollars, this amounts to \$14 billion of exports.¹

Projections to the year 2003 predict that Laredo will still channel nearly 70 percent of U.S. exports through its gateway. However, the understandable rise in overall U.S. exports to Mexico, as a result of NAFTA, lead to an estimated \$36 billion in value of goods. This is an increase of nearly sixty percent or \$13 billion over ten years.²

Looking at these projections, it is easy to understand the importance of focusing on efficiency at this border crossing. If operating costs are not investigated and border crossing schemes are not adjusted, surface transportation carriers (trucks and railroads for the purpose of this study only) will be faced with losing profit by rising inefficiencies created by institutional barriers, dissimilar management practices and infrastructure constraints.

The purpose of this report is to investigate efficiency using one element of a shipper's operating cost -- fuel consumption. In approaching the subject of fuel consumption, this study presents an overview practices used in the distribution process.

This report will seek to answer several questions about fuel efficiency. Is fuel consumption at the border a significant portion of a shipper's overall operating cost? If so, what is the magnitude of that cost? Which mode of transportation, rail or truck, is more fuel efficient when crossing the border? At what stage of the trip through a border gateway does fuel efficiency seem to be a problem? This report uses a case study format of two companies located at the Laredo gateway to assess answers to these questions.

The remainder of Chapter 1 provides an overview of commercial shipping across the border. It describes recent agreements, notably the North American Free Trade Agreement (NAFTA), and recent regulatory changes within the transportation industry on both sides of the border. The overview concludes with an introductory breakdown of the two transportation modes pertinent to this study.

¹ Estimates based on the Lyndon B. Johnson School of Public Affairs Model of NAFTA Impacts, University of Texas at Austin, (October 1994), (Handout.)

² Estimates based on the Lyndon B. Johnson School of Public Affairs Model, (March 1995), (Handout.)

In Chapter 2, typical border crossing methods are evaluated for motor and rail carriers. Crossing schemes presented in recent studies by the Center for Transportation Research are discussed. The process J.B. Hunt Transport and Southern Pacific Lines use in transborder shipments are also outlined.

Chapter 3 begins a case study of Contract Freighters, Inc., (CFI), a motor carrier with a significant presence in Laredo. This chapter not only provides an overview of their operations in Laredo but it also describes the crossing process. Finally, this chapter addresses the inefficiencies experienced by CFI. The report continues with Chapter 4 presenting a Union Pacific Railroad (UP) case study. Practices for transborder shipments are outlined which include a brief overview of the operations at UP's intermodal yard north of Laredo.

The report includes a synopsis of initiatives to increase efficiency in Chapter 5. Among these initiatives are infrastructure expansion and the deployment of new technology. Finally, the report discusses the actual impact of fuel consumption at the border in Chapter 6. Actual data are used to illustrate the magnitude of the situation. The report concludes by answering the questions raised earlier. Research findings suggest that congestion of trucks and their crossing practices at the Laredo gateway currently cause excess fuel consumption.

ABSTRACT

As U.S.- Mexico trade experiences growth after the 1993 ratification of the North American Free Trade Agreement (NAFTA) with considerable economic benefits to the State of Texas, a look at the efficiency of transportation services and linkages at border ports-of-entry is a natural step in planning for future infrastructure. Even before the ratification of the NAFTA, many ports-of-entry experienced the problem of congestion. The move toward trade expansion amplifies the problem. These inefficiency problems, witnessed by producers and shippers, are found in fuel consumption (from waiting at the border or transferring goods at the border), substandard transportation infrastructures, dissimilar business practices between Mexican and the U.S., and regulatory practices.

This report evaluates the efficiency of moving cargo at the Laredo gateway. The surface transportation modes investigated were motor carriers and railroads. Using two case studies, Contract Freighters, Inc. (CFI) and Union Pacific (UP), this investigation contrasts several border crossing schemes used in the transportation industry.

A desirable goal for moving cargo across the border is to eliminate the multi-stage process which sometimes takes a day or two. This study concludes that fuel consumption used in this transborder process increases substantially.

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CHAPTER 1. U.S.- MEXICO OVERVIEW OF COMMERCIAL SHIPPING PRACTICES

BEYOND THE BORDER

A recent report comparing motor carrier deregulatory efforts in Mexico and the United States stated that the Mexican Roads, Bridges and Motor Carrier Act of 1993 has fostered greater deregulation in the Mexican trucking industry than has any U.S. legislation to its trucking industry. This is important since the majority of cargo is hauled by trucks and buses.

The Mexican motor carrier industry has historically been fragmented, informal, and undercapitalized. Heavy government regulation not only created this condition, but inhibited the development of competitive and efficient services such as door-to-door and just-in-time delivery. Mexican for-hire motor carriers are generally small in size, unaccustomed to a competitive environment, and saddled with old equipment. Acknowledging this situation, Mexico has taken significant steps to bring competition to its motor carrier industry through legal reforms.

In 1989, Mexico began deregulation of its motor carrier industry as part of an overall strategy to increase flexibility to both users and suppliers of trucking services. Two main goals of the reforms were to deregulate rates and renovate the nation's obsolete motor carrier fleet and infrastructure.¹

In June 1989, The Mexican Secretary of Communications and Transportation (Secretaria De Comunicaciones y Transportes — SCT) signed the Agreement for Modernization and Restructuring of the Motor Carrier Industry, thus marking the beginning of the reorganization of the Mexican trucking industry. New, less-restrictive trucking regulations were subsequently issued a month later. In this less-restrictive trucking-service market, customers were no longer required to use warehousing and other cargo facilities once mandated by the government. The new regulations clearly stipulated that all registered common carriers could operate freely on all federal highways and state-owned roads when moving freight of any kind, except hazardous materials, and could make pickups and deliveries anywhere in the country. Mexico has since passed the 1993 Roads, Bridges and Motor Carrier Act, which continues the liberalization and codifying process through which competition in the market is guaranteed.

Through the restructuring process, the Mexican government adjusted the motor carrier tariff structure, resulting in reduced costs. Drayage costs, for example, no longer carry a mandatory surcharge for handling imported cargo over the border from the United States.

¹ Lyndon B. Johnson School of Public Affairs. *Logistics Management and U.S. - Mexico Transportation Systems - A Preliminary Investigation*. Policy Research Project Report Series, no. 109. (Austin, Tex., 1994), p. 21.

According to Mexican transportation experts, tariffs have decreased in the range of 25 to 30 percent.

In the context of border operations, Mexican customs regulations effectively serve as nontariff trade barriers. Unlike countries in much of the world, Mexico requires all imports to be handled by a licensed customs broker, who incurs liability for the shipment. The requirement restricts the choice of freight forwarders. All imports are currently processed through a Mexican customs broker, adding delays, costs and risks.

As stated earlier, the trucking industry carries by far the majority of freight cargo in Mexico, and the Mexican government has passed laws and regulatory reforms to make sure that Mexican infrastructure and regulations do not hinder the economic growth expected through increased trade. The efforts have paid off through a huge increase in competition that has driven down costs substantially.²

The deregulation of the transportation industry in Mexico means that rates are to be negotiated freely between user and provider, based on volume of traffic, type of freight, and frequency of shipments. This process parallels deregulation in the United States. The significant difference is the lack of filing of published rates. This will cause rate negotiation and implementation to be on a "contract" type arrangement rather than tariff filing. This is intended to promote healthy transportation competition in Mexico.³

NAFTA is designed to liberalize trade and ease market restrictions on both sides of the United States-Mexico border.⁴ Yet, in the motor carrier industry, the agreement does not sanction perfectly liberalized trade. While NAFTA delineates the guidelines for resolving some issues, other issues have been left unaddressed and threaten the process of trade liberalization.

One issue that is not addressed, and is seen as less of a threat and more a hindrance to efficiency, is the way trucking businesses operate in Mexico. Mexican carriers operate older fleets, have different equipment, and are regulated in a different fashion than their U.S. counterparts. These practices create the particular inefficiencies that result in excess fuel consumption and shipping holdups at the border.

Another issue is the shift to intermodalism to address the differences in regulations and business practices as well as to optimize usage of the available infrastructure.

² Ibid., pp. 21-22.

³ Contract Freighters Inc., "Logistics in Mexico," Presentation by Gary Nichols, CFI Director of International Development, Report at the Council of Logistics Management Annual Conference (1992), p. 6.

⁴ Lyndon B. Johnson School of Public Affairs. *Texas Mexico Multimodal Transportation*. Policy Research Project Report, no. 104. (Austin, Tex.), p. 45.

The Salinas administration moved much more rapidly to deregulate the trucking industry than the railroads; therefore, it is not unexpected that the NAFTA bill will place a greater emphasis on motor carriage. The Mexican trucking industry deregulation is only beneficial to Mexican nationals, leaving U.S. trucking companies to build relations with Mexican carriers. NAFTA does not allow increasing foreign participation in ownership of carriers. Not until December 18, 1995 will U.S. carriers be allowed to own any part of a Mexican carrier (49 percent). However, Mexican carriers may own 100 percent of a U.S. carrier. U.S. carrier participation will be allowed to climb up to 51 percent ownership by 2001 and by the year 2004, U.S. carriers will be allowed 100 percent ownership of a Mexican carrier. These types of investments will be permitted in Mexican trucking companies or terminals providing exclusively international cargo service. (Refer to the Appendix for a NAFTA timetable for trucking provisions.)

COMMERCIAL SHIPPING BY HIGHWAY

Commercial shipments hauled by motor carriers on highways are classified primarily by density of the commodity plus the cost of insuring that item. Shipping weights are further categorized in LTL (less-than-truckload), 500 to 9,999 pounds, and TL (truckload), 10,000 pounds and greater. In Texas, the LTL category makes up the majority of the common carrier service; therefore it deserves the most attention.⁵

Commodities needing special permits deserve mention because they will naturally need special attention and thus delay the process of crossing the border. Hazardous materials and chemicals are two commodities which would need special permits.

Food and/or perishable products like frozen fish or beer also require special handling through the use of refrigerated trailers. These trailers, called reefers, are also potential sources for delay in crossing the border because they need to be monitored more closely.

Many shipments are delivered to the border and placed in temporary storage facilities or yards to accommodate an intermodal transfer, easing the movement of the goods across the border. Union Pacific's Port of Laredo, which will be discussed in Chapter 4, is an example of such an intermodal transfer facility.

⁵ L.B.J. School. *Texas Mexico Multimodal Transportation*. PRP Report, no. 104. p. 129.

COMMERCIAL SHIPPING BY RAIL

Rail is one of the most cost-effective modes for shipping large amounts of bulk products and is the nation's largest carrier mode by volume.⁶ Recent innovations in containerization and intermodal technologies have expanded the types of products shipped by rail and have increased joint ventures between railroad and trucking firms. In fact, containerization has allowed shippers to combine two or more of the various modes of transportation in the movement of products over long distances.⁷ Before the devaluation of the peso, three major rail carriers with direct overland connections to the National Railways of Mexico (FNM) experienced an increase in their business into Mexico in the first half of 1994.⁸

SHIPPING OVER THE TEXAS/MEXICO BORDER

Staff at the Center for the Study of Strategies at the Monterrey Technical Institute have estimated that 30 percent of the imports into Mexico are shipped by rail carriers (U.S. \$17.7 billion), while ten percent of Mexican exports (U.S. \$3.5 billion) are shipped by rail. Motor carriers ship 62 percent of Mexican imports (U.S. 36.5 billion) and 76 percent of Mexican exports (U.S. \$26.3 billion), making the Texas-Mexico border region one of the world's most active transborder shipping regions in terms of value.⁹ Simple adjustments to transborder shipping strategies could result in great savings to rail and motor carriers alike.

Shipments by Roadways

The issue of commercial transportation efficiency at the border is illustrated more comprehensively in this report using motor carriers. Since the focus of this report is on border inefficiencies, one of the most inefficient elements in the crossing scheme, the drayage arrangement, deserves attention.

The drayage process, whereby cargo is transferred across the border by a third-party carrier, is filled with inefficiencies. This process has been described as the forgotten link in the intermodal chain. A study performed by Mercer Management Consulting for the Association of

⁶ Lyndon B. Johnson School of Public Affairs. *Logistics Management and U.S. - Mexico Transportation Systems - A Preliminary Investigation*. Policy Research Project Report Series, no. 109. (Austin, Tex., 1994), p. 37.

⁷ Ibid.

⁸ Lawrence H. Kaufman, "Mexican Traffic Accelerates for UP, SP, and Santa Fe," *Journal of Commerce* (June 27, 1994), p. B1.

⁹ Alejandro Ibarra-Yunez, "Trends in Transport Services in Mexico for the Nineties," Lecture at Seminar Transport Trends in Mexico sponsored by U.S. Mexican Policy Studies Program, LBJ School of Public Affairs, (Austin, Tex., March 25, 1995.)

American Railroads was commissioned to identify problems and suggest solutions.¹⁰ The study primarily focused on Chicago and Los Angeles, and one could assume that the situation would be worse at the border because of the additional institutional barriers in transborder cargo flow.

The study found that drayage costs depend more on time and very little on distance. Labor costs for drayage in Chicago and Los Angeles average just over \$20 an hour, independent of whether the draymen were moving or waiting. Equipment operating costs and fuel are about 45 cents per mile. With the other overhead amount of about \$25 per load, the total cost comes to about \$40 per hour.

The study indicates that most drayage providers who are owner-operators must earn \$300 to \$400 a day in order to pay for their tractor, cover operating costs and earn a modest profit. The Mercer study found that the most promising way to reduce drayage costs was to pay more attention to backhauls and repositioning. Empty mileage drives up the cost at the same \$40 per-hour-rate as loaded mileage.

The Mercer Study also suggests that most of the improvements in the industry are not high-tech but involve tradeoffs within and between intermodal carriers. An example of an improvement suggested in the study balances the cost of manning multiple terminal gates against the cost of letting the draymen wait in one long line.

Inefficient drayage operations have an effect on intermodal shipping competition because each shipment is based on door-to-door cost and service. It is safe to conclude that those companies who learn to work with drayage firms to maximize drayage efficiency will be the most competitive.¹¹

Rail Shipments

A rough estimate of the modal share of rail transportation through the Laredo gateway is about ten percent, according to staff at Union Pacific.¹² This estimate is close to one made by staff at the Center for Study of Strategies at Monterrey Technical Institute, who indicate a border-wide modal share for rail of 30 percent for south-bound cargo and ten percent for north-bound cargo.

The Texas railroad system is grouped into three railroad classes. The major players in the railroad industry are identified as Class 1 railroad carriers. Five Class 1 railroads currently operate in

¹⁰ Joseph Bonney, "Cutting Drayage Costs," *American Shipper Magazine*, (December, 1993), p. 58.

¹¹ Ibid.

¹² Interview by James Sassin with K. J. Prejean, Team Leader, International Customer Service Center, Union Pacific Railroad, Laredo, Tex., November 17, 1994.

Texas: (1) Atchison, Topeka & Santa Fe (ATSF); (2) Burlington Northern (BN); (3) Kansas City Southern (KSC); (4) Union Pacific (UP); and (5) Southern Pacific (SP). Class 2 and 3 railroads are operated over 796 track miles; among these, the Texas-Mexican Railway operates over 157 miles, linking Laredo with the Port of Corpus Christi.¹³ The Mexican railroad system within the border states is comprised of 4,268 miles of track in Coahuila and 1,640 miles in Chihuahua.¹⁴

There are five major rail gateways between Texas and Mexico: (1) Brownsville, (2) Laredo, (3) Eagle Pass, (4) Presidio, and (5) El Paso. Of the Class 1 carriers serving these gateways, UP generates the largest volume of business. UP's revenues from its operations in Mexico were \$250 million in 1991, an increase of 18 percent over 1990.¹⁵

Union Pacific, chosen as a case study for this report, is also the dominant rail carrier through the Laredo gateway, carrying 65 percent of its U.S.- Mexico rail traffic through its Port of Laredo intermodal yard 17 miles north of the city. According to early 1993 statistics, the railroad hauled 150,000 carloads of auto parts and general merchandise through this gateway. American President Lines (APL) uses UP to carry commodities six days a week on double-stack trains.¹⁶

CONCLUSION

Commercial shipping between the U.S. and Mexico are predominantly by motor carriers. Because nearly two-thirds of all shipments use trucks, greater emphasis is placed on investigating the practices of motor carriers. This report looks at the opportunities for lowering operating costs while increasing the potential for intermodal shipping. In the next chapter, border crossing schemes for rail and trucks are discussed.

¹³ Espinosa Rescala, Juan Carlos, Harrison, Rob and McCullough, B.F. *Effect of the North American Free Trade Agreement on the Transportation Infrastructure in the Laredo-Nuevo Laredo Area*, Center for Transportation Research, Report 1312-2, University of Texas at Austin, (Austin, Tex., November 1993), p. 38.

¹⁴ *Ibid.*, p. 41.

¹⁵ L.B.J. School. *Texas Mexico Multimodal Transportation*. PRP Report, no. 104, p 63.

¹⁶ Paul D. Schneider, "Mexican Connection," *Trains* (January, 1993), pp. 51-52.

CHAPTER 2. BORDER CROSSING METHODS

A recent study at the Center for Transportation Research (CTR) has outlined a schematic for truck traffic crossing the Laredo border. The crossing patterns illustrated in that study, along with crossing schemes used by Southern Pacific Railroad Lines and J.B. Hunt Transport Services, are explained in this chapter.

SOUTH-BOUND TRUCK TRAFFIC

The crossing scheme for truck traffic begins with the CTR findings. The U.S. carrier brings a loaded trailer from the trailer's point of origin to the carrier's yard in Laredo. A freight forwarding company, or less frequently, a U.S. customs broker agency will handle the border crossing. Usually, pre-notification of the shipment is received, allowing preparation time for documents needed to clear U.S. and Mexican customs. Delivering the documentation in a timely manner is critical to expedite the border crossing. In the case of LTL (less-than-truckload) shipments, the loads are broken down into different routes or consolidated in the carrier's yard. The trailer is then delivered to the freight forwarder's yard, where the load may be consolidated, checked, or downloaded in order to be inspected or classified. Trailers from larger U.S. carriers will usually be truckload shipments and will cross the border and reach their destination with their original load. The freight forwarders may use their own tractors, or they may subcontract the services of a drayage company.¹⁷

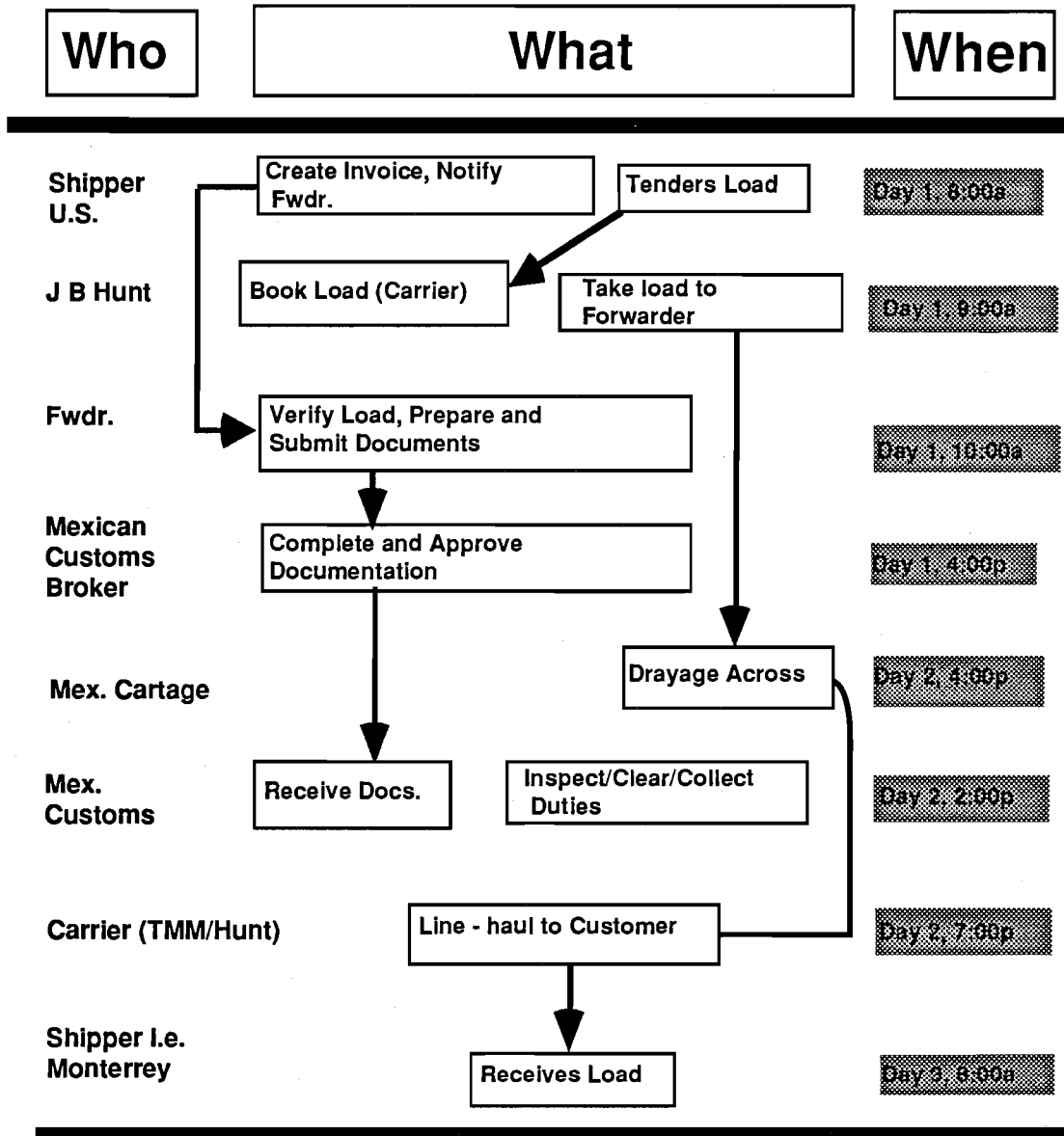
The documents, referred to as "pedimento," are prepared and duties are paid prior to the crossing of the merchandise into Mexico. Once the pedimento have been submitted to Mexican customs, they are delivered to the Mexican broker, who works with the U.S. freight forwarder. On the U. S. side, the freight forwarder is notified that the load has been cleared, and the truck then proceeds south-bound. To move merchandise out of the U.S., a Shipper's Export Declaration has to be presented at U.S. customs, either manually or electronically. Licensed material or in-bond documents to be canceled are also presented when necessary. Once on the Mexican side, the dispatcher from the Mexican customs brokerage meets the trucks, matches the manifest (or "relacion de entrada") brought by the trucker with the pedimento, and presents them to the Mexican customs officer. The Mexican customs' computer then determines whether the truck should be inspected. The percentage of shipments inspected depends on the regulation that is

¹⁷ Said, Claudia, Harrison, Rob, Hudson W.R., *Transborder Traffic and Infrastructure Impacts on the City of Laredo, Texas*, Center for Transportation Research, Report 1312-1, University of Texas at Austin, (Austin, Tex., November 1993), p. 33.

applicable to different categories of merchandise. Shipments then go through a random process of inspections. This process utilizes green lights to proceed and red lights to stop for an inspection. If a shipment gets a green light, it proceeds, with the Mexican customs process taking about 15 minutes. If it gets a red light, the truck goes to the inspection yard for further processing. After passing through customs, the trailer is then hooked up to the Mexican carrier's tractor and taken to its final destination or another carrier.

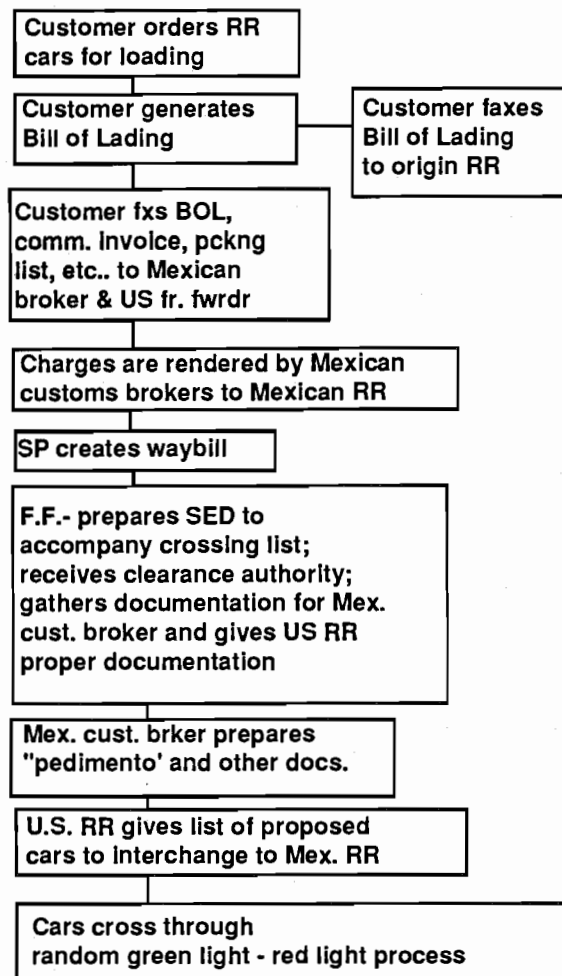
The border crossing scheme used by J.B. Hunt in its south-bound shipments is illustrated in Figure 2.1. The crossing method is illustrative of the one outlined in the CTR report with the addition of the time element, and indicates that a shipment could take 48 hours from the time the invoice is created until it reaches a destination in Monterrey. The most significant portion of the scheme is the 11 hours it could take for a shipment to move through the drayage process.

The sequence begins with the shipper creating the invoice and notifying the forwarder. The forwarder then submits documents to the Mexican customs broker for approval. While the broker is handling the paperwork, J.B. Hunt is carrying the load to the location where it is dispatched to a Mexican cartage company. The cartage company completes the drayage process by bringing the shipment through Mexican customs and delivering it to the line-haul carrier. In this case, Transportation Maritima Mexicana, S.A. de C.V., (TMM)/Hunt de Mexico, is responsible for the line-haul to the customer. The last portion of the scheme is the actual delivery to the customer's final destination. In this example, the destination is Monterrey.



Source: J.B. Hunt Transport Services. Inc., 1995.

Figure 2.1 South-bound crossing method used by J.B. Hunt Transport



Source: "Doing Business in Mexico," Southern Pacific Lines, 1994. pp. 3-4.

Figure 2.2 South-bound crossing method used by Southern Pacific Lines

SOUTH-BOUND RAIL TRAFFIC

The Southern Pacific Line's procedure for shipping goods south-bound is described next.¹⁸ Its sequence for crossing the border is illustrated in Figure 2.2. First, the customer works with the originating railroad by ordering cars and faxing them a bill of lading. Next, documentation

¹⁸ "Doing Business With Mexico," Richard T. Campbell, Director - Strategic Analysis - Mexico, Southern Pacific Lines, (1994), p. 3. (Handout.)

such as a bill of lading, packing list, commercial invoice, and packing lists are faxed to the Mexican broker and to an affiliated U.S. freight forwarder or customs broker. The customer sends originals via overnight service to a U.S. freight forwarder or customs broker. Failure to supply all proper documents could result in border demurrage and late document charges. At this time, all moneys for Mexican railroad freight charges are rendered by the Mexican customs broker to the Mexican railroad along with the bill of lading/shipping instructions. The Mexican broker then renders per diem charges to the U.S. railroad serving the border at the time the car is cleared. Then, SP or the originating railroad creates a waybill and SP (Tex-Mex railroad at Laredo) gives a copy to the Mexican broker for information to complete documentation.

Next, the freight forwarder or U.S. customs broker prepares and files a "Shipper's Export Declaration" (SED), which will accompany the crossing list given to the U.S. railroad. The freight forwarder is also responsible for obtaining clearance from U.S. customs, gathering U.S. certificates required by the importer, and providing the U.S. railroad with a crossing list, an SED, a copy of the Mexican railroad waybill and a copy of the paid per diem form.

The next stage is handled by a Mexican customs broker, who represents the Mexican importer, and is the only legal facilitator authorized by Mexican law. Mexican law holds the broker responsible for all import duty assessment, government tax ID number, and special documentation required for certain commodities. Responsibilities of the Mexican customs broker are to present documentation "pedimento" and duties to the Mexican customs office, to prepare Mexican railroad shipping instructions/bill of lading, to pay applicable per diem charges to the U.S. railroad making interchange with a Mexican Railroad, to pay any accrued border demurrage on behalf of the shipper or consignee depending on the "Terms of the Sale," and to present a copy of the Mexican railroad waybill and certified paid per diem form to the freight forwarder.

During the last stage of the process, the U.S. railroad gives a list of proposed cars to interchange to the Mexican railroad. The Mexican railroad checks the list against the documentation list and accepts the interchange of cars if they are properly documented. The final step involves a process whereby each car goes through a random green light - red light procedure. If the light turns red, the car must be inspected before it is carried to its final destination.¹⁹

¹⁹ Ibid., pp. 3-4.

NORTH-BOUND TRUCK TRAFFIC

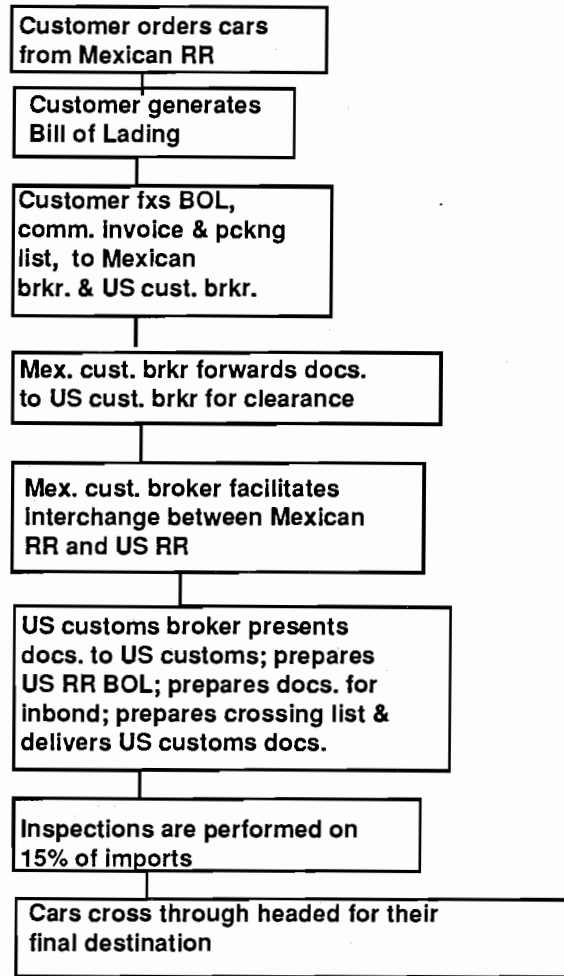
The border crossing method identified in the CTR study is described for trucks traveling north. A load of cargo to be imported into the U.S. is transported from its point of origin to Nuevo Laredo by a Mexican carrier. From that point, a Mexican transfer or "alijador" crosses the trailer into the U.S. Prior to crossing, the Mexican export documents "pedimentos," which are similar to the import documents, are presented to clear Mexican customs. Imports into the U.S. are normally handled by a U.S. customs broker, who will work with a Mexican customs broker to handle the export documentation in Mexico. In an automated process, the Mexican broker will send the documents electronically or by fax to the U.S. broker, who then inputs the information into the U.S. customs centralized database. When the truck arrives at U.S. customs, there are different ways of dispatching. The truck goes into the import lot with the driver and truck documentation and with the Inward Cargo Manifest. The broker's dispatcher meets the truck, matches the documents prepared at the broker's office with those brought by the truck, and gives them to the import inspector.²⁰

NORTH-BOUND RAIL TRAFFIC

Once again, Southern Pacific Lines is used to illustrate the transborder rail crossing scheme at Laredo. Their north-bound process, as illustrated in Figure 2.3, begins with the customer ordering cars from a Mexican rail carrier. They generate a Bill of Lading and fax it, along with a commercial invoice, a packing list and other required certificates to the Mexican broker and the U.S. customs broker. The customer then sends document originals via overnight service to the U.S. customs broker. Failure to supply all proper documents could result in border demurrage and storage charges. The Mexican broker also forwards documentation to the U.S. customs broker for U.S. clearances. The Mexican customs broker is the only legal facilitator authorized by Mexican law.

The Mexican railroad then provides a list of cars which will interchange with the U.S. railroad. The U.S. railroad checks the list against their documentation list and accepts the interchange of cars if they are properly documented.

²⁰ Said, Claudia, Harrison, Rob, Hudson W.R., *Transborder Traffic and Infrastructure Impacts on the City of Laredo, Texas*, Center for Transportation Research, Report 1312-1, University of Texas at Austin, (Austin, Tex., November, 1993), p. 34.



Source: "Doing Business in Mexico," Southern Pacific Lines, 1994. pp. 3-4.

Figure 2.3 North-bound crossing method used by Southern Pacific Lines

The next step involves the U.S. customs broker, who represents the importer or exporter depending on the "Terms of Sale," and their responsibilities are manifold: (1) they protect against U.S. customs fines by arranging inspections of merchandise by U.S. customs; (2) they prepare revised commercial invoices or packing lists; (3) they collect duties from the importer and pay to U.S. customs; (4) they prepare all required forms and gather all required certifications; (5) they present documentation to U.S. customs and prepare the U.S. railroad bill of lading; (6) they

prepare documentation for inbound shipments entering the U.S.; and (7) they prepare crossing lists of cleared cars to give to the U.S. railroad at Laredo.

The final step is administered by U.S. customs. Inspections are performed on approximately 15 percent of import shipments with about half of these being conducted to insure that the products comply with trademark, copyright, labeling and commercial invoice description regulations. The other half are for enforcement of smuggling and other interdictive measures. All shipments are subject to selection for U.S. customs inspection, with some requiring complete off-loading (transfer) of lading for inspection, and the cost is borne by the importer of record.²¹

CONCLUSION

The efficient flow of the crossing strategies presented in this chapter depend on appropriate dissemination of shipping documents. The potential for delays is great if shipments arrive at the border without complete paperwork.

The crossing methods for rail and motor carriers are similar. One of the dissimilar elements is the drayage process used by trucks. Crossing patterns are even similar for goods traveling to and from Mexico for each mode. A primary difference is the deployment of freight forwarders for goods traveling south.

The next chapter discusses the case study evaluations, where these crossing schemes are compared and contrasted with those of Contract Freighters, Inc. and Union Pacific Railroad.

²¹ Class Presentation by Richard T. Campbell, Director - Strategic Analysis - Mexico, Southern Pacific Railroad, at the Lyndon B. Johnson School of Public Affairs, Austin, Texas, September 6, 1994.

CHAPTER 3. CONTRACT FREIGHTERS, INC. CASE STUDY

OVERVIEW

Contract Freighters, Inc. (CFI) began conducting business in Mexico in 1986 with 85 carriers.²² Unlike J.B. Hunt, who formed only a handful of partnerships from the beginning, CFI works with approximately 20 Mexican carriers. Furthermore, CFI currently lists 188 approved brokers/freight forwarders who may select these carriers.²³ Rather than relying on agreements with only a few Mexican carriers, CFI, with its large pool of Mexican carriers, is able to offer a more diverse package of services, making CFI unique.

CFI, headquartered in Joplin, Missouri, is an irregular route truckload carrier with 43 years of business history in the United States and eight years in Mexico. Based on 1992 Interstate Commerce Commission (ICC) statistics, CFI is in the top 50 largest motor transportation companies in the United States. In the truckload carrier category, CFI ranks as one of the larger carriers in gross revenues and is consistently top ranked for operating performance. They generated \$193.3 million in revenue for 1993. Also in 1993, 100 percent of the approximately 1,400 trucks and 4,000 48-foot trailers were equipped with AIR-RIDE suspension, making them the only major truckload carrier to offer a 100 percent AIR-RIDE transportation service. This service addresses a key decision element made by shippers, which is handling.

CFI has grown in the Mexican market a minimum of 50 percent annually for each of the past five years. In 1992, they moved more than 40,000 truckloads to and from Mexico. Since the deregulation of trucking in the United States, CFI has grown over 1,000 percent with revenues increasing from \$12 million annually in 1980 to over \$170 million in 1992.²⁴ Most of this growth is attributed to the progressive changes taking place in the Mexican market.²⁵ It is still too early to make any estimate about the effects the peso devaluation will have on the growth of CFI. In early 1995, CFI was moving approximately 25 loads per day across the border at Laredo. This figure was down by more than 50 percent from the end of 1994 when they were moving 60 to 80 loads per day.²⁶

²² Romba, Phil, "Golden Borders," *DES Magazine*, (June, 1994), p.35.

²³ CFI Approved Brokers/Freight Forwarders, Laredo, Tex., April 27, 1994 (Revised List)

²⁴ Contract Freighters, Inc., Joplin, MO. 1994. (Brochure.)

²⁵ Contract Freighters Inc., "Logistics in Mexico," Presentation by Gary Nichols, CFI Director of International Development, Council of Logistics Management Annual Conference (1992), pp. 6-7. (Handout.)

²⁶ Interview by James Sassin with Saul Gonzalez, Manager of Mexican Operations/Sales, Contract Freighters, Inc., Laredo, Tex., January 6, 1995.

Most of the tractors used by CFI are Kenworth T600A models equipped with 350 horsepower Cummins diesel engines. Their oldest truck still in use is four years old.

The tractors, traveling on the open road (e.g. the interstate) pulling fully loaded trailers, operate at a fuel consumption rate of 6.7 miles per gallon. That figure would be eight percent lower with an empty trailer.²⁷ Operating costs and fuel efficiency calculations using these numbers are evaluated in a later chapter.

CFI purports that hidden costs affect efficiency. The total cost per mile is not necessarily the total cost of transportation. A complete breakdown of CFI's operating costs are not presented in this report; however, the list below shows a prioritization of the key elements in CFI's shipping costs in Mexico.

1. Special packaging/handling
2. Line haul transportation basics — cost per mile, per cwt per vehicle (trailer or container), or cubic displacement
3. Border custom brokerage/freight forwarder fees (USA)
4. Warehousing handling fees — for unloading/storage/reloading/palletizing, etc.
5. Border custom brokerage/freight forwarder fees (Mexico)
6. Cartage across border — usually negotiated and included with Mexican freight forwarder charges
7. Cargo insurance within Mexico, if desired
8. Mexican motor carrier charges — per mile/per vehicle/ cwt, etc.

CFI emphasized that if the eight key elements are not handled in a professional and timely manner, major snags in the distribution process may occur. They also emphasize the importance of the selection of a carrier familiar with the marketplace.

Another inefficiency is the cost of equipment. Demurrage costs almost \$20 per trailer, which equates to almost \$1,800 per day for the total number of trailers operating in Mexico, a cost most carriers are attempting to reduce.²⁸

CFI uses the telephone and fax machine to process orders and stay in close contact with their carriers and shippers. They are able to monitor the movement of a shipment at any point in

²⁷ Telephone interview by James Sassin with Herb Schmidt, Senior Vice-President Operations, Contract Freighters Inc., Joplin, MO. January 11, 1995.

²⁸ Contract Freighters Inc., "Logistics in Mexico," Presentation by Nichols, CFI Director of International Development, Council of Logistics Management Annual Conference, (1992), p. 4. (Handout.)

the U.S. at any time using a tracking system called the Highway Master®. It is expected that this system will be utilized in Mexico in the near future.²⁹

NORTH-BOUND TRUCK TRAFFIC BY CFI

The split between south-bound and north-bound loads before the peso devaluation was about three to one.³⁰ Sequencing details about cargo moving north-bound by CFI were not available

SOUTH-BOUND TRUCK TRAFFIC BY CFI

During the primary portion of the data-gathering phase of this study, which was before the peso devaluation, the shipping emphasis was on the south-bound direction. As a result, literature on the sequencing of CFI's Mexico-to-U.S. shipping practices is limited. Also, it should be noted that CFI is historically a carrier that primarily moves in the south-bound direction. CFI's method for shipping to Mexico follows.

There are two essential actions that can mean the difference between a timely delivery and one marred by delays. First, the shipper should clearly stipulate its requirements in a written agreement which should include delivery date and equipment specifications — anything that may affect the disposition of the delivery or goods. For this reason, it is advantageous to work with a forwarder that has a good system for handling advanced paperwork and can ensure that the necessary documentation will be sent well in advance of the load.

After a load is picked up from its point of origin, it is hauled to a terminal in Laredo. Laredo is considered a key gateway by CFI because it has better highway connections and a consolidation of investments by both borders. Most major Mexican carriers gravitate to Laredo where U.S. carriers like CFI have invested in large state-of-the-art terminals. A "funnel" situation occurs at the border because carriers must post a bond to ensure equipment entering Mexico will leave the country within a specified number of days and must also exit Mexico through the same "port" it entered.

Trailers must be inspected at the U.S. terminal before being handed over to a cartage company. This insures that equipment will return from Mexico in the same condition it was sent. In the eight years prior to the 1994 data used in this report, CFI never lost a trailer in Mexico. Once

²⁹ Contract Freighters Inc., *Highway Master*®, 1994, (Brochure.)

³⁰ Muller, E.J. "Trucking into Mexico," Senior Editor, *Distribution Magazine*, (June 1993), p. 13.

the trailer is loaded and inspected, it is given to a cartage company which has authority to move it across the border, through customs, and deliver it to the Mexican carrier.³¹

As many as 2000 loads cross the 1.8 mile long Laredo bridge every day (1993 figures) and the back-up can be lengthy. One of the more crucial delays is caused by truckers whose loads have not been pre-cleared, and whose duties have not been paid in advance. The problem of duty payments has worsened as a result of a decline in Mexican spending power from the peso devaluation.³²

The majority of loads (in excess of 98 percent) moving into Mexico through Laredo cross the downtown bridge rather than the new Colombia toll bridge near the CFI yard. This toll facility connects Texas to the Mexican state of Nuevo Leon. The bridge diverts traffic from Nuevo Laredo in the neighboring state of Tamaulipas. Mexican brokers are licensed by the state, and it is thought that brokers who forfeit a license in Nuevo Laredo to set up shop in Nuevo Leon may not get a new license. Therefore, 150 forwarders/brokers are in Nuevo Laredo and four are in Nuevo Leon.

During the customs inspection and duty collection, delays are caused by carriers that do not send paperwork in advance and instead wait until the trailer has entered Mexico. Of the 2,000 loads that cross at Nuevo Laredo daily, there are perhaps 200 different carriers involved. If paperwork and duties have been handled in advance, crossing can take two hours. With paperwork delays, loads can spend many hours, and even days, in the U.S. forwarder yard awaiting approval to move.

Clearing customs begins at Module 1, which exists at all gateways. One out of every 20 trailers is subject to a mandatory inspection. Drivers then process through the green light — red light system. A green light means cargo is free to travel upon payment of duties, and a red light means it will be detained. Customs may inventory the whole trailer if they are unfamiliar with the shipper, consignee or carrier, or they may determine that the load and the manifest do not match and demand that more duties be paid by the forwarder.

Duties are paid at the Bank of Laredo upon clearance. Customs brokers can pay in cash, by check or through wire transfer. A wire transfer hastens the process, but many companies are afraid of untraceable breaks in the paper trail and do not want to pay twice to get shipments into the country. They would rather wait to hand over duties at the point of entry. This does not apply to big shippers who handle their paperwork through faxes and pay duties through wire transfers.

³¹ Ibid.

³² Interview by James Sassin with Saul Gonzalez, Manager of Mexican Operations/Sales, Contract Freighters, Inc., Laredo, Tex., January 6, 1995.

Once through customs, the trailer is delivered to the Mexican carrier's terminal where loads are prepared for the move inland. Here, CFI trailers arrive at Transportes Nueva Laredo, one of 21 Mexican trucking firms with which CFI does business. Optimally, a trailer should be cleared through this facility in less than four hours. If the Mexican partner does not have a well-organized system and incoming shipments have not already been accounted for and equipment reserved, this process can be delayed.

In the final stage, regardless of where a vehicle enters Mexico, it will encounter another customs checkpoint 25 kilometers from the port of entry. The agents at these stations check the license of the Mexican driver and to see that the cargo seal is intact and that the bond was properly issued and intact in the trailer. Surprisingly, there are rarely delays in this final stage.

Finally, it is important to note that the method CFI uses to ship cargo south-bound is comparable to that of J.B. Hunt. However, one difference needs to be pointed out. J.B. Hunt's use of fewer carriers reduces the possibility for border delays. Customs officials tend to inventory whole trailers if they are unfamiliar with a carrier, and since CFI uses a greater number of carriers, the potential for customs officials to be unfamiliar with CFI carriers is greater than with those of J.B. Hunt.

CONCLUSION

Currently, 2,000 loads of cargo cross at Laredo daily. More than 98 percent of the loads use the downtown bridge, leaving the Colombia bridge near the CFI yard underutilized. Though normal movement of CFI shipments through the downtown bridge is at the same level as other shippers in Laredo, it could be expedited with the use of the Colombia bridge. This is the most obvious of the findings in the CFI case study.

Another noteworthy finding is a continuing emphasis of the importance of having shipping documents handled in an expeditious manner. CFI personnel are quick to point out that the paperwork needs to be in place in order for cargo to move. This is especially important for their business because they work with multiple carriers and brokers/forwarders.

CHAPTER 4. UNION PACIFIC CASE STUDY

OVERVIEW

Union Pacific's (UP's) Laredo facility has 25 tracks, a 1,100 car capacity, and trailer-on-flatcar (TOFC) facilities with two overhead cranes. UP serves approximately two-thirds of the industries that use rail transport in Laredo, including five of Laredo's industrial parks. The Laredo gateway is the sole rail border crossing capable of carrying railcars weighing 279,000 pounds gross weight.

UP has formed alliances with two highly respected motor carriers. In March 1992, UP and J.B. Hunt Transport announced that they would provide door-to-door intermodal service at both UP's Memphis and Chicago ramps. Goods originating at these ramps can now proceed to the Port of Laredo intermodal facility. This service is a relatively new intermodal link with Mexico.³³

The Port of Laredo intermodal facility, owned and operated by Union Pacific Motor Freight, currently has four tracks to assist inbound and outbound trains. In addition, five tracks — soon to be expanded to nine — are used for holding or arranging blocks of trains. With the customs office moving to the Port, freight movement is expected to flow more efficiently.³⁴

The other partnership with Schneider National Trucking, finalized in September 1992, creates links to northern California and the Pacific Northwest along with UP's existing connections in Texas and Mexico.³⁵

These efforts toward increasing intermodal shipping practices are illustrative of optimizing the use of the available transportation infrastructure and therefore distributing cargo more efficiently, often eclipsing other efficiency efforts.

An area briefly investigated in this study explored the usage and efficiency of locomotives. While actual fuel efficiency data was not gathered, attitudes about locomotive fuel consumption were easily gleaned from UP's practices

Surprisingly, rail engines are rarely turned off. It was found that if they are turned off, moisture infiltrates the cylinders, severely damaging the engine.³⁶ It is not unusual for locomotives to remain running for the entire 90-day duration between servicing.

³³ *Texas Mexico Multimodal Transportation*. Policy Research Project Report, no. 104, p 66

³⁴ Interview by James Sassin with Oscar R. Salinas, Operations Manager, Union Pacific Motor Freight, Port Laredo, Tex., January 5, 1995.

³⁵ Had it been known that these partnerships existed before subjects for the case studies were chosen, one of these trucking companies would have probably been selected.

³⁶ Interview by James Sassin with Juan Aguilar, Manager, International Customer Service Center, Union Pacific Railroad, Laredo, Tex., November 17, 1994.

A recent cover story in *Popular Mechanics* evaluated the new 5,000 horsepower, 25-ton Caterpillar 3612 diesel called the MK5000C. It has 1,000 horsepower more than traditional locomotives. Built by the MK Rail Corporation (a subsidiary of Morrison Knudsen), it challenges the new EMD built by the General Electric and General Motors' Electro-Motive Division. The engines use diesel-electrical locomotion.

With these stronger engines, fewer locomotives will be needed to pull each train. Using fewer locomotives addresses the energy/emission problem, which is expected to worsen with increased transborder movement. (A ten percent per year increase for the next five to six years is projected by Union Pacific.)³⁷

Southern Pacific will receive the first three MK5000Cs. Union Pacific will get the next three. MK Rail is expected to make 62 of the MK5000Cs in 1995.³⁸

Currently, it is unknown how these locomotives will compare with traditional locomotives in terms of overall fuel efficiency. However, because the new locomotive's power supply will be a combination of alternating current (AC) and diesel engine, the load distribution of the locomotive will be such that stress on the rails will be reduced drastically. The arrival date of these locomotives at the Laredo gateway is undetermined.

CROSSING THE BORDER

Until recently, UP was operating on a schedule whereby cargo would move north for 12 hours and then shift south for 12 hours. During those 12 hours, the yard either at the border or at the Port of Laredo would stage or block as many as 400 cars at a time.³⁹

This type of crossing scheme is adjusted according to demand. Illustrated in Tables 4.1 and 4.2 are monthly railcar counts in both directions across the Laredo bridge from 1991 to 1994. The trend toward increased transborder flow from 1991 to 1994 is easy to decipher and also is misleading. However, another observation from the tables is the fluctuation from month to month. This fluctuation keeps the UP crossing scheme dynamic with a need for constant adjustment.

³⁷ Union Pacific Railroad, *A Bridge to the Future - Laredo, Tex.*, Laredo, Tex., (1994), (Brochure.)

³⁸ Pope, Gregory T., "5000 Horsepower!" *Popular Mechanics*, December, 1994, pp. 49-52.

³⁹ Interview by James Sassin with K.J. Prejean, Team Leader, International Customer Service Center, Union Pacific Railroad, Laredo, Tex., November 17, 1994.

TABLE 4.1 CARS RECEIVED FROM FNM RAILROAD TO UNION PACIFIC AT LAREDO (NORTH-BOUND).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
9 1	5142	5046	6023	5383	6013	5454	5952	6565	5850	6981	6186	6501
9 2	7121	7826	7836	6727	7718	6343	6732	6754	7181	7913	7207	7261
9 3	8110	7513	8855	7748	7434	9313	6028	6252	6823	7016	7667	8030
9 4	8261	8061	9496	7334	7902	8168	5529	7541	6629	8382		

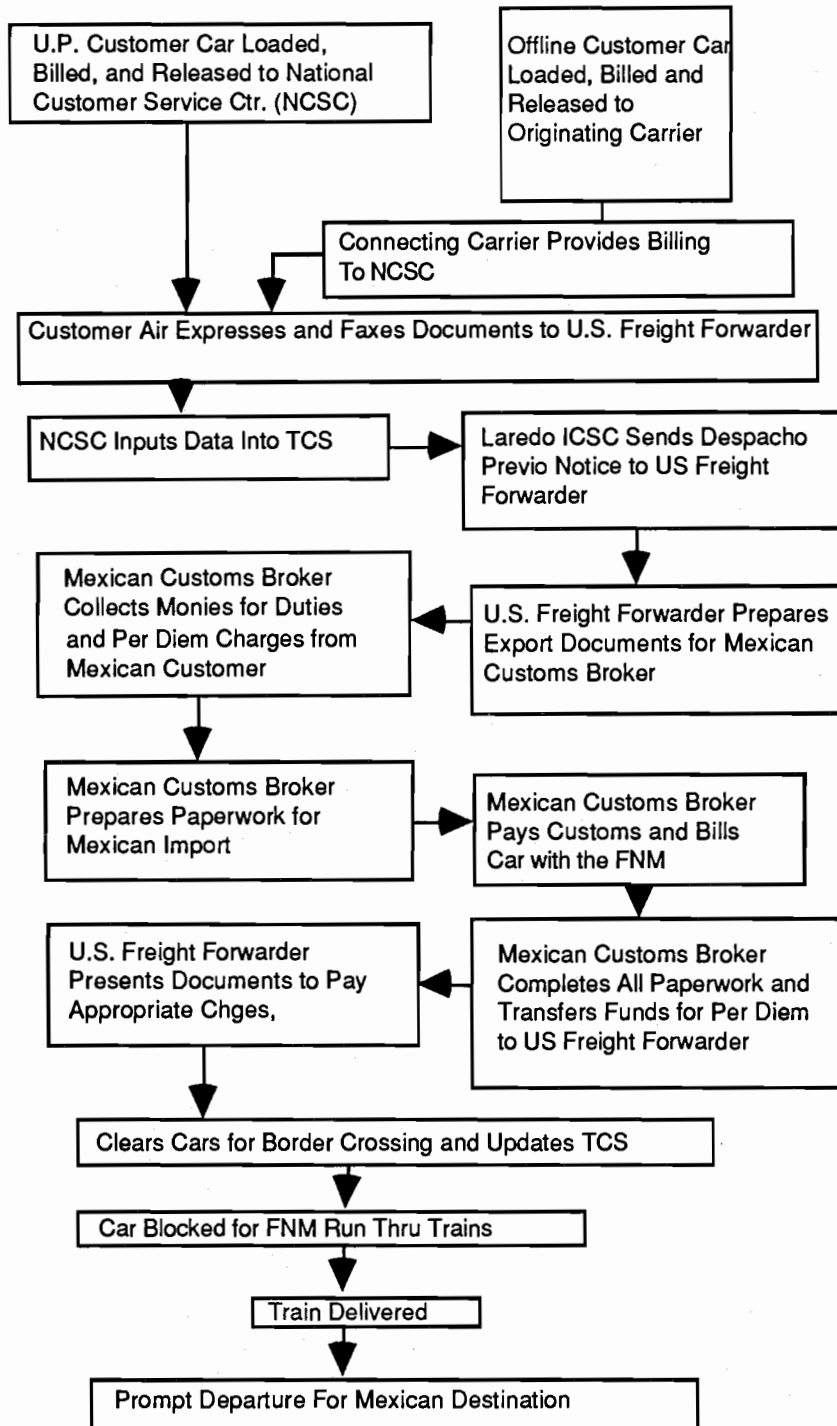
TABLE 4.2 CARS DELIVERED TO FNM RAILROAD BY UNION PACIFIC AT LAREDO GATEWAY (SOUTH-BOUND).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
9 1	5024	5226	5943	5381	5798	5788	5776	6068	6018	6347	6237	7156
9 2	6680	7409	8049	7573	9177	6929	6597	6524	7363	7083	7132	7495
9 3	7996	7534	8626	8028	9268	8953	6766	7561	6697	7589	7995	7952
9 4	7997	7571	9214	8584	9084	6378	4255	8268	6795	9421		

Source: Juan J. Aguilar, Union Pacific Railroad, Laredo, Tex.
November 11, 1994, (computer printout.)

UP's border crossing scheme has been streamlined through a pre-clearing process initiated in 1990, called "Despacho Previo" (DP), which is outlined in the flowchart in Figure 4.1.⁴⁰ In the south-bound direction, Union Pacific holds its traffic on the U.S. side of the border until its cars have been cleared by Mexican customs.

⁴⁰ Interview by James Sassin with Juan Aguilar, Manager, International Customer Service Center, Union Pacific Railroad, Laredo, Tex., November 17, 1994



Source: Union Pacific Railroad, Laredo Tex, 1994

Figure 4.1 The Union Pacific despacho previo process (south-bound)

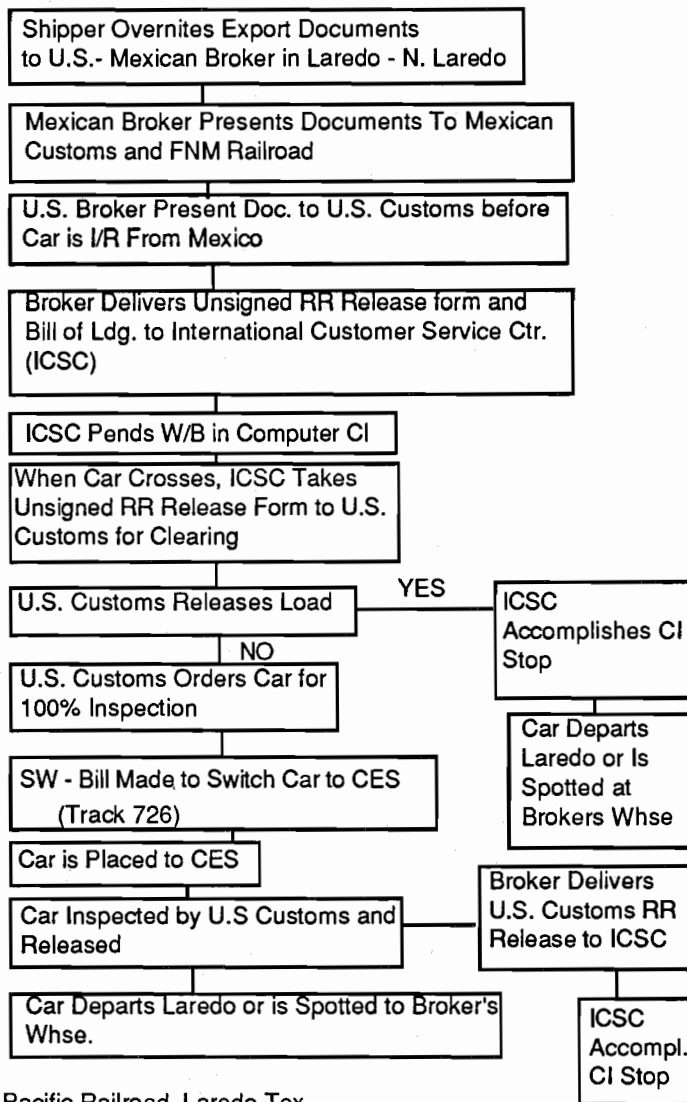
The UP crossing sequence begins with their National Customer Service Center (NCSC), at the border. The Center is responsible for connecting the customer with the freight forwarder and the customs broker. By taking care of the paperwork and sending the DP notice to the U. S. freight forwarder, the shipper is assured that it is pre-cleared.

The freight forwarder then prepares export documents for the Mexican customs broker. After receipt of the documents, the Mexican customs broker collects the duty and per diem fees from the Mexican customer. The Mexican customs broker then prepares the paperwork for Mexican import. After all fees are paid and all paperwork transferred, the U.S. freight forwarder arranges for the cars to cross the border. Once cleared, the broker's agent sends notification, and the cars proceed through Nuevo Laredo to their final destination. According to a recent Center for Transportation Research report, about 60 percent of all rail shipments are pre-cleared using this system.⁴¹

Traffic in the north-bound direction can also be pre-cleared, as illustrated in Figure 4.2. When a trailer leaves its point of departure in Mexico, an invoice is faxed to the U.S. customs broker who pre-files the documents with U.S. customs. When the railcars cross the bridge, the U.S. customs office is notified to verify that the railcar is free to proceed. Those railcars that are not pre-cleared are sealed by customs with a holding seal at the bridge and held at the rail yard until the broker provides the correct documentation.⁴²

⁴¹ Said, Claudia, Harrison, Rob, Hudson W.R., *Transborder Traffic and Infrastructure Impacts on the City of Laredo, Texas*, Center for Transportation Research, Report 1312-1, University of Texas at Austin, (Austin, Tex., November 1993), p. 38.

⁴² Ibid.



Source: Union Pacific Railroad, Laredo Tex, 1994

Figure 4.2 Union Pacific pre-files crossing process (north-bound)

The trainmaster (or Manager of Train Operations as they are now called by UP) for FNM and Tex-Mex makes the decision at the bridge as to how and when a "cut" of cars is going to cross the bridge. This decision is based on space available in the yard. The actual physical crossing process appears to be rather unscientific and a bit antiquated. For example, in the north-bound direction the block of cars is pushed onto the middle of the bridge with an FNM engine. It is then

left waiting for an inspector and an engine on the other side of the bridge.⁴³ A locomotive may not reach it immediately, so there is a chance it will wait on the bridge for an unnecessarily longer time.

"Hot shot" cargo has the highest priority. Rail cars loaded with automobiles are the best example of "hot shot" cargo through the Laredo railyard. These cars are not allowed to remain stationary for long periods of time.⁴⁴

Actual rail transborder crossing times in each direction were not obtained in this study. Though these times could help further understand the actual magnitude of border crossing inefficiencies, they are not essential in realizing congestion is a problem at the one-lane bridge used by UP. This congestion worsens when the pre-clearing process is delayed, which occurs frequently.

Once again, it is necessary to point out that UP's crossing process is similar to that used by Southern Pacific Lines. One difference, which could be termed as an advantage, is UP's presence at the border. The fact that UP not only has direct access to Laredo's only railroad bridge and a large yard near it, but also owns an intermodal yard, positions them to operate more efficiently than SP.

CONCLUSION

Union Pacific is undergoing a transition period that began before the peso devaluation. They have not only implemented a standardized and dynamic crossing sequence, but they have also taken steps to automate all communications systems. Many of these steps are outlined in the following chapter.

UP is unique because of its intermodal capabilities, enabling it to adjust to changing demands with relative ease. Its Port of Laredo serves as a transition point where cars are blocked for shipment in both directions. The blocking process is also allowed to be flexible and dynamic because of the multiple tracks. With a trend toward intermodal cargo shipping, UP will be well-positioned for the distribution of cargo across the border.

⁴³ Interview by James Sassin with Juan Aguilar, Manager, International Customer Service Center, Union Pacific Railroad, Laredo, Tx, November 17, 1994

⁴⁴ Interview by James Sassin with K.J. Prejean, Team Leader, International Customer Service Center, Union Pacific Railroad, Laredo, Tx, November 17, 1994.

CHAPTER 5. INITIATIVES TO INCREASE EFFICIENCY

Through the investigative process, several initiatives to increase efficiency by Union Pacific and Contract Freighters, Inc. were identified. This chapter summarizes the findings for ease of reference. The list serves as a beginning checklist for monitoring the progress of the initiatives in the future.

1. New bridge for UP. The proposed International Railroad Bridge to meet the growth of rail traffic across the border will be 1,200 feet long and include two tracks. Construction may start in 1995, with completion scheduled within three or four years.⁴⁵
2. Intermodal yard for UP. UP's intermodal yard outside of Laredo, called the Port of Laredo, outgrew itself almost immediately after it opened. A recent expansion is expected to be enough to keep pace with marginal growth. However, it is expected that the increase in intermodal business due to shifting operating practices to avoid infrastructure constraints will necessitate further expansion.⁴⁶
3. New divided highway in front of CFI. The two-lane roadway (FM 1472 or Mines Road) leading to the Colombia Bridge — where CFI is located — is currently being expanded into a four-lane divided highway. The potential for increased motor carrier capacity at the gateway into Nuevo Leon is considerably greater as a result. However, other changes need to take place for this bridge to be useful, such as relocating Mexican customs brokers to Nuevo Leon. The current figure for motor carrier cargo loads using the Colombia Bridge rather than the downtown bridge is less than two percent.
4. Tracking technology. Tracking technology stops at the border. Currently, there is no way to electronically track a shipment from origin to destination across the U.S./Mexican border. However, new methods to track shipments have been developed for loads traveling in the U.S. and Canada.

The HighwayMaster® mobile communication network is the type of tracking technology used by CFI. This system advertises that it operates the world's largest seamless enhanced-services cellular network, enabling a dispatcher to know the

⁴⁵ *A Bridge to the Future*, Union Pacific Railroad, Laredo, Tex., (1994), (Brochure.)

⁴⁶ Interview by James Sassin with Robert Gonzalez, Terminal Manager, Union Pacific Railroad, Port Laredo, Tex., January 5, 1995

location of a particular load at 30-minute intervals. CFI has been using the HighwayMaster® system since late 1994.⁴⁷

5. Mexican business attitude. A dynamic Mexican business attitude has increased efficiency across the border. Prior to the peso devaluation in December 1994, it was obvious to UP personnel that the Mexicans had become more pro-active in their business affairs.⁴⁸ It is as if Mexican businesses had an opportunity as never before to control or plan their destiny. If this attitude stays intact, it will not only assist in their rising from this devastating situation but also create a more efficient flow of transportation across the border.

6. Operational enhancements. Recently, Union Pacific's international office at Laredo added state-of-the-art automated operations. Prior to this, the majority of their operations were performed manually. In addition, they also installed a 1-800 number to assist shippers on both sides of the border in tracking their cargo.⁴⁹

Effective January 1, 1995, the Mexican Operations Group was established to effectively manage the daily border operations between FNM and UP.

7. Customs re-deployment. Beginning in October 1995, the U.S. Customs Service will implement the agency's first reorganization in 60 years. All 45 district offices and seven regional offices will close. The remaining employees — about 400 — will be placed in the 20 new "Customs Management Centers" (CMCs) around the country, where the administrative work will be handled.⁵⁰

Research has shown that one of the greatest points of inefficiency in the process of crossing the border by rail at the Laredo gateway is the delay in obtaining customs clearance.⁵¹ Technology, or the lack of technology, and communication seem to be at the root of this inefficiency.

In a recent article in the *Journal Of Commerce*, Customs Commissioner George Weise said that the scattering of district offices and the separation of management and operations will benefit customs at all levels. "District offices now spend about 75

⁴⁷ Contract Freighters Inc., *Highway Master®*, 1994, (Brochure.)

⁴⁸ Interview by James Sassin with K.J. Prejean, Team Leader, International Customer Service Center, Union Pacific Railroad, Laredo, Tex., November 17, 1994.

⁴⁹ Ibid.

⁵⁰ Storm, Patrick "Customs 'Redeploys' Work Force," *Intermodal Shipping*, November 1994, p. 4.

⁵¹ Interview by James Sassin with K.J. Prejean, Team Leader, International Customer Service Center, Union Pacific Railroad, Laredo, Tex., November 17, 1994.

percent of their resources on port activity, so redistributing the other 25 percent will make the agency run more efficiently," he said.⁵²

Five "Strategic Trade Centers" in New York, Los Angeles, Dallas, Chicago and Miami will be set up to handle long-term strategy for handling three major international trade issues: (1) textile fraud, (2) anti-dumping, and (3) the protection of copyrights, patents and trademarks.⁵³

Customs officials say the goal in reorganization is to locate staff closer to where cargo is actually processed at some 301 ports of entry.⁵⁴

8. Cut fuel consumption. New technology and tougher emission standards have prompted truck and locomotive engine manufacturers to design more fuel-efficient engines. The new MK5000C locomotive designed by M.K. Rail Corporation adds an extra 1,000 horsepower more than average, making it capable of replacing multiple locomotives.⁵⁵

It is expected that these locomotives will be in full production in a few years. Motor carriers, like CFI, can expect to soon be using tractors with these more fuel efficient, high-powered engines.

The added feature of these locomotives is that they use alternating current (AC) generating units combined with the diesel engines. Historically, locomotives which relied on diesel-electric propulsion used direct current (DC) as the electrical source. The new AC/diesel arrangement allows a redistribution of the load on the rails, which produces less strain on the engine and less stress on the rails.

Kenworth, for instance, recently tested a Kenworth T600 72-inch Aerocab — similar to the type used by CFI — equipped with a Cummins N14 engine rated at 460 horsepower and averaging 8.62 miles per gallon on a coast-to-coast run. Gary Ziebell, an engineer with Kenworth, said, "If fuel costs \$1.13 per gallon, a truck traveling 100,000 miles at 8.6 MPG versus one traveling the same distance at 6.5 MPG saves more than \$4,200 over that distance." ⁵⁶

⁵² Maggs, John, "Reinventing Customs," *Journal of Commerce*, October 3, 1994. p. 1A.

⁵³ Ibid.

⁵⁴ Mongelluzzo, Bill, "Brokers Fear Reorganization May Hurt Smaller Port Service," *Journal of Commerce*, October 3, 1994, p. 12A.

⁵⁵ Pope, Gregory T., "5000 Horsepower!" *Popular Mechanics*, December 1994. p. 49-52.

⁵⁶ Harrington, Lisa, "Fleets Catch Up With Technology," *Transportation and Distribution*, (April 1995), pp. 30-31.

CONCLUSION

These initiatives, when implemented, will not only expedite transborder cargo movement and bring it a step closer to seamless transportation, but they will also reduce operating costs wasted on excess fuel consumption.

Figures taken from UP show an increase of 40 to 60 percent of cars from 1991 to 1994. (See Tables 4.1 and 4.2.) If certain measures to relieve congestion at the border are not implemented now, the infrastructure will suffer from the increase in transborder movements.

CHAPTER 6. ENERGY AND ECONOMIC EFFICIENCY

The ideal crossing scenario is a seamless one where the paperwork and clearance process has been expedited so the motor or rail carrier could merely move across the border without stopping. Though this type of scenario is the ultimate in transborder cargo movement, one could safely predict that this will never happen. However, it should be noted that even though the ultimate scenario is not achievable, adjustments that bring that goal closer should be performed at every available opportunity. In order to accomplish that, the present scenario needs to be understood.

This chapter looks at the magnitude of the efficiency of the current scenario. Because more data were found for motor carriers, they are used to illustrate the impact of fuel consumption at the Laredo gateway.

The magnitude and scale of the problem is evaluated using a hypothetical motor carrier longhaul from San Antonio to Monterrey. Table 6.1 lists the values used in calculating fuel consumption over the approximately 300-mile route through the Laredo gateway.

TABLE: 6.1 FUEL COSTS FOR MOTOR CARRIER TRIP FROM SAN ANTONIO

Stages of Travel	Fuel U.S.	Fuel Mexico	Time	Miles	Fuel Cost (\$1.13)
Hwy	6.7 mpg	6.0 mpg		130 Mex 130 U.S.	\$46
Intercity	5.0 mpg (est.)	5.0 mpg (est.)			
Drayage	5.0 mpg (est.)	5.0 mpg (est.)			\$3
Idling	0.47 gal/hour		6 h		\$3
Total					\$52

Sources: CFI (fuel on hwy cost); American Association of Railroads (operating cost); SAIA (drayage cost); J B Hunt (idling time); Fed. Highway Administration, Report FHWA - RD - 80, Table 5 (idling fuel consumption).

Figure 6.1 illustrates the disparity in fuel consumption as it crosses the border. As much as 2.82 gallons per trip can be consumed while idling and waiting at the border. Another noteworthy element is the drayage segment, which adds an extra 0.2 gallons per mile per trip. The increase in fuel consumption is due to excess movement of the draymen — they go north to the border as a stand-alone tractor and return attached to a loaded trailer — as well as the use of

older, less efficient tractors by the draymen. It should also be noted that intercity truck travel increases fuel consumption.

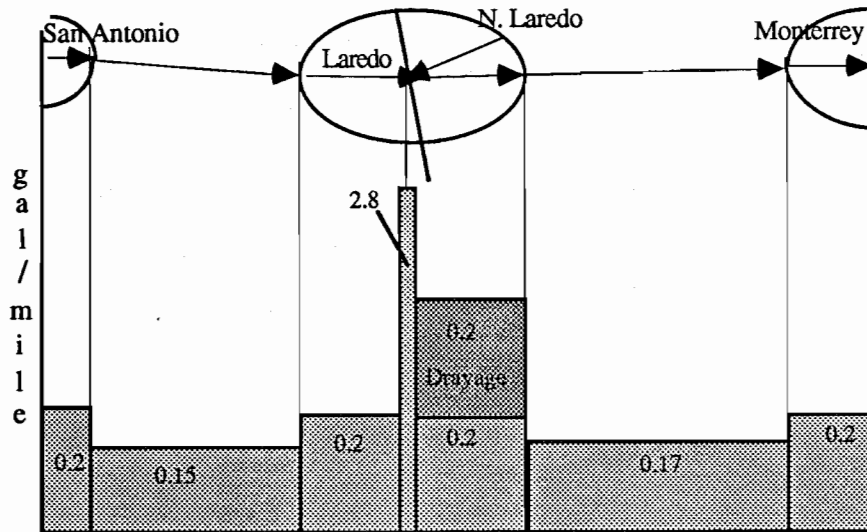
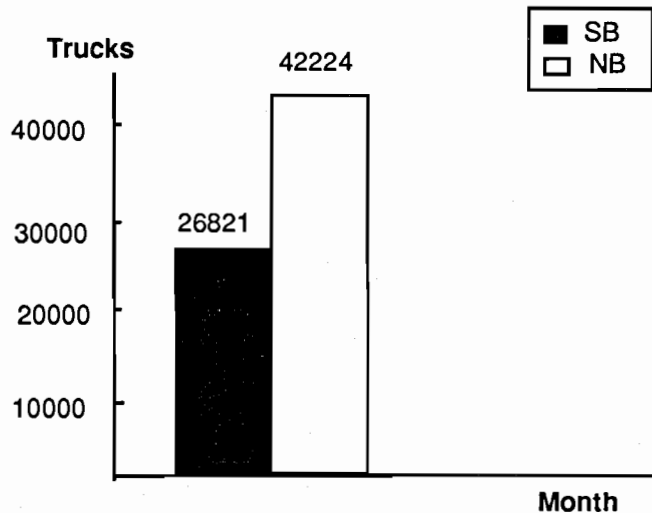


Figure 6.1 Motor carrier fuel consumption from San Antonio to Monterrey (distance, in miles, is not to scale)

THE OVERALL MAGNITUDE OF FUEL CONSUMPTION WHEN CROSSING

Figure 6.2 indicates the average number of loaded trucks crossing the border monthly in the first quarter of 1995. When the north- and south-bound directions are added together, the total is 69,045 loads crossing the border per month. However, these figures are further amplified when calculating fuel consumption.



Source: John McCray, University of Texas at San Antonio, April 1995.

Figure 6.2 Average monthly north-bound and south-bound loaded trucks at Laredo in first quarter 1995

The drayage process would cause the number to quadruple when calculating fuel. Because each of these 69,045 loads is delivered to the border and essentially left to be picked up by a tractor from across the border, the number of trips made by these tractors doubles. Therefore, when calculating fuel costs, the total one-way trips for tractors participating in delivering loads per month is 138,090. At the first quarter average, 1,657,080 one-way trips would be made in 1995.

When looking at the yearly fuel consumption for this segment of the shipment, a length and a per-vehicle consumption rating are needed. For example, if that distance is 14 miles and drayage tractors use 5.0 miles per gallon, each tractor would consume 2.8 gallons per trip. This would translate to 4.64 million gallons of fuel needed in cartaging goods across the border. This figure is conservative because it does not include the empty trailer trips through the border crossing.

If this were to be compared to the total amount of fuel needed for each seamless trip from origin to destination, it would be easy to see the impact of the congestive/inefficient border crossing process. To illustrate, following is the hypothetical situation used earlier. On the U.S. side of the border, each of the loads is either bound for or originating from San Antonio. On the

Mexican side, each load is either bound for or originating from Monterrey. As shown in Table 6.1, the fuel cost per trip is \$46 excluding intercity travel. Therefore, the 1995 total fuel cost for a seamless scenario would be \$76.2 million and the total fuel used would be 68.05 million gallons.

With this example, fuel used for drayage purposes would be seven percent of the total cost of the fuel. It should be emphasized that this is a standardized hypothetical situation, and it is expected that the seven percent figure would decrease under a more realistic situation where origins and destinations are stretched over longer distances. However, as stated earlier in this report, 51 percent of U.S. exports originate in Texas and therefore a large percentage of all trips use routes with roughly the same U.S. length.

CONCLUSION

Fuel costs increase for shipments crossing the border by motor carrier at a rate of as much as seven percent. However, since true origin and destination information is unknown, the figure is expected to be slightly lower.

When considering that fuel consumption amounts to about ten percent of the overall operating costs for motor carriers, a seven percent increase in fuel consumption due to border crossing seems minor. Furthermore, these costs seem even less significant when compared to the overall transportation logistics chain. However, the significance certainly increases when the financial impact is localized to the Laredo/Nuevo Laredo area.

CHAPTER 7. CONCLUSIONS

In concluding, a predictable question is asked: Is there in fact an efficiency problem with cargo crossing the Texas/Mexico border by rail and trucks? Unequivocally, the answer is yes. The answer could have been reached without this study, but in approaching the question without assuming the answer, insight was not only attained into the scale and magnitude of the problem but also an observance was made of efficient practices or initiatives.

Concerning the scale and magnitude of the efficiency problem, in evaluating a total trip from the U.S. to Mexico or vice versa, congestion at the Laredo gateway stands out in two ways. First, increasing operating costs as a result of increased fuel consumption are of concern. For example, recent comparisons of motor carrier operating costs of highway travel versus intercity travel show that these costs nearly quadruple in the intercity. This is noticeable even without adding the extra cost for crossing the border. Second, the sequencing of moving cargo through the Laredo gateway usually adds at least one day to the total trip time. With motor carriers, the drayage process alone takes about one-half of a day. These time delays could be reduced.

Both rail and motor carriers will experience further delays if customs clearances and duty collections continue to detain the process. From the case study information, it was found that the U.S. Customs clearance process contained the greatest inefficiency when goods moved northward. The duty collection situation, where Mexican businesses have difficulty paying duties, is a temporary circumstance caused by the peso devaluation. Often, south-bound shipments are stored until Mexican customers are able to pay duty fees.

Next, the report outlines several initiatives found in the case studies. These initiatives are outlined in three general categories: (1) infrastructure expansions to reduce delay, (2) innovative business and operational strategies, and (3) technological improvements. These initiatives are included to illustrate remedies or tactics necessary to alleviate some of the inefficiencies.

Finally, it should be noted that these inefficiencies produce externalities which have a more far-reaching effect than the financial impact addressed in this report. The increased consumption of fuel at borders and intercities also increases emissions in those areas. The air quality and surrounding environment are put at risk or jeopardized to accommodate trade expansion. In addition, the quality of life of citizens of these border cities is compromised not only because of increased congestion, but also because their health is at risk from breathing air with a higher concentration of toxic fumes.

APPENDIX

NAFTA Timetable for Trucking Provisions

INVESTMENT

Mexico

Investment Rights

December 18, 1995

Up to 49 percent of U.S. and Canadian investment will be permitted in Mexican trucking companies or terminals providing exclusively international cargo services.

January 1, 2001

Up to 51 percent of U.S. and Canadian investment will be permitted in Mexican trucking companies or terminals providing exclusively international cargo services.

January 1, 2004

100 percent of U.S. and Canadian Investment will be permitted in Mexican trucking companies or terminals providing exclusively international cargo services. U.S. and Canadian Investment may not own, directly or indirectly, an interest in an enterprise providing truck services for the carriage of Mexican domestic cargo.

United States

Investment Rights

December 18, 1995

Mexican citizens will be permitted to own or establish an enterprise in the United States only for the transportation of international cargo between points in the United States.

ACCESS

Mexico

Access Rights

December 18, 1995

U.S. and Canadian carriers will be permitted to provide international cross-border truck services to or from the territory of the Mexican border states of Baja California, Sonora, Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas.

January 1, 2000

U.S. and Canadian carriers will be permitted to provide international cross-border truck services to or from the territory of Mexico.

United States

Access Rights

December 18, 1995

Mexican carriers will be permitted to obtain operating authority to provide international cross-border truck services to or from the U.S. border states of California, Arizona, New Mexico, and Texas.

January 1, 2000

Mexican carriers will be permitted to obtain operating authority to provide international cross-border truck services to or from the United States and Canada.

LEASING

Mexico

January 1, 1994

Regulations

NAFTA provides financial and operational regulations scheduled to take effect in January 1994. Mexico published regulations on November 22, 1994 which allow U.S. companies to lease new and used vehicles, with a maximum age of 5 years, to private and for-hire carriers in Mexico.

BIBLIOGRAPHY

- Bonney, Joseph, "Cutting Drayage Costs," *American Shipper Magazine*, December, 1993, p. 58.
- Campbell, Richard T., Director - Strategic Analysis - Mexico, Class Presentation, Southern Pacific Railroad, Lyndon B. Johnson School of Public Affairs, Austin, Texas, September 6, 1994.
- Campbell, Richard T., "Doing Business With Mexico," Director - Strategic Analysis - Mexico, Southern Pacific Lines, 1994, p. 3. (Handout.)
- Contract Freighters Inc., *Highway Master*, "1994, (Brochure.)
- Contract Freighters Inc., "Logistics in Mexico," Report at the Council of Logistics Management Annual Conference, 1992, p. 6.
- Espinosa Rescala, Juan Carlos, Rob Harrison and B.F. McCullough, *Effect of the North American Free Trade Agreement on the Transportation Infrastructure in the Laredo-Nuevo Laredo Area*, Center for Transportation Research Report 1312-2, The University of Texas at Austin, November 1993, p. 38.
- Harrington, Lisa, "Fleets Catch Up With Technology," *Transportation and Distribution*, April 1995, pp. 30-31.
- Ibarra-Yunez, Alejandro, "Trends in Transport Services in Mexico for the Nineties," Lecture at Seminar Transport Trends in Mexico sponsored by U.S. Mexican Policy Studies Program, Lyndon B. Johnson School of Public Affairs, Austin, Tex., March 25, 1995.
- Kaufman, Lawrence H., "Mexican Traffic Accelerates for UP, SP, and Santa Fe," *Journal of Commerce*, June 27, 1994, p. B1
- Lyndon B. Johnson School of Public Affairs, *Texas-Mexico Multimodal Transportation*, Policy Research Project Report No. 104., Austin, Tex., p. 45.
- Lyndon B. Johnson School of Public Affairs, *Logistics Management and U.S.-Mexico Transportation Systems - A Preliminary Investigation*, Policy Research Project Report Series No. 109, Austin, Tex., 1994, p. 21.
- Maggs, John, "Reinventing Customs," *Journal of Commerce*, October 3, 1994, p. 1A.
- Mongelluzzo, Bill, "Brokers Fear Reorganization May Hurt Smaller Port Service," *Journal of Commerce*, October 3, 1994, p. 12A.
- Muller, E.J., "Trucking into Mexico," Senior Editor, *Distribution Magazine*, June 1993, p. 13.
- Pope, Gregory T., "5000 Horsepower!" *Popular Mechanics*, December, 1994. pp. 49-52.
- Romba, Phil, "Golden Borders," *DES Magazine*, June 1994, p.35.
- Said, Claudia, Rob Harrison, and W.R. Hudson, *Transborder Traffic and Infrastructure Impacts on the City of Laredo, Texas*, Center for Transportation Research, Report 1312-1, The University of Texas at Austin, November 1993, p. 33.
- Schneider, Paul D., "Mexican Connection," *Trains*, January, 1993, pp. 51-52.

Storm, Patrick, "Customs 'Redeploys' Work Force," *Intermodal Shipping*, November 1994, p. 4.