Moving Texas Exports
Examining the role of transportation in the vehicle part supply chain
CONTENTS

Introduction ........................................................................................................... 1
Background ............................................................................................................. 2

Motor Vehicle Export Supply Chain .................................................................... 5
Moving Parts Among Suppliers by Truck .............................................................. 7
Moving Parts Among Suppliers by Rail ................................................................. 7
Moving Parts from Tier 1 Supplier ....................................................................... 7

Transportation Issues ........................................................................................... 8
Rail Crew Changes and Inspections .................................................................... 8
Inadequate Port-of-Entry Infrastructure ................................................................. 9
Inadequate Rail Infrastructure ............................................................................. 9
Rail Corridor Encroachment ................................................................................ 10
Southbound Inspections ..................................................................................... 10

Key Findings ......................................................................................................... 11

References ........................................................................................................... 12
The freight transportation system of a state has a direct and indirect impact on international trade. The mode of transportation has a direct impact on the cost, efficiency, and reliability of moving export products to overseas markets. So too does the capacity of the transportation infrastructure. Freight infrastructure investments that increase system capacity could reduce travel times and costs, which can translate into increased economic productivity, as well as enhanced labor and market access. Better labor and market access, in turn, could contribute to increased economic competitiveness (3), which can result in increased exports. The Organization for Economic Cooperation and Development (4) reported that most countries with high-quality infrastructure rank high in the world index for overall competitiveness. Specifically, quality infrastructure is a key indicator of international economic competitiveness because it determines the scale, volume, and efficiency of international trade.

The objective of this series of papers is to describe the supply chains for six of Texas’ major export commodities and identify the role of transportation in the supply chain. The objective of this series of papers is to describe the supply chains for six of Texas’ major export commodities and identify the role of transportation in the supply chain. The study examined the transportation concerns of exporters, transportation policies and regulations affecting the costs of exports, and infrastructure concerns. This is the fourth paper in the series and documents the role of transportation in the motor vehicle part export supply chain and key transportation issues and concerns that were documented and shared with the study team.

**Introduction**

In 2014, U.S. exports of goods and services amounted to $2.34 trillion, with Texas accounting for $289 billion of that amount (1). Furthermore, in 2013, Texas’ exports supported approximately 1.1 million jobs (2). There is no doubt that Texas’ transportation system—its roads, rail, ports, pipelines, airports, and border crossings—facilitates export trade.
Background

In the first quarter of 2014, Texas’ automotive manufacturing industry employed 35,808 Texans in 466 firms at an average annual wage of $58,753. On a national scale, Texas ranked seventh in terms of automotive manufacturing employment (5).

The Texas auto manufacturing industry is made up of three sectors:

- Motor vehicle manufacturing and assembly.
- Motor vehicle body and trailer manufacturing.
- Motor vehicle part manufacturing.

Of the three sectors, motor vehicle part manufacturing is the largest in terms of employment and number of firms. In the first quarter of 2014, motor vehicle part manufacturing accounted for approximately 45.5 percent of the state’s automotive manufacturing employment (i.e., 16,288 workers). The sector also accounted for 269 of the 466 automotive manufacturing firms. However, motor vehicle part manufacturing firms tend to be small, typically employing on average 60 people (5). Figure 1 illustrates the locations of selected major motor vehicle part manufacturers in Texas.

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Figure 1. Top Motor Vehicle Part Manufacturers in Texas.

Source: (5).
Texas’ motor vehicle part manufacturing supply chain is highly integrated with motor vehicle part manufacturers in Mexico. Often, partially assembled components cross the Texas-Mexico border multiple times in the binational shared production of motor vehicle parts (as illustrated in the motor vehicle part export supply chain) (6). Texas and Mexico’s highway and rail transportation infrastructure is a key component in facilitating this shared production of motor vehicle parts. IH 35, MX 85, and MX 75 connect Mexico’s major auto component manufacturers with those in Texas and have been called the North American Free Trade Agreement (NAFTA) auto corridor (see Figure 2).

This binational shared production of motor vehicle parts is also evident from the U.S.-Mexico trade data. In 2014, motor vehicle parts were the leading U.S. export commodity to Mexico, accounting for 9 percent of the total U.S. exports to Mexico. Figure 3 shows the growth in U.S. imports and exports of motor vehicle parts between 2010 and 2014. U.S. exports of motor vehicle parts (in terms of value) increased by approximately 53.6 percent between 2010 and 2014, while U.S. imports of motor vehicle parts increased by approximately 69.9 percent during the same time period (6). U.S. imports of motor vehicle parts are almost double that of U.S. exports of motor vehicle parts in terms of value. Almost all of the production of Mexican motor vehicle parts is intended for the U.S. market. The strong trading relationship between the United States and Mexico in motor vehicle parts is mainly attributed to NAFTA, which allows for faster and more efficient trade between the United States and Mexico.
Motor Vehicle Part Export Supply Chain

As stated previously, Texas’ motor vehicle part manufacturing supply chain is highly integrated with motor vehicle part manufacturing in Mexico. For example, a partially assembled electronic component from a Tier 2 supplier located in San Luis Potosi or Guanajuato is moved by truck or rail across the U.S.-Mexico border to a Tier 1 supplier in Dallas/Fort Worth where value is added to the component.

The border crossing process for motor vehicle parts differs depending on whether truck or rail is used to transport the motor vehicle parts (see Figure 4). Between 1995 and 2010, rail was the dominant mode of transportation for vehicles (other than railway or tramway rolling stock), vehicle parts, and accessories (in terms of value) between the United States and Mexico. However, over the past four years, rail has started to lose market share against the trucking mode, and by 2014, rail moved only 47 percent of the value of vehicles, vehicle parts, and accessories traded between the United States and Mexico (8).

Original equipment manufacturers (OEMs) make the final product for the consumer.

Tier 1 suppliers supply directly to the OEM. Tier 1 suppliers typically manufacture components such as engine parts, steering and suspension systems, air conditioning systems, and electronic components.

Tier 2 suppliers manufacture the components needed by Tier 1 suppliers. Tier 2 suppliers typically manufacture specialized forged parts, die casting, plastic parts, and machined parts.

Tier 3 suppliers provide the inputs and raw materials needed by Tier 2 suppliers for the manufacturing of the specialized parts (7).
Figure 4. Export Supply Chain for Motor Vehicle Parts.
Moving Parts Among Suppliers by Truck
Commercial merchandise exports by truck require the following steps once the shipment is at the border location in Texas:

1. Import documentation is filed with Mexican customs (Aduanas). This is usually performed by a Mexican customs broker. If necessary, import duties are paid.
2. A truck with merchandise and a copy of the documentation travels to the border. Aduanas, using a red-light/green-light decision process, may select the loaded truck for secondary inspection.
3. The loaded truck takes merchandise to a warehouse or yard.
4. A Mexican licensed vehicle picks up the load and takes it to the final destination in Mexico.

Empty vehicles cross without stopping at the Aduanas booths. Current operation conditions increase the number of empty trips to relocate transportation equipment.

Moving Parts Among Suppliers by Rail
Railroads crossing from the United States to Mexico for auto parts and auto-industry-related products can cross the border without customs inspection at the border. This makes the border crossing process for auto parts exported from the United States to Mexico extremely efficient because auto parts are usually containerized and transported in unit trains.

Moving Parts from Tier 1 Supplier
From the U.S. Tier 1 supplier, the motor vehicle parts can be transported to:

- The automobile manufacturer (e.g., Toyota in San Antonio), or,
- A parts distribution center, from where it is moved by truck or rail to a marine port for export to, for example, Europe.

The Greater Houston Partnership reported motor vehicles and parts exports to Saudi Arabia, Germany, Russia, Kuwait, and Chile through the Houston-Galveston Customs District, which includes the Ports of Houston, Galveston, Texas City, Freeport, Lavaca, and Corpus Christi, and Houston Intercontinental and Sugar Land Regional Airports (10).
Transportation Issues

Due to the size and complexity of the motor vehicle part export supply chain, extensive logistics and planning are required by all parties in the supply chain. Any delay or breakdown among the three tiers of suppliers can have a ripple effect on the chain. In general, the motor vehicle part supply chain has historically been very efficient but is impacted by congestion at the border, which prevents the industry from achieving higher levels of efficiency. The documented concerns relating to the transportation of motor vehicle export parts therefore center on crossing the border with Mexico. Delays are imposed by rail crew changes, inspection requirements, congested infrastructure, and encroachment on rail infrastructure. Border and customs delays impact the entire supply chain and disrupt both production at assembly plants and distribution at other tiered facilities.

Rail Crew Changes and Inspections

U.S. and Mexican railroads are required to change crews at the border. Some border crossings do not have the infrastructure to make the required crew changes at the international bridge. This results in an additional 15 or 20 minutes of transit time in each direction when crossing the border. The railroads have proposed interchanging U.S. and Mexican crews at inland foreign trade zones. Such a change would require that the crew receive visas (border crossing cards that allow for temporary passage through the border for business or pleasure) and special access through immigration checkpoints. However, these changes have not been implemented due to the Mexican railroads’ lack of standard training procedures, as determined by the U.S. Federal Railroad Administration (11).

Safety inspections also cause additional delays at the border because Mexican air brake inspections are not recognized in the United States. Allowing for consolidated inspections would also diminish border-crossing times (12). However, U.S. safety concerns currently prevent adoption of this procedure.

Notably, Union Pacific Railroad (UP) has invested an estimated $50 million on border security projects that allow Customs and Border Patrol (CBP) to better and more safely inspect trains. Strategically located rail inspection portals, for example, allow CBP officers to inspect trains for illegal contraband or human smuggling from a safe location without trains having to stop (13).
Inadequate Port-of-Entry Infrastructure

Inadequate port-of-entry (POE) infrastructure and staffing (e.g., design of the border facilities, inadequate crossing capacity, and inadequate road capacity serving the crossings) create bottlenecks on the Texas-Mexico border and result in excessive wait times for trucks to cross the border. Excessive wait times increase the cost of truck transportation and therefore the cost of trade.

CBP has reported that approximately $6 billion (or approximately $600 million per year for 10 years) is needed to fund identified POE capital needs (14). Although Congress has been reviewing POE funding, funding levels have been inadequate to cover the identified capital needs on the U.S.-Mexico border. This is daunting for Texas, which shares the largest border with Mexico, given that there are 34 bridges and border crossings (28 bridges serving vehicular and/or pedestrian traffic, and 6 serving freight rail) between Texas and Mexico.

Inadequate Rail Infrastructure

In terms of rail infrastructure, industry is concerned about strained capacity accessing and crossing the Texas-Mexico border. Specifically, the rail bridge at Laredo is a single-track structure used by UP, Kansas City Southern Railway Company (KCSR), and Kansas City Southern de Mexico to cross to and from Mexico. The bridge is expected to exceed its capacity in the near future (15) if more stringent screenings and inspections are implemented that will slow down the actual international crossing time. KCSR is, however, investing in its Laredo Subdivision, which includes the International Bridge at Laredo. In 2015, KCSR announced that the company will invest $18 million that includes structural steel improvements at the International Bridge at Laredo (16).

UP has also made considerable investments at the Laredo border crossing. The company installed an improved signal system on the Laredo subdivision1 to allow trains to proceed to and from the border more efficiently. UP has also recently announced significant additional investment in expanding the Port Laredo intermodal terminal (13).

1 A segment of the railroad system designated by the railroad for administrative and operational purposes.
**Rail Corridor Encroachment**

The cross-border rail system is impacted by growing gateway communities on the border that are encroaching on rail corridors, causing conflicts at grade crossings, and capacity concerns because of limited space for rail terminal expansion. In the El Paso area and in Laredo, the major rail terminals that serve cross-border rail are within the urban boundaries, compromising safety and the operating speed of trains. For example, conflicts at grade crossings in the City of Juarez have resulted in the window for rail operating between Ciudad Juárez and El Paso being limited to 10 hours per day, for example, from 10:00 p.m. to 8:00 a.m. The rail industry, however, expects time restrictions to be eased as the Mexican government continues its effort to grade-separate crossings in downtown Juarez (13). Addressing rail gateway bottleneck issues is complex and involves substantial investments but is critical to the role of rail in U.S.-Mexico trade.

**Southbound Inspections**

At a few Texas border crossings, CBP has started to perform random manual inspections on the U.S. side of the border on trucks crossing into Mexico (e.g., transporting U.S. export merchandise), with the goal of identifying illegal shipments of money and weapons. The existing border crossing facilities are not designed for southbound commercial inspection on the U.S. side of the border. Consequently, this has created congestion at the POE and approaching facilities.

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**Addressing rail gateway bottleneck issues is complex and involves substantial investments but is critical to the role of rail in U.S.-Mexico trade.**
**Key Findings**

The following are the key findings from this research:

- Required rail crew changes and safety inspections impose delays crossing the Texas-Mexico border.
- Inadequate POE infrastructure and staffing levels create bottlenecks on the Texas-Mexico border and result in excessive wait times for trucks to cross the border, increasing the cost of truck transportation and trade.
- Rail bridge capacity on the Texas-Mexico border — specifically at Laredo — will be further strained if more stringent screenings and inspections are implemented.
- Growing border communities are encroaching on rail corridors, causing conflicts at grade crossings and capacity concerns because of limited space for rail terminal expansion.
- Existing truck border-crossing facilities were not designed for southbound commercial inspections, so recent manual truck inspections on the U.S. side of the border have created congestion at the POE and approaching facilities.
References


13. Email communication with Union Pacific Railroad, October 7, 2015.

