COMMODITY Flow Analysis

H-GAC Regional Goods Movement Study

submitted to

Houston-Galveston Area Council

submitted by

Cambridge Systematics, Inc.

with

Halcrow, Inc.
Dannenbaum Engineering Corporation
Knudson, LP
Alliance Transportation Group
American Transportation Research Institute

February 2011

Table of Contents

List of Tables

List of Tables (continued)

List of Tables (continued)

List of Tables (continued)

List of Figures

List of Figures (continued)

List of Figures (continued)

List of Figures (continued)

Executive Summary

ES.1 Introduction

The Houston-Galveston region is a freight hub of national importance. Houston ranks 4th in truck volumes , 1st in pipeline volumes, 2nd in port volumes and 11th in air cargo volumes.[1] Precise data on the volume of rail freight moving through all the metropolitan areas of the United States are not available, but clearly the H-GAC region is a critical node in the national system and home to a major rail carload market.

Recognizing the potential impacts of these movements on the region's transportation system and its economic vitality, the Houston-Galveston Area Council (H-GAC) has commissioned a Regional Goods Movement Study in order to evaluate the region's extensive multi-modal goods movement system, identify critical issues, and develop strategies and recommendations for improving mobility and access for both commuters and freight.

What is freight?

Freight, or goods movement, simply refers to the transportation of physical goods from one location to another. It includes everything from mail, chemicals, machinery, food and groceries, steel, automobiles, and anything else that is shipped from one place to another. These goods are being demanded by area businesses, residents and visitors.

What is in this report?

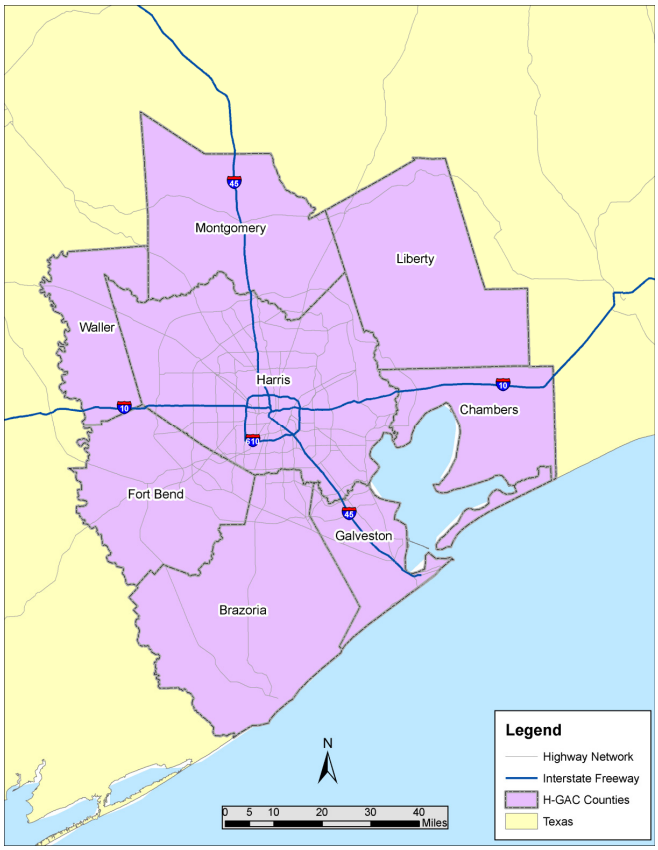
This report is one in a series of technical reports and it describes and analyzes the amount and types of commodities moving across the Houston-Galveston region's transportation system. The data and findings from this analysis will serve as a building block for assessing the goods movement system's deficiencies and future needs. This profile focuses on the two primary measures of freight activity, tonnage, and value. Tonnage is an indicator of the demand that freight movement places on the transportation infrastructure while value is an indicator of the economic activity associated with freight. The data are analyzed by direction, by mode, by commodity, and by trading partner for both current (2007 base year) and future (2035 forecast data) freight flows.

The data source for the analysis in this report is the TRANSEARCH commodity flow database, a commercial data product developed by IHS Global Insight, Inc. It is important to note that TRANSEARCH data used for this analysis does not include any data on commodities moved by pipelines, and the data on freight rail traffic is incomplete in that it only includes traffic that either originates or terminates within the region. Hence, the statistics presented understate the total volume and value of goods moving in the region.

[1] Truck, pipeline and air cargo data based on FHWA FAF3 (2007 base year) and port rankings obtained from American Association of Port Authorities.

The study area, shown in Figure ES.1, is comprised of the eight counties included within the H-GAC region.

Figure ES.1 The Houston-Galveston Region



Source: National Transportation Atlas Database

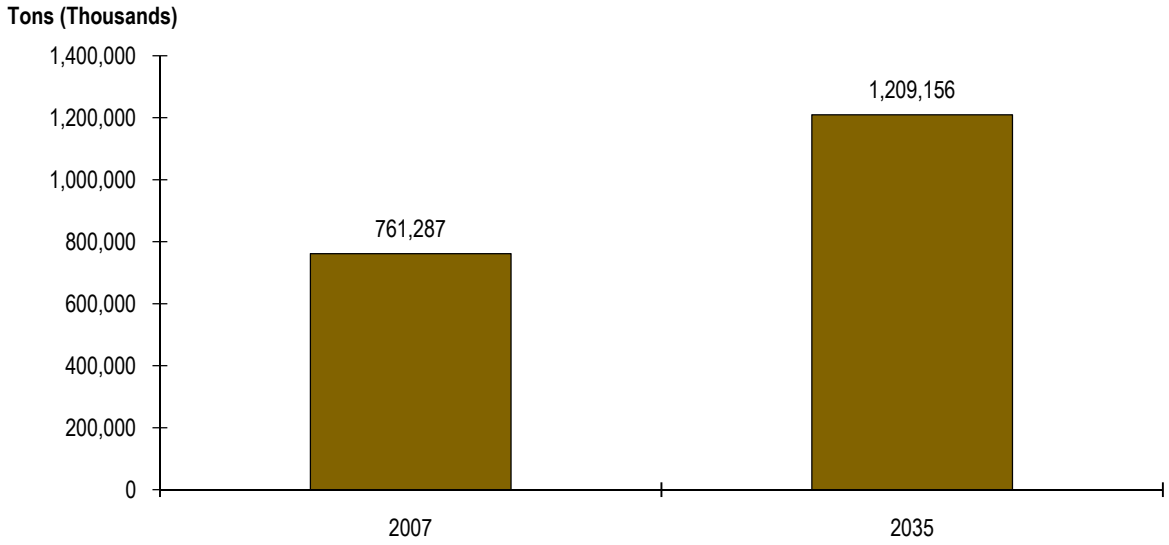
ES.2 How Much Freight Is Moving Through the Houston-Galveston Region?

In 2007, 761.3 million tons of freight moved into, out of, within, or through the Houston-Galveston region. These shipments had an estimated value of $1.5 trillion.[2] By 2035, these freight flows are projected to grow 58 percent by weight (to 1.2 billion tons) and more than 120 percent by value. These projections represent organic growth – or the growth that is expected due to population

[2] All value figures in this report refer to current year dollars. 2007 figures are in 2007 dollars and 2035 figures are in 2035 dollars as estimated in the TRANSEARCH data.

increases and general macroeconomic projections. They are also unconstrained, which means that they assume that the region's transportation infrastructure will be able to accommodate the growth. If the infrastructure cannot handle the forecasted growth, the economic activity associated with it will either not occur or will move to a region that can accommodate it. Figure ES.2 displays the level of freight movement that occurred in 2007 and the projected level of freight movement in 2035.

Figure ES.2 Expected Growth of Regional Freight Flows *By Weight*



Source: IHS Global Insight

ES.3 Where Is the Freight Coming From and Going To?

Directional Analysis

Nearly half (48 percent) of the freight moving over the region's transportation network in 2007 was traveling inbound, i.e., originating outside of the region and terminating within the region. Inbound freight represents regional imports. Because consumers and businesses must pay for goods received, inbound freight is also associated with an outflow of dollars from the region.

Nearly one third (30 percent) of freight moving across the region traveled outbound in 2007. Outbound freight originates within the region and terminates outside of it. Outbound freight represents exports from the region and is considered *wealth-generating* freight because it is associated with an inflow of dollars.

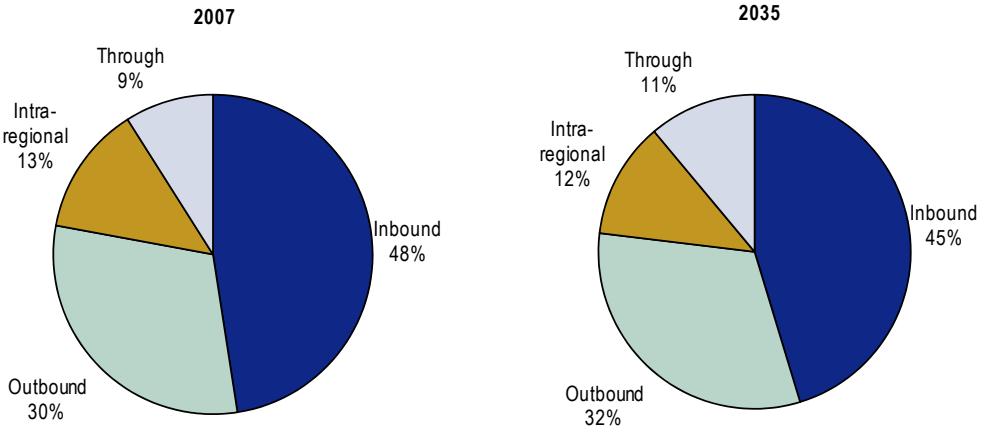
Intraregional freight, or freight that both originates and terminates within the region, accounted for 13 percent of the total. Intraregional freight represents the degree to which the region is trading with itself. It is associated with neither imports nor exports, but reflects the level to which the

region is able to supply the goods it needs (both consumer and production materials) from within its boundaries.

About one tenth (9 percent) of regional freight neither originates nor terminates within the region but is simply passing through. This means that more than 90 percent of the freight using the region's transportation system is servicing the regional economy in one way or another and not just passing through. Through freight, while important for the national and global economy, is less significant for the regional economy; however, the movement of through freight does utilize and impact the regional transportation system as a means to reach its final destination. The proportion of through freight in the Houston-Galveston region is low compared to that of other regions. For example, 43 percent of the total freight in the Atlanta region is through,[3] more than 70 percent in Nashville[4], and more than 40 percent in Baltimore[5].

The relative proportions of inbound, outbound, intraregional and through freight are projected to change only slightly by 2035. (see Figure ES.3 below.)

Figure ES.3 Direction of Total Freight Flows by Weight
2007 and 2035



Source: IHS Global Insight

Trading Partners

Identifying the region's major trading partners helps planners (and others) understand the Houston-Galveston region's place in the larger national economic landscape and its role within the national and global freight transportation system. Trading partners are identified by combining

[3] Atlanta Regional Freight Mobility Plan.

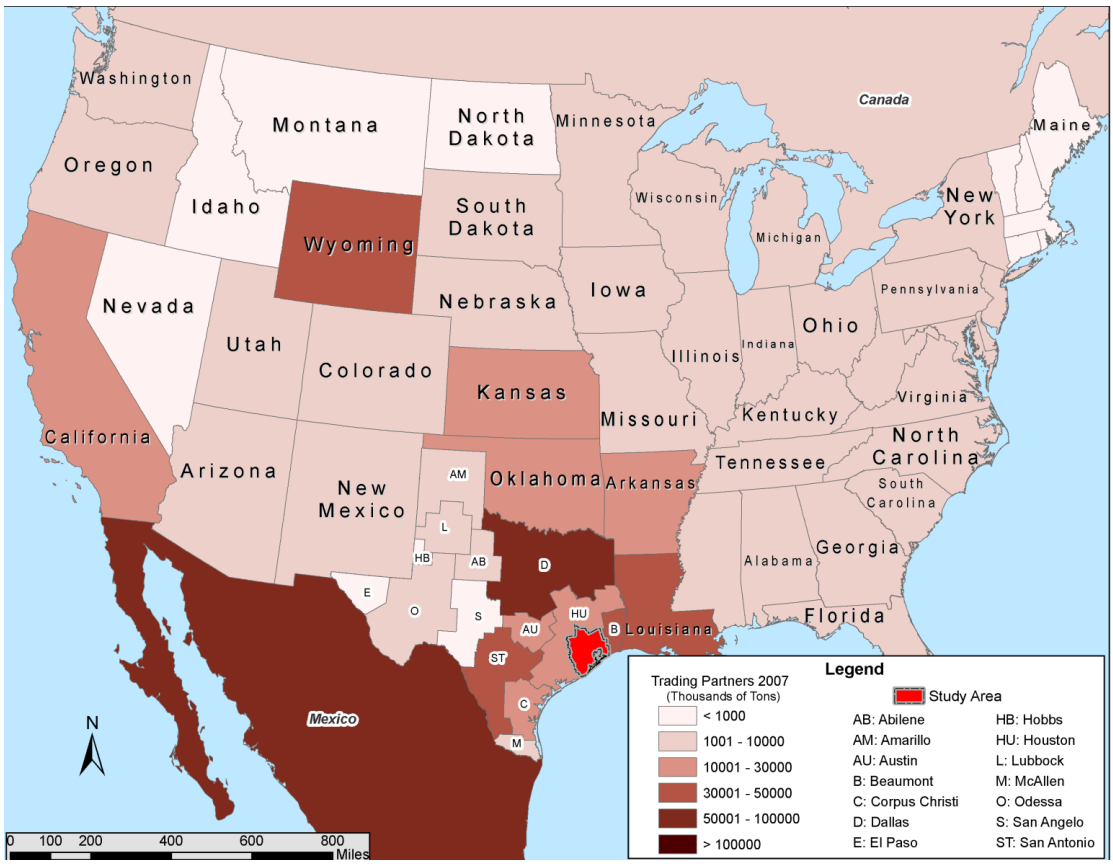
[4] Nashville Regional Freight Study.

[5] Baltimore Regional Goods Movement Study.

the inbound and outbound freight flows between the study region and the trading partner region and highlighting those trading partner regions with the largest freight flows. For this study, trading partner regions are confined to North America since the focus of the study is on highways and intermodal connections in the region.

Figure ES.4 displays the top ten North American trading partners for freight movements into and out of the Houston-Galveston region by weight in 2007. The top three trading partners – Mexico, the Dallas Region, and Louisiana – account for about 29 percent of total flows by weight. Wyoming is the fourth largest trading partner due almost entirely to the large quantities of coal shipped by rail from the Powder River Basin to power plants and port terminals in the Houston-Galveston region. While the Houston-Galveston region trades with every region in North America, three of its top ten trading partners are within Texas and two (Mexico and Louisiana) are adjacent to Texas. This is shown graphically in Figure ES.4 and is evidence that the region is particularly important economically to the State of Texas and to the south-central United States.

Figure ES.4 Trading Partners by Weight
2007



Source: IHS Global Insight

ES.4 How (By What Mode) Is Freight Transported in the Region?

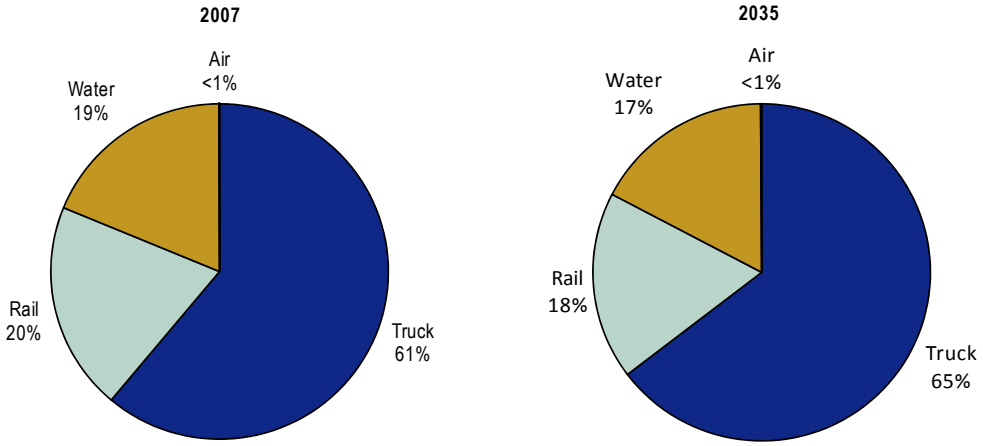
Freight utilizes five modes of transportation; roadways, railways, water, air, and pipelines.[6] Trucks carry the most freight by both weight and value. They are the most flexible of all the modes and they handle much of the local delivery service for the other modes. The rail and water modes account for a smaller proportion of total tons and value, but are critically important in moving heavy and bulky commodities over long distances. Air freight comprises a very small proportion of total freight when compared to trucks and rail but is the carrier of choice for long distance, very high-value, time sensitive freight.

Mode selection is a choice based on economics. Some of the elements considered when determining which mode to use include distance traveled, the value and weight of the commodity, the degree of delivery time sensitivity, and various other supply chain considerations. Certain commodities lend themselves to particular modes of transport. Coal, for example, is rarely hauled by truck, but is frequently hauled by rail or water. Petrochemicals and other bulk liquids are hauled by water, rail, truck, and pipeline, but generally not by air. Crude oil is transported by water and pipeline. Consumer goods are carried by water, rail, air, and truck, with final delivery to a retail outlet handled almost exclusively by truck. The ability of the public sector to influence mode choice will be limited by the types of goods being transported. For goods with modal flexibility, modal diversion ultimately will hinge on the public sector's ability and willingness to alter the modal economics through regulation, pricing, subsidy or other factors impacting modal costs and service.

Figure ES.5 shows the Houston-Galveston region's freight mode share. About 61 percent of all freight tonnage was moved by truck in 2007. By 2035, the truck mode share is projected to grow to about 65 percent (see Figure ES.5). The rail and water modes handle 20 and 19 percent of total regional freight respectively, with slightly smaller proportions projected in 2035.

[6] Pipeline data is not available in the TRANSEARCH database and is not included in this Technical Memorandum. The pipeline mode will be addressed within the Modal Profile Technical Memorandum.

Figure ES.5 Mode Share by Weight – All Directions
2007 and 2035



Source: IHS Global Insight

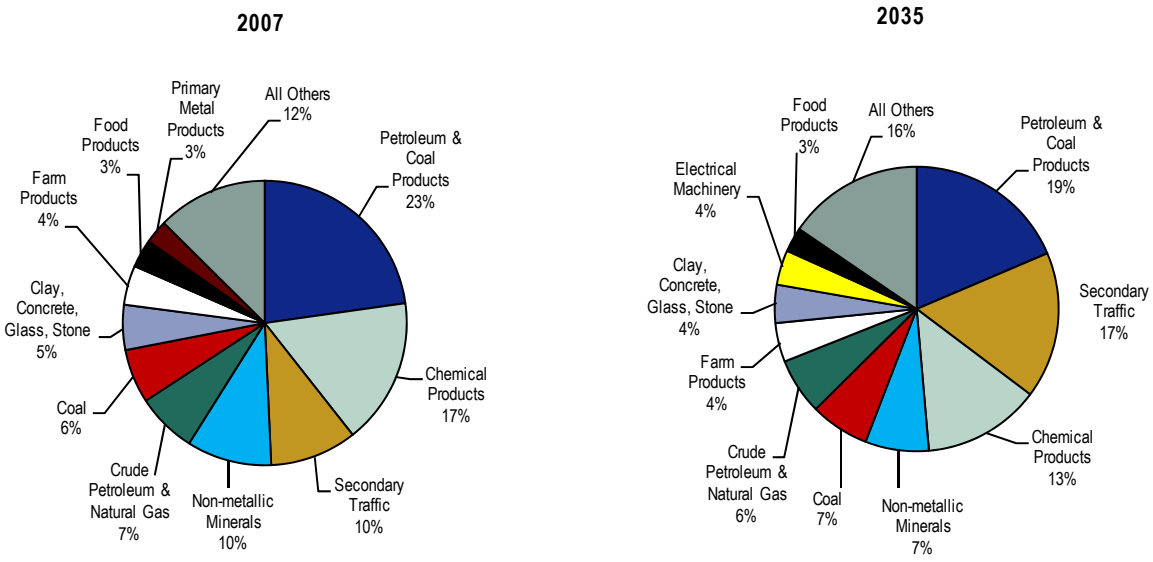
ES.5 What Kind of Freight Is Moving Through the Region?

The backbone of the Houston-Galveston region's economy is the petrochemical industry. This is reflected in the types of commodities moving over the regional transportation system. Figure ES.6 shows that the three commodity groups most closely associated with the petrochemical industry (petroleum and coal products, chemical products, and crude petroleum & natural gas) comprise nearly half of all freight transported based on total tonnage (23 percent, 17 percent, and seven percent respectively for a total of 47 percent). Also, many of the primary metal products transported across the region are used by industries that support the petrochemical industry.

Commodities such as secondary traffic; non-metallic minerals; food products; and clay, concrete, glass and stone products are related to the demands associated with the growing population of the region. Secondary traffic consists of warehouse / distribution traffic and drayage. It represents the distribution of consumer and manufactured goods and is a proxy of sorts for the demands related to a growing consumer market. The forecasted growth of secondary traffic illustrated in Figure ES.6 primarily reflects the projected organic growth of the region's population and economy relative to the projected growth of the petrochemical industry.

Figure ES.6 Top 10 Commodities by Weight – Inbound, Outbound, and Intraregional

2007 and 2035



Source: IHS Global Insight

Key Findings from the Commodity Flow Analysis

- 90 percent of all freight tonnage moving in the H-GAC region is servicing the local economy, meaning it is either being picked up from or delivered to a local business or resident.
- Six of the region's ten top trading partners (in terms of volume) are within the State of Texas. This demonstrates the importance of the region's transportation infrastructure to the rest of the State.
- The top three commodities account for nearly half of all the freight moving in the region. These include petroleum and coal products, secondary traffic (defined here as freight flows to and from distribution centers or via intermodal facilities), and chemical products.
- Harris County is by far the largest freight generator and attractor within the region. It accounted for more than 77 percent of all inbound tonnage and more than 74 percent of all outbound tonnage.

1.0 Introduction

The Houston-Galveston Area Council (H-GAC) has commissioned a Regional Goods Movement Study to provide a comprehensive evaluation of the multi-modal goods movement system as well as strategies and recommendations for improving mobility and access for both commuters and freight. The central goal of the study is to develop a plan for a safe and efficient goods movement system that enhances freight mobility and economic competitiveness while mitigating the community impacts of goods movement. This report is one in a series of technical memorandums to be developed as part of the study. The framework for conducting the H-GAC Regional Goods Movement Study provides the building blocks necessary to identify the key elements of the H-GAC region's freight transportation system and how they relate to one another and to the region's economy. The framework integrates five primary areas of research, described below.

This report documents the findings for the *Commodity Flows* block and will be used to inform the needs assessment to be conducted as part of subsequent tasks. A quantitative commodity flow analysis helps policy-makers and analysts better understand freight movements into, out of, within, and through the study area by identifying the volumes and types of commodities moved, their origins and destinations, and their mode of transport. This profile focuses on the two primary measures of freight activity-tonnage and value. Tonnage is an indicator of the demand that freight movement places on the transportation infrastructure while value is an indicator of the economic activity associated with freight. The data were analyzed by direction, (i.e., inbound, outbound, intraregional, and through moves), by mode (truck, rail, air, and water), by commodity type, and by trading partner for both 2007 base year and 2035 forecast.

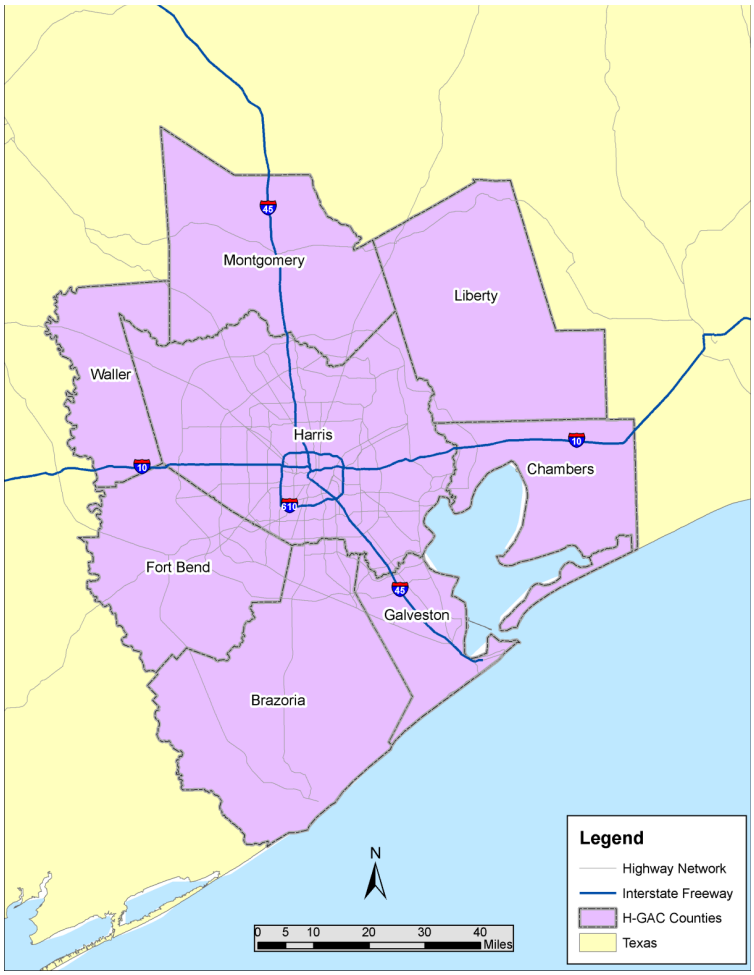
This report provides both regional and county-level analysis of commodity flows moving into, out of, through, and within the H-GAC region and is organized as follows. Section 2.0 provides an analysis of the data from a regional perspective. This includes a high-level overview of the data (Section 2.2), a more detailed analysis by mode (Section 2.3), an analysis by commodity type

(Section 2.4), and a review of the region's most important trading partners (Section 2.5). Section 3.0 presents the commodity flow analysis at the county-level for each of the eight counties in the study region. Additional data in the form of tables, charts, and other graphics are provided in the appendix.

1.1 Data and Methodology

The study area is comprised of the eight counties included in the Houston-Galveston Area Council region. This area includes Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties, and is shown in Figure 1.1. Throughout the remainder of this report the words "region" or "regional" will refer to this eight-county study area.

Figure 1.1 H-GAC Region



Source: National Transportation Atlas Database

The data source for the analysis in this report is the TRANSEARCH commodity flow database. TRANSEARCH is a commercial data product developed by IHS Global Insight, Inc. that incorporates a mix of public sector data (for rail, air, and water movements) and proprietary data (from trucking companies and logistics services) to estimate freight flows. TRANSEARCH provides estimates of freight tonnage and units moving between different geographic areas (counties, business economic areas, and states), by different transportation modes (truck, rail, water, and air), distinguished by commodity type.[7] The database also includes 2035 projections of freight flows that are used to describe future demand for freight transportation in the H-GAC region. It is important to note the following characteristics of the TRANSEARCH data used in this analysis:

- The database does not include any estimates for commodities transported via pipelines. The Freight Analysis Framework, Version 3 (FAF3) developed by the Federal Highway Administration (FHWA) estimates that more than 392 million tons of freight moved via pipeline in the Houston region in 2007. Adding this to the totals reported in the TRANSEARCH data results in 50 percent more freight moving in the region than is reported in the current report.
- The TRANSEARCH dataset does not include international trading partner data, with the exception of Mexico and Canada. However, international traffic is captured and recorded as domestic traffic if the freight moves to or from the region's international gateways via truck.
- The complete Surface Transportation Board (STB) Waybill rail dataset was not available for this analysis. Therefore the rail freight traffic represent estimates based on the STB Public Sample Waybill data and does not include through rail traffic. This results in an under-reporting of freight rail traffic.[8]
- The TRANSEARCH data is not "linked," meaning that it counts freight that is carried by more than one mode multiple times. For example, if a ton of sand is brought into the region by train and then transported within the region via truck, that same ton of sand will be counted in both rail and truck tonnage.

1.2 Key Findings

The Houston-Galveston region is a freight hub of national importance. Analysis of FHWA's Freight Analysis Framework 3 (FAF3) data shows that in 2007 the Houston CSA (Combined Statistical Area) was ranked 4th in the nation in truck tonnage[9] behind the New York, Los Angeles, and Chicago regions. This same data ranks the Houston region 1st in the nation in pipeline volumes and 11th in air freight tonnage. The American Association of Port Authorities ranks Houston 2nd in the nation, behind southern Louisiana, in terms of total 2009 cargo trading

[7] Commodity information is provided at the Standard Transportation Commodity Code (STCC) 2 level of detail.

[8] This also results in differences between the data presented here and that found in other regional rail reports.

[9] Analysis of 2007 FAF3 data for inbound and outbound truck tonnages by metropolitan area.

volumes.[10] Precise data on the volume of rail freight moving through all the metropolitan areas of the United States is not available, but clearly the Houston-Galveston region is a critical node in the national freight distribution system. A summary of key TRANSEARCH commodity flow analysis findings are presented below. More detailed analysis follows in Section 2.0.

Commodity Flow Summary

- Nearly 761 million tons of inbound, outbound, intraregional, and through freight moved over the H-GAC region's transportation network in 2007. Forty-eight percent of this traffic was inbound, 30 percent was outbound, 13 percent was intraregional, and nine percent was through traffic. The value of this freight was over $1.5 trillion.
- By 2035, inbound, outbound, intraregional, and through freight is expected to grow to 1.2 billion tons and have a value of more than $3.3 trillion.
- The freight transportation mode split by weight was 61 percent truck, 20 percent rail, 19 percent water, and less than one percent air in 2007. By 2035, the mode split by weight is projected to be 65 percent truck, 18 percent rail, 17 percent water, and less than one percent air.
- The mode split by value was 88 percent truck, seven percent rail, five percent water, and less than one percent air in 2007. By 2035, the mode split by value is projected to be 92 percent truck, five percent rail, three percent water, and less than one percent air.
- Harris County is by far the largest freight generator and receiver within the region. It accounted for more than 77 percent of all inbound tonnage and over 74 percent of all outbound tonnage in 2007. Harris County is projected to be similarly dominant in 2035.

Truck Flows

- In 2007, over 465 million tons of inbound, outbound, intraregional, and through freight was hauled by truck over the region's roadway infrastructure. Thirty-five percent of this traffic was inbound, 32 percent was outbound, 18 percent was intraregional, and 15 percent was moving through the region (i.e., had both an origin and a destination outside of the H-GAC region). The value of this freight was over $1.3 trillion.
- By 2035, inbound, outbound, intraregional, and through truck freight is expected to grow to 781 million tons, an increase of nearly 70 percent and have a value of more than $3.0 trillion, an increase of more than 130 percent.
- Harris County received more than 77 percent of all truck freight inbound to the region in both 2007 and is projected to maintain that level in 2035. Harris County also generated a similar proportion of outbound truck freight.

[10] http://aapa.files.cms-plus.com/Statistics/2009US_PORTRANKINGS_BY_CARGO_TONNAGE.pdf accessed 12/9/10.

Rail Flows

- In 2007, more than 152 million tons of inbound, outbound, and intraregional freight was hauled by rail over the region's rail network. Sixty-seven percent of this traffic was inbound, 28 percent was outbound, and five percent was intraregional. The value of this freight was more than $106 billion.
- By 2035, inbound, outbound, and intraregional rail freight will grow to nearly 218 million tons with a value of more than $146 billion.
- Harris County received 78 percent of all inbound rail freight to the region in 2007 and is projected to maintain that share in 2035. It generated more than 73 percent of the region's outbound rail freight in 2007.

Top Commodities

- The top three commodity groups moving over the region's transportation infrastructure in both 2007 and 2035 are petroleum and coal products, secondary traffic (defined here as freight flows to and from distribution centers or via intermodal facilities), and chemical products. Together they account for more than half of total commodities by weight both currently and in the future.
- In 2007, the top truck commodity was secondary traffic, which accounted for 53 percent of total truck tonnage. Chemical products were second (nine percent of total truck tonnage), and non-electrical machinery (six percent of total truck tonnage) was third.
- In 2007, the top rail commodity was coal, which accounted for 27 percent of the region's total rail tonnage. Chemical products were second (also 27 percent of total rail tonnage), and non-metallic minerals were third (11 percent of total rail tonnage).

Top Trading Partners

- The top three H-GAC trading partners in North America – the country of Mexico, the Dallas Region, and the State of Louisiana – account for about 29 percent of total freight flows by weight.
- In 2007, the top commodity group moved to and from the region's top North American trading partner (Mexico) was crude petroleum, natural gas, and gasoline, accounting for a little more than 53 percent of total tonnage. This was followed by petroleum and coal products at ten percent and electrical machinery at six percent.
- In 2007, the top commodity group moved to and from the region's second largest trading partner (the Dallas Region) was secondary traffic, accounting for a little more than 29 percent of total tonnage. This was followed by petroleum and coal products at 19 percent and food or kindred products at 17 percent. In 2007, the top commodity group moved to and from region's third largest trading partner (the State of Louisiana) was petroleum and coal products, accounting for 47 percent of total tonnage. This was followed by chemical products at 27 percent and secondary traffic at six percent.

2.0 Regional Commodity Flow Analysis

2.1 Overview

In 2007, 761.3 million tons of freight moved into, out of, within, or through the H-GAC region. These shipments had an estimated value of $1.5 trillion.[11] Approximately 362 million tons (48 percent) traveled inbound, 231 million tons (30 percent) traveled outbound, and 100 million tons (13 percent) traveled from one point within the region to another point within the region. Through freight accounted for 68 million tons or nearly nine percent of the total. This proportion of through freight is interestingly low and means that more than 90 percent of all freight moving across the region's transportation infrastructure is servicing the regional economy and is not simply passing through the region.

Weight versus Value

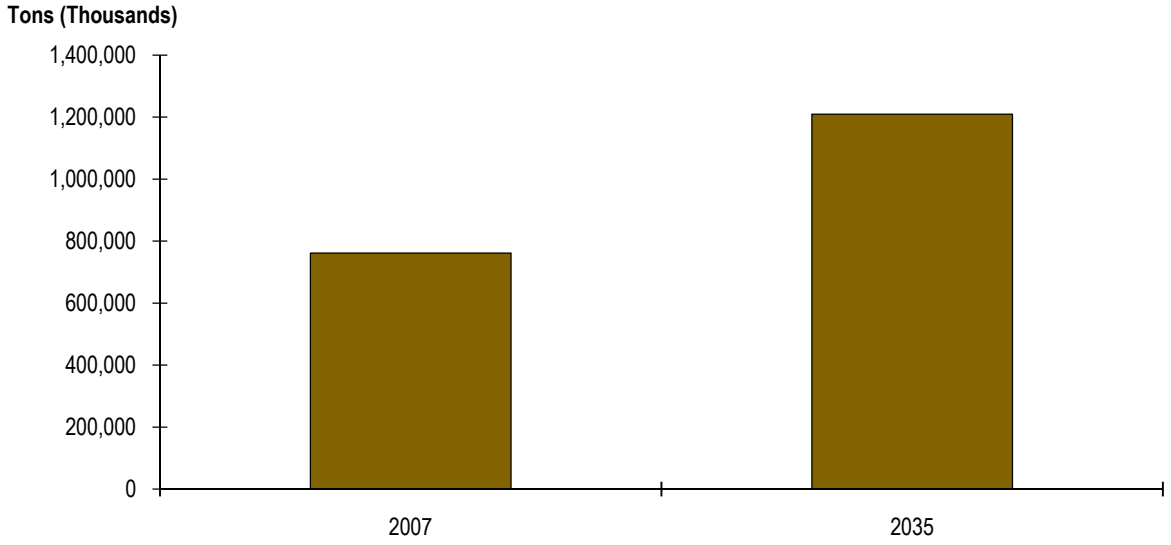
A weight-based commodity flow analysis is a fundamental element of any freight study, as the weight of shipped commodities is important to understanding how freight vehicles use the transportation system. This understanding is critical when addressing factors such as bridge stress, pavement consumption, and congestion. Shipment weights for different commodity types are also crucial when assessing the impacts of certain commodities and industries (including petrochemicals, consumer goods, coal, and nonmetallic minerals) on the transportation system.

However, it also is important to consider the value of the products being transported. Describing shipment value provides another view of freight movements within the region, and is particularly important in understanding the impacts of value-added manufacturing and service-related industries. These industries tend to generate and ship lower-weight, higher-value commodities.

Commodity flow patterns by weight are presented throughout this Technical Memorandum and are supplemented with value analysis at key points. A number of value-oriented charts and tables are included in the appendix. Figures 2.1 and 2.2 show the growth of freight on the region's transportation network in terms of tonnage and value respectively, and the following sections provide more detail about these movements.

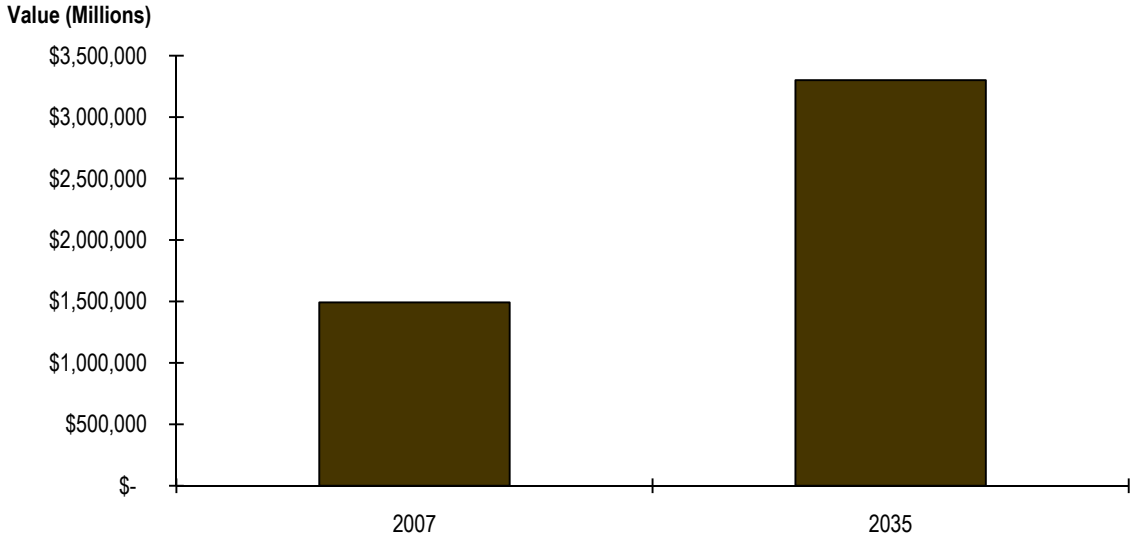
[11] All value figures in this report refer to current year dollars. 2007 figures are in 2007 dollars and 2035 figures are in 2035 dollars as estimated in the TRANSEARCH data.

Figure 2.1 Expected Growth of Regional Freight Flows
By Weight



Source: IHS Global Insight

Figure 2.2 Expected Growth of Regional Freight Flows
By Value



Source: IHS Global Insight

2.2 Directional Analysis

Directional analysis describes and compares the magnitude of freight, in terms of both weight and value, moving over the region's transportation infrastructure by *direction*. It also can help reveal the underlying economic structure of the region. Every freight shipment can be categorized as moving in one of four directions- inbound, outbound, intraregional, or through. Freight flows are assigned a direction according to the following definitions:

- **Inbound freight** movements originate outside of the region and terminate within the region. Inbound freight represents **imports** to the region. Because consumers and businesses must pay for goods received, inbound freight also is associated with a corresponding outflow of dollars from the region.
- **Outbound freight** movements originate within the region and terminate outside of the region. Outbound freight represents **exports** from the region and is considered *wealth-generating* freight because it is associated with an inflow of dollars to the region.
- **Intraregional freight** movements originate and terminate within the region. Intraregional freight moves represent the degree to which the region is trading with itself. It is associated with neither imports nor exports, but reflects the level to which the region is able to supply the goods it needs (both consumer and production materials) from within its boundaries.
- **Through freight** movements originate outside of the region, traverse the region, and terminate outside of the region. Through freight moves, while very important for the national and global economy, do not directly impact the regional economy to a significant degree; however, the movement of through freight does utilize and impact the regional transportation system as a means to reach its final destination.

In 2007, more than 760 million tons of freight moved over the region's transportation system. By 2035, total freight is projected to increase by nearly 59 percent to more than 1.2 billion tons. Table 2.1 displays freight flows by weight and direction in 2007 and in 2035 while Figure 2.3 graphically displays the proportion of regional freight tonnage by direction.

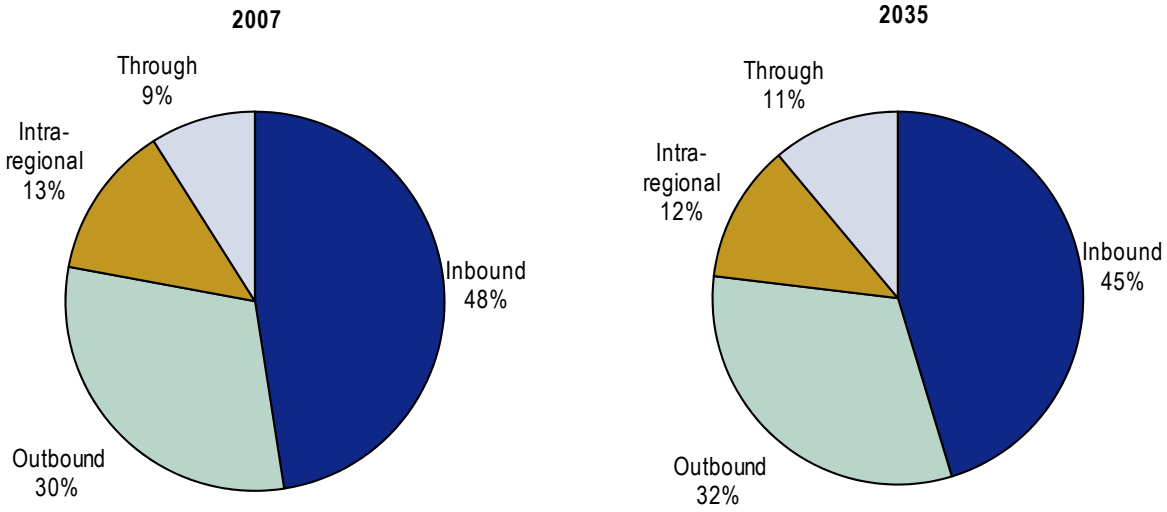
Table 2.1 Total Tonnage by Direction
Tons in Thousands

Direction	2007	2035	Percent Change
Inbound	361,937	547,929	51.3%
Outbound	231,190	381,876	65.2%
Intraregional	99,759	145,466	45.8%
Through[a]	68,402	133,884	95.7%
Total	**761,287**	**1,209,156**	**58.8%**

Source: IHS Global Insight.

[a] Through rail moves were not included in this TRANSEARCH dataset due to the inability to obtain the full Surface Transportation Board (STB) Waybill Dataset. Therefore, the total through tonnage shown here likely underestimates actual through tonnage due to the lack of through rail data.

Figure 2.3 Direction of Total Freight Flows by Weight
2007 and 2035

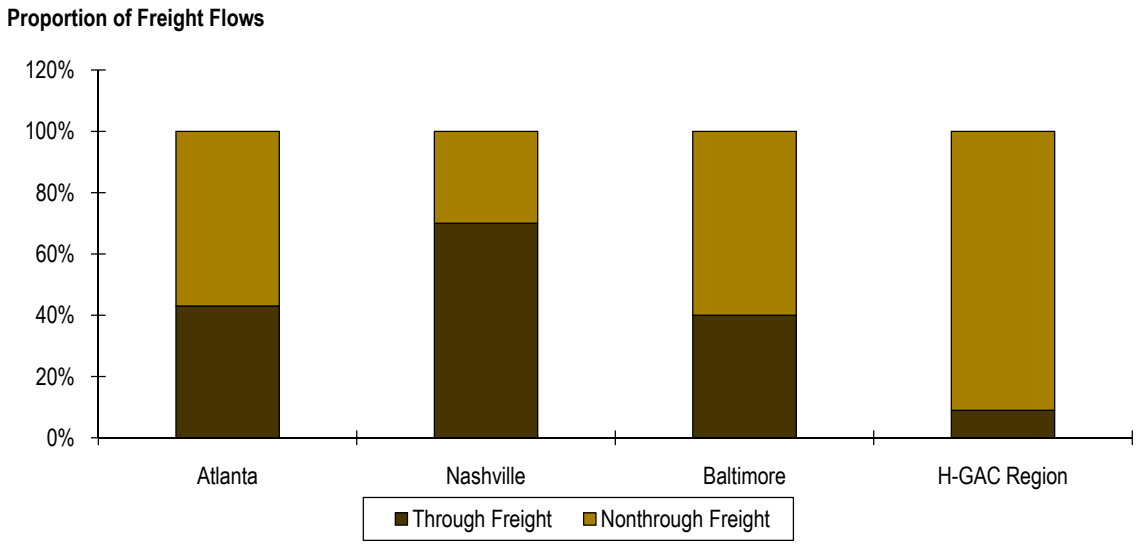


Source: IHS Global Insight

In 2007, only nine percent of total freight flows by weight were through moves that did not originate or terminate within the region. This is a very small percentage compared to that of many other regions in the country. For example, 43 percent of the total freight in the Atlanta region is through,[12] more than 70 percent in Nashville, and more than 40 percent in Baltimore (see Figure 2.4). This means that more than 90 percent of the freight moving along the H-GAC region's transportation system is servicing the local economy in one way or another. Even though through freight is the fastest growing component by weight within the region, it is forecast to account for just 11 percent of total freight by 2035.

[12] Atlanta Regional Freight Mobility Plan.

Figure 2.4 Through Freight Proportions – H-GAC and Other Regions



Source: Cambridge Systematics analysis of data from relevant regional freight studies.

The largest component of total regional freight is traveling inbound (48 percent of the 2007 total) which indicates that the Houston-Galveston region is a net importer of goods. Inbound freight utilizes that part of the transportation network that provides access to distribution centers and retail nodes (finished consumer goods), as well as manufacturing facilities, port terminals, and cargo airports in the region.

Outbound freight is the second largest component (30 percent of the 2007 total) and indicates that the Houston-Galveston region has a vibrant export sector. Outbound freight utilizes that part of the transportation network that provides access from national distribution centers, manufacturing facilities, port terminals, and cargo airports in the region.

Value is an indicator of the economic activity associated with freight. In 2007, total freight shipments over the H-GAC region's transportation infrastructure were valued at nearly $1.5 trillion. By 2035, this figure is projected to grow by more than 120 percent to a little more than $3.3 trillion. Table 2.2 displays freight flows by value and direction for 2007 and 2035 while Figure 2.5 graphically displays the proportion of regional freight value by direction.

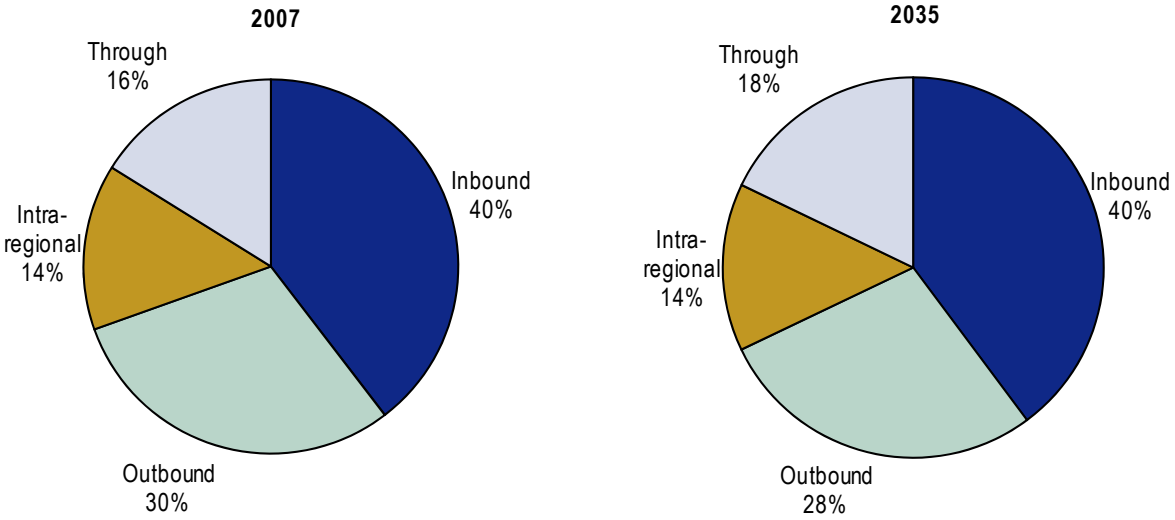
Table 2.2 Total Value by Direction for the H-GAC Region
Dollars in Millions

Direction	2007	2035	Percent Change
Inbound	$590,592	$1,314,098	122.5%
Outbound	$446,687	$927,186	107.6%
Intraregional	$213,754	$470,350	120.0%
Through[a]	$240,568	$589,300	145.0%
Total	**$1,491,601**	**$3,300,933**	**121.3%**

Source: IHS Global Insight.

[a] Through rail moves were not included in this TRANSEARCH dataset due to the inability to obtain the full Surface Transportation Board (STB) Waybill Dataset. Therefore, the total through tonnage shown here likely underestimates actual through tonnage due to the lack of through rail data.

Figure 2.5 Direction of Total Freight Flows by Value
2007 and 2035



Source: IHS Global Insight

Value analysis provides insight into the flow of money into and out of the regional economy. Inbound tonnage implies an outbound flow of money as consumers and businesses pay for the goods received. Similarly, outbound tonnage implies an inbound flow of money as regional businesses receive payment for goods or raw materials produced.[13]

The largest component of total regional freight (by value) is traveling inbound (40 percent of the 2007 total) which indicates that the Houston-Galveston region experiences a net outflow of money related to freight movement. This is contrasted with the outbound freight in the region which is the second largest component by value (30 percent of the 2007 total).

In 2007, 16 percent of total freight flows by value were through moves that did not originate or terminate within the region. Intraregional moves that reflect the level to which the region is able to meet its demand for goods through suppliers within the region comprised 14 percent. The directionality of freight flows through the H-GAC region is only expected to be marginally different in 2035, with a two percent reduction in the outbound traffic and a corresponding increase in the through traffic. The following sections provide more detail on inbound, outbound, and intraregional trips.

Directional Analysis – Inbound Freight

When looking at inbound freight it is important to understand where the freight is going– its termination point. The TRANSEARCH dataset identifies the origins and destinations of freight flows at the *county* level; therefore, it is not possible to identify a particular manufacturing facility, distribution center, port terminal, etc., as the termination point. All inbound freight flows terminating in Chambers County, for example, will be routed (within TRANSEARCH) to terminate at a centroid within the County. However, it is clear that both inbound and outbound flows will impact the regional transportation system, particularly its major trade corridors (interstates and mainlines) and the connections to those corridors.

Terminating Counties for Total Inbound Freight

Figures 2.6 and 2.7 graphically present, by county, the distribution of total inbound tonnage for 2007 and 2035.[14] Harris County alone accounts for nearly 77 percent of all inbound tonnage to the region in 2007 and is projected to account for almost 74 percent of inbound tonnage by 2035. This means that maintaining and upgrading freight facilities within Harris County as its population

[13] This should be viewed in a relative sense. TRANSEARCH considers freight bound for the Port of Houston as inbound to the region, for example, even though it will be loaded onto a vessel for final delivery elsewhere. Also, goods that have intermediate stopping points are counted as separate freight flows. This means that a shipment that arrives inbound by air, is trucked to a regional distribution center, stored for a time, then shipped out of the region to a customer will be counted three times; once as an inbound air shipment, once as an intraregional truck shipment, and once as an outbound truck shipment. Therefore, these value analyses provide relative and general insight into the flow of money into and out of the regional economy.

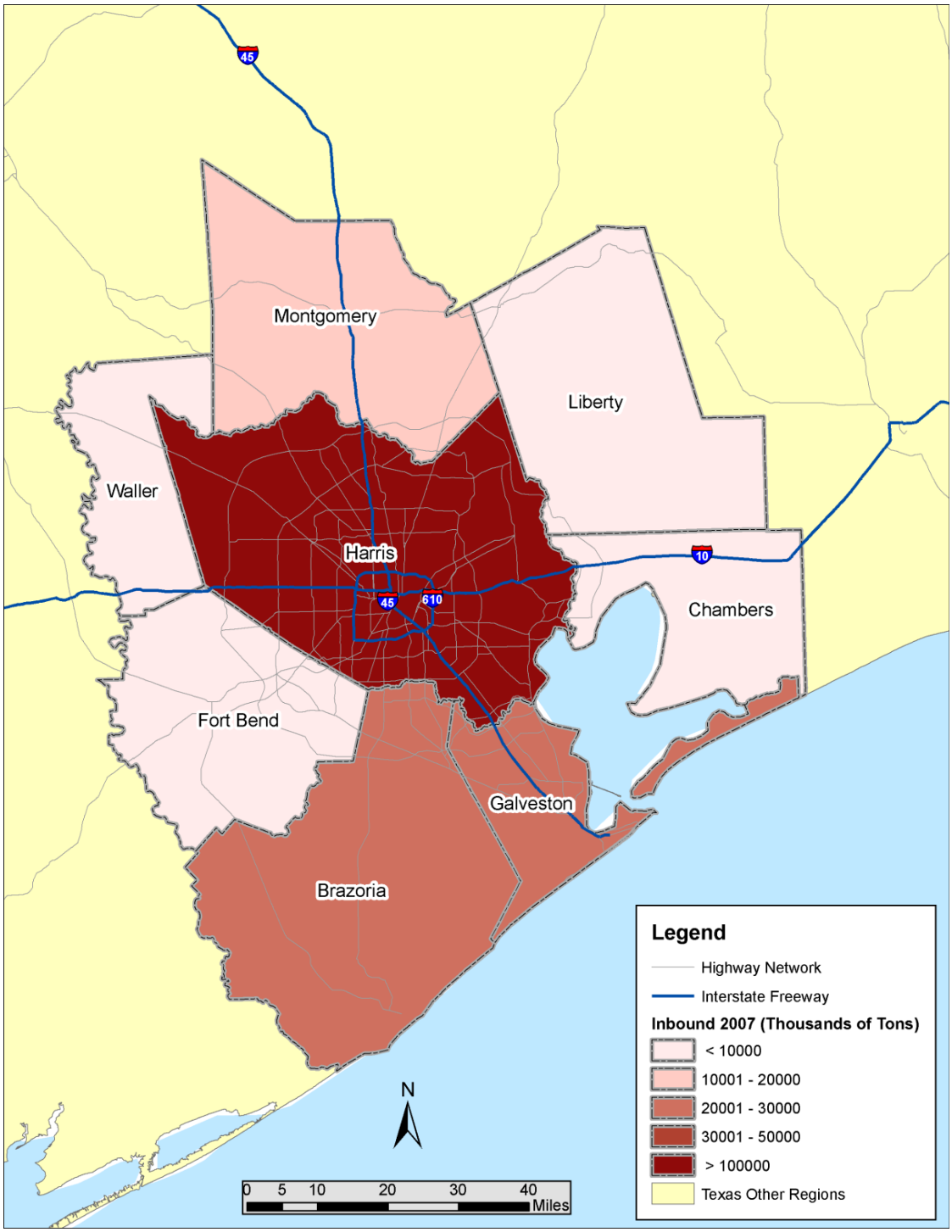
[14] Tables detailing inbound tonnage and value by county are available in the appendix.

(and resulting traffic) continues to increase will be important to the vitality of the regional economy.

Galveston and Fort Bend counties received 8.2 percent and 7.8 percent of inbound tonnage, respectively in 2007 (9.1 percent and 7.8 percent by 2035), while Brazoria County received 4.9 percent in 2007 and is expected to receive a little more than 7.0 percent in 2035, a substantial increase of over 40 percent (although from a very low base). The remaining counties (Montgomery, Chambers, Liberty, and Waller) combined accounted for a little more than two percent of inbound tonnage in both 2007 and 2035.

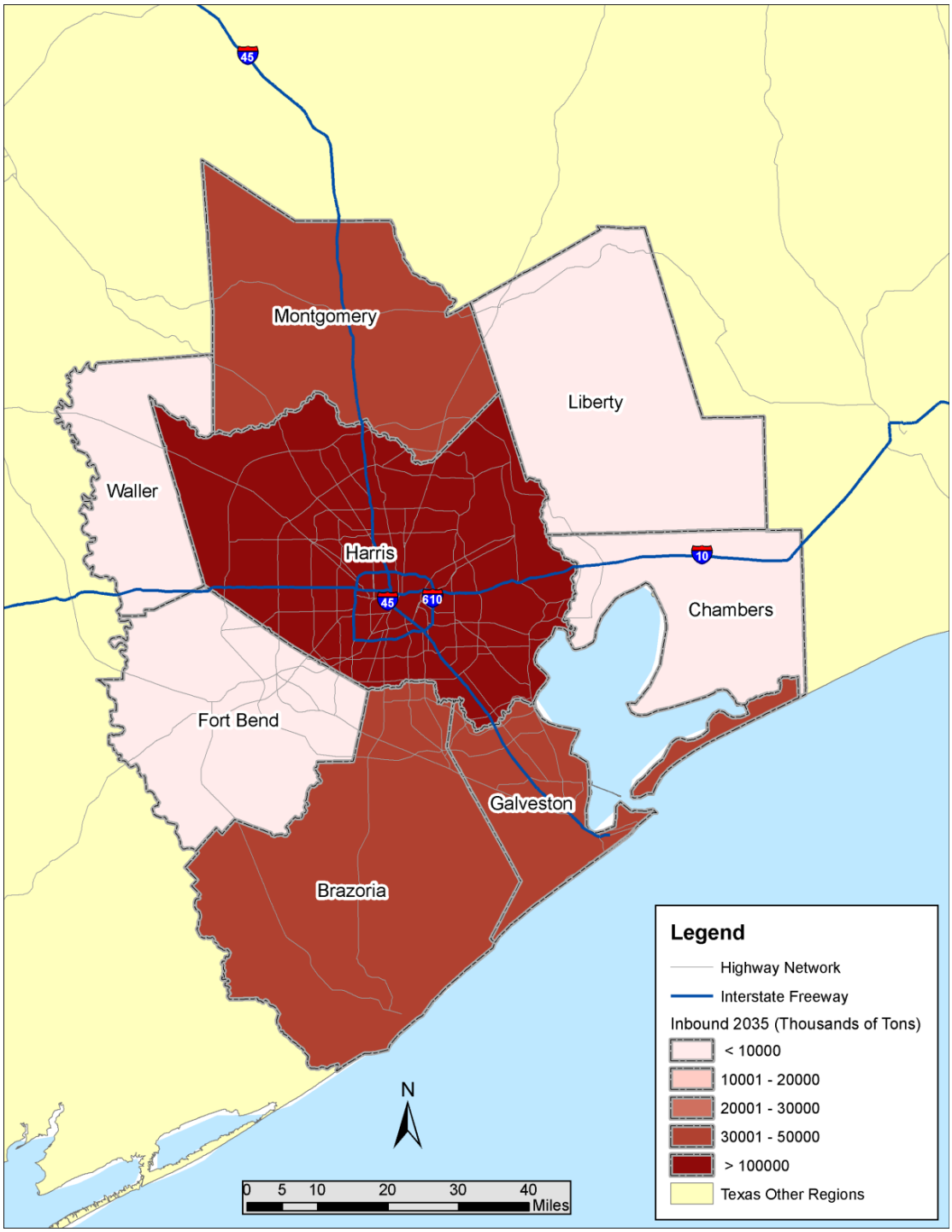
In terms of value, Harris County is the largest recipient of inbound freight by far, receiving about 78 percent of all inbound value to the region in both 2007 and 2035.

Figure 2.6 Terminating Counties for Total Inbound Freight by Weight
2007



Source: IHS Global Insight

Figure 2.7 Terminating Counties for Total Inbound Freight by Weight
2035



Source: IHS Global Insight

Directional Analysis – Outbound Freight

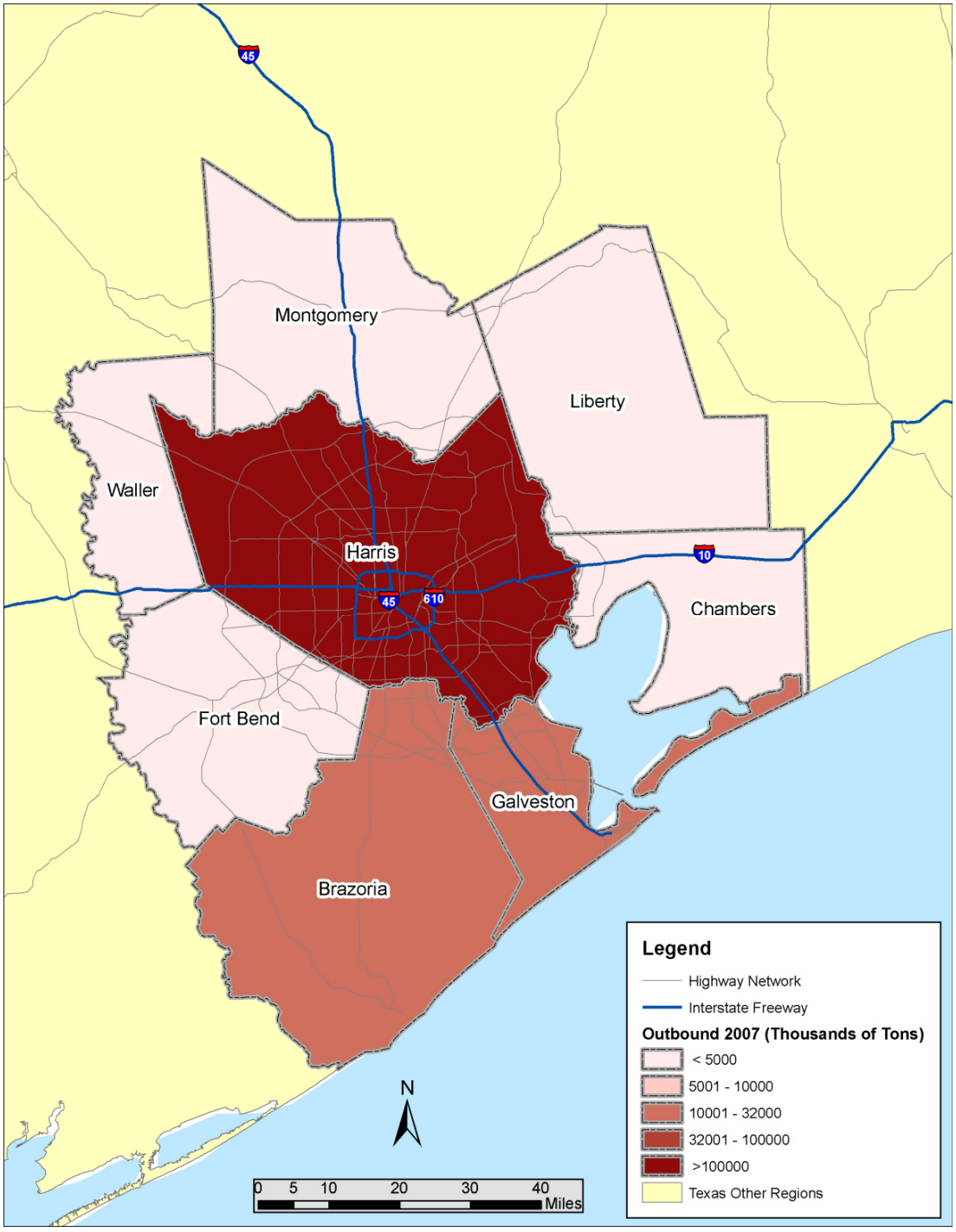
It also is important to understand where the regional outbound freight is being generated from – its origination point. As noted in the previous section, the TRANSEARCH dataset identifies the origins and destinations of freight flows at the county level; therefore, it is not possible to identify a particular manufacturing facility, distribution center, port terminal, etc., as an origination point using this database. All outbound freight flows originating in Fort Bend County, for example, are routed within TRANSEARCH with the origin at a centroid within the County. Additional data collection will be conducted in future tasks that will provide more insight into the specific origins and destinations of regional commodity flows.

Originating Counties for Total Outbound Freight

Harris County accounted for more than 74 percent of outbound freight tonnage originating from the region in 2007. By 2035, a little less than 74 percent of all outbound tonnage from the region will originate in Harris County, a marginal reduction. This highlights the importance of the Harris County economy to that of the Houston-Galveston region both now and into the foreseeable future. Maintaining and improving freight access within Harris County is, therefore, critically important to the region. Harris County also leads the region in terms of the value of freight originating there. In 2007, it accounted for more than 83 percent of the total value originating from the region. Figures 2.8 and 2.9 graphically present, by county, the distribution of total outbound tonnage for 2007 and 2035, respectively.[15]

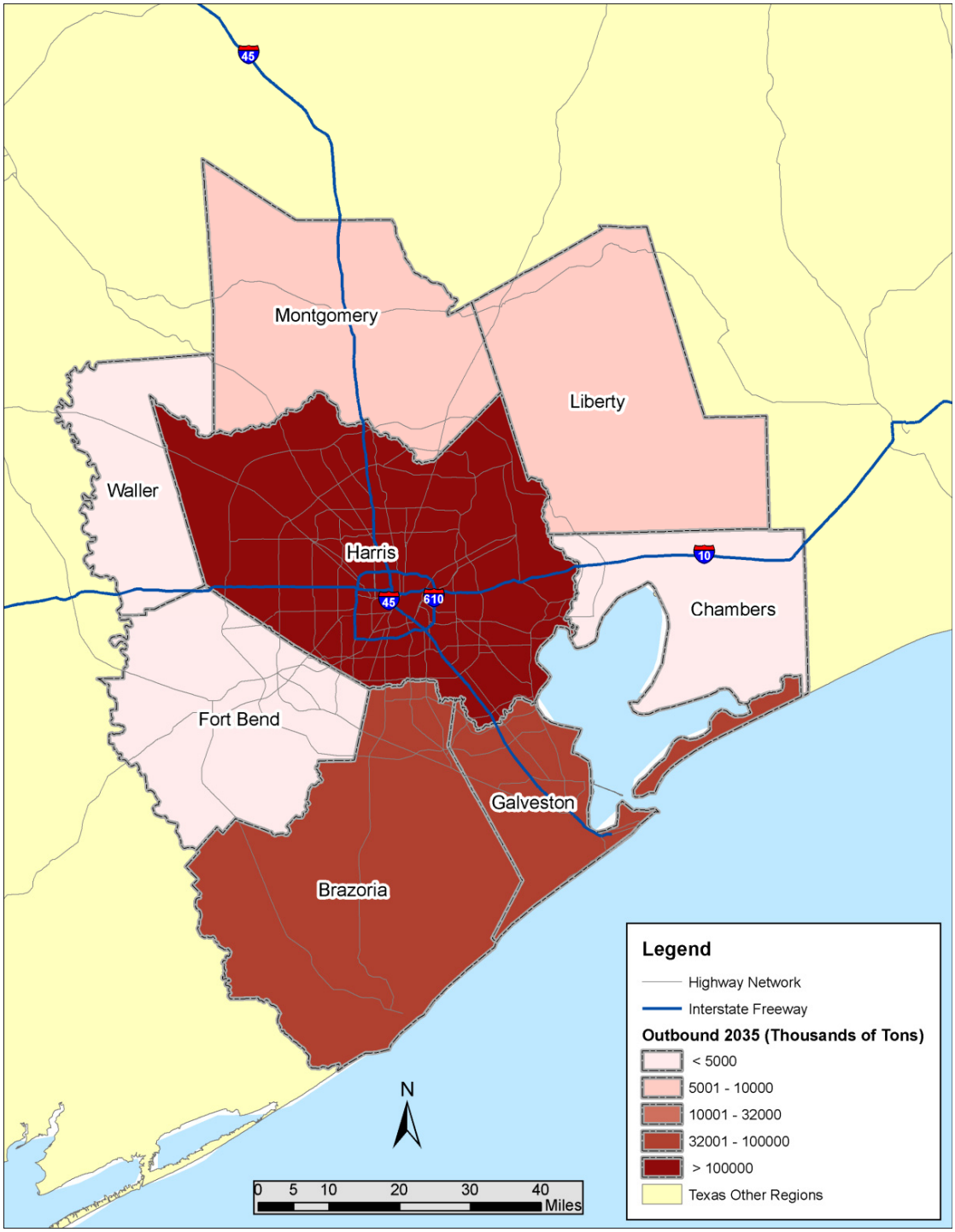
[15] Tables detailing outbound tonnage and value by county are available in the appendix.

Figure 2.8 Originating Counties for Total Outbound Freight by Weight
2007



Source: IHS Global Insight

Figure 2.9 Originating Counties for Total Outbound Freight by Weight
2035



Source: IHS Global Insight

Directional Analysis – Intraregional Freight

To understand more about how intraregional freight moves within a region, a ranked list of origin-destination pairs was developed (see Table 2.3 below). Within the Houston-Galveston region, the origin-destination pair with the greatest level in intraregional freight by weight is internal movements within Harris County (i.e., Harris County origins to Harris County destinations). More than 54 percent of all intraregional freight moves by weight in 2007 (50 percent in 2035) were between origins and destinations within Harris County. The second and third most significant origin-destination pairs are Galveston County to Harris County, and Harris County to Brazoria County. By 2035, the top three pairs are projected to be the same as they were in 2007, except that the order of the second and third place pairs is reversed. Tables 2.3 and 2.4 show the top ten origin-destination pairs in 2007 and 2035 by weight. The majority of intraregional freight is handled by trucks (more than 80 percent by weight), with the rail and water modes each handling about 8.5 percent. Much of the intraregional water movement is likely due to lightering operations (process of transferring cargo between vessels of different sizes, usually between a barge and a bulker or oil tanker) while the relatively large proportion of intraregional freight rail moves are chemical products that may be moving among refineries and chemical manufacturing facilities.

Table 2.3 Top 10 Origin-Destination Pairs for Total Intraregional Traffic by Weight

2007, Tons in Thousands

Origin	Destination	Truck	Rail	Water	Air	Total
Harris County	Harris County	46,142	3,572	4,701	0	**54,414**
Galveston County	Harris County	4,512	619	2,394	0	**7,526**
Harris County	Brazoria County	6,615	383	124	0	**7,122**
Harris County	Galveston County	5,193	450	236	0	**5,880**
Brazoria County	Harris County	3,842	816	126	0	**4,784**
Liberty County	Harris County	2,794	271	0	0	**3,065**
Galveston County	Galveston County	1,527	104	750	0	**2,382**
Montgomery County	Harris County	1,915	30	0	0	**1,945**
Harris County	Liberty County	216	1,567	0	0	**1,783**
Fort Bend County	Harris County	1,689	20	0	0	**1,709**
All Others		8,349	581	217	0	**9,147**
Total		**82,794**	**8,414**	**8,550**	**0**	**99,759**

Source: IHS Global Insight.

Table 2.4 Top 10 Origin-Destination Pairs for Total Intraregional Traffic by Weight
2035, Tons in Thousands

Originating County	Terminating County	Truck	Rail	Water	Air	Total
Harris County	Harris County	63,262	3,881	5,642	0	**72,785**
Harris County	Brazoria County	18,086	487	214	0	**18,787**
Galveston County	Harris County	5,025	776	2,446	0	**8,247**
Harris County	Galveston County	6,988	555	238	0	**7,782**
Brazoria County	Harris County	5,632	810	199	0	**6,641**
Liberty County	Harris County	4,015	658	0	0	**4,673**
Harris County	Liberty County	300	3,379	0	0	**3,679**
Galveston County	Galveston County	1,605	147	1,102	0	**2,855**
Montgomery County	Harris County	2,373	60	0	0	**2,433**
Brazoria County	Brazoria County	2,147	127	10	0	**2,285**
All Others		14,121	689	490	0	**15,299**
Total		**123,554**	**11,572**	**10,340**	**0**	**145,466**

Source: IHS Global Insight.

2.3 Mode Share Analysis

Freight utilizes five modes of transportation; roadways, railways, water, air, and pipelines.[16] Mode share analysis enables better understanding of how the region's transportation infrastructure is impacted by freight movement.

Mode Share Analysis – All Directions (Inbound, Outbound, Intraregional, and Through)

Tables 2.5 and 2.6 display the breakdown of total freight tonnage and value by mode for both 2007 and 2035. Clearly, trucks are the dominant mode of freight transportation throughout the region, both by weight and by value. About 61 percent of all freight tonnage was moved by truck in 2007. By 2035, the truck mode share is projected to grow to about 65 percent (see Figure 2.10).[17] The rail and water modes handled 20 and 19 percent of total regional freight, respectively in 2007, with slightly smaller proportions in 2035.

[16] Pipeline data are not available in the TRANSEARCH database and is not included in this Technical Memorandum. The pipeline mode will be addressed within the Modal Profile Technical Memorandum.

[17] Pie charts describing the mode share by value for 2007 and 2035 are located in the appendix.

Table 2.5 Summary of Regional Freight Flows by Weight

Tons in Thousands

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	163,325	247,998	51.8%	101,707	150,647	48.1%	96,728	149,001	54.0%	177	284	60.5%	361,937	547,929	51.5%
Outbound	150,944	276,051	82.9%	42,432	55,734	31.3%	37,525	49,159	31.0%	289	932	222.5%	231,190	381,876	65.2%
Intraregional	82,794	123,554	49.2%	8,415	11,572	37.5%	8,550	10,340	20.9%	–	–	–	99,759	145,466	45.8%
Through	68,402	133,884	95.7%	N/A[a]	N/A[a]	N/A[a]	–	–	–	–	–	–	68,402	133,884	95.7%
Total	**465,464**	**781,487**	**67.9%**	**152,554**	**217,953**	**42.9%**	**142,803**	**208,500**	**46.0%**	**466**	**1,216**	**160.9%**	**761,287**	**1,209,156**	**58.8%**

Source: IHS Global Insight.

[a] Through rail moves were not included in this TRANSEARCH dataset due to the inability to obtain the full Surface Transportation Board (STB) Waybill Dataset. Therefore, the total through tonnage shown here likely underestimates actual through tonnage.

Table 2.6 Summary of Regional Freight Flows by Value

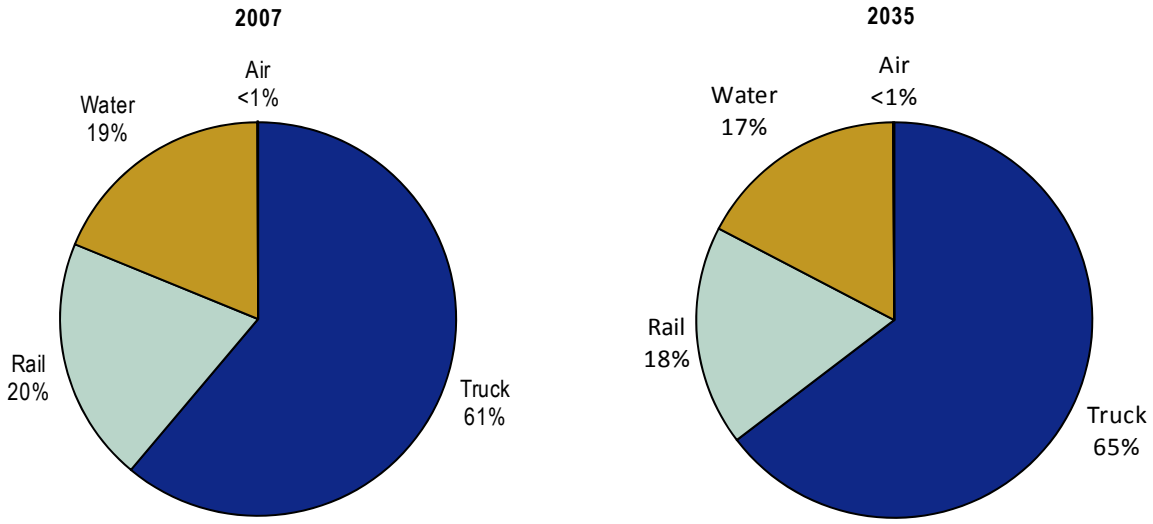
Dollars in Millions

Direction	Truck		Percent Change (2007 to 2035)	Rail		Percent Change (2007 to 2035)	Water		Percent Change (2007 to 2035)	Air		Percent Change (2007 to 2035)	Total		Percent Change (2007 to 2035)
	2007	2035		2007	2035		2007	2035		2007	2035		2007	2035	
Inbound	502,707	1,178,932	134.5%	42,205	65,592	55.4%	43,704	64,444	47.5%	1,976	5,130	159.6%	590,592	1,314,098	122.5%
Outbound	368,397	823,509	123.5%	50,818	61,036	20.1%	26,125	38,749	48.3%	1,347	3,891	188.9%	446,687	927,186	107.6%
Intraregional	192,817	441,220	128.8%	13,808	19,788	43.3%	7,129	9,342	31.0%	–	–	–	213,754	470,350	120.0%
Through	240,568	589,300	145.0%	N/A[a]	N/A[a]	N/A[a]	–	–	–	–	–	–	240,568	589,300	145.0%
Total	**1,304,489**	**3,032,962**	**132.5%**	**106,831**	**146,416**	**37.1%**	**76,958**	**112,535**	**46.2%**	**3,323**	**9,021**	**171.5%**	**1,491,601**	**3,300,933**	**121.3%**

Source: IHS Global Insight.

[a] Through rail moves were not included in this TRANSEARCH dataset due to the inability to obtain the full Surface Transportation Board (STB) Waybill Dataset. Therefore, the total through values shown here underestimates actual through tonnage.

Figure 2.10 Mode Share by Weight – All Directions
2007 and 2035



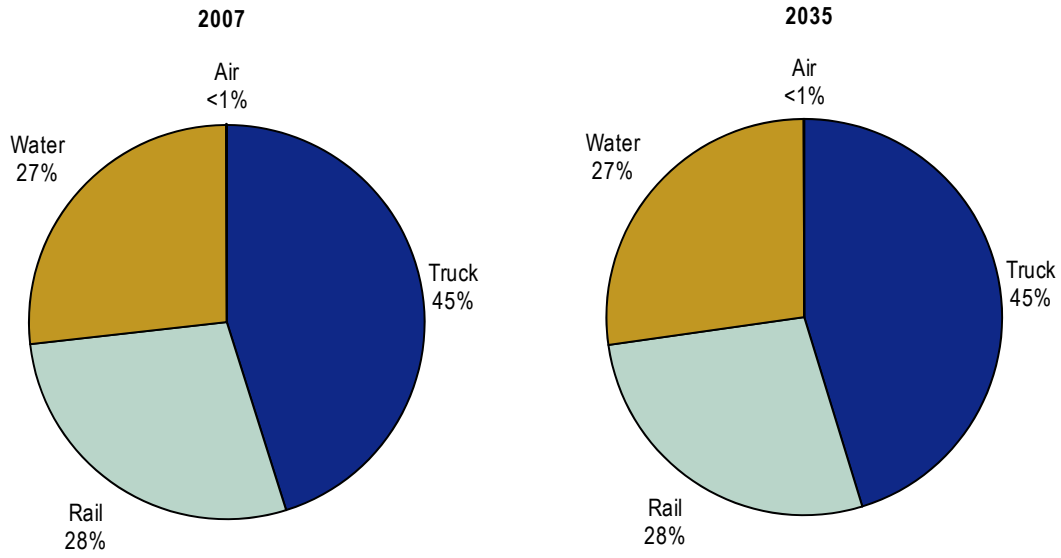
Source: IHS Global Insight

Mode Share Analysis – Inbound

Figure 2.11[18] shows the mode share by weight for freight moving in the inbound direction. Compared to total freight tonnage (all directions), a significantly greater proportion of inbound freight arrives via the water and rail modes. The reasons for this become apparent when analyzing the commodity mix of *inbound* freight (discussed in some detail in Section 3.0) as compared to that of *total* freight. For example, two of the top inbound commodities are crude petroleum (transported primarily by water) and coal (transported primarily by rail). These two commodities are a greater proportion of inbound freight than they are of total freight which partly explains why the water and air modes account for a greater share of inbound tonnage than they do for total tonnage. Additional tables and charts describing the mode share by value are included in the appendix.

[18] Pie charts displaying inbound mode share by value are located in the appendix.

Figure 2.11 Mode Share by Weight – Inbound
2007 and 2035



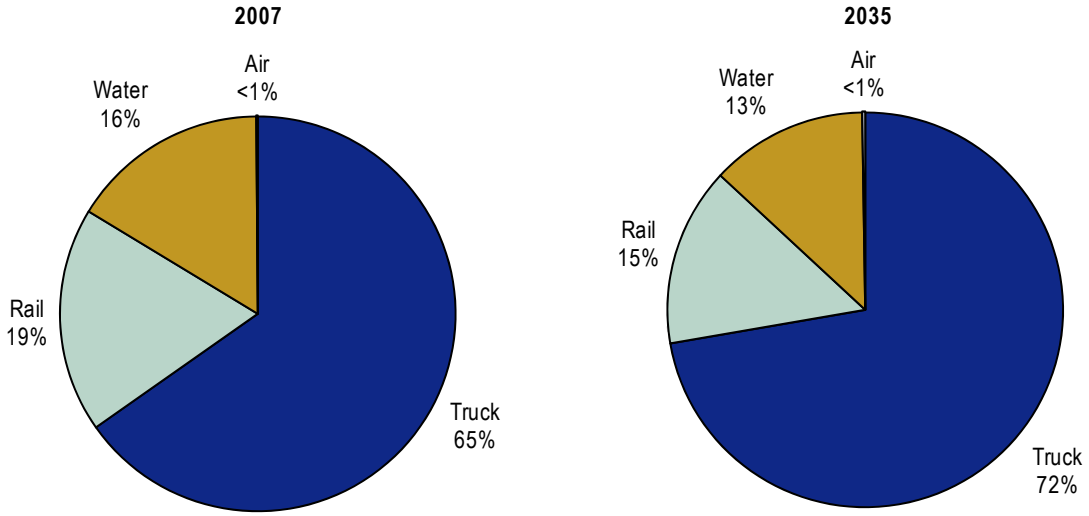
Source: IHS Global Insight

Mode Share Analysis – Outbound

Figure 2.12[19] shows the mode share by weight for freight moving in the outbound direction. Compared to total freight tonnage (all directions), a slightly greater proportion of outbound freight arrived via truck in 2007. By 2035, the proportion of outbound freight arriving by truck is forecast to be 72 percent, significantly higher than the 65 percent it is projected to be for total tonnage (all directions). The primary reason for this becomes apparent when analyzing the 2035 commodity mix forecast of *outbound* freight (discussed in some detail in Section 3.0) as compared to that of *total* freight. Between 2007 and 2035, the commodity group that is projected to grow the most is secondary traffic (traffic related to warehouse and distribution activities). This commodity group is almost entirely transported by truck.

[19] Pie charts displaying outbound mode share by value are located in the appendix.

Figure 2.12 Mode Share by Weight – Outbound
2007 and 2035



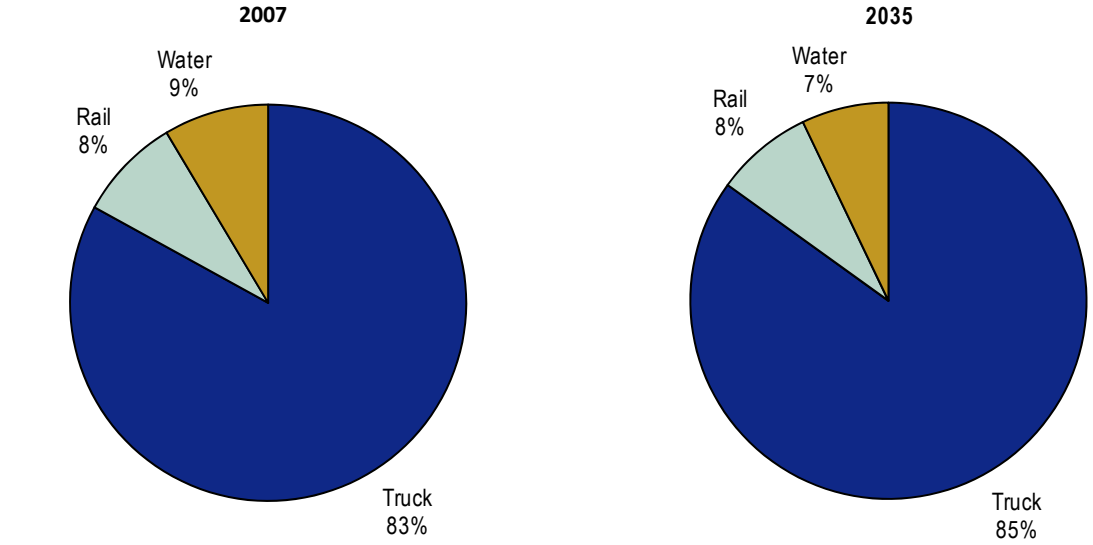
Source: IHS Global Insight

Mode Share Analysis – Intraregional

Figure 2.13[20] shows the mode share by weight for intraregional freight. Compared to total freight tonnage (all directions), a significantly greater proportion of intraregional freight was moved by truck in both 2007 (83 percent versus 61 percent) and 2035 (85 percent versus 65 percent). This makes sense because the rail, water, and air modes are much less likely to haul freight short distances than trucks are. This is reflected in the types of commodities hauled intraregionally (secondary traffic; nonmetallic minerals; and clay, concrete, glass, and stone products) as described in Section 3.0. These commodities primarily serve local consumers and the local construction sector.

[20] Pie charts displaying outbound mode share by value are located in the appendix.

Figure 2.13 Mode Share by Weight – Intraregional
2007 and 2035



Source: IHS Global Insight

Mode Share Analysis – Truck Mode

As shown in Figure 2.10 above, 61 percent of the total tonnage of freight moving in the region is transported by truck. Of that 61 percent, the directional flow is as follows (see Figure 2.14):[21]

- Thirty-five percent of the freight tonnage moved by truck is inbound to the Houston-Galveston region; Thirty-two percent of the freight tonnage moved by truck is outbound from the Houston-Galveston region;
- Eighteen percent of the total truck tonnage moves internally within the Houston-Galveston region; and
- Fifteen percent of the freight tonnage moved by truck passes through the region.

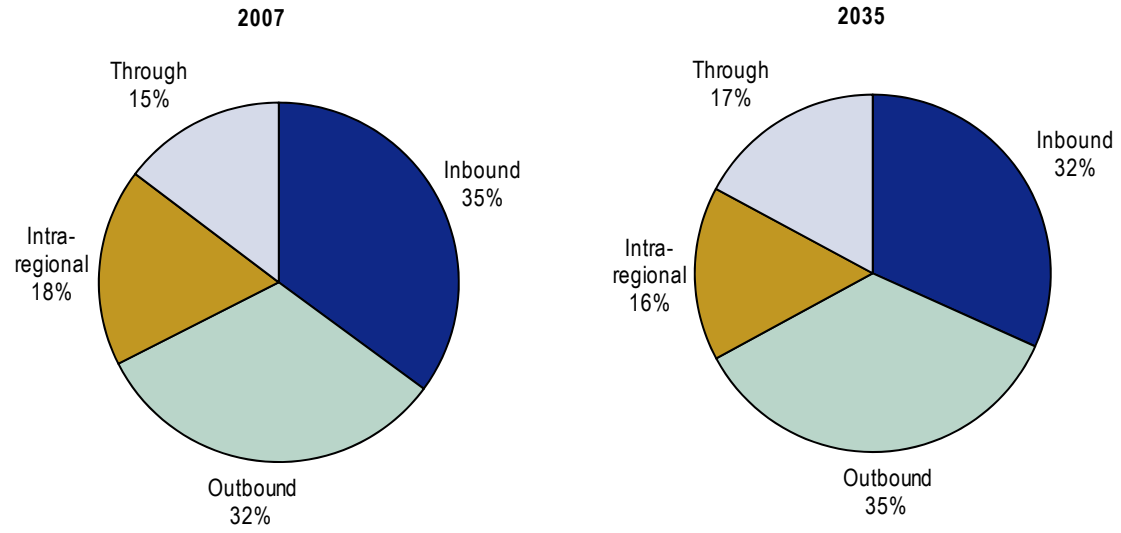
Notable is the fact that the inbound and outbound truck flows are even, allowing for balanced trade lanes. This is important because it allows carriers a better opportunity to reduce empty hauls which leads to more competitive trucking rates for the region's shippers. These ratios are projected to change only slightly between 2007 and 2035.

Tables 2.7 and 2.8 display the 2007 and 2035 truck volumes by weight and value, respectively. They also provide a breakdown by type of truck, including truckload, less-than-truckload (LTL),

[21] Pie charts displaying direction of total truck flows by value are located in the appendix.

and private carrier.[22] A portion of truck flows is "unclassified." This category corresponds to truck moves that have an origin or a destination in Mexico.

Figure 2.14 Direction of Truck Freight Flows by Weight
2007 and 2035



Source: IHS Global Insight

[22] Truckload refers to shipments for a single shipper, LTL refers to trucks carrying shipments for multiple shippers (thus making multiple stops), and private trucks refer to trucks operated by the shipper as opposed to for-hire carriers.

Table 2.7 Summary of Truck Freight Flows by Weight

Tons in Thousands

Direction	Truckload 2007	Truckload 2035	Percent Change (2007 to 2035)	LTL 2007	LTL 2035	Percent Change (2007 to 2035)	Private Truck 2007	Private Truck 2035	Percent Change (2007 to 2035)	Unclassified 2007	Unclassified 2035	Percent Change (2007 to 2035)	Total Truck 2007	Total Truck 2035	Percent Change (2007 to 2035)
Inbound	80,087	110,582	38.1%	2,119	3,480	64.2%	75,203	117,594	56.4%	5,915	16,341	176.3%	163,325	247,998	51.8%
Outbound	77,426	109,168	41.0%	1,796	3,575	99.0%	52,962	91,180	72.2%	18,760	72,128	284.5%	150,944	276,051	82.9%
Intraregional	43,059	56,306	30.8%	467	763	63.4%	39,268	66,485	69.3%	–	–	–	82,794	123,554	49.2%
Through	30,719	47,538	54.8%	1,851	3,739	102.0%	20,099	29,553	47.0%	15,732	53,054	237.2%	68,402	133,884	95.7%
Total	**231,292**	**323,594**	**40.0%**	**6,233**	**11,558**	**85.4%**	**187,532**	**304,812**	**62.5%**	**40,407**	**141,523**	**250.2%**	**465,464**	**781,487**	**67.9%**

Source: IHS Global Insight.

Table 2.8 Summary of Truck Freight Flows by Value

Dollars in Millions

Direction	Truckload 2007	Truckload 2035	Percent Change (2007 to 2035)	LTL 2007	LTL 2035	Percent Change (2007 to 2035)	Private Truck 2007	Private Truck 2035	Percent Change (2007 to 2035)	Unclassified 2007	Unclassified 2035	Percent Change (2007 to 2035)	Total Truck 2007	Total Truck 2035	Percent Change (2007 to 2035)
Inbound	199,485	466,291	133.7%	13,405	30,730	129.2%	269,821	606,319	124.7%	19,996	75,592	278.0%	502,707	1,178,932	134.5%
Outbound	150,937	282,719	87.3%	7,751	21,768	180.8%	186,617	426,817	128.7%	23,092	92,205	299.3%	368,397	823,509	123.5%
Intraregional	78,891	158,231	100.6%	1,538	3,719	141.8%	112,387	279,271	148.5%	–	–	–	192,817	441,220	128.8%
Through	108,101	255,034	135.9%	10,978	30,279	175.8%	86,443	175,933	103.5%	35,046	128,055	265.4%	240,568	589,300	145.0%
Total	**537,415**	**1,162,275**	**116.3%**	**33,672**	**86,496**	**156.9%**	**655,269**	**1,488,340**	**127.1%**	**78,134**	**295,851**	**278.6%**	**1,304,489**	**3,032,962**	**132.5%**

Source: IHS Global Insight.

Mode Share Analysis – Rail Mode

As shown in Figure 2.10 above, 20 percent of the total tonnage of freight moving in the region is transported by rail. Of that 20 percent, the directional flow is as follows (see Figure 2.15):[23, 24]

- Sixty-seven percent of the freight tonnage moved by rail is inbound to the Houston-Galveston region;
- Twenty-eight percent of the freight tonnage moved by rail is outbound from the Houston-Galveston region;
- Five percent of the total rail tonnage moves internally within the Houston-Galveston region; and
- An unknown proportion of the freight tonnage moved by rail passes through the region.

These ratios are projected to change only slightly between 2007 and 2035. The relatively large proportion of intraregional freight rail moves are chemical products that may be moving among refineries and chemical manufacturing facilities. Tables 2.9 and 2.10 display the 2007 and 2035 rail volumes by weight and value, respectively. They also provide a breakdown by type, including carload, intermodal, and NAFTA rail moves.

[23] Pie charts displaying direction of total rail flows by value are located in the appendix.

[24] Through rail moves were not included in this TRANSEARCH dataset due to the inability to obtain the full Surface Transportation Board (STB) Waybill Dataset.

Table 2.9 Summary of Rail Freight Flows by Weight

Tons in Thousands

Direction	Carload 2007	Carload 2035	Percent Change (2007 to 2035)	Intermodal 2007	Intermodal 2035	Percent Change (2007 to 2035)	NAFTA 2007	NAFTA 2035	Percent Change (2007 to 2035)	Total Rail 2007	Total Rail 2035	Percent Change (2007 to 2035)
Inbound	94,852	137,860	45.3%	4,585	10,224	123.0%	2,271	2,562	12.8%	101,707	150,647	48.1%
Outbound	34,261	39,881	16.4%	4,668	11,418	144.6%	3,503	4,435	26.6%	42,432	55,734	31.4%
Intraregional	8,414	11,572	37.5%	–	–	–	–	–	–	8,414	11,572	37.5%
Total	**137,527**	**189,312**	**37.7%**	**9,253**	**21,643**	**133.9%**	**5,773**	**6,997**	**21.2%**	**152,553**	**217,952**	**42.9%**

Source: IHS Global Insight.

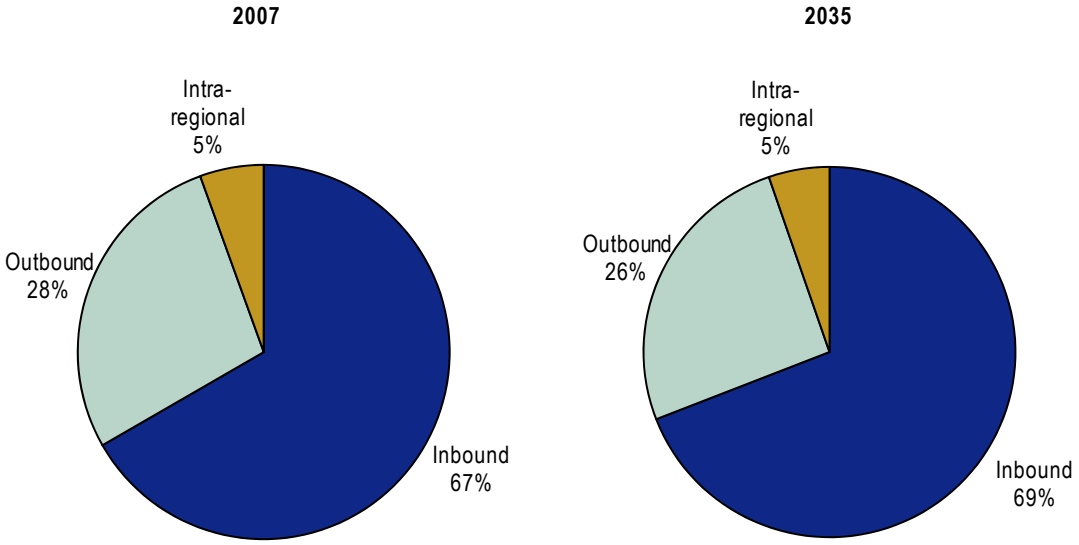
Table 2.10 Summary of Rail Freight Flows by Value

Dollars in Millions

Direction	Carload 2007	Carload 2035	Percent Change (2007 to 2035)	Intermodal 2007	Intermodal 2035	Percent Change (2007 to 2035)	NAFTA 2007	NAFTA 2035	Percent Change (2007 to 2035)	Total Rail 2007	Total Rail 2035	Percent Change (2007 to 2035)
Inbound	39,656	62,214	56.9%	618	1,012	63.8%	1,931	2,366	22.5%	42,205	65,592	55.4%
Outbound	46,057	54,952	19.3%	843	1,090	29.3%	3,918	4,994	27.5%	50,818	61,036	20.1%
Intraregional	13,808	19,788	43.3%	–	–	–	–	–	–	13,808	19,788	43.3%
Total	**99,521**	**136,954**	**37.6%**	**1,460**	**2,102**	**44.0%**	**5,850**	**7,360**	**25.8%**	**106,832**	**146,415**	**37.1%**

Source: IHS Global Insight.

Figure 2.15 Direction of Rail Freight Flows by Weight
2007 and 2035



Source: IHS Global Insight

2.4 Analysis by Commodity Type

Understanding the types of commodities that are transported over the region's transportation system reveals potential freight transportation needs (such as the degree of time sensitivity of freight shipments) as well as the underlying reasons for the Houston-Galveston region's particular modal profile and how it is expected to evolve.

The TRANSEARCH database provides commodity information at the two-digit Standard Transportation Commodity Code (STCC) level. A complete list of commodity groups by STCC number is shown in Table 2.11 below.

Table 2.11 Major Commodity Groups

STCC2	Commodity Description	STCC2	Commodity Description
01	Farm Products	32	Clay, Concrete, Glass, or Stone Products
08	Forest Products	33	Primary Metal Products
09	Fish or Other Marine Products	34	Fabricated Metal Products
10	Metallic Ores	35	Machinery; Except Electrical
11	Coal	36	Electrical Machinery, Equipment, or Supplies
13	Crude Petroleum, Natural Gas, or Gasoline	37	Transportation Equipment
14	Nonmetallic Minerals	38	Instruments, Optical Goods, Watches, or Clocks
19	Ordnance or Accessories	39	Miscellaneous Manufactured Products
20	Food or Kindred Products	40	Waste or Scrap Materials
21	Tobacco Products	41	Miscellaneous Freight Shipments
22	Textile Mill Products	42	Shipping Containers
23	Apparel	43	Mail
24	Lumber or Wood Products	44	Freight Forwarder Traffic
25	Furniture or Fixtures	45	Shipper Association or Similar Traffic
26	Pulp, Paper, or Allied Products	46	Miscellaneous Mixed Shipments
27	Printed Matter	47	Small Packaged Freight Shipments
28	Chemicals or Allied Products	48	Hazardous Waste
29	Petroleum or Coal Products	49	Hazardous Materials
30	Rubber or Miscellaneous Plastics Products	50	Secondary Traffic
31	Leather		

Source: IHS Global Insight

Total Commodities

Overview

A summary of the top ten commodities moving inbound, outbound, and intraregionally via all modes is provided in Tables 2.12 and 2.13. The top three commodities in both 2007 and 2035 are petroleum and coal products, chemical products, and secondary traffic. Combined they account for nearly half of total commodities by weight in both 2007 and in 2035 (see Figure 2.16). It should be noted that three of the top ten commodities (nonmetallic minerals; clay, concrete, glass, and stone; and coal) are heavy and have relatively low value compared to finished or intermediate manufactured goods (petroleum and coal products, chemical products, and secondary traffic).[25]

25 Secondary traffic consists of warehouse and distribution traffic and drayage. It represents the distribution of relatively high value manufactured and consumer goods.

Shippers of basic materials, such as coal, tend to be more concerned with minimizing the cost of transportation rather than speed of delivery, while shippers of manufactured goods tend to emphasize travel times and reliability over per-ton mile transport cost.

Table 2.12 Top 10 Commodities by Weight – Inbound, Outbound, and Intraregional

2007, Tons in Thousands

Commodity	STCC2	Truck Tons	Rail Tons	Water Tons	Air Tons	Total Tons
Petroleum and Coal Products	29	83,883	10,949	61,035	0	155,866
Chemical Products	28	48,054	40,545	25,046	17	113,663
Secondary Traffic	50	74,499	67	2	2	67,788
Nonmetallic Minerals	14	47,760	17,475	2,552	1	66,208
Crude Petroleum and Natural Gas	13	93	133	46,724	–	46,950
Coal	11	21	41,401	572	–	41,994
Clay, Concrete, Glass, and Stone	32	32,368	2,567	146	6	35,087
Farm Products	01	14,291	14,707	1,607	9	30,614
Food Products	20	18,272	3,205	542	2	22,020
Primary Metal Products	33	12,676	4,784	780	4	18,244
All Others		65,147	16,719	3,799	425	86,090
Total		**397,062**	**152,553**	**142,803**	**466**	**692,885**

Source: IHS Global Insight.

Table 2.13 Top 10 Commodities by Weight – Inbound, Outbound, and Intraregional

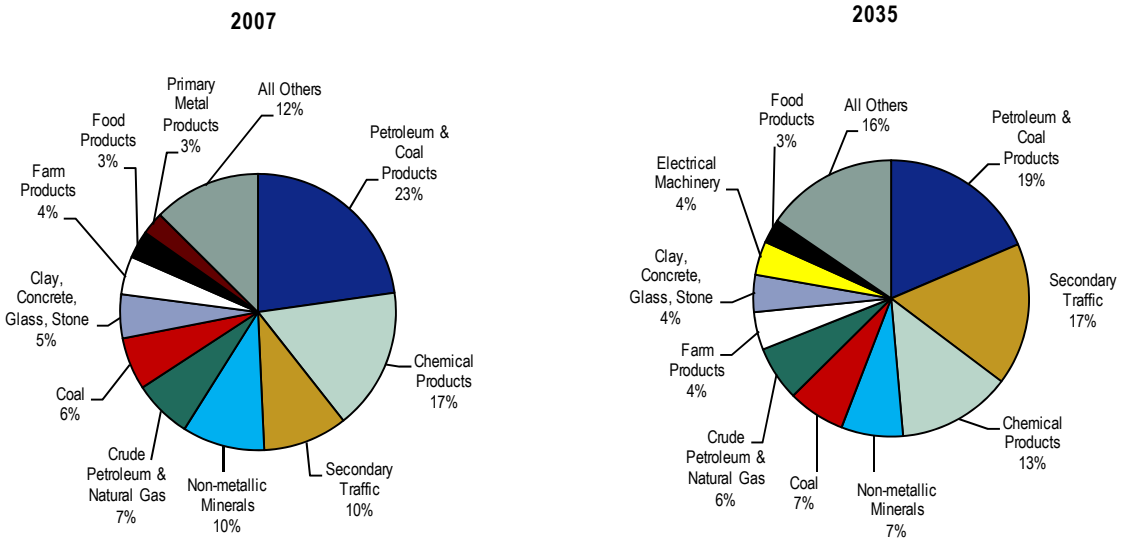
2035, Tons in Thousands

Commodity	STCC2	Truck Tons	Rail Tons	Water Tons	Air Tons	Total Tons
Petroleum and Coal Products	29	102,654	11,771	85,554	0	199,979
Secondary Traffic	50	178,970	98	4	3	179,075
Chemical Products	28	60,214	50,012	33,558	21	143,805
Nonmetallic Minerals	14	57,696	14,999	5,087	1	77,783
Coal	11	50	71,391	887	–	72,329
Crude Petroleum and Natural Gas	13	218	223	68,453	–	68,895
Farm Products	01	18,125	24,450	5,002	6	47,583
Clay, Concrete, Glass, and Stone	32	43,073	3,032	467	12	46,583
Electrical Machinery	36	41,742	136	14	606	42,498
Food Products	20	25,851	3,207	1,119	3	30,180
All Others		119,008	38,634	8,355	564	166,561
Total		**647,602**	**217,952**	**208,500**	**1,216**	**1,075,270**

Source: IHS Global Insight.

Figure 2.16 Top 10 Commodities by Weight – Inbound, Outbound, and Intraregional

2007 and 2035



Source: IHS Global Insight

Inbound Commodities

Tables 2.14 and 2.15 detail the freight tonnage inbound to the region in 2007 and 2035. These shipments are regional imports and represent consumer goods for the regions' residents and visitors and inputs for the regions producers. Inbound freight in 2007 totaled 362 million tons. The top inbound commodities are petroleum and coal products (56 million tons), nonmetallic minerals (53 million tons), and crude petroleum and natural gas (46 million tons). Figure 2.17 displays this information graphically.

Table 2.14 Top 10 Commodities by Weight – Inbound
2007, Tons in Thousands

Commodity	STCC2	Truck Tons	Rail Tons	Water Tons	Air Tons	Total Tons
Petroleum and Coal Products	29	13,546	3,554	38,605	0	55,706
Nonmetallic Minerals	14	34,001	17,131	2,255	0	53,387
Crude Petroleum and Natural Gas	13	64	33	45,500	–	45,597
Coal	11	15	41,401	76	–	41,493
Secondary Traffic	50	31,090	–	–	–	31,090
Chemical Products	28	14,682	7,799	7,759	11	30,252
Farm Products	01	11,143	14,656	120	1	25,920
Clay, Concrete, Glass, and Stone	32	13,709	2,336	121	1	16,166
Lumber and Wood Products	24	11,222	518	0	0	11,740
Food Products	20	7,458	2,814	33	2	10,308
All Others		23,917	7,999	1,544	159	33,618
Total		**163,325**	**101,707**	**96,728**	**177**	**361,937**

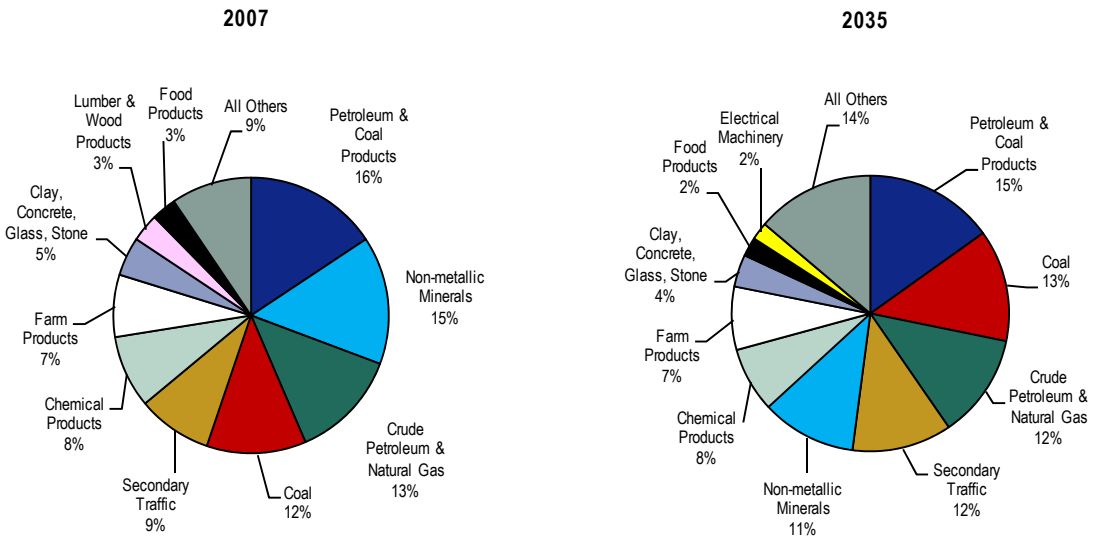
Source: IHS Global Insight.

Table 2.15 Top 10 Commodities by Weight – Inbound
2035, Tons in Thousands

Commodity	STCC2	Truck Tons	Rail Tons	Water Tons	Air Tons	Total Tons
Petroleum and Coal Products	29	15,191	4,403	63,387	0	82,981
Coal	11	45	71,391	60	0	71,497
Crude Petroleum and Natural Gas	13	145	63	66,636	0	66,845
Secondary Traffic	50	64,081	0	0	0	64,081
Nonmetallic Minerals	14	42,101	14,356	4,427	0	60,884
Chemical Products	28	20,262	9,990	11,184	11	41,448
Farm Products	01	15,859	24,395	111	1	40,366
Clay, Concrete, Glass, and Stone	32	17,437	2,729	414	1	20,581
Food Products	20	9,454	2,651	119	3	12,227
Electrical Machinery	36	11,136	34	7	45	11,222
All Others		52,286	20,633	2,655	223	75,797
Total		**247,998**	**150,647**	**149,001**	**284**	**547,929**

Source: IHS Global Insight.

Figure 2.17 Top 10 Commodities by Weight – Inbound
2007 and 2035



Source: IHS Global Insight

Outbound Commodities

Tables 2.16 and 2.17 display the total freight tonnage that originates from the region in 2007 and 2035. These shipments, totaling 231 million tons, represent regional exports or wealth-generating freight. Ensuring efficient freight transportation for these exported goods is of great importance to producers and, therefore, is critical to the economic competitiveness of the region. The top outbound commodities are petroleum and coal products (71 million tons), chemical products (65 million tons), and secondary traffic (23 million tons). Petroleum and coal products make up the largest proportion by weight for both the inbound and outbound commodities in both 2007 and 2035. Figure 2.18 displays this information graphically.

Table 2.16 Top 10 Commodities by Weight – Outbound
2007, Tons in Thousands

Commodity	STCC2	Truck Tons	Rail Tons	Water Tons	Air Tons	Total Tons
Petroleum and Coal Products	29	45,014	6,501	19,355	0	70,869
Chemical Products	28	26,760	25,948	12,361	6	65,075
Secondary Traffic	50	22,698	67	2	2	22,769
Primary Metal Products	33	9,999	1,228	56	2	11,285
Food Products	20	9,331	388	508	0	10,227
Clay, Concrete, Glass, and Stone	32	8,337	206	25	5	8,574
Electrical Machinery	36	5,226	39	3	110	5,378
Fabricated Metal Products	34	4,201	79	14	17	4,312
Lumber and Wood Products	24	3,716	164	0	0	3,881
Miscellaneous Mixed Shipments	46	–	3,726	–	5	3,730
All Others		15,661	7,811	5,202	147	28,820
Total		**150,944**	**42,432**	**37,525**	**289**	**231,190**

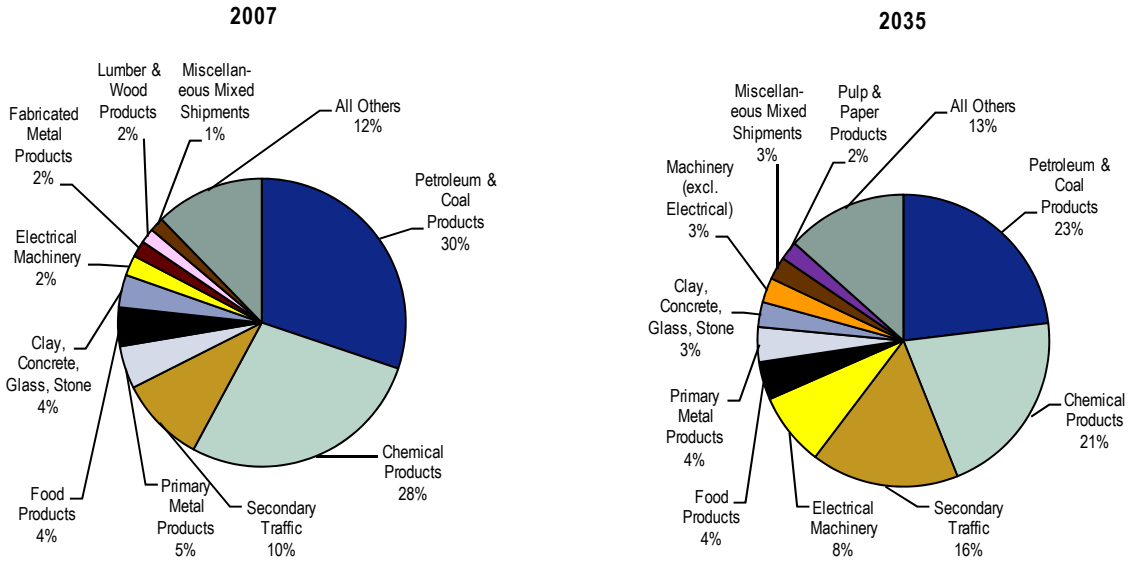
Source: IHS Global Insight.

Table 2.17 Top 10 Commodities by Weight – Outbound
2035, Tons in Thousands

Commodity	STCC2	Truck Tons	Rail Tons	Water Tons	Air Tons	Total Tons
Petroleum and Coal Products	29	63,044	6,523	18,577	0	88,144
Chemical Products	28	32,775	30,450	16,476	10	79,711
Secondary Traffic	50	62,415	98	4	3	62,520
Electrical Machinery	36	30,322	83	5	561	30,971
Food Products	20	14,505	553	1,000	0	16,057
Primary Metal Products	33	13,332	1,272	148	4	14,756
Clay, Concrete, Glass, and Stone	32	10,232	268	54	11	10,565
Machinery (Excluding Electrical)	35	10,093	126	49	171	10,439
Miscellaneous Mixed Shipments	46	–	9,609	–	18	9,627
Pulp and Paper Products	26	7,676	171	86	5	7,938
All Others		31,657	6,581	12,762	149	51,148
Total		**276,051**	**55,734**	**49,159**	**932**	**381,876**

Source: IHS Global Insight.

Figure 2.18 Top 10 Commodities by Weight – Outbound
2007 and 2035



Source: IHS Global Insight

Intraregional Commodities

Tables 2.18 and 2.19 summarize the level of intraregional freight movement in 2007 and 2035. These shipments, totaling 100 million tons, are essential for meeting the demands of local producers (especially in the chemical products manufacturing industry), and supporting local construction activity and personal consumption within the region. The top intraregional commodities are petroleum and coal products (29 million tons), secondary traffic (21 million tons), and chemical products (18 million tons). Nonmetallic minerals and clay, concrete, glass, and stone products (essential for the local construction industry) account for 13 and 10 million tons, respectively. Figure 2.19 displays this information graphically.

Table 2.18 Top 10 Commodities by Weight – Intraregional

2007, Tons in Thousands

Commodity	STCC2	Truck Tons	Rail Tons	Water Tons	Total Tons
Petroleum and Coal Products	29	25,323	894	3,075	29,291
Secondary Traffic	50	20,710	0	0	20,710
Chemical Products	28	6,611	6,798	4,926	18,335
Nonmetallic Minerals	14	12,713	107	151	12,971
Clay, Concrete, Glass, and Stone	32	10,322	25	0	10,347
Farm Products	01	1,698	0	27	1,726
Food Products	20	1,482	2	0	1,485
Lumber and Wood Products	24	1,152	1	0	1,153
Fabricated Metal Products	34	1,048	0	4	1,052
Machinery (Excluding Electrical)	35	420	0	4	424
All Others		1,315	587	362	2,264
Total		**82,794**	**8,414**	**8,550**	**99,759**

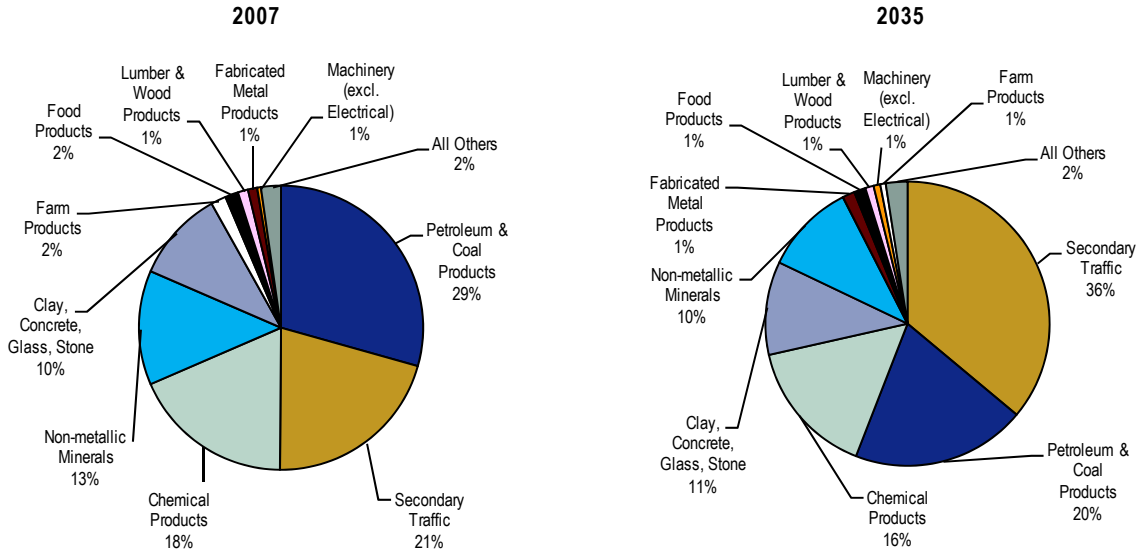
Source: IHS Global Insight.

Table 2.19 Top 10 Commodities by Weight – Intraregional
2035, Tons in Thousands

Commodity	STCC2	Truck Tons	Rail Tons	Water Tons	Total Tons
Secondary Traffic	50	52,474	0	0	52,474
Petroleum and Coal Products	29	24,420	845	3,590	28,854
Chemical Products	28	7,177	9,571	5,897	22,646
Clay, Concrete, Glass, and Stone	32	15,403	35	0	15,438
Nonmetallic Minerals	14	14,790	108	232	15,130
Fabricated Metal Products	34	2,030	0	7	2,037
Food Products	20	1,893	3	0	1,896
Lumber and Wood Products	24	1,394	1	0	1,395
Machinery (Excluding Electrical)	35	1,100	0	10	1,111
Farm Products	01	905	0	8	913
All Others		1,967	1,009	596	3,572
Total		**123,554**	**11,572**	**10,340**	**145,466**

Source: IHS Global Insight.

Figure 2.19 Top 10 Commodities by Weight – Intraregional
2007 and 2035



Source: IHS Global Insight

2.5 Analysis by Trading Partner

In addition to the analysis by mode and commodity summarized in the previous sections, it also is important to identify the region's key trading partners. Key trading partners are identified by combining the inbound and outbound freight flows between the study area and the trading partner region and highlighting the trading partner regions with the largest freight flows.

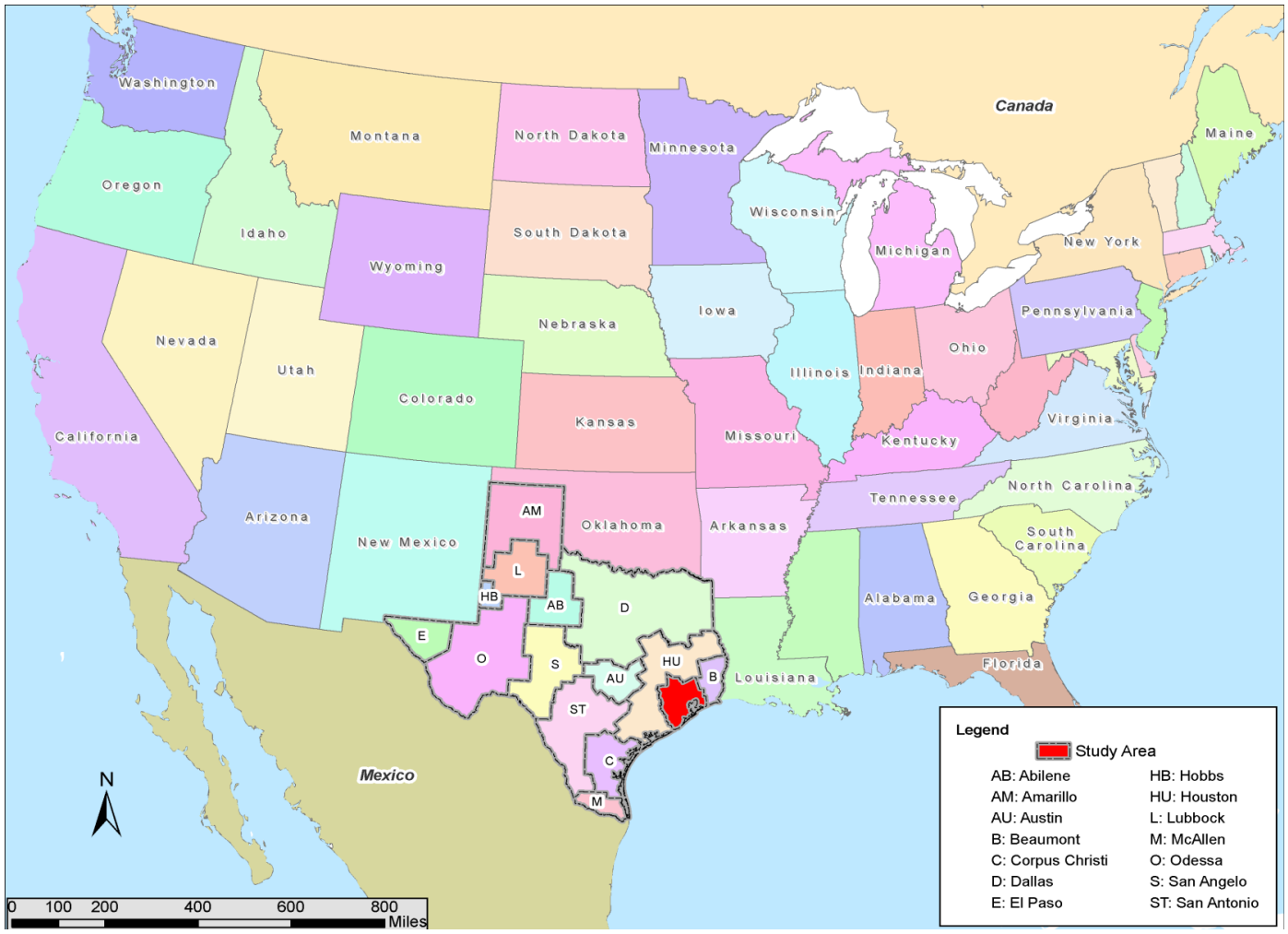
Identifying the region's major trading partners helps planners (and others) understand the Houston-Galveston region's place in the larger national economic landscape and its role within the national and global freight transportation system by identifying critical corridors. It also can help identify additional potential market opportunities for firms in the region.

Trading Partners

The "trading partners" (external to the Houston-Galveston region) consist of the 14 Bureau of Economic Analysis (BEA) regions within Texas,[26] the rest of the states and the District of Columbia, and the neighboring countries of Canada and Mexico. These external regions are displayed graphically in Figure 2.20 on the next page.

[26] Table A.31 in the appendix describes the geography of the BEA regions within Texas.

Figure 2.20 External Regions



Source: IHS Global Insight

Tables 2.20 and 2.21 list the top ten trading partners for freight movements into and out of the Houston-Galveston region by weight in 2007 and 2035. Figures 2.21 and 2.22 display the same information graphically. The top three trading partners – Mexico, the Dallas Region, and Louisiana – account for about 29 percent of total flows by weight. The fact that six of the top ten trading partners are other regions within Texas and two more (Mexico and Louisiana) are adjacent to Texas is evidence that the Houston-Galveston region is particularly important economically to the State of Texas and to the south-central region of the United States. The data also suggest that the H-GAC region is not currently a major national distribution hub relative to Chicago or Southern California.

Table 2.20 Top 10 Trading Partners by Total Weight

2007, Tons in Thousands

Trading Partner	Total Tonnage	Percent of Total	Originating Tonnage (To Study Region)	Percent of Inbound	Terminating Tonnage (From Study Region)	Percent of Outbound
Mexico	82,295	12%	55,456	12%	26,839	8%
Dallas Region	76,203	11%	39,252	9%	36,951	11%
Louisiana	42,228	6%	25,785	6%	16,443	5%
Wyoming	41,814	6%	41,169	9%	645	0%
San Antonio Region	34,383	5%	23,379	5%	11,004	3%
Beaumont Region	34,015	5%	22,586	5%	11,429	3%
Houston Region[a]	25,357	4%	18,075	4%	7,282	2%
Corpus Christi Region	24,306	4%	14,986	3%	9,320	3%
California	23,747	3%	11,029	2%	12,718	4%
Austin Region	14,950	2%	11,243	2%	3,707	1%
Intraregional	99,759	14%	99,759	22%	99,759	30%
Other	193,830	28%	98,976	21%	94,853	29%
Total	**692,885**	**100%**	**461,695**	**100%**	**330,948**	**100%**

Source: IHS Global Insight.

[a] The Houston Region trading partner consists of those counties in the Houston BEA Region that are not part of the eight-County Study Area.

Table 2.21 Top 10 Trading Partners by Total Weight
2035, Tons in Thousands

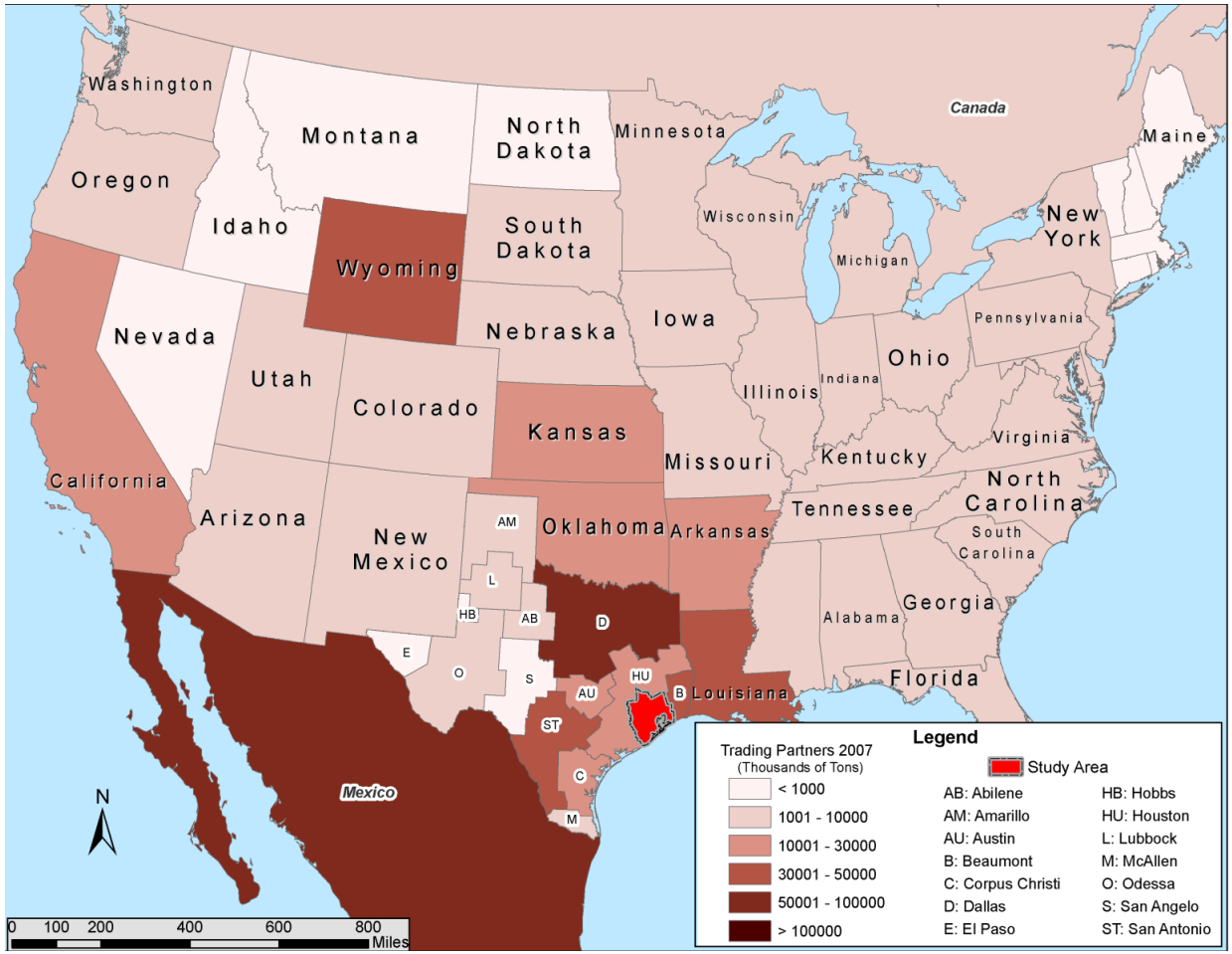
Trading Partner	Total Tonnage	Percent of Total	Originating Tonnage (To Study Region)	Percent of Inbound	Terminating Tonnage (From Study Region)	Percent of Outbound
Mexico	176,553	16%	92,342	13%	84,211	16%
Dallas Region	116,434	11%	53,796	8%	62,638	12%
Wyoming	74,745	7%	73,876	11%	870	0%
Houston Region	57,890	5%	46,640	7%	11,250	2%
Louisiana	57,840	5%	40,223	6%	17,617	3%
San Antonio Region	48,363	4%	29,383	4%	18,980	4%
California	44,857	4%	25,915	4%	18,942	4%
Beaumont Region	31,260	3%	17,897	3%	13,363	3%
Corpus Christi Region	26,927	3%	15,290	2%	11,637	2%
Nebraska	19,948	2%	18,902	3%	1,046	0%
Intraregional	145466	14%	145466	21%	145466	28%
Other	274,987	26%	133,665	19%	141,322	27%
Total	**1,075,270**	**100%**	**693,395**	**100%**	**527,341**	**100%**

Source: IHS Global Insight.

Trading Partner – Mexico

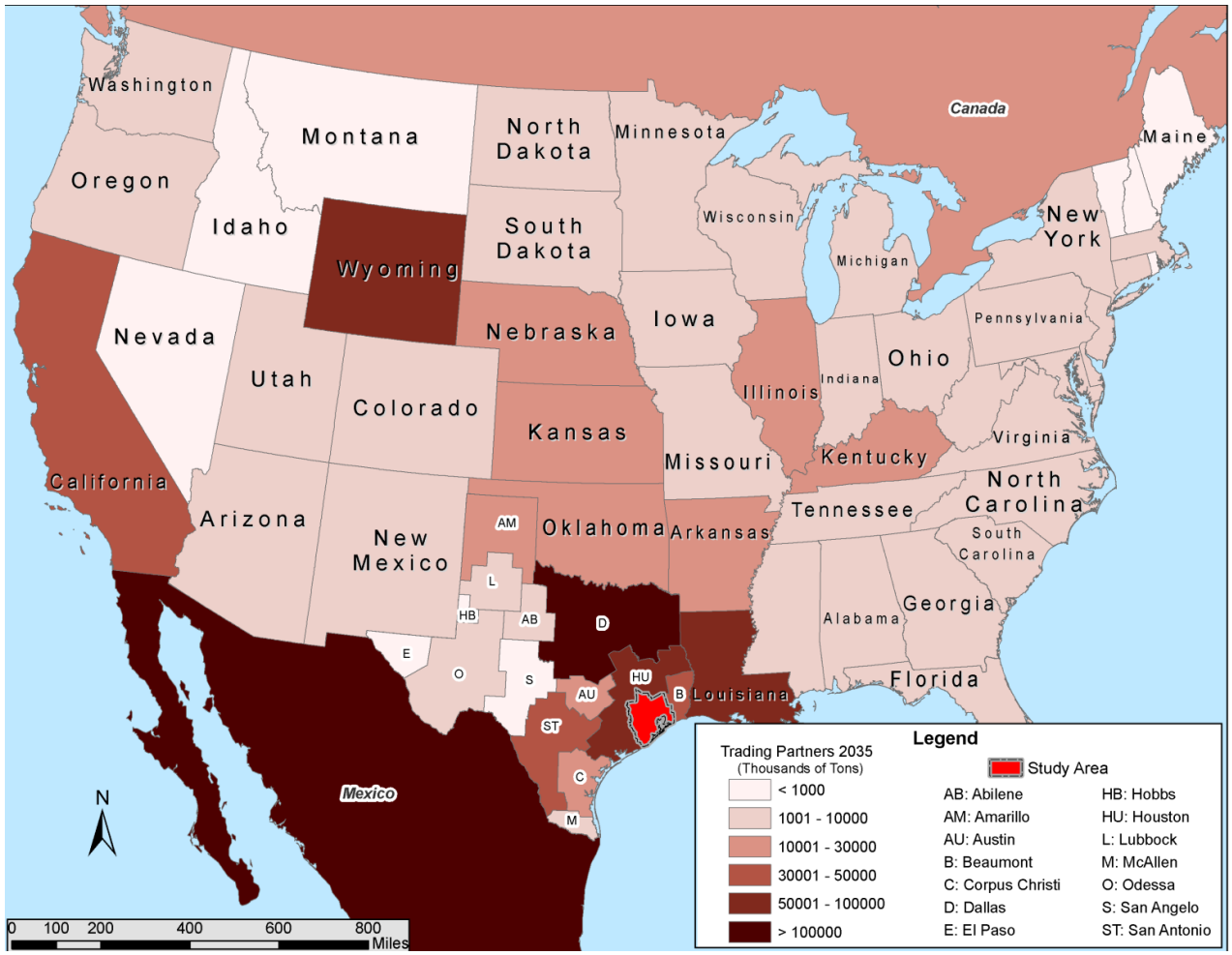
The country of Mexico is the region's largest North American trading partner. Tables 2.22 and 2.23 show the commodity composition of this trade. In 2007, the top commodity group moving to and from Mexico was crude petroleum, natural gas, and gasoline, accounting for a little more than 53 percent of total trade by weight. It is significant that nearly this entire commodity group is transported by water. In fact, 68 percent of all trade between the Houston-Galveston region and Mexico is moved by water. Trucks haul nearly 29 percent of all goods traded with Mexico while rail accounts for less than three percent. Figure 2.23 displays this information graphically.

Figure 2.21 Trading Partners by Weight
2007



Source: IHS Global Insight

Figure 2.22 Trading Partners by Weight
2035



Source: IHS Global Insight

Table 2.22 Top 10 H-GAC/Mexico Commodities by Total Weight

2007, Tons in Thousands

Commodity	STCC2	Truckload Tons	Less Than Truckload Tons	Private Truck Tons	Total Truck Tons	Carload Rail Tons	Intermodal Rail Tons	NAFTA Rail Tons	Total Rail Tons	Air Tons	Water Tons	All Tons
Crude Petroleum, Natural Gas, and Gasoline	13	–	–	–	91	–	–	3	3	–	43,525	43,619
Petroleum and Coal Products	29	–	–	–	1,056	–	–	30	30	0	7,323	8,409
Electrical Machinery	36	–	–	–	5,224	–	–	20	20	0	1	5,245
Chemical Products	28	–	–	–	1,802	–	–	574	574	0	1,853	4,229
Transportation Equipment	37	–	–	–	1,756	–	–	762	762	0	4	2,522
Farm Products	01	–	–	–	906	–	–	43	43	0	1,367	2,316
Primary Metal Products	33	–	–	–	1,545	–	–	245	245	0	397	2,187
Pulp and Paper Products	26	–	–	–	2,095	–	–	31	31	0	45	2,171
Food Products	20	–	–	–	1,147	–	–	71	71	0	510	1,728
Machinery (Excluding Electrical)	35	–	–	–	1,652	–	–	53	53	0	8	1,713
Remaining Commodities		–	–	–	6,291	–	–	617	617	0	1,250	8,158
Total		–	–	–	**23,563**	–	–	**2,450**	**2,450**	**0**	**56,282**	**82,295**

Source: IHS Global Insight.

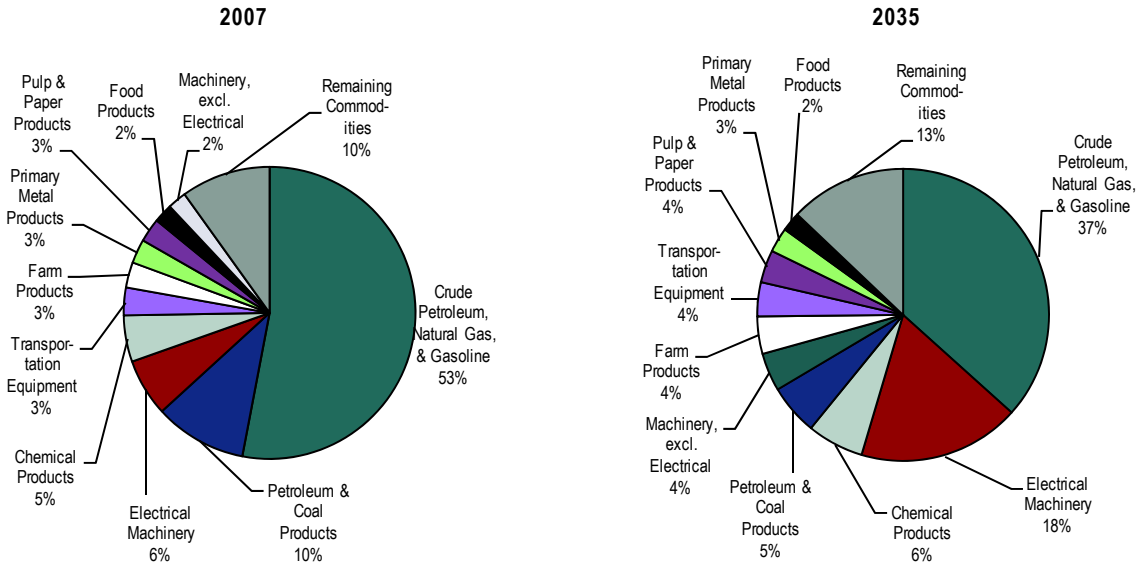
Table 2.23 Top 10 H-GAC/Mexico Commodities by Total Weight

2035, Tons in Thousands

Commodity	STCC2	Truckload Tons	Less Than Truckload Tons	Private Truck Tons	Total Truck Tons	Carload Rail Tons	Intermodal Rail Tons	NAFTA Rail Tons	Total Rail Tons	Air Tons	Water Tons	All Tons
Crude Petroleum, Natural Gas, and Gasoline	13	–	–	–	216	–	–	6	6	–	64,514	64,735
Electrical Machinery	36	–	–	–	31,623	–	–	43	43	2	6	31,674
Chemical Products	28	–	–	–	6,831	–	–	698	698	0	3,557	11,086
Petroleum and Coal Products	29	–	–	–	1,188	–	–	35	35	0	8,646	9,868
Machinery (Excluding Electrical)	35	–	–	–	7,366	–	–	82	82	0	18	7,467
Farm Products	01	–	–	–	2,409	–	–	56	56	0	4,837	7,303
Transportation Equipment	37	–	–	–	5,570	–	–	1,066	1,066	0	9	6,646
Pulp and Paper Products	26	–	–	–	6,222	–	–	35	35	0	107	6,364
Primary Metal Products	33	–	–	–	3,428	–	–	226	226	0	1,182	4,836
Food Products	20	–	–	–	2,619	–	–	82	82	0	1,059	3,760
Remaining Commodities		–	–	–	18,193	–	–	777	777	1	3,843	22,815
Total		–	–	–	**85,666**	–	–	**3,106**	**3,106**	**3**	**87,778**	**176,553**

Source: IHS Global Insight.

Figure 2.23 Top 10 H-GAC/Mexico Commodities by Total Weight
2007 and 2035



Source: IHS Global Insight

Trading Partner – Dallas Region

The Dallas area is the region's second largest trading partner. Tables 2.24 and 2.25 show the commodity composition of this trade. The trade with the Dallas area is very different from the trade with Mexico (see previous section) in that the commodities traded are quite different and the primary mode of transportation is different. In 2007, the top commodity group moved to and from the Dallas area was secondary traffic, accounting for 29 percent of total trade by weight. Whereas trade with Mexico was related to crude petroleum, trade with Dallas is heavy with consumer and manufactured goods (secondary traffic). Also, more than 90 percent of goods moved between Dallas and Houston are hauled by truck (as opposed to just 29 percent for Mexico). This is not surprising given that Dallas serves as the distribution hub for Asian borne goods destined for the Houston region. Figure 2.24 displays this information graphically.

Table 2.24 Top 10 H-GAC/Dallas Region Commodities by Total Weight

2007, Tons in Thousands

Commodity	STCC2	Truckload Tons	Less Than Truckload Tons	Private Truck Tons	Total Truck Tons	Carload Rail Tons	Intermodal Rail Tons	NAFTA Rail Tons	Total Rail Tons	Air Tons	Water Tons	All Tons
Secondary Traffic	50	3,896	136	14,395	18,427	–	–	–	–	–	–	22,323
Petroleum and Coal Products	29	11,379	87	4,957	16,423	45	–	–	45	0	–	16,468
Nonmetallic Minerals	14	2,965	–	2,955	5,920	2,906	–	–	2,906	–	–	8,826
Chemical Products	28	4,232	29	2,483	6,744	1,118	–	–	1,118	0	–	7,862
Clay, Concrete, Glass, and Stone	32	3,387	316	3,062	6,765	1,065	–	–	1,065	0	–	7,830
Lumber and Wood Products	24	2,533	18	2,440	4,991	5	–	–	5	–	–	4,996
Food Products	20	2,170	16	1,501	3,687	23	–	–	23	0	–	3,711
Primary Metal Products	33	1,430	17	606	2,053	201	–	–	201	0	–	2,254
Fabricated Metal Products	34	777	31	747	1,555	2	–	–	2	1	–	1,558
Pulp and Paper Products	26	660	13	520	1,194	19	–	–	19	0	–	1,213
Remaining Commodities		925	56	950	1,931	1,100	6	–	1,106	20	–	2,856
Total		**34,355**	**718**	**34,617**	**69,690**	**6,485**	**6**	**–**	**6,491**	**22**	**–**	**76,203**

Source: IHS Global Insight.

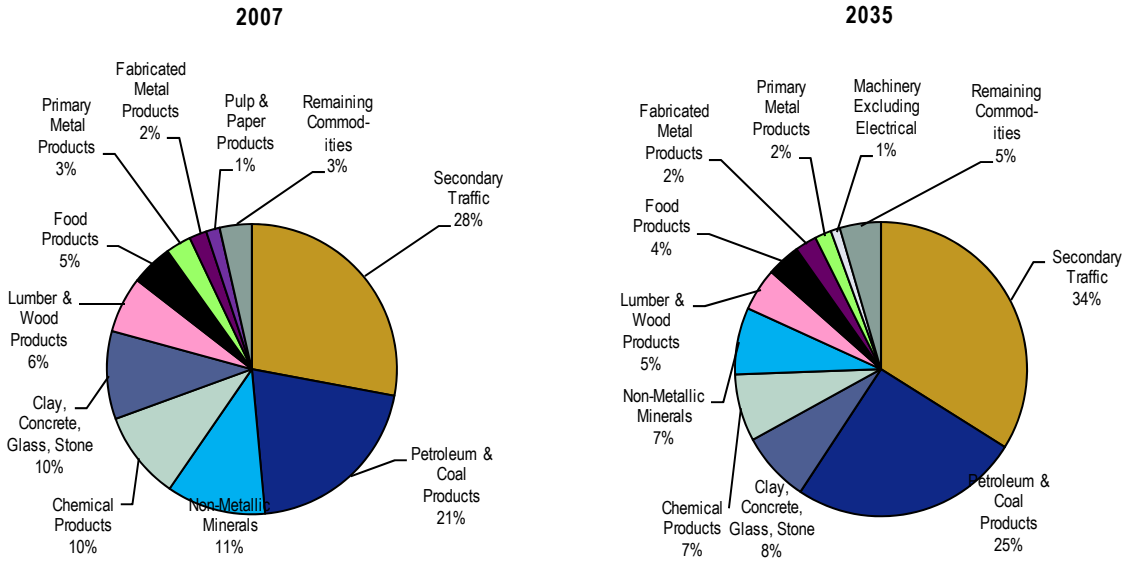
Table 2.25 Top 10 H-GAC/Dallas Region Commodities by Total Weight

2035, Tons in Thousands

Commodity	STCC2	Truckload Tons	Less Than Truckload Tons	Private Truck Tons	Total Truck Tons	Carload Rail Tons	Intermodal Rail Tons	NAFTA Rail Tons	Total Rail Tons	Air Tons	Water Tons	All Tons
Secondary Traffic	50	8,502	301	30,700	39,503	–	–	–	–	–	–	39,503
Petroleum and Coal Products	29	20,157	151	9,112	29,420	75	–	–	75	0	–	29,495
Clay, Concrete, Glass, and Stone	32	3,955	342	3,520	7,817	1,186	–	–	1,186	0	–	9,004
Chemical Products	28	4,643	33	2,732	7,408	1,254	–	–	1,254	0	–	8,662
Nonmetallic Minerals	14	2,881	–	2,871	5,753	2,846	–	–	2,846	–	–	8,599
Lumber and Wood Products	24	2,795	20	2,670	5,485	6	–	–	6	–	–	5,490
Food Products	20	2,529	17	1,737	4,284	30	–	–	30	0	–	4,314
Fabricated Metal Products	34	1,392	56	1,330	2,778	4	–	–	4	2	–	2,784
Primary Metal Products	33	1,371	17	576	1,965	166	–	–	166	0	–	2,131
Machinery (Excluding Electrical)	35	789	39	360	1,188	–	–	–	–	4	–	1,192
Remaining Commodities		1,697	109	2,009	3,814	1,411	13	–	1,424	22	–	5,260
Total		**50,711**	**1,086**	**57,619**	**109,415**	**6,978**	**13**	**–**	**6,990**	**28**	**–**	**116,434**

Source: IHS Global Insight.

Figure 2.24 Top 10 H-GAC/Dallas Region Commodities by Total Weight
2007 and 2035



Source: IHS Global Insight

Trading Partner: Louisiana

The State of Louisiana is the region's third largest trading partner. Tables 2.26 and 2.27 show the commodity composition of this trade. Petroleum and chemical products account for more than 74 percent of total trade with Louisiana and are transported primarily by water. In fact, more than 55 percent of commodities moved between Louisiana and the Houston-Galveston region are transported by water, with smaller proportions transported by truck and rail. Figure 2.25 displays the information in Tables 2.26 and 2.27 graphically.

Table 2.26 Top 10 H-GAC/Louisiana Commodities by Total Weight *2007, Tons in Thousands*

Commodity	STCC2	Truckload Tons	Less Than Truckload Tons	Private Truck Tons	Total Truck Tons	Carload Rail Tons	Intermodal Rail Tons	NAFTA Rail Tons	Total Rail Tons	Air Tons	Water Tons	All Tons
Petroleum and Coal Products	29	1,276	21	495	1,791	867	–	–	867	0	17,018	19,677
Chemical Products	28	2,816	27	1,142	3,985	3,391	3	–	3,394	0	4,208	11,588
Secondary Traffic	50	611	110	1,604	2,326	–	–	–	–	–	–	2,326
Nonmetallic Minerals	14	641	–	508	1,149	15	–	–	1	–	66	1,231
Clay, Concrete, Glass, and Stone	32	529	225	302	1,056	2	–	–	2	0	99	1,157
Crude Petroleum, Natural Gas, and Gasoline	13	–	–	–	–	61	–	–	61	–	1,016	1,077
Food Products	20	567	5	330	902	78	–	–	78	0	28	1,009
Primary Metal Products	33	458	10	168	636	50	–	–	50	0	164	849
Lumber and Wood Products	24	332	6	236	573	35	–	–	35	–	–	608
Waste and Scrap	40	–	–	–	–	90	–	–	90	–	488	579
Remaining Commodities		664	23	381	1,068	348	14	–	362	1	696	2,127
Total		**7,894**	**427**	**5,166**	**13,487**	**4,937**	**17**	**–**	**4,954**	**2**	**23,785**	**42,228**

Source: IHS Global Insight.

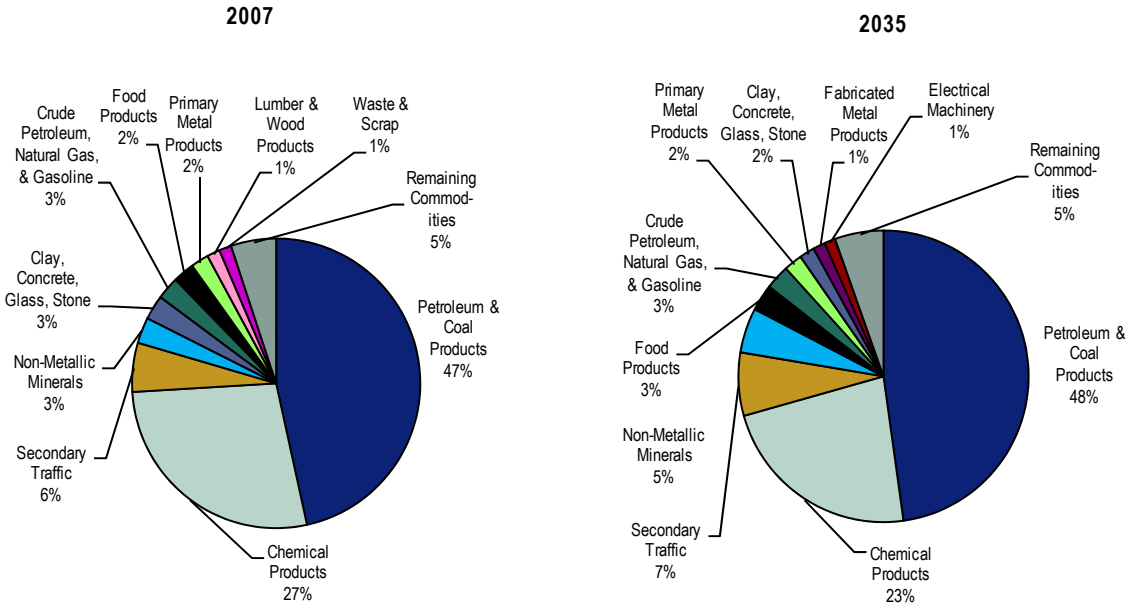
Table 2.27 Top 10 H-GAC/Louisiana Commodities by Total Weight

2035, Tons in Thousands

Commodity	STCC2	Truckload Tons	Less Than Truckload Tons	Private Truck Tons	Total Truck Tons	Carload Rail Tons	Intermodal Rail Tons	NAFTA Rail Tons	Total Rail Tons	Air Tons	Water Tons	All Tons
Petroleum and Coal Products	29	1,505	37	552	2,094	1,150	–	–	1,150	0	24,409	27,653
Chemical Products	28	3,193	33	1,303	4,529	4,185	4	–	4,190	0	4,470	13,188
Secondary Traffic	50	1,043	205	2,828	4,077	–	–	–	–	–	–	4,077
Nonmetallic Minerals	14	1,507	–	1,195	2,702	33	–	–	33	–	156	2,891
Food Products	20	971	8	546	1,525	130	–	–	130	0	53	1,708
Crude Petroleum, Natural Gas, and Gasoline	13	–	–	–	–	87	–	–	87	–	1,474	1,561
Primary Metal Products	33	549	5	265	819	57	–	–	57	0	307	1,183
Clay, Concrete, Glass, and Stone	32	328	146	183	657	4	–	–	4	0	311	973
Fabricated Metal Products	34	395	24	183	602	–	–	–	–	0	180	783
Electrical Machinery	36	536	13	146	694	0	–	–	0	1	4	700
Remaining Commodities		814	27	499	1,339	835	26	–	862	2	920	3,122
Total		**10,841**	**498**	**7,700**	**19,039**	**6,482**	**31**	–	**6,513**	**3**	**32,284**	**57,840**

Source: IHS Global Insight.

Figure 2.25 Top 10 H-GAC/Louisiana Commodities by Total Weight
2007 and 2035



Source: IHS Global Insight

Summary

The freight profiles of each of the H-GAC's three top trading partners are quite distinct from one another. This is due in large part to the very different markets these trading partners serve. The primary features of trade with Mexico are the large volume of crude petroleum, petroleum and coal products, and chemicals transported by water; and the variety of lighter weight, higher value commodities transported from Mexico by truck. This trading pattern is dependent on well-maintained shipping channels, terminal facilities, and pipelines as well as efficient highway connections between the region and the Mexican border (primarily I-10 and U.S. 59). Trade with the Dallas region focuses on truck-based transport of secondary products (goods associated with warehouse and distribution activity) and petroleum products. This puts particular emphasis on I-45 and the various arterials that provide the last mile connection to port terminals, manufacturing facilities, and warehouse/distribution facilities in the H-GAC and Dallas regions. Trade with Louisiana is concentrated in waterborne petroleum and chemical products, chemical products shipped by rail, and chemical products and secondary traffic hauled by truck. These trading patterns are impacted by the effectiveness of the port and rail operations in the region as well the efficiency of I-10 between Houston and points east.

3.0 County Freight Movement Profiles

To better understand which portions of the H-GAC region are impacted by which types of freight movement, county-level freight profiles were developed. This section of the report describes the existing conditions and expected growth in freight tonnage and value for each of the eight H-GAC counties.

Table 3.1 and Figures 3.1 and 3.2 show 2007 and 2035 freight tonnage for inbound, outbound, and intra-county movements for each of the eight H-GAC counties. Although Harris County currently is (and will continue to be) the jurisdiction that has the highest level of freight, Brazoria, Chambers, and Montgomery counties are projected to experience the largest freight growth rates. These data suggest that improving or at least maintaining freight mobility within Harris County is critical to the competitiveness of the overall region. Also, the high-growth rates projected for Brazoria, Chambers, and Montgomery counties suggest that major truck routes such as the Nolan Ryan Expressway (TX Route 288), Interstate 10, and Interstate 45 will experience significantly increased freight volume and may require additional capacity. As part of ongoing analysis efforts, these routes will be reviewed in more detail to determine whether or not capacity increases are justified. The following sections provide summaries for each of the counties in the study area. Each summary provides data on freight flows by mode, direction and commodity type.

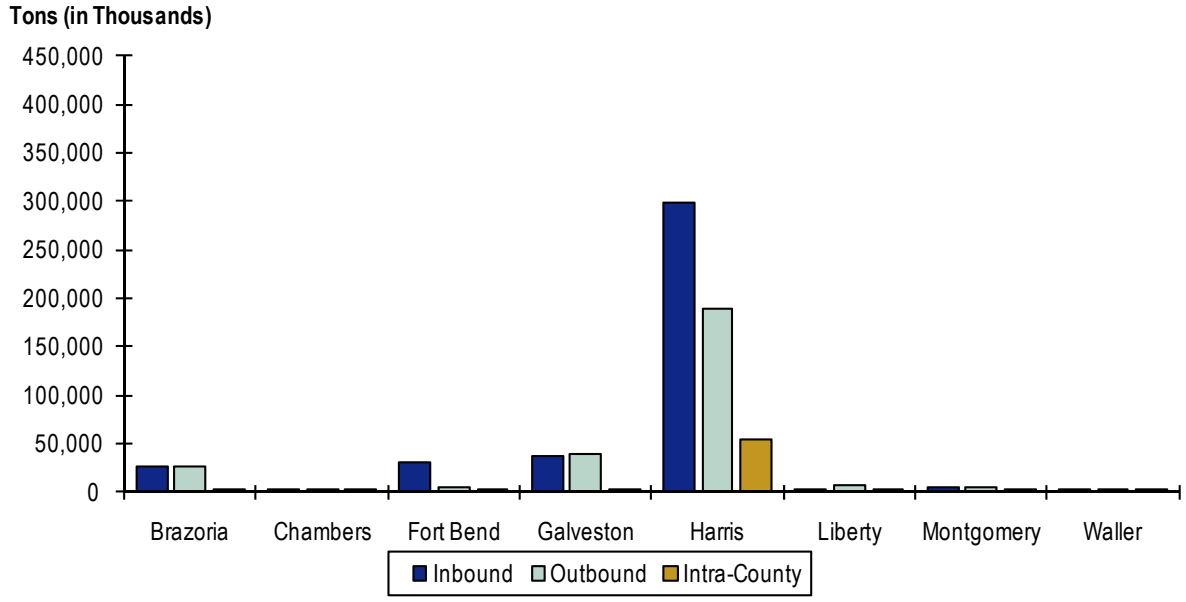
Table 3.1 Inbound, Outbound, and Intra-County Freight Flows by County

2007 and 2035, Tons in Thousands

County	Inbound		Percent Change (2007 to 2035)	Outbound		Percent Change (2007 to 2035)	Intra-County		Percent Change (2007 to 2035)	Total		Percent Change (2007 to 2035)
	2007	2035		2007	2035		2007	2035		2007	2035	
Brazoria	25,583	59,809	133.8%	26,833	42,980	60.2%	1,614	2,285	41.6%	54,029	105,074	94.5%
Chambers	2,559	3,585	40.1%	1,058	2,906	174.6%	1	3	133.9%	3,618	6,494	79.5%
Fort Bend	30,390	46,076	51.6%	4,318	6,173	42.8%	316	422	33.8%	35,023	52,671	50.4%
Galveston	36,832	60,141	63.3%	38,992	57,470	47.4%	2,382	2,855	19.8%	78,205	120,466	54.0%
Harris	298,043	430,179	44.3%	188,871	316,432	67.5%	54,414	72,785	33.8%	541,329	819,397	51.4%
Liberty	3,558	6,258	75.9%	6,823	11,729	71.9%	97	170	75.2%	10,478	18,157	73.3%
Montgomery	4,587	6,984	52.2%	4,739	10,596	123.6%	174	165	-5.6%	9,501	17,744	86.8%
Waller	1,146	1,679	46.5%	314	370	17.8%	2	1	-42.2%	1,462	2,051	40.2%

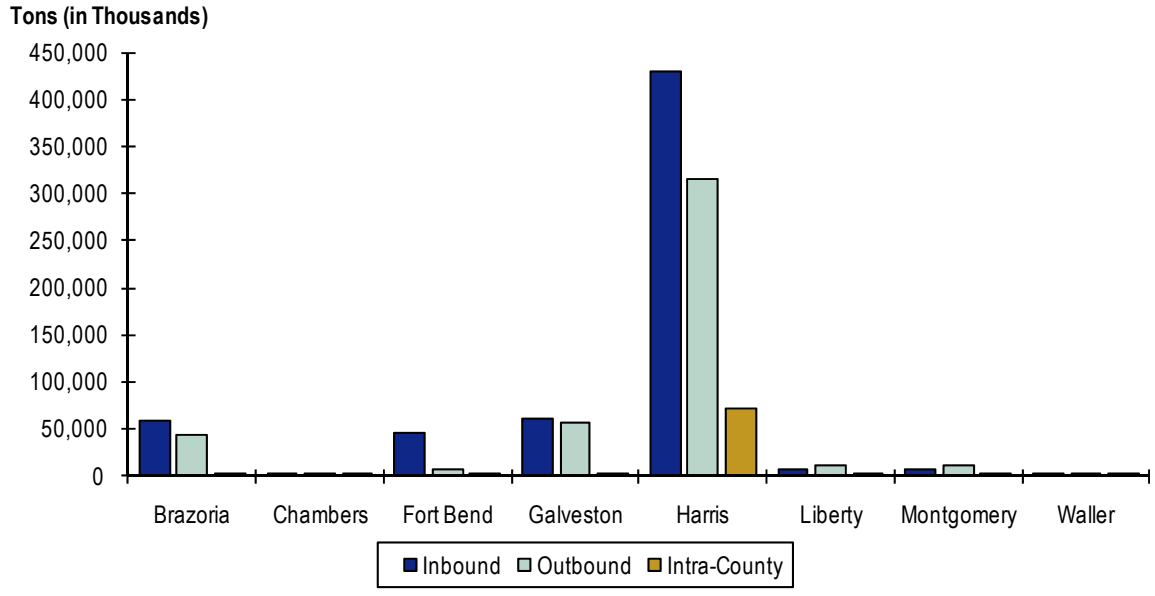
Source: IHS Global Insight.

Figure 3.1 Inbound, Outbound, and Intra-County Freight Flows by County
2007



Source: IHS Global Insight

Figure 3.2 Inbound, Outbound, and Intra-County Freight Flows by County
2035



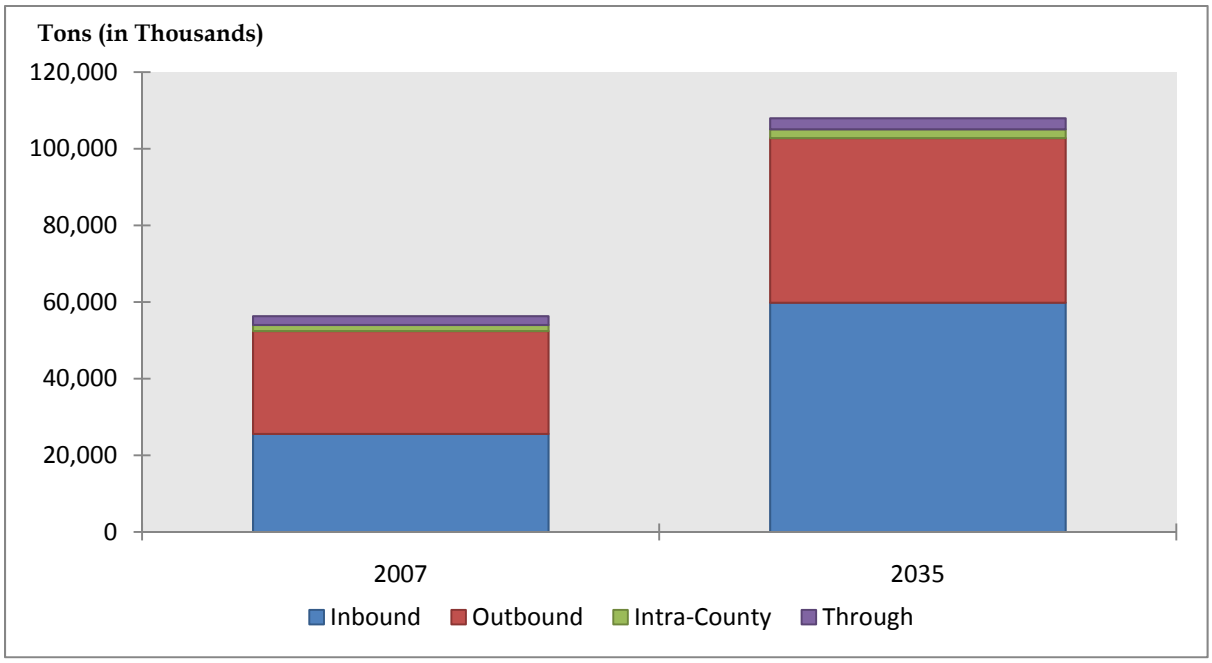
Source: IHS Global Insight

3.1 Brazoria County

Directional Analysis – Brazoria County

In 2007, 56 million tons of freight moved into, out of, within, or through Brazoria County. Approximately 26 million tons (45 percent) traveled inbound, 27 million tons (48 percent) traveled outbound, 1.6 million tons (three percent) traveled from one point within the county to another. Through freight accounted for 2.3 million tons or about four percent of the total. By 2035, total freight moving across the county is expected to grow to 108 million tons, an increase of more than 91 percent (see Figure 3.3).

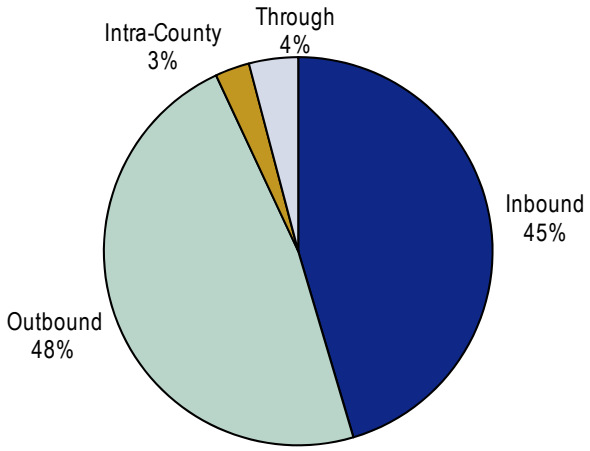
Figure 3.3 Growth in Total Weight of Freight Flows by Direction – Brazoria County



Source: IHS Global Insight

Figure 3.4 displays the proportion of freight flows moving across Brazoria County by direction in 2007. Through freight comprises just four percent of all freight in the County which is typical of counties that are not straddling major north-south or east-west freight corridors. This means that 96 percent of freight moving through the County is servicing the local economy in some fashion. Just three percent of total Brazoria County freight flows begin and end within the County. Most of these intra-county moves consist of chemicals and allied products.

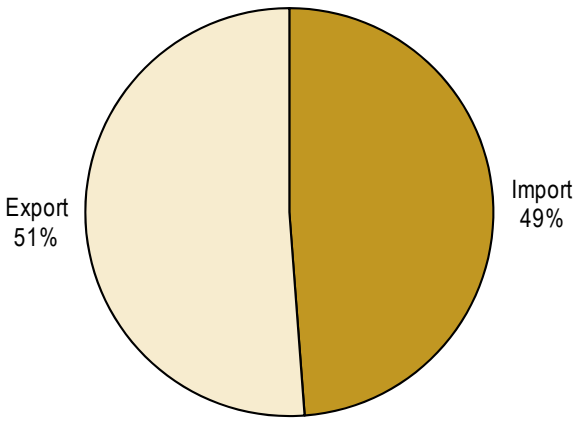
Figure 3.4 Direction of Total Freight Flows by Weight – Brazoria County
2007



Source: IHS Global Insight

Figure 3.5 highlights the balance of imports (inbound tonnage) to exports (outbound tonnage) and shows that Brazoria County businesses ship more outbound goods than they receive inbound thus translating into a freight trade surplus of only two percent. This represents a balance in trade which offers carriers better opportunities to reduce empty loads. This helps attract carriers and leads to more competitive shipping terms for regional industries.

Figure 3.5 Imports/Exports – Brazoria County
2007



Source: IHS Global Insight

Tables 3.2 and 3.3 display Brazoria County freight flows by mode and direction and Figure 3.6 displays the expected growth by mode between 2007 and 2035.

Table 3.2 Summary of Brazoria County Freight Flows by Weight

Tons in Thousands

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	17,605	44,781	154.4%	3,502	6,593	88.3%	4,476	8,436	88.5%	–	–	–	25,583	59,809	133.8%
From H-GAC	7,227	19,838	174.5%	469	640	36.5%	257	604	135.3%	–	–	–	7,953	21,083	165.1%
Outbound	17,252	31,966	85.3%	6,366	6,079	-4.5%	3,215	4,936	53.5%	–	–	–	26,833	42,980	60.2%
To H-GAC	4,917	7,677	56.1%	969	986	1.8%	201	298	48.3%	–	–	–	6,087	8,961	47.2%
Intra-County	1,474	2,147	45.7%	130	127	-1.8%	10	10	1.0%	–	–	–	1,614	2,285	41.6%
Through	2,301	2,895	25.8%	–	–	–	–	–	–	–	–	–	2,301	2,895	25.8%
Total	**38,631**	**81,789**	**111.7%**	**9,998**	**12,799**	**28.0%**	**7,701**	**13,381**	**73.8%**	–	–	–	**56,330**	**107,968**	**91.7%**

Source: IHS Global Insight.

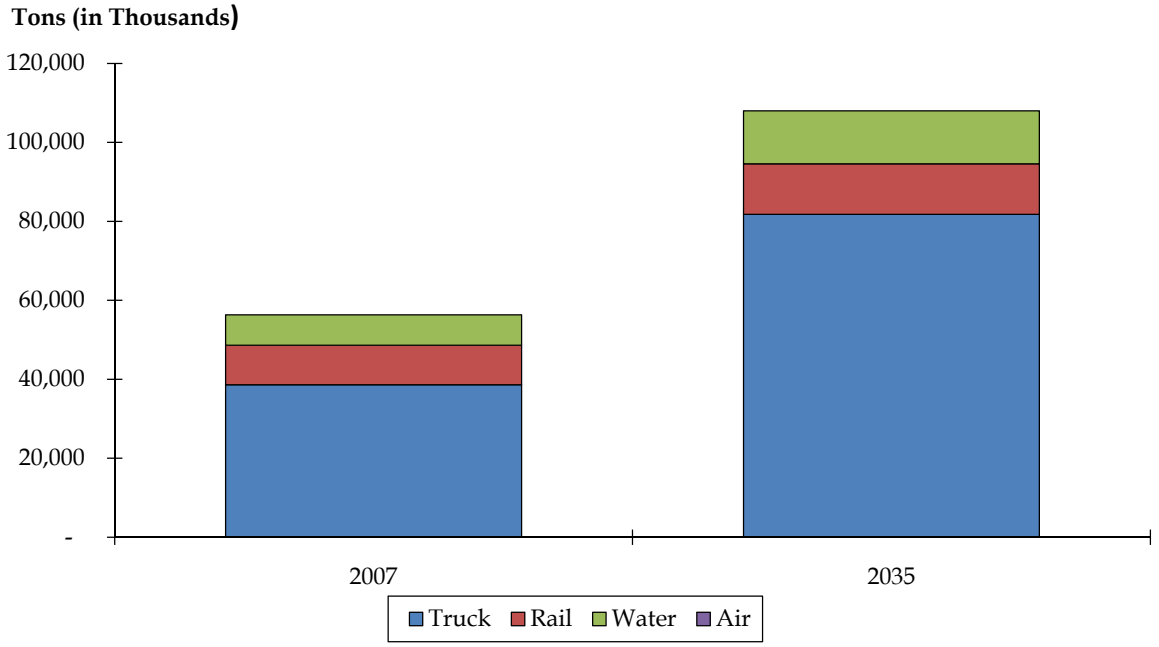
Table 3.3 Summary of Brazoria County Freight Flows by Value

Dollars in Millions

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	$90,587	$260,079	187.1%	$2,613	$4,123	57.8%	$2,466	$4,389	78.0%	–	–	–	$95,666	$268,591	180.8%
From H-GAC	$31,617	$103,148	226.2%	$593	$797	34.4%	$312	$647	107.7%	–	–	–	$32,521	$104,592	221.6%
Outbound	$17,739	$30,971	74.6%	$8,043	$7,396	-8.0%	$2,439	$3,539	45.1%	–	–	–	$28,222	$41,907	48.5%
To H-GAC	$3,233	$5,415	67.5%	$1,344	$1,335	-0.6%	$232	$597	157.4%	–	–	–	$4,809	$7,347	52.8%
Intra-County	$846	$983	16.2%	$124	$119	-4.2%	$8	$8	1.0%	–	–	–	$978	$1,110	13.5%
Through	$4,397	$7,561	71.9%	–	–	–	–	–	–	–	–	–	$4,397	$7,561	71.9%
Total	**$113,569**	**$299,593**	**163.8%**	**$10,781**	**$11,639**	**8.0%**	**$4,913**	**$7,937**	**61.5%**	–	–	–	**$129,263**	**$319,168**	**146.9%**

Source: IHS Global Insight.

Figure 3.6 Growth in Total Weight of Freight Flows by Mode – Brazoria County

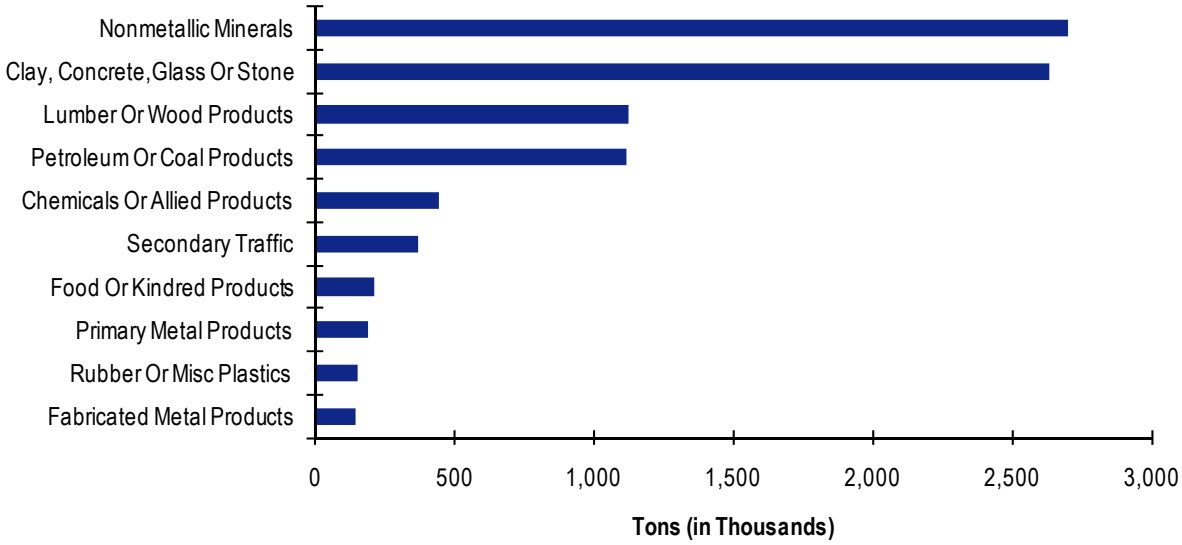


Source: IHS Global Insight

Commodity Analysis – Brazoria County

In 2007, more than 54 million tons of freight moved inbound, outbound, and within Brazoria County. By weight, the petrochemical industry is the largest freight generator in the County as evidenced by the fact that chemicals and petroleum products combined account for more than 29 million tons or approximately 54 percent of total tonnage (see Figure 3.7).

Figure 3.7 Commodities – Brazoria County
2007



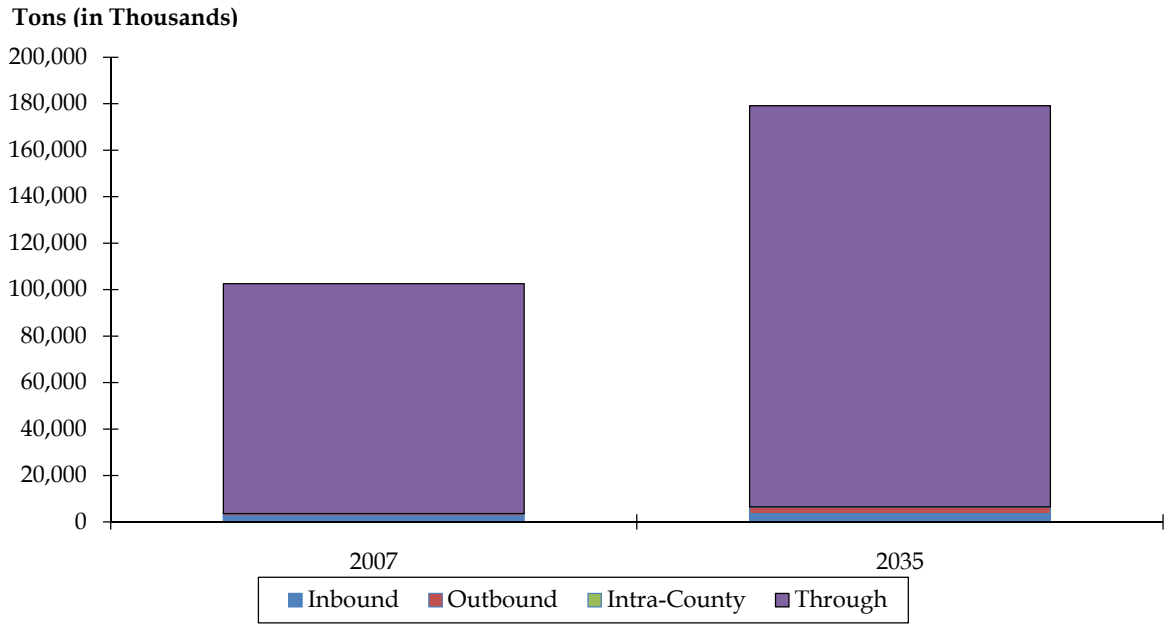
Note: Sum of inbound, outbound, and intra-county freight.
Source: IHS Global Insight

3.2 Chambers County

Directional Analysis – Chambers County

In 2007, 103 million tons of freight moved into, out of, within, or through Chambers County. Approximately 2.6 million tons (three percent) traveled inbound, 1.1 million tons (one percent) traveled outbound, 1.0 thousand tons (less than one percent) traveled from one point within the county to another. Through freight accounted for 99 million tons or 96 percent of the total. By 2035, total freight moving across the county is expected to grow to 179 million tons, an increase of nearly 75 percent (see Figure 3.8).

Figure 3.8 Growth in Total Weight of Freight Flows by Direction – Chambers County

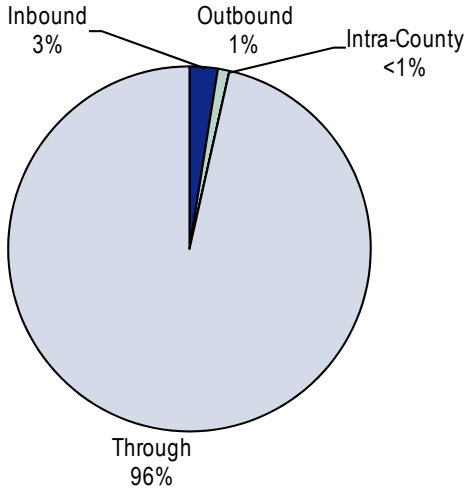


Source: IHS Global Insight

Figure 3.9 displays the proportion of freight flows moving across Chambers County by direction in 2007. Through freight comprises 96 percent of all freight in the County which is typical of more rural counties that straddle major north-south or east-west freight corridors such as I-10. This means that just four percent of freight moving through the County is servicing the local economy in one form or another. Less than one percent of total Chambers County freight flows begin and end within the County. Most of these intra-county moves consist of petroleum or coal products.

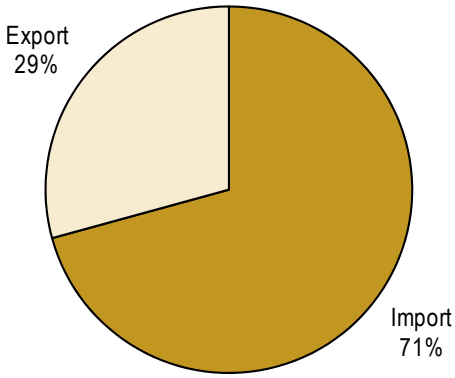
Figure 3.10 highlights the balance of imports (inbound tonnage) to exports (outbound tonnage) and shows that Chambers County businesses receive more inbound goods than they ship outbound, thus translating into a freight trade deficit of 42 percent.

Figure 3.9 Direction of Total Freight Flows by Weight – Chambers County
2007



Source: IHS Global Insight

Figure 3.10 Imports/Exports – Chambers County
2007



Source: IHS Global Insight

Tables 3.4 and 3.5 display Chambers County freight flows by mode and direction and Figure 3.11 displays the expected growth by mode between 2007 and 2035. The data indicate outbound, intra-regional and intra-county flows will be the fastest growing trade flows and that trucks will continue to be the dominant mode. Hence, while I-10 will continue to be important, highway facilities throughout the county will experience significant growth in truck volumes.

Table 3.4 Summary of Chambers County Freight Flows by Weight

Tons in Thousands

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	1,931	2,822	46.1%	628	763	21.6%	–	–	–	–	–	–	2,559	3,585	40.1%
From H-GAC	760	1,187	56.1%	3	2	-35.5%	–	–	–	–	–	–	763	1,189	55.8%
Outbound	799	2,702	238.1%	251	156	-37.6%	9	49	456.8%	–	–	–	1,058	2,906	174.6%
To H-GAC	423	1,294	206.3%	12	17	44.7%	–	–	–	–	–	–	435	1,312	201.8%
Intra-County	1	3	133.9%	–	–	–	–	–	–	–	–	–	1	3	133.9%
Through	98,932	172,596	74.5%	–	–	–	–	–	–	–	–	–	98,932	172,596	74.5%
Total	**101,663**	**178,122**	**75.2%**	**878**	**919**	**4.7%**	**9**	**49**	**456.8%**	**–**	**–**	**–**	**102,550**	**179,090**	**74.6%**

Source: IHS Global Insight.

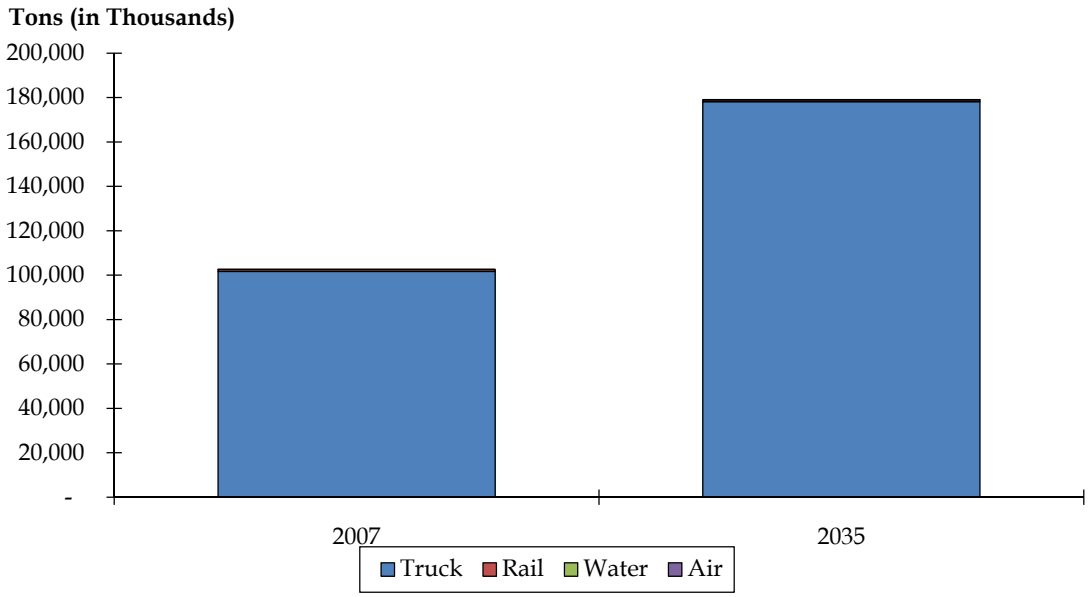
Table 3.5 Summary of Chambers County Freight Flows by Value

Dollars in Millions

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	$11,933	$18,806	57.6%	$551	$657	19.2%	–	–	–	–	–	–	$12,484	$19,462	55.9%
From H-GAC	$4,179	$7,469	78.7%	$10	$6	-38.5%	–	–	–	–	–	–	$4,190	$7,476	78.4%
Outbound	$896	$6,762	654.8%	$356	$177	-50.3%	$10	$74	623.4%	–	–	–	$1,262	$7,013	455.7%
To H-GAC	$115	$183	59.3%	$16	$8	-46.4%	–	–	–	–	–	–	$131	$192	46.7%
Intra-County	$3	$19	444.9%	–	–	–	–	–	–	–	–	–	$3	$19	444.9%
Through	$346,239	$795,207	129.7%	–	–	–	–	–	–	–	–	–	$346,239	$795,207	129.7%
Total	**$359,072**	**$820,793**	**128.6%**	**$907**	**$834**	**-8.1%**	**$10**	**$74**	**623.4%**	**–**	**–**	**–**	**$359,989**	**$821,701**	**128.3%**

Source: IHS Global Insight.

Figure 3.11 Growth in Total Weight of Freight Flows by Mode – Chambers County



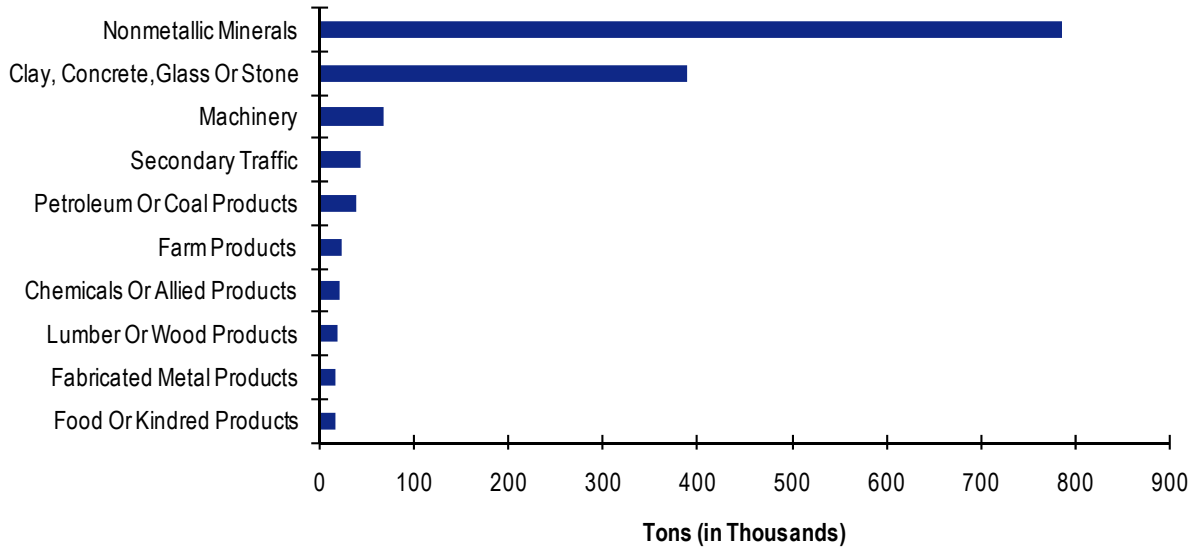
Source: IHS Global Insight

Commodity Analysis – Chambers County

In 2007, about 3.6 million tons of freight moved inbound, outbound, and within Chambers County. By weight, secondary traffic (which represents the distribution of manufactured and consumer goods) is the largest freight generator in the County accounting for more than 1.5 million tons or approximately 42 percent of total tonnage (see Figure 3.12).

Figure 3.12 Commodities – Chambers County

2007



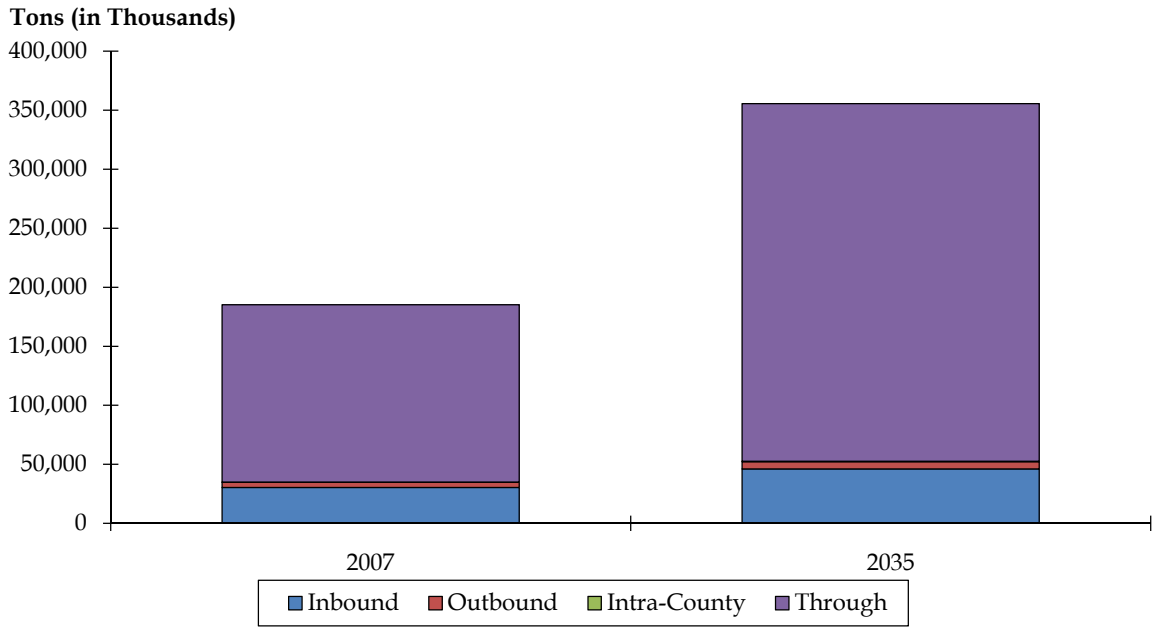
Note: Sum of inbound, outbound, and intra-county freight.
Source: IHS Global Insight

3.3 Fort Bend County

Directional Analysis – Fort Bend County

In 2007, 185 million tons of freight moved into, out of, within, or through Fort Bend County. Approximately 30 million tons (17 percent) traveled inbound, 4.3 million tons (two percent) traveled outbound, 306 thousand tons (less than one percent) traveled from one point within the county to another. Through freight accounted for 150 million tons or 81 percent of the total. By 2035, total freight moving across the county is expected to grow to 356 million tons, an increase of 92 percent (see Figure 3.13).

Figure 3.13 Growth in Total Weight of Freight Flows by Direction – Fort Bend County

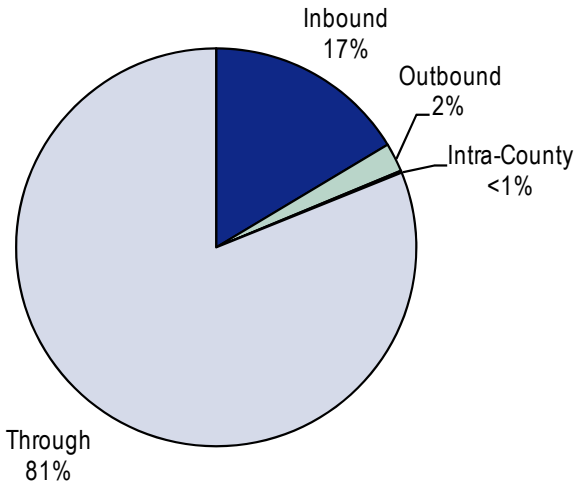


Source: IHS Global Insight

Figure 3.14 displays the proportion of freight flows moving across Fort Bend County by direction in 2007. Through freight comprises 81 percent of all freight in the County which is typical for counties that straddle major north-south or east-west freight corridors. This means that just 19 percent of freight moving through the County is servicing the local economy in some fashion. Less than one percent of total Fort Bend County freight flows begin and end within the County. Most of these intra-county moves consist of nonmetallic minerals.

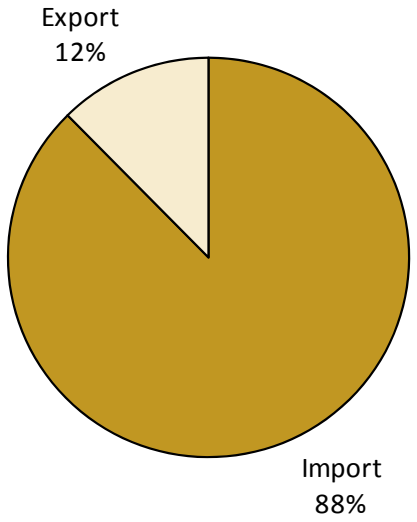
Figure 3.15 highlights the balance of imports (inbound tonnage) to exports (outbound tonnage) and shows that Fort Bend County businesses receive more inbound goods than they ship outbound thus translating into a freight trade deficit of 76 percent.

Figure 3.14 Direction of Total Freight Flows by Weight – Fort Bend County
2007



Source: IHS Global Insight

Figure 3.15 Imports/Exports – Fort Bend County
2007



Source: IHS Global Insight

Tables 3.6 and 3.7 display Fort Bend County freight flows by mode and direction and Figure 3.16 displays the expected growth by mode between 2007 and 2035.

Table 3.6 Summary of Fort Bend County Freight Flows by Weight

Tons in Thousands

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	17,417	26,727	53.5%	12,972	19,349	49.2%	–	–	–	–	–	–	30,390	46,076	51.6%
From H-GAC	2,012	3,085	53.3%	209	290	39.2%	–	–	–	–	–	–	2,220	3,375	52.0%
Outbound	4,165	5,948	42.8%	152	225	47.6%	–	–	–	–	–	–	4,318	6,173	43.0%
To H-GAC	1,889	1,900	0.6%	25	44	75.7%	–	–	–	–	–	–	1,914	1,943	1.5%
Intra-County	314	420	33.8%	2	2	41.1%	–	–	–	–	–	–	316	422	33.8%
Through	150,207	302,921	101.7%	–	–	–	–	–	–	–	–	–	150,207	302,921	101.7%
Total	**172,103**	**336,016**	**95.2%**	**13,126**	**19,576**	**49.1%**	**–**	**–**	**–**	**–**	**–**	**–**	**185,230**	**355,592**	**92.0%**

Source: IHS Global Insight.

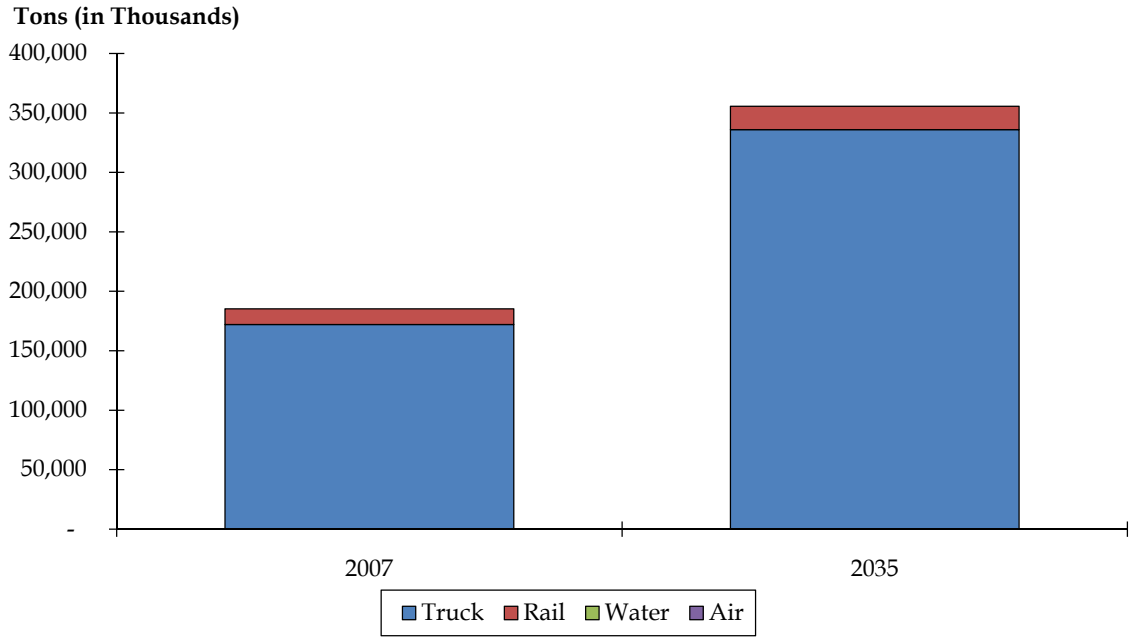
Table 3.7 Summary of Fort Bend County Freight Flows by Value

Dollars in Millions

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	$14,417	$31,413	117.9%	$3,282	$5,666	72.7%	–	–	–	–	–	–	$17,699	$37,080	109.5%
From H-GAC	$1,504	$3,416	127.2%	$568	$810	42.6%	–	–	–	–	–	–	$2,072	$4,226	104.0%
Outbound	$4,910	$11,630	136.9%	$260	$465	79.1%	–	–	–	–	–	–	$5,170	$12,095	134.0%
To H-GAC	$757	$1,624	114.5%	$52	$134	158.3%	–	–	–	–	–	–	$809	$1,758	117.3%
Intra-County	$17	$53	210.1%	$3	$6	89.7%	–	–	–	–	–	–	$20	$59	191.3%
Through	$463,754	$1,247,194	168.9%	–	–	–	–	–	–	–	–	–	$463,754	$1,247,194	168.9%
Total	**$483,098**	**$1,290,290**	**167.1%**	**$3,545**	**$6,137**	**73.1%**	–	–	–	–	–	–	**$486,643**	**$1,296,427**	**166.4%**

Source: IHS Global Insight.

Figure 3.16 Growth in Total Weight of Freight Flows by Mode – Fort Bend County

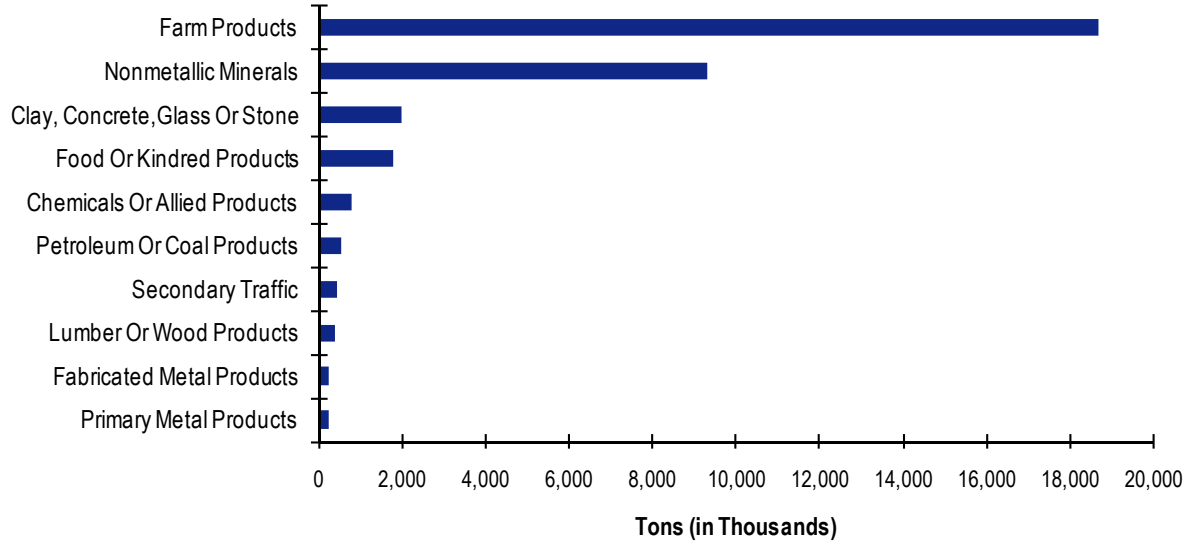


Source: IHS Global Insight

Commodity Analysis – Fort Bend County

In 2007, about 35 million tons of freight moved inbound, outbound, and within Fort Bend County. By weight, farm products are the largest freight generator in the County accounting for more than 18.7 million tons or approximately 53 percent of total tonnage (see Figure 3.17).

Figure 3.17 Commodities – Fort Bend County
2007



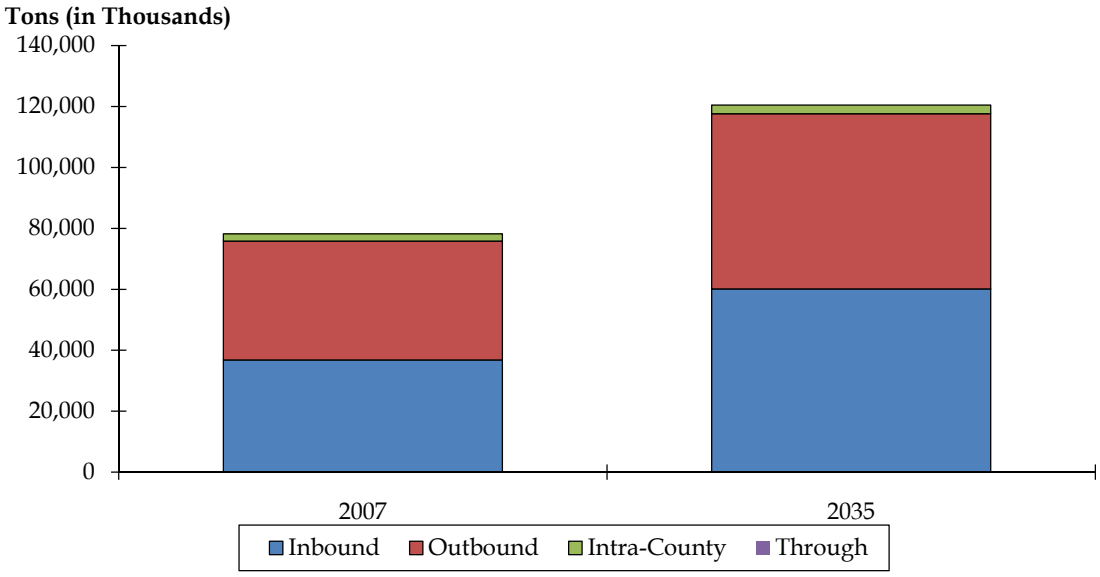
Note: Sum of inbound, outbound, and intra-county freight.
Source: IHS Global Insight

3.4 Galveston County

Directional Analysis – Galveston County

In 2007, 78 million tons of freight moved into, out of, within, or through Galveston County. Approximately 37 million tons (47 percent) traveled inbound, 39 million tons (50 percent) traveled outbound, 2.4 million tons (three percent) traveled from one point within the county to another. By 2035, total freight moving across the County is expected to grow to 120 million tons, an increase of 54 percent (see Figure 3.18).

Figure 3.18 Growth in Total Weight of Freight Flows by Direction – Galveston County



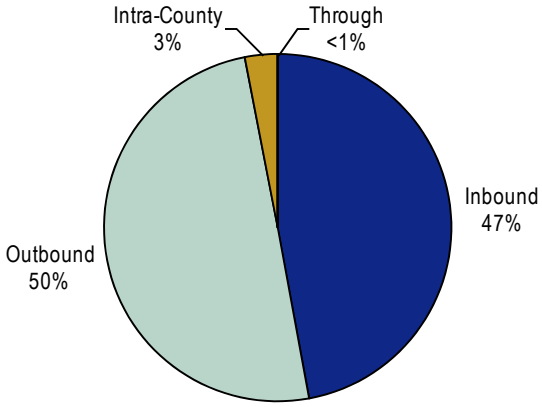
Source: IHS Global Insight

Figure 3.19 displays the proportion of freight flows moving across Galveston County by direction in 2007. No through freight was attributed to Galveston County within the TRANSEARCH database as the freight coming into the port and continuing through the County is classified as inbound freight.[27] Just three percent of total Galveston County freight flows begin and end within the County. Most of these intra-county moves consist of petroleum or coal products and farm products.

[27] Another reason for the lack of through freight is due to the way TRANSEARCH routes freight over the transportation network. The resolution of the TRANSEARCH network is at the county level, meaning that each county is its own centroid. In the specific case of Galveston County, the freight moving between Brazoria and Chambers counties for example, are routed such that none of it passes through any portion of Galveston County.

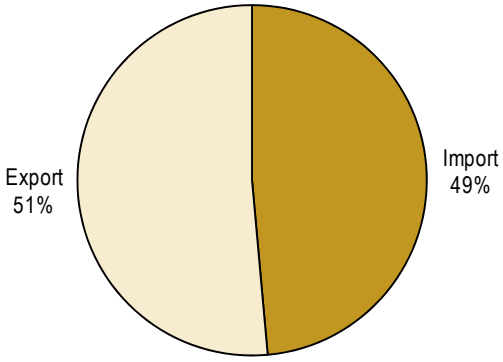
Figure 3.20 highlights the balance of imports (inbound tonnage) to exports (outbound tonnage) and shows that Galveston County businesses ship more outbound goods than they receive inbound thus translating into a freight trade surplus of two percent. This is also influenced by the import/export activity of the Port.

Figure 3.19 Direction of Total Freight Flows by Weight – Galveston County
2007



Source: IHS Global Insight

Figure 3.20 Imports/Exports – Galveston County
2007



Source: IHS Global Insight

Tables 3.8 and 3.9 display Galveston County freight flows by mode and direction and Figure 3.21 displays the expected growth by mode between 2007 and 2035.

Table 3.8 Summary of Galveston County Freight Flows by Weight

Tons in Thousands

Direction	Truck		Percent Change (2007 to 2035)	Rail		Percent Change (2007 to 2035)	Water		Percent Change (2007 to 2035)	Air		Percent Change (2007 to 2035)	Total		Percent Change (2007 to 2035)
	2007	2035		2007	2035		2007	2035		2007	2035		2007	2035	
Inbound	12,091	19,584	62.0%	3,639	5,882	61.6%	21,101	34,675	64.3%	–	–	–	36,832	60,141	63.3%
From H-GAC	6,211	9,414	51.6%	566	707	24.8%	311	338	8.5%	–	–	–	7,088	10,458	47.5%
Outbound	19,202	31,813	65.7%	4,865	6,130	26.0%	14,925	19,527	30.8%	–	–	–	38,992	57,470	47.4%
To H-GAC	5,157	6,634	28.6%	726	960	32.1%	2,527	2,836	12.2%	–	–	–	8,411	10,430	24.0%
Intra-County	1,527	1,605	5.1%	104	147	41.4%	750	1,102	46.8%	–	–	–	2,382	2,855	19.8%
Through	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	**32,821**	**53,003**	**61.5%**	**8,608**	**12,159**	**41.3%**	**36,777**	**55,304**	**50.4%**	–	–	–	**78,205**	**120,466**	**54.0%**

Source: IHS Global Insight.

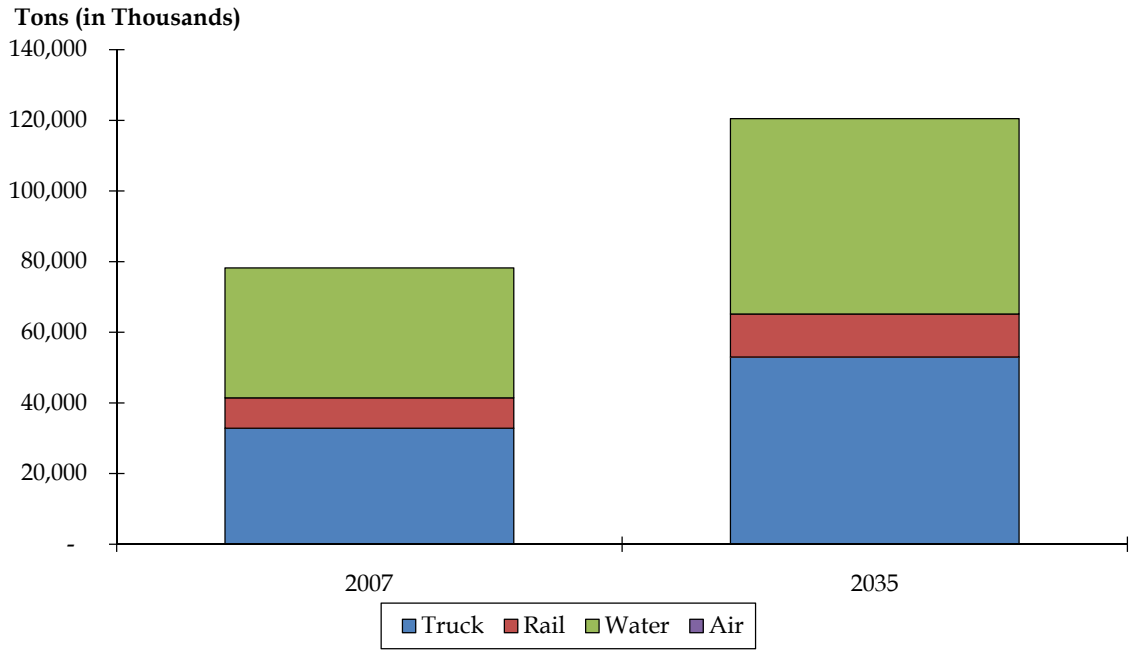
Table 3.9 Summary of Galveston County Freight Flows by Value

Dollars in Millions

Direction	Truck		Percent Change (2007 Percent	Rail		Percent Change (2007 Percent	Water		Percent Change (2007 Percent	Air		Percent Change (2007 Percent	Total		Percent Change (2007 Percent
	2007	2035		2007	2035		2007	2035		2007	2035		2007	2035	
Inbound	$33,177	$76,628	131.0%	$2,805	$4,161	48.3%	$8,780	$15,692	78.7%	–	–	–	$44,761	$96,481	115.5%
From H-GAC	$12,331	$29,754	141.3%	$650	$813	25.1%	$208	$238	14.2%	–	–	–	$13,189	$30,804	133.6%
Outbound	$32,355	$55,712	72.2%	$6,442	$8,152	26.5%	$8,871	$11,427	28.8%	–	–	–	$47,669	$75,291	57.9%
To H-GAC	$8,270	$12,615	52.5%	$1,217	$1,704	40.0%	$1,448	$1,670	15.3%	–	–	–	$10,935	$15,989	46.2%
Intra-County	$2,428	$5,055	108.2%	$110	$159	44.8%	$449	$657	46.2%	–	–	–	$2,987	$5,871	96.5%
Through	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	**$67,960**	**$137,395**	**102.2%**	**$9,357**	**$12,472**	**33.3%**	**$18,100**	**$27,776**	**53.5%**	–	–	–	**$95,417**	**$177,643**	**86.2%**

Source: IHS Global Insight.

Figure 3.21 Growth in Total Weight of Freight Flows by Mode – Galveston County

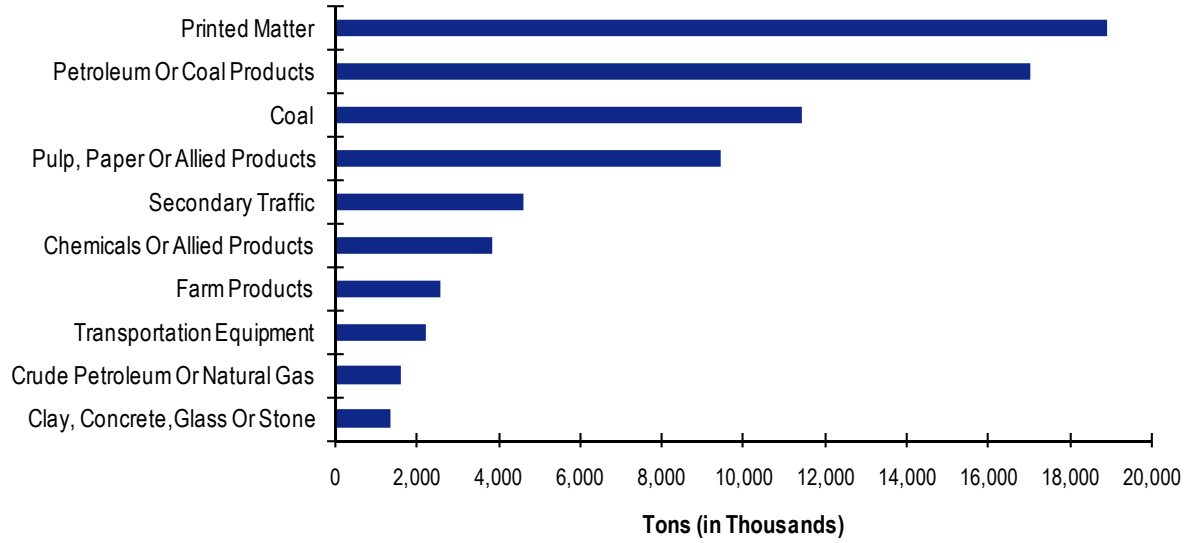


Source: IHS Global Insight

Commodity Analysis – Galveston County

In 2007, about 78 million tons of freight moved inbound, outbound, and within Galveston County. By weight, the paper and printing industry is the largest freight generator in the County accounting for 28.3 million tons or approximately 36 percent of total tonnage (see Figure 3.22).

Figure 3.22 Commodities – Galveston County
2007



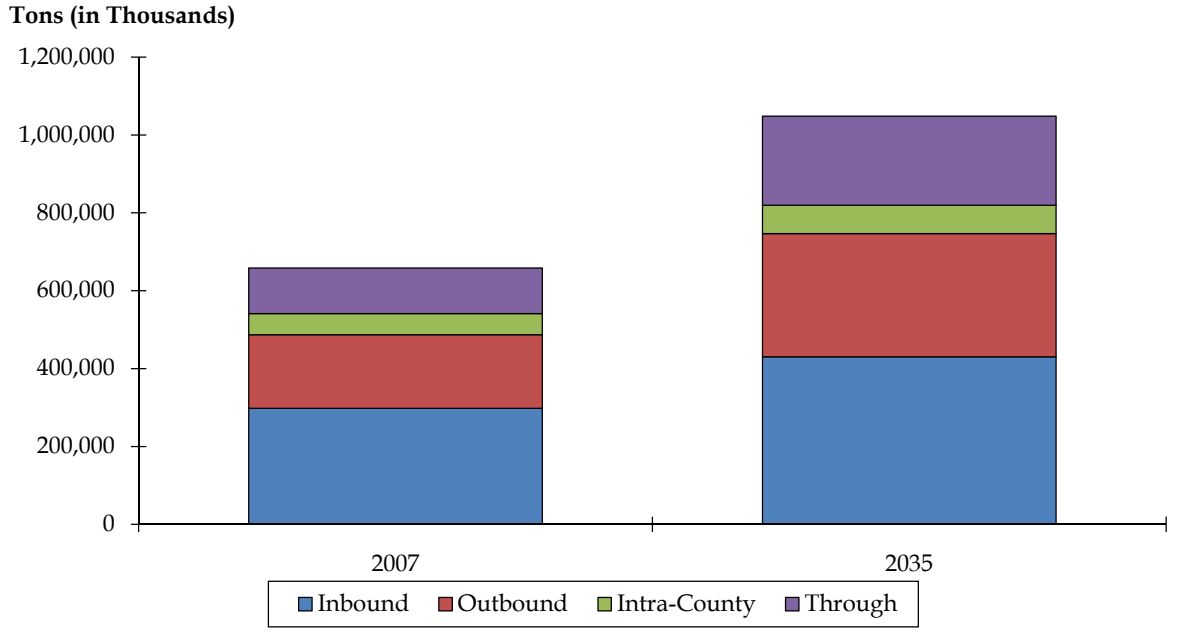
Note: Sum of inbound, outbound, and intra-county freight.
Source: IHS Global Insight

3.5 Harris County

Directional Analysis – Harris County

In 2007, 658 million tons of freight moved into, out of, within, or through Harris County. Approximately 298 million tons (45 percent) traveled inbound, 189 million tons (29 percent) traveled outbound, 54 million tons (eight percent) traveled from one point within the county to another. Through freight accounted for 117 million tons or 18 percent of the total. By 2035, total freight moving across the county is expected to grow to 1.0 billion tons, an increase of 59 percent (see Figure 3.23).

Figure 3.23 Growth in Total Weight of Freight Flows by Direction – Harris County

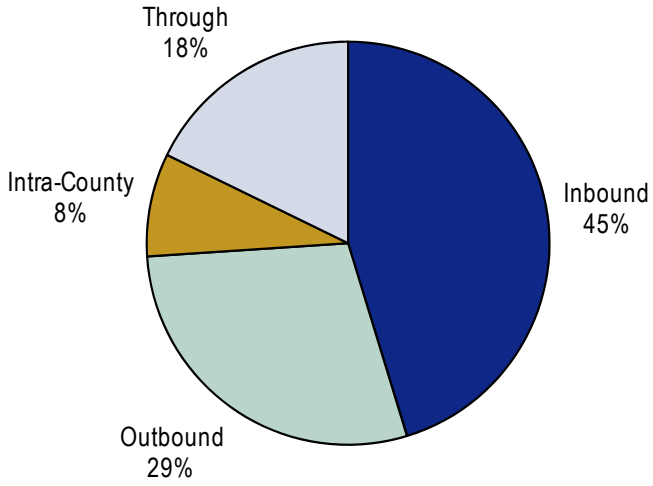


Source: IHS Global Insight

Figure 3.24 displays the proportion of freight flows moving across Harris County by direction in 2007. Through freight comprises 18 percent of all freight in the County which is a smaller proportion than is typical for other areas of similar size. This low level of through freight means that most the freight moving across the County is servicing the local economy in one way or another. About eight percent of total Harris County freight flows begin and end within the County. Most of these intra-county moves consist of petroleum or coal products and chemicals or allied products.

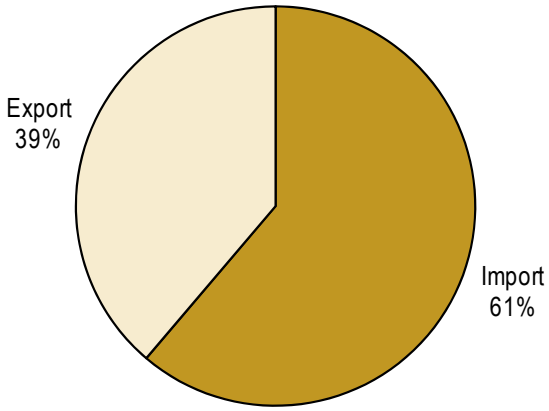
Figure 3.25 highlights the balance of imports (inbound tonnage) to exports (outbound tonnage) and shows that Harris County businesses receive more inbound goods than they ship outbound thus translating into a freight trade deficit of 22 percent.

Figure 3.24 Direction of Total Freight Flows by Weight – Harris County
2007



Source: IHS Global Insight

Figure 3.25 Imports/Exports – Harris County
2007



Source: IHS Global Insight

Tables 3.10 and 3.11 display Harris County freight flows by mode and direction and Figure 3.26 displays the expected growth by mode between 2007 and 2035.

Table 3.10 Summary of Harris County Freight Flows by Weight

Tons in Thousands

Direction	Truck		Percent Change (2007 to 2035)	Rail		Percent Change (2007 to 2035)	Water		Percent Change (2007 to 2035)	Air		Percent Change (2007 to 2035)	Total		Percent Change (2007 to 2035)
	2007	2035		2007	2035		2007	2035		2007	2035		2007	2035	
Inbound	141,649	200,479	41.5%	81,978	119,940	46.3%	74,239	109,477	47.5%	177	284	60.8%	298,043	430,179	44.3%
From H-GAC	15,244	19,896	30.5%	1,766	2,353	33.3%	2,521	2,645	4.9%	–	–	–	19,530	24,894	27.5%
Outbound	132,569	240,777	81.6%	33,548	46,489	38.6%	22,465	28,234	25.7%	289	932	222.2%	188,871	316,432	67.5%
To H-GAC	14,582	29,046	99.2%	2,556	4,651	81.9%	360	452	25.5%	–	–	–	17,499	34,149	95.1%
Intra-County	46,142	63,262	37.1%	3,572	3,881	8.7%	4,701	5,642	20.0%	–	–	–	54,414	72,785	33.8%
Through	117,044	228,779	95.5%	–	–	–	–	–	–	–	–	–	117,044	228,779	95.5%
Total	**437,404**	**733,297**	**67.6%**	**119,098**	**170,310**	**43.0%**	**101,405**	**143,353**	**41.4%**	**466**	**1,216**	**161.0%**	**658,373**	**1,048,175**	**59.2%**

Source: IHS Global Insight.

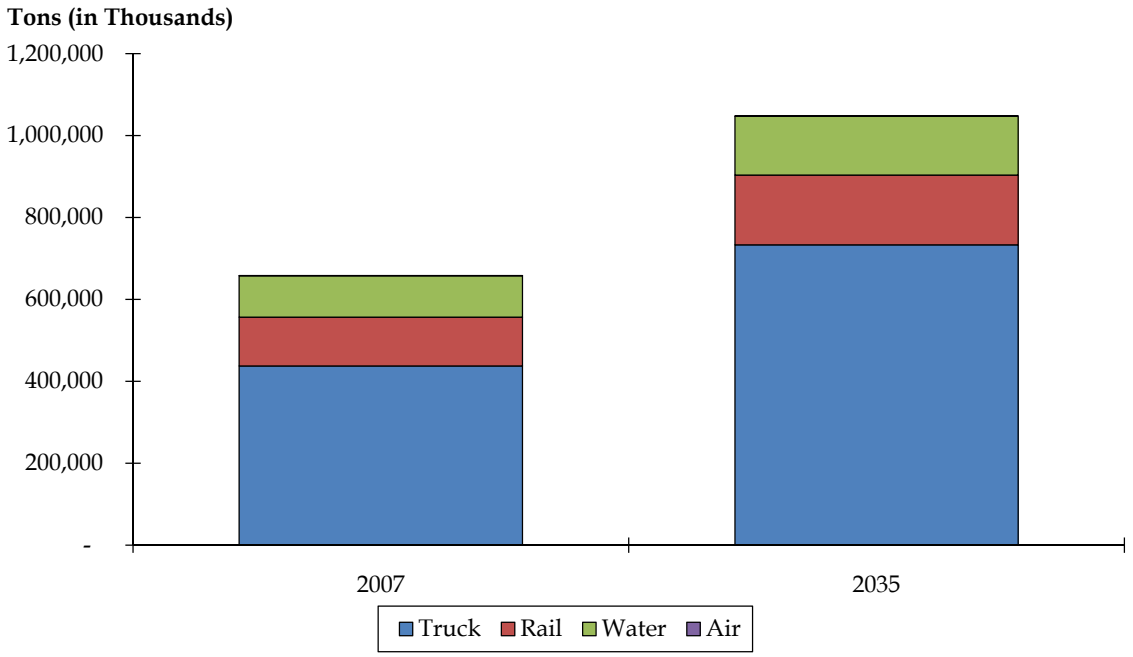
Table 3.11 Summary of Harris County Freight Flows by Value

Dollars in Millions

Direction	Truck		Percent Change (2007 to 2035)	Rail		Percent Change (2007 to 2035)	Water		Percent Change (2007 to 2035)	Air		Percent Change (2007 to 2035)	Total		Percent Change (2007 to 2035)
	2007	2035		2007	2035		2007	2035		2007	2035		2007	2035	
Inbound	$405,370	$930,025	129.4%	$36,535	$55,940	53.1%	$34,564	$47,371	37.1%	$1,976	$5,130	159.6%	$478,446	$1,038,465	117.0%
From H-GAC	$10,980	$17,198	56.6%	$2,709	$3,841	41.8%	$1,526	$1,946	27.6%	–	–	–	$15,215	$22,985	51.1%
Outbound	$369,476	$869,554	135.3%	$40,287	$50,870	26.3%	$16,850	$26,540	57.5%	$1,347	$3,891	188.9%	$427,960	$950,856	122.2%
To H-GAC	$48,912	$142,999	192.4%	$4,158	$7,782	87.2%	$365	$564	54.3%	–	–	–	$53,435	$151,345	183.2%
Intra-County	$127,346	$270,043	112.1%	$6,264	$7,281	16.2%	$4,625	$5,845	26.4%	–	–	–	$138,236	$283,170	104.8%
Through	$337,898	$825,752	144.4%	–	–	–	–	–	–	–	–	–	$337,898	$825,752	144.4%
Total	**$1,240,091**	**$2,895,375**	**133.5%**	**$83,087**	**$114,091**	**37.3%**	**$56,039**	**$79,756**	**42.3%**	**$3,323**	**$9,022**	**171.5%**	**$1,382,540**	**$3,098,243**	**124.1%**

Source: IHS Global Insight.

Figure 3.26 Growth in Total Weight of Freight Flows by Mode – Harris County

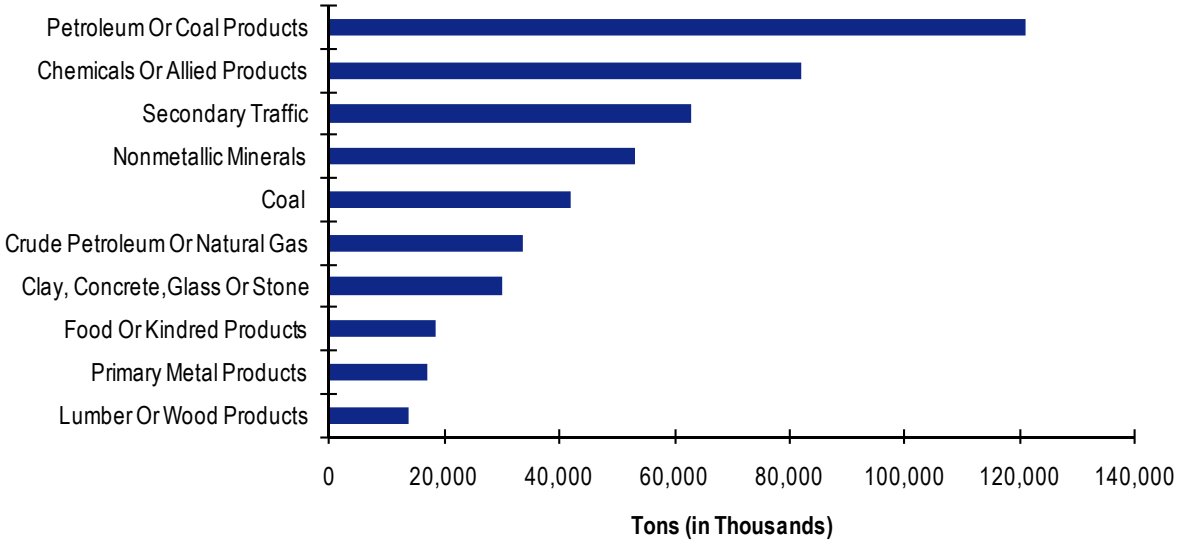


Source: IHS Global Insight

Commodity Analysis – Harris County

In 2007, about 541 million tons of freight moved inbound, outbound, and within Harris County. By weight, the petrochemical industry is the largest freight generator in the County as evidenced by the fact that petroleum products, chemical products, and crude petroleum and natural gas combined account for 237 million tons or approximately 44 percent of total tonnage (see Figure 3.27).

Figure 3.27 Commodities – Harris County
2007



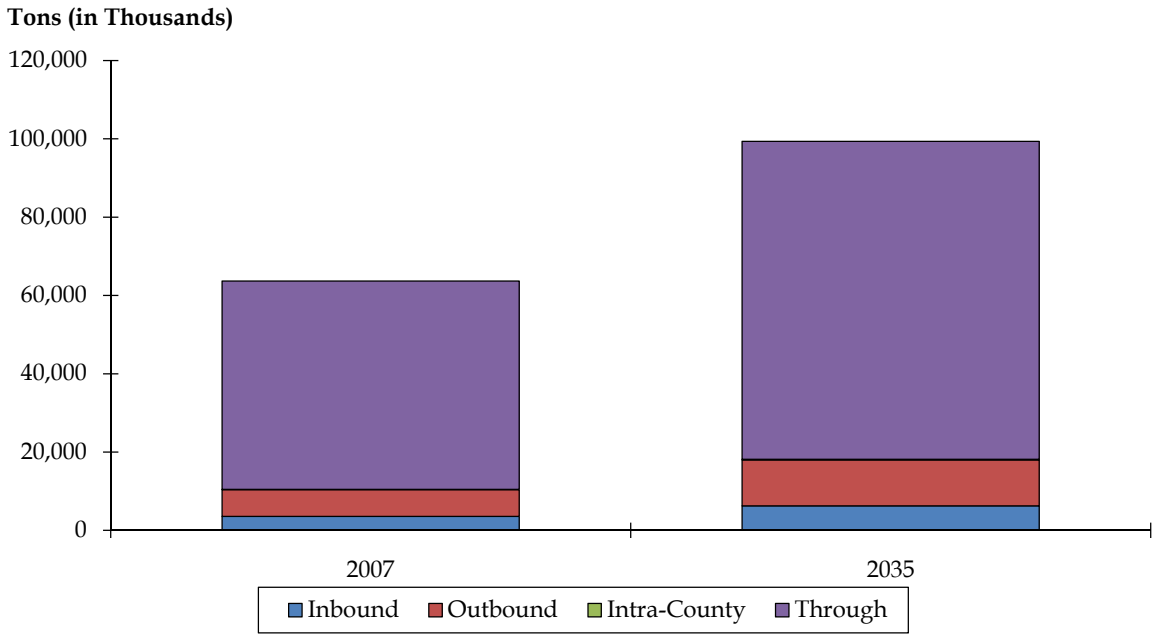
Note: Sum of inbound, outbound, and intra-county freight.
Source: IHS Global Insight

3.6 Liberty County

Directional Analysis – Liberty County

In 2007, 64 million tons of freight moved into, out of, within, or through Liberty County. Approximately 3.6 million tons (six percent) traveled inbound, 6.8 million tons (11 percent) traveled outbound, 97 thousand tons (less than one percent) traveled from one point within the county to another. Through freight accounted for 53 million tons or 83 percent of the total. By 2035, total freight moving across the County is expected to grow to 99 million tons, an increase of 56 percent (see Figure 3.28).

Figure 3.28 Growth in Total Weight of Freight Flows by Direction – Liberty County

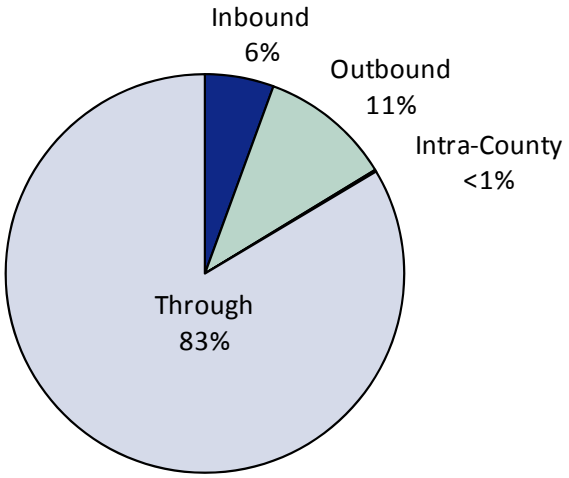


Source: IHS Global Insight

Figure 3.29 displays the proportion of freight flows moving across Liberty County by direction in 2007. Through freight comprises 83 percent of all freight in the County which is typical for smaller counties that straddle major freight corridors. This means that just 17 percent of freight moving through the County is servicing the local economy in some fashion. Less than one percent of total Liberty County freight flows begin and end within the County. Most of these intra-county moves consist of nonmetallic minerals and clay, concrete, glass, or stone products.

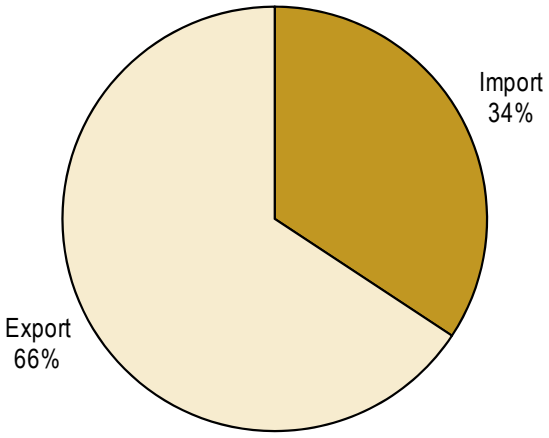
Figure 3.30 highlights the balance of imports (inbound tonnage) to exports (outbound tonnage) and shows that Liberty County businesses ship more outbound goods than they receive inbound thus translating into a freight trade surplus of 32 percent.

Figure 3.29 Direction of Total Freight Flows by Weight – Liberty County
2007



Source: IHS Global Insight

Figure 3.30 Imports/Exports – Liberty County
2007



Source: IHS Global Insight

Tables 3.12 and 3.13 display Liberty County freight flows by mode and direction and Figure 3.31 shows the expected growth by mode between 2007 and 2035.

Table 3.12 Summary of Liberty County Freight Flows by Weight

Tons in Thousands

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	1,248	1,998	60.1%	2,310	4,260	84.4%	–	–	–	–	–	–	3,558	6,258	75.9%
From H-GAC	292	421	44.1%	1,568	3,381	115.6%	–	–	–	–	–	–	1,861	3,802	104.3%
Outbound	5,174	8,048	55.5%	1,649	3,681	123.3%	–	–	–	–	–	–	6,823	11,729	71.9%
To H-GAC	3,600	5,708	58.6%	278	670	140.9%	–	–	–	–	–	–	3,878	6,378	64.5%
Intra-County	97	168	74.5%	–	1	289.8%	–	–	–	–	–	–	97	170	75.2%
Through	53,210	81,217	52.6%	–	–	–	–	–	–	–	–	–	53,210	81,217	52.6%
Total	**59,729**	**91,432**	**53.1%**	**3,958**	**7,942**	**100.6%**	**–**	**–**	**–**	**–**	**–**	**–**	**63,687**	**99,374**	**56.0%**

Source: IHS Global Insight.

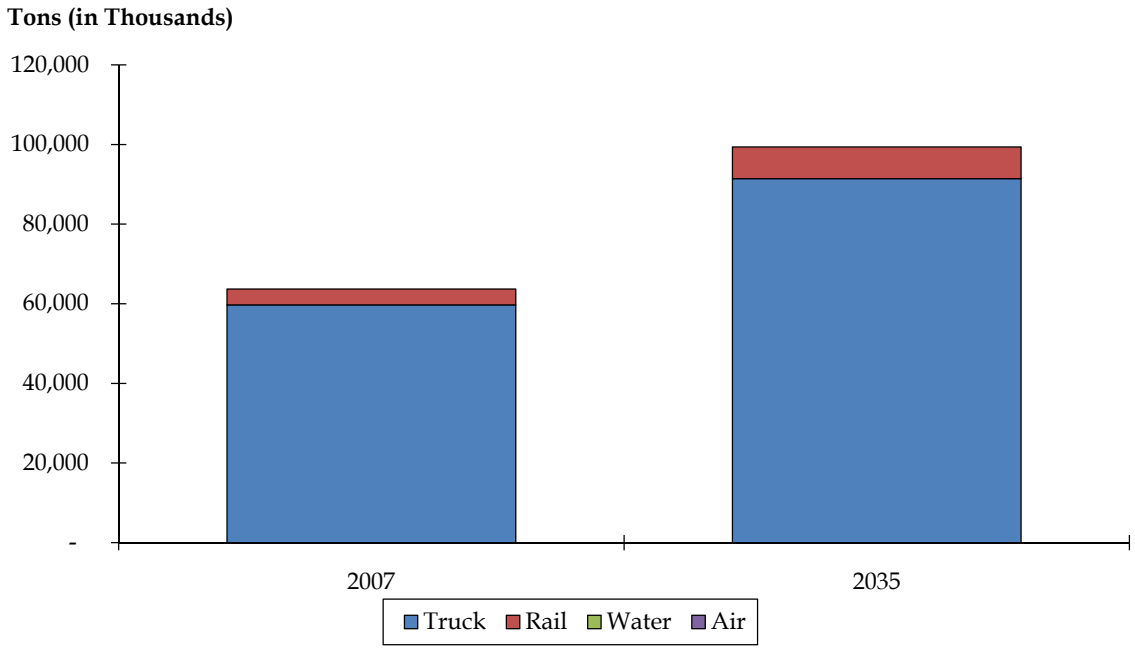
Table 3.13 Summary of Liberty County Freight Flows by Value

Dollars in Millions

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	$3,571	$9,771	173.6%	$3,245	$6,507	100.5%	–	–	–	–	–	–	$6,816	$16,278	138.8%
From H-GAC	$438	$1,091	149.3%	$2,727	$5,882	115.7%	–	–	–	–	–	–	$3,165	$6,974	120.3%
Outbound	$1,062	$2,310	117.4%	$2,452	$5,709	132.9%	–	–	–	–	–	–	$3,514	$8,019	128.2%
To H-GAC	$246	$382	55.0%	$453	$1,132	150.0%	–	–	–	–	–	–	$699	$1,513	116.5%
Intra-County	$3	$6	105.9%	$0	$2	319.4%	–	–	–	–	–	–	$4	$8	135.4%
Through	$144,219	$281,033	94.9%	–	–	–	–	–	–	–	–	–	$144,219	$281,033	94.9%
Total	**$148,855**	**$293,121**	**96.9%**	**$5,697**	**$12,218**	**114.5%**	**–**	**–**	**–**	**–**	**–**	**–**	**$154,553**	**$305,339**	**97.6%**

Source: IHS Global Insight.

Figure 3.31 Growth in Total Weight of Freight Flows by Mode – Liberty County

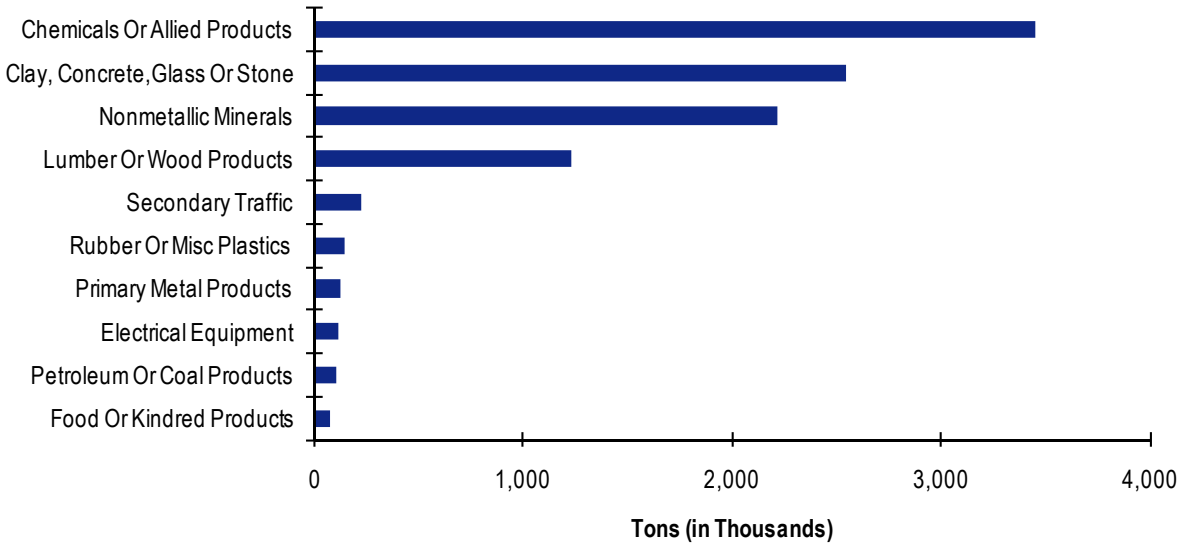


Source: IHS Global Insight

Commodity Analysis – Liberty County

In 2007, about 10.5 million tons of freight moved inbound, outbound, and within Liberty County. By weight, the chemical industry is the single largest freight generator in the County as evidenced by the fact that chemical products account for 3.5 million tons or approximately 33 percent of total tonnage (see Figure 3.32). Clay, concrete, glass, and stone; nonmetallic minerals; and lumber or wood products combined account for 6.0 million tons or 57 percent of total tonnage reflecting the strength of the construction industry in the County.

Figure 3.32 Commodities – Liberty County
2007



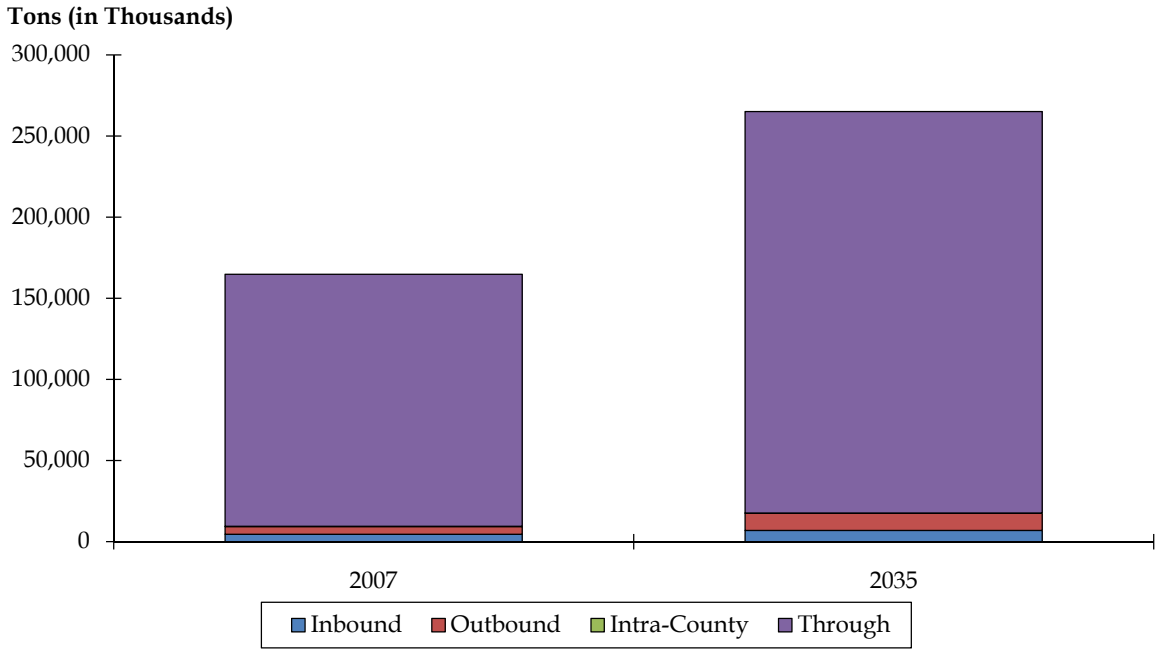
Note: Sum of inbound, outbound, and intra-county freight.
Source: IHS Global Insight

3.7 Montgomery County

Directional Analysis – Montgomery County

In 2007, 165 million tons of freight moved into, out of, within, or through Montgomery County. Approximately 4.6 million tons (three percent) traveled inbound, 4.7 million tons (three percent) traveled outbound, 174 thousand tons (less than one percent) traveled from one point within the county to another. Through freight accounted for 155 million tons or 94 percent of the total. By 2035, total freight moving across the County is expected to grow to 263 million tons, an increase of 61 percent (see Figure 3.33).

Figure 3.33 Growth in Total Weight of Freight Flows by Direction – Montgomery County



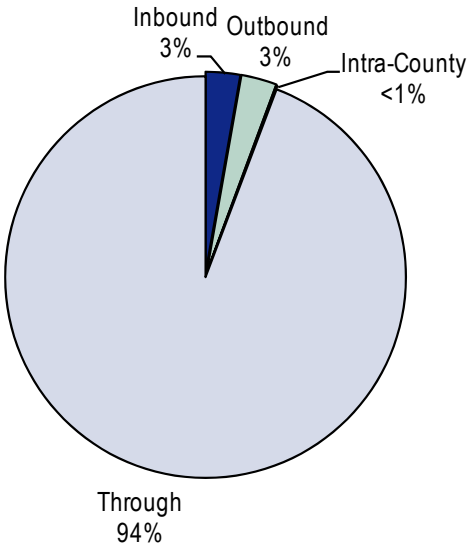
Source: IHS Global Insight

Figure 3.34 displays the proportion of freight flows moving across Montgomery County by direction in 2007. Through freight comprises 94 percent of all freight in the County which is typical of smaller counties that straddle major north-south or east-west freight corridors. This means that just six percent of freight moving through the County is servicing the local economy in one form or another. Less than one percent of total Montgomery County freight flows begin and end within the County. Most of these intra-county moves consist of clay, concrete, glass or stone products.

Figure 3.35 highlights the balance of imports (inbound tonnage) to exports (outbound tonnage) and shows that Montgomery County businesses ship more outbound goods than they receive inbound thus translating into a freight trade surplus of only two percent. This represents a balanced trade lane which allows for better opportunities for carriers to match inbound and outbound loads,

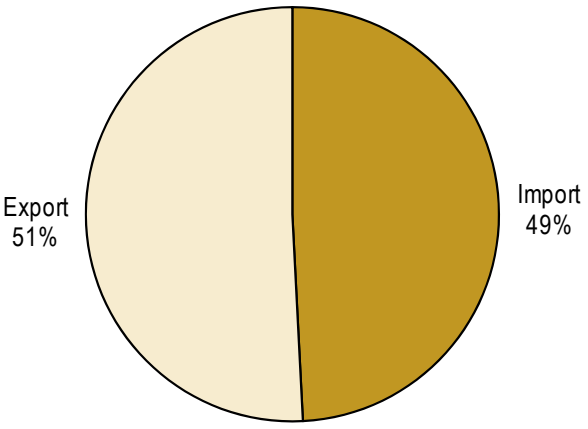
reducing empty hauls. As a result, regional shippers benefit from more competitive shipping terms.

Figure 3.34 Direction of Total Freight Flows by Weight – Montgomery County
2007



Source: IHS Global Insight

Figure 3.35 Imports/Exports – Montgomery County
2007



Source: IHS Global Insight

Tables 3.14 and 3.15 display Montgomery County freight flows by mode and direction and Figure 3.36 displays the expected growth by mode between 2007 and 2035.

Table 3.14 Summary of Montgomery County Freight Flows by Weight

Tons in Thousands

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	3,514	5,999	70.7%	1,073	984	-8.3%	–	–	–	–	–	–	4,587	6,984	52.2%
From H-GAC	1,164	1,712	47.1%	22	33	48.7%	–	–	–	–	–	–	1,186	1,745	47.1%
Outbound	4,538	10,219	125.2%	201	377	87.6%	–	–	–	–	–	–	4,739	10,596	123.6%
To H-GAC	2,354	3,411	44.9%	39	83	110.3%	–	–	–	–	–	–	2,393	3,494	46.0%
Intra-County	174	164	-5.8%	0	1	109.1%	–	–	–	–	–	–	174	165	-5.6%
Through	155,266	247,306	59.3%	–	–	–	–	–	–	–	–	–	155,266	247,306	59.3%
Total	**163,492**	**263,689**	**61.3%**	**1,275**	**1,362**	**6.9%**	**-**	**-**	**-**	**-**	**-**	**-**	**164,767**	**265,051**	**60.9%**

Source: IHS Global Insight.

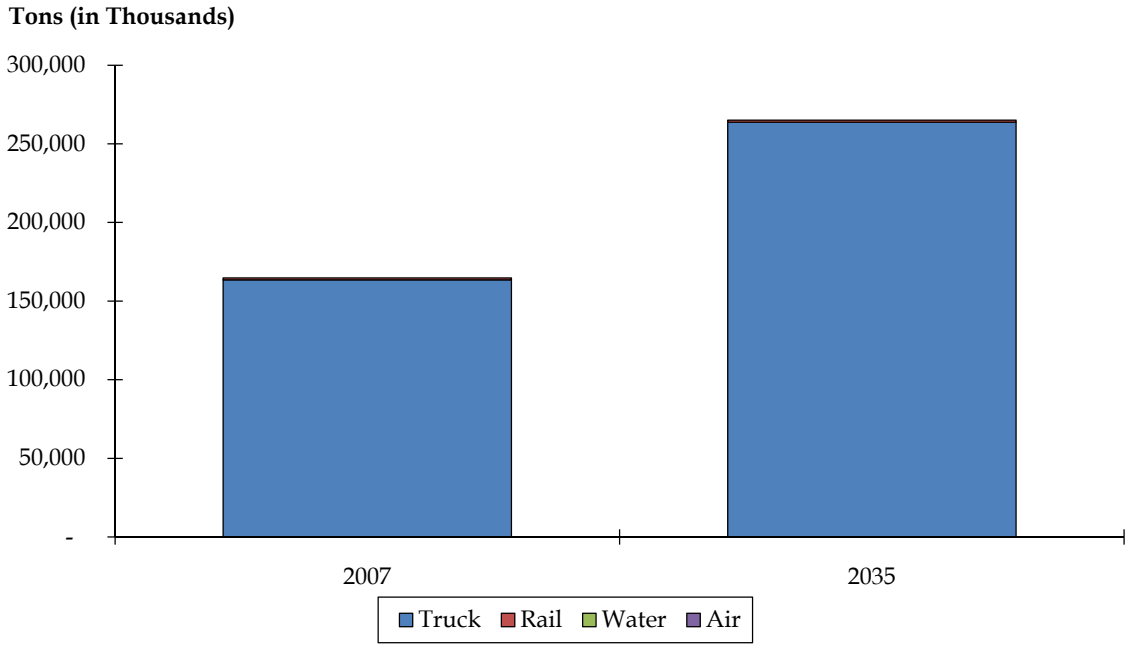
Table 3.15 Summary of Montgomery County Freight Flows by Value

Dollars in Millions

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	$5,259	$15,941	203.1%	$466	$739	58.5%	–	–	–	–	–	–	$5,725	$16,680	191.3%
From H-GAC	$972	$2,643	172.1%	$45	$67	46.8%	–	–	–	–	–	–	$1,017	$2,710	166.5%
Outbound	$3,426	$10,420	204.1%	$266	$462	73.5%	–	–	–	–	–	–	$3,693	$10,882	194.7%
To H-GAC	$563	$1,687	200.0%	$64	$119	86.7%	–	–	–	–	–	–	$626	$1,806	188.5%
Intra-County	$8	$25	205.4%	$0	$1	153.2%	–	–	–	–	–	–	$8	$26	203.8%
Through	$427,734	$901,062	110.7%	–	–	–	–	–	–	–	–	–	$427,734	$901,062	110.7%
Total	**$436,427**	**$927,447**	**112.5%**	**$733**	**$1,202**	**64.0%**	**-**	**-**	**-**	**-**	**-**	**-**	**$437,160**	**$928,649**	**112.4%**

Source: IHS Global Insight.

Figure 3.36 Growth in Total Weight of Freight Flows by Mode – Montgomery County

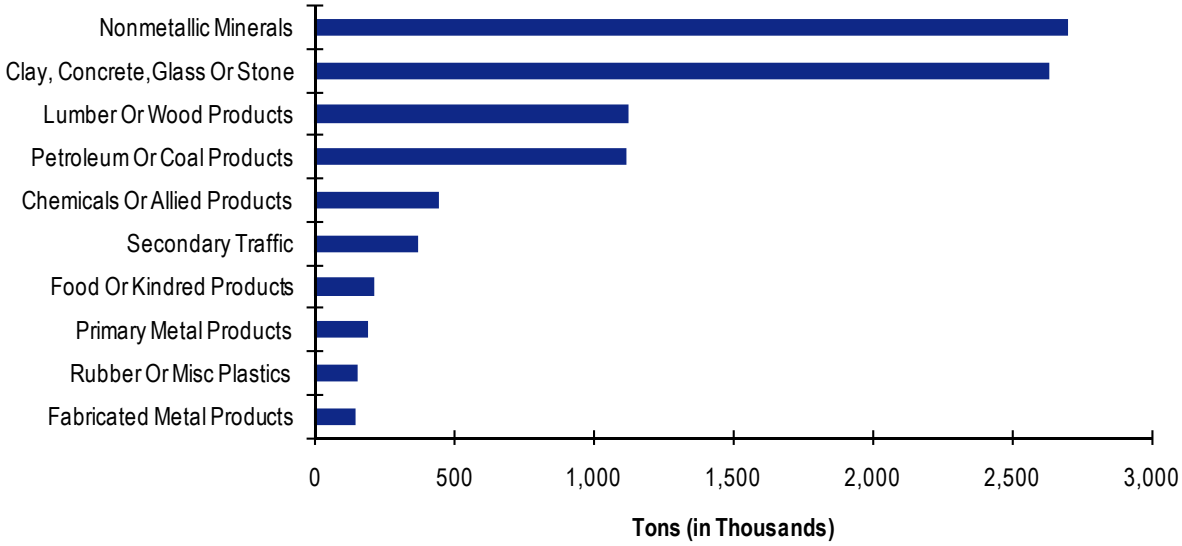


Source: IHS Global Insight

Commodity Analysis – Montgomery County

In 2007, about 9.5 million tons of freight moved inbound, outbound, and within Montgomery County. Nonmetallic minerals; clay, concrete, glass, and stone; and lumber or wood products combined account for 6.5 million tons or 68 percent of total tonnage reflecting the strength of the construction industry in the County (see Figure 3.37).

Figure 3.37 Commodities – Montgomery County
2007



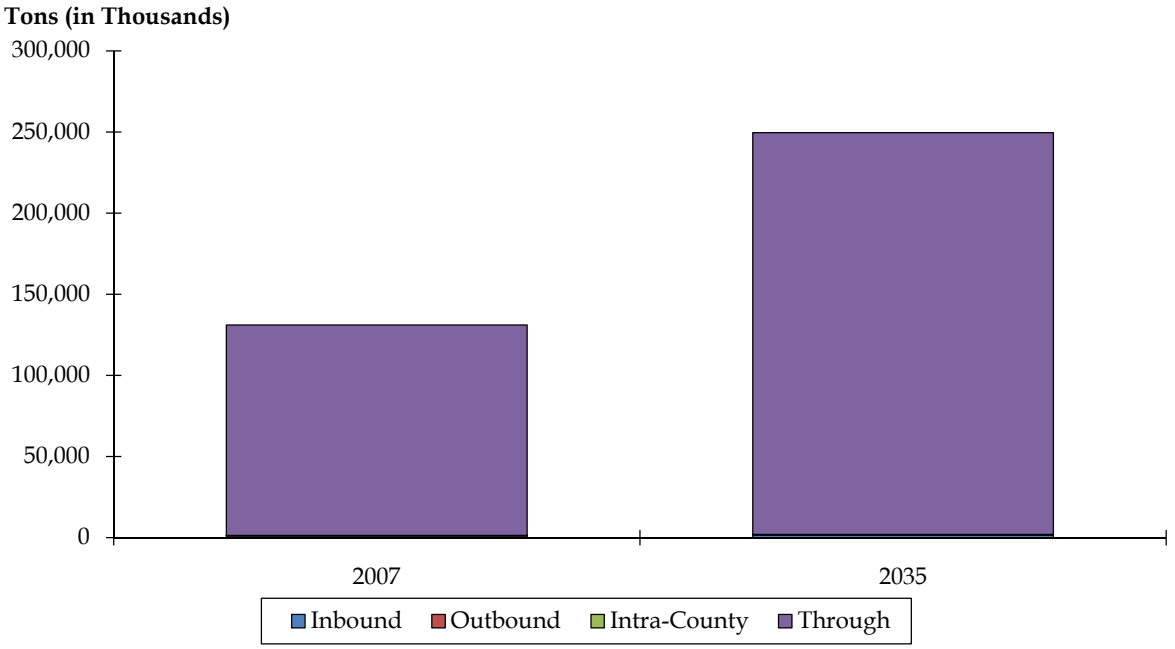
Note: Sum of inbound, outbound, and intra-county freight.
Source: IHS Global Insight

3.8 Waller County

Directional Analysis – Waller County

In 2007, 131 million tons of freight moved into, out of, within, or through Waller County. Approximately 1.1 million tons (one percent) traveled inbound, 314 thousand tons (less than one percent) traveled outbound, two thousand tons (less than one percent) traveled from one point within the County to another. Through freight accounted for 130 million tons or 99 percent of the total. By 2035, total freight moving across the County is expected to grow to 250 million tons, an increase of 90 percent (see Figure 3.38).

Figure 3.38 Growth in Total Weight of Freight Flows by Direction – Waller County

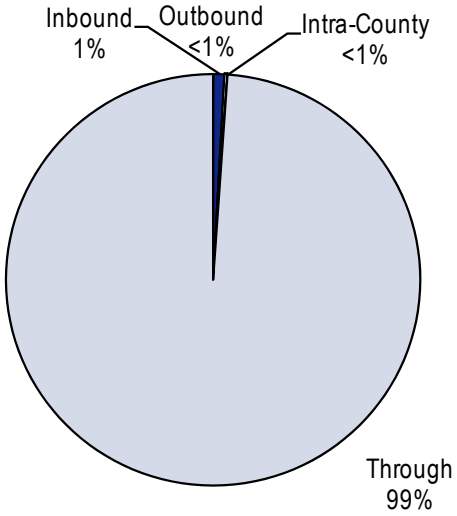


Source: IHS Global Insight

Figure 3.39 displays the proportion of freight flows moving across Waller County by direction in 2007. Through freight comprises 99 percent of all freight in the County which is typical of smaller counties that straddle major north-south or east-west freight corridors. This means that just 1 percent of freight moving through the County is servicing the local economy in one form or another. Only a tiny proportion of total Waller County freight flows begin and end within the County. Most of these intra-county moves consist of clay, concrete, glass, or stone products.

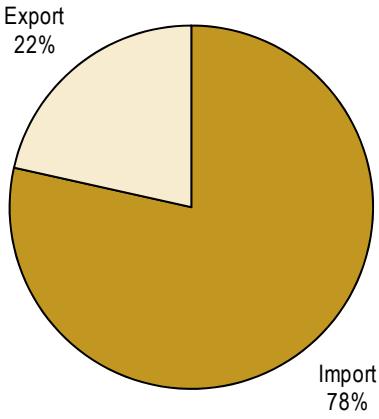
Figure 3.40 highlights the balance of imports (inbound tonnage) to exports (outbound tonnage) and shows that Waller County businesses receive more inbound goods than they ship outbound, thus translating into a freight trade deficit of 56 percent.

Figure 3.39 Direction of Total Freight Flows by Weight – Waller County
2007



Source: IHS Global Insight

Figure 3.40 Imports/Exports – Waller County
2007



Source: IHS Global Insight

Tables 3.16 and 3.17 display Waller County freight flows by mode and direction and Figure 3.41 displays the expected growth by mode between 2007 and 2035.

Table 3.16 Summary of Waller County Freight Flows by Weight

Tons in Thousands

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	934	1,391	49.0%	212	288	35.6%	–	–	–	–	–	–	1,146	1,679	46.5%
From H-GAC	155	231	49.3%	3	5	46.0%	–	–	–	–	–	–	158	236	49.2%
Outbound	308	361	17.4%	6	9	39.4%	–	–	–	–	–	–	314	370	17.8%
To H-GAC	141	113	-20.2%	1	2	51.1%	–	–	–	–	–	–	142	114	-19.6%
Intra-County	2	1	-42.2%	–	–	–	–	–	–	–	–	–	2	1	-42.2%
Through	129,621	247,574	91.0%	–	–	–	–	–	–	–	–	–	129,621	247,574	91.0%
Total	**130,864**	**249,327**	**90.5%**	**219**	**297**	**35.7%**	**–**	**–**	**–**	**–**	**–**	**–**	**131,083**	**249,624**	**90.4%**

Source: IHS Global Insight.

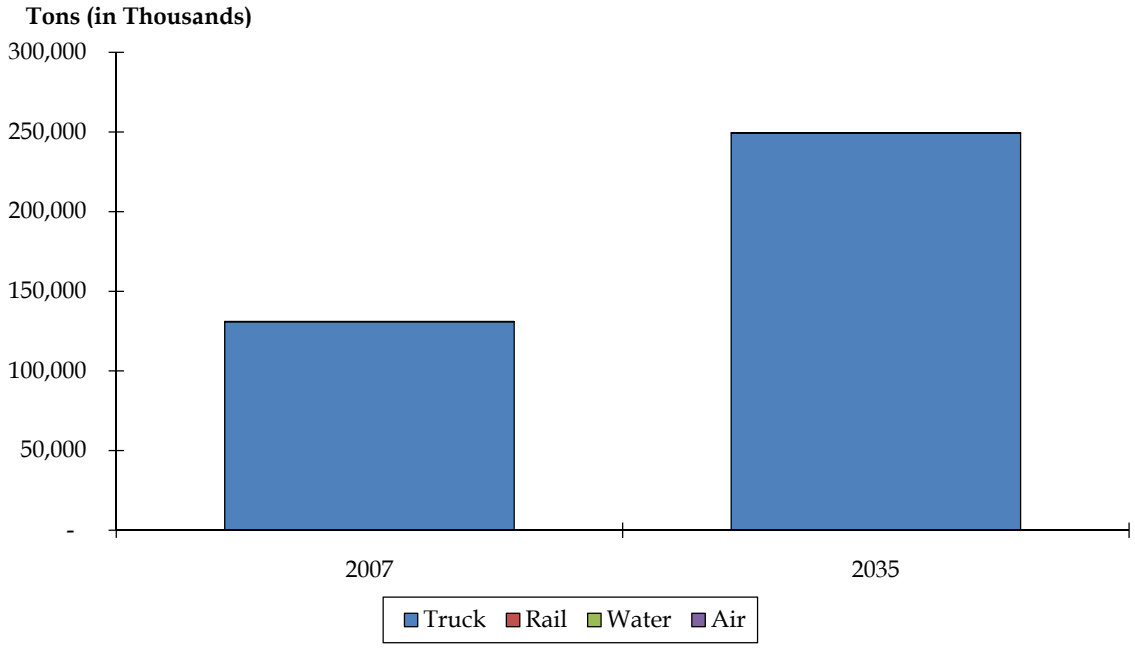
Table 3.17 Summary of Waller County Freight Flows by Value

Dollars in Millions

Direction	Truck 2007	Truck 2035	Percent Change (2007 to 2035)	Rail 2007	Rail 2035	Percent Change (2007 to 2035)	Water 2007	Water 2035	Percent Change (2007 to 2035)	Air 2007	Air 2035	Percent Change (2007 to 2035)	Total 2007	Total 2035	Percent Change (2007 to 2035)
Inbound	$539	$1,307	142.2%	$13	$18	36.3%	–	–	–	–	–	–	$553	$1,325	139.6%
From H-GAC	$127	$317	150.7%	$3	$4	24.0%	–	–	–	–	–	–	$130	$321	147.4%
Outbound	$697	$1,188	70.4%	$17	$23	34.6%	–	–	–	–	–	–	$714	$1,211	69.6%
To H-GAC	$69	$132	90.9%	$4	$5	35.7%	–	–	–	–	–	–	$73	$137	88.0%
Intra-County	$0	$0	12.4%	–	–	–	–	–	–	–	–	–	$0	$0	12.4%
Through	$410,261	$1,115,531	171.9%	–	–	–	–	–	–	–	–	–	$410,261	$1,115,531	171.9%
Total	**$411,497**	**$1,118,025**	**171.7%**	**$31**	**$41**	**35.4%**	**–**	**–**	**–**	**–**	**–**	**–**	**$411,528**	**$1,118,066**	**171.7%**

Source: IHS Global Insight.

Figure 3.41 Growth in Total Weight of Freight Flows by Mode – Waller County

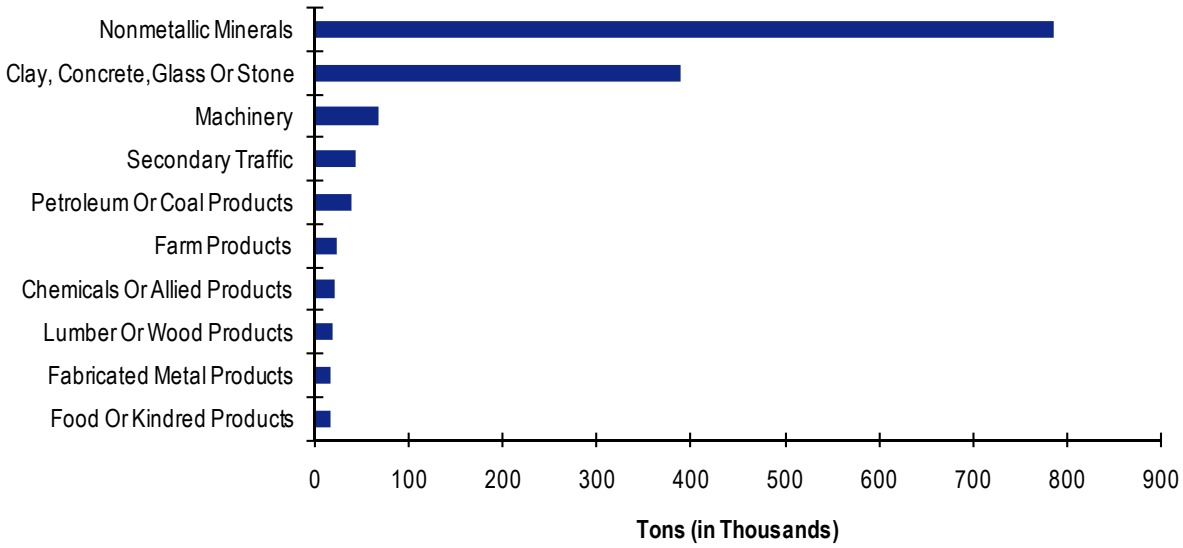


Source: IHS Global Insight

Commodity Analysis – Waller County

In 2007, about 1.5 million tons of freight moved inbound, outbound, and within Waller County. Nonmetallic minerals and clay, concrete, glass, and stone products combined account for 1.2 million tons or 80 percent of total tonnage reflecting the relative strength of the construction industry in the County (see Figure 3.42).

Figure 3.42 Commodities – Waller County
2007



Note: Sum of inbound, outbound, and intra-county freight.
Source: IHS Global Insight

Appendix A

Supplemental Data

A. Supplemental Data

The appendix includes additional detail data on commodity flows in the region. Data on directional flows, modal flows and commodity types are provided in tonnage and values for 2007 and 2035.

A.1 Inbound Data

Table A.1 Terminating Counties for Total Inbound Freight by Weight
2007, Tons in Thousands

Terminating County	Truck	Rail	Water	Air	Total
Harris County	126,405	80,212	71,719	177	278,513
Galveston County	5,880	3,073	20,790	–	29,744
Fort Bend County	15,406	12,764	–	–	28,169
Brazoria County	10,377	3,033	4,219	–	17,629
Montgomery County	2,350	1,051	–	–	3,401
Chambers County	1,171	624	–	–	1,795
Liberty County	956	741	–	–	1,697
Waller County	779	209	–	–	988
Total	**163,325**	**101,707**	**96,728**	**177**	**361,937**

Source: IHS Global Insight.

Table A.2 Terminating Counties for Total Inbound Freight by Weight
2035, Tons in Thousands

Terminating County	Truck	Rail	Water	Air	Total
Harris County	180,583	117,587	106,832	284	405,286
Galveston County	10,171	5,175	34,337	–	49,683
Fort Bend County	23,643	19,058	–	–	42,701
Brazoria County	24,942	5,952	7,831	–	38,726
Montgomery County	4,287	951	–	–	5,238
Liberty County	1,577	879	–	–	2,456
Chambers County	1,634	761	–	–	2,395

Waller County	1,160	283	–	–	1,443
Total	**247,998**	**150,647**	**149,001**	**284**	**547,929**

Source: IHS Global Insight.

Table A.3 Terminating Counties for Total Inbound Freight by Value
2007, Dollars in Millions

Terminating County	Truck	Rail	Water	Air	Total
Harris County	394,390	33,827	33,038	1,976	463,231
Brazoria County	58,970	2,020	2,154	–	63,145
Galveston County	20,846	2,155	8,571	–	31,572
Fort Bend County	12,914	2,714	–	–	15,628
Chambers County	7,754	541	–	–	8,295
Montgomery County	4,287	421	–	–	4,708
Liberty County	3,133	518	–	–	3,651
Waller County	413	10	–	–	423
Total	**502,707**	**42,205**	**43,764**	**1,976**	**590,653**

Source: IHS Global Insight.

Table A.4 Terminating Counties for Total Inbound Freight by Value
2035, Dollars in Millions

Terminating County	Truck	Rail	Water	Air	Total
Harris County	912,827	52,099	45,424	5,130	1,015,480
Brazoria County	156,930	3,327	3,742	–	163,999
Galveston County	46,875	3,348	15,454	–	65,677
Fort Bend County	27,997	4,857	–	–	32,854
Montgomery County	13,297	673	–	–	13,970
Chambers County	11,336	650	–	–	11,987
Liberty County	8,680	625	–	–	9,305
Waller County	989	14	–	–	1,004
Total	**1,178,932**	**65,592**	**64,620**	**5,130**	**1,314,274**

Source: IHS Global Insight.

A.2 Outbound Data

Table A.5 Originating Counties for Total Outbound Freight by Weight
2007, Tons in Thousands

Originating County	Truck	Rail	Water	Air	Total
Harris County	117,987	30,992	22,105	289	171,373
Galveston County	14,045	4,138	12,398	–	30,581
Brazoria County	12,335	5,398	3,014	–	20,746
Liberty County	1,574	1,371	–	–	2,945
Fort Bend County	2,276	128	–	–	2,404
Montgomery County	2,184	162	–	–	2,346
Chambers County	376	239	9	–	624
Waller County	166	5	–	–	172
Total	**150,944**	**42,432**	**37,525**	**289**	**231,190**

Source: IHS Global Insight.

Table A.6 Originating Counties for Total Outbound Freight by Weight,
2035, Tons in Thousands

Originating County	Truck	Rail	Water	Air	Total
Harris County	211,731	41,839	27,782	932	282,283
Galveston County	25,179	5,170	16,691	–	47,040
Brazoria County	24,289	5,092	4,638	–	34,019
Montgomery County	6,808	294	–	–	7,103
Liberty County	2,340	3,011	–	–	5,351
Fort Bend County	4,048	181	–	–	4,229
Chambers County	1,407	139	49	–	1,595
Waller County	248	7	–	–	256
Total	**276,051**	**55,734**	**49,159**	**932**	**381,876**

Source: IHS Global Insight.

Table A.7 Originating Counties for Total Outbound Freight by Value
2007, Dollars in Millions

Originating County	Truck	Rail	Water	Air	Total
Harris	320,564	36,130	16,484	1,347	374,525
Galveston	24,086	5,225	7,423	–	36,733
Brazoria	14,506	6,700	2,207	–	23,413
Fort Bend	4,153	208	–	–	4,360
Montgomery	2,864	203	–	–	3,067
Liberty	816	1,999	–	–	2,815
Chambers	781	340	10	–	1,131
Waller	628	13	–	–	641
Total	**368,397**	**50,818**	**26,125**	**1,347**	**446,687**

Source: IHS Global Insight.

Table A.8 Originating Counties for Total Outbound Freight by Value
2035, Dollars in Millions

Originating County	Truck	Rail	Water	Air	Total
Harris	726,555	43,088	25,976	3,891	799,510
Galveston	43,098	6,448	9,757	–	59,302
Brazoria	25,556	6,061	2,942	–	34,559
Fort Bend	10,005	331	–	–	10,337
Montgomery	8,732	344	–	–	9,076
Chambers	6,579	169	74	–	6,822
Liberty	1,928	4,578	–	–	6,506
Waller	1,056	18	–	–	1,074
Total	**823,509**	**61,036**	**38,749**	**3,891**	**927,186**

Source: IHS Global Insight.

A.3 Intraregional Data

Table A.9 Top 10 Origin-Destination Pairs for Total Intraregional Traffic by Value

2007, Dollars in Millions

Originating County	Terminating County	Truck	Rail	Water	Air	Total
Harris County	Harris County	127,346	6,264	4,625	–	138,236
Harris County	Brazoria County	30,268	479	223	–	30,970
Harris County	Galveston County	11,970	523	142	–	12,636
Galveston County	Harris County	6,545	1,030	1,360	–	8,935
Brazoria County	Harris County	2,867	1,123	166	–	4,156
Harris County	Chambers County	3,998	7	–	–	4,006
Harris County	Liberty County	396	2,727	–	–	3,123
Galveston County	Galveston County	2,428	110	449	–	2,987
Harris County	Fort Bend County	1,315	387	–	–	1,701
Galveston County	Brazoria County	1,321	101	89	–	1,510
All Others		4,361	1,058	74	–	5,493
Total		**192,817**	**13,808**	**7,129**	**–**	**213,754**

Source: IHS Global Insight.

Table A.10 Top 10 Origin-Destination Pairs for Total Intraregional Traffic by Value

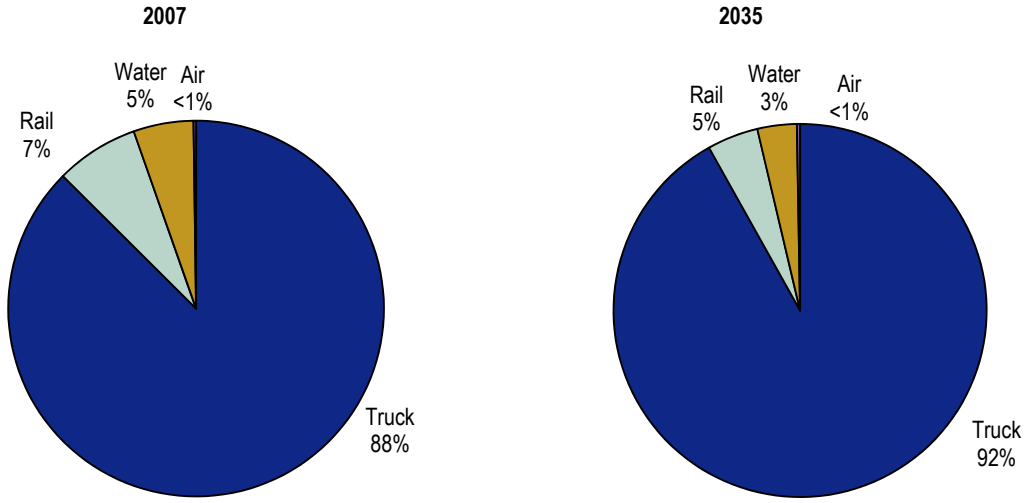
2035, Dollars in Millions

Originating County	Terminating County	Truck	Rail	Water	Air	Total
Harris County	Harris County	270,043	7,281	5,845	–	283,170
Harris County	Brazoria County	100,150	600	406	–	101,156
Harris County	Galveston County	28,835	658	158	–	29,651
Galveston County	Harris County	9,196	1,397	1,429	–	12,022
Harris County	Chambers County	7,268	5	–	–	7,273
Harris County	Liberty County	1,001	5,880	–	–	6,881
Brazoria County	Harris County	4,611	1,103	518	–	6,231
Galveston County	Galveston County	5,055	159	657	–	5,871
Harris County	Fort Bend County	3,070	585	–	–	3,656
Galveston County	Brazoria County	2,793	173	242	–	3,208
All Others		9,199	1,946	88	–	11,233
Total		**441,220**	**19,788**	**9,342**	**–**	**470,350**

Source: IHS Global Insight.

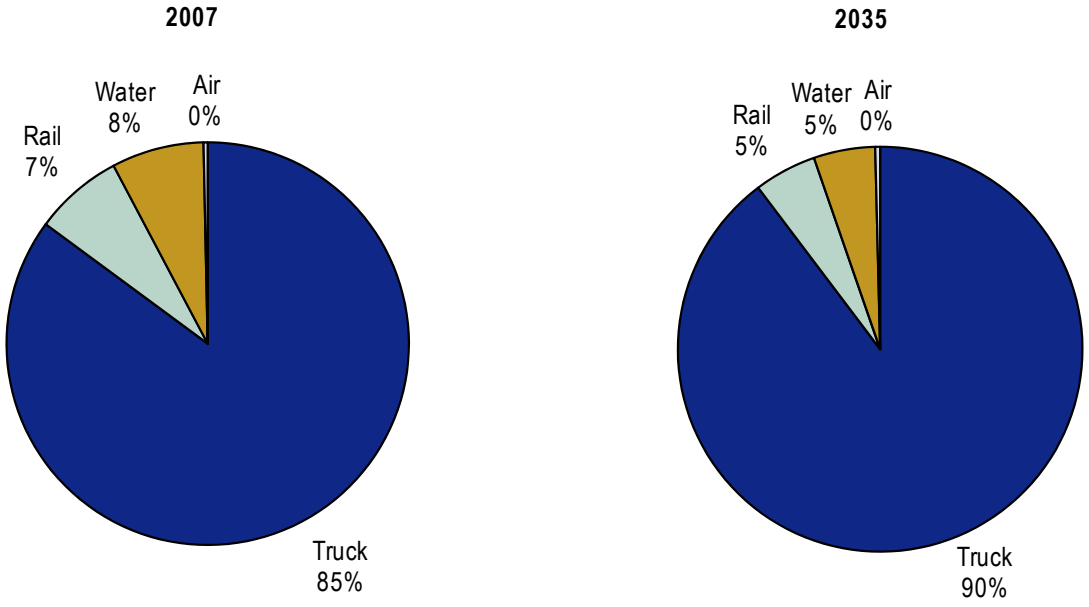
A.4 Mode Share Data

Figure A.1 Mode Share by Value – All Directions
2007 and 2035



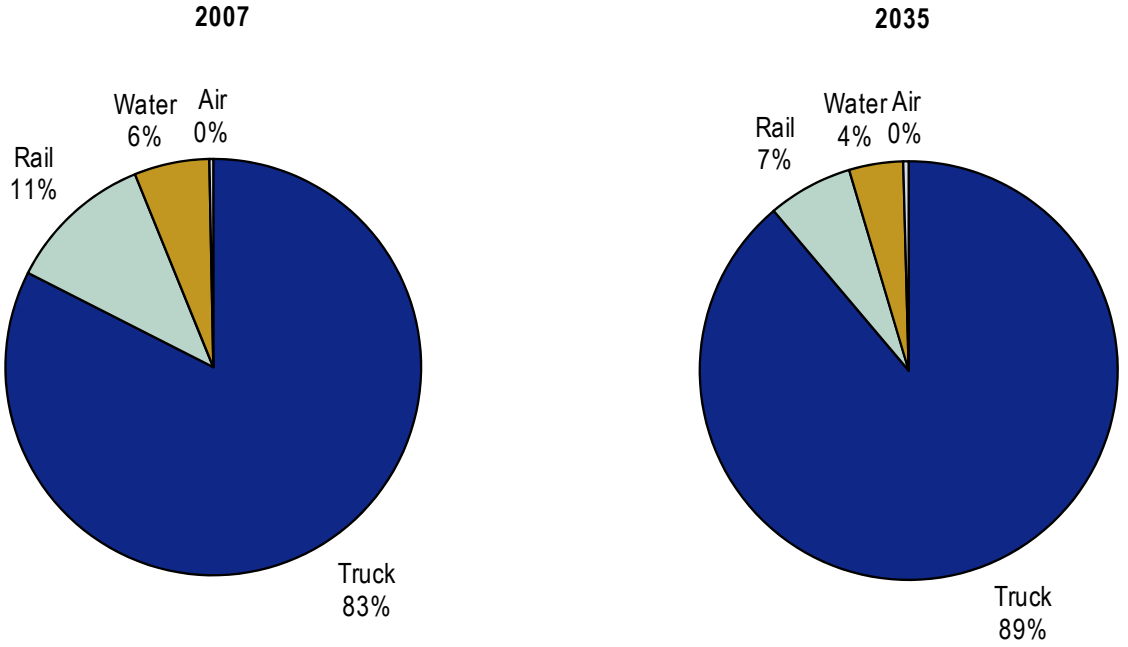
Source: IHS Global Insight

Figure A.2 Mode Share by Value – Inbound
2007 and 2035



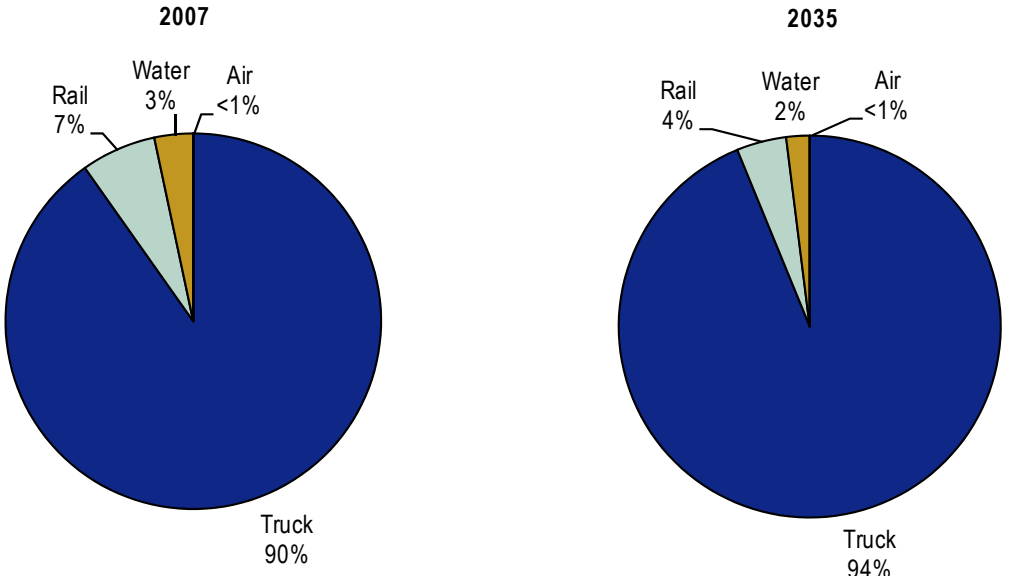
Source: IHS Global Insight

Figure A.3 Mode Share by Value – Outbound
2007 and 2035



Source: IHS Global Insight

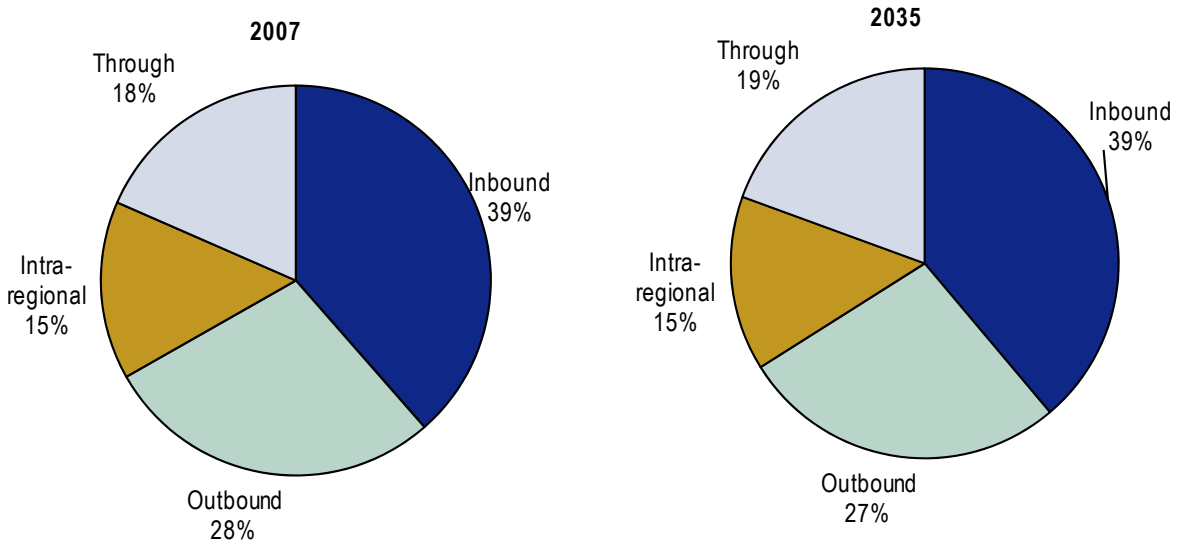
Figure A.4 Mode Share by Value – Intraregional
2007 and 2035



Source: IHS Global Insight

A.5 Truck Data

Figure A.5 Direction of Truck Freight Flows by Value
2007 and 2035

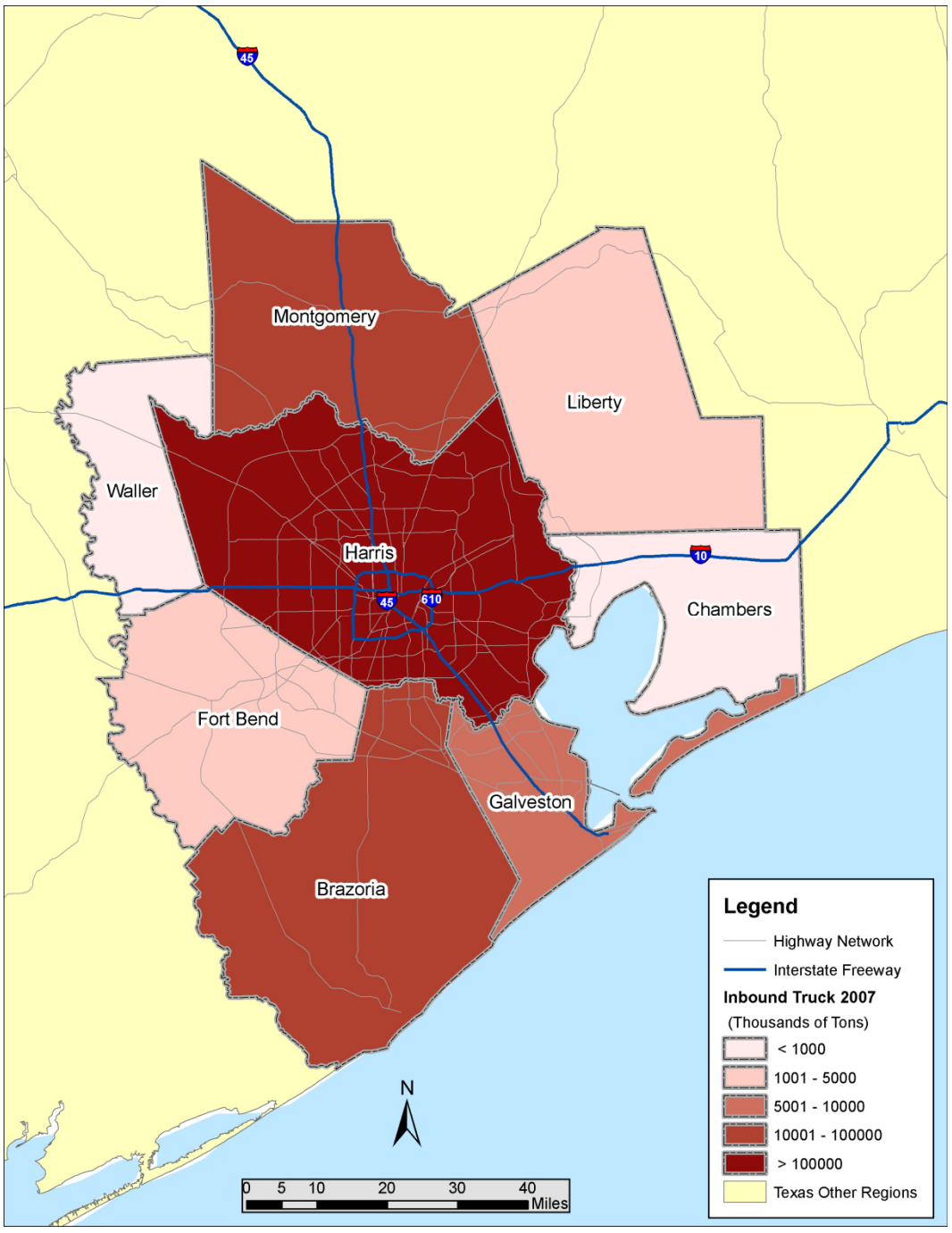


Source: IHS Global Insight

Terminating Counties for Inbound Truck Freight

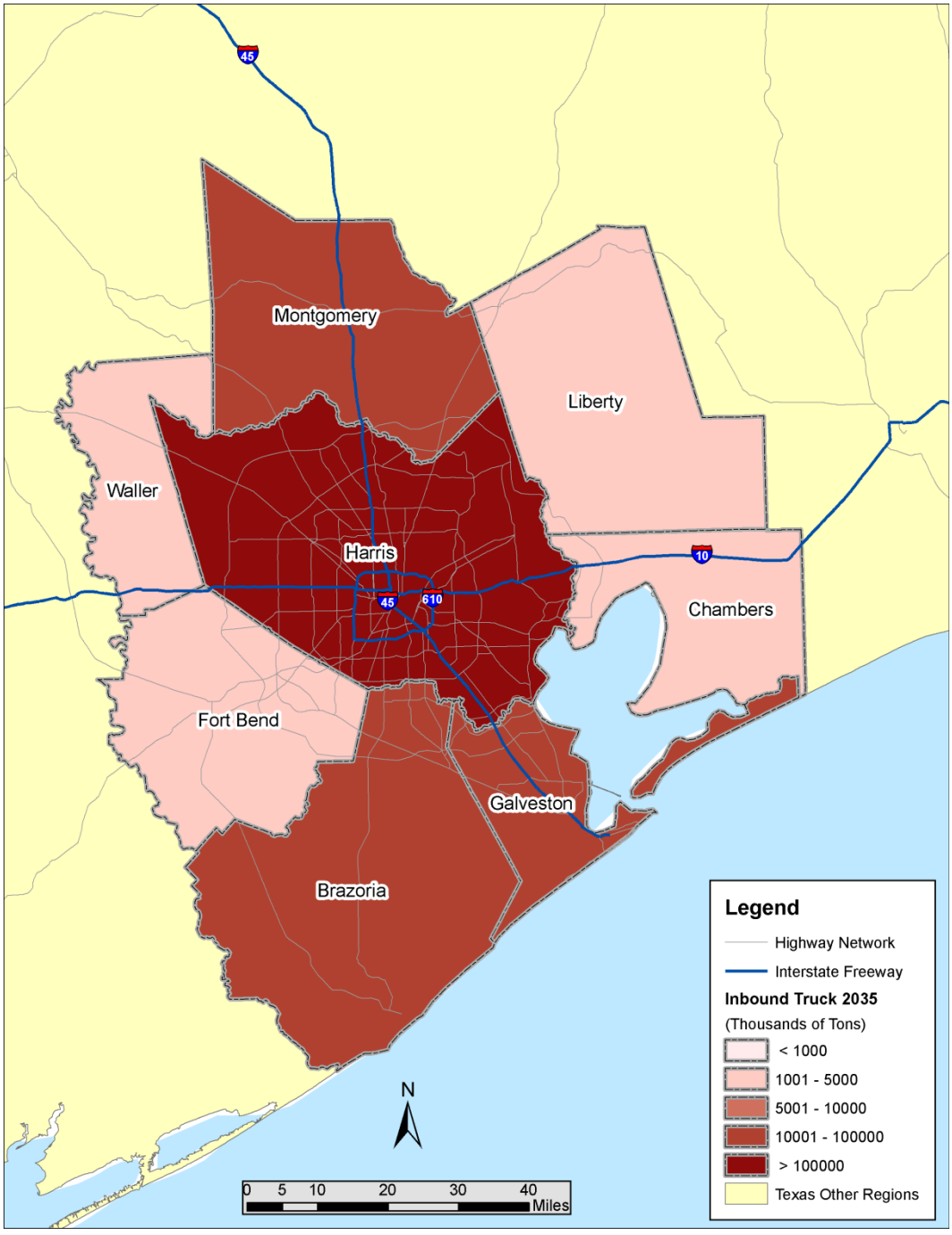
Harris County receives the largest amount of truck freight by far in terms of both tonnage and value. In 2007, 77 percent of the region's total truck tonnage and 78 percent of its total truck value terminated in Harris County. Fort Bend, Brazoria, and Galveston counties combined accounted for 19 percent of total inbound truck freight and value in 2007. The remaining counties (Montgomery, Chambers, Liberty, and Waller) received just three percent of total inbound truck tonnage and four percent of inbound truck value in 2007. Graphical representations of this data are provided in Figures A.6 and A.7 and the actual data by county is provided in Tables A.11 and A.12.

Figure A.6 Terminating Counties for Inbound Truck Freight by Weight
2007



Source: IHS Global Insight

Figure A.7 Terminating Counties for Inbound Truck Freight by Weight
2035



Source: IHS Global Insight

Table A.11 Terminating Counties for Inbound Truck Freight by Weight

2007 and 2035, Tons in Thousands

Terminating County	Truck	Rail	Water	Air	Total
Harris County	126,405	80,212	71,719	177	278,513
Galveston County	5,880	3,073	20,790	–	29,744
Fort Bend County	15,406	12,764	–	–	28,169
Brazoria County	10,377	3,033	4,219	–	17,629
Montgomery County	2,350	1,051	–	–	3,401
Chambers County	1,171	624	–	–	1,795
Liberty County	956	741	–	–	1,697
Waller County	779	209	–	–	988
Total	**163,325**	**101,707**	**96,728**	**177**	**361,937**

Source: IHS Global Insight.

Table A.12 Terminating Counties for Inbound Truck Freight by Value

2007 and 2035, Dollars in Millions

Terminating County	2007 Value	2007 Percent of Total	2035 Value	2035 Percent of Total
Harris County	394,390	78%	912,827	77%
Brazoria County	58,970	12%	156,930	13%
Galveston County	20,846	4%	46,875	4%
Fort Bend County	12,914	3%	27,997	2%
Chambers County	7,754	2%	11,336	1%
Montgomery County	4,287	1%	13,297	1%
Liberty County	3,133	1%	8,680	1%
Waller County	413	0%	989	0%
Total	**502,707**	**100%**	**1,178,932**	**100%**

Source: IHS Global Insight.

Originating Counties for Outbound Truck Freight

Figures A.8 and A.9 graphically present, by county, the distribution of total outbound truck tonnage for 2007 and 2035, respectively. Harris County accounts for more than 78 percent of all 2007 outbound tonnage from the region and nearly 77 percent of that in 2035.

Outbound freight by weight and value for both 2007 and 2035 are shown in Tables A.13 and A.14.

Table A.13 Originating Counties for Outbound Truck Freight by Weight

2007 and 2035, Tons in Thousands

Originating County	2007 Tons	2007 Percent of Total	2035 Tons	2035 Percent of Total
Harris County	117,987	78%	211,731	77%
Galveston County	14,045	9%	25,179	9%
Brazoria County	12,335	8%	24,289	9%
Fort Bend County	2,276	2%	4,048	1%
Montgomery County	2,184	1%	6,808	2%
Liberty County	1,574	1%	2,340	1%
Chambers County	376	0%	1,407	1%
Waller County	166	0%	248	0%
Total	**150,944**	**100%**	**276,051**	**100%**

Source: IHS Global Insight.

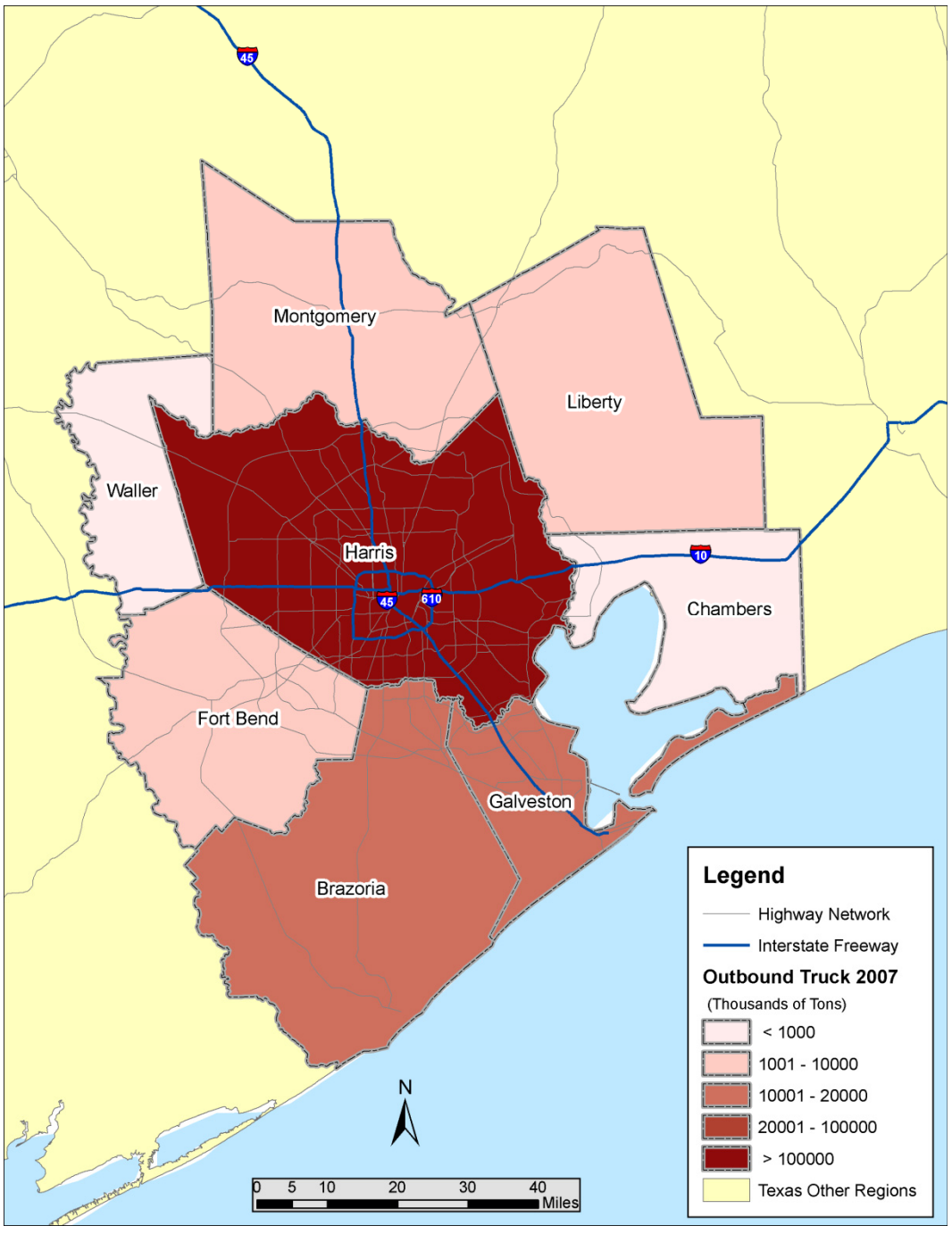
Table A.14 Originating Counties for Outbound Truck Freight by Value

2007 and 2035, Dollars in Millions

Originating County	2007 Value	2007 Percent of Total	2035 Value	2035 Percent of Total
Harris County	$320,564	87%	$726,555	88%
Galveston County	$24,086	7%	$43,098	5%
Brazoria County	$14,506	4%	$25,556	3%
Fort Bend County	$4,153	1%	$10,005	1%
Montgomery County	$2,864	1%	$8,732	1%
Chambers County	$781	0%	$6,579	1%
Liberty County	$816	0%	$1,928	0%
Waller County	$628	0%	$1,056	0%
Total	**368,397**	**100%**	**823,509**	**100%**

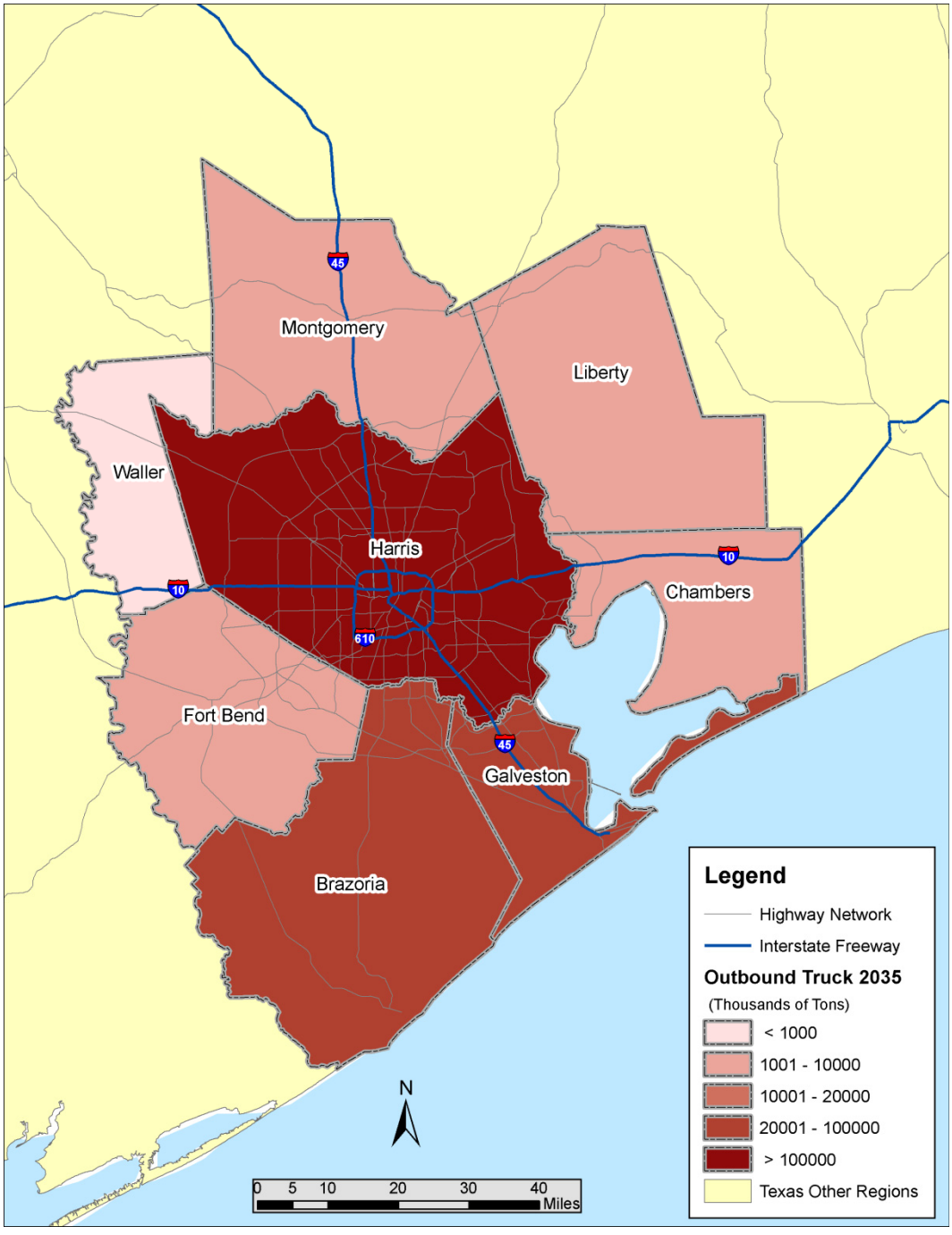
Source: IHS Global Insight.

Figure A.8 Originating Counties for Outbound Truck Freight by Weight
2007



Source: IHS Global Insight

Figure A.9 Originating Counties for Outbound Truck Freight by Weight
2035



Source: IHS Global Insight

Intraregional Origin Destination Pairs – Truck

Intraregional truck traffic is expected to grow from 82.8 million tons in 2007 to 123.6 million tons in 2035, an increase of 49.2 percent. In 2007, the top three origin-destination pairs for intraregional traffic were Harris County to Harris County, Harris Count to Brazoria County, and Harris County to Galveston County. These top origin-destination pairs are projected to remain the same in 2035. Tables A.15 and A.16 show the top ten intraregional origin-destination pairs by weight for truck traffic in 2007 and 2035.

Table A.15 Top 10 Origin-Destination Pairs for Intraregional Truck Traffic by Weight

2007, Tons in Thousands

Originating County	Terminating County	Tons
Harris County	Harris County	46,142
Harris County	Brazoria County	6,615
Harris County	Galveston County	5,193
Galveston County	Harris County	4,512
Brazoria County	Harris County	3,842
Liberty County	Harris County	2,794
Montgomery County	Harris County	1,915
Fort Bend County	Harris County	1,689
Galveston County	Galveston County	1,527
Brazoria County	Brazoria County	1,474
All Others		7,090
Total		**82,794**

Source: IHS Global Insight.

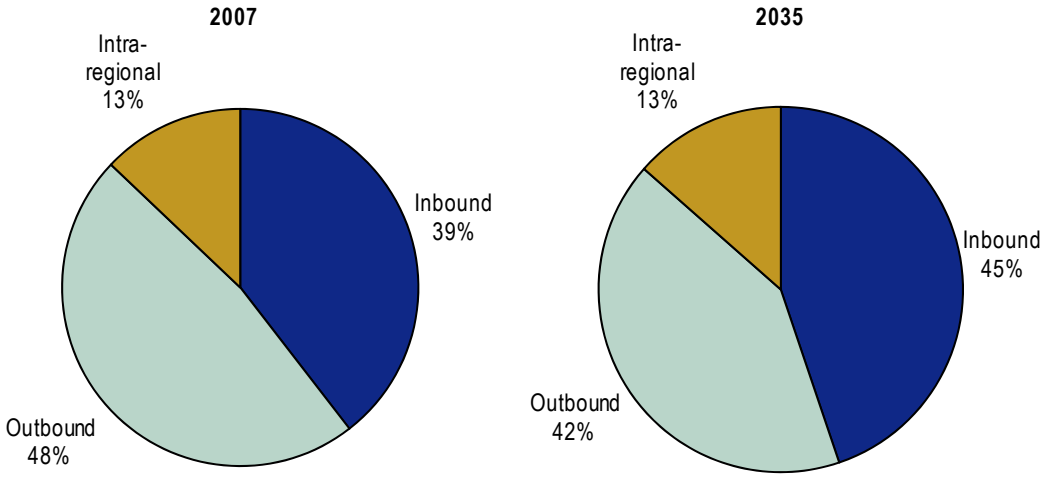
Table A.16 Top 10 Origin-Destination Pairs for Intraregional Truck Traffic by Weight
2035, Tons in Thousands

Originating County	Terminating County	Tons
Harris County	Harris County	63,262
Harris County	Brazoria County	18,086
Harris County	Galveston County	6,988
Brazoria County	Harris County	5,632
Galveston County	Harris County	5,025
Liberty County	Harris County	4,015
Montgomery County	Harris County	2,373
Brazoria County	Brazoria County	2,147
Fort Bend County	Harris County	1,611
Galveston County	Galveston County	1,605
All Others		12,809
Total		**123,554**

Source: IHS Global Insight.

A.6 Rail Data

Figure A.10 Direction of Rail Freight Flows by Value
2007 and 2035



Source: IHS Global Insight

Terminating Counties for Inbound Rail Freight

Figures A.11 and A.12 graphically present, by county, the distribution of inbound rail tonnage for 2007 and 2035, respectively. Harris County accounted for nearly 79 percent of all inbound rail tonnage to the region in 2007 and just over 78 percent in 2035. Inbound rail freight by weight and value for both 2007 and 2035 are shown in Tables A.17 and A.18.

Table A.17 Terminating Counties for Inbound Rail Freight by Weight

2007 and 2035, Tons in Thousands

Terminating County	2007 Tons (in Thousands)	Percentage	2035 Tons (in Thousands)	Percentage
Harris County	80,212	79%	117,587	78%
Fort Bend County	12,764	13%	19,058	13%
Galveston County	3,073	3%	5,175	3%
Brazoria County	3,033	3%	5,952	4%
Montgomery County	1,051	1%	951	1%
Liberty County	741	1%	879	1%
Chambers County	624	1%	761	1%
Waller County	209	0%	283	0%
Total	**101,707**	**100%**	**150,647**	**100%**

Source: IHS Global Insight.

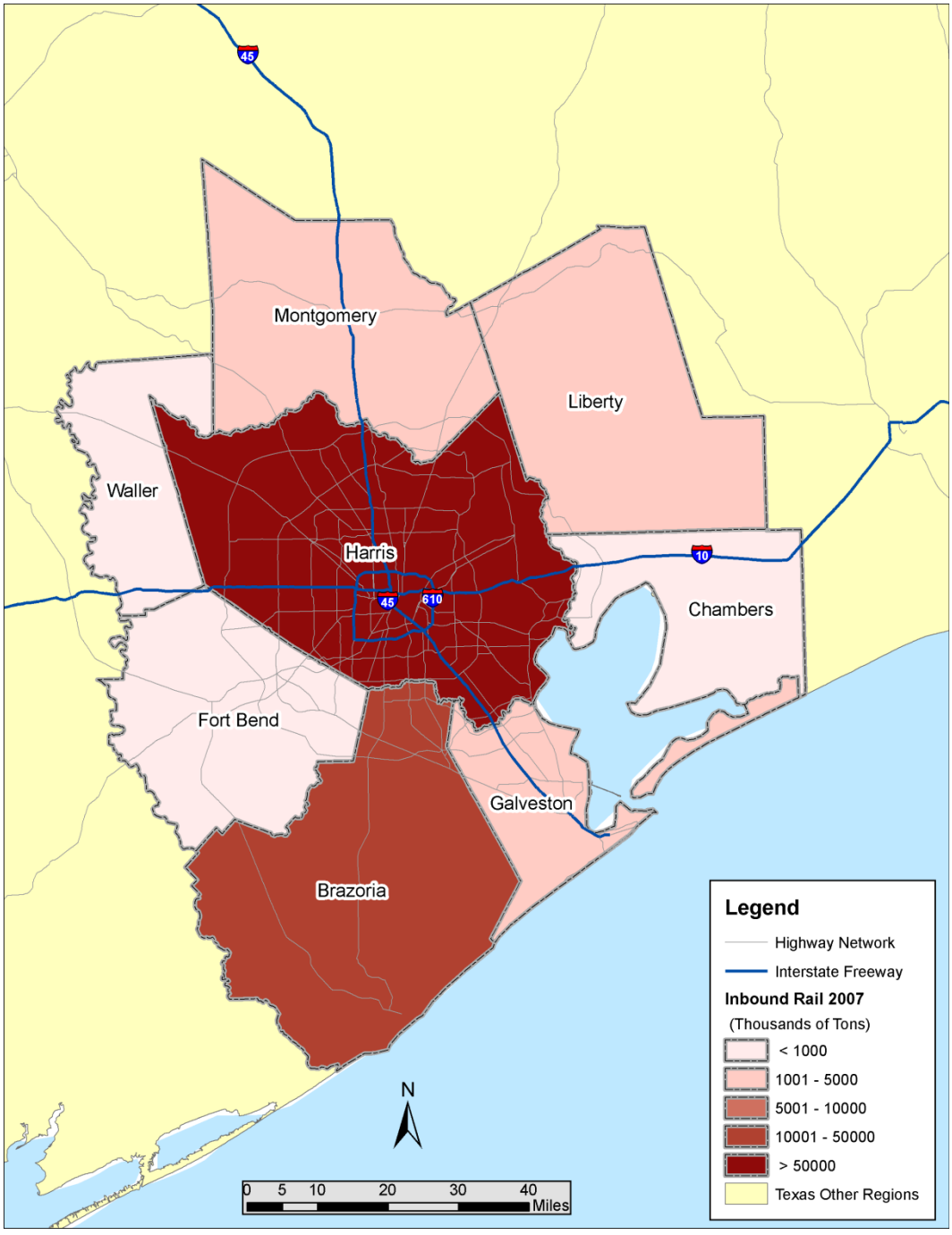
Table A.18 Terminating Counties for Inbound Rail Freight by Value

2007 and 2035, Dollars in Millions

Terminating County	2007 Value	2007 Percentage	2035 Value	2035 Percentage
Harris County	33,827	80%	52,099	79%
Fort Bend County	2,714	6%	4,857	7%
Galveston County	2,155	5%	3,348	5%
Brazoria County	2,020	5%	3,327	5%
Chambers County	541	1%	650	1%
Liberty County	518	1%	625	1%
Montgomery County	421	1%	673	1%
Waller County	10	0%	14	0%
Total	**42,205**	**100%**	**65,592**	**100%**

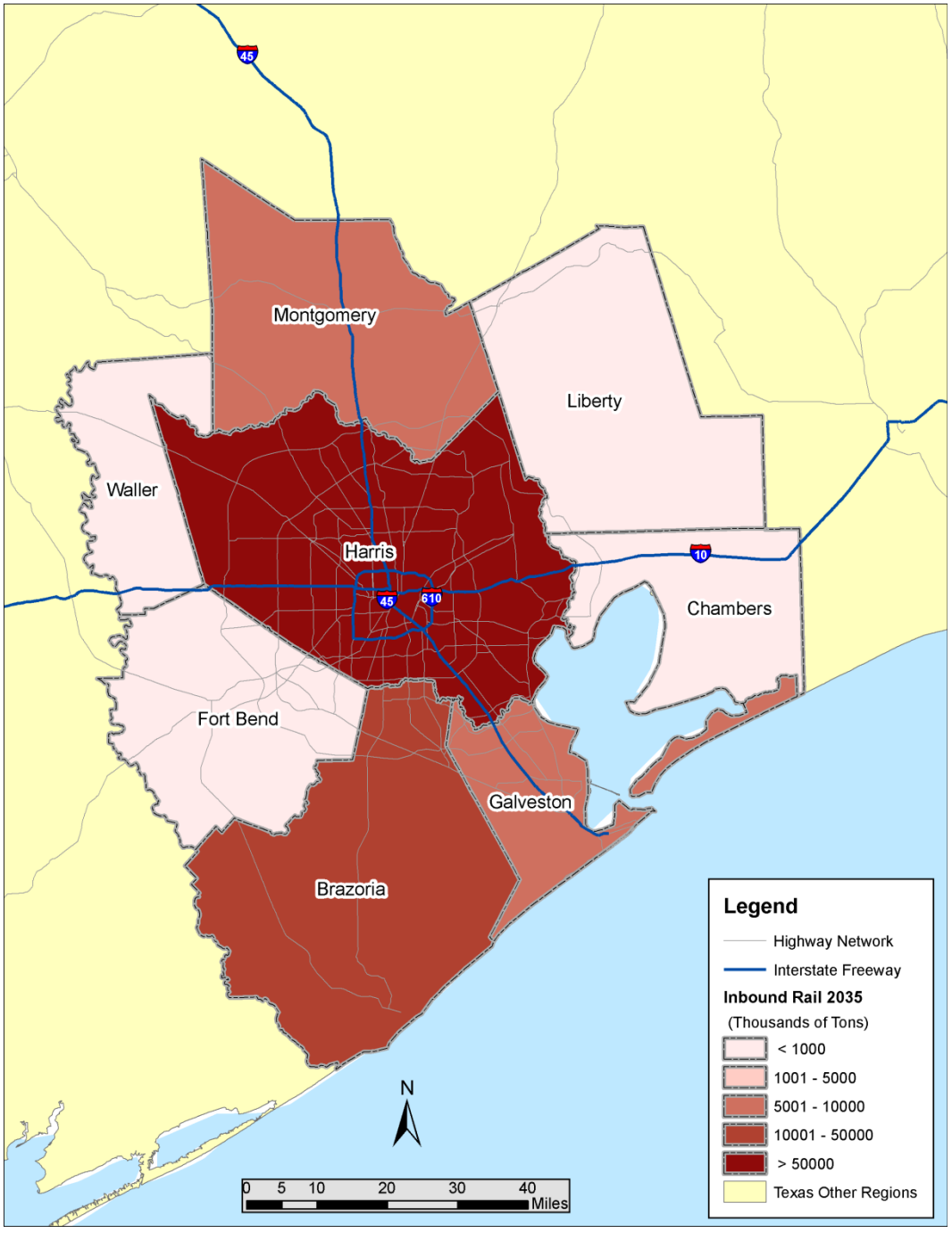
Source: IHS Global Insight.

Figure A.11 Terminating Counties for Inbound Rail Freight by Weight
2007



Source: IHS Global Insight

Figure A.12 Terminating Counties for Inbound Rail Freight by Weight
2035



Source: IHS Global Insight

Originating Counties for Outbound Rail Freight

Harris County accounted for more than 73 percent of outbound rail freight originating from the region in 2007. By 2035, it is projected to account for more than 75 percent of outbound rail freight from the region. Figures A.13 and A.14 graphically present, by county, the distribution of total outbound rail tonnage for 2007 and 2035, respectively. Outbound rail freight by weight and value for both 2007 and 2035 are shown in Tables A.19 and A.20.

Table A.19 Originating Counties for Outbound Rail Freight by Weight

2007 and 2035, Tons in Thousands

Originating County	2007 Tons (in Thousands)	2007 Percent of Total	2035 Tons (in Thousands)	2035 Percent of Total
Harris County	30,992	73%	41,839	75%
Brazoria County	5,398	13%	5,092	9%
Galveston County	4,138	10%	5,170	9%
Liberty County	1,371	3%	3,011	5%
Chambers County	239	1%	139	0%
Montgomery County	162	0%	294	1%
Fort Bend County	128	0%	181	0%
Waller County	5	0%	7	0%
Total	**42,432**	**100%**	**55,734**	**100%**

Source: IHS Global Insight.

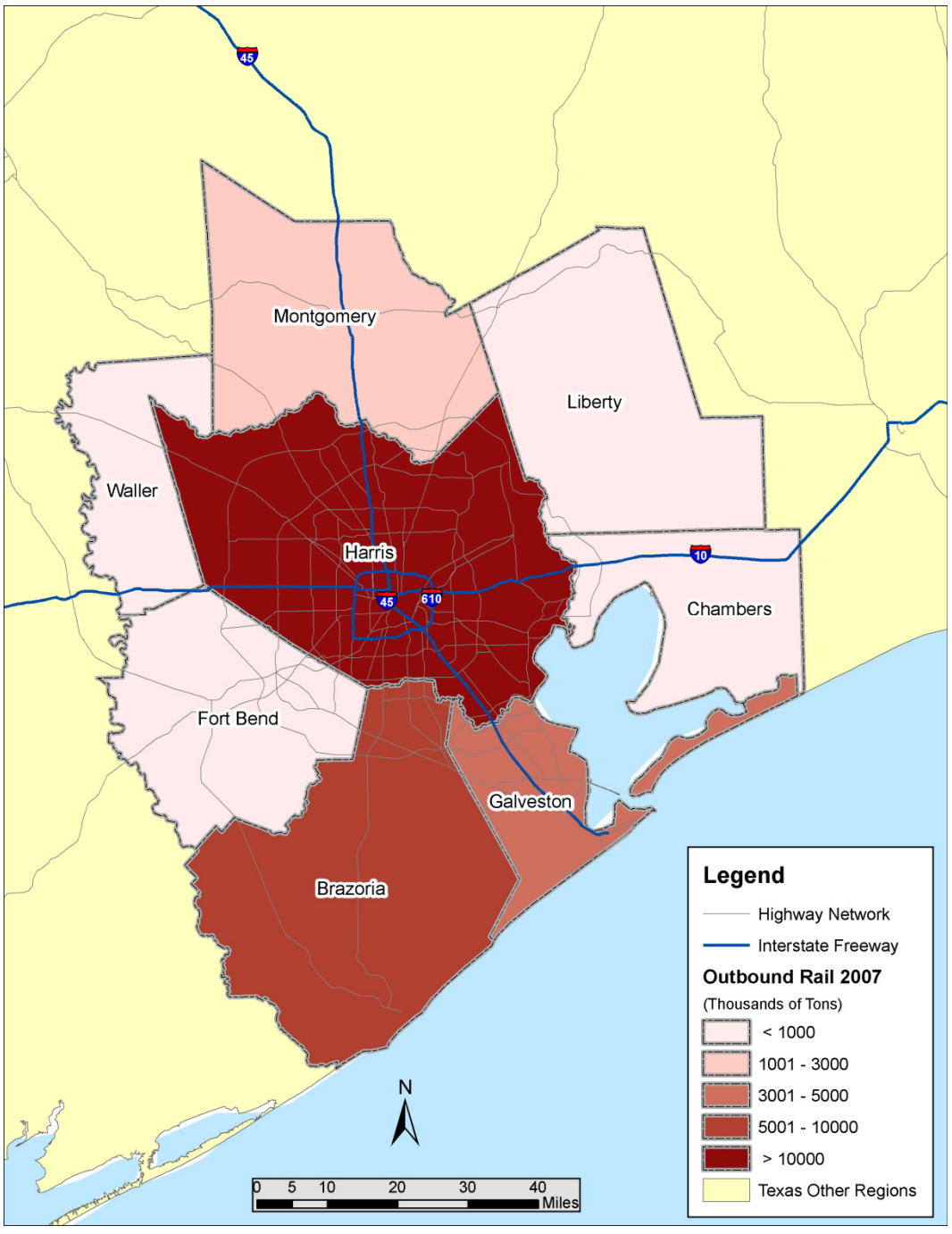
Table A.20 Originating Counties for Outbound Rail Freight by Value

2007 and 2035, Dollars in Millions

Originating County	2007 Value	2007 Percent of Total	2035 Value	20305 Percent of Total
Harris County	$36,130	71%	$43,088	71%
Brazoria County	$6,700	13%	$6,061	10%
Galveston County	$5,225	10%	$6,448	11%
Liberty County	$1,999	4%	$4,578	8%
Chambers County	$340	1%	$169	0%
Fort Bend County	$208	0%	$331	1%
Montgomery County	$203	0%	$344	1%
Waller County	$13	0%	$18	0%
Total	**$50,818**	**100%**	**$61,036**	**100%**

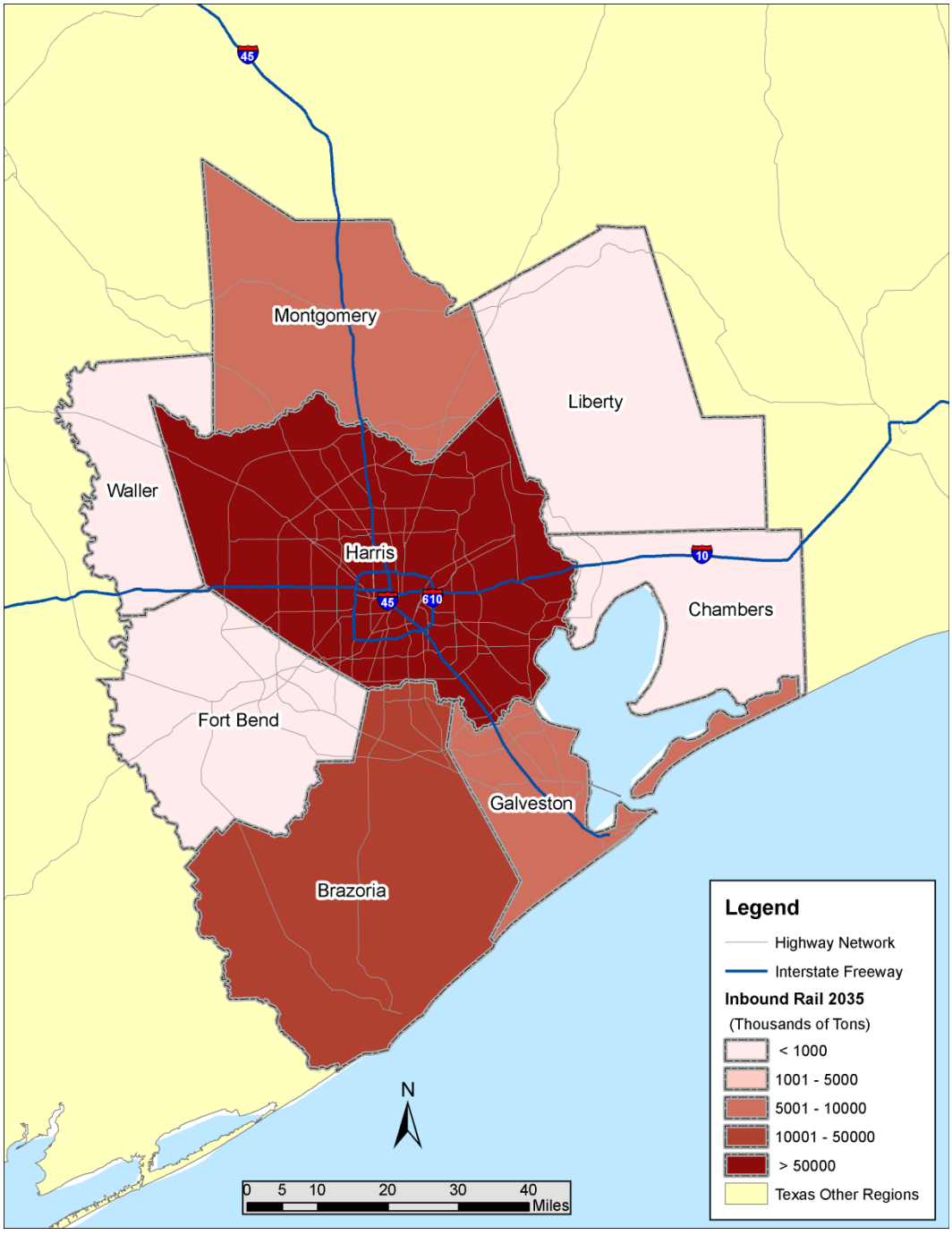
Source: IHS Global Insight.

Figure A.13 Originating Counties for Outbound Rail Freight by Weight
2007



Source: IHS Global Insight

Figure A.14 Originating Counties for Outbound Rail Freight by Weight
2035



Source: IHS Global Insight

Intraregional Origin Destination Pairs – Rail

Intraregional rail traffic is very low-volume compared to inbound and outbound rail traffic. In 2007, the top three origin-destination pairs for intraregional rail traffic were Harris County to Harris County, Harris County to Liberty County, and Brazoria County to Harris County. By 2035, the top three pairs are projected to remain the same.

Table A.21 Top 10 Origin-Destination Pairs for Intraregional Rail Traffic by Weight

2007, Tons in Thousands

Originating County	Terminating County	Tons
Harris County	Harris County	3,572
Harris County	Liberty County	1,567
Brazoria County	Harris County	816
Galveston County	Harris County	619
Harris County	Galveston County	450
Harris County	Brazoria County	383
Liberty County	Harris County	271
Harris County	Fort Bend County	136
Brazoria County	Brazoria County	130
Brazoria County	Galveston County	104
All Others		366
Total		**8,414**

Source: IHS Global Insight.

Table A.22 Top 10 Origin-Destination Pairs for Intraregional Rail Traffic by Weight
2035, Tons in Thousands

Originating County	Terminating County	Thousands
Harris County	Harris County	3,881
Harris County	Liberty County	3,379
Brazoria County	Harris County	810
Galveston County	Harris County	776
Liberty County	Harris County	658
Harris County	Galveston County	555
Harris County	Brazoria County	487
Harris County	Fort Bend County	200
Galveston County	Galveston County	147
Galveston County	Brazoria County	137
All Others		539
Total		**11,572**

Source: IHS Global Insight.

A.7 Commodity Data

Truck Commodities

This section exhibits the region's top truck commodities (for inbound, outbound, and intrastate moves) in 2007 and 2035 by weight. Tables A.23 and A.24 consider the top commodities with respect to total truck tonnage, while Tables A.25 and A.26 consider the top commodities with respect to total truck value.

All Distances; All Directions

In 2007, the top truck commodity is petroleum and coal products, which accounts for 21 percent of total truck tonnage. Second is secondary traffic (19 percent of total truck tonnage), and third is chemical products (12 percent of total truck tonnage). (See Tables A.23 and A.24 and Figure A.15.)

Table A.23 Top 10 Truck Commodities by Weight – Inbound, Outbound, and Intraregional

2007, Tons in Thousands

Commodity	STCC2	Truck Tons	Percent of Total
Petroleum and Coal Products	29	83,883	21%
Secondary Traffic	50	74,499	19%
Chemical Products	28	48,054	12%
Nonmetallic Minerals	14	47,760	12%
Clay, Concrete, Glass, and Stone	32	32,368	8%
Food Products	20	18,272	5%
Lumber and Wood Products	24	16,090	4%
Farm Products	01	14,291	4%
Primary Metal Products	33	12,676	3%
Fabricated Metal Products	34	9,783	2%
All Others		39,388	10%
Total		**397,062**	**100%**

Source: IHS Global Insight.

Table A.24 Top 10 Truck Commodities by Weight – Inbound, Outbound, and Intraregional

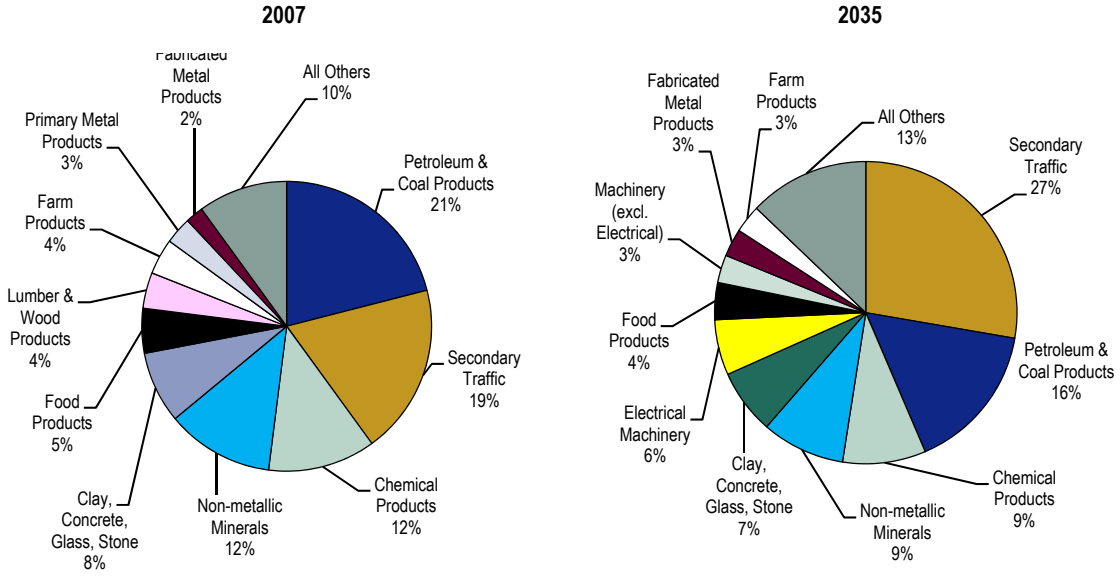
2035, Tons in Thousands

Commodity	STCC2	Truck Tons	Percent of Total
Secondary Traffic	50	178,970	28%
Petroleum and Coal Products	29	102,654	16%
Chemical Products	28	60,214	9%
Nonmetallic Minerals	14	57,696	9%
Clay, Concrete, Glass, and Stone	32	43,073	7%
Electrical Machinery	36	41,742	6%
Food Products	20	25,851	4%
Machinery (Excluding Electrical)	35	18,823	3%
Fabricated Metal Products	34	18,694	3%
Farm Products	01	18,125	3%
All Others		81,758	13%
Total		**647,602**	**100%**

Source: IHS Global Insight.

Figure A.15 Top 10 Truck Commodities by Weight – Inbound, Outbound, and Intraregional

2007 and 2035



Source: IHS Global Insight

Table A.25 Top 10 Truck Commodities by Value – Inbound, Outbound, and Intraregional

2007, Dollars in Millions

Commodity	STCC2	Value	Percent of Total
Secondary Traffic	50	$566,957	53%
Chemical Products	28	$96,854	9%
Machinery (Excluding Electrical)	35	$65,892	6%
Electrical Machinery	36	$63,027	6%
Petroleum and Coal Products	29	$47,079	4%
Fabricated Metal Products	34	$38,434	4%
Primary Metal Products	33	$25,597	2%
Rubber and Miscellaneous Plastics	30	$24,48	2%
Food Products	20	$21,922	2%
Miscellaneous Manufactured Products	39	$20,704	2%
All Others		$92,971	9%
Total		**$1,063,921**	**100%**

Source: IHS Global Insight.

Table A.26 Top 10 Truck Commodities by Value – Inbound, Outbound, and Intraregional

2035, Dollars in Millions

Commodity	STCC2	Value	Percent of Total
Secondary Traffic	50	$1,363,526	56%
Electrical Machinery	36	$306,032	13%
Machinery (Excluding Electrical)	35	$207,138	8%
Chemical Products	28	$123,146	5%
Fabricated Metal Products	34	$70,873	3%
Petroleum and Coal Products	29	$58,435	2%
Precision Instruments	38	$56,590	2%
Miscellaneous Manufactured Products	39	$47,253	2%
Rubber and Miscellaneous Plastics	30	$45,134	2%
Primary Metal Products	33	$33,937	1%
All Others		$131,598	5%
Total		**$2,443,661**	**100%**

Source: IHS Global Insight.

Rail Commodities

This section exhibits the region's top rail commodities (for inbound, outbound, and intrastate moves) in 2007 and 2035 by weight. Tables A.27 and A.28 consider the top commodities with respect to total rail tonnage, while Tables A.29 and A.30 consider the top commodities with respect to total rail value.

All Distances; All Directions

In 2007, the top rail commodity is coal, which accounts for 27 percent of total rail tonnage. Second is chemical products (27 percent of total rail tonnage), and third is nonmetallic minerals (11 percent of total). (See Tables A.27 and A.28 and Figure A.16.)

Table A.27 Top 10 Rail Commodities by Weight – Inbound, Outbound, and Intraregional

2007, Tons in Thousands

Commodity	STCC2	Rail Tons	Percent of Total
Coal	11	41,401	27%
Chemical Products	28	40,545	27%
Nonmetallic Minerals	14	17,475	11%
Farm Products	01	14,707	10%
Petroleum and Coal Products	29	10,949	7%
Miscellaneous Mixed Shipments	46	7,836	5%
Primary Metal Products	33	4,784	3%
Transportation Equipment	37	3,862	3%
Food Products	20	3,205	2%
Clay, Concrete, Glass, and Stone	32	2,567	2%
All Other Commodities		5,221	3%
Total		**152,553**	**100%**

Source: IHS Global Insight.

Table A.28 Top 10 Rail Commodities by Weight – Inbound, Outbound, and Intraregional

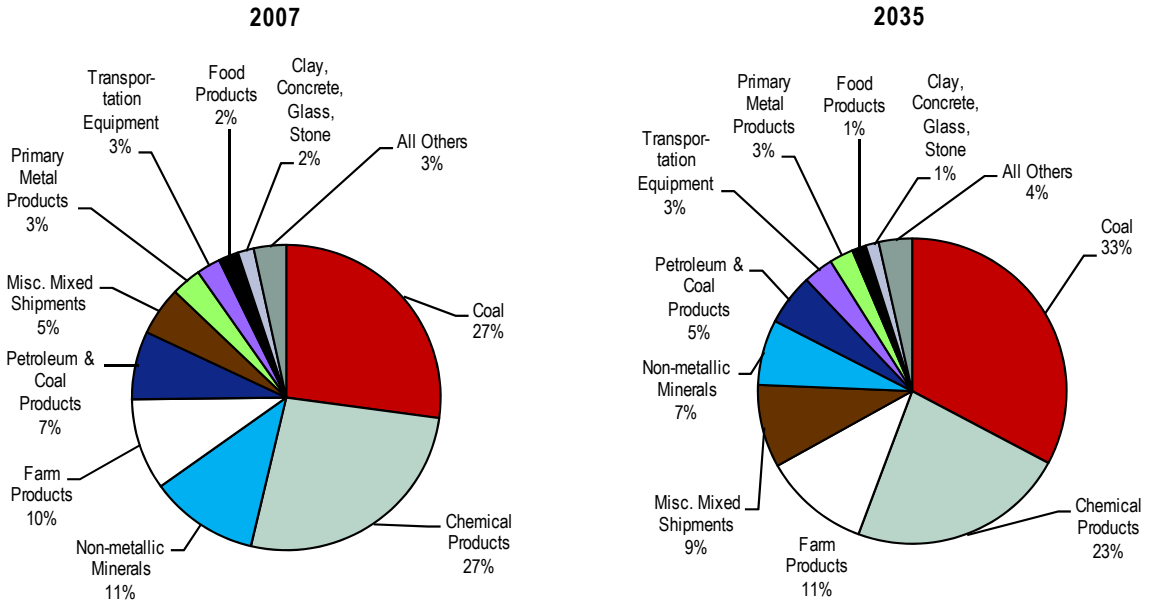
2035, Tons in Thousands

Commodity	STCC2	Rail Tons	Percent of Total
Coal	11	71,391.12	33%
Chemical Products	28	50,012.11	23%
Farm Products	01	24,449.59	11%
Miscellaneous Mixed Shipments	46	19,023.28	9%
Nonmetallic Minerals	14	14,998.55	7%
Petroleum and Coal Products	29	11,770.72	5%
Transportation Equipment	37	6,880.38	3%
Primary Metal Products	33	5,504.62	3%
Food Products	20	3,206.70	1%
Clay, Concrete, Glass, and Stone	32	3,031.72	1%
All Other Commodities		7,683.48	4%
Total		**217,952.28**	**100%**

Source: IHS Global Insight.

Figure A.16 Top 10 Rail Commodities by Weight – Inbound, Outbound, and Intraregional

2007 and 2035



Source: IHS Global Insight

Table A.29 Top 10 Rail Commodities by Value – Inbound, Outbound, and Intraregional

2007, Dollars in Millions

Commodity	STCC2	Rail Value	Percent of Total
Chemical Products	28	$23,419	42%
Transportation Equipment	37	$15,631	28%
Primary Metal Products	33	$5,676	10%
Petroleum and Coal Products	29	$3,040	5%
Farm Products	1	$2,620	5%
Food Products	20	$2,284	4%
Coal	11	$551	1%
Clay, Concrete, Glass, and Stone	32	$436	1%
Waste and Scrap	40	$432	1%
Ordinance and Accessories	19	$409	1%
All Others		$1,517	3%
Total		**$56,014**	**100%**

Source: IHS Global Insight.

Table A.30 Top 10 Rail Commodities by Value – Inbound, Outbound, and Intraregional

2035, Dollars in Millions

Commodity	STCC2	Rail Value	Percent of Total
Chemical Products	28	$77,672	53%
Transportation Equipment	37	$34,981	24%
Primary Metal Products	33	$8,941	6%
Petroleum and Coal Products	29	$7,430	5%
Farm Products	1	$4,844	3%
Food Products	20	$2,704	2%
Metallic Ores	10	$1,669	1%
Machinery (Excluding Electrical)	35	$1,260	1%
Waste and Scrap	40	$1,214	1%
Coal	11	$931	1%
All Others		$4,770	3%
Total		**$146,415**	**100%**

Source: IHS Global Insight.

Table A.31 Texas Regions by County

Abilene Region		
Callahan	King	Scurry
Fisher	Knox	Shackelford
Haskell	Mitchell	Stonewall
Jones	Nolan	Taylor
Amarillo Region		
Armstrong	Donley	Ochiltree
Bailey	Gray	Oldham
Carson	Hall	Parmer
Castro	Hansford	Potter
Childress	Hartley	Randall
Collingsworth	Hemphill	Roberts
Cottle	Hutchinson	Sherman
Dallam	Lipscomb	Wheeler
Deaf Smith	Moore	
Austin Region		
Bastrop	Hays	Travis
Blanco	Lee	Williamson
Burnet	Llano	
Caldwell	Milam	
Beaumont Region		
Hardin	Jefferson	Orange
Jasper	Newton	Tyler
Corpus Christi Region		
Aransas	Jim Wells	Martin
Bee	Kennedy	Nueces
Brooks	Kleberg	Refugio
Duval	Live Oak	San Patricio
Dallas Region		
Anderson	Fannin	Navarro
Archer	Foard	Palo Pinto
Baylor	Franklin	Panola
Bell	Grayson	Parker
Bosque	Gregg	Rains
Bowie	Hamilton	Red River

Table A.31 Texas Regions by County (continued)

Dallas Region (continued)		
Brown	Hardeman	Rockwall
Camp	Harrison	Rusk
Cass	Henderson	San Saba
Cherokee	Hill	Smith
Clay	Hood	Somervell
Coleman	Hopkins	Stephens
Collin	Hunt	Tarrant
Comanche	Jack	Throckmorton
Cooke	Johnson	Titus
Coryell	Kaufman	Upshur
Dallas	La Salle	Van Zandt
Delta	Lamb	Wichita
Denton	Marion	Wilbarger
Eastland	Matagorda	Wise
El Paso	Mills	Wood
Erath	Montague	Young
Falls	Morris	
El Paso Region		
Culberson	Ellis	Hudspeth
Hobbs Region		
Gaines	Yoakum	
Houston Region (Excluding the Study Area)		
Angelina	Grimes	Robertson
Austin	Houston	Sabine
Brazos	Jackson	San Augustine
Burleson	Levaca	San Jacinto
Calhoun	Leon	Shelby
Colorado	Limestone	Trinity
Dewitt	Mason	Victoria
Fayette	McLennan	Walker
Freestone	Nacogdoches	Washington
Goliad	Polk	Wharton

Table A.31 Texas Regions by County (continued)

Lubbock Region		
Briscoe	Garza	Lubbock
Cochran	Hale	Lynn
Crosby	Hockley	Motley
Dickens	Kent	Swisher
Floyd	Lamar	Terry
McAllen Region		
Cameron	Starr	Willacy
Hidalgo		
Odessa Region		
Andrews	Glasscock	Presidio
Borden	Howard	Reagan
Brewster	Jeff Davis	Reeves
Crane	Loving	Terrell
Crockett	Maverick	Upton
Dawson	Midland	Ward
Ector	Pecos	Winkler
San Angelo Region		
Coke	Kinney	Schleicher
Concho	Madison	Sterling
Edwards	McCulloch	Sutton
Irion	Menard	Tom Green
Kimble	Runnels	Val Verde
San Antonio Region		
Atascosa	Guadalupe	Real
Bandera	Jim Hogg	Uvalde
Bexar	Karnes	Webb
Comal	Kendall	Wilson
Dimmit	Kerr	Zapata
Frio	Lampasas	Zavala
Gillespie	McMullen	
Gonzales	Medina	

Source: IHS Global Insight