

APPENDIX B

Freight and Goods Movement

HIGHLIGHTS

In 1998, the region's airports, seaports, roadways and railways moved 81 billion tons of freight to, from and within the Houston-Galveston area. The prospects for attracting more freight activity to the Houston-Galveston area are strong.

- IAH ranks fourth nationally in terms of passenger volume and is the 12th largest international cargo gateway in the United States. Growth forecasts for IAH indicate a 6 percent annual growth rate.
- The ports of Houston, Freeport, Galveston and Texas City handled 286 million tons of cargo in 2001, which is more than any other single port in the nation.
- According to the statewide transportation plan, the percentage of trucks on major roadways in and around Houston in 2000 was 11.3 percent of total traffic, on average. By 2025, the percentage of trucks on major roadways in and around Houston will increase to 13.6 percent, on average, with some roads carrying as many as 36 percent trucks.
- Inbound and outbound rail freight handled by Texas Gulf Coast Ports is forecasted to increase from 106 million tons in 1998 to more than 144 million tons by 2025. Houston is expected to continue to account for the largest volume of rail freight tonnage in Texas, forecast to increase by almost 49 percent from 70 million tons in 1998 to 104 million tons by 2025.

The 2025 RTP includes several areas to address in freight-related planning efforts.

- Participation with coalitions promoting high-speed rail corridors through Texas.
- Representation on the I-69 and Trans Texas Corridor steering committees.
 - Consider establishing a freight-related Transportation Improvement Program
 - Consider implementing a Freight Steering Committee
 - Expand upon the findings of the Harris County Rail Study, once completed
 - Explore opportunities to consolidate rail facilities
- Follow up on the Quick Response Initiative by developing medium- and long-range recommendations

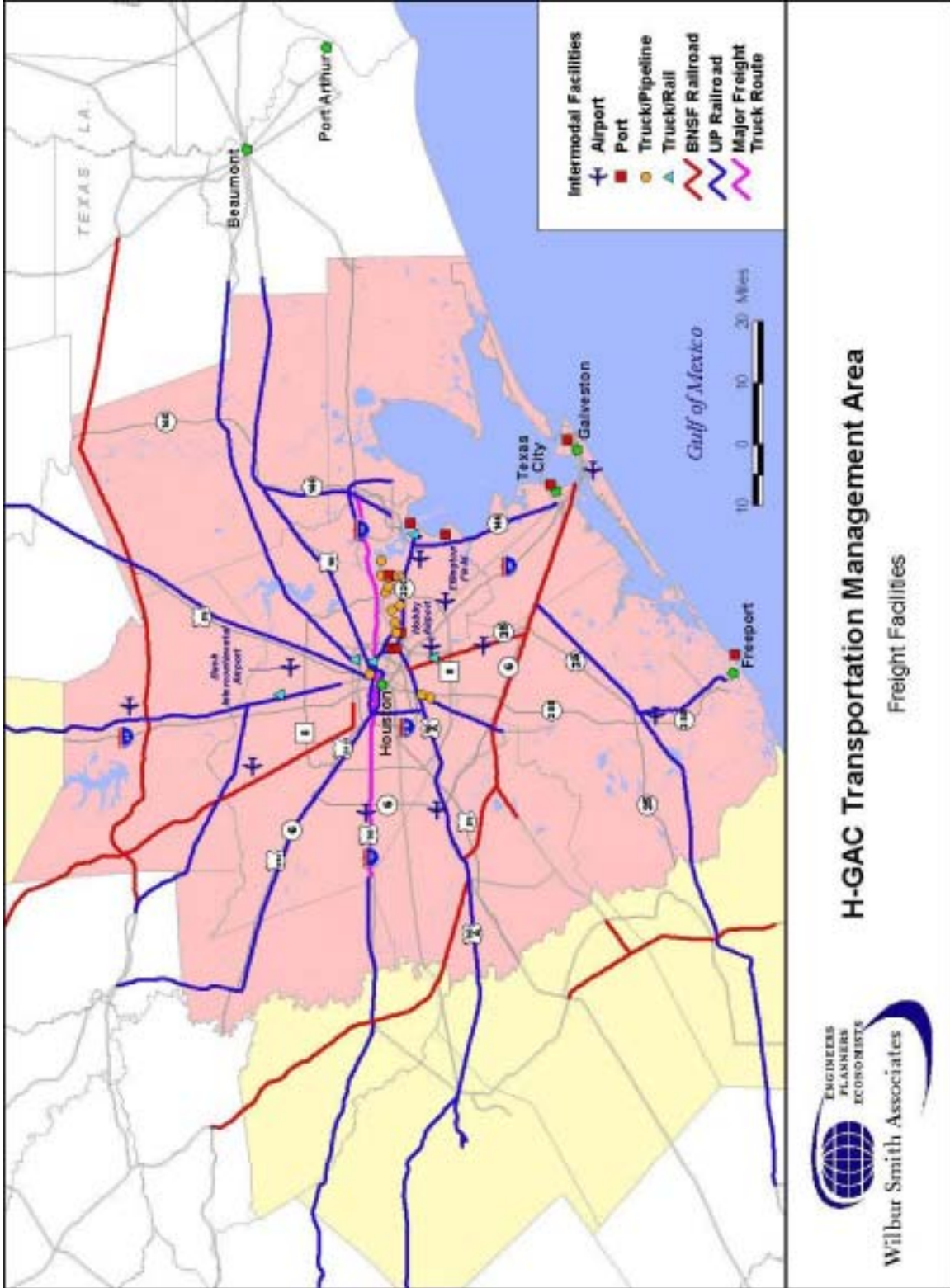
This appendix includes information presented in the following sections:

- Description of the major freight facilities in the Houston-Galveston area including: seaports, airports, railroads
- Description of freight flows in the Houston-Galveston area
- Discussion of truck traffic in the Houston-Galveston area
- Strategies to address increased truck trips on area roadways
- Regional freight related initiatives
- List of additional areas to address in subsequent freight related research/planning efforts

SECTION 1: MAJOR FREIGHT FACILITIES IN THE HOUSTON-GALVESTON AREA

Port Facilities

The ports in the Houston-Galveston area comprise some of the busiest ports in the nation. The Port of Houston represents one of the busiest ports in the country, while the ports of Freeport and Texas City are also nationally significant. Maritime traffic is a stimulus for growth in railroad and highway freight movement, and a primary cause for the increase in growth of freight movement in the Houston-Galveston area over the last decade. The table following the map below shows the growth experienced by selected Texas ports in terms of tonnage handled between 1990 and 2000.



Tonnage Handled by Texas Ports, 1990-2000				
Port	1990	2000	% Change	Change
Houston	126,178,000	191,419,000	34%	65,241,000
Corpus Christi	60,165,000	82,973,000	27%	22,808,000
Texas City	48,052,000	61,586,000	22%	13,534,000
Beaumont	26,729,000	82,653,000	68%	55,924,000
Port Arthur	30,681,000	21,387,000	-43%	(9,294,000)
Freeport	14,526,000	30,985,000	53%	16,459,000
Galveston	9,620,000	10,643,000	10%	1,023,000
Brownsville	1,372,000	3,268,000	58%	1,896,000
Port Lavaca	5,097,000	10,552,000	52%	5,455,000

Source: U.S. Army Corps of Engineers

The Houston region is served by four deep-draft port facilities, including the ports of Freeport, Galveston, Houston and Texas City. The role of each port has evolved to meet regional and international market demands, concurrent with landside access and freight mobility. Each strategic port facility has a specific role in terms of the global trade network. These roles are identified below:

Port Name	Port Role
Port of Freeport	Container Port
Port of Galveston	General Purpose Cargo, Cruise
Port of Houston	International Gateway; General Purpose Cargo including Container and Bulk Cargo and Cruise
Port of Texas City	International Gateway Bulk Cargo Port

Source: Latin American Trade Transportation Study Phase II

The four ports' individual rankings in various categories of trade, clarify each facility's role and relative volume of trade by cargo and vessel type.

U.S. Waterborne Foreign Trade 2000, Port Rankings	Port of Freeport	Port of Galveston	Port of Houston	Port of Texas City
Volume of Cargo Total	18	40	1	10
Volume of cargo carried by Ocean Liner. (Container and breakbulk cargo)	34	25	5	44
Volume of cargo carried by Tanker. (Bulk Liquid cargo such as crude oil)	12	28	1	6
Volume of cargo carried by Tramp. (Dry cargo such coal, grain and fertilizers)	66	34	5	46
U.S. Port Rankings by Cargo Volume, Total Trade 2001	24	56	2	9
North American Container Traffic 2002, Port Rankings by TEU's (Only Top 40 Ranked)	36	N/A	12	N/A

Source: American Association of Port Authorities

The impact of the region's deep water ports on the surrounding road and rail networks varies based on the roles they play, as port facility type, and the cargos handled. Container cargo tends to be of a higher value and more time sensitive, thereby creating greater numbers of landside vehicular traffic impacts on the surrounding highway and local road network. Bulk cargo is less time sensitive and is typically transported by railroad, which impacts delivery times and safety issues inherent with rail transport and local road crossing conflicts.

Port of Houston

The Port of Houston is a general purpose, deep-water cargo port that is the world's sixth largest port and has historically ranked first in the nation for volume of foreign tonnage and second in the nation for total tonnage. The Port of Houston handles 40 percent of all freight moving through Texas ports and more than 90 percent of all container cargo moving through the

Houston-Galveston region. The port consists of both public and privately controlled facilities. The Port of Houston Authority is the public agency at the Port of Houston. Cargo handled through the public complex accounts for approximately 15 percent of cargo in terms of tons and value. The private operators handle nearly 85 percent of cargo in terms of tons and value. The main private operator at the Port of Houston is Shell Oil.

Public and private dock facilities and industrial parks at the Port of Houston extend for 25 miles along the Houston Ship Channel, which is maintained by the Army Corp of Engineers. The Houston Ship Channel, including its tributaries and basins, is a 50-mile-long waterway that reaches from the head of Galveston Bay at Morgan's Point to the turning basin within the city limits of Houston. A shallow-draft channel extends up Buffalo Bayou from the turning basin to the Main Street bridge. Additional facilities of the port are located along the upper west side of Galveston Bay at Bayport near Red Bluff. Major facilities/terminals include:

Facility/Terminal	Function
The Turning Basin Terminal	Navigational head wharves, transit shed, warehouses
Wharf 32	Project and heavy cargo
Barbours Cut Terminal	Container terminal (9th largest in U.S.)
Woodhouse Terminal	Roll-on/roll-off ramp, general cargo, public grain elevator
Care Terminal	Wharves, 45,000 sqft. warehouse, 13-acre marshalling yard
Jacintoport Terminal	82,500 sqft. transit shed, 7.5 acre marshalling yard
Bayport Terminal	Container terminal
PHA Bulk Materials Handling Plan	Bulk material

Source: Port of Houston

Port of Houston Forecasted Growth

From 2001 to 2002 the Port of Houston had nearly an 8 percent growth in import/export total container volume, as expressed in 20-foot equivalent units (TEUs).¹ Bulk material handled at the port increased by 22 percent over the same period. The Port Import/Export Reporting Service (PIERS) data projected an average six percent annual increase in container volumes over the next three years for the Port of Houston project.

¹ PIERS' Port Horizons, Imports and Exports in TEUs (2001 – 2005) Supplement to PIERS' Horizons, U.S. Container Forecasts, The Journal of Commerce/PIERS

TEU = "Twenty-Foot Equivalent Unit" a standard linear measurement used in quantifying container traffic flows. One 20-foot long container equals one TEU while one 40-foot containers equals two TEUs.

Port of Houston Expansion Plans

The Port of Houston Authority plans to continue development of a major marine terminal complex on about 1,050 acres along the south side of the Bayport ship channel called the Bayport Terminal Project. Full buildout is not anticipated until 2030. The terminal complex will include docking, loading, unloading and storage container facilities. In addition to facilities for cruise ships, the terminal will contain an intermodal yard, warehousing facilities and properties available for light industrial development. The project also contains a four-part system to collect and treat storm water runoff that would otherwise enter Galveston Bay. The economic benefit of this project is estimated to be more than 15,000 jobs by 2015 and nearly \$800 million in business revenue. By 2030, the economic benefit is estimated to be 32,000 new jobs and \$2.4 billion in business revenue. The cost of the project is anticipated to be \$1.2 billion and developed in a market driven timeline.

The Port of Houston proposed more than 25 enhancements for the port, including rail and roadway improvements. The major projects, anticipated to cost more than \$10 million each, are:

- Extending PTRA track mainline rail from strang yard to Bayport
- Paving 2 miles of roads and industrial park – east
- Extending PTRA track from mainline to the intermodal yard
- Grade separated crossing at State Highway 146 and PTRA lead track
- Paving 72 acres of storage yards in industrial park – west
- Widening of port road east of SH 146 (6-lane with raised median)
- Paving of 23 acres at Jacintoport

Port of Galveston

The Port of Galveston was established in 1825 and is Texas' oldest commercial port enterprise. The Port of Galveston provides direct access to the Gulf of Mexico, and the majority of its cargo volume is bulk grains. Other major commodity types include sugar, liquid bulk, bananas and other fruit.

The Port of Galveston owns and operates public wharves, transit sheds, open and covered storage facilities, warehouses and freight handling facilities. The Port leases land and facilities to others, including a bulk export grain elevator leased to Farmland Industries Inc., a bulk import sugar terminal leased to Imperial-Holly Corporation, a bulk liquid dock leased to Galveston Terminal Inc., a shipyard repair facility leased to PMB/Bechtel Corp., and an area leased to The Woodlands Corporation for tourist development.

Port of Galveston Forecasted Growth

In 2002, the Port of Galveston experienced gains in the volume of fresh fruit and general cargo. Activity between 2001 and 2002 has seen dramatic increases in the number of cruise ship vessels and passengers passing through the Port of Galveston. During the

same period, tonnage passing through the port decreased by 27 percent. The port is projecting an increase of cruise passengers through the port of as many as one million passengers in 2004.

PORT OF GALVESTON			
	2001	2002	% Change
Total Tonnage	4,270,734	3,356,568	-27.24%
Number of Passengers	148,701	266,830	44.27%
<i>Number of Vessels</i>			
Cargo/Lay Ships	625	557	-12.21%
Barges	265	336	21.13%
Cruise Ship Calls	94	152	38.16%

Source: Port of Galveston

Port of Galveston Expansion Plans

Current expansion plans for the Port of Galveston reflect the recent increase in cruise ship passengers at the port. The port expects to spend \$15 million revamping cruise ship terminal 2 in 2004, and is looking at additional modifications to cruise ship terminal 3, estimated at \$20 million.

Another impact of the increased cruise ship business is increased traffic on Harborside Drive. The port is looking at proposing improvements to this roadway, in order to accommodate cruise-related truck and passenger traffic.

For the cargo side of the port, officials are preparing to implement a mixed-use west end development that will include a roll-on/roll-off container ramp, warehousing space and additional cranes.

Port of Freeport

Port of Freeport is a publicly owned port that began operating more than 100 years ago when the first jetty system was built in Freeport, Texas. Since that time, the Port has become one of the fastest growing ports on the entire Gulf Coast. The port is currently ranked as the 16th largest port in the United States in terms of tonnage handled, according to the American Association of Port Authorities.

The Port of Freeport handles a variety of agricultural products, such as rice, bananas and other fruits. More than 90 percent of the port's tonnage consists of agricultural products. Dole Fruit Company Inc. is one of the top 25 container carriers in the world and a major carrier at the port. General cargo and dry bulk freight are also handled through the Port of Freeport. The Port of

Freeport operates four terminals, including the Brazosport Turning Basin, Brazos River Turning Basin, Upper Turning Basin and the Stauffer Turning Basin.

Port of Freeport Growth Forecasts

The Port of Freeport was ranked the 12th largest container terminal in the U.S. in 2002, which was largely due to a nearly 25 percent increase in containerized traffic experienced at the port between 2001 and 2002. Container traffic is expected to continue to increase through 2005, although at a more moderate rate of about 5 percent per year.

Port of Freeport Expansion Plans

Major expansion of cargo handling capabilities at the Port of Freeport will be unimpeded by physical capacity, since the port possesses more than 8,000 acres of land available for development. Of this amount, 1,400 acres are environmentally mitigated, and all parcels are accessible by water, highway and railroad.

The port is currently engaged in Phase II of its expansion, which calls for widening the existing channel from 400 feet to 800-900 feet, and deepening the channel from 40 to 60 feet. This expansion will allow greater access for multiple ships. Other expansion plans call for increased lag and crude oil handling facilities at the port. A 60,000 square foot cold storage facility is also in the design phase at the port.

Port of Texas City

The Port of Texas City is a privately owned for-profit port that serves as property owner and landlord to the facility operators. The Port of Texas City almost exclusively handles bulk liquid products, which include chemical and crude oil products. The Port of Texas City ranked ninth in the nation in terms of tons handled in 2001. In 2001, the port handled more than 62 million tons of cargo. It is estimated that 40 million tons of crude oil entered the port, of which approximately 30 million tons is processed in Texas City. The remaining 10 million tons of crude oil is typically transported by pipeline to Oklahoma.

Port of Texas City Growth Forecasts

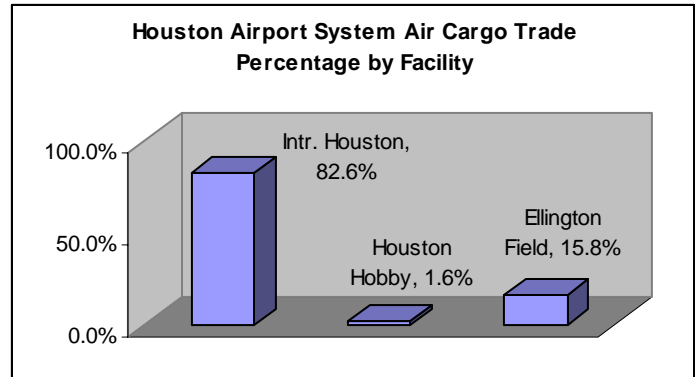
Growth forecasts for the Port of Texas City are tied directly to the oil business growth. If oil business increases, then Port of Texas City activity historically increases.

Port of Texas City Expansion Plans

The Port of Texas City is not restricted from increasing intake of additional chemicals or crude oil. Port officials estimate they could increase trade by at least 40 percent without constructing new facilities. Therefore, the Port of Texas City has no expansion plans in the foreseeable future.

Houston Airport System

The Houston Airport System (HAS), comprised of George Bush Intercontinental Airport/Houston (IAH), William P. Hobby Airport (HOU) and Ellington Field (EFD), ranks fourth nationally and sixth worldwide in terms of passenger volume. Bush Intercontinental Airport/Houston (IAH) is one of the fastest growing international airfreight hubs in the United States. IAH is ranked as the 12th largest international air cargo gateway in the United States, and remains in the top 25 nationally for total air cargo volume.



Air cargo handled through the Houston Airport System increased in 2002 by four percent over 2001, finishing the year with 330,000 tons of cargo handled. IAH handles the vast majority of air cargo for the Houston Airport System, with nearly 83 percent of all air cargo. Belly cargo operations accounted for 53.7 percent of cargo volume at IAH in 2002, and grew 4.6 percent with 161,000 tons of shipments. Freight-only cargo volume, including scheduled and chartered cargo, rose 6.1 percent in 2002. In total IAH cargo volume in 2002 increased by 5.3 percent over 2001 totals. Hobby Airport handled nearly two percent of the air cargo in Houston, while Ellington Field handled nearly 16 percent of all air cargo. Ellington handled 52,000 tons of cargo in 2002, down 1.6 percent from 2001. This distribution of air cargo within the HAS will change in 2003 because United Parcel Service (UPS), the major air cargo carrier at Ellington Field, has relocated to IAH's new air cargo complex.

Houston Airport System Passenger, Cargo and Aircraft Operations - 2002

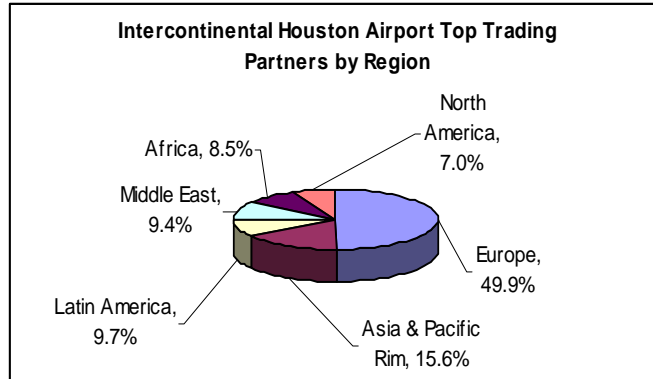
Airport	Passengers	Cargo Tons	Aircraft Operations
Bush Intercontinental	33,904,847	273,078	456,831
Houston Hobby	8,035,727	5,338	246,230
Ellington Field	76,035	52,285	102,016
Total	42,016,609	330,701	805,077

Source: Houston Airport System

Houston Intercontinental Airport Air Cargo Growth Forecasts

International air cargo traffic through IAH has increased 10 percent in the past five years, and with the addition of a new air cargo complex at IAH, the trend is expected to continue. An annual 6 percent growth rate is forecasted for IAH based on historical trends and anticipated new market growth.

Half of the international air cargo trade with IAH is currently from Europe. IAH has targeted increasing trade with Latin America because of the expected threefold increase of trade with Latin America over the next 20 years. For manufactured goods, which are more likely to travel via



air, trade is expected to increase six times over in the next 20 years.² A strategic advantage that IAH has over traditional trading partners with Latin America, such as Miami, is its geographic location in the center of the country. Houston is located within 36 hours by road or rail from any point in the country. New facilities designed to handle perishable goods from Latin America will also increase trade opportunities at IAH.

Houston Intercontinental Airport Air Cargo Expansion Activity

The Houston Airport System has completed Phase I of a major expansion of air cargo handling facilities at Bush Intercontinental Airport. When fully completed, the complex will encompass 120 acres on the northeast side of the airport, providing easy access to the proposed I-69 NAFTA Superhighway. Phase I of the development included ramp space for parking up to 20 wide body aircraft simultaneously, and provides more than 550,000 square feet of cargo building space. Cargo aircraft now have direct access to Runway 8-26, the future Runway 8L-26R, and, once the midfield taxiway is constructed, Runway 9-27. All three runways are located on the north side of the passenger terminal.

IAH cargo capacity is projected to triple once the air cargo complex is completed. In addition to increased capacity, airlines and shippers will have the ability to distribute air cargo faster and more efficiently throughout the U.S. and internationally. A stand-alone facility will house federal inspection services, including the U.S. Immigration and Naturalization Service (INS), U.S. Customs Service, U.S. Department of Agriculture, and U.S. Health Inspection Services, providing easy one-stop service to customs brokers, air cargo carriers and all other cargo customers. The IAH air cargo distribution complex can easily be expanded in the future as air cargo develops.

² LATTS, Latin American Trade and Transportation Study, 2001

William P. Hobby Airport

The City of Houston's first public airport, William P. Hobby, was acquired in 1937. Today, HOU primarily serves domestic regional and national commercial carriers for the Houston Airport System. In 2002, the airport served more than eight million passengers and offered service from 13 carriers. Southwest Airlines is the largest carrier at Hobby Airport, serving nearly 85 percent of Hobby's passengers.

Hobby Airport handles less than 2 percent of air cargo in the Houston area. All air cargo handled at Hobby Airport is transported in the cargo section of passenger planes, and 92 percent was handled by Southwest Airlines in 2002.

Increases in air cargo at Hobby Airport will likely mirror increases in passenger activity for the foreseeable future. Although nearly \$250 million is being spent modernizing Hobby's terminal building and other airport facilities, there are no expansion plans for air cargo facilities at Hobby Airport.

Ellington Field

Ellington Field, formally an air force base, still has a strong military presence. Ellington was passed into civilian hands in 1984 under the City of Houston's jurisdiction. However, NASA and the Texas Air National Guard (TXANG) still conduct flight operations at Ellington. Ellington is a base of operations for corporate and commercial cargo and private aviation operations, and served more than 76,000 passengers in 2002, an increase of 26 percent over 2001. With the move of UPS in February 2003 to IAH, air cargo likely will be dramatically reduced at Ellington Field. Future expansion of air cargo handling facilities at Ellington Field is not envisioned in the future.

Rail Freight Movement in Texas and the Houston-Galveston Area

The rail network in Houston is dominated by two major Class I railroads, Union Pacific (UP) and Burlington Northern Santa Fe (BNSF). Terminal companies Houston Belt and Terminal (HBT) and Port Terminal Railroad Association (PRTA) are terminal switching companies in Houston that have now been acquired by UP and BNSF. The acquisition of Southern Pacific (SP) by UP provided additional infrastructure on which UP could operate, and the railroad has worked to integrate these facilities into its larger network. With increasing freight movements from the ports along the Gulf Coast, all existing track has been viewed by UP management as necessary.³

Rail Freight Movement in Texas

In the 1990s, there was a 40 percent increase in tons of rail freight transported in the state of Texas. In 1991, 230 million tons of rail freight was transported in Texas. By 1999, this figure had increased to approximately 323 million tons – an increase of almost 40 percent. The figure on the following page depicts commodity flows by rail throughout the state.

³ Inventory of Railroad Operating Conditions in the East End of Houston, Texas Transportation Institute, Texas A&M University System, February, 2003

Statewide Rail Commodity Flows

During the same period, the number of railcars handled in Texas grew even more quickly than the rise in tonnage, increasing from 4.1 million cars in 1991 to 7.2 million cars in 1999. The expansion of trade, especially with Mexico in the years following passage of the North American Free Trade Agreement (NAFTA), the growth of manufacturing, and a rapidly growing population all contributed to increases in rail freight shipped around the state.

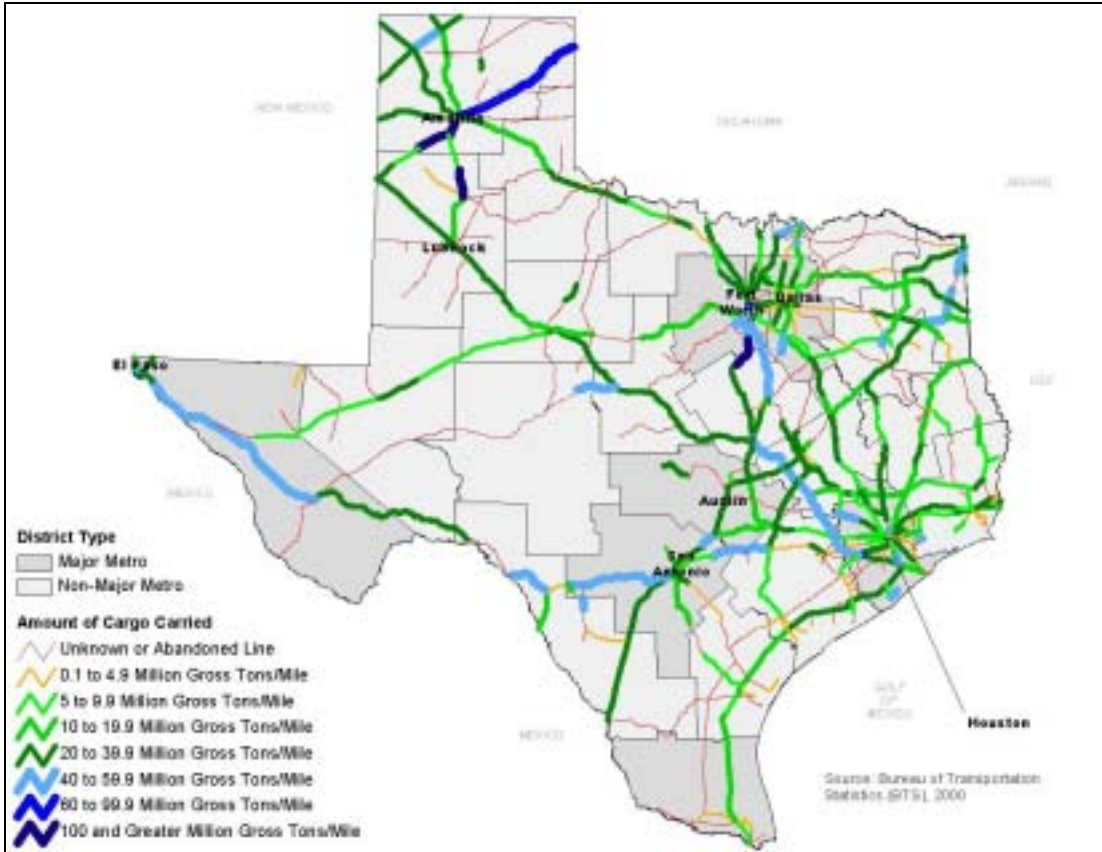
Rail Freight Movement in Houston-Galveston Area

Houston accounted for the largest volume of rail freight originating in Texas, as well as the greatest amount of freight destined for other parts of Texas. The Houston Rail District is responsible for generating nearly 30 percent (28.7 million tons) of the total freight from Texas, and nearly 45 percent (46 million tons) of the freight coming into Texas. The Dallas and Fort Worth districts combined were responsible for 13 percent of the rail freight tonnage destined for points in Texas. The graphic on the following page shows how the Houston area accommodates higher rail freight volumes than other areas in Texas.

The transport of chemicals represents almost 64 percent of all rail commodities originating in the Gulf Coast port districts, and is the largest rail commodity originating in the Houston area. As the nation's leading center for chemicals manufacturing, the Houston district accounts for a large share of the entire tonnage destined for other major metropolitan areas.

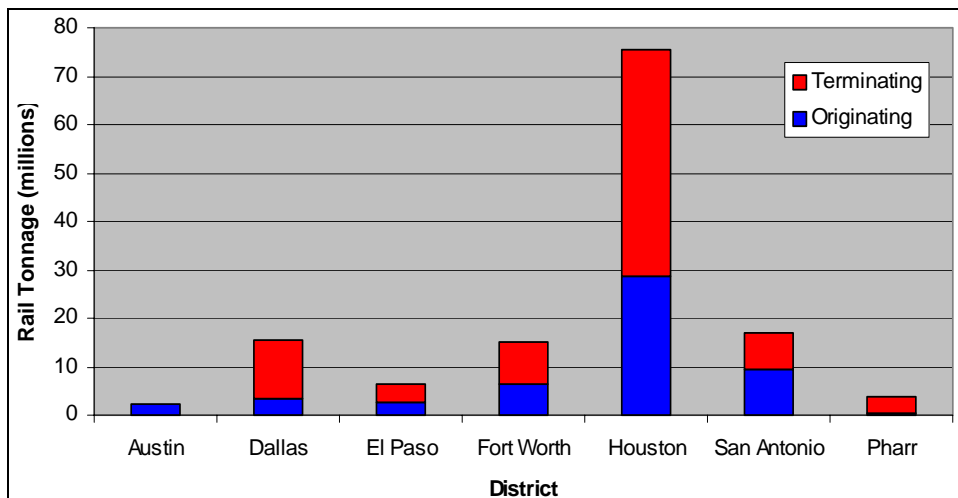
The second largest rail commodity originating in major metropolitan districts in Texas in 1998 was non-metallic ores (almost 26 percent). Used by the construction industry, non-metallic ores (including aggregate rock) are among the top commodities brought into the Houston district by rail. Coal is the most important commodity carried by rail destined for major metropolitan districts in Texas. Coal accounts for 20 percent of the rail tonnage destined for major metropolitan districts and approximately 27 percent of the rail freight destined for Gulf Coast port districts in Texas. Often hauled from Wyoming's Powder River Basin, coal is used to generate electricity at coal burning power plants throughout Texas, and is the largest volume inbound commodity to the Houston district.

Commodity Flows by Rail in Texas



Source: Texas Department of Transportation, Transportation Planning and Programming Division

1998 Rail Tonnage Handled by Major Metropolitan District

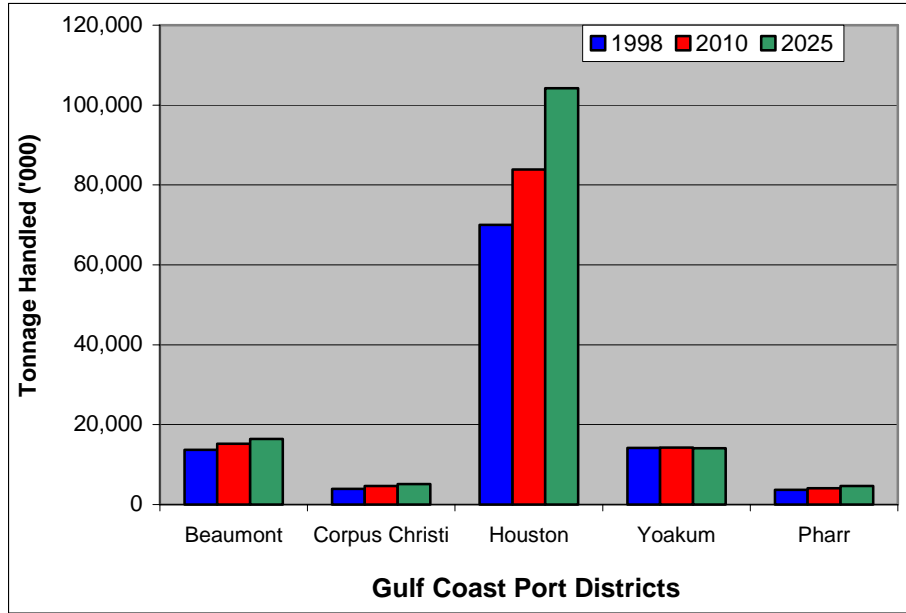


Source: Reebie Associates

Forecasted Rail Freight Trends

Inbound and outbound rail freight handled by Texas Gulf Coast Ports is forecasted to increase from 106 million tons in 1998 to more than 144 million tons by 2025. Houston is expected to continue to account for the largest volume of rail freight tonnage in Texas, forecast to increase by almost 49 percent from 70 million tons in 1998 to 104 million tons by 2025. The following figure compares rail tonnage handled by Texas ports in 1998 with the tonnage forecasted for 2010 and 2025.

Forecast Rail Tonnage Handled by Texas' Gulf Coast Port Districts



Source: DRI-WEFA

Port of Houston

Texas' busiest and largest port in terms of tonnage and commercial value is the Port of Houston. Reduced charges for containers at the Port of Houston have made rail an attractive mode at this port. The Port Terminal Railroad Association (PRTA) revised the formula for determining the cost of transport and effectively reduced the cost of handling containers. The result of this methodology change is a decrease in the average cost per container from \$50 to \$10. The reduction in costs for handling containers will likely further stimulate the growth of rail traffic at the port and contribute to increases in the amount of marine tonnage handled.

The Port of Houston provides more than 170 miles of railroad tracks and heavy equipment for moving freight, including container lift machines, cranes, rail ramps, forklifts, and heavy lift docks. Approximately 130 different trucking companies also transport cargo in and out of the port. The main commodities include grain, iron and steel, and container shipments.

U.S. Army Corps of Engineers statistics show a constant increase in total tonnage handled by the Port of Houston, from 109 million tons (1980) to 191 million tons (2000). This

increase in tonnage is expected to continue, creating enormous challenges for highway and rail infrastructure.

Rail Related Expansion Plans

Expansion of rail capacity is primarily focused on improvements and expansion of port rail terminal facilities. The following rail related improvements were identified in the Draft State Rail Plan:

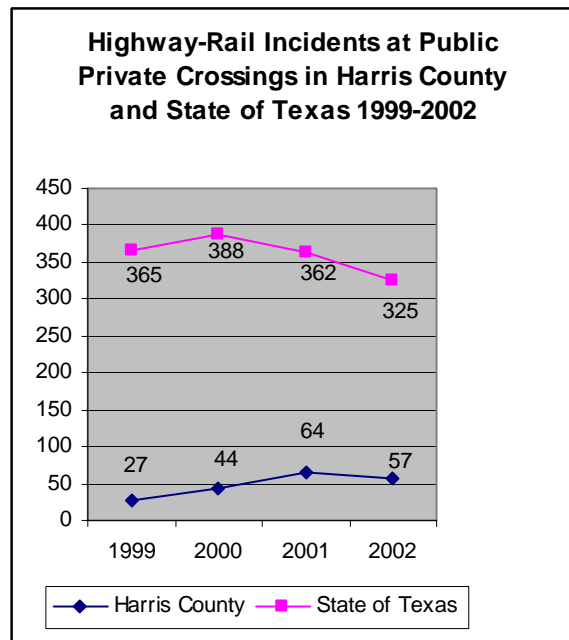
- The Port of Houston is in the process of extending the lead track at Barbour's Cut to the west. This project will increase the capacity of the three-mile single-track section used by both UP and PTR. The project is currently in the design stage.
- The Port of Houston Authority is also planning to develop a new intermodal facility at Bayport in southeast Harris County, which will include access by highway, rail and waterways.

At-Grade Rail Crossings

A major concern among residents and rail operators in the Houston-Galveston area are the safety issues surrounding public at-grade crossings in centers of population and commerce. There are 1,009 such public at-grade crossings in Harris County alone. As many as 32 trains on one rail line may be routed through the east side of Houston on any given day. Issues identified as major areas of concerns related to rail crossings include:

- access to local schools over rail corridors;
- access for emergency vehicles;
- noise impacts;
- pedestrian safety issues; and
- crossing blockage causing delays of commerce.

According to the Federal Railroad Administration, the number of highway-rail incidents at public private crossings in the State of Texas has remained relatively stable from 1999 to 2002, and declined slightly from 365 in 1999 to 325 in 2002. At the same time, incidents in Harris County have increased rapidly from 27 in 1999 to 64 in 2001. Incidents decreased slightly in 2002 down to 57 incidents during the course of the year.



HIGHWAY-RAIL INCIDENTS AT PUBLIC AND PRIVATE CROSSINGS STATE OF TEXAS
Year Totals 1999, 2000, 2001, 2002

Counties	Total		Total Year Counts			YTD Counts Jan - Dec		% Change Over Time		
	Accs	% of Total	1999	2000	2001	2001	2002	1999 to 2001	2000 to 2001	2001 to Dec 2002
GRAND TOTAL....	1,440	100.0	365	388	362	362	325	-0.8	-6.7	-10.2
Automobile	574	39.9	158	153	142	142	121	-10.1	-7.2	-14.8
Pickup truck	343	23.8	88	96	82	82	77	-6.8	-14.6	-6.1
Truck-trailer	251	17.4	54	66	70	70	61	29.6	6.1	-12.9
Truck	157	10.9	33	39	37	37	48	12.1	-5.1	29.7
Van	57	4.0	17	17	12	12	11	-29.4	-29.4	-8.3
Other	29	2.0	7	10	9	9	3	28.6	-10.0	-66.7
Pedestrian	13	0.9	5	2	4	4	2	-20.0	100.0	-50.0
Other motor vehicle	8	0.6	2	2	4	4		100.0	100.0	
Motorcycle	5	0.3	1	2			2			
Bus	2	0.1		1	1	1				
School bus	1	0.1			1	1				

HIGHWAY-RAIL INCIDENTS AT PUBLIC AND PRIVATE CROSSINGS IN HARRIS COUNTY

Year Totals 1999, 2000, 2001, 2002

Counties	Total		Total Year Counts			YTD Counts Jan - Dec		% Change Over Time		
	Accs	% of Total	1999	2000	2001	2001	2002	1999 to 2001	2000 to 2001	2001 to Dec 2002
GRAND TOTAL....	192	100.0	27	44	64	64	57	137.0	45.5	-10.9
Automobile	78	40.6	14	16	26	26	22	85.7	62.5	-15.4
Truck-trailer	40	20.8	3	11	13	13	13	333.3	18.2	
Pickup truck	35	18.2	4	9	10	10	12	150.0	11.1	20.0
Truck	24	12.5	3	5	7	7	9	133.3	40.0	28.6
Van	6	3.1	1	1	4	4		300.0	300.0	
Pedestrian	4	2.1	1	1	1	1	1			
Other	2	1.0	1	1						
Bus	1	0.5			1	1				
School bus	1	0.5			1	1				
Other motor vehicle	1	0.5			1	1				

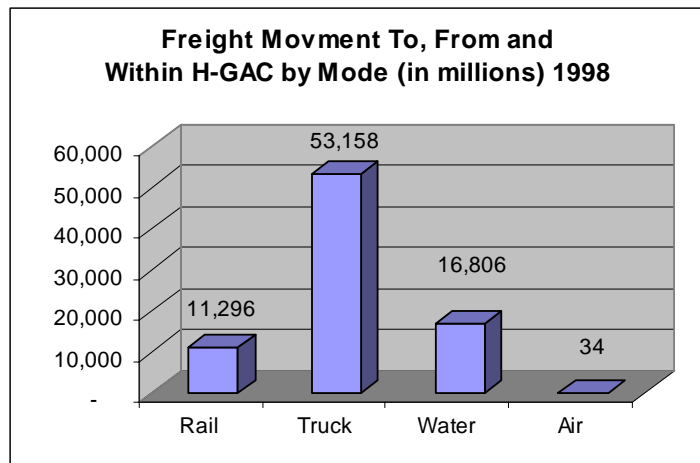
SECTION 2: FREIGHT FLOWS IN THE HOUSTON-GALVESTON AREA

Reebie Associates compiles national freight flow data used by federal and local government agencies to identify how and where freight moves throughout the country. This data is updated every five years. The most recent year for which data is available for the Houston-Galveston area is 1998. Used with special permission from Reebie Associates, this data provides the most complete and current information available to evaluate the flows of freight to, from and within the Houston-Galveston area. In 1998, more than 81 billion tons of freight moved to, from and within the 13-county H-GAC region. The table below shows the breakdown of how much freight moved internationally and domestically, as well as by mode of transport and percent. This table also indicates if the origin or destination point was located in the H-GAC region.

Freight Moved in the Houston-Galveston Area, 1998		
Mode And Type Of Freight Movement	Tons	Percent
INTERNATIONAL RAIL		
Rail Freight Originating in Houston	1,024,839,870	1.26%
Rail Freight Terminating in Houston	1,844,108,637	2.27%
Rail Freight Movement within Houston	2,530,669	0.00%
DOMESTIC RAIL		
Rail Freight Originating in Houston	2,865,869,744	3.53%
Rail Freight Terminating in Houston	5,552,642,858	6.83%
Rail Freight Movement within Houston	5,848,066	0.01%
INTERNATIONAL TRUCK		
Truck Freight Originating in Houston	1,067,000,869	1.31%
Truck Freight Terminating in Houston	1,136,105,120	1.40%
Truck Freight Movement within Houston	1,090,236	0.00%
DOMESTIC TRUCK		
Truck Freight Originating in Houston	25,874,409,552	31.83%
Truck Freight Terminating in Houston	24,987,372,439	30.74%
Truck Freight Movement within Houston	92,312,238	0.11%
INTERNATIONAL WATERBOURNE		
Waterborne Freight Originating in Houston	105,577,251	0.13%
Waterborne Freight Terminating in Houston	176,307,199	0.22%
DOMESTIC WATERBOURNE		
Waterborne Freight Originating in Houston	6,276,834,106	7.72%
Waterborne Freight Terminating in Houston	10,239,013,971	12.59%
Waterborne Freight Movement within Houston	8,324,988	0.01%
INTERNATIONAL AIR CARGO		
Air Cargo Originating in Houston	65,613	0.00%
Air Cargo Terminating in Houston	53,647	0.00%
DOMESTIC AIR CARGO		
Air Cargo Originating in Houston	9,312,898	0.01%
Air Cargo Terminating in Houston	24,701,089	0.03%
Total Tonnage Moved	81,294,321,060	100%

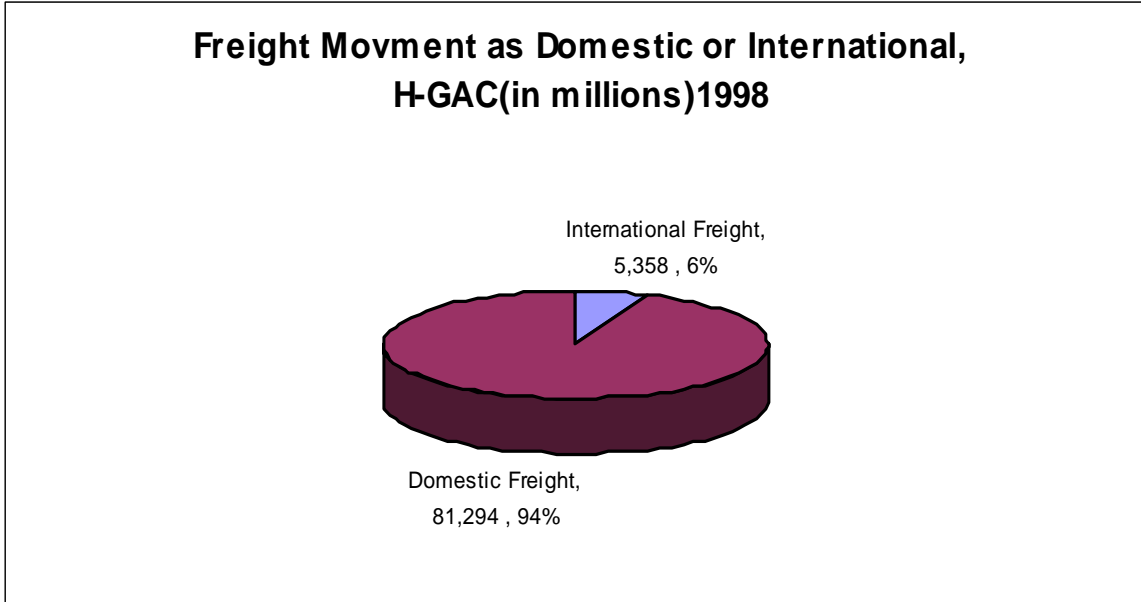
Source: Reebie Associates

A key finding in the table above is that 65 percent of the tons moved to, from and within the Houston-Galveston area in 1998 were moved by truck. This figure includes both domestic and international freight. As shown in the chart to the right, waterborne freight accounted for 21 percent of the tons moved within the region, totaling 16.8 billion tons. Rail accounted for the movement of 11.3 billion tons of freight, while air cargo accounted for 34 million tons moved. In terms of total value of shipments in the U.S., air cargo ranks second at 12 percent behind truck cargo



value at 80 percent. Rail and water cargo account for 7 and 2 percent respectively of the total value of cargo handled in the U.S.⁴

One factor that contributes to the greater share of freight moving by truck versus other modes is that crude oil and chemical products, which are handled in large quantities at the ports in the H-GAC region, are frequently processed at or in close proximity to those ports. The resulting product is then shipped out again, or transported via oil pipeline to destinations such as Oklahoma. If crude oil products and chemicals were moved inland by other means, it would most likely be transported by rail and result in an increase in the share of tons moved rail.

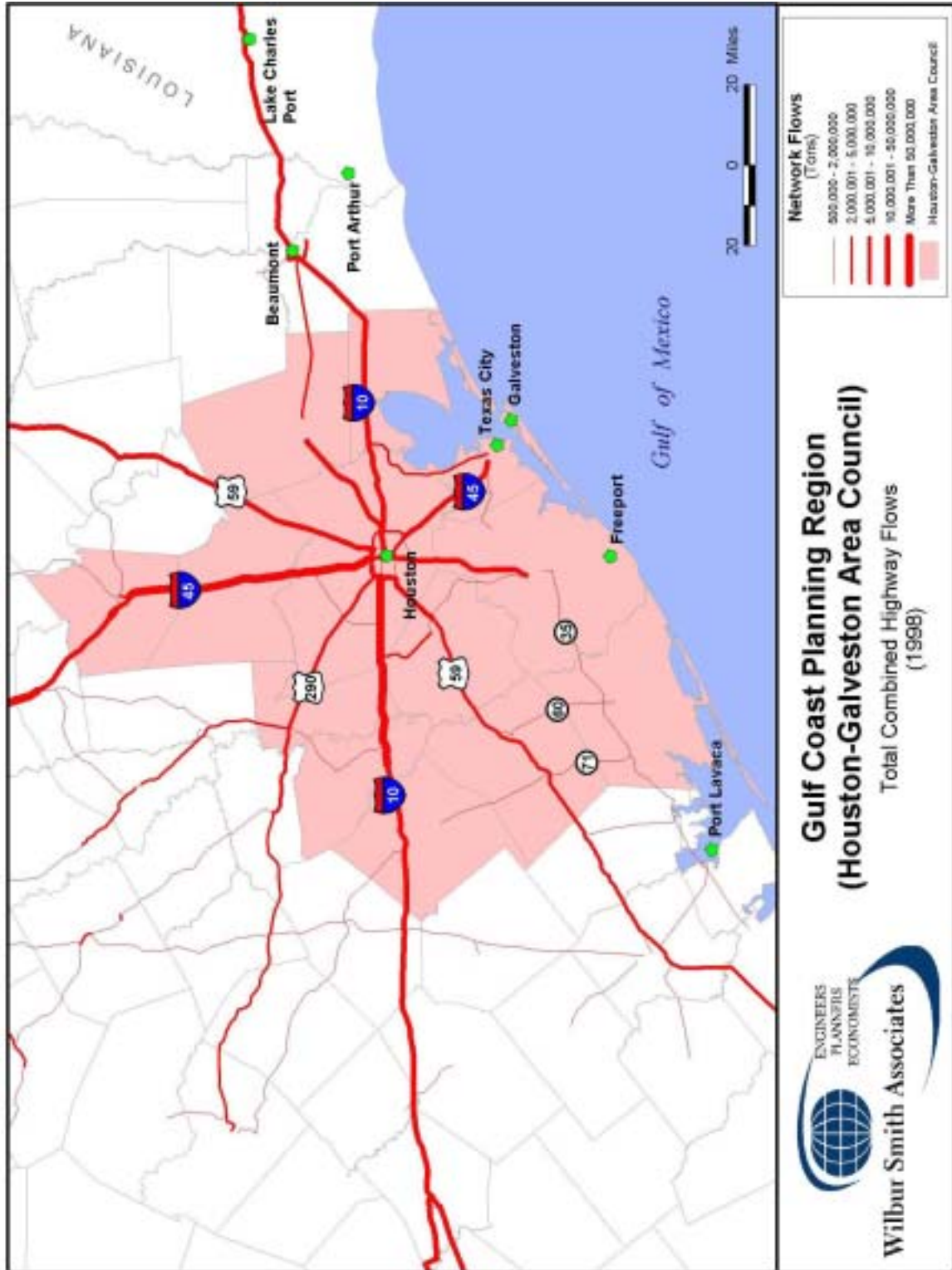


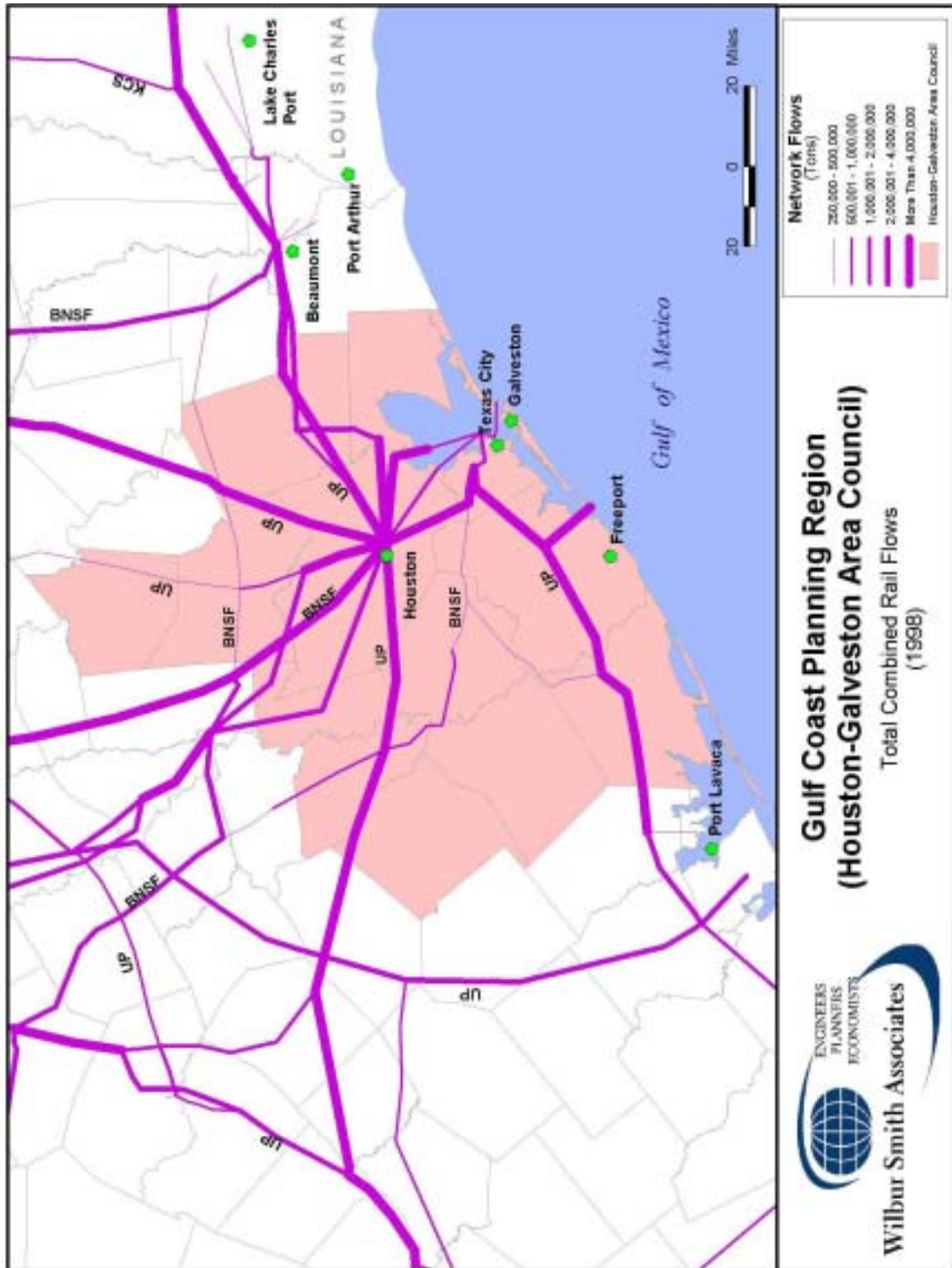
The figure above shows that a majority (94 percent) of the freight movements in 1998 were domestic freight movements. Only 6 percent of freight movements were international movements.

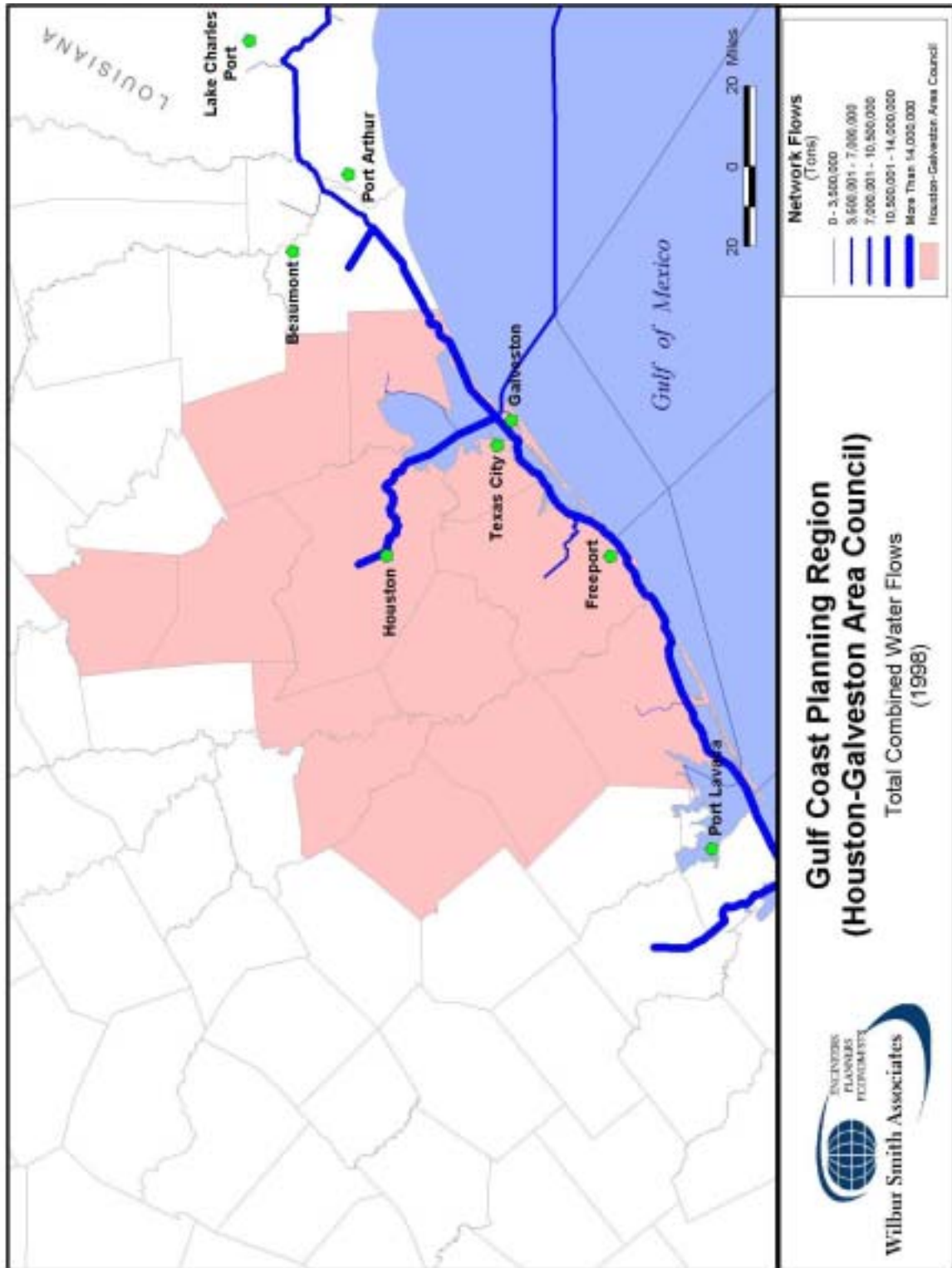
The three maps on the following pages show freight flows assigned to specific highway, railways, and shipping channels. The highway flow map clearly shows that Interstate 10 and Interstate 45 are the primary freight highways of importance in the Houston-Galveston area. Specifically, I-10 west of downtown and I-45 north of Houston are the segments that show flows of more than 50 billion tons annually.

The Houston area rail flow map shows that Houston serves as major rail hub for the region, and that the Union Pacific rail lines transport a majority of the tonnage along the system. The flow data map shows that waterborne flows in the Houston-Galveston area are concentrated at the Port of Houston and along the intercoastal waterway. Inland waterborne transport does not play a significant role in the transport of freight in the Houston region.

⁴ Source: The Freight Story, 2002 Freight Analysis Framework, U.S.DOT (FHWA) – 1998 Data







SECTION 3: TRUCK TRAFFIC IN THE HOUSTON-GALVESTON AREA

The quality of life of any metropolitan area is enhanced by a strong and vibrant economy. A common byproduct of a strong local economy is the generation of increased truck trips and associated stress on the local transportation system. A manufacturing-based economy, such as Houston's, impacts the transportation system and results in significant truck traffic on area roadways.

The prospects for attracting more freight activity to Houston-Galveston area are strong. Freight facilities in the region will continue to attract growth. IAH ranks fourth nationally in terms of passenger volume and is the 12th largest international cargo gateway in the United States. Growth forecasts for IAH indicate a 6 percent annual growth rate. The ports of Houston, Freeport, Galveston and Texas City handled 286 million tons of cargo in 2001, which is more than any other single port in the nation. In 1998, the region's airports, seaports, roadways and railways moved 81 billion tons of freight to, from and within the Houston-Galveston area. Latin American trade is predicted to increase threefold in the next 20 years, and legislation, such as NAFTA, has made it easier to trade with Mexico and Canada. Now the potential exists to expand economic markets, resulting in increased trade with those countries. Given Texas' close proximity to trade partners, such as Mexico and other Latin American countries, the Houston area should expect the number of trucks to increase on area roadways.

According to the statewide transportation plan, the percentage of trucks on major roadways in and around Houston in 2000 was 11.3 percent of total traffic, on average, with more than 30 percent of truck trips on I-10 east of Houston.⁵

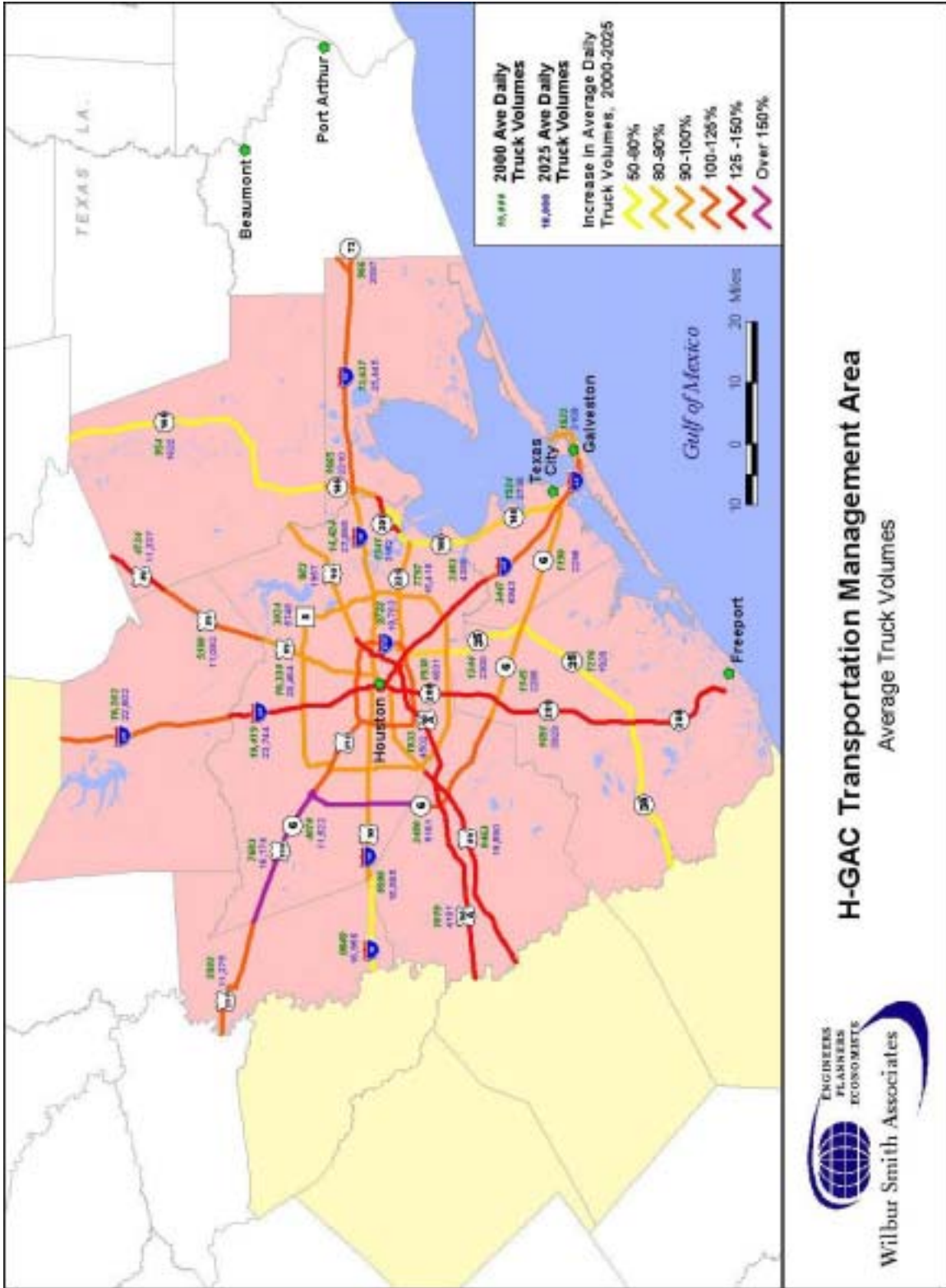
By 2025, the percentage of trucks on major roadways in and around Houston will increase to 13.6 percent, on average, with some roads carrying as many as 36 percent trucks.

Traffic projections indicate that traffic for all types of vehicles will increase by 64 percent by 2025. Those projections, coupled with a modest increase in the average percentage of truck trips by 2025, will result in a dramatic increase in truck trips on the major roadways in the Houston-Galveston area. If alternative solutions are not implemented, the Houston area will see more than double the number of trucks on the major roadways between 2000 and 2025.

The map on the following page shows average truck volumes in 2000 and 2025 for the Houston Galveston area. The roadway segments with the brightest colors (purple and red) indicate the highest percentage of increase in truck volume over the 25-year period. The roadways with greatest increase in actual truck volume over this period are: I-10 in Chambers County, I-45 in Harris and Montgomery counties, and U.S. 59 in Fort Bend and Harris counties.

The map shows no distinct trend in terms of truck traffic growth becoming concentrated in one area of the region. However, it is noteworthy that the roadway forecasted to experience the highest growth in truck percentage, SH 6 north of U.S. 90A, is not close to a major freight facility. Therefore, it is assumed the through trips from generators outside of the region will contribute to the high increase in truck traffic along this segment of roadway.

⁵ Statewide Transportation Plan prepared by Wilbur Smith Associates



SECTION 4: STRATEGIES TO ADDRESS INCREASED TRUCK TRIPS ON AREA ROADWAYS

The time to plan for the safe and efficient movement of freight in the Houston-Galveston area is prior to the time that congestion begins to negatively impact the economy because of excessive delay costs and increased costs of doing business. Strategies that address unique circumstances along with targeted solutions have already been implemented in the Houston area. In a study by the Texas Transportation Institute, researchers evaluated a policy restricting trucks to certain lanes on an 8-mile stretch of I-10 East. After implementing the lane restrictions, the study recorded a dramatic 68 percent reduction in crashes along the test section of the corridor.

Another strategy targeted specifically for the Houston-Galveston area is to assist freight intensive businesses that process raw materials to locate in proximity to freight facilities, such as railroads or port properties. By enhancing the opportunity for these businesses to utilize rail and vessels for transporting freight, the potential that these industries will occupy shrinking space on roadways is greatly diminished.

Strategies that have been implemented in other jurisdictions to address increasing mode share of trucked freight movement should be considered for the Houston region. Such strategies could include many of the following recommendations:

- Designate network roles for freight routes, such as through routes, arterial stem routes, and local connectors. Use these designations to channel investments to the highways that play key network roles for movement of freight.
- Incorporate trucks in the design of the traffic system, such as traffic signalization, intersection design and turning radius design
- Require new development to accommodate freight related concerns, such as the provision of a sufficient turning radius into delivery points (i.e. shopping centers and retail establishments)
- Require freight access for commercial and business establishments (off street delivery bays and loading zones)
- Intelligent Transportation System solutions could be implemented, such as travel management systems and traveling information systems
- Consolidated Freight/Rail Corridors, such as the Alameda Corridor in Los Angeles or the one envisioned for the Trans Texas Corridor.

SECTION 5: REGIONAL FREIGHT RELATED INITIATIVES

Gulf Coast States High Speed Rail Corridor

Texas is a state member (together with Alabama, Mississippi, Louisiana and Florida) of the Southern Rapid Rail Transit Commission. This commission spearheaded the recent official designation of the Gulf Coast corridor that runs between Houston, New Orleans and Mobile, Alabama, and also extends from New Orleans to Birmingham, Alabama.

Designation of the high-speed corridor will make the area eligible to receive federal funds, which will be combined with state and local funds to make grade crossing improvements

in the corridor. To eliminate grade crossing hazards, states plan to have a mix of grade separations, warning device enhancements and crossing closures. There are approximately 470 grade crossings in the corridor. The Gulf Coast states and cities along the route are expected to make a commitment to work with private railroad companies and the federal government to gradually upgrade existing railroad rights of way, so that speeds of 90 miles per hour and greater can be achieved.

Gulf Rivers Intermodal Partnership

The Gulf Rivers Intermodal Partnership (GRIP) is a confederation of eight states, with the mission to advance the maritime mode of transportation as a multimodal, intermodal partner in freight transportation. GRIP recognizes that the United States is reaching the "tipping point" in freight transportation partly because infrastructure demand exceeds available capacity - both existing and planned.

Consequently, state departments of transportation are no longer looking solely at the highway mode of freight transportation. These departments realize that to meet the capacity demands in the 21st century, all available modes of transportation must be developed to their fullest potential. The recommendation is to continue to work through the Gulf Rivers Intermodal Partnership to increase utilization of the inland waterway system and coastal shipping. They now recognize that the maritime mode can serve as an alternative or complement to other modes in meeting freight transport demands.

Quick Response Team

In 1999, H-GAC procured consultants to facilitate a partnership with freight movement industries. The agency issued a Request for Qualifications to develop an Intermodal Congestion Quick Response Team (QRT), and a program to respond to congestion problems identified by the goods movement industry. The main purposes of the QRT program were to demonstrate sensitivity to freight congestion issues by the public sector agencies; increase opportunities for public/private partnerships; and provide low-cost, fast solutions. The results of the effort led to the identification of 68 access needs at 27 of the 72 regionally significant intermodal facilities in the H-GAC region. This effort resulted in 6 funded freight-sensitive projects.

Trans Texas Corridor

The Trans Texas Corridor is a conceptual plan for a new type of multi-use, statewide transportation corridor that will incorporate as many as seven different envelopes for vehicular travel, truck travel, high-speed rail, freight rail, commuter rail, pipeline, and utility transmission. The corridor is envisioned as a 4,000-mile, multi-use corridor up to 1,200 feet wide, with 6 separate lanes for passengers, 4 separate truck-only lanes, and 6 rail lines, including lines for high-speed rail, commuter rail and freight rail.

Dedicated truck lanes will provide enhanced freight movement capabilities within Texas. The truck lanes will be built first and passenger vehicles will share the truck facility until such time that the passenger vehicle lanes can be constructed. Four segments of the Trans Texas Corridor have been identified as priority segments, and two of them connect to Houston.

Interstate 69

Interstate 69 is an effort by the federal government and coalition states to construct a road that provides the shortest route between the Northeast/Midwest and South Texas. It will reduce travel time, fuel consumption and costs over existing circuitous routes and serve the largest segments of U.S. trade with Mexico and Canada. Construction/connection of this roadway will certainly increase the potential for trade/freight traffic in the Houston area.

Interstate 69 is the combination of two federally designated High Priority Corridors. Corridor 18 extends from Michigan and Illinois south through Indiana, Kentucky, Tennessee, Mississippi, Arkansas and Louisiana, and terminates at the termini of U.S. 77 and U.S. 281 in the Rio Grande Valley. Corridor 20 is designated as U.S. 59 from Texarkana through Houston and continuing to Laredo. The I-69 corridor states and the states using I-69 and its border crossing ports account for nearly 63 percent of total U.S. truck-borne trade within North America. No other highway comes close to matching I-69 for trade volume and service efficiency. Other facts include:

- I-69 border crossing ports from Laredo to Brownsville handle 49 percent of total U.S. truck-borne trade with Mexico
- I-69 border crossings in Michigan handle nearly 47 percent of U.S. truck-borne trade with Canada
- I-69 corridor states account for 51 percent of U.S. truck-borne trade with Mexico
- 22 of the nation's top 25 seaports are directly connected to I-69
- 16 of the nation's top air cargo airports are readily accessible by I-69

SECTION 6: ADDITIONAL AREAS TO ADDRESS IN SUBSEQUENT FREIGHT-RELATED RESEARCH/PLANNING EFFORTS

- Expand the study area to include an area larger than the Houston-Galveston region
- Consider establishing a freight-related Transportation Improvement Program
- Consider implementing a Freight Steering Committee
- Glean insights from the Harris County Rail Study, once completed
- Explore opportunities to consolidate rail facilities
- Follow up on the Quick Response Initiative by developing medium- and long-range recommendations