Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
TX-99/2994-2F		

4. Title and Subtitle	5. Report Date
PROJECT SUMMARY: THE VALUE OF TEXAS PORTS	April 1997
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
Zane A. Goff, William F. McFarland, Billy Edge, John Basilotto, and Sara Graalum	Research Report 2994-2F

9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Texas Transportation Institute The Texas A&M University System College Station, Texas 77843-3135 and The University of Texas at San Antonio San Antonio, TX 78249	
	11. Contract or Grant No. Study No. 7-2994

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
Texas Department of Transportation Research and Technology Transfer Office P. O. Box 5080 Austin, Texas 78763-5080	Final: July 1996-December 1996

15. Supplementary Notes	14. Sponsoring Agency Code
Research performed in cooperation with the Texas Department of Transportation and the Texas Port Association Research Study Title: Identify and Assess the Collective Contribution (Value) of Texas Ports to Texas and the Nation	

16. Abstract

The foremost objective of this project is to demonstrate the importance of the ports in the State of Texas to the economy of the state and the nation. Traditionally, the economic value of the state's ports has focused upon the economic impact to the region or a small sector of the state. Seldom has the full interior regions of the state been considered when evaluating the economic impact of the ports.

Moreover, the assessment will provide information including data, analyses, and findings that may be used by TxDOT in developing a statewide port planning assistance program. In fulfilling these objectives, the study synthesizes the information which has been collected and analyzed to develop regional benefits of the state's ports. Where these data are absent, additional data have been obtained from the port and the region as appropriate to extend the regional impacts to the state.

17. Key Words	18. Distribution Statement
Economics, Impact, Employment, Income, Sales, Ports, Value, Seaports, Intermodal, NAFTA	No restrictions. This document is available to the public through NTIS: National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161

19. Security Classif.(of this report)	20. Security Classif.(of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	34	

PROJECT SUMMARY:
THE VALUE OF TEXAS PORTS

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Research Report 2994-2F
Research Study Number 7-2994
Research Study Title: Intentify and Assess
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Sponsored by
Texas Department of Transportation
In cooperation with the
Texas Port Association

April 1997

TEXAS TRANSPORTATION INSTITUTE
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IMPLEMENTATION STATEMENT

The regional importance of the Texas ports has been documented in other studies for several of the ports in the state, but the regional studies have not been extended to include the entire state. Therefore, this economic impact study includes statewide aspects for the collective Texas ports to help demonstrate the economic value of the ports to the entire state.

The findings of this research can be implemented when making policy decisions concerning Texas ports and intermodal connections and when providing public information on Texas ports. The results will be useful in educating the public, media, industry, and government entities of the importance of the state's ports to the economy of Texas. The findings can also be implemented when providing information on a national scale about economic importance of the Texas ports.

DISCLAIMER

The contents of this report reflect the views of the authors who are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the official views or policies of the Texas Department of Transportation or the Texas Ports Association. This report does not constitute a standard, specification, or regulation.

ACKNOWLEDGEMENT

This project was sponsored jointly by the Texas Department of Transportation and the Texas Ports Association. Ms. Joann Riester, TxDOT, served as Project Director, while Mr. James Randall, also of TxDOT, was the Research Program Coordinator. Their outstanding cooperation and sincere interest in this project is deeply appreciated.

Mr. John LaRue, Executive Director of the Port of Corpus Christi Authority and President of the Texas Ports Association, Mr. Les Sutton, Hollywood Marine, and Mr. Neil McLellan, U.S. Army Corps of Engineers, also offered thoughtful insights in addressing the problems broached by this study. Their able assistance in gathering needed information was extremely helpful.

Also, much gratitude is due Dr. Steven Fuller, Professor of Agricultural Economics at Texas A&M University, and Mr. Robert Seinkiewicz, U.S. DOT-Maritime Administration, for assistance well beyond what was asked.

Finally, this study could not have been done without the cooperation and information provided by:

Mr. Ernest Connor, General Manager, Port of Galveston
Mr. Robert C. Cornelison, Port Director, Port Isabel-San Benito Navigation District
Mr. Ben M. Goldstein, Port Director, Port of Port Arthur
Mr. H. Thomas Kornegay, Port Director, Port of Houston Authority
Mr. C. James Kruse, Port Director, Port of Brownsville
Mr. Bill G. Masters, Port Director, Port of Beaumont
Mr. W.G. Palmer, Port Director, Port of Harlingen Authority
Mr. A.J. Reixach, Jr., Port Director, Brazos River Harbor Navigation District
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Mr. Harlan W. Ritter, President and Port Director, Port of Texas City
Mr. Robert H. Van Borssum, Port Director, Port of Port Lavaca-Point Comfort
Mr. Michael G. Wilson, Port Director, Willacy County Navigation District

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SUMMARY

This report assesses the economic impacts of Texas ports to the state and the nation, and also assesses the economic impacts of port growth due to increased trade associated with the North American Free Trade Agreement (NAFTA). These economic impacts of ports are measured in terms of employment, personal income, business sales, and local, state, and federal taxes.

CHAPTER 1
INTRODUCTION

The U.S. port system is an essential component not only in our national transportation and defense systems, but is also a significant contributor to our national economy. Ports act as economic catalysts in the region in which they are located. They generate jobs, income, revenue, and taxes by providing services that move the waterborne cargo either into the hinterlands or from the hinterlands onto the waterways. The shipping and receiving industries, in turn, make investments that generate more jobs, income, revenues, and taxes (U.S. Maritime Administration, 1994). A recent U.S. Maritime Administration study (1996) revealed that U.S. ports

- handled over 2.2 billion tons[1] of cargo (1994),
- handled over 1 billion tons of foreign trade valued at $565.7 billion (1994), and
- handled 95% of U.S. waterborne foreign trade tonnage (1995).

In turn, this activity stimulated the following economic impacts in 1994:

- 15.9 million jobs,
- $515.1 billion in personal income,
- $1.6 trillion in business sales,
- $783.3 billion to the nation's Gross Domestic Product (GDP) or 12% of the nation's Gross Domestic Product, and
- $210.1 billion in local, state, and federal taxes.

This implies that, on the average, 7,179 jobs are supported by one million tons of cargo, $233 in personal income is supported by one ton of cargo, and $733 in business sales is associated with one ton of cargo, all of which results in $96 in taxes collected per one ton of cargo. Of course, these are merely averages, and outcomes will differ significantly from port to port, depending significantly on cargo mix.

[1] Throughout this report, a ton will refer to the English unit of 2,000 pounds.

The water transportation mode is so efficient and safe that it goes unnoticed. In terms of labor productivity, the water mode is over 23% more productive than rail, and 1,250% more productive than trucking.[2] This means that there are 162,000 water transportation employees, 250,000 rail employees, and over 1.5 million trucking employees in the United States. In terms of energy used per ton-mile, barge transportation is again the most efficient. Barge is 48% more energy efficient than rail and over 990% more energy efficient than trucking (Hardebeck et al., 1996; Davis, 1995). Water transportation is also safe in terms of deaths per ton-mile: it is over 160% safer than rail and over 21,000% safer than trucking.[3]

1.1 OVERVIEW OF TEXAS PORTS

In Texas, there are 12 deep-draft ports, each of which is directly accessible to the Gulf of Mexico, and there are 15 shallow-draft ports or port districts in the state.

Table 1.1 Deep-draft and Shallow-draft Ports in Texas

Deep-draft Ports		Shallow-draft Ports	
Beaumont	Orange	Anahuac	Port Aransas
Brownsville	Port Arthur	Aransas Pass	Port Mansfield
Corpus Christi	Port Isabel	Bay City	Port O'Connor
Freeport	Port Lavaca-Pt.Comfort	Fulton	Rockport
Galveston	Sabine Pass Harbor	Harlingen	Seadrift
Houston	Texas City	Ingleside	Sweeney
		Liberty	Victoria
		Palacios	

Additionally, there are many more docking facilities along the Texas portion of the Gulf Intracoastal Waterway (GIWW).

For 1994, Texas had six ports that ranked in the top 50 U.S. ports in terms of tonnage: Houston (2nd), Corpus Christi (6th), Port Arthur (14th), Texas City (16th), Beaumont (30th), and Freeport (36th). Also for the same year, two Texas ports, Houston and Galveston, ranked 9th and 24th, respectively, in containerized cargo (U.S. Maritime Administration, 1996). This is a spectacular performance, especially when one considers that in 1994 the top 50 U.S. ports accounted for over 89% of all port tonnage, and that the top 25 container ports handled over 97% of all U.S. container units.

Texas ports averaged about 350 million tons of cargo annually for the years 1990-94, and from 1989-94, Texas port tonnage grew at almost a 3% annual rate, while U.S. GDP grew at a 2%

[2] Figures derived from tables contained in reference U.S. Dept. of Commerce, 1996 on the basis of tons per employee.
[3] Ibid

annual rate. The almost 380 million tons going through Texas ports in 1994 represents over 17% of the total U.S. port tonnage.

Table 1.2 Cargo Tonnage of Texas Ports, 1989-94

Year	Tonnage (Millions)	Annual Change
1989	329.5	
1990	330.8	0.4%
1991	326.8	-1.2%
1992	338.8	3.7%
1993	356.5	5.2%
1994	378.9	6.3%
5-Year Avg. *	346.4	2.8%

* compound rate

Table 1.3 Major Exports of Texas Ports, 1994

Product	Tons (Million)	Portion of total exports
Chemicals & related products	13.3	30%
Petroleum & related products	12.7	29%
Agricultural products	12.6	29%
Manufactured equipment	1.2	3%
Forest products	0.6	1%
Total top 5 products	40.4	92%
Total exports	43.9	

The Texas ports exported almost 44 million tons of cargo in 1994. However, these exports consisted of essentially five products: chemicals, petroleum, agricultural, manufactured equipment, and forest products. According to Table 1.3, these products accounted for 92% of all Texas exports for 1994.

Table 1.4 depicts the import cargo of Texas ports. In 1994, Texas ports imported over 187 million tons of cargo. Petroleum and related products accounted for 86% of these imports, followed by iron/steel and chemicals at 2% each, sand and gravel at 1%, and agricultural-related products at 1%. These five products accounted for 93% of total imports by Texas ports.

Table 1.4 Major Imports of Texas Ports, 1994

Product	Tons (Million)	Portion of total imports
Petroleum & related products	161.2	86%
Iron and steel	4.6	2%
Chemicals & related products	4.2	2%
Sand & gravel	2.2	1%
Agricultural products	1.7	1%
Total top 5 products	173.9	93%
Total imports	187.1	

Additionally, domestic movement (movement between U.S. ports) of nearly 148 million tons of cargo went through Texas ports in 1994.

The ports of Texas have achieved these impressive figures and concomitant rankings with very little governmental assistance. On the other hand, competitors of the Texas ports–the ports located in Louisiana, Mississippi, and Alabama–obtain subsidies from their respective states for a variety of revenue generating capital improvement projects. Louisiana, for example, provides funding to develop new projects, giving Louisiana ports a competitive advantage over Texas ports in attracting new business.

The problem of obtaining capital will continue to worsen. Environmentally related regulations and laws, such as those imposed by the Texas Parks and Wildlife Department, the Texas General Land Office, the Texas Natural Resource Conservation Commission, the U.S. Clean Air Act, the U.S. Endangered Species Act, and the U.S. Oil Pollution Act will increase port expenses without generating revenues. In addition, Texas ports also need to have their own channels dredged (Boske and Harrison, 1995b).

Reductions in funding for the U.S. Army Corps of Engineers have persisted for the last several years and will continue to be reduced by 15% over the next four years. This presents a serious impediment to the operation, maintenance, and improvement of the GIWW. Since the GIWW provides Texas ports with needed access to the inland waterway system, these federal cutbacks threaten to further diminish the financial capacity of Texas ports.

Strengthening the relationship with the state would benefit Texas ports in many ways. One of the benefits to the ports would be increasing the borrowing capacity of the ports for infrastructure improvements. Currently, several small ports have difficulty obtaining funds for infrastructure development and improvements. A closer alliance with the state would reduce this difficulty.

One of the ways to develop a stronger relationship between the Texas ports and the state's stakeholders is to identify the direct, indirect, and induced economic impacts to the stakeholders and the state. The regional importance of the ports has been documented for several of the ports in the state, but the regional studies have not been extended to include the entire state. Therefore, this economic impact study includes statewide aspects for the collective ports to help demonstrate the economic value of the ports to the entire state.

As trade progresses due to NAFTA, important trading relationships with Mexico and Latin American countries are poised to flourish. Successful relationships, however, will be a result of appropriately applied investments that are predicated upon economic studies fully demonstrating the value or benefits to be derived from such investments.

1.2 STUDY OBJECTIVES

There are two objectives of this study: (1) to assess the economic impacts of Texas ports to the state and the nation, and (2) to assess the economic impacts of port growth due to increased trade associated with NAFTA.

The economic impacts of ports are measured in terms of employment, personal income, business sales, and local, state, and federal taxes.

1.3 ORGANIZATION OF REPORT

Chapter Two presents an estimation of employment, business sales, and taxes attributable to Texas ports, and Chapter Three summarizes and concludes this report.

CHAPTER 2
ECONOMIC IMPACTS OF TEXAS PORTS

Economic impacts of the Texas ports are estimated in this chapter. Section 2.1 presents definitions of the port industry, port users, and port capital spending. Section 2.2 estimates the employment, personal income, business sales, and taxes due to Texas ports. Section 2.3 provides an estimate of these impacts on the non-coastal areas of the state, in terms of the value of goods exported and imported. Section 2.4 shows the value of goods to the nation. Section 2.5 concludes this chapter and provides an estimate of the economic impacts due to NAFTA.

2.1 DEFINITIONS

The analysis of economic impacts is concerned with three groups that comprise the port system: the port industry, port users, and port capital spending. The port industry is concerned with the movement of cargo through the port. This includes those services that enable the cargo to be moved from its point of origin to the vessel or from the vessel to its destination. These services are the following:

- Inland transportation: railways, trucking firms, barge firms, or pipeline firms;
- Navigational services;
- Governmental agencies;
- Chandlers;
- Suppliers of bunkers;
- Minor ship/boat repair services;
- Stevedoring firms;
- Longshoremen;
- Equipment rental services;
- Container services;
- Terminal operators;
- Storage and warehouse services;
- Wharfage and drayage operations;

- Export packing operations;
- Agency operations;
- Freight forwarders;
- Custom house brokers;
- Crew services;
- Banking and insurance services; and
- Other professional services.

Port users, on the other hand, are not directly required to move goods through the port. They include

- shipbuilding and major repair services,
- shipping companies,
- government installations (e.g., Coast Guard),
- industries dependent on the port in the sense that the port's existence was a major factor in the firm's location decision.

Thus, enterprises that are physically located at the port would qualify. For example, export-oriented shippers located within the port study area, such as wood products industries, agricultural product industries, coal and other mineral products, and manufacturing industries, would qualify as port users. Importers such as petroleum refiners and others whose economic activity is closely tied to the port would qualify as well; however, consumer goods importers, such as department store chains, are not dependent industries because they are likely to have a national distribution system and not be located within the port county due to the port.

Port capital spending is primarily concerned with new port construction, enlargement, or rehabilitation projects, all of which would involve local area construction firms and their employees who work on the various port-related projects.

2.2 ECONOMIC IMPACTS OF TEXAS PORTS

This section provides an estimate of the total employment, personal income, business sales, local, state, and federal taxes attributable to Texas ports. These estimates are dichotomized by component of the port system (i.e., port industry, port user, port capital spending), as well

as the type of effect each component contributes to the economic impact (i.e., direct, indirect, induced).

Table 2.1 shows the employment attributable to Texas ports in 1994. Nearly 1 million (942,883) people in Texas could attribute their employment to the Texas ports. The port industry directly contributed 29,372 jobs to Texans, and the indirect and induced effects of the port industry contributed another 23,514 for a total of over 52,000 jobs due to the port industry. Port users produced 133,343 jobs and 755,116 indirect and induced jobs, resulting in 888,459 jobs for Texas that were attributed to Texas port users, while port capital spending accounted for 880 direct jobs and 1,539 jobs in total.

Table 2.1 Employment Attributable to Texas Ports, 1994

	Direct	Indirect and Induced	Total
Port Industry	29,372	23,514	52,885
Port Users	133,343	755,116	888,459
Port Capital Spending	880	658	1,539
Totals	163,595	779,288	942,883

The 942,883 people employed earned over $30 billion in 1994, according to Table 2.2. This is an average of over $32,000 per year, over 20% more than the average Texan for 1994. The port industry directly earned $806.5 million, and $880.4 million was earned from jobs that were a result of indirect and induced employment.

Table 2.2 Personal Income (in $ Millions) Attributable to Texas Ports, 1994

	Direct	Indirect and Induced	Total
Port Industry	806.5	880.4	1,687.0
Port Users	5,730.3	22,744.8	28,475.1
Port Capital Spending	15.4	19.1	34.5
Totals	6,552.2	23,644.3	30,196.6

Port users' employees directly earned over $5.7 billion; an additional $22.7 billion of personal income was the result of indirect and induced employment. Capital spending at the Texas ports provided construction workers $15.4 million in direct earnings; indirect and induced earnings were $19.1 million due to this activity.

Table 2.3 presents the business sales attributed to Texas ports in 1994. Direct business sales were over $68 billion. Of this amount, the port industry contributed over $2 billion, while port users and direct capital spending at Texas ports contributed $66.6 billion and $39.3 million of direct business sales, respectively. Total indirect and induced business sales from the port system was over $109 billion, and when added to the direct effects, business sales totaled over $178 billion in 1994.

Table 2.3 Business Sales (in $ Millions) Attributable to Texas Ports, 1994

	Direct	Indirect and Induced	Total
Port Industry	2,176.0	4,502.6	6,678.7
Port Users	66,564.7	104,647.8	171,212.5
Port Capital Spending	39.3	90.4	129.7
Totals	68,780.0	109,240.8	178,020.9

The Texas Input-Output Model estimates Gross State Product (GSP) at 48.96% of total business sales. Hence, the total contribution of Texas ports to the Texas GSP was $87.2 billion or 18.6% of the Texas GSP in 1994.

Table 2.4 Local Taxes (in $ Millions) Attributable to Texas Ports, 1994

	Direct	Indirect and Induced	Total
Port Industry	25.2	52.2	77.4
Port Users	772.3	1,214.0	1,986.3
Port Capital Spending	0.3	1.2	1.5
Totals	797.8	1,267.4	2,065.2

Table 2.4 reveals that the Texas port system contributed over $2 billion in local taxes to the coastal county economies of Texas in 1994. Almost $0.8 billion was estimated to be direct effects, and over $1.2 billion was estimated to be due to indirect and induced effects.

Table 2.5 shows that the Texas ports also contributed over $2.8 billion in state taxes– $1.1 billion directly and over $1.7 billion due to indirect and induced effects. Adapting data

provided by the U.S. Bureau of Census[4] (1995), the nearly $2.9 billion in state taxes attributable to Texas ports in 1994 supported approximately 18,400 jobs in the state of Texas at an average annual wage of almost $30,000.

Table 2.5 State Taxes (in $ Millions)
Attributable to Texas Ports, 1994

	Direct	Indirect and Induced	Total
Port Industry	35.1	72.5	107.6
Port Users	1,071.7	1,684.8	2,756.6
Port Capital Spending	0.5	1.5	2.0
Totals	1,107.3	1,758.8	2,866.2

The federal taxes attributed to Texas ports are shown in Table 2.6. The direct, indirect, and induced contributions of Texas ports were over $9 billion in federal taxes in 1994. According to the U.S. Bureau of Census (1995), $1 million of receipts supported 1.7828 federal jobs in 1994, and 7.35% of total receipts went for wages of federal employees. Using these statistics, the federal jobs generated by the federal taxes attributed to Texas ports would have been 16,536 with a combined personal income of $681.7 million or $41,225 annual personal income per job, which is over 50% more than the average Texan earned in 1994.

Table 2.6 Federal Taxes (in $ Millions)
Attributable to Texas Ports, 1994

	Direct	Indirect and Induced	Total
Port Industry	113.4	234.6	348.0
Port Users	3,468.1	5,452.2	8,920.3
Port Capital Spending	2.0	4.9	6.8
Totals	3,583.5	5,691.7	9,275.1

In total, the Texas ports were responsible for generating over $14 billion in local, state, and federal taxes.

Table 2.7 presents a summary of the economic impacts of Texas ports on a tonnage basis. In 1994, the total jobs attributed to Texas ports was 2,507 per million tons. Personal income due to Texas ports amounted to $81 per ton, while business sales due to Texas port activities were $473 per ton. The total taxes were $38 per ton.

4 Approximately 24% of Texas revenues go to wages and benefits; fringe benefits are about 25% of wages

Table 2.7 Summary of Economic Impacts of Texas Ports-Tonnage Basis

Category	Total effects
Jobs per million tons:	2,507
Personal income $ per ton:	81
Business sales $ per ton:	473
Federal, state, local taxes $ per ton:	38

2.3 VALUE OF TEXAS PORTS TO NON-COASTAL TEXAS

It is an extremely difficult task to gage the economic impacts, in terms of employment, personal income, business sales, and taxes, on non-coastal areas of Texas. First and foremost, the input-output multipliers do not give geographic information other than that they are applicable to the state of Texas. We can assume, with a certain amount of confidence, that the majority of the direct economic effects are within the county where the ports are located, but the indirect and induced effects may or may not include the non-coastal areas. However, we can demonstrate that the Texas ports have an economic effect on the other communities of Texas by estimating the value of goods that are imported to and from these communities, as well as naming the communities themselves.

There is a misconception among many Texans that the ports just benefit the coastal region of Texas. As Table 2.8 points out, over 30 cities located in the non-coastal regions[5] of Texas imported goods valued at almost $580 million. Dallas received over $280 million of goods via Texas ports, followed by Laredo at almost $100 million, and San Antonio at over $90 million.

Table 2.9 shows that 48 non-coastal Texas cities exported over $3.1 billion worth of goods via the Texas ports in 1995. The leading export cities were: Three Rivers with over $1.6 billion, Dallas with almost $1.1 billion, Lufkin with about $55 million, and Texarkana with almost $50 million. The value of exports from non-coastal cities are over five times the value of imports.

The trade passing through Texas ports affects 67 non-coastal cities in Texas[6] and encompasses all regions of Texas. Trade via Texas ports goes from El Paso in West Texas to Bon Wier in East Texas, as far north as Borger in the Panhandle and Wichita Falls in North Texas, to Austin in Central Texas and Laredo in South Texas. Total trade affecting the non-coastal regions of Texas via the Texas ports in 1995 amounted to almost $3.7 billion.

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[5] The coastal region is defined in this report to be the county of the port plus one county west of the port.

[6] The 67 cities consist of the cities listed on Tables 2.8 and 2.9; however, some cities both import and export and are on both lists.

Table 2.8 Value of Goods Imported Via Texas Ports by Non-Coastal Texas Cities, 1995

Non-Coastal Texas City	Value in $Millions	Non-Coastal Texas City	Value in $Millions
Dallas	280.48	Subtotal	570.26
Laredo	99.89	Sunnyvale	1.99
San Antonio	90.22	Jacksonville	1.83
El Paso	18.88	Hempstead	1.66
Ft. Worth	14.19	Palestine	1.03
Irving	13.24	Crockett	1.00
Carrollton	11.28	Waco	0.80
Grapevine	9.50	Nacogdoches	0.48
Bellaire	7.00	Ballinger	0.35
Round Rock	5.35	Tyler	0.08
Longview	5.27	Greenville	0.03
Austin	4.55	Center	0.01
Brownwood	4.28	Hearne	0.01
Wylie	3.52	Other cities*	0.01
Wichita Falls	2.61		
Subtotal	570.26	Total	579.82

*Bon Wier, Hamilton, Clifton, Pineland

Table 2.9 Value of Goods Exported Via Texas Ports by Non-Coastal Texas Cities, 1995

Non-Coastal Texas City	Value in $Millions	Non-Coastal Texas City	Value in $Millions
Three Rivers	1,631.20	Subtotal	3,071.81
Dallas	1,096.30	Laredo	2.95
Lufkin	54.71	Corrigan	2.78
Texarkana	49.96	Wimberley	2.20
Plano	31.79	Richardson	2.03
Lubbock	27.89	Corsicana	1.99
Arlington	22.43	Camden	1.89
El Paso	19.99	Midlothian	1.67
Irving	17.11	New Waverly	1.48
San Antonio	16.34	Mineral Wells	1.43
Gorman	13.66	Pineland	1.39
Odessa	12.21	Shamrock	1.35
Jasper	10.98	Mason	1.19
Red Oak	8.61	Nacagdoches	1.19
Ft. Worth	7.70	Kaufman	1.15
Diboll	6.85	Monroe	1.07
Plainview	6.44	Hereford	1.05
Llano	6.35	Bon Wier	0.75
Austin	5.54	Borger	0.67
Garland	4.80	Wichita Falls	0.67
Catarina	4.52	Palestine	0.60
Lone Star	4.34	Brady	0.56
Abilene	4.21	Gonzales	0.33
Grapevine	3.99	Kosse	0.16
Caldwell	3.89		
	3,071.81	Total	3,102.39

2.4 VALUE OF TEXAS PORTS TO THE NATION

The same approach used in Section 2.3 was employed to determine the value of Texas ports to the nation. The Texas ports have a trade relationship with all states of the United States, except Alaska and Nebraska, as well as the District of Columbia.

The value of goods imported by states other than Texas is displayed in Table 2.10. Almost $4.2 billion of goods from Texas ports were imported by states other than Texas in 1995. Leading state importers via Texas ports were: New York, $843.8 million; California, $416.5 million; Illinois, $399.9 million; Maryland, $264.0 million; and, Connecticut, $252.3 million.

Table 2.10 Value of Goods Imported Via Texas Ports by the Nation, 1995

State	Value in $Millions	State	Value in $Millions
New York	843.8	Subtotal	4,046.0
California	416.5	Tennessee	25.0
Illinois	399.9	Oregon	23.0
Maryland	264.0	Utah	15.5
Connecticut	252.3	Virginia	12.0
Michigan	243.7	Indiana	11.3
New Jersey	242.8	Nevada	10.5
Missouri	201.3	New Mexico	10.3
Florida	192.4	Mississippi	9.3
Ohio	183.6	Delaware	7.9
Pennsylvania	152.0	Hawaii	5.1
Louisiana	109.1	Alabama	4.1
Colorado	83.0	West Virginia	3.6
Oklahoma	77.9	New Hampshire	3.3
Wisconsin	48.5	Kentucky	3.1
Massachusetts	45.9	Wyoming	2.1
Washington	45.9	Vermont	2.0
North Carolina	45.4	Iowa	1.2
Kansas	38.9	Rhode Island	0.3
South Carolina	35.2	Maine	0.2
Georgia	34.1	South Dakota	0.2
Arkansas	30.7	District of Columbia	0.1
Arizona	29.6	Idaho	0.1
Minnesota	29.5		
Subtotal	4,046.0	Total	4,196.4

The export value of goods from states other than Texas via the Texas ports was almost $10.1 billion in 1995. The top 5 states were: New York, $1.154 billion; California, $1.139 billion; New Jersey, $962 million; Ohio, $680 million; and, Pennsylvania, $651 million. Over $14.2 billion in total trade with states other than Texas was accomplished via the Texas ports.

Table 2.11 Value of Goods Exported Via Texas Ports by the Nation, 1995

State	Value in $Millions	State	Value in $Millions
New York	1,153.5	Subtotal	9,491.0
California	1,138.5	Arizona	77.0
New Jersey	961.9	Mississippi	71.7
Ohio	679.7	District of Columbia	67.9
Pennsylvania	651.1	Indiana	64.1
Tennessee	536.1	Alabama	47.1
Illinois	514.0	Maryland	45.4
Connecticut	481.3	Nevada	43.7
Florida	468.8	Oregon	43.0
Oklahoma	403.4	Iowa	39.8
Louisiana	375.1	North Carolina	31.8
Missouri	320.5	Utah	14.4
Delaware	269.0	New Mexico	12.9
Arkansas	259.3	South Carolina	11.4
Kansas	215.7	Kentucky	10.4
Georgia	172.9	Idaho	9.7
Minnesota	156.4	Rhode Island	5.0
Washington	153.8	Hawaii	3.0
Michigan	140.2	Montana	1.3
Colorado	136.4	Wyoming	0.9
Wisconsin	133.9	North Dakota	0.7
Virginia	86.2	Maine	0.4
Massachusetts	83.6		
Subtotal	9,491.0	Total	10,092.4

2.5 ECONOMIC IMPACTS OF TEXAS PORTS DUE TO NAFTA TRADE

From 1986 to 1994, the value of U.S. exports to Mexico grew at a compound annual rate of 17.45%, in real dollar terms; imports from Mexico grew at a compound real annual rate of 11.33% over this same period. However, the value of trade exported to Mexico via sea and waterways was only 4.1% of total export trade. In contrast, the value of imports from Mexico by water was over three times the export rate--13.2% (Boske and Harrison, 1995a).

Table 2.12 shows the projected tonnage attributable to Mexican NAFTA trade at Texas ports for the years 1994-2004. As reported by Boske and Harrison (1995a), the value of Texas exports to Mexico was $17.389 million in 1992, while the value of imports from Mexico to Texas amounted to $12.838 million. In constructing Table 2.12, the following is assumed:

- Texas export and import growth rate in value replicated the U.S. rates of 17.45% and 11.33%, respectively.
- Texas export and imports percentage via water is the same as the U.S. at 4.1% and 13.1%, respectively.
- Value of export and import tonnage for Texas ports is estimated by Port of Houston experience in 1995 of $660 per export-ton and $263 per import-ton.

Table 2.12 projects that tonnage due to NAFTA will grow from 10.72 million in 1995 to 30.49 million in 2004.

Table 2.12 Tonnage at Texas Ports Due to NAFTA, 1994-2004

Year	Export Value ($Billions)	Import Value ($Billions)	Exports via Water ($Billions)	Imports via Water ($Billions)	Estimated NAFTA Total Tonnage (Millions)
1992	17.389	12.838			
1993	20	14			
1994	23	16			
1995	27	18	1	2	10.72
1996	32	20	1	3	12.03
1997	38	22	2	3	13.41
1998	45	24	2	3	14.85
1999	53	27	2	4	16.85
2000	62	30	3	4	18.92
2001	73	33	3	4	21.11
2002	86	37	4	5	23.92
2003	101	41	4	5	26.87
2004	119	46	5	6	30.49

Table 2.13 projects the economic impacts on Texas attributable to NAFTA trade via Texas ports. The table was constructed based on the tonnage data contained in Table 2.12 and on the impact per ton summary of Table 2.7. According to the table, employment attributable to NAFTA trade via Texas ports will increase from almost 27,000 in 1995 to over 76,000 in 2004. Personal income will increase from almost $900 million in 1995 to over $2.4 billion in 2004, while business sales will increase from $5.1 billion to over $14.4 billion for the same period. Total taxes will increase from over $400 million to almost $1.2 billion for the 1995-2004 period.

Table 2.13 Projected Economic Impacts of NAFTA Via Texas Ports

Year	Employment	Personal Income ($Millions)	Business Sales ($Millions)	Total Taxes ($Millions)
1995	26,870	868	5,070	407
1996	30,167	975	5,692	457
1997	33,619	1,086	6,343	510
1998	37,227	1,203	7,024	564
1999	42,250	1,365	7,971	640
2000	47,429	1,532	8,949	719
2001	52,919	1,710	9,984	802
2002	59,980	1,938	11,316	909
2003	67,352	2,176	12,707	1,021
2004	76,450	2,470	14,424	1,159

CHAPTER 3
SUMMARY AND CONCLUSIONS

3.1 STATE IMPACTS

Texas ports are a valuable economic resource for the state, as well as the nation. The Texas port system acts as an economic catalyst. Collectively, the Texas ports contribute significantly to Texas in employment, personal income, business sales, Gross State Product (GSP), and in generating local, state, and federal taxes.

In 1994, almost one million Texans were employed due to the ports of Texas. Over 163,000 jobs were due to the direct activities of the Texas ports, while almost 780,000 jobs were due to indirect and induced expenditures. These Texan job holders earned over $30 billion dollars, or approximately $32,000 per year. This is approximately 20% higher earnings than the average Texan. The direct effects of the Texas ports on business sales exceeded $68 billion, while the indirect and induced effects added over $109 billion. Texas ports contributed, directly and indirectly, almost 19% to Texas GSP in 1994. Activities related to Texas ports contributed over $2 billion in local taxes and almost $3 billion in state taxes, which supported approximately 18,400 state employees.

In addition, the economic impacts of Texas ports are felt beyond the Texas coastal area. Over 30 non-coastal Texas cities received goods valued at almost $580 million via Texas ports in 1995, while 48 non-coastal Texas cities exported over $3.1 billion via Texas ports.[7] The total trade affecting the non-coastal areas of Texas via the Texas ports in 1995 amounted to almost $3.7 billion.

3.2 NATIONAL IMPACTS

The nation as a whole also benefits from using Texas ports. In 1995, almost $4.2 billion of imports to other states went through Texas ports. Over $10 billion of exported goods from other states came through Texas ports. Over $14.2 billion in total trade with states other than Texas was accomplished via the Texas ports in 1995.

The Texas ports also facilitate the contributions of NAFTA to the Texas economy. Through Texas ports, NAFTA is projected to contribute over 76,000 jobs in 2004, with personal

[7] The total number of different citites affected by trade in 1995 was 67, since some importing cities were also exporting cities.

income of almost $2.5 billion, business sales of over $14 billion, and total taxes of almost $1.2 billion.

The nation benefits from the Texas ports in other ways:

- Texas ports provide efficient access to Mexican and South American markets for business firms located in other states.
- The Texas port system generates over $9 billion in federal taxes.
- Over 16,500 federal jobs are supported by federal taxes generated by the Texas port system.
- Average annual wage of federal job holders supported by Texas port federal taxes is over $41,000.

REFERENCES

Boske, L.B. and Robert Harrison. "U.S.-Mexico Trade and Transportation Corridors, Logistics, Practices and Multimodal Partnerships," LBJ School of Public Affairs, University of Texas at Austin, Policy Research Project Report, Number 113, Austin, TX, 1995a.

_____. "The Texas Seaport and Inland Waterway System," LBJ School of Public Affairs, University of Texas at Austin, Policy Research Project Report, Number 114, Austin, TX, 1995b.

Davis, Stacy C. Transportation Energy Data Book: Edition 15, Oak Ridge National Laboratory, Oak Ridge, TN, 1995.

Hardebeck, Suzanne and John Basilotto. "Economic Impact of Barge Transportation on the Texas Portion of the Gulf Intracoastal Waterway (GIWW) and Extension of the GIWW Into Mexico," Research Report 2993-1 (Draft), Center for Ports and Waterways, Texas Transportation Institute, College Station, TX, and the University of Texas at Brownsville, 1996.

U.S. Maritime Administration. "Public Port Financing in the United States," Office of Port and Intermodal Development, U.S. Department of Transportation, Washington, D.C., 1994, pp. 146.

_____. "A Report to Congress on the Status of the Public Ports of the United States," Draft Report , Office of Port and Intermodal Development, U.S. Department of Transportation, Washington, D.C., 1996, pp. 68.