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List of Acronyms

AAPA	American Association of Port Authorities
AAR	Association of American Railroads
APL	American President Lines
ATSF	Atchison, Topeka, and Santa Fe Railway Company
BN	Burlington Northern Railroad Company
BNA	Burlington Northern America
CCTA	Corpus Christi Terminal Association
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (or Superfund)
CMC	Customs Management Centers
CMP	Coastal Management Programs
COFC	Container-on-flatcar
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DMA	Texas Dredge Materials Act
DWT	Dead weight ton
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FM	Farm-to-market road
FNM	Mexican National Railways (Ferrocarriles Nacionales de México)
FTZ	Foreign Trade Zone
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GIWW	Gulf Intracoastal Waterway
GRI	Galveston Railway
HMTF	Harbor Maintenance Trust Fund
I	Interstate Highway
ICC	Interstate Commerce Commission
ILA	International Longshoreman's Association
IPA	Integral Port Administrations (in Mexico)
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
KCS	Kansas City Southern Railway Company
MLB	Minilandbridge
MPO	Metropolitan Planning Organization
MPRSA	Marine Protection, Research and Sanctuaries Act

NAFTA	North American Free Trade Agreement
NEPA	National Environmental Policy Act
NHS	National Highway System
OECD	Organization for Economic Cooperation and Development
OPA 90	Oil Pollution Act of 1990
PBI	Protexa Burlington International
PL480	Agricultural Trade Development and Assistance Act of 1954 (Public Law 480)
RM	Ranch-to-market road
RO/RO	Roll on-Roll off
SCT	Secretariat of Communications and Transportation (Secretaría de Comunicaciones y Transportes)
SH	State Highway
SP	Southern Pacific Lines
TACA	Trans-Atlantic Carrier Agreement
TEU	Twenty-foot-equivalent container unit
TMM	Transportacion Maritima Mexicana
TNRCC	Texas Natural Resource Conservation Commission
TOFC	Trailer-on-flatcar
TPWD	Texas Parks and Wildlife Department
TTI	Texas Transportation Institute
TxDOT	Texas Department of Transportation
UP	Union Pacific Railroad Company
USCS	United States Customs Service
USDOT	United States Department of Transportation
VEDC	Victoria County Economic Development Corporation
VMT	Vehicle miles traveled
VO-MTO	Major vessel operating-multimodal transport operator

Foreword

The Lyndon B. Johnson School of Public Affairs has established interdisciplinary research on policy problems as the core of its educational program. A major part of this program is the nine-month policy research project, in the course of which two or three faculty direct the research of graduate students of diverse backgrounds on a public policy issue of concern to a government agency. This "client orientation" brings students face-to-face with administrators, legislators, and other officials active in the policy process and demonstrates the occasional difficulties of relating research findings to the world of political realities.

This report is the product of a policy research project conducted in the 1994-95 academic year with funding from the Texas Department of Transportation. The study is part of a two-year project coordinated by the LBJ School and UT Austin Center for Transportation Research to investigate public policy issues related to the Texas Seaport and Waterway System.

The curriculum of the LBJ School is intended not only to develop effective public servants but also to produce research that will enlighten and inform those already engaged in the policy process. The project that resulted in this report has helped to accomplish the first task. It is our hope and expectation that the report itself will contribute to the second.

Finally, it should be noted that neither the LBJ School nor the University of Texas at Austin necessarily endorses the views or findings of this study.

Max Sherman
Dean

Preface and Acknowledgments

The policy research project that produced this report was conducted during the 1994-95 academic year as a cooperative effort between the LBJ School of Public Affairs and the UT Austin Center for Transportation Research, with funding by the Texas Department of Transportation.

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Chapter 1. Executive Summary

Introduction

This report presents a comprehensive overview of the Texas seaport and inland waterway system, the results of which are intended to be integrated into the Texas Transportation Plan. Next year's report, the second in a two-report series, will explore possible remedies to statewide maritime issues, as well as other aspects of Texas waterborne commerce. As Texas prepares for greater economic prosperity and integration under the North American Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trade (GATT), the benefits of anticipated increased trade flows will depend heavily on the ability of the state's intermodal transportation infrastructure to efficiently accommodate additional traffic. The term "intermodal" refers to a combination of various forms of transport--primarily ship, truck, and rail. The Texas seaport and inland waterway system is an integral part of the state's intermodal transportation infrastructure.

Historically, the state of Texas has done little to assist or promote its maritime commerce. Yet, even without a great deal of assistance, Houston and other Texas ports have managed to become important links for Mexican commerce and global trade. Port authorities, in general, are often reluctant to seek state assistance, fearing loss of autonomy. This reluctance is likely to ease because the ability to correct problems is often beyond the control of port officials, residing instead with local, state, and federal authorities. The state may, indeed, be able to provide useful services and assistance. But consideration of such services and assistance ought to be based upon a comprehensive understanding of current operations at Texas ports, their intermodal links to the state's transportation network, major issues and legislation affecting waterborne commerce, and future opportunities and constraints in promoting international maritime trade.

The Texas seaport and inland waterway system accounts for much of the state's movement of domestic and international cargo. The state's 12 deep-draft ports and 15 shallow-draft ports accounted for over 390 million tons of cargo moved in 1993, which is half of the state's foreign imports and exports. Of those ports, Houston, Texas City, Port Arthur, and Corpus Christi are among the top 20 ports in terms of tonnage (for all services) in the United States. The Port of Houston is ranked number two in the United States in terms of tonnage for all services and number one for tanker services. The Gulf Intracoastal Waterway contributes another 100 million tons of cargo, of which 70 percent occurs along the 423 miles of Texas waterway, making it the nation's third busiest waterway.

This report is divided into eight chapters examining global, national, and Texas waterborne commerce; the Gulf Intracoastal Waterway; Mexico's seaport and inland waterway system; seaport access to the Texas railway system; seaport access to the Texas highway system; legislation affecting Texas seaports; and issues affecting current and future port and waterway performance. Appendixes contain profiles of individual Texas seaports. Included are Houston, Corpus Christi, Galveston, Texas City, Freeport, Bay City, Victoria, Port Lavaca, Brownsville, Port Isabel, Harlingen, Port Mansfield, Sabine Pass, Beaumont, Orange, and Port Arthur. There is also a profile of the Port of New Orleans, the major competitor of large Texas ports on the Gulf of Mexico. The profiles contain information on each port to the extent that it is available in the following areas: operations and services, top five imports and exports, existing facilities and equipment, modernization and expansion plans, strategic and master plans, revenues and expenditures, intermodal access and land transportation costs, economic impacts, and major issues affecting Texas ports.

Major Findings

Texas ports have remained strong in the face of a volatile trade market and massive economic and political upheaval around the world. However, to remain competitive in the future, import and export markets must be analyzed thoroughly and changes made accordingly. Containerized trade has shown significant increases over the past 10 to 15 years and remains a potential growth market for Texas ports. The term "containerized" refers to the use of containers for cargo transport, which may be shipped by three basic modes--ship, truck, and rail. However, port managers must make their ports economically efficient and improve intermodal connections to accomplish this task.

The Mexican government's recent attempts to privatize its port system ultimately affects the Texas seaport and inland waterway system in terms of commerce. Consequently, Texas and Mexico ports can look at their relationship as one of competition or partnership. Mexico has gone to great lengths to make its port system more efficient in terms of both cost and delivery (or turnaround times).

Texas ports may view these developments as either a threat or an opportunity. Threat, if ports concentrate on that portion of U.S.-Mexico trade that enters Texas ports destined for Mexico via land-access gateways. Hence, Texas ports may view Mexico's privatization attempts as greater competition, whereby seaborne trade is diverted to Mexican ports rather than Texas ports.

However, developments at Mexico's ports may be viewed as growth opportunities for Texas ports. It is an opportunity for Texas ports if land choke-points are taken into consideration. Shipping by sea between Texas and Mexico bypasses these choke-points and, if Mexican ports become more efficient, they provide a shipment alternative that will be a growth opportunity for the Texas seaport and inland waterway system.

Issues

Landside Access Issues

Landside access adequacy is a primary factor in port competitiveness. Where ports have insufficient highway or rail access, cargoes may be diverted to ports with better landside access. This is an issue that is becoming exceedingly important to ports because overall trade, in particular container cargo, is steadily increasing. Currently, Texas ports have great concern over their road, rail, and intermodal access, as well as the congestion and maintenance that go along with such infrastructure. Attention also has been turned to this issue, in part because of the passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), which provides federal funds for intermodal facility expansion and modernization.

Many Texas port officials indicate they have serious problems with landside access. These officials cite insufficient state and federal highway system access, and a general lack of rail service, and infrastructure as factors impeding the Texas maritime system's competitiveness. Brownsville and Port Lavaca-Point Comfort cite the need for a direct interstate highway system link, while Corpus Christi and Port Arthur need improved highway corridors and access. Rail service needs improvement at Orange County, Brownsville, Houston, and Corpus Christi, and better general port access is required at Freeport and Brownsville. For Houston, the primary need is for improved intermodal access. Domestic trade at Texas ports, as well as foreign trade, will be constrained with insufficient infrastructure, facilities, and landside access, unless future planning and funding improve current conditions.

Environmental Issues

As available disposal sites become increasingly scarce, and pressures to protect the environment increase, dredging and the environmental compliance cost associated with proper dredge material disposal have become the most crucial issues facing the Texas maritime system today. Because of the environmental compliance cost, which is primarily a result of numerous legislatively enacted statutes mandating proper disposal (see *Legislative Issues* below), the ability of ports to dredge adequately has been severely limited. This inability to dredge subsequently affects the port's borrowing ability by increasing investor skepticism. Additionally, the Gulf Intracoastal Waterway is affected by these dredging regulations, most notably in the area of Laguna Madre, near Corpus Christi. Ports south of this area are greatly concerned about the possibility of closure.

Financing Issues

Difficulty in funding for port capital improvement projects and landside access improvements affects all Texas ports. The current federal and state government trend is reduced spending, including decreased funding for local projects. Consequently, more ports are competing for diminishing funds. Unlike other Gulf Coast states, Texas does not assist its ports in borrowing funds. Some smaller Texas ports have expressed the inability to secure adequate private-sector investment, making many improvement plans impossible. Additionally, federally mandated regulatory compliance stretches the already limited port budgets. Complying with these regulations, such as those pertaining to the Clean Water Act and the Federal Oil Pollution Act, raises the operational costs of Texas ports. Even such large ports as Corpus Christi have had difficulty in securing funding for projects that do not directly generate revenues, such as landside access improvements. While funding issues were not explored in-depth for this report, it has become overwhelmingly clear that this issue should be investigated thoroughly. This may well be accomplished in the second year of this research project.

Port Planning Issues

Port planning capabilities are directly related to port financing options and abilities. Planning is a primary concern for all Texas ports, as proper planning secures the financial stability of Texas ports, both in competitive strategy development and in securing funding. The importance of proper planning by ports cannot be emphasized enough; like most private and public entities, this ability to plan is the cornerstone for a port's future. Most large ports visited during this study had master plans, while typically small ports did not. The strategic planning abilities of the larger

Texas ports have inevitably weighed in their favor in effectively securing funds, while small ports, without adequate planning resources, find funding procurement much more difficult. Initiating a statewide port-planning assistance program may further the efforts of small ports to grow, as well as improve the overall competitive position of Texas ports within the Gulf port region.

Legislative Issues

Maritime commerce in the United States and Texas is faced with a litany of legislation under which it must operate. As an illustration, the following acts, all associated with the environment, affect the port and waterway system: the Clean Water Act; the Marine Protection, Research and Sanctuaries Act; the National Environmental Policy Act; the Endangered Species Act; the Oil Pollution Act of 1990; the Comprehensive Environmental Response, Compensation, and Liability Act; the Toxic Substances Response, Compensation, and Liability Act; the Resource Conservation and Recovery Act; the Shore Protection Act; the Coastal Zone Management Act; and the Texas Dredge Materials Act. Other acts, which are not environmental in nature, also affect the Texas seaport and inland waterway system. These include the Agricultural Trade Development and Assistance Act, the Shipping Act of 1984 and the proposed Ocean Shipping Reform Act, the Intermodal Surface Transportation Efficiency Act of 1991, the Harbor Maintenance Trust Fund, and the Texas Coastal Waterway Act of 1975.

The cumulative affect of the multitude of legislation is making it increasingly difficult for ports to operate. For example, to prepare for maintenance dredging at a port, disposal of spoil into the waters must abide by the Clean Water Act, which prohibits actions having a deleterious affect on water quality. Additionally, the dredging project must abide by the Marine Protection, Research, and Sanctuaries Act, which regulates the dumping of materials into waters that might affect water quality, marine environment, and ecological systems. Likewise, the National Environmental Policy Act mandates that environmental impact studies be conducted before any projects are undertaken. The Texas General Land Office must give permission before any public land is disturbed during a port operations' maintenance (such as dredging) or expansion. Finally, the Endangered Species Act, which provides protection for endangered animals or plants, also applies to the dredging operations.

Today's port managers must be experts in port operations as well as government, legal, and environmental policy. Not only is their job becoming increasingly more difficult, but it also requires substantial expertise and is more time consuming than ever before. Furthermore, port operations are becoming ever costlier, with no mitigation foreseen.

Legislation, which hampers port operations, is not expected to decrease; to the contrary, it has always been U.S. custom to add laws to the books, thereby increasing legal complexities. This steady increase in legislation is not likely to alleviate port operational costs; therefore, state assistance may be useful in providing federal government intervention, funding support, and planning facilitation. However, before state assistance plans may be implemented, one must first understand the intricacies involved in port operations, such as dredging policies, intermodal access, funding issues, and permit processes. This report provides the first step in acknowledging the difficulties faced by the Texas seaport and inland waterway system today.

Data Sources

Various quantitative data sources have been integrated and used in the following chapters and port profiles. Contained within this report are data concerning the tonnage of cargo moved by the Texas ports and the Port of New Orleans. One set of data is collected by the United States Army Corps of Engineers (Corps); these data are compiled and appear in the publication *Waterborne Commerce of the United States*. The other set of data is collected by the individual ports. It is important for the reader to understand that the data collected by the Corps and supplied in *Waterborne Commerce of the United States*, on the one hand, and data collected by individual ports, on the other hand, generally are not consistent due to the manner of collection.

The Corps data are collected by measuring all cargo imported or exported along a demarcated stretch of the coast. These data include all cargo, inbound or outbound, that lands in the demarcated coast. Additionally, the data include cargo that traverses public docks and all private facilities along the coast. Because the statistics include traffic to and from the private docks used by the many oil refineries along the Texas coast, these tonnage numbers are significantly larger than those that are contained in the data collected by ports. The *Waterborne Commerce* statistics are utilized by both the U.S. Department of Commerce and the shipping industry; therefore, they are mentioned in this report. Due to these statistics' inclusion of both public and private dock traffic data, they are useful in measuring the traffic volume moving into the state from a given area, as well as measuring the impact waterborne commerce has on the Texas economy.

The Corps statistics are not useful in measuring the amount of cargo utilizing the public ports of Texas. To accurately measure the impact that public ports have on the economy, the authors attempted to collect internal data from the individual ports about the volume of cargo each handles. These data are useful in measuring the impact public ports have on the surrounding economy and the ports' aggregate impact on the state's economy.

In an attempt to make this report a more useful document, both sets of data have been included. Where information was available, the port profiles contain the internal port data as well an approximation of the cargo value. This cargo-value estimation is created using the Corps data; therefore, the commodities contained therein will not match those of the port. The Corps data for individual ports are included in the appendixes.

To perform an in-depth investigation into the status of the Texas port and inland waterway system, this study has incorporated information from such diverse sources as the *Texas Transportation Plan,* federal and state legislation, academic journals, and *Journal of Commerce* reports. Furthermore, project team members completed numerous interviews with port directors, marketing managers, legislative affairs directors, and others to obtain information not readily available by other means. Team members also made many on-site port visits to further validate the research effort. To determine what sources are used for specific information contained herein, please refer to the citations included at each chapter or profile's closure.

Chapter 2. Global, National, and Texas Waterborne Commerce

Introduction

The purpose of this chapter is to provide an overview of global waterborne commerce and various factors affecting U.S. ports and Texas ports. Additionally, it will offer an abbreviated description of the Texas seaport and inland waterway system. Issues and current trends affecting foreign and coastline domestic trade will be outlined, as well as trends in containerized shipping utilization trends.

The U.S. public and private port industry combined consists of 183 commercial deep-draft ports dispersed along the U.S. Atlantic, Gulf, Pacific, and Great Lake coasts. Included in that number are the seaports of Alaska, Guam, Hawaii, Puerto Rico, Saipan, and the U.S. Virgin Islands.[1] The U.S. public port industry consists of over 100 nonfederal agencies. These agencies were established pursuant to government enactments to develop, manage, and promote waterborne commerce and to aid economic growth. Agencies that oversee the national ports and waterway systems include port authorities, navigation districts, bistate authorities, and departments within state and local governments.[2]

The Global View

The seaborne proportion of world trade has held fairly steady over recent years at 20-25 percent of total shipments. With the onset of a worldwide recession around 1980, the seaborne-trade expansion ended in the face of declining exports and imports in most, if not all, economies. A strong upturn occurred in 1984, and after a pause in 1985, total seaborne trade resumed its climb in 1986.[3]

In the Organization for Economic Cooperation and Development (OECD) countries, economic performance differences, erratic fluctuations in exchange rates, and changing patterns of competitive advantage in major commodity trades make seaborne trade flows volatile.

Newly industrializing countries, particularly in Asia, have started to penetrate aggressively almost all export markets with a growing variety of manufactured goods.[4] If current trends continue, Asia will become the world's largest market with purchasing power exceeding that of North America or Western Europe by the year 2000.[5]

Since the breakdown of central and eastern European countries and the former Soviet Union, their subsequent quest for market economies has met with either limited or no success. Former Soviet states have experienced an average output decline of approximately one-third. Africa's share of developing countries' food exports halved in the years 1970 to 1990.[6]

In Latin American countries, where political change toward democratic governments has been occurring, a move toward privatization has been developing. These countries' recovery and trade growth will be uncertain over the next several years. Although Mexico, with its NAFTA links, may be in a better growth position, results are not certain.

Table 2.1 shows seaborne-trade trends for various commodities. While there was a general downturn in all trade in the early to mid-1980s, an upswing began around 1986. Overall international seaborne trade increased by 17 percent over the period 1988-93. The largest increase among various commodities was crude oil, which increased by 29 percent over the same period. Oil products, coal, and other cargo showed an increase of between 10 and 17 percent over the period, while iron ore and grain showed a decrease over the period.

Grain shipments have most likely decreased because of the various countries' economic turmoil (such as in the former Soviet Union, eastern and central European countries, Central American countries, etc.) as well as the persistent occurrance of drought in Africa. The growing manufactured goods markets found in many Asian countries might be affecting the increase in other general cargo.

Table 2.1. International Seaborne Trade, 1988-93 (in Millions of Metric Tons)

Year	Crude Oil	Oil Products	Iron Ore	Coal	Grain	Other Cargo	Total
1988	1,042	325	348	304	196	1,460	3,675
1989	1,120	340	362	321	192	1,525	3,860
1990	1,190	336	347	342	192	1,570	3,977
1991	1,247	326	358	369	200	1,610	4,110
1992	1,307	335	334	371	208	1,660	4,215
1993*	1,345	358	345	348	193	1,710	4,299
1993/88 Change (%)	29.1	10.2	<-1.0	14.5	-1.5	17.1	17.0

Source: Adapted from Institute of Shipping and Economics, *Shipping Statistics Yearbook, 1994* (Washington, D.C., 1995) p. 111.

* Estimate.

The relative position of the world trade routes over the previous ten years has changed as well. The Far East/North America route was the largest in terms of TEUs (20-foot-equivalent container units) deployed in 1980. In 1991 the Far East/Europe trade route had surpassed the North American route, which in 1980 was 60 percent larger than the Far East/Europe route. Additionally, intra-Asian trades are estimated to be at the same level currently as the Far East/Europe trade market in terms of TEUs.[7]

Containerization and the move toward multimodal transport to provide seamless transport service is accelerating in regions outside North America and Europe.[8] Major vessel operating multimodal transport operators (VO-MTOs) have seen a dramatic increase in TEUs since 1987, approximately doubling across the board for years 1987 through 1994. In addition, there has been a move toward mergers and acquisitions as a consequence of fierce competition among operators, likely diminishing the smaller operators' role.[9] In addition to forcing out smaller operators, it has and will serve to decrease shipping rates.

Although global seaborne trade grew by only 30 percent between 1970 and 1986, the world merchant fleet size almost doubled, from 340 million dead weight tons (DWT) to 650 million DWTs. These massive fleets' capacity today exceeds market demand in all commodities by substantial margins. As a result, freight rates declined significantly.[10] The combined effects of declining freight rates, competition, and overcapacity have forced shipping companies to undergo major transformations to reduce the cargo-shipping costs.

The maritime industry has either developed or adopted various new technologies in shipbuilding, cargo handling, and communications areas. Additionally, the industry has restructured to integrate sea and land transport and has reorganized its ports.[11]

Port development plans are frequently optimistic about expected throughputs and rely heavily on worldwide trade growth and the individual port's ability to attract increased trade shares.[12] While there will likely be a slow, but steady, commodity-related increase in bulk-capacity demand over the next several years, ports must still look to improving their relative position to competitors. It is fundamental to all ports that internal transportation and communication systems improvements be made to assist growth.

In response to the economic realities facing the port industry, management is now being forced to more carefully consider its own economic profitability rather than to give primary attention to regional economic development as it often tended to do in the past. Ports must be able to offer a competitive package of facilities, infrastructure, and port charges to attract cargo. Additionally, bond-rating agencies are looking at ports' financial performances in rating debts for bond-financed, capital-improvement projects.[13]

Table 2.2 shows trends in U.S. seaborne trade with various regions over the period 1989-93. In exports, the United States has shown a significant trade loss to several regions, the former Soviet Union being the most apparent with an approximate 96 percent downturn over the period. Exports to Canada and Australia dropped 36 and 21 percent, respectively, over the same period. Increases in export tonnage were found in Africa (32 percent), Central America (15 percent), and the Near East (16 percent) over the period. The U.S. global exports' total over the period indicates an approximate 10 percent overall loss.

Table 2.2. U.S. Seaborne Trade by World Region, 1989-93

Country/Territory	Exports[a]	Imports[a]	Total Volume[a]	Total Value[b]
Africa	31.7	<1.0	5.5	4.4
Asia	-4.9	-17.9	-8.4	17.0
Australia/Oceania	-20.7	-22.2	-21.7	-5.4
Canada	-36.0	5.6	-13.9	80.6
Caribbean	-2.2	30.5	19.7	24.6
Central America (includes Mexico)	15.2	26.8	24.0	14.7
Eastern Europe	-9.5	-49.6	-24.2	3.2
Former Soviet Union	-95.9	51.5	-45.2	-15.8
Near East	15.9	8.9	10.1	26.3
South America	8.6	24.8	<1.0	19.3
Western Europe	-13.2	-1.3	-7.8	9.1
U.S. Global Total	**-10.1**	**7.3**	**<-1.0**	**14.7**

Source: Adapted from U.S. Bureau of Census, *FT 920 U.S. Merchandise Trade: Selected Highlights*, December issues (Washington, D.C., 1989-94).

[a]In metric tons.

[b]In percentages.

The United States has been importing 50 percent less from Eastern Europe, 22 percent less from Australia, and 18 percent less from Asia. The U.S. import tonnages from the former Soviet Union are 51 percent higher than previous for the period, while the imports from the Caribbean, Central America, and South America all show increases ranging from 24 to 31 percent for the period. Total U.S. global imports have increased by over 7 percent.

U.S. seaborne trade's overall volume for various regions has decreased for the period. These regions include the former Soviet Union, which has decreased 45 percent; Eastern Europe, 24 percent; and Australia, 22 percent. Increases in trade volume are found in the Caribbean, increasing 20 percent, and Central America, 24 percent. Total U.S. global trade volume experienced virtually no change over the period.

However, overall dollar value of U.S. seaborne trade has increased by nearly 15 percent. Canada shows the greatest change in trade by dollar value with the United States, increasing approximately 80 percent. Trade with Canada over the period nearly doubled from $7.4 billion in 1989 to nearly $13.4 billion in 1993. Dollar value of trade with the Near East increased by 26 percent, the Caribbean by 25 percent, and South America and Asia by 19 and 17 percent, respectively. The most significant loss in dollar value of trade was with the former Soviet Union, down by almost 16 percent.

United States Ports

In 1993, approximately 350 million short tons of cargo, including much of the high-value merchandise shipped in containers or in breakbulk form, were shipped annually through facilities owned and operated by America's public ports. This equates to approximately one-third of the total volume and two-thirds of the total value of U.S. foreign commerce. U.S. ports on the coasts and on inland waterways provide 3,214 berths for deep-draft ships and transfer cargo and passengers through 1,941 public and private marine terminals.[14] U.S. ports' cargo includes bulk (loose cargo), breakbulk, liquid bulk, dry bulk, and general cargo in containers.

U.S. public ports also play a critical role in our national defense, peacekeeping, and humanitarian efforts around the world. In particular, ports support the mobilization, deployment, and resupply of U.S. military forces. During Operation Desert Storm, over two dozen ports handled two-thirds of the military cargo.[15]

In 1993, U.S. ports (both public and private) handled import/export cargo totaling 990.7 million short tons (up 2.3 percent from 1992) with a value of $510.3 billion. In comparison to 1992, import tonnage rose by nearly 10.8 percent while exports fell by 8.2 percent.[16]

Table 2.3 shows trends in U.S. waterborne foreign commerce in terms of exports, imports, and container usage in imports and exports from 1992 through November 1994, as well as data for 1990 through 1994. U.S. seaborne exports decreased during the period 1992-94 by nearly 15 percent, while imports increased by over 24 percent. Overall trade in short tons was up nearly 7 percent. For container cargo from 1992-94, exports were down by approximately 4 percent, while imports were up over 16 percent. Overall container cargo was up 10 percent over the same period. Container trade in the United States, measured in TEUs, increased 6 percent from 1991 to 1992. In 1992, 18.6 million TEUs were shipped through U.S. ports.[17]

Table 2.3. U.S. Waterborne Foreign Commerce, 1990-November 1994 (in Thousands of Short Tons)

	1990	1991	1992	1993	Jan-Nov 1994	%Change 1994/92	%Change 1994/93
Exports	413,228	434,258	432,378	391,782	335,737	-14.77	-6.93
Imports	553,219	501,383	536,085	593,841	605,459	24.12	11.52
Total	966,447	935,641	968,464	985,623	941,195	6.75	4.15
Containers							
Exports	41,114	44,782	49,237	47,115	45,864	-3.86	8.90
Imports	40,271	39,514	43,130	46,065	45,022	16.05	8.22
Total	81,385	84,296	92,366	93,180	90,886	9.56	8.56

Source: Adapted from U.S. Bureau of the Census, *U.S. Waterborne Exports and General Imports Annual* (Washington, D.C., 1990-94).

Changes in U.S. Customs

To assist in competing in a changing global maritime industry, U.S. Customs is attempting to alter its structure. As of January 16, 1995, the district and regional offices in San Diego and New Orleans were replaced by two trial Customs Management Centers (CMCs). By decentralizing their agency and putting more decision-making power at individual ports, it is hoped that the import process will be expedited and a reduction in "port shopping" by importers will occur through the uniformly enforced regulations at all U.S. ports.

The organization will be based on well-staffed port offices with extensive frontline authority, each clustered around one of 20 CMCs that will handle payrolls, vacations, building upkeep, and other internal matters for the district's port offices. These will be prototypes and will begin an eight-month trial period for the CMCs.[18]

Economic Impact for United States

Approximately 70 percent of U.S. Customs duty revenues on imports are received at ports, equaling approximately $12 billion in 1992. Since World War II, public port investment in shoreside facilities has totaled $12.5 billion. An additional $5.5 billion will be invested before 1997.[19]

Table 2.4 shows the 1992 economic impact of U.S. ports on our economy. Employment generated by the port industry, users, and capital expenditures amounts to over 15 million jobs. Income generated by port industries, users, and capital expenditures totals over $500 billion. Sales in these areas grossed $1.5 trillion, and $780 billion was produced in gross domestic product. In tax revenue, these areas accounted for $154 billion in federal taxes and $56.5 billion in state and local taxes.

Table 2.4. U.S. Port Economic Impact, 1992

	Port Industry	Port Users	Port Capital Expenditures	Total
Employment	1,540,225	13,749,605	27,320	15,317,150
Income	$52 billion	$470 billion	$935 million	$523 billion
Sales	$139 billion	$1.4 trillion	$2.2 billion	$1.5 trillion
GDP*	$73.7 billion	$705 billion	$1.3 billion	$780 billion
Federal Taxes	$14.5 billion	$139 billion	$252 million	$154 billion
State and Local Taxes	$5.5 billion	$51 billion	$96 million	$56.5 billion

Source: Adapted from American Association of Port Authorities, *U.S. Public Port Facts,* Alexandria, Va., September 1994. (Brochure).

*Gross domestic product.

Port Factors

Deep-draft ports are those ports that accommodate oceangoing vessels. Oceangoing vessels move over 95 percent of U.S. overseas trade by weight and 75 percent by value.[20] Public-sector ports develop and maintain the shoreside facilities for intermodal-cargo transfer from ships and barges to trucks and railroads.[21]

Typical Ports

Figure 2.1 depicts what a "typical" Texas port operation looks like. A port is a harbor area in which are located marine terminal facilities for transferring cargo between ships and land transportation. As seaborne trade moves into or out of the port, there are several on-carrier options available.

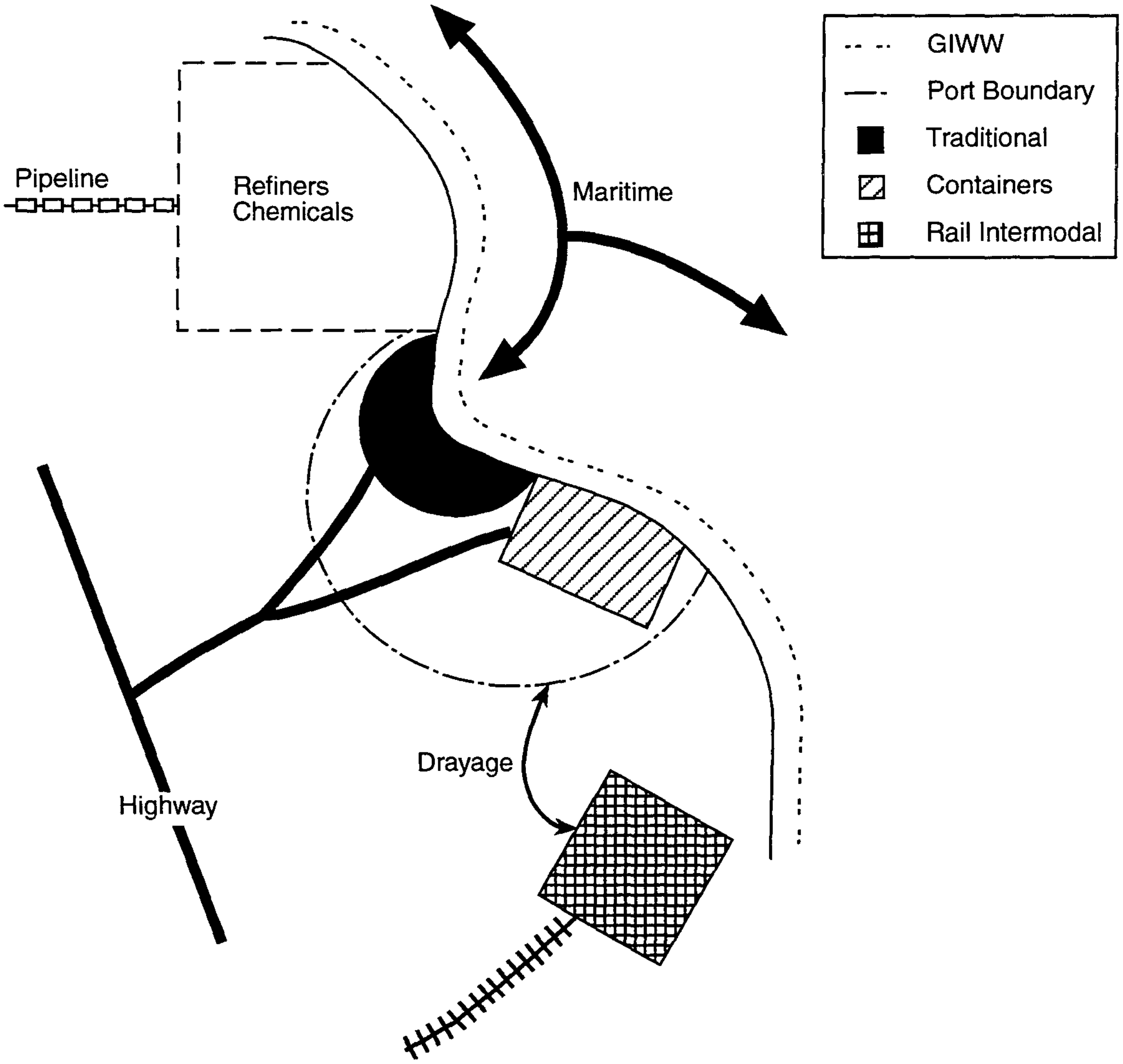
The import/export cargo may move by drayage (movement of freight between terminals and/or warehouses by trucks or other vehicles) to/from the rail lines for inland or outbound transfer. These rail lines may be located dockside or a few miles away. Feeder lines are low-density lines that collect and/or distribute rail traffic between railcar loading/unloading terminals and a rail mainline. These rail lines might be owned by either the railroad companies or the ports. In some cases, only one railroad might own the rail lines having port access, in which case they would charge all other railroad companies utilizing the lines for transport.

Cargo may also be on-off-loaded for or from inland truck transport. Highway access may or may not be efficiently located at the port. Additionally, inbound and outbound cargo may not be transported immediately, in which case it is moved to port warehouses for an indefinite period. In these cases, the port charges for warehousing space (demurrage) but often allows a certain amount of free time. For example, the port charging regular port usage fees may opt to include a standard 30-day free warehousing space. After the initial 30 days in the warehouse, the port may then charge a fee for extra time incurred.

Pipelines are another means of transport for chemical or petroleum products. These products, either inbound or outbound, may be moved via pipeline to and from refineries and chemical plants. In some cases, the pipelines extend out into the water to buoys for improved efficiency and safer chemical and petroleum products transport.

These ports may also possess container facilities. These cargo containers are specially designed to be easily interchangeable among the three basic modes transportation--ship, truck, and rail. These containers may be on- or off-loaded to marshaling yards utilizing container cranes, RO/RO (roll on-roll off), or in some cases, heavy-duty forklifts. The ports' intermodal systems may vary in terms of their efficiency and capabilities.

Figure 2.1. Typical Texas Port Operations



Port Authorities

Over 100 public port authorities and agencies are located along U.S. coasts and the Great Lakes, as well as in Alaska, Hawaii, Puerto Rico, Guam, and the U.S. Virgin Islands. The U.S. Constitution grants the federal government exclusive jurisdiction over the United States' navigable waters, including its deep-draft channels and harbors--authority delegated primarily to the Coast Guard and the U.S. Army Corps of Engineers. However, federal jurisdiction over harbors ends at the water's edge. Port authorities in the United States are established via enactment or grant of authority by state legislatures and are state or local government instruments. Port activities, nonetheless, are still subject to federal jurisdiction where pertaining to foreign and interstate commerce.[22]

In addition to maritime functions, the range of permitted port authority activities may also include airports, bridges, tunnels, commuter rail systems, inland river or shallow-draft barge terminals, industrial parks, Foreign Trade Zones, world trade centers, terminal or shortline railroads, shipyards, dredging, marinas, and other public recreational facilities.[23]

Factors Affecting Port Selection

Table 2.5 ranks factors affecting port selection according to shippers, purchasing managers, and ports. Shipment information and loss and damage performance are factors selected most often by purchasing managers in selecting ports for international shipments. However, ports tend to place greater emphasis on physical attributes, such as equipment availability and large-volume shipments.

Research indicates that worldwide ports tailor their services to accommodate ocean carriers, although other customers, such as shippers and consignees, should be considered as well. Failure to accommodate these other customers will ultimately have a negative effect on a port's economic performance.[24] Ports having adequate physical facility capabilities must also be willing to nurture their customer service areas. Port selection factors receive similar rankings between shippers and consignees; therefore, pursuing one group will also attract the other.

Additionally, awareness of trends in carrier strategies and ship and cargo-handling technologies is required to enable port managers to make demand-responsive and cost-effective decisions on investments and operating arrangements.[25]

Table 2.5. Port Selection Factors

Factor	Purchasing Managers	Shippers	Ports	F-ratio
Shipment Information	4.06	4.12	3.64	4.99*
Loss and Damage Performance	3.98	4.40	4.26	2.58
Low Freight Charges	3.89	4.08	3.93	0.70
Equipment Availability	3.89	4.35	4.50	5.20*
Convenient Pick up and Delivery	3.83	4.14	4.14	1.50
Claims Handling Ability	3.80	3.60	3.05	8.70*
Special Handling Ability	3.54	3.66	3.99	3.17**
Large-Volume Shipments	3.19	3.32	4.07	12.74*
Large and Odd-Sized Freight	3.15	3.21	3.63	3.13**

Source: Adapted from Paul R. Murphy, "A Comparative Analysis of Port Selection Factors," *Transportation Journal*, vol. 34, no. 1 (Fall 1994), pp. 19-20.

Note: 1 = very unimportant; 5 = very important.

*Significant at the .01 level.

**Significant at the .05 level.

Port managers must constantly devise strategies to adjust to the changing environment and devote much of their energy to marketing. These marketing campaigns are directed toward shippers rather than individual operators, as shipper discretion determines which ports will be utilized. Factors in interport competition include elements of location, facilities, seaward and landside access, efficiency, charges, inland transport costs, and government policies for port development and transport.[26] Increasingly, port selection is tied to ship turnaround time, which in turn is effectively linked to land distribution systems.

Texas Ports

The Texas Gulf Coast is comprised of 12 deep-draft ports and 15 shallow-draft ports or districts containing more than one shallow-draft port.[27] Map 2.1 shows the geographic location of the deep-draft ports. The deep-draft ports are as follows:

1. Port of Beaumont
2. Port of Brownsville Navigation District
3. Port of Corpus Christi Authority
4. Port of Freeport
5. Port of Galveston
6. Port of Houston Authority
7. Matagorda Ship Channel (Port of Port Lavaca-Point Comfort)
8. Port of Orange County Navigation and Port District
9. Port of Port Arthur Navigation District
10. Port of Port Isabel
11. Sabine Pass
12. Port of Texas City Terminal Railway Company.

Of those ports, Houston, Texas City, Port Arthur, and Corpus Christi are among the top 20 ports (for all services) in the United States. The Port of Houston Authority is ranked number two in the United States for all services (behind Gramercy, Louisiana) and number one for tanker services.[28] Texas shallow-draft ports are as follows:

1. Port of Anahuac
2. Port of Port Aransas
3. Port of Aransas Pass
4. Port of Bay City
5. Port of Fulton
6. Port of Harlingen
7. Port of Ingleside

8. Port of Liberty

9. Port of Palacious

10. Port of Port Mansfield

11. Port of Port O'Connor

12. Port of Rockport

13. Port of Seadrift

14. Port of Sweeney

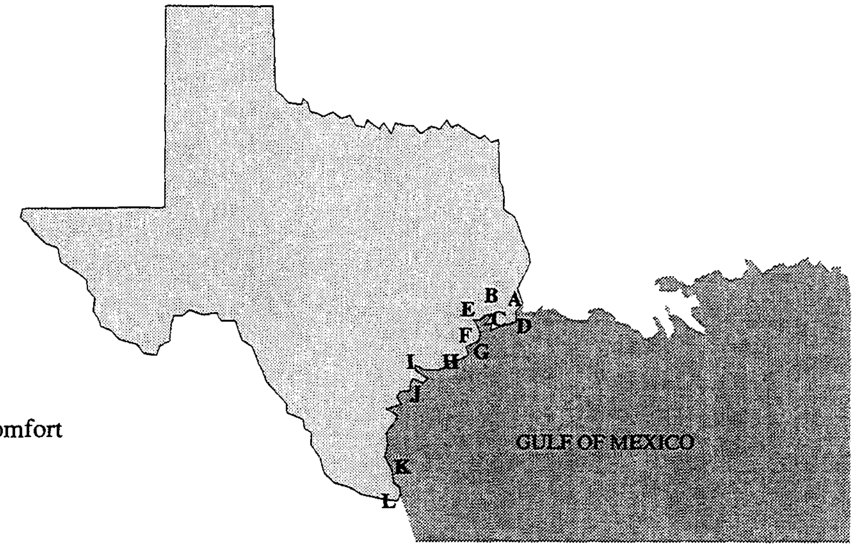
15. Port of Victoria

Along the Gulf Intracoastal Waterway, over 100 million tons of cargo were transported in 1992,[29] of which 70 percent of that activity occurred along the 423 miles of waterway in Texas.[30] The GIWW is the nation's third busiest waterway.[31]

Map 2.1. Texas Deep-Draft Port Network

Ports of Texas

A Orange
B Beaumont
C Port Authur
D Sabine Pass Harbor
E Houston
F Texas City
G Galveston
H Freeport
I Port Lavaca/Point Comfort
J Corpus Christi
K Port Isabel
L Brownsville



Texas Port Overviews

Port of Houston

The Port of Houston, a deep-draft port, is a 50-mile-long complex of diversified public and private entities and is Texas' busiest and largest port in terms of tonnage and value. It is 400 feet wide and 40 feet deep. In 1971, the Texas Legislature changed the name of the Harris County Houston Ship Channel Navigation District to the Port of Houston Authority and gave it expanded powers for fire and safety protection along the channel. Landside access is available from four Class I rail carriers, 130 trucking companies that serve the Houston area, and U.S. interstate highways 10, 45, and 59.

The Port of Houston possesses the largest port facility infrastructure on the Gulf of Mexico. The port maintains facilities to accommodate the movement of petroleum, bulk minerals, chemicals, grain, containers, and general cargo. These include a general-cargo complex, intermodal terminal, dry-bulk facilities, material-handling plant, public grain elevator, and a deep-water basin providing access to liquid-bulk cargo facilities. The banks of the turning-basin terminal accommodate 2.5 miles of wharves, transit sheds, and warehouses. There is also a foreign trade zone located at the port.

The Fentress Bracewell Barbours Cut container terminal is an intermodal terminal for container, roll on-roll off vessels, and cargo. The terminal has five 1,000-foot container berths (a sixth berth is currently being constructed), 20 yard cranes, and 10 container cranes. Marshaling areas can accommodate more than 21,500 TEUs. For trucks, 24 exit lanes are provided.[32]

Port of Texas City

The Port of Texas City is a private port. It has no affiliation with any government or public agency. The Texas City Railway Company acts as port authority and coordinates all port functions with the port users. The port is located on Galveston Bay, 11 miles inland from the Gulf of Mexico, 5 miles north of Galveston. The channel to the port is approximately 6 miles long with 400-foot bottom width and 40-foot depth. Immediate landside access is available by any one of four rail carriers or Interstate 45.

The great majority of the port facilities are used to support the main commodities going through--petroleum and chemical products. The port contains 43 berths, with 22 being privately owned by such companies as Amoco Oil and Union Carbide. The port also provides two supertanker docks for crude petroleum and numerous tanker and barge docks. Additional features include a dry-bulk cargo facility.[33]

Port of Freeport

The Port of Freeport is a deep-draft port located on the central coast of Texas, approximately 60 miles southwest of Houston. The elevation of the port is 3 to 12 feet above sea level. The major trade areas of the Port of Freeport are Central America, South America, and the Middle East. The port has 7,000 acres of deep-draft, shallow-draft, and highway frontage land available for industrial development.

There is a significant amount of containerized cargo generated in the port's area, which is transported, not by water, but by either rail or track to a rail center in Houston. The port's challenge is to find a way to participate in this business, competing with the other transportation modes. Key issues facing the Port of Freeport today revolve around insufficient highway and rail infrastructure accessing the port, financing capital-improvement projects, and increasing environmental impediments.[34]

Port of Galveston

Galveston Island, situated 2 miles off the Texas coast, is approximately 50 miles south of Houston. The Port of Galveston facilities, located at the entrance to Galveston Bay, constitute a large portion of the greater port complex. The GIWW runs alongside the Port of Galveston, and the Galveston Channel provides access to the open gulf. This channel has an authorized minimum depth of 40 feet and is 1,200 feet wide at its narrowest point. The port owns and operates for-hire public wharves, transit sheds, open and covered storage facilities, warehouses, and freight-handling facilities. In addition, the port leases land and facilities to area industries.[35]

Port of Brownsville

The Port of Brownsville, a deep-draft port, is located at Texas' southernmost tip at the end of a 17-mile channel that meets the Gulf of Mexico at the Brazos Santiago Pass. The port, with its dry- and liquid-bulk handling facilities is primarily a bulk freight industrial port. In 1994, the port moved over 3 billion short tons.[36] Of the port's total shipments, over one-third was transported via the Gulf Intracoastal Waterway.

The port's major transported products include petroleum and coal products, primary metal products, minerals, and food products. The Port of Brownsville can be characterized as a Northern Mexican port, as the majority of its traffic is between the port and the city of Monterrey, Mexico.[37]

Port of Harlingen

The Port of Harlingen is a shallow-draft port located 4 miles from the city of Harlingen on State Highway 106 and 25 miles west of mile marker 646 on the Gulf Intracoastal Waterway. Located in the heart of the Rio Grande Valley, the port is an important link in south Texas' transportation network.

For the year ending September 30, 1994, charges for sales and services to just two customers, Diamond Shamrock and Rio Grande Valley Sugar Cooperative, represented 46 percent and 26 percent, respectively, of the port's total operating revenue.[38] Diamond Shamrock moves gas and diesel products through the port, while the Rio Grande Sugar Cooperative ships bulk sugar to New Orleans. Other port-located industries transport bulk materials and fertilizers through the port.

Port of Port Isabel

Formed in 1929, the Port Isabel/San Benito Navigation District was originally formed to serve a local refinery, but today it serves as a base for 27 companies engaged in a variety of businesses. The deep-draft port, with a controlling depth of 36 feet, is located at the southern tip of Texas, 29 miles north of the Rio Grande. As a nonoperating port, Port Isabel has several important industrial and fishing customers, which include a shrimp hatchery and shrimp docks, recreational marina, and cruise lines. Port facilities process 40 percent of all shrimp caught in Texas, which is distributed to every state in the nation.[39]

Port of Port Mansfield

Created in 1948 by action of the voters in the district, Port Mansfield has traditionally been dependent on offshore drilling. At one time, there were 60 to 70 offshore drilling rigs located off the port. Today, the port is active in recreational facilities; the small-craft basin is 80 percent leased, while the industrial basin is 80 percent vacant.[40] The main port users are recreational fishers, although M.I. Drilling Fluids brings in two barges per month of Ferox drilling mud, which totals about 1,000 tons per month.[41]

Victoria Barge Canal

The Victoria Barge canal extends 36 miles from the Gulf Intracoastal Waterway in San Antonio Bay to a point about 15 miles from Victoria. It is utilized by the oil and gas petrochemical industries, which are the region's main industries. The canal's biggest customers include Fordyce Sand/Gravel, Precon Structures, and Willard Fertilizer. Commodities moved on the canal are primarily sand and gravel, petrochemical products, and industrial chemicals.

In an effort to increase the canal's utilization and marketability, plans are currently underway to widen and deepen the canal. The $32.5 million project will expand the canal's dimensions from 9 feet deep and 100 feet wide to 12 feet deep and 125 feet wide. This expansion will extend the canal's dimensions equivalent to the Gulf Intracoastal Waterway's dimensions. This project is expected to be completed in 1998.

Port of Bay City/Matagorda Harbor

The Port of Bay City Authority has two ports under its jurisdiction: the Port of Bay City and Matagorda Harbor. The Port of Bay City is a shallow-draft channel with a depth of 12 feet, located about 15 miles from the GIWW 100 miles southwest of Houston. Matagorda Harbor is located 20 miles south of Bay City on Matagorda Bay. It was opened in 1990 and has a depth of 15 feet.

The Port of Bay City has only one major customer utilizing its public facilities. Way Energy imports petroleum, which its pumps directly from barges to its storage tanks located near the port. Matagorda Harbor is primarily a recreational facility and is used for boating and fishing. The Port of Bay City Authority is concentrating on the harbor for its economic development efforts and is currently expanding the facilities. A recreational vehicle (RV) park is currently under construction, and plans are underway to continually add new boat slips to the 120 that are presently in place.

Port of Port Lavaca-Point Comfort

The Port of Port Lavaca-Point Comfort is a deep-draft port with an operating depth of 36 feet. It is located at the end of the Matagorda Ship Channel on the eastern shore of Lavaca Bay. The port serves local industries and manufacturers, which are generally petrochemical processing, primary metals manufacturing, oil and gas production, and agriculture. The port's largest customer is Formosa Plastics Corporation, a chemical manufacturer.

A $62 million port-expansion project was completed in December 1994. The project was made possible through an agreement between Formosa Plastics Corporation and Calhoun County Navigation District, in which Formosa agreed to bear bond-financing responsibility. As a result of the agreement, the port now has a liquid-cargo ship terminal that includes bulkheads, pipe rack capabilities, and modern safety facilities. Port usage has been increasing, especially in the international trade arena.

Port of Corpus Christi

Operating for over 65 years, the Port of Corpus Christi Authority moves the second greatest amount of tonnage of all Texas seaports. This deep-draft port is located on the Corpus Christi ship channel, which spans approximately 36 miles with six turning basins. Immediate access is available by either of two major highways, the GIWW, or service by one of three railroad lines.

The port maintains facilities to accommodate petroleum, bulk minerals, chemicals, grain, containers, and general cargo movements. Those commodities moved along the GIWW include crude petroleum, petrochemicals, and refined petroleum products. Additional port features include a public grain elevator, an industrial park comprising over 300 acres, and a foreign trade zone with oil refineries, manufacturing sites, and warehouses.

Port Tonnages

In 1992 alone, Texas ports handled over 378 million tons of cargo, of which almost 40 percent passed through the Port of Houston (refer to table 2.6). The top four ports--Houston, Corpus Christi, Texas City, and Port Arthur--accounted for 72 percent of all tonnage handled by Texas ports. Over a six-year period, tonnage handled by Texas ports increased from 290 million tons to 378 million tons--a 30 percent increase.

Table 2.6. Tonnage Handled by Texas Ports, 1987-92 (in Thousands of Short Tons)

Port	1992	1991	1990	1989	1988	1987	% Change
Houston	137,663	131,514	126,178	125,583	124,867	112,546	22.3
Corpus	60,866	59,052	62,023	58,441	56,310	51,240	18.8
Texas City	43,104	43,290	48,071	41,272	42,747	37,233	11.6
Port Arthur	33,525	29,835	30,679	31,128	23,801	20,616	62.6
Beaumont	22,702	22,383	26,729	31,668	31,947	29,759	-23.7
Freeport	14,953	15,666	14,494	15,176	15,138	13,980	7.0
Galveston	12,317	10,858	9,620	11,838	12,355	8,684	41.8
Matagorda	5,389	6,266	N/A	N/A	N/A	N/A	N/A
Victoria	4,265	3,408	3,740	3,143	3,562	3,655	16.7
Brownsville	1,594	1,610	1,372	1,361	1,237	1,234	29.2
Other	44,575	N/A	15,249	13,457	14,668	12,021	270.8
Totals	**378,703**	**323,882**	**336,312**	**333,067**	**326,632**	**290,968**	**30.2**

Source: Adapted from U.S. Army Corps of Engineers, *Waterborne Commerce of the United States,* part 2 (Fort Belvoir, Va., 1987-92).

Trends in Imports and Exports

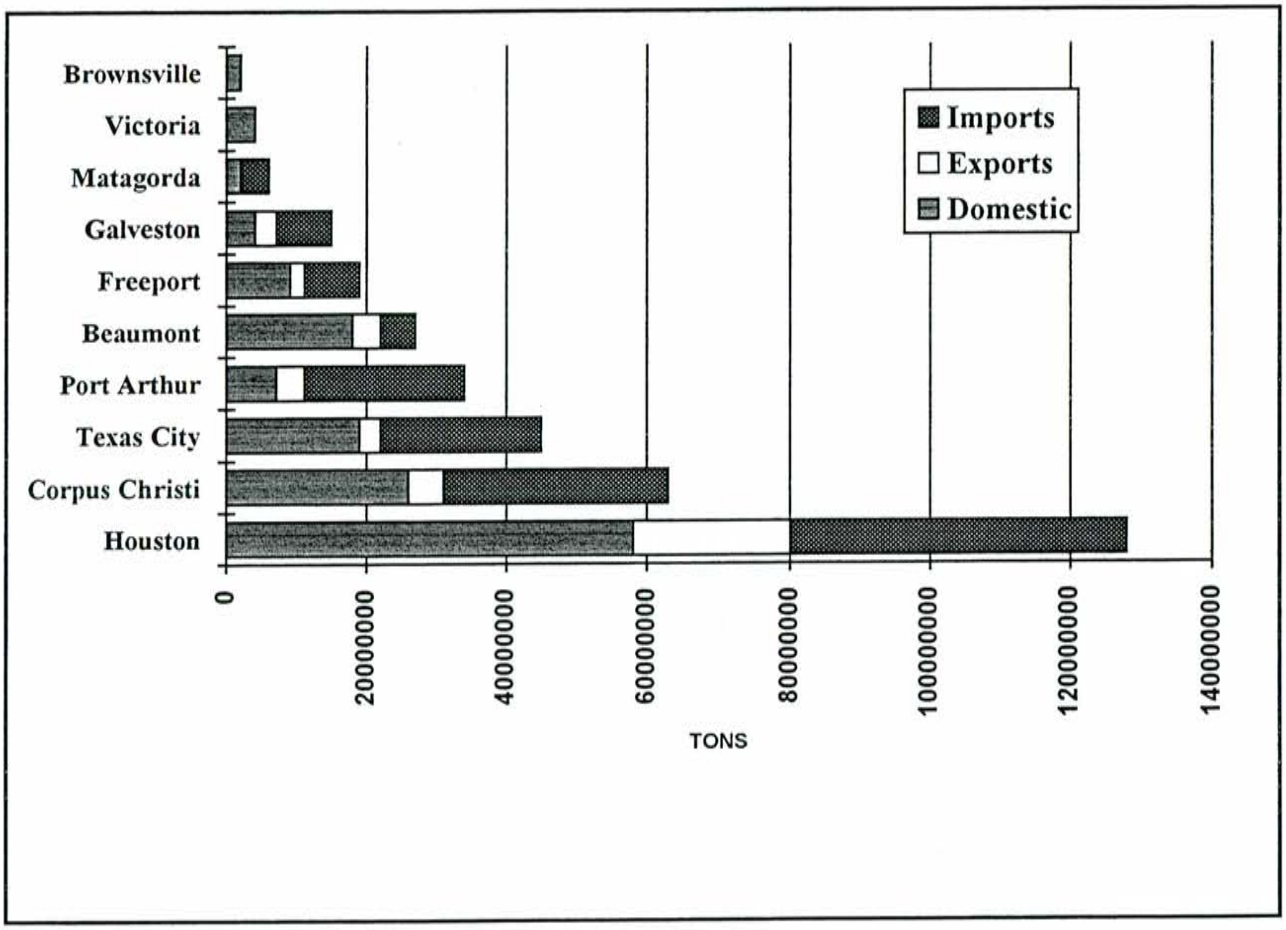
Current trends for Texas ports indicate a large increase in annual tonnage. For Houston, an increase of approximately 22 percent occurred over the period 1987-92. Corpus Christi increased by approximately 18.8 percent, Texas City by 13 percent, Port Arthur by nearly 63 percent, Freeport by 7 percent, Galveston by 43 percent, Victoria by 17 percent, Brownsville by 29 percent, and all other ports combined by 270 percent. The only port that showed a decrease over the same period is Beaumont, with a downturn of 24 percent; however, Beaumont rebounded after 1992 with an increase of 51 percent.[42] On average, all ports combined showed an increase of 30 percent over the period 1987-92.

As figure 2.2 indicates, both Houston and Beaumont have large proportions of domestic commerce tonnage, while Victoria and Brownsville are almost exclusively domestic commerce. Houston, which leads the nation in foreign commerce, has the largest proportion of export tonnage compared to all other Texas ports. Port Arthur has the largest proportion of import tonnage compared to other Texas ports.

As imports increase nationwide, Port Arthur can expect a greater positive impact (higher proportion of increase in tonnage handled) than other Texas ports. This type of impact might be evident for the year 1989; where all other Texas ports tended to have stable or lower total tonnage handled, Port Arthur showed a significant increase in total tonnage. From 1988 through 1993, Port Arthur, with its large proportion of import tonnage, has overtaken Texas City for the Texas ports' number three rank (refer to table 2.6). This increase was primarily due to substantially higher import tonnages.

As table 2.7 shows, foreign trade for the top four Texas ports (1989-93) indicated a trend for substantial export growth at Texas City, while imports showed moderate overall growth. Houston gained heavily in both import tonnage and export tonnage (primarily in import) for the same period. Corpus Christi showed slow to moderate growth in import tonnage and accomplished heavy gains in export tonnage. Port Arthur showed the most significant gains overall with substantial increases in both import and export. Port Arthur nearly doubled its import tonnage over this period.

Figure 2.2. Foreign and Domestic Commerce through Ten Major Texas Ports, 1992
(in Short Tons)



Source: Adapted from U.S. Army Corps of Engineers, *Waterborne Commerce of the United States,* part 2, Belvoir, Va., 1992.

Table 2.7. Texas Oceanborne Foreign Trade, Top Four Texas Ports, All Services 1989-93 (in Thousands of Short Tons)

1989

Texas Rank	Port	Total Tons	Pct.[a]	Import Tons	Pct.[a]	Export Tons	Pct.[a]
1	Houston	55,806	-3	35,483	-3	20,323	-1
2	Corpus Christi	33,618	10	29,111	12	4,507	-1
3	Texas City	19,511	-3	18,015	-4	1,496	18
4	Port Arthur	17,541	30	14,850	39	2,691	-6

1990

Texas Rank	Port	Total Tons	Pct.[b]	Import Tons	Pct.[b]	Export Tons	Pct.[b]
1	Houston	55,961	*	36,095	2	19,866	-2
2	Corpus Christi	32,002	-5	27,850	-5	4,152	-8
3	Texas City	25,618	31	23,511	31	2,107	41
4	Port Arthur	17,988	3	15,268	3	2,720	1

1991

Texas Rank	Port	Total Tons	Pct.[c]	Import Tons	Pct.[c]	Export Tons	Pct.[c]
1	Houston	68,291	22	41,065	14	27,225	37
2	Corpus Christi	34,290	7	28,670	3	5,620	35
3	Texas City	24,029	-6	20,895	-11	3,134	49
4	Port Arthur	20,512	14	17,541	15	2,971	9

Continued on next page

Table 2.7. *Continued*

1992

Texas Rank	Port	Total Tons	Pct.[d]	Import Tons	Pct.[d]	Export Tons	Pct.[d]
1	Houston	72,784	7	45,959	12	26,825	-1
2	Corpus Christi	34,189	*	28,907	*	5,282	-6
3	Port Arthur	25,293	23	21,966	25	3,327	12
4	Texas City	24,358	1	21,968	5	2,389	-24

1993

Texas Rank	Port	Total Tons	Pct.[e]	Import Tons	Pct.[e]	Export Tons	Pct.[e]
1	Houston	79,405	9	54,329	18	25,076	-7
2	Corpus Christi	36,519	7	29,566	2	6,953	32
3	Port Arthur	32,902	30	28,485	30	4,417	33
4	Texas City	26,307	8	24,280	11	2,027	-15

Source: Adapted from U.S. Department of Transportation, Maritime Administration, *U.S. Oceanborne Foreign Trade Routes, October 1992* (Washington, D.C., 1993), pp. 128-131; and U.S. Bureau of the Census, *United States Waterborne Foreign Commerce,* (Washington, D.C., 1994), pp. 348-414.

[a]Compared to calendar year 1988, percent change.

[b]Compared to calendar year 1989, percent change.

[c]Compared to calendar year 1990, percent change.

[d]Compared to calendar year 1991, percent change.

[e]Compared to calendar year 1992, percent change.

*Less than 0.5 percent.

Table 2.8 gives total import and export dollar values for major Texas ports, along with their U.S. port rankings for the year 1993. Houston gained in terms of import dollar value (up 10 percent) from 1992 to 1993 but lost 4 percent in export dollar value. In dollar value, Houston was ranked number seven in the U.S. during 1993. Corpus Christi experienced losses of 12 percent in import dollar value between 1992 and 1993 but gained 15 percent in export dollar value.

Beaumont, although a smaller port than Houston and Corpus Christi, made an extremely strong showing for the same period. In imports, Beaumont increased by nearly 79 percent and in exports also did very well with an increase of over 30 percent.

Table 2.8. Texas Ports' Rankings by Total Dollar Import/Export Values, 1993 (in Millions of U.S. Dollars)

Port	Imports	% Change 1993/92	U.S. Rank	Exports	% Change 1993/92	U.S Rank
Houston	11,252	10.3	7	14,276	-3.8	2
Corpus Christi	2,763	-12.5	22	920	15.1	32
Port Arthur	2,896	12.3	21	464	-0.2	44
Texas City	2,295	-3.2	25	377	-21.2	50
Galveston	1,451	-0.2	32	1,518	16.7	24
Beaumont	841	78.7	46	471	30.8	44

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993,1994).

Based on economic and commodity forecasts, demand for waterborne transport of international freight is expected to increase on average by about one-half percent per year for the next several years.[43]

The peso devaluation has had a significant impact on Texas ports. Mexico devalued its currency in December 1994, and at the time of this report the peso has lost 40 percent of its value against the dollar. This action by the Mexican government is an attempt to reduce the nation's $5 billion trade deficit with Europe and nearly $6 billion trade deficit with Asia. Since much of the Mexico-destined European cargo is transported via Texas ports, the fallout is expected to be significant. However, it is hoped that the peso will stabilize quickly, thereby having only a short-term loss for Texas ports.[44]

Containerized Trade

Container-ship development began in World War II with the military success of prepackaged shipments to overseas points and the rising costs of stevedore services and labor in general. Thus began the use of standardized containers for shipping materials.[45] Although, volumetric efficiency delayed the concept, studies indicated significant turnaround-time savings, lower insurance rates because of reduced pilferage and damage, increased customer satisfaction, and the greater facility of containerized transshipping from sea terminal to land transportation.[46]

One initial disadvantage of containership development is a rather substantial capital investment in port facilities, such as special berths, weight-handling equipment, storage areas, and land transportation links, all of which must be made if full potential savings are to be realized.

The East Coast and West Coast ports have recorded the largest intermodal container traffic increases, and this has come at the expense of Gulf of Mexico and Great Lakes ports, where former all-water services have been dropped in favor of MLB (mini-landbridge) moves.[47] The Gulf ports, in particular Houston, New Orleans, Tampa, and Miami, are looking to Latin American, African, Caribbean, and Mediterranean trades for their long-term market niche. However, some major traded commodities are not yet fully containerized (such as coffee or bananas), and none of those commodities is a major user of inland intermodal rail transportation.[48]

Major Trade Areas[49]

Overseas containerized-trade markets include Europe and the Mediterranean, Latin America, Africa and the Middle East, and the Far East. Houston's primary containerized-cargo trading partners are Europe and the Mediterranean, which comprise 58 percent of all containerized cargo moving through Houston's port. Latin America constitutes 20 percent of all containerized cargo moving through the Port of Houston, the Far East 13 percent, and African/Middle Eastern countries 9 percent.

Other gulf ports trade primarily with Latin American countries. For Central America, Galveston handles 4 percent of gulf port container trade compared to Freeport's 8 percent and Houston's 7 percent share of the trade. Freeport handles 10 percent of the gulf port container trade with South America, while Houston handles 56 percent of that trade. Houston appears to have the bulk of container trade with South America, but in Central American container trade, Galveston and Freeport handle approximately the same volume as Houston.

Trends in Containerized Trade

Currently, approximately half of all foreign imports and exports moving through Texas are via the ports. Of the exports moving through Texas, container shipments through the Texas ports account for 15 percent of the total (38 percent of all foreign waterborne exports are containerized cargo at the Texas ports), indicating a strong need for container-handling facilities in the future. Refer to table 2.9. The primary container-handling ports in Texas are Houston, Freeport, and Galveston.

Since 1986, containerized cargo has become the most important business unit at the Port of Houston.[50] Although Houston is the largest-volume container-handling facility on the Gulf Coast, it has been losing market shares in container-handling over the previous few years. The Port of Houston's share of the Gulf Coast container market declined from 55 percent in 1990 to 47 percent in 1993. This occurred while growth at all gulf ports (including Houston) showed an increase of 18 percent over the same period. Refer to table 2.10. Over the ten-year period from 1983 to 1993, Houston went from an eighth-place ranking in the United States (for total container handling) to an eleventh-place ranking in 1993.[51]

Based upon existing trends and assuming no major changes in infrastructure, intermodal, or technology, projections for Houston's future container handling indicate an annual average growth rate of 3 percent.[52] In 1993, the Houston Port Authority earmarked $90 million for expanding rail access and rail capacity at Barbours Cut Terminal (current container-handling facility) to improve the port's intermodal capacity. Additionally, the port plans to aggressively market the container-handling facilities to Puerto Rico, which is the United States' largest single containerized cargo market in Latin America, with 5.5 million tons of containerized cargo annually.[53]

Table 2.9. Percentage of Imports and Exports Moving through Texas Ports, 1992

	Imports		Exports			
Mode	Percent of Total Value		Percent of Total Volume		Percent of Total Value	
	World	Mexico	World	Mexico	World	Mexico
Sea	49	9	51	12		
Container					15	1
Noncontainer					25	3
Air	6	1	<1	<1	18	4
Surface	45	90	49	88	42	92

Source: Adapted from U.S. Bureau of the Census, *United States Waterborne Foreign Commerce* (Washington, D.C., 1993).

Table 2.10. Comparison of the Port of Houston's Market Share among All Gulf Coast Ports, 1990-93

	1990	1991	1992	1993*
Total Gulf Coast Containers (in Thousands of TEUs)	620.0	643.8	701.6	731.8
Port of Houston Containers (in Thousands of TEUs)	343.0	335.1	339.7	341.6
Port of Houston Market Share	55%	52%	48%	47%

Source: Adapted from PIERS, Booz-Allen and Hamilton, *Port of Houston Authority, Master Plan Final Report, 1994* (Houston: Port of Houston Authority, July 1994), pp. III5-6.

Note: Industry volumes do not match PHA statistics due to accounting methods.

*Estimates.

Coastline Domestic Trade

Domestic trade occurring along the Texas coast often utilizes the Gulf Intracoastal Waterway. This waterway links numerous transportation arteries, such as railroads, highways, and ports.[54] Approximately 70 million tons of cargo are shipped along the waterway annually, and nearly 100 percent is domestic.

The GIWW provides numerous farm-to-market roads with access to the wealth of natural resources found in the coastal regions. The GIWW is used to gather oil, gas, sulfur, seafood, and other coastal resources, and it provides delivery to much of the continental United States via the Mississippi River system.[55]

Barge transportation along the Texas portion of the GIWW is economical, efficient, and safe. Bulk material handling and energy efficiency often make barge shipping six to seven times less expensive than rail and truck alternatives. It has also proven to be the safest method of transporting hazardous materials within Texas.[56]

Since the waterway is a shallow-draft channel, almost all traffic is domestic. Only in recent years has a small volume of international cargo or cargo destined for other U.S. regions moved on the waterway.[57]

Domestic Trade and Texas Ports

Domestic trade among Texas ports has shown some significant changes from 1988 to 1992. (See table 2.11.) Beaumont, with its large increases in import and export dollar values, has shown the most significant domestic tonnage decrease, down nearly 29 percent for the period 1988-92. Brownsville, Matagorda, and Galveston showed substantial increases in domestic tonnage over the same period with 40, 44, and 32 percent, respectively. Other Texas ports, including Houston, Corpus Christi, and Port Arthur showed small increases of less than 10 percent over the period. Texas City and Freeport both showed moderate declines over the period.

Table 2.11. Domestic Trade and Texas Ports, 1992/88 (in Thousands of Short Tons)

Port	Total Tons		Percent Change 1992/1988
	1988	1992	
Houston	60,269	64,879	7.6
Corpus Christi	23,558	24,565	4.3
Texas City	19,720	18,746	-4.9
Port Arthur	8,710	8,231	5.8
Beaumont	22,207	15,809	-28.8
Freeport	8,823	7,587	-14.1
Galveston	2,984	3,949	32.3
Matagorda	1,173	1,693	44.3
Brownsville	906	1,275	40.1

Source: U.S. Army Corps of Engineers, *Waterborne Commerce of the United States*, part 2 (Fort Belvoir, Va., 1988-94), pp. 348-414.

Note: Includes coastwise, internal, and intraport.

Major Cargo and Trends of Coastline/Domestic Trade

Based on economic and commodity forecasts, demand for coastwise freight transport is expected to increase by 12 percent and internal freight transport by 18 percent over the next 20 years in Texas. Over 60 percent of the commodities currently transported along the GIWW are petroleum or coal products, and over 16 percent are chemical-related products.[58]

Total tonnage transported along the GIWW grew by 39 percent from 1982 to 1991. Petroleum products tonnage increased by 28 percent over the same period, chemical products by 36 percent, coal by 150 percent, and all other products combined by 44 percent.[59] The trend for cargo types tends to indicate higher proportions of coal, chemicals, and other products in comparison to petroleum products. However, petroleum products combined with coal still accounted for over 60 percent of the waterway transported cargo.

Conclusion

In 1993 alone, the Texas seaport and inland waterway system moved over 390 million tons of cargo. This tonnage illustrates the strength of Texas ports in the face of a volatile trade market and massive economic and political upheaval around the world. However, to remain competitive in the future, import and export markets must be analyzed thoroughly and changes made accordingly. Containerized trade has shown significant usage increases over the past 10 to 15 years and remains a potential growth market for Texas ports. However, port managers must make their ports economically efficient and improve intermodal connections to accomplish this task. Additionally, ports should look at all factors involved in port selection processes to determine what improvements should be accomplished and what marketing strategies to develop.

While this chapter has given a brief overview and description of global trends, U.S. ports, and the Texas port and waterway systems, it has not been inclusive or comprehensive. Chapter 3 will provide an in-depth description and analysis of the Gulf Intracoastal Waterway's Texas portion, as well as issues affecting the GIWW, such as the environmental consequences of dredging. Subsequently, because Mexico is a major U.S. trading partner, chapter 4 will provide an overview of Mexico's ports, including discussion of issues affecting those ports. Afterward, chapters 5 and 6 will provide extensive descriptions of Texas' intermodal connections. Additionally, funding, legislation, and other major issues affecting Texas ports and waterway systems will be profiled in chapters 7 and 8. Finally, comprehensive, individual Texas port profiles are included in this report's appendixes.

Notes

[1]Rexford B. Sherman, "Public Seaport Agencies in the United States and Canada," American Association of Port Authorities, Alexandria, Va., 1990, p. 2 (draft).

[2]American Association of Port Authorities (AAPA), *U.S. Public Port Facts,* Alexandria, Va., 1993. (Brochure.)

[3]Hans Jurgen Peters, *Seatrade, Logistics, and Transport,* Policy and Research Series, report no. 6, Policy, Research, and External Affairs (Washington, D.C.: The World Bank, June 1990), p. 2.

[4]Ibid., pp. 2-4.

[5]Organization for Economic Coordination and Development, "Draft 1993 Annual Report of the Maritime Transport Committee," Directorate for Science, Technology and Industry, July 13, 1994, p. 116 (draft).

[6]Ibid., pp. 117-18.

[7]Ibid.

[8] U.S. Department of Transportation (USDOT), Maritime Administration, *Double Stack Container Systems: Implications for U.S. Railroads and Ports, Task V Report* (Washington, D.C., June 1990), pp. 27-32.

[9]Organization for Economic Coordination and Development, Draft 1993 Annual Report, pp. 118-21.

[10]Peters, *Seatrade, Logistics, and Transport,* p. 3.

[11]Ibid.

[12]Ibid.

[13]Bill Mongelluzzo, "Ports Look Inward as Priorities Change," *Journal of Commerce* (January 18, 1995), p. 1A.

[14]AAPA, *U.S. Public Port Facts.*

[15]Ibid.

[16]U.S. Army Corps of Engineers (Corps), *Waterborne Commerce of the United States, 1994,* part 2 (Fort Belvoir,

Va., 1995), pp. 348-418.

[17]U.S. Bureau of the Census, *U.S. Waterborne Exports and General Imports Annual* (Washington, D.C., 1990-1994).

[18]Peter Tirschwell, "Customs Acts To Put Power in Hands of Ports," *Journal of Commerce* (February 3, 1995), p. 1A.

[19]AAPA, *U.S. Public Port Facts.*

[20]Ibid.

[21]Sherman, Public Seaport Agencies, pp. 2-3.

[22]Ibid.

[23]AAPA, *U.S. Public Port Facts.*

[24]Paul R. Murphy, "A Comparative Analysis of Port Selection Factors," *Transportation Journal*, vol. 34, no. 1 (Fall 1994), pp. 19-20.

[25]Peters, *Seatrade, Logistics, and Transport,* pp. 2-4.

[26]Ibid.

[27]Texas Department of Transportation (TxDOT), Multimodal Operations Office, December 30, 1994.

[28]USDOT, Maritime Administration, *U.S. Oceanborne Foreign Trade Routes, October 1992* (Washington, D.C., 1993), pp. 128-33.

[29]Corps, *Your Gulf Intracoastal Waterway,* 1992. (Brochure.)

[30]TxDOT, *The Gulf Intracoastal Waterway in Texas, 1995,* Austin, Tex., 1994), p.2. (Brochure.)

[31]TxDOT, "The Texas Transportation Plan: The Texas Multimodal Transportation System," Austin, Tex., 1994, p. III-38 (discussion draft).

[32]Port of Houston Authority, *The Houston Ship Channel, Economic Lifeline to the World,* Houston. (Brochure.)

[33]Texas City Terminal Railway Company, *Texas City Terminal Railway Company, 1994,* Texas City, Tex. (Brochure.)

[34]Letter from A. J. Reixach Jr., Executive Port Director, to William D. Dye, Texas Department of Transportation, May 26, 1994.

[35]Port of Galveston, *Comprehensive Annual Financial Report of the Board of Trustees of the Galveston Wharves, December 1993, Management of the Wharves* (Galveston, Tex.: Port of Galveston, 1994), pp. 15-17.

[36]Brownsville Navigation District, "Annual Cargo Reports, 1994, Brownsville, Texas." (document).

[37]Interview by Jeffrey Stys with C. James Kruse, Port Director and General Manager, The Port of Brownsville, Brownsville, Tex., March 11, 1995, Brownsville, Tex.

[38]The Port of Harlingen Authority, "Annual Report, 1993," Harlingen, Tex., p. 15 (document).

[39]Interview by Jeffrey Stys with Robert C. Cornelison, Port Director, Port Isabel/San Benito Navigation District, Port Isabel, Tex., March 10, 1995, Port Isabel, Tex.

[40]Interview by Jeffrey Stys with Michael Wilson, Port Director and General Manager, Willacy County Navigation District and Port Mansfield Public Utility District, Raymondville, Tex., March 11, 1995, Raymondville, Tex.

[41]Response by Michael Wilson to request for information by the TxDOT, June 6, 1994.

[42]"Smaller Texas Ports Buoyed by Success of Larger Rivals," *Texas: Journal of Commerce Special Report* (June 8, 1993), p. 8a.

[43]TxDOT, Texas Multimodal Transportation System, p. III-38.

[44]Kevin Hall, "Texas Ports Prepare for Fallout from Peso," *Journal of Commerce* (Jan. 12, 1995), p. 1B.

[45] David R. McKenzie, Mark C. North, and Daniel S. Smith, *Intermodal Transportation: The Whole Story,* 1st ed. (Omaha, Nebr.: Simmons-Boardman, 1989), pp. 7-26.

[46]*Encyclopedia Brittanica, 1994,* 15th ed. (Chicago, 1994) vol. 28, p. 852.

[47]Mini-landbridge (MLB) is a port-to-port movement replacing one end of an ocean voyage. MLB service uses a land transportation mode--sometimes truck but usually rail--to serve a second port from a single port call.

[48] USDOT, Maritime Administration, *Double Stack Container Systems*, pp. 29-30.

[49]Booz-Allen and Hamilton, *Port of Houston Authority, Master Plan Final Report, 1994* (Houston, July 1994), pp. III-5-6. Data for this section were obtained from the Houston Master Plan.

[50]Ibid., p. III-4.

[51] AAPA, *U.S. Public Port Facts.*

[52]Booz-Allen and Hamilton, *Port of Houston Authority,* p. III-10.

[53]Port of Houston Authority, "Master Plan Describes Economic Opportunities," *Port of Houston* (November 1994), p. 16.

[54]Bonnie Adams, "Waterway Vital Part of Multimodal Network," *Transportation News,* vol. 19, no. 12 (August 1994), p. 5.

[55]Corps, *Your Gulf Intracoastal Waterway.*

[56]Texas Department of Highways and Public Transportation, Texas Marine Advisory Service, *The Gulf Intracoastal Waterway,* Austin, Tex., 1989. (Brochure.)

[57]TxDOT, Texas Multimodal Transportation System, p. III-39.

[58]Corps, *Waterborne Commerce Statistics, 1991,* part 2 (Fort Belvoir, Va., 1992).

[59]Ibid.

Chapter 3. Gulf Intracoastal Waterway

Introduction

This chapter provides an overview of the characteristics and components of Texas' portion of the Gulf Intracoastal Waterway, with specific emphasis given to issues involving the GIWW's continued operational feasibility. The first sections provide a description of the GIWW and its commodity flows, as well as the GIWW's interactions with Texas ports. Subsequently, issues involving infrastructure and maintenance, funding, safety, and factors threatening closure of the GIWW are addressed. The impact any GIWW closure might have on roadway degradation, congestion, emissions, and fuel costs is also explored. The chapter ends with a detailed enumeration and discussion of the numerous issues involving dredging and material disposal, which are the most significant factors impeding GIWW operations.

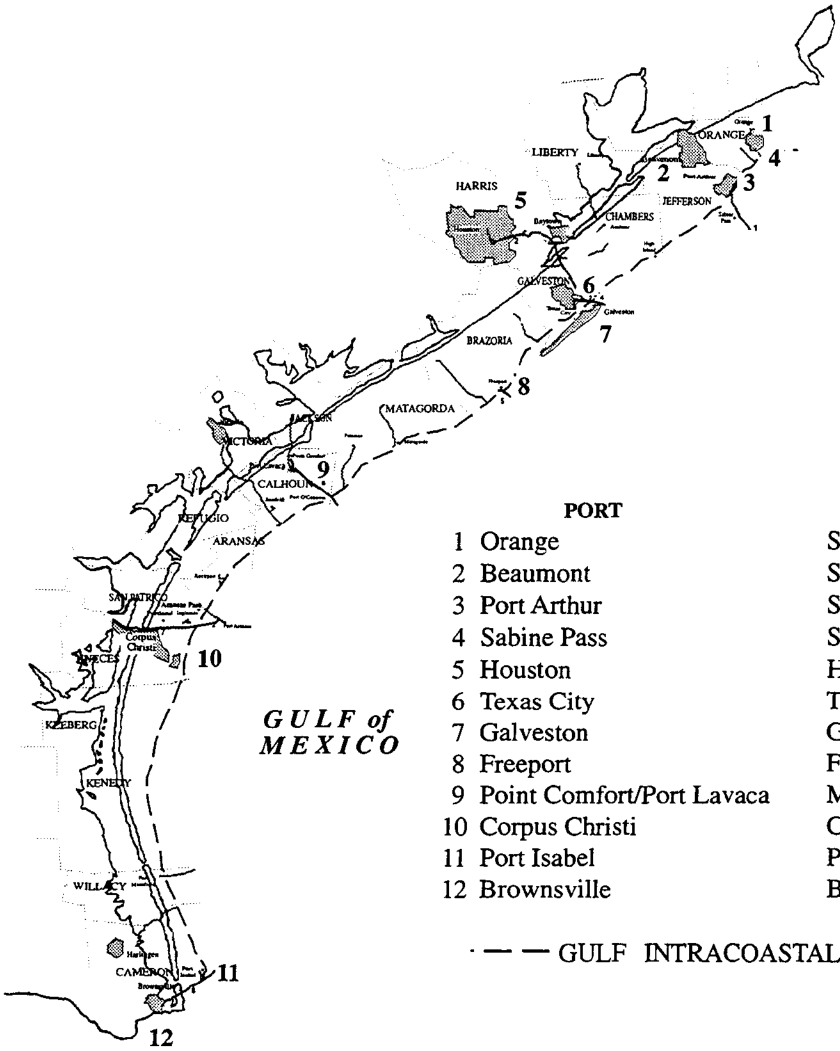
Overview

The Gulf Intracoastal Waterway is a 1,300-mile-long, man-made canal that runs along the Gulf of Mexico's coastline from Texas' southernmost tip at Brownsville to St. Marks, Florida. The GIWW was originally constructed to provide a connection between all of the small Gulf Coast ports. The impetus for creating such a link was the discovery of oil in East Texas, as well as the growing need to move steel and other manufacturing materials. Ultimately, however, the GIWW enabled the gulf ports to be linked with the entire country via the inland waterway system.[1]

The Texas portion of the waterway is 423 miles long. Because it is less than 25 feet deep, it is defined as a shallow-draft channel. The U.S. Army Corps of Engineers maintains the waterway at an authorized width of 125 feet and a depth of 12 feet. The waterway is directly linked with Texas' 12 deep-draft port channels, as shown in map 3.1. The GIWW also connects to the interstate marine thoroughfare of the Mississippi and Ohio Rivers, two of the busiest waterways in the country.[2]

The GIWW is the third busiest canal in the United States. It largely accommodates barge traffic, as this is the waterway's most effective use. According to the Waterborne Commerce Statistics Center, the GIWW carried an estimated 115 million tons of goods in 1993. Average tonnage moved on the waterway from 1980 to 1992 was 72.5 million tons of goods each year.[3] Because the GIWW is a shallow-draft facility, almost all traffic on the canal is internal (domestic). However, in recent years, small volumes of cargo destined for other parts of the United States as well as international cargo have been moved on the waterway.[4]

Map 3.1. Texas Gulf Intracoastal Ports and Waterways



PORT	WATERWAY
1 Orange	Sabine River
2 Beaumont	Sabine - Neches Waterway
3 Port Arthur	Sabine - Neches Waterway
4 Sabine Pass	Sabine Pass Harbor
5 Houston	Houston Ship Channel
6 Texas City	Texas City Channel
7 Galveston	Galveston Harbor & Channels
8 Freeport	Freeport Harbor
9 Point Comfort/Port Lavaca	Matagorda Ship Channel
10 Corpus Christi	Corpus Christi Ship Channel
11 Port Isabel	Port Isabel Ship Channel
12 Brownsville	Brazos Island Harbor

· — — GULF INTRACOASTAL WATERWAY

Recreation and fishing are important uses of the GIWW as well. The waterway serves as a passage to coastal regions and is also used for skiing, fishing, and cruising. A 1980 study indicated that 2.4 million recreational boat trips originate in Texas coastal waters each year. Approximately 1.9 million, or 79 percent of these trips, utilize the GIWW. Additionally, access to prime fishing areas is provided by the GIWW. In 1992 alone, commercial and sport fishing boats traversing the GIWW produced a catch of 85.8 million pounds of shrimp, oysters, crabs, and finfish. This catch was estimated as having a value of $157.5 million.[5]

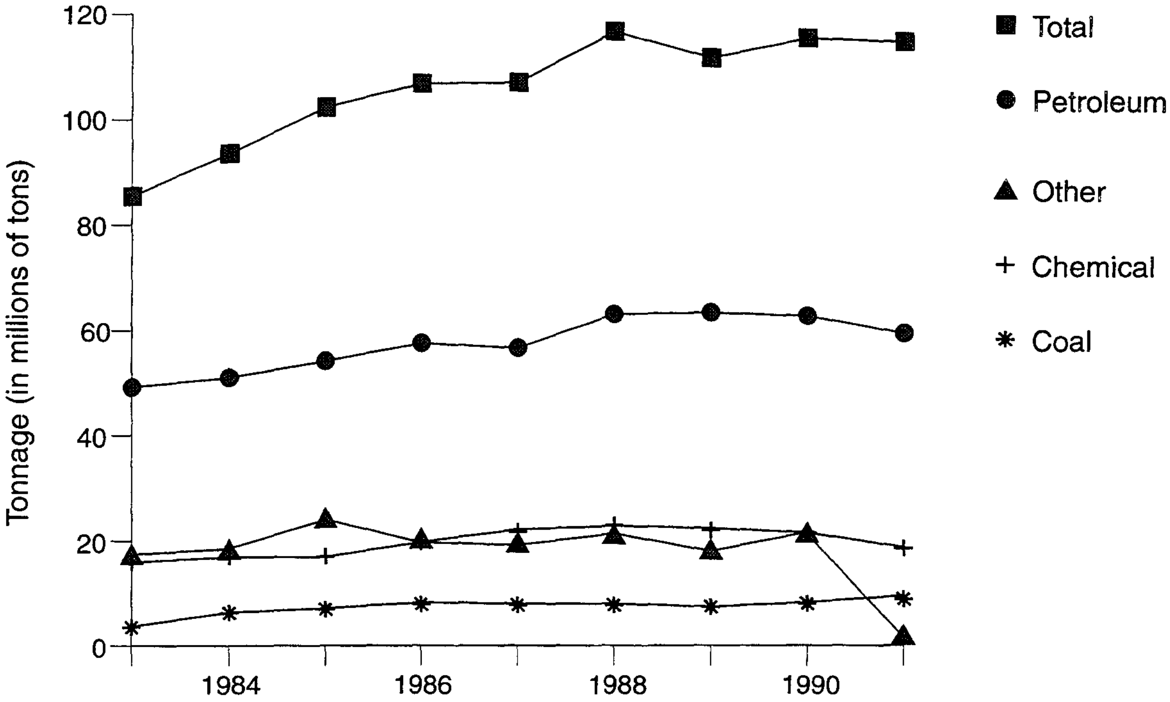
Commodity Flow Concentrations

An analysis of the commodity movements on the GIWW illustrates which product types are most frequently moved on the waterway in terms of tonnage. The GIWW lends itself to the movement of bulk, nonperishable goods; therefore, it is widely used for the transport of petroleum and chemical products. For the period from 1983 to 1991, over 60 percent of the commodities transported on the GIWW were petroleum and coal products, and another 15 percent of the commodities were chemicals and related products. Other bulk items moved on the GIWW include crude materials, manufactured goods, food and farm products, and machinery.[6] Figure 3.1 compares the movement of the major types of products moved on the GIWW for the period 1983 to 1991.

The Texas portion of the waterway is often viewed in terms of the northernmost, middle, and southernmost sections. The northernmost section (section 1) runs from the Sabine River to Galveston; the middle section (section 2) runs from Galveston to Corpus Christi; and the southernmost section (section 3) runs from Corpus Christi to the Mexican border.

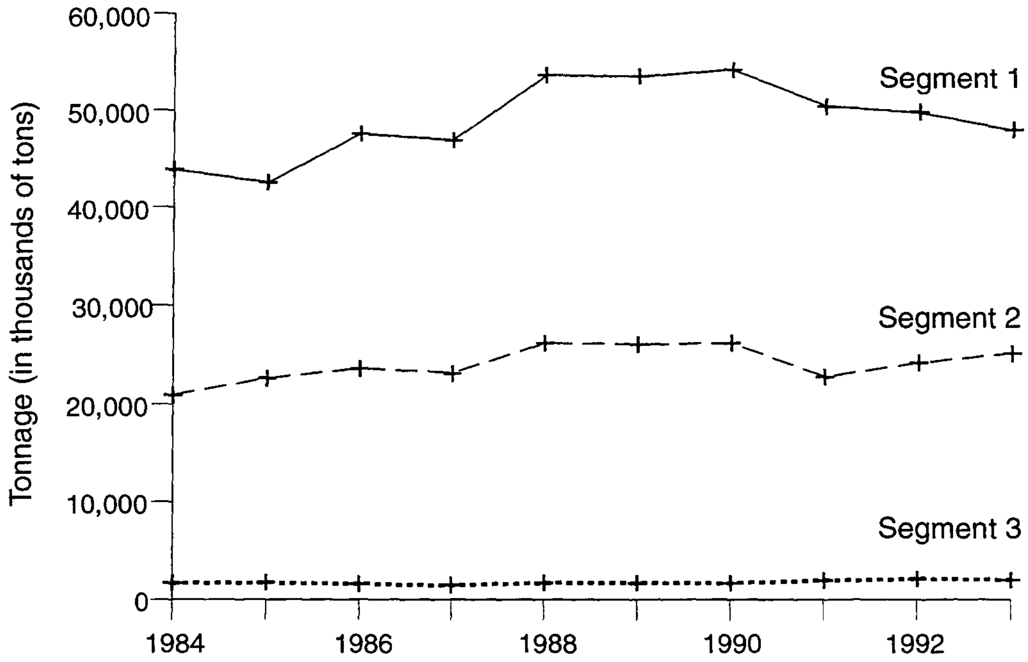
The most heavily utilized portion of the GIWW is the northernmost segment (segment 1), which runs from the Sabine River to Galveston. Approximately 45 to 55 million tons of goods were moved annually on this segment from 1984 to 1993, or about two-thirds of all through-traffic. The middle segment (segment 2) runs from Galveston to Corpus Christi. About one-third of all GIWW traffic, or 20 to 25 million tons of goods, was moved on this segment each year from 1984 to 1993. During that same period, about 1.8 to 2.4 million tons of goods were moved annually on segment 3, which runs from Corpus Christi to the Mexican border.[7] Figure 3.2 illustrates the breakdown of tonnage moved along the three segments of the Texas portion of the GIWW from 1984 to 1993.

Figure 3.1. Total Tonnage Moved on GIWW, by Commodity, 1983-91



Source: Texas Department of Transportation, *The Texas Transportation Plan: Modal Profiles*, 1994 ed. (Austin, Tex., 1995).

Figure 3.2. Total Tonnage on Texas Portion of GIWW, 1984-93



Source: Adapted from U.S. Army Corps of Engineers, *Waterborne Commerce of the United States*, part 2 (Fort Belvoir, Va., 1993).

The most commonly used vessels on the GIWW are self-propelled tug- or towboats, and non-self-propelled tankers. This is again a reflection of the dominance of petroleum and chemical products as the principal goods moved on the waterway. For 1993, traffic moving upbound, or in a northerly direction on the GIWW, was approximately equivalent to the amount of traffic moving downbound, or in a southerly direction. Table 3.1 shows a breakdown of the number of trips taken on the Texas portion of the waterway by vessel, both upbound and downbound, in 1993.[8]

Table 3.1. Trip Totals on Texas Portion of GIWW, 1993

	Segment 1	Segment 2	Segment 3
Upbound			
Self-Propelled			
Pass and Dry Cargo	1,006	10,013	475
Tanker	10	3	0
Tug or Tow	13,127	8,286	990
Non Self-Propelled			
Dry Cargo	4,111	2,784	409
Tanker	17,010	8,647	663
Total	35,264	29,733	2,537
Downbound			
Self-Propelled			
Pass & Dry Cargo	962	9,992	464
Tanker	14	3	0
Tug or Tow	13,126	8,392	996
Non Self-Propelled			
Dry Cargo	4,071	2,774	381
Tanker	17,066	8,616	656
Total	35,239	29,777	2,479
Total Trips	**70,503**	**59,510**	**5,034**

Source: Adapted from U.S. Army Corps of Engineers, *Waterborne Commerce of the United States.*, part 2 (Fort Belvoir, Va., 1993).

Interaction between GIWW and Texas Ports

The GIWW plays an important role in the efficiency and viability of the Texas waterway system. For the most part, facilities for the transfer of materials from barges to the port are adequate for Texas ports. Concerns raised by ports regarding the GIWW focused on the need to continue maintenance dredging of the waterway and to ensure the unimpeded movement of barges from one destination to the next.[9] Barge traffic is an integral part of many of the port economies throughout the entire GIWW, and some ports feel their future strategic plans are closely linked to the operation of the GIWW.

As was shown in table 3.1, the bulk of activity on the waterway is largely focused on the northern and middle sections (sections 1 and 2) due to traffic patterns and the location of the larger Texas ports in these sections.[10] However, for many of the shallow-draft ports in particular, the GIWW is vital to their economic survival. This is true both for ports that rely almost entirely on barge traffic as well as ports that function primarily as recreational facilities.

As noted above, most of the cargo moved along Texas waterways was petroleum and petrochemical products. The GIWW is well suited for the movement of such cargo, and, therefore, has allowed many of the smaller, shallow-draft facilities to engage in both interstate and international trade. Commercial fishing access via the GIWW has had a significant impact on these port economies as well. For comprehensive information regarding specific Texas port and GIWW interactions, refer to individual port profiles in the appendixes.

Infrastructure Improvements and Maintenance

An important priority concerning the GIWW is the need for infrastructure improvements and maintenance. At various locations along the GIWW, conditions exist that can cause problems or impediments to navigation on the waterway. One such problem is the result of shoaling, which refers to the action of wind, waves, currents, and rain that causes the bottom of the GIWW to be filled with sediments. Shoaling creates the necessity for maintenance dredging, which will be discussed in depth in later sections.

Other problems include bridges with inadequate span widths, realignment to address restricting curvatures, and the misplacement of buoy markers in the channel. Additionally, the two river locks and floodgates located on the GIWW need rehabilitation, without which they may present a severe problem in cargo movement via GIWW to various ports.[11]

Many of these problems stem from a lack of adequate resources at the Army Corps of Engineers to address these needs in Texas. The Corps operations and maintenance budget, from which funds are used for infrastructure improvements on the GIWW and other waterways, has been reduced in recent years.

Financing

Reductions in funding for the Corps has created major impediments to operations, maintenance, and improvements of the GIWW. Many users of the GIWW and other waterways are very concerned that the Corps' GIWW operations and maintenance budget eventually could be eliminated entirely to reduce federal expenditures. This is widely viewed by users of the waterway as a shortsighted method for controlling federal spending.[12]

Another financial resource for maintenance of the GIWW is the Texas Department of Transportation (TxDOT), which, as the nonfederal sponsor of the GIWW, is responsible for obtaining rights-of-way for dredged material disposal sites. TxDOT budgets approximately $1 million annually for the acquisition of such rights-of-way and for administrative purposes. However, funds for this program come from the nondedicated portions of the state highway fund and are not adequate for meeting the various operational needs of the GIWW.[13]

In response to the inadequate financial support of the Corps' GIWW responsibilities, a barge fuel-use tax was imposed in the 1980s. Prior to this time, no user fees were collected. This federal tax has steadily increased over a ten-year period, most recently in 1994 from 15¢ to 20 ¢ per gallon. However, it has been estimated that only about 7.3 percent of the maintenance costs for the Texas GIWW are recovered by the federal government from this tax.[14]

The federal government has considered a proposal to increase the fuel tax to $1 per gallon. Some federal officials believe this is the level of taxation necessary to bring the operations and maintenance budget to an adequate level, meeting all U.S. inland waterway system needs. However, the barge industry believes a $1 per gallon tax would make it impossible for many companies to operate at a profit utilizing the GIWW.[15]

Other industries, including petroleum and petrochemical processors, farmers, and utilities, all rely heavily on the GIWW for the economical transport of their goods. The barge industry, which pays for the fuel tax, is concerned that increased taxes have been making it increasingly difficult for GIWW users to remain competitive with rail transportation. As a result, any further increase in the tax could have a highly detrimental effect on industry users, resulting in a heavy loss of barge business.[16]

Partly as a result of the various budget constraints, the GIWW has not seen a major overhaul of structural improvements in many years, even though such improvements are necessary in order for modern technologies to be utilized on the waterway. However, barge operators, wary of creating a situation where an increase in the fuel tax would become necessary, have urged the federal government to move cautiously before making any expensive capital upgrades. Also influencing this decision is the average annual growth rate for the GIWW, which has been a modest 0.8 percent over the last ten years.[17] Additionally, environmental concerns have made it increasingly difficult to proceed with structural changes.

Safety

Transport of materials by water is a relatively safe method, particularly for hazardous materials. According to a study on the transport of hazardous materials, from 1976 to 1984 only six hazardous spills were recorded for Texas.[18] However, a barge collision on the GIWW would have very serious consequences, and therefore is an issue of concern. Safety risks are associated with heavily traveled portions of the waterway, increasing tow sizes, high levels of hazardous cargoes, and a lack of proper training for tow operators.

Many safety problems stem from impediments to navigation, resulting from the Corp's inability to make infrastructure improvements in a timely fashion. The need to maintain adequate safety features on the GIWW is another reason infrastructure improvements should be a high priority to the barge industry and other users of the GIWW.[19]

Partly as a result of the highly publicized accidents involving waterborne traffic--such as the Exxon Valdez oil spill and the tugboat crash in Mobile, Alabama--the barge industry has taken steps to improve safety procedures. Some companies have initiated random drug and alcohol testing of tow operators. Additionally, the industry has been developing a model company safety program, in which the best safety practices will be incorporated into a set of procedures adopted industrywide.[20]

Factors Threatening Operation of GIWW

There are concerns that certain circumstances could force the closure of portions of the GIWW, either temporarily or indefinitely. A closure of the GIWW would most likely result from the occurrence of one of two categories of events. The first category of events is classified as structural or operational problems. These include erosion, shoaling, natural disasters, or accidents. The second category refers to limitations due to environmental concerns and financial issues.[21]

Erosion is continually taking place along the Texas coastline. In Sargent, Texas, this problem is especially acute. Erosion has progressed to the point where there is a serious threat of breaching the GIWW. A breach would subject the GIWW to gulf wave and current action, eventually forcing closure of the channel at that point. The Corps assessed the situation, and consequently, funding has been authorized by Congress to construct a protective wall system to stop the erosion.[22]

As mentioned earlier, shoaling action generates a buildup of sediments in the GIWW. This material must be removed by dredging. Without maintenance dredging, the channel would no longer be deep enough to accommodate barge traffic.

Natural disasters that would effect the waterway include unusual flooding on the rivers along the Texas coast, high water levels on the GIWW, hurricanes, and storms. These events could cause large amounts of debris to be dumped into the waterway, forcing its closure. Likewise, they could cause structural damage to the channel, forcing traffic on the GIWW to be halted until repairs could be made. On average, Texas experiences hurricanes every other year and tropical storms every three years; therefore, the possibility of a natural disaster is very high and the threat very serious.[23]

Another concern involves the safe operation of barges on the waterway. A serious accident, perhaps involving a collision between two barges carrying hazardous materials, could also force the closure of the waterway. The GIWW passes through some of the most environmentally sensitive areas of the Texas coast. Many of these areas contain wetlands, which are highly productive and delicate resources. The wetland vegetation is an integral part of the coastal ecosystem, and it retards erosion by anchoring the unstable soil found in coastal regions. Additionally, these wetlands provide a habitat for many species of waterfowl, mammals, and reptiles and serve as nurseries for finfish and shellfish as well.

Of significant importance are the many endangered species found in the Texas coastal waters adjacent to the GIWW. These endangered species are dependent on the wetland habitat for their survival. Consequently, before any actions that could affect the GIWW are taken (such as disposal of dredge material into environmentally sensitive areas), consideration must be given to the impact they may have on the region's species and resources.[24]

As mentioned earlier in the chapter, financing issues are an important concern for the GIWW. It is possible that if adequate funding for the operation of the GIWW is unavailable, the channel would not be properly maintained, and thus its operations would cease.

Impact of Closure of the GIWW

Studies have determined that the probability for extended closure of the GIWW is low. Likewise, the Corps has indicated it does not expect any closure of the GIWW to last more than 30 days.[25] However, some types of events, such as natural disasters, could cause the GIWW to shut down for prolonged periods. If this should occur, it would likely cause a shift in the mode of transport used to move commodities dependent on the GIWW.

A study examined the effect this shift would have on the roadways. It predicted that some portion of 34.5 million tons, or 52 percent of the amount moved on the GIWW, would be shifted to Texas roadways. The degree to which the mode of transport would shift would depend on which point on the GIWW the closure occurred.[26]

Impact on roadways was determined by examining the level of roadway degradation that would result from the shift in transport mode. This modal shift would cause a reduced life span of roads as a result of significantly increased levels of roadway traffic. According to the study, the shortened life span of roadways varied from a few months to 15 years.

The study also looked at the impact on road congestion that would result from an interruption in service to the GIWW. The resulting increase in truck traffic would, accordingly, increase the level of congestion on roadways.

Other effects of an increase in rail and truck traffic examined by the study include the impact on fuel costs and level of emissions. An analysis of a hypothetical closure of the GIWW at one point showed a significant impact on both of these factors. In the case analysis, fuel costs for the annual barge transport of 41.5 million tons of goods was estimated at $25.4 million. To transport these same goods by truck would cost $150.9 million, and by rail $29.8 million. This translates to an increase in fuel costs of $155.3 million.

Likewise, an analysis of emissions revealed that a shift away from barge transport would increase emissions dramatically. Transport by barge of 41.5 million tons of goods was estimated to generate 7,162 tons of emissions annually. If the transport of these same goods were to be done by truck and rail, emissions generated would increase to 39,169 tons. This is a net growth of 32,007 tons of emissions.[27]

Dredging

The continuous shoaling that fills the GIWW with sediment requires that the channel be dredged periodically to allow its uninterrupted use. Eight areas of the waterway are noted for requiring the most frequent maintenance; these are listed in table 3.2.

Table 3.2. Shoaling Rates along the GIWW

Location	GIWW Mile Points	Shoaling Rate
Galveston Bay	348	2.3 ft/yr (0.7 m/yr)
Intersection of GIWW and Houston Ship Channel	351.1	2.0 ft/yr (0.61 m/yr)
Brazos River	400.4	4.0 ft/yr (1.22 m/yr)
Matagorda Bay	454.3 to 457	5.0 ft/yr (1.52 m/yr)
San Antonio Bay	492 to 500	2.7 ft/yr (0.82 m/yr)
Redfish Bay	531	3.2 ft/yr (0.98 m/yr)
Baffin Bay	596 to 605	2.0 ft/yr (0.61 m/yr)
Laguna Madre	657 to 660	2.7 ft/yr (0.82 m/yr)

Source: Adapted from Texas Department of Transportation, *The Texas Transportation Plan: Modal Profiles*, 1994 ed. (Austin, Tex., 1995), tab V.

The process of dredging and the disposal of dredge materials has raised concerns from the environmental community. Concerns are focused primarily in areas where the GIWW passes through environmentally sensitive areas containing wetlands or species habitat. As a result of these concerns, some environmental groups have suggested closure of the GIWW's southern portion as a means to improving the area's environmental quality.

As available disposal sites become increasingly scarce, and pressures to protect the environment increase, dredging has become one of the most crucial issues facing the GIWW and ports in Texas. A questionnaire distributed to Texas ports resulted in 9 out of the 13 respondents citing environmental regulations and concerns regarding dredging as issues of serious concern. Many ports in the southernmost portion of Texas saw the environmental community's objections to dredging as threatening their ability to expand and, ultimately, their economic survival.[28]

Two areas where the environmental community has taken action against the Corps' dredging activities are in the Laguna Madre and Port Aransas. Many designated dredge disposal sites for the GIWW are located in the Laguna Madre's open waters. The Laguna Madre, an environmentally sensitive, shallow, saltwater lagoon, is used as spawning grounds for many fish and shrimp, and it supports 380 species of birds. Consequently, the environmental community is very concerned that the GIWW maintenance dredging and dredge-material disposal are causing significant damage to the Laguna Madre ecosystem.[29]

Action was taken by environmental groups against the Corps in the fall of 1994. A coalition of seven environmental groups filed a federal lawsuit against the Corps to halt the dumping of dredge spoil in the Laguna Madre. The suit called for the Corps to conduct an environmental impact study analyzing the consequences of dredging operations. Additionally, the environmentalists claimed the Corps did not adequately evaluate the environmental effects of dredging and failed to consider alternatives to dumping materials in the lagoon.[30] A judge subsequently ruled to deny the plaintiffs' request.[31]

Charged with assuring navigability, the Corps has continued to dredge the portion of the GIWW that passes through the Laguna Madre. However, in response to the environmental community's concerns, steps to minimize impact and further study the dredging effects have also been incorporated into dredging plans.[32] These steps include extensive seagrass planting, control of sediments, and turbidity studies.

Port Aransas is well known for its proximity to the Aransas National Wildlife Refuge, which is home to the world's last flock of whooping cranes, now numbering 131 birds. The GIWW passes between the refuge and the barrier islands that protect it from the Gulf of Mexico. Environmental concerns have been raised by the U.S. Fish and Wildlife Service that erosion within the refuge has resulted from the effects of boat wakes from vessels using the GIWW. However, the Corps has determined that at least some portion of the erosion is caused by wind force effects. Total erosion has been occurring at an average rate of 2 feet per year, which translates into a loss of about 2 acres per year of whooping crane habitat.

The U.S. Fish and Wildlife Service also objects to the Corps' disposing of dredge material along the shore opposite the refuge, citing that dredge material has been covering up wetlands, further impacting the crane habitat. Currently, a study is underway to examine the long-term effects of the GIWW on crane habitat, with a final report due in 1998. The Corps has determined that reinforcement of the 8.5-mile Aransas Bay shoreline is necessary and is currently examining the feasibility of rerouting the GIWW away from the refuge.[33] Additionally, the study is exploring the possibility of GIWW realignment and is developing various beneficial uses for the dredge material.[34]

Conclusion

The Gulf Intracoastal Waterway has been in use in its present form since the mid-1900s. The Texas portion of the GIWW has been a dependable thoroughfare, particularly to the petroleum, petrochemical, and agricultural industries. Moreover, it is an important commercial trade link between Texas ports and other U.S. ports and is increasingly important with foreign trade markets. The GIWW has provided both an economical and relatively safe method of transporting bulk cargo to and from the gulf region.

The future of the GIWW has become less clear as factors arise that may hamper the growth of the channel. Limitations, such as funding, make structural and technological improvements difficult, and the need to address environmental concerns is becoming more critical. Because the GIWW provides significant economic benefits to the state of Texas, it is worthwhile for the state to continue to actively support its continued use. The key is to develop innovative methods of dealing with the challenges that confront the GIWW today.

Notes

[1]Telephone interview by Carol Kim with Dave Swenson, Gulf Intracoastal Canal Association, Lafayette, La., April 13, 1995, Austin, Tex.

[2]Texas Department of Transportation (TxDOT), *The Gulf Intracoastal Waterway in Texas* (Austin, Tex., 1994), p. 5.

[3]U.S. Army Corps of Engineers (Corps), *Waterborne Commerce Statistics* (New Orleans, La., March 1994).

[4]TxDOT, *The Texas Transportation Plan: Partnerships into the 21st Century, Modal Profiles*, 1994 ed. (Austin, Tex., 1995), tab V, p. 5.

[5]TxDOT, *The Gulf Intracoastal Waterway in Texas,* pp. 6-8.

[6]Corps, *Waterborne Commerce Statistics.*

[7]TxDOT, Modal Profiles, p. 4.

[8]Corps, *Waterborne Commerce of the United States,* part 2 (Fort Belvoir, Va., 1993), pp. 527-28.

[9]Responses by individual Texas ports to TxDOT questionnaire, "The Texas Transportation Plan, 1994," and LBJ School of Public Affairs, University of Texas at Austin, questionnaire, "Texas Port Issues Survey," March 1995.

[10]Corps, *Waterborne Commerce of the United States,* pp. 527-28.

[11]Telephone interview with Dave Swenson, April 13, 1995.

[12]Ibid.

[13]TxDOT, Modal Profiles, p. 20.

[14]Ibid.

[15]Telephone interview with Dave Swenson, April 13, 1995.

[16]U.S. Congress, House, Public Works and Transportation Subcommittee on Investigations and Oversight, *Inland Waterways Infrastructure Issues and Recommendations on New Construction Projects for the Inland: Hearing,*

103rd Cong., 2nd sess., May 4, 1994.

[17]Ibid.

[18]TxDOT, Modal Profiles, p. 32.

[19]Telephone interview with Dave Swenson, April 13, 1995.

[20]Ibid.

[21]Texas Transportation Institute (TTI), Texas A&M University System, *Closure of the GIWW and Its Impact on the Texas Highway Transportation System: Final Report,* vol. 1, Cooperative Research Program Report 1283-2F (College Station, Tex., 1993), p. 11.

[22]TxDOT, *The Gulf Intracoastal Waterway in Texas,* p. 32.

[23]TTI, Closure of the GIWW, p. 11.

[24]TxDOT, *The Gulf Intracoastal Waterway in Texas,* p. 4.

[25]TTI, Closure of the GIWW, p. 86.

[26]Ibid.

[27]Ibid., pp. 81-82.

[28]TxDOT, Modal Profiles, p. 30.

[29]"Think Tank Finds Maintenance Dredging Harms Ecosystem," *BNA State Environment Daily* (June 27, 1994); and TxDOT, *The Gulf Intracoastal Waterway in Texas,* p. 11.

[30]TxDOT, *The Gulf Intracoastal Waterway in Texas,* p. 25.

[31]Ibid.

[32]Ibid.

[33]Corps, *Gulf Intracoastal Waterway, Texas, Section 216 Reconnaissance Report* (Galveston, Tex., November 1989), p. 1.

[34]TxDOT, *The Gulf Intracoastal Waterway in Texas,* p. 33.

Chapter 4. Mexican Seaport and Inland Waterway System

Introduction

With the recent passage of the North American Free Trade Agreement and sweeping Mexican maritime law reforms, trade between Texas and Mexican seaports is expected to increase. Nine percent of the total U.S. import cargo (by value) from Mexico arrives via Texas seaports. In exports to Mexico, 1 percent of the total Texas export trade value is container traffic and 3 percent is noncontainer traffic with Mexico.[1] Texas ports are strategically located to take advantage of Mexico's increased trade.

This chapter begins with an overview of Mexican ports' available facilities and infrastructure. Although the Mexican port system has many shallow- and deep-draft ports, the ports of Altamira, Veracruz, Tampico, Manzanillo, and Lázaro Cárdenas are Mexico's most important ports. Map 4.1 indicates the geographic location of Mexico's ports. Each major port's equipment, infrastructure, and cargo tonnage are profiled.

The second section focuses on the recent Mexican port law changes. The section includes an overview of the 1993 Mexican Law of Ports, which opened the way for Mexico's privatization of its ports, and the Mexican government's recent announcement to privatize container facilities. Also noted are the estimated private investment levels needed at the major Mexican ports.

The third section chronicles Mexico's shipper activity and the recent Mexican peso devaluation's effect on shipper and carrier expansion plans. Afterward, the final section examines the potential Gulf Intracoastal Waterway extension in Tamaulipas, Mexico. Although this extension has been previously proposed, the Tamaulipas' state government is actively promoting the project in both Mexico and Texas. However, the project's efficiency and cost-effectiveness have been questioned.

Overview of Mexican Ports

Strategically located between North, Central, and South America, and with outlets to both the Pacific and Atlantic oceans, Mexico is optimally situated in one of the world's largest and more dynamic commercial zones. Mexico's 18 largest commercial, deep-draft ports handle 80 percent of the country's total foreign trade.[2] In 1992, Mexican ports handled 175 million tons of cargo, of which 70 percent were oil and oil products.[3] Also in 1992, Mexican ports moved approximately 445,000 TEUs in container traffic.[4]

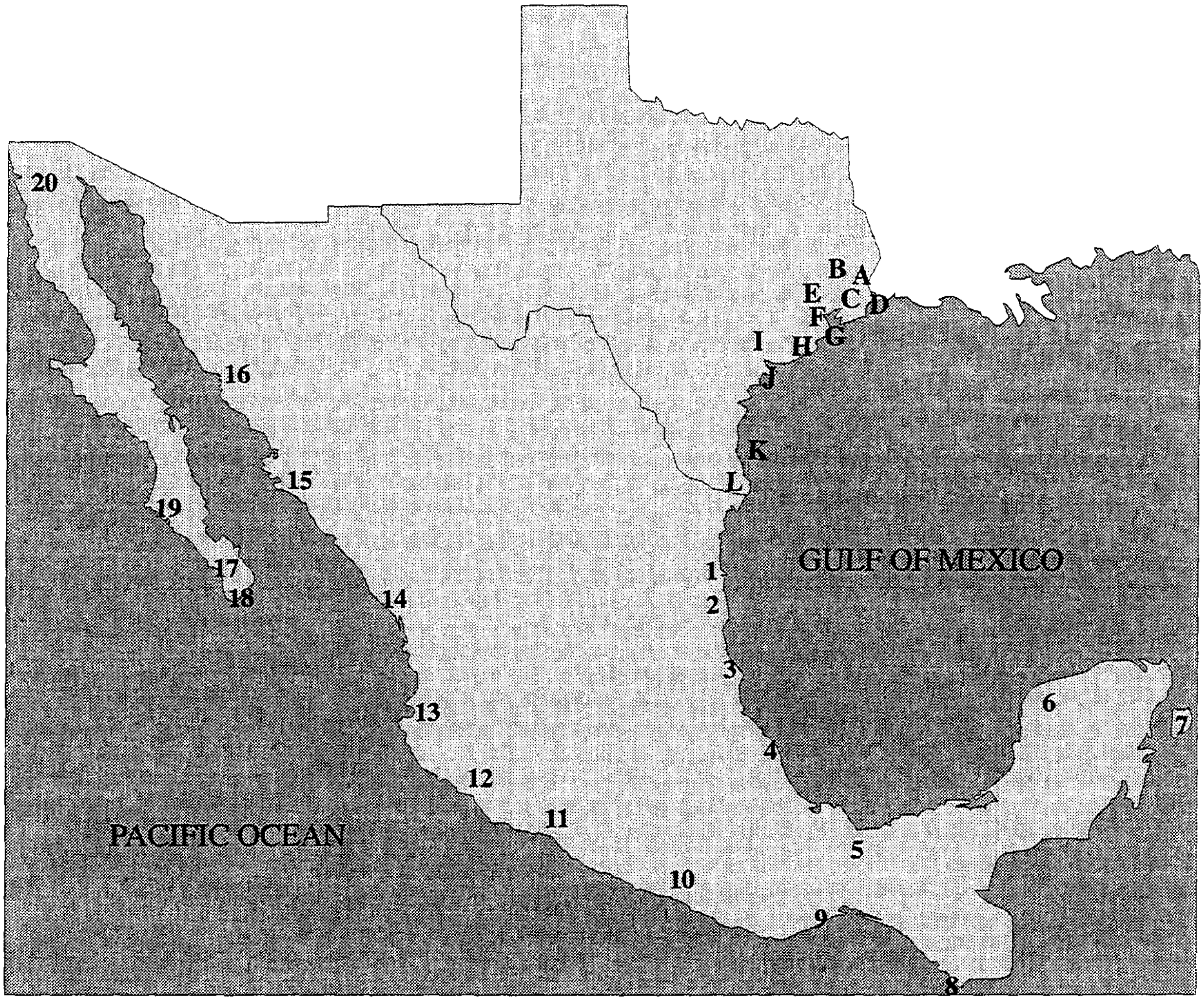
In 1993, the national port system handled almost 180 million freight tons.[5] Of the total amount, 67 percent were oil and hydrocarbon products handled by Pemex, the national oil company; 17 percent were minerals handled by external private cargo terminals. The remaining 16 percent, nearly 29 million tons, consisted of bulk, general, and container cargo handled through the main commercial ports.

Over the last four years, agricultural products and container cargo represented the most significant growth increases, but the actual container traffic is considered low, given the Mexican economy's size and its industrialization level. Yet container movements showed a 100 percent growth increase from 1988 to 1991, yielding a 60 percent total cargo increase.[6] In 1993, after the four main ports' installation of eight gantry cranes, the containerized cargo volume reached 464 thousand TEUs total volume.[7]

Four Mexican ports--Veracruz, Altamira, Manzanillo, and Lázaro Cárdenas--handle 60 percent of all Mexican seaborne trade.[8] Each port maintains specialized container terminals.[9] Table 4.1 lists these four ports', along with Tampico's, available infrastructure and equipment. Table 4.2 lists the four major ports' primary Mexican city destinations and mileages by both road and rail.

Mexican ports, like all ports worldwide, need reliable landside transportation access to move goods to and from the ports. According to José San Martín Romero, Director of Planning, Division of Toll Roads, Secretariat of Communications and Transportation (SCT), the four largest ports have optimized their operations with modern equipment and control systems; however, problems still exist with the adequacy of landside access.[10] Road connection and rail line improvements have not been adequate, nor have they been equal to Mexico's port improvements.[11] In response to this situation, the SCT was expected to announce by the summer of 1995 that it will begin an intersecretarial coordination of the different transportation ministries.[12] This coordination will ensure that all modes of transportation will have the same objective.

Map 4.1. Texas and Mexican Port Network



Ports of Mexico

1	Altamira	11	Lazaro Cardenas
2	Tampico	12	Manzanillo
3	Tuxpan	13	Puerto Vallarta
4	Veracruz	14	Mazatlan
5	Coatzacoalcos	15	Topolobampo
6	Progreso	16	Guaymas
7	Cozumel	17	Pichilingue
8	Puerto Madero	18	C. San Lucas
9	Salina Cruz	19	San Carlos
10	Acapulco	20	Ensenada

Ports of Texas

A	Orange	G	Galveston
B	Beaumont	H	Freeport
C	Port Authur	I	P. Lavaca/Pt Comfort
D	Sabine Pass Harbor	J	Corpus Christi
E	Houston	K	Port Isabel
F	Texas City	L	Brownsville

Table 4.1. Infrastructure at Major Mexican Ports

	Veracruz	Altamira	Tampico	Lázaro Cárdenas	Manzanillo
Warehouses	85,241 sq. m.	4,480 sq. m.	36,968 sq. m.	33,974 sq. m.	19,765 sq. m.
Access Channel	14 m.	12 m.	9-11 m.	14 m.	14 m.
Turning Basin	13 m.	12 m.	10-12 m.	14 m.	14 m.
Overseas Docking	2,466 m.	1,511 m.	2,129 m.	2,484 m.	2,111 m.
Wharf Cranes	4	3	N/A	3	2
Berth Position	2	2	N/A	1	1
Docking Positions	19	7	23	12	9

Source: Adapted from Puertos Mexicanos, "Puertos Mexicanos, Investment Opportunities in Container Terminals," in *The Mexican Ports: Investment for the Future*, Mexico City, Mexico, 1994. (Pamphlet.)

Table 4.2. Land Connections at Major Mexican Ports

Port	Destination	By Road	By Railroad (Duration of Trip)
Veracruz	Mexico City	433 kms.	419 kms. (838 min.)
Altamira	Monterrey	564 kms.	517 kms. (1,034 min.)
	Nuevo Laredo	793 kms.	785 kms. (1,570 mins.)
	Mexico City	576 kms.	1,014 kms. (2,028 mins.)
Manzanillo	Guadalajara	313 kms.	355 kms. (710 min.)
	Mexico City	804 kms.	1,141 kms. (2,282 min.)
Lázaro Cárdenas	Mexico City	688 kms.	799 kms. (1,598 min.)

Source: Adapted from Puertos Mexicanos, "Puertos Mexicanos, Investment Opportunities in Container Terminals," in *The Mexican Ports: Investment for the Future*, Mexico City, Mexico, 1994. (Pamphlet.)

Veracruz

Centrally located on Mexico's eastern, Gulf of Mexico coast, Veracruz is Mexico's oldest and most important port. The port's strategic location near the country's most important industrial and commercial zones, which are highway and railway connected, makes it an important agricultural and industrial transport link. The port ships 23.8 percent of Mexico's seagoing cargo and, over the past few years, has developed its ability to handle containers and agricultural bulk.[13] Veracruz is the only port where projected cargo levels justify a second terminal in the short run, as it is the only port presently operating at capacity.[14] Table 4.3 gives Veracruz traffic for the years 1990 to 1992.

Table 4.3. Veracruz: Port Traffic, 1990-92

	1990	1991	1992
Containers (TEUs)	110,019	121,681	178,181
General Cargo (in thousands of tons)	738	1,070	957
Agricultural Bulk (in thousands of tons)	1,407	1,109	1,484
Fluids	507	706	604
Vessels Operated	699	741	938

Source: Adapted from Puertos Mexicanos, "Puertos Mexicanos, Investment Opportunities in Container Terminals," in *The Mexican Ports: Investment for the Future*, Mexico City, Mexico, 1994. (Pamphlet.)

Altamira

Located on Mexico's eastern coast as well, Altamira is the closest port to the United States' border. Altamira's freight volume accounts for 5.3 percent of the country's total seaborne trade. The port has tremendous growth potential, as the available surrounding area can be developed into industrial parks. Additionally, Altamira has rail and highway links to Monterrey and Mexico City and a specialized rail link to the Pacific coast's Port of Manzanillo. The port has been operating for three years and is located only 42 kilometers from Tampico.[15]

Table 4.4. Altamira: Port Traffic, 1990-92

	1990	1991	1992
Containers (TEUs)	37,710	36,955	52,978
General Cargo (in thousands of tons)	179	170	150
Agricultural Bulk (in thousands of tons)	N/A	N/A	N/A
Fluids	277	385	512
Vessels Operated	205	279	473

Source: Adapted from Puertos Mexicanos, "Puertos Mexicanos, Investment Opportunities in Container Terminals," in *The Mexican Ports: Investment for the Future*, Mexico City, Mexico, 1994. (Pamphlet.)

Tampico

Tampico is Mexico's second busiest eastern coast port, handling 14.4 percent of the total Mexican seaborne trade. Located along the Panuco River banks, it has rail and highway connections with Mexico's most important economic centers: Mexico City, Guadalajara, and Monterrey. The port has specialized rail service to the Port of Manzanillo. Furthermore, Tampico's close proximity to the Altamira port, and specialization in handling several cargo types, afford the two ports a complementary relationship.[16]

Table 4.5. Tampico: Port Traffic, 1990-92

	1990	1991	1992
Containers (TEUs)	36,987	33,056	42,597
General Cargo (in thousands of tons)	1,042	993	869
Agricultural Bulk (in thousands of tons)	1,750	1,174	771
Mineral Bulk (in thousands of tons)	1,931	1,176	1,335
Vessels Operated	842	707	749

Source: Adapted from Puertos Mexicanos, "Puertos Mexicanos, Investment Opportunities in Container Terminals," in *The Mexican Ports: Investment for the Future*, Mexico City, Mexico, 1994. (Pamphlet.)

Lázaro Cárdenas

Lázaro Cárdenas, Mexico's third busiest port and most important Pacific port, handles 14.1 percent of Mexico's seaborne trade.[17] The port is linked to the cities of Morelia, Michoacán, and Mexico City by both highway and rail. Lázaro Cárdenas primarily handles oil products, chemical products, and containers. Additionally, the port has sufficient territorial reserves and infrastructure to allow future heavy industrial development. These industries will be specifically oriented toward exports to the Pacific Basin countries.

Table 4.6. Lázaro Cárdenas: Port Traffic, 1990-92

	1990	1991	1992
Containers (TEUs)	26,159	39,192	44,742
General Cargo (in thousands of tons)	914	869	915
Agricultural Bulk (in thousands of tons)	93	132	122
Mineral Bulk (in thousands of tons)	3,093	2,876	3,179
Vessels Operated	276	234	274

Source: Adapted from Puertos Mexicanos, "Puertos Mexicanos, Investment Opportunities in Container Terminals," in *The Mexican Ports: Investment for the Future*, Mexico City, Mexico, 1994. (Pamphlet.)

Manzanillo

The Pacific coast's Port of Manzanillo is considered Mexico's "gateway to the Pacific." The port handles 10.6 percent of the country's seaborne trade, making it Mexico's second busiest Pacific port.[18] Manzanillo, with its location and infrastructure, has the capacity for increased trade with Pacific Rim countries, the United States, and Canada. Moreover, the port is the main link between the Pacific and Mexico's industrial and trade zones. The port also has development potential for tourist cruises, as it is located near Mexico's most popular tourist destinations.

Table 4.7. Manzanillo: Port Traffic, 1990-92

	1990	1991	1992
Containers (TEUs)	32,792	41,895	50,419
General Cargo (in thousands of tons)	459	278	385
Agricultural Bulk (in thousands of tons)	425	436	1,160
Mineral Bulk (in thousands of tons)	1,664	1,496	2,010
Vessels Operated	326	229	347

Source: Adapted from Puertos Mexicanos, "Puertos Mexicanos, Investment Opportunities in Container Terminals," in *The Mexican Ports: Investment for the Future*, Mexico City, Mexico, 1994. (Pamphlet.)

Privatization

In 1988, the Salinas administration began initiating profound and numerous economic reforms, including the divestiture of nonstrategic public companies. Within this wide-ranging reform, and in response to world market competition, Mexico actively reoriented its port policy by decentralizing, deregulating, and privatizing its national port system.[19] According to the SCT publication, *Investment and Development in Mexico*, the decentralization process objective is "two fold: first to promote self-sufficiency of ports by subjecting them to free market forces; and second, a corollary to the first goal, to enhance the value of port services to its users, by relying on improved quality and increased efficiency."[20]

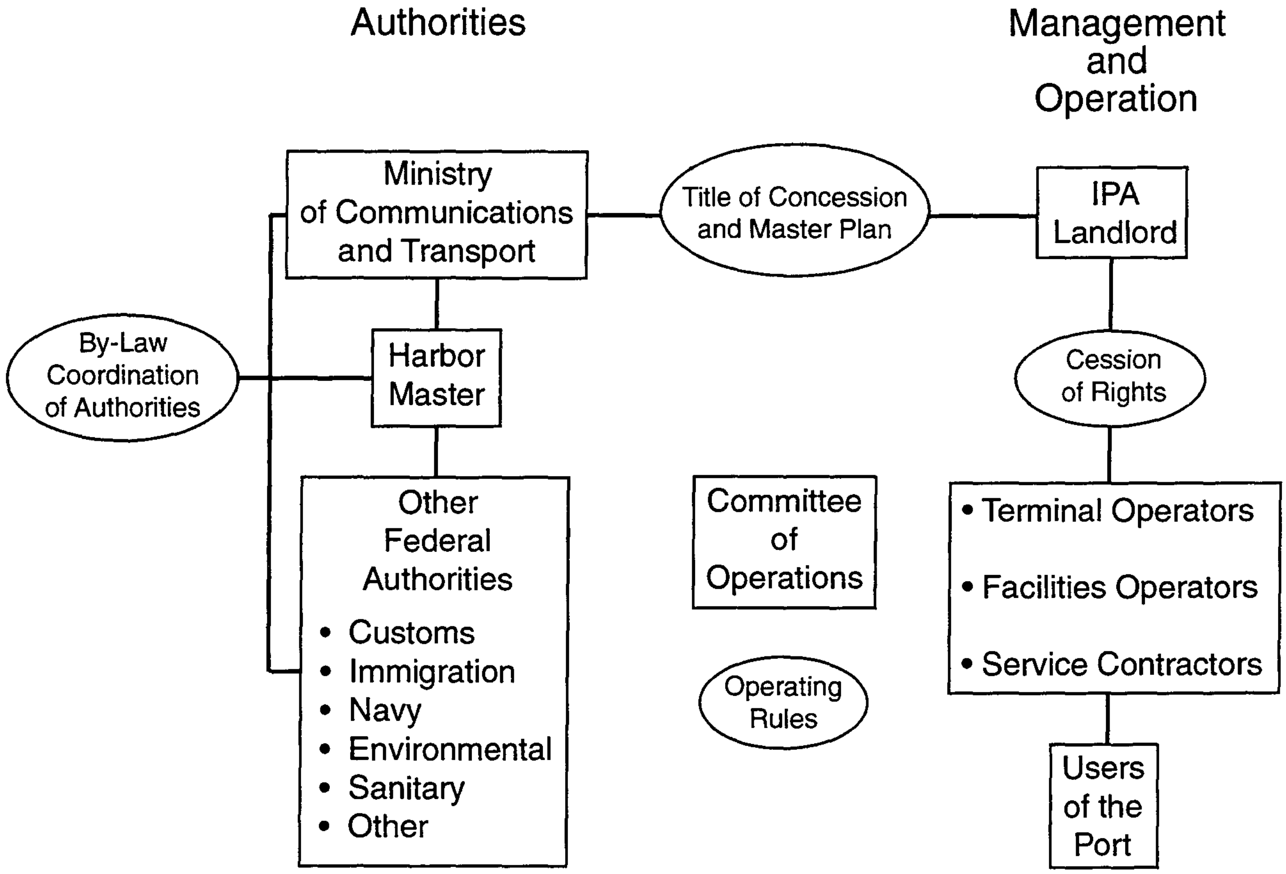
Acknowledging that the Mexican ports' cargo volumes are not consistent with Mexico's development level or its growth potential, the government undertook a national port system privatization and modernization program. Prior to the reforms, the government exercised centralized port administration, which in turn reduced private participation in ports and resulted in the nation's ports lacking competitiveness.[21] When the Mexican government began to investigate the possibility of port privatization, it was believed that the privatization process would be complete in two to three months.[22]

Initially, the Mexican government's privatization model was to be accomplished by selling its ports at a wholesale price to the private sector. However, with World Bank and U.S. consultants' advice, the government changed its privatization model to one that included concessions and leasing of facilities, while still retaining ownership of these facilities in the public domain.[23] The 1993 Mexican Law of Ports redefined the government's role in ports to perform purely normative and supervisory functions.[24] In addition, Puertos Mexicanos, the federal maritime agency, was officially liquidated on September 30, 1994, with a portion of its oversight functions transferred to the SCT.

The Mexican Law of Ports provides that each port will be governed by an Integral Port Administration (IPA), which is constituted as a chartered corporation with responsibility for all port administrative functions, including construction, planning, and promotion.[25] These responsibilities had previously been the federal government's responsibility.[26] Existing port infrastructure, including land and water areas, were retained in the public domain; however, their development and use are now subject to concession. The IPAs are granted a multiple concession of the port enclosure which may be awarded for 50 years and then extended for periods similar to those originally granted.[27] Figure 4.1 shows the new port organization according to the Mexican Law of Ports. Seventeen ports have established IPAs, which handle 96 percent of Mexico's commercial cargo, excluding Pemex-shipped oil and hydrocarbon products.[28]

The IPAs are required to follow a master plan containing information on the port enclosure, operation, investment programs, and other measures related to efficient administration. Acting as landlords, the IPAs will be able to cede part of their concession rights to third parties, by contracting out the terminals, facilities, and related services operations. However, responsibilities such as customs, immigration, and sanitary inspection will remain under direct government control.[29]

Figure 4.1. Port Organization According to the Mexican Port Law



Source: Puertos Mexicanos, *The Mexican Ports Investment for the Future: Restructuring and Privitization Process* (Puertos Mexicanos, Mexico, D.F.: 1994).

A committee of operations will reside at each port to oversee day-to-day port management as well as the coordination among operators, service contractors, users, and different government authorities.[30] Additionally, the administrators will formulate port work rules, which are subsequently submitted to the operations committee.[31] Once approved by the operations committee, these work rules will be SCT registered. Finally, the operations committee will issue recommendations concerning rules, time schedules, assignment of berthing spaces, and fees.

The Mexican Law of Ports entitles the creation of individual port advisory commissions, which will be organized by each port's state government. The commission will be made up of state and municipal government representatives, regional chambers of commerce, port users, unions, and the port management itself. These advisory commissions will be entitled to make recommendations on matters affecting urban activities as well as the area's environmental balance. The port administrator will also be required to inform the advisory commission of the master plan and any amendments to it, in addition to the port expansion and modernization projects.[32]

Investment in Mexican Ports

Total Mexican port private investments, from 1989 through the first semester of 1992, had reached $1 billion.[33] In 1994 alone, $350 million was invested primarily at the ports of Manzanillo, Altamira, and Veracruz.[34] These private investments financed the construction and operation of 79 specialized cargo terminals and 17 marinas. Also, it is estimated that Mexican ports will need an additional $770 million to be invested by 2010 to modernize facilities.[35] Of this total amount 70 percent, or $560 million, will be necessary simply to develop the four main ports' basic infrastructure. Other regional ports will need the remaining $210 million. Table 4.8 profiles the concessions that have been granted at various Mexican ports.

Table 4.8. Concessions Granted to Operate and Construct Port Facilities

Function	Company	Ports
Terminals handling fluids	German-based BASF and U.S.- based Container Care International have control in these types of terminals; Japanese-based Mitsui Group and the South Korean trading company Sunkyong each have a partial stake	
Intermodal facilities	Japanese automobile manufacturer Nissan formed an equal partnership with Mexican shipping company Transportación Maritima Mexicana to manage one of the intermodal concessions	
Two grain terminals, three cement terminals, and intermodal facility for handling shipments of automobiles		Manzanillo (Sinaloa)
Facilities to handle petrochemical shipments		Altamira (Tamaulipas), Port of Tuxpan (Veracruz)
Cement handling facilities		Progresso (Yucatan), Salina Cruz (Oaxaca), Guymas (Sonora), Ensenada (Baja California), Coatzacoalcos (Veracruz)
Grain terminal		Tampico (Tamaulipas), Veracruz, Coatzacoalcos, Tuxpan (all in Veracruz), Topolobambo (Sinaloa)
Tourist transportation		Zihuatenego (Guerrero), Cozumel, Punta Venados (both in Quintana Roo)

Continued on next page

Table 4.8. *Continued*

May 1994 concessions for development	Progreso, Ensenada, Guymas, Topolobambo, Mazatlan, Tuxpan, Dos Bocas (Tabasco), Frontera (Tabasco), Cabo San Lucas (Baja California Sur)
September 1994 concession for further development	Coatzacoalcos, Salina Cruz, Acapulco, Puerto Vallarta, Campeche, all ports in the state of Baja California Sur
Box terminal	Veracruz, Manzanillo, Lázaro Cárdenas
Multiple use terminal	Lázaro Cárdenas, Manzanillo, Altamira

Source: Adapted from "Transportation Secretariat (SCT) Awards Various Concessions to Private Sector at 20 Seaports," in Latin America Data Base (The University of New Mexico, Albuquerque, N. Mex., August 25, 1993); and Kevin G. Hall, "Mexico Opens Bidding Process for Box Terminals," *Journal of Commerce* (March 1, 1995), p. 1D.

Along with privatization and decentralization, the Mexican government is encouraging private investment in both IPAs and port infrastructure. Mexican private investors may purchase 100 percent of chartered corporations' shares, which operate the IPAs, terminal and facilities operators, and service contractors. However, under Mexican law, foreign investment is limited to 49 percent of IPA equity and is unlimited through Mexican chartered corporations operating terminals, facilities, and services.[36]

Initially, for practical purposes, the IPAs' equity will be fully underwritten by the federal government.[37] During this time, the IPAs will be managed by an independent administrative body that will autonomously set policies and make all decisions. Once their financial position and prospects are clear, they will be put up for private sector sale through an international bid offer.

Privatization of Container Facilities

On January 3, 1995, as part of the Agreement of Unity to Overcome the Economic Emergency,[38] the Mexican government announced that the Veracruz, Manzanillo, Lázaro Cárdenas, and Tampico container terminal facilities would be put up for bids within 60 days.[39] According to the agreement, the bid call was expected to be published on March 3, 1995.[40] Mexico-registered steamship lines and stevedoring companies will all be eligible to bid for these facilities. Bankers, coordinating the long-term concessions auction, indicated they expect to raise about $200 million, although some observers have dismissed this figure.[41]

The complete privatization process is expected to take anywhere from nine months to one year.[42] Bids are expected to be returned in the three to four months after the call has been made, and once approved, the process will take another six to eight months to complete. According to one port administrator, the ideal container facilities investments' would be joint ventures, because while Mexico prefers Mexican investors, it realizes that many foreign companies have the experience, technology, and knowledge of international administrative standards.[43]

The Gulf of Mexico Port of Veracruz, and the Pacific coast ports of Manzanillo and Lázaro Cárdenas, are auctioning their box terminals. Also being auctioned are two multiple-use terminals at Lázaro Cárdenas, two in Manzanillo, and two in Altamira. There is only one apparent bidding process restriction: companies can bid on all container terminals, but there is a limit on who can win how many terminals. According to an official from the SCT's maritime office, bidders will not be granted more than one terminal on each coast. To bid, interested parties will have to put forward a 2 million peso guarantee. To bid on two or more ports, parties will have to put forward a 4 million peso deposit.[44]

Current Activities in Privatization and Investment

During the past two years, with privatization and the global trade increase, Mexican port traffic has increased. According to industry executives, clearer private-sector investment rules are necessary before the ports reach their full potential.[45] Few investors have shown an active interest in IPA investments, primarily because their financial returns would be very long-term.[46] An additional investor concern is that the IPAs' administrators are past port directors, who manage the ports the same way as when Puertos Mexicanos controlled them.[47] At most ports, only 30 to 40 percent of administrative personnel are new; however, almost all of the Altamira's administrative force is new.[48]

Another important privatization step allows steamship lines to negotiate wharf usage fees with Mexican ports.[49] According to the General Coordinating Office of Ports and Merchant Marine's spokesperson, Miguel Vergara, each port will have significant wharfage fee discretion, as long as those fees remain less than 4 percent of the shipped product's final value. Whereas wharfage fees were originally sent to Mexico City for allocation and distribution, the fees now stay at the individual ports. According to Port of Veracruz' officials, the fees now staying at Veracruz may be used to finance projects instead of going to Mexico City.[50]

Shipper Activity with Mexico

With the shipment increases spurred by the passage of NAFTA, as well as increasing U.S. and Mexico border congestion, more and more maritime shipping companies and railroads are entering the Mexican transport market.[51] The Mexican currency crisis and failed attempts at all-water routes to Mexico have fostered uncertainty in water transport to Mexico. However, these problems have also led to the development of alternatives in water transport to Mexico.

Protexa Burlington International (PBI) was a joint venture owned equally by Grupo Protexa, a Mexican maritime firm, and Burlington Northern (BN), the U.S. rail carrier. Services began in April 1993, but BN subsequently announced that all services were indefinitely suspended as of October 1, 1994.[52] PBI was dedicated to rail-barge-rail service that operated between Galveston, Texas, and Coatzacoalcos, Mexico. Services included on-loading and off-loading railcars from barges, connecting U.S. and Mexican railroads.[53] The service was beset by permit and dredging problems, along with construction delays, during its Port of Coatzacoalcos introduction. Service was also expected to be extended to the Port of Veracruz, for which the partnership had already received the port's permission.[54]

One problem faced by the joint venture was that it could not compete with the rates and turnaround times offered by Union Pacific Railroad through Laredo. The situation was further complicated by poor turnaround times in recent months, as the state-owned Mexican National Railways (Ferrocarriles Nacionales de Mexico-FMN) suffered chronic locomotive power shortages.[55]

CSX Transportation Company's plans to initiate a similar Mexico barge service have been, according to CSX President John Snow, "put on the back burner."[56] CSX is redefining market projections and determining which traffic is best suited for rail-barge and which should remain on an all-rail route.[57] The peso devaluation has further complicated any plans to start a rail-barge service into Mexico from New Orleans or Mobile, Alabama.[58]

Mexus Ro-Ro Line was officially inaugurated in September 1994, offering 36-hour transport service every four days from Houston, Texas, to Tuxpan, Mexico. The Mexus' chartered vessel has a 220- to 230-trailer carrying capacity. Additionally, the roll on-roll off vessel can handle trailers, flatbed trailers, and irregular loads.[59]

Other shipper activity includes American President Lines' (APL) agreement to share vessels with Transportacion Maritima Mexicana (TMM), Mexico's largest maritime transporter.[60] The agreement allows APL to move freight from Asia to Manzanillo on TMM ships, while TMM will receive APL vessel space to the U.S. West Coast. Because of the current Mexican economic crisis, TMM and APL will not immediately develop double-stack train services at Manzanillo as planned but will continue to rely on weekly, fixed-day, single-stack services to Mexico City and Guadalajara from Manzanillo.[61]

Additionally, Maersk Line and Lykes Bros. Steamship are discussing the possibility of sharing space on ships traveling between various gulf ports and Mexico. This deal would take Maersk's place of Gulf Service, which is being canceled. Maersk's Gulf Service included one vessel rotating biweekly, between the Veracruz, Houston, New Orleans, and Kingston, Jamaica, ports. An agreement between these companies would allow Maersk to continue transporting cargo into and out of Mexico, without paying its own operating costs. Maersk would also maintain a

Mexico presence through its joint service with Sea-Land Service, calling on Mexico's Pacific ports.[62]

BOC International Corporation, a small Boston-based cargo consolidator, recently suspended its weekly all-water service to Mexico on Lykes when its cargo began to pile up on Veracruz' docks.[63] BOC entered into a Lykes Bros. Steamship agreement to avoid Mexican border bottlenecks by taking advantage of an all-water Boston-to-Mexico route. The service would have been the only nine-day service to Tampico and twelve-day containership service to Veracruz.[64] BOC International had been shipping one 40-foot container per week since April 1994 but dropped the service one week after the peso fell. Bob Lewis, the president of BOC International, stated they will review the Lykes service again "when things straighten out in the Mexican economy."[65]

Gulf Intracoastal Waterway

The Mexican State of Tamaulipas' government has proposed an extension of the Gulf Intracoastal Waterway. Although canal development plans have been in existence for more than 100 years, this latest attempt is in response to the expected increase in transport demand resulting from growing trade among Mexico, the United States, and Canada.[66] The proposed canal would improve linkages between the U.S.', Canada's, and Mexico's principle production and consumption centers through an economical and safe means of transportation. Eighty percent of the trade between the United States and Mexico is concentrated on the United States' eastern zone. According to the State of Tamaulipas' government, a GIWW extension would provide a less expensive alternative to congested land crossings.[67]

This proposed project would connect the cities of Matamoros and Tampico and extend 420 kilometers along the Tamaulipas coast. The Port of Brownsville, which is currently the GIWW's southernmost point, would be the first contact point between this new extension and the rest of the GIWW. This canal proposes to strengthen the commercial interaction between the Atlantic coast of the United States and Mexico and also permit better trade links between the Mexican economy and the European and Pacific economies.

By taking advantage of the area's lagoons and natural estuaries, only 25 percent of the 420 kilometers on the Tamaulipas coastline would need to be dredged. It is hoped that the canal would establish a more economical transport means close to the country's most important industrial centers, as well as make Mexican products more competitive in North American markets. This project would have additional advantages for Tamaulipas, including area economic development by creating tourist, industrial, and commercial centers.[68]

When complete, the canal would operate as an IPA, managed and defined under the Mexican Law of Ports' concession scheme.[69] The required investment would be totally private, while the Tamaulipas government would maintain a normative coastal development function, as well as ensuring that the concessionaire complies with the terms of the concession. Currently, the Tamaulipas government has not reported any investor interest.

An important project component is the development of an international crossing linking the proposed extension and the Port of Brownsville. The connection would be a two-way canal, with a width of 122 meters and a length of 5,182 meters, constructed on Port of Brownsville property.[70] This canal would be the connection between the extended Mexican canal and the GIWW and would be constructed from an existing Port of Brownsville canal. The Lauro Villar Beach and Matamoros highway connection would provide Mexico access to this international crossing. However, before any crossing construction begins, Tamaulipas' state government would need to apply for an international crossing presidential permit from the U.S. State Department. This is a formidable challenge considering the difficulty the Port of Brownsville has experienced trying to receive a presidential permit for an international bridge.

According to *Canal Intercostero Tamaulipeco, Cruce Internacional,* the plan includes the following infrastructure projects. In the United States, the Port of Brownsville canal would need to be drained and a bridge constructed over the international crossing between the city of Brownsville and Boca Chica Beach. At the international crossing, structures would be needed to protect the Rio Grande banks from erosion on both sides of the river. In Mexico, a verification terminal, which would expedite import and export transactions, as well as immigration transactions, would be constructed. This terminal would also house all the necessary governmental authorities.[71]

Conclusion

In light of NAFTA's recent passage, Texas seaports are strategically located to take advantage of increasing trade with Mexican seaports. It should be noted, however, that while major Mexican ports currently do not threaten Texas ports' business, Mexican ports' political and infrastructure development should be closely monitored. Mexican port privatization may increase port efficiency, as well as facilitate the use of all-water routes to Mexico. Additionally, the proposed GIWW extension into Mexico, although not an immediate possibility, could have long-term effects on cargo movements between the United States and Mexico.

Notes

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[3]SCT, *Investment and Development in Mexico,* p. 5.

[4] Puertos Mexicanos, *The Mexican Ports: Investment for the Future,* Mexico City, Mexico, 1994, pp. 4, 5, 12. (Pamphlet.)

[5]Ibid., p. 4.

[6]Ibid., pp. 6-7.

[7]Puertos Mexicanos, *The Mexican Ports: Investment for the Future*, p. 6.

[8]SCT, *Investment and Development in Mexico,* p. 7.

[9]Puertos Mexicanos, *Investment Opportunities in Container Terminals,* Mexico City, Mexico, March 14, 1994, p. 4. (Pamphlet.)

[10]Interview by Jeffrey Stys with José San Martín Romero, Director of Planning, Division of Toll Roads, Secretariat of Communications and Transportation, Mexico City, Mexico, January 9, 1995, Mexico City, Mexico.

[11]Interview by Jeffrey Stys with Hugo Cruz Valdés, Asesor del Vocal Ejecutivo, Puertos Mexicanos, Mexico City, Mexico, January 10, 1995, Mexico City, Mexico.

[12]Interview by Jeffrey Stys with Thomás Eduardo Asperó Zanella, Gerente de Promoción, Puertos Mexicanos, Mexico City, January 10, 1995, Mexico City, Mexico.

[13]Puertos Mexicanos, *Port of Veracruz, Mexico,* Mexico, D.F. (Pamphlet.)

[14]Puertos Mexicanos, *Investment Opportunities in Container Terminals,* p. 4.

[15]Puertos Mexicanos, *Port of Altamira, Mexico,* Mexico, D.F. (Pamphlet.)

[16]Puertos Mexicanos, *Port of Tampico, Mexico,* Mexico, D.F. (Pamphlet.)

[17]Puertos Mexicanos, *Port of Lázaro Cárdenas, Mexico*, Mexico, D.F. (Pamphlet).

[18]Puertos Mexicanos, *Port of Manzanillo, Mexico,* Mexico, D.F. (Pamphlet.)

[19]Official Gazette of the Federation, The Mexican Ports, *Investment for the Future, Law of Ports*, English translation (Mexico City, Mexico, 1993, p. i.

[20]SCT, *Investment and Development in Mexico,* p. 5.

[21]Puertos Mexicanos, *The Mexican Ports: Investment for the Future,* p. 14.

[22]Interview with José San Martín Romero, January 9, 1995.

[23]Ibid.

[24]Puertos Mexicanos, *The Mexican Ports: Investment for the Future,* p. 9.

[25]Puertos Mexicanos, *The Mexican Ports: Investment for the Future,* p. 10.

[26]Official Gazette of the Federation, *Investment for the Future*, p. ii.

[27]Puertos Mexicanos, *The Mexican Ports: Investment for the Future,* p. 10.

[28]Jaime Hernandez, "Venta de Puertos, hasta que 'amaine el temporal': SCT," *El Financiero* (January 31, 1995), p. 12.

[29]Puertos Mexicanos, *The Mexican Ports: Investment for the Future,* p. 12.

[30]Interview with José San Martín Romero, January 9, 1995.

[31]Puertos Mexicanos, *The Mexican Ports: Investment for the Future,* p. 16.

[32]Ibid.

[33]SCT, *Investment and Development in Mexico,* p. 9.

[34]Interview with Hugo Cruz Valdés, January 10, 1995.

[35]SCT, *Investment and Development in Mexico,* p. 4.

[36]Puertos Mexicanos, *The Mexican Ports: Investment for the Future,* p. 15.

[37]Ibid., p. 16.

[38] The Agreement of Unity to Overcome the Economic Emergency was an agreement between the Mexican government and the Mexican labor unions to work together in solving economic crises.

[39]"Acuerdo De Unidad Para Superar La Emergencia Economica," *El Financiero* (January 4, 1995).

[40]Hernandez, "Venta de Puertos, hasta que 'amaine el temporal': SCT," p. 12.

[41]John M. Nagel, "Bids open on Mexican port terminal concessions," *Traffic World* (March 1, 1995), p. 19.

[42]Interview with Thomás Eduardo Asperó Zanella, January 10, 1995.

[43]Interview by Jeffrey Stys with Herman L. Deutsch, Marketing Director, and Serafin Vázquez, Manager of Operations, Port of Veracruz, Veracruz, Mexico, January 6, 1995, Veracruz, Mexico.

[44]Kevin G. Hall, "Mexico Opens Bidding Process for Box Terminals," *Journal of Commerce,* p. 1D.

[45]John M. Nagel, "Improvements at Mexican ports spur growth, but more investment, productivity needed," *Traffic World* (October 3, 1994), p. 30.

[46]Kevin G. Hall, "Mexican Port Lures Carriers as Privatization Pays Dividends," *Journal of Commerce* (October 3, 1994), p. 12D.

[47]Nagel, Improvements at Mexican ports spur growth, p. 30.

[48]Interview with Hugo Cruz Valdés, January 10, 1995.

[49]John M. Nagel, "Private Ports: Wharfage-fee Reform Marks Important Step in Port Decentralization," *El*

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[50]Interview with Herman L. Deutsch, January 6, 1995.

[51]Bruce Vail, "Bose to try water route to Mexico," *American Shipper* (July 1994), p. 9-N.

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[55]Lawrence H. Kaufman and Kevin G. Hall, "BN Pulls Plug on Gulf Barge Operation," *Journal of Commerce* (October 3, 1994).

[56]Burke, "BN ends Mexico barge service," p. 22.

[57]Kaufman and Hall, "BN Pulls Plug on Gulf Barge Operation."

[58]Allen R. Wastler, "Mexico-US Barge Runs May Stage Comeback," *Journal of Commerce* (March 8, 1995), p. 1B.

[59]Kevin G. Hall, "Roll-On, Roll-Off Line Offers Route to Mexico without Border Hassles," *Journal of Commerce* (October 5, 1994).

[60]Nagel, Improvements at Mexican ports spur growth, p. 30.

[61]Terry Brennan, "Growth of all-water routes to Mexico stymied by crises, but benefits still touted," *Traffic World* (February 27, 1995), pp. 35-36.

[62]"Lykes, Maersk Discuss Joint Mexican Service," *Journal of Commerce* (March 8, 1995), p. 1B.

[63]Brennan, Growth of all-water routes to Mexico stymied by crises, pp. 35-36.

[64]Vail, "Bose to try water route to Mexico," p. 9-N.

[65]Brennan, "Growth of all-water routes to Mexico stymied by crises," pp. 35-36.

[66]Presentation by Juan José Garcia Gonzales, Director General of Canal and Coastal Infrastructure, at the TxDOT, Austin, Tex., October 12, 1994.

[67]State of Tamaulipas, *Canal Intercostero Tamaulipeco,* March 1994, p. 5. (Pamphlet.)

[68]Ibid.

[69]Ibid., p. 5.

[70]State of Tamaulipas, *Canal Intercostero Tamaulipeco*, Cruce Internacional, September 1994, p. 2. (Pamphlet.)

[71]Ibid., p. 3.

Chapter 5. Railway System Access to Texas Ports

Introduction

This chapter provides an overview of the Texas freight railway system. Projections of future levels of freight rail activity are outlined based on the currently increasing commercial traffic flows and growth of intermodalism. Following an overview, this chapter provides an analysis of the adequacy of rail access to Texas port facilities.

Overview of State Freight Railway System

The Interstate Commerce Commission (ICC) categorizes freight railroads into the following three classifications based upon railroad operating revenues:

1. Class I Railroads: Freight rail carriers with revenue in excess of $250 million annually;

2. Class II Railroads: Freight rail carriers with revenue between $20 and $250 million; and,

3. Class III Railroads: Freight rail carriers with revenue of less than $20 million. Class III railroads are mostly local and short-line freight rail operators and switching and terminal companies.[1]

Railroads Operating in Texas

The Railroad Commission of Texas reports that 44 different freight railroads operated in Texas in 1993. Five were Class I railroads, one was a Class II railroad, and 38 were Class III railroads. This represents an increase in the number of railroads serving Texas since 1978. The 1978 "Texas State Rail Plan" identified only 33 railroad companies operating in Texas. Table 5.1 lists the names of the 44 rail carriers and map 5.1 shows their route systems in Texas.

Class I Railroads

Five Class I railroads serve the state of Texas, operating 10,430 miles in 1993, a figure equivalent to 85 percent of all railroad mileage in the state. Total mileage operated by the Class I railroads decreased from 10,835 in 1992 to 10,430 in 1993.[2]

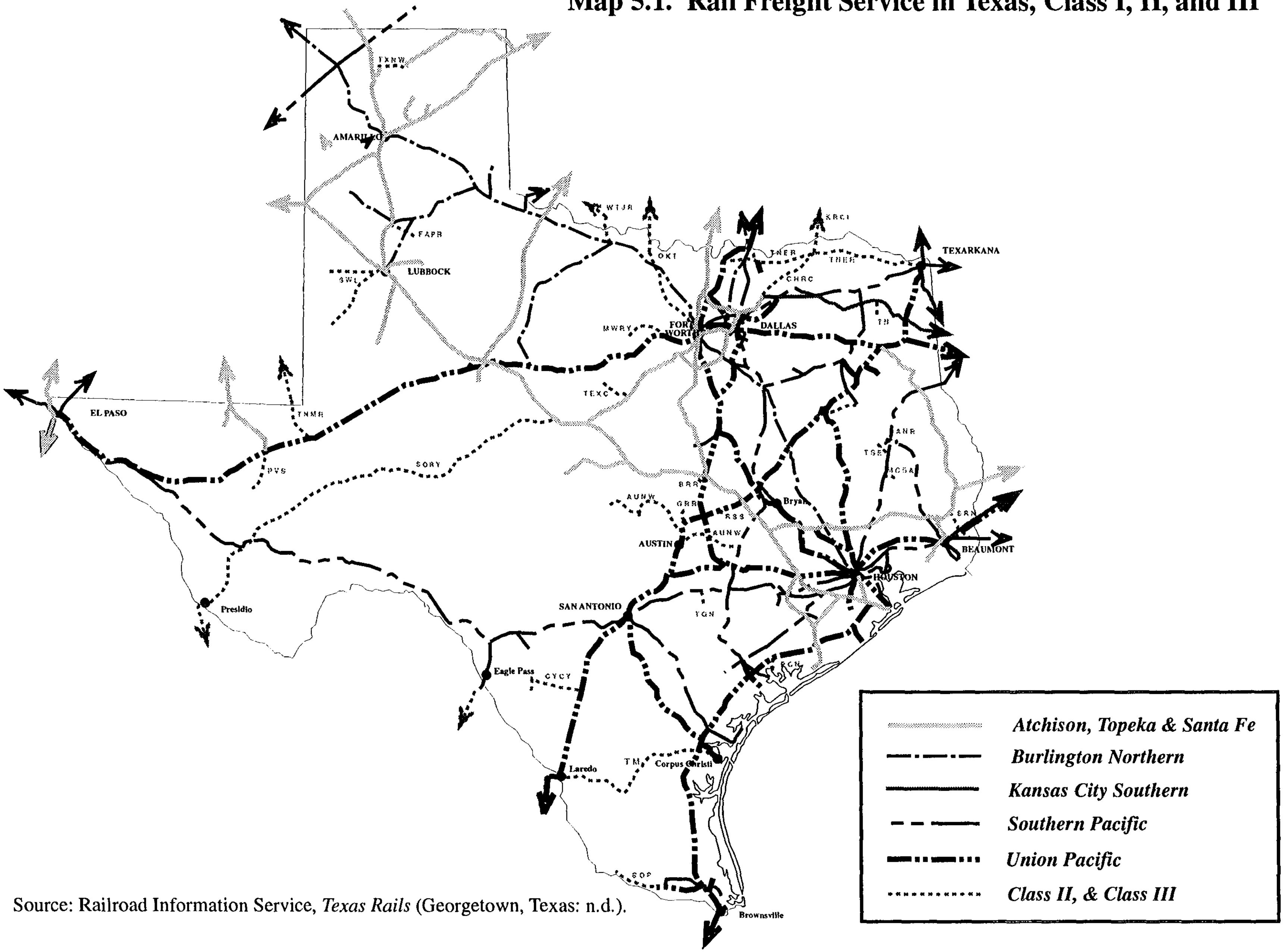
The following section briefly describes some of the major operating characteristics of the five Class I railroads operating in Texas in 1993.[3]

Table 5.1. Railroads Operating in Texas, 1993

Code	Name	Mileage
Class I Railroads		
ATSF	Atchison, Topeka & Santa Fe Railway Company	2,490
BN	Burlington Northern Railroad Company	1,106
KCS	Kansas City Southern Railway Company	293
SP	Southern Pacific Lines	2,972
UP	Union Pacific Railroad Company	3,569
Class II Railroads		
TM	Texas Mexican Railway Company	157
Class III Railroads		
ANR	Angelina & Neches River Railroad Company	22
AUNW	Austin and Northern Railroad Company, Inc.	162
BOP	Border Pacific Railroad Company	32
BRG	Brownsville and Rio Grande International Railroad	10
CHRC	Chaparral Railroad Company, Inc.	81
CYCY	Crystal City Railroad Company	55
DART	Dallas, Garland & Northeastern Railroad	62
FAPR	Floydada & Plainview Railroad Company	5
FWWR	Fort Worth and Western Railroad Company	11
GRR	Galveston Railroad, L.P.	38
GCSR	Gulf, Colorado & San Saba Railway Corp.	67
GRR	Georgetown Railroad Company, Inc.	29
HBYD	Houston Belt and Terminal Railway Company	54
KRR	Kiamichi Railroad Company, Inc.	16
MCSA	Moscow, Camden & San Augustine Railroad Company	7
PNR	Panhandle Northern Railroad Company	31
PVS	Pecos Valley Southern Railway Company	34
PCN	Point Comfort & Northern Railway Company	13
PTRA	Port Terminal Railroad Association	46
RVRR	Rio Valley Railroad	50
RSS	Rockdale, Sandow & Southern Railroad Company	6
SRN	Sabine River & Northern Railroad Company	38
SWGR	Seagraves, Whiteface and Lubbock Railroad Company	103
SO	South Orient Railroad Company, Ltd.	386
SPL	South Plains Lamesa RR, Ltd.	55
SW	Southwestern Railroad Co., Inc.	73
TNMR	Texas & New Mexico Railroad	34
TN	Texas & Northern Railway Company	8
TXOR	Texas & Oklahoma Railroad Company	176
TEXC	Texas Central Railroad Company	25
TXGN	Texas, Gonzales & Northern Railway Company	12
TCT	Texas City Railway Company	6
TXNW	Texas North Western Railway Company	32
TNER	Texas Northeastern Railroad	184
TSE	Texas South-Eastern Railroad Company	18
TXTC	Texas Transportation Company	1
WRRC	Western Railroad Company	4
WTJR	Wichita,Tillman & Jackson Railway Company	17
	Total: Class I, II & III Freight Railroads	**12,590**

Source: Official annual rail carrier reports filed with Rail Safety and Planning Section, Railroad Commission of Texas.

Map 5.1. Rail Freight Service in Texas, Class I, II, and III



Source: Railroad Information Service, *Texas Rails* (Georgetown, Texas: n.d.).

Union Pacific Railroad Company (UP)

Union Pacific is the largest freight rail carrier in Texas. The 3,569 miles of rail line operated by UP accounts for almost 30 percent of all rail mileage in the state and for almost 50 percent of total Class I rail intrastate revenues in Texas. The total number of rail miles operated in Texas has declined over the past five years. However, during the same period, systemwide revenues and UP's Texas portion of revenues have increased, despite the reduction in rail miles.

Southern Pacific Lines (SP)

Southern Pacific operates the second largest rail network in Texas, with 2,972 miles in operation in 1993. SP is also the only Class I rail carrier to have increased the number of miles of track it has in operation in recent years. Between 1989 and 1993, total rail mileage operated by SP in Texas expanded by almost 15 percent, from 2,594 to 2,972 miles. However, this increase is due to the integration of subsidiary operations into its general operation.

Atchison, Topeka, and Santa Fe Railway Company (ATSF)

The Atchison, Topeka, and Santa Fe Railway operated just under 2,490 miles of track in Texas in 1993. This represents more than a 20 percent decline from the 3,200 miles it operated in 1989. Total system revenues derived in the Texas portion of its operations also declined over that period. Texas intrastate operating revenues represent 14 percent of the ATSF system operating revenues. Its track system, clustered in the south-central United States, extends to California in the west, and stretches south to Texas from Illinois.

Burlington Northern Railroad Company (BN)

Burlington Northern operates the longest rail system in North America, a 25,000-mile system spanning 25 states and 2 Canadian provinces. In Texas, BN operated 1,106 miles of rail line in 1993. As with most of the other Class I rail carriers, the amount of rail line operated by BN has declined since 1989. Incidentally, both intrastate and interstate Texas traffic have increased during the past five years, but BN's proportion of traffic attributed to Texas has remained approximately the same over that period.[4]

In June 1994, BN announced plans to acquire the Atchison, Topeka, and Santa Fe Railroad for $2.7 billion in stock. This merger could lead to the creation of the largest Class I railroad serving Texas and the nation. A merged BN and ATSF would have 31,000 miles of track in 27 states and annual revenues of approximately $8 billion.[5] The proposed BN-Santa Fe merger is subject to approval by the Interstate Commerce Commission, which is supposed to issue a final decision by the end of August 1995.[6]

Kansas City Southern Railway Company (KCS)

Kansas City Southern, at 293 rail miles, operates less mileage than any other Class I rail carrier in Texas and derives approximately 15 percent of its total revenue from Texas. KCS' system revenues have increased slightly during the past five years. However, revenues from rail operations in Texas have shown little or no growth over the period. Projections are that KCS will continue to represent less than 5 percent of total Texas rail operations in terms of mileage.[7]

Class II and III Railroads

At the same time that the number of Class I railroads has declined, the number of Class II and III (or regional short-line) railroads serving Texas has expanded, to 39 in 1994 from 33 in 1978. In 1993, there was only a single Class II railroad operating in Texas--Texas Mexican Railway Company (TM). In 1993, 32 Class III railroads operated 1,619 miles of track and handled approximately 450,000 railcar loads of traffic. Total employment by Texas Class III railroads was 1,361 in 1993.

Railroad companies who operate within the confines of a terminal and provide switching services to other railroad companies are defined as switching and terminal companies. Although switching and terminal companies operated only one-third of Class III rail mileage, they accounted for the largest share of Class III railroad employment and railcar handling in 1993. Switching and terminal companies accounted for 75 percent of Class III railroad employment and 65 percent of Class II railcar traffic.[8]

Major Commodities Transported by Texas Rail

Table 5.2 shows that the top five categories of originating commodities transported by rail in Texas for 1992 were chemicals, nonmetallic minerals, petroleum products, farm products, and mixed freight. Chemicals ranked first among originating commodities, accounting for 30 percent of total state-originated tonnage. Ranking second at 21 percent were nonmetallic minerals, including sand, gravel, crushed stone, and cement. Petroleum and coal products, farm products, and mixed freight accounted for 7 percent each.

In 1992, coal represented 26 percent of rail-freight tonnage terminating in Texas. The second largest category of rail freight commodities was nonmetallic minerals, at 15 percent. Farm products comprised 15 percent of rail-freight tonnage terminating in Texas as well. Chemicals and food products accounted for 11 percent and 3 percent, respectively, as seen in table 5.3.[9]

Table 5.2. Top Commodity Groups Transported by Rail, 1992 of Texas Origin

Commodity	Number of Tons	Percent of Total
Chemicals	27,870,736	30
Nonmetallic Minerals	19,991,401	21
Petroleum/Coal	6,928,005	7
Farm Products	6,629,251	7
Mixed Freight	6,353,646	7

Source: Adapted from Association of American Railroads, *Railroads and States* (Washington, D.C., 1994), p. 100.

Table 5.3. Top Commodity Groups Transported by Rail, 1992 of Texas Destination

Commodity	Number of Tons	Percent of Total
Coal	39,518,083	26
Nonmetallic Minerals	22,572,641	15
Farm Products	22,189,955	15
Chemicals	17,391,648	11
Food	9,957,247	7

Source: Adapted from Association of American Railroads, *Railroads and States* (Washington, D.C., 1994), p. 100.

Projections of Future Rail Traffic

Most rail-freight categories are projected to grow at an average annual rate of 1.5 percent over the next 20 years.[10] Rail-freight use is projected to grow more rapidly for the transport of packaged goods than for the transport of bulk commodities. The differing growth rates for rail tonnage, container activity, and carloads result from the types of commodities likely to be shipped by freight rail in the future. Containers are typically used to transport packaged goods while carloads reflect bulk-commodity shipments.

Rail freight activity is projected to grow at a slower rate than highway-freight activity because lighter-weight commodities with high projected future growth are those most likely to be moved by truck. However, Class I railroads view the current trend toward a consolidation of railroads, which reduces the need for time-consuming switches between railroads in many corridors, as a way to reduce delays and improve the efficiency and reliability of rail freight. Both the rail and shipping industries believe that this trend, in combination with new technology, can make rail more competitive in the future and lead to a shift of some long-distance freight from truck to rail.

Intermodal Traffic Growth

The transfer of freight from one mode of transportation to another (e.g., water to rail) is certainly not a new concept. It is, in fact, a common transportation practice that has been around for thousands of years. However, the phenomenal growth of containerization over the past 40 years has helped to popularize the term *intermodal transportation*, while simultaneously giving it a newer, stricter interpretation that centers around transferring containers (and trailers) among modes (ship, rail, or truck).[11]

Perhaps the biggest technological breakthrough for rail container service was the double-stack container car, the first railcar designed from the wheels up exclusively to carry containers. Earlier rail containers had been carried either on flatcars or in gondola cars. When marine containers began to ride the rails, they had to share space with trailers on flatcars. But with the appearance of the double-stack car, a much more efficient means of hauling containers by rail became available.[12]

There is a definite trend within the railroad industry to recognize intermodal traffic, and especially double-stack traffic, as a separate line of business, and to reorganize accordingly. No two railroad organizations are alike, but most share some common features, including

1. specific responsibility for intermodal operations at a high level, usually vice president;

2. a tendency to combine several intermodal functions--sales, marketing, operations, terminals--in a single department;

3. treatment of intermodal transportation as a separate profit center, with at least some separate accounts; and

4. the emergence of intermodal operations as a separate business group or entity.[13]

Both Southern Pacific and Atchison, Topeka and Santa Fe have consolidated intermodal marketing and intermodal operations under a single vice-president. Although neither railroad seems to have defined intermodal operations as a separate business group or profit center, the concentration of intermodal activities recognizes that intermodal marketing and operations differ from other marketing and operations and benefit from a greater degree of coordination. Both the SP and ATSF railroads placed the entire intermodal function under marketing, signaling the central importance of marketing and customer service in the intermodal field.[14]

Union Pacific has taken an entirely different approach. UP's major double-stack customers have specific types of contracts that do not involve UP in ongoing marketing or buy-back roles. UP has also discounted its premium piggyback service in favor of its double-stack trains. Trailer traffic for major accounts will subsequently be added to double-stack trains or to other high-priority movements by UP.

Burlington Northern has taken still another approach with the creation of BN America (BNA), a domestic container business group. BNA markets domestic container services, in its own containers and other equipment, on BN intermodal trains, including the Expediter network. BNA is not physically or financially separated from BN. It does, however, intend to expand domestic container services beyond the BN system.[15]

Future of Intermodal Traffic

Intermodal traffic on the railroads began to increase steadily from the mid-1950s to 1980 and subsequently emerged as a railroad success story for the 1980s. By 1980, the Association of American Railroads (AAR) was reporting over 1.6 million intermodal carloadings (3.1 million trailers and containers) after reaching a peak in 1979 of nearly 1.9 million carloadings (3.3 million trailers and containers). The tremendous growth of containerized freight between the mid-1950s and 1980 would strongly suggest that a growing portion of these carloadings late in this time period included containers.[16]

The 1980s experienced an even more dramatic increase in railroad intermodal traffic. In 1988, over 5.7 million trailers and containers were carried by American railroads, an 87 percent increase from the nearly 3.1 million carried in 1980.[17] Intermodal traffic growth was by no means consistent, but it continued to grow when other traffic segments were static or declining. As a result, intermodal traffic accounted for a growing share of railroad traffic and revenues and demanded a larger share of management attention.

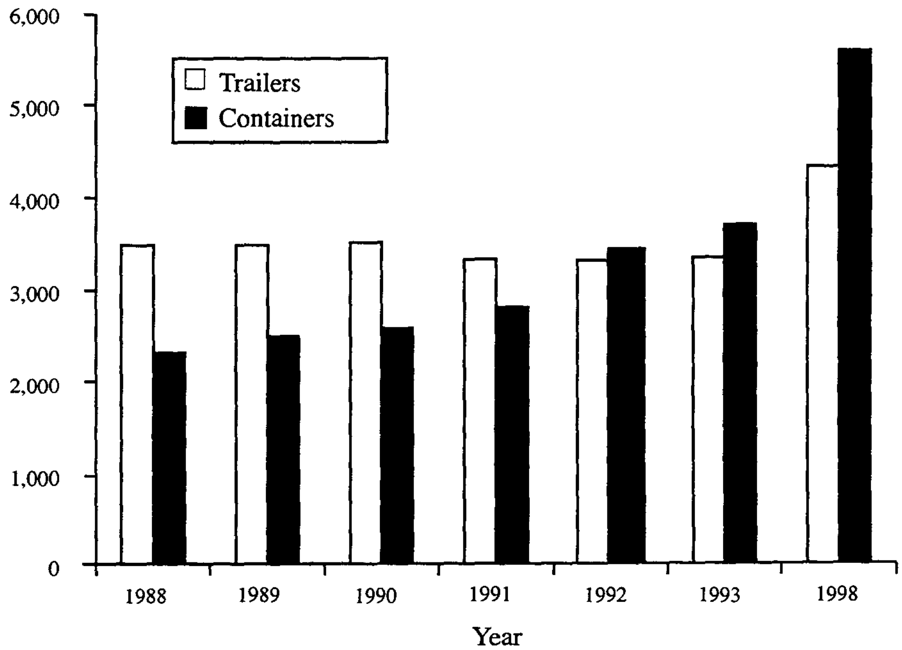
The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) committed the United States to an intermodal transportation system. For railroads, intermodalism is now a major portion of their business and is the fastest-growing segment of rail traffic. One key component of intermodal cargo shipment is the movement of highway trailers and containers on railroad flatcars. This kind of intermodalism combines the energy efficiency of long-distance rail with the door-to-door convenience of highway transportation. But any rail move that involves another mode of transportation--motor carrier, barge, or oceangoing containership--is intermodal.[18]

A recent study predicted that demand for trailers will continue to be strong. According to a report by the Economic Planning Associates, in the first half of 1994 intermodal traffic showed a substantial increase. Loadings for the first 24 weeks were 13.5 percent higher than a year earlier; trailer traffic was up 8 percent and container traffic was 18 percent higher. The growth is largely due to railroads and trucking firms cooperating to provide more efficient traffic movements from points of loading to points of delivery, a trend that is expected to continue in the future.[19]

One of the fastest-growing segments of intermodal shipments is the use of double-stack railcars. Double-stacking involves the loading of two containers, stacked one upon the other, on a railcar. Extensive double-stack service was inaugurated in 1985 and now comprises 30 percent of all intermodal shipments.[20]

While railroads are making additions to their fleets of trailer- and container-handling railcars, demand for intermodal service is expected to outstrip supply of equipment. Still, Economic Planning Associates estimates that 14,500 intermodal flatcars will be delivered this year and 13,500 next year, which will help ease equipment shortages.[21] Figure 5.1 shows previous and projected levels of intermodal traffic carloadings.

Figure 5.1. Intermodal Traffic Carloadings (000)



Source: Association of American Railroads, Economics and Finance Department.

Texas Waterborne Rail Traffic

Texas ports are looking to trade with Latin America, Africa, the Caribbean, Mexico, and the Mediterranean for their long-term market niches. Some major commodities in international trade are not yet fully containerized (such as coffee or bananas), and they are major users of inland intermodal rail transportation.

Table 5.4 provides information on railroad access to Texas ports. The table shows that some companies have a rail monopoly on access to certain ports. Union Pacific, for example, is the only railroad serving the Port of Freeport and Southern Pacific is the only rail carrier serving the Port of Harlingen.

Table 5.4. Rail Service at Texas Ports

Ports	Rail Service
Beaumont	ATSF, KCS, SP, UP
Brownsville	Brownsville & Rio Grande International switches to UP and SP
Corpus Christi	Corpus Christi Terminal Association owns track jointly used by SP, TM, UP
Freeport	UP
Galveston	Galveston Railroad switches to the ATSF, BN, SP, UP
Harlingen	SP
Houston	Port Terminal Railroad Association switches to Houston Belt & Terminal, ATSF, BN, SP, UP
Port Lavaca	Point Comfort & Northern Railway, SP, UP
Orange	UP, SP, Sabine River & Northern Railroad Company
Port Arthur	KCS, SP
Texas City	Texas City Terminal Railway switches to the ATSF, BN, SP, UP

Source: Interviews with Texas port officials.

Conditions of the Existing Rail Access Facilities at Texas Ports

The condition of rail access to a given port depends on the local circumstances. Some of the major factors are

1. the arrangement of existing trackage;
2. the availability of trackage rights or reciprocal switching to other railroads;
3. the presence of a port, municipal, or jointly owned switching or terminal railroad;
4. the configuration of street trackage, grade crossings, drawbridges, and other obstacles;
5. the clearances of tunnels, bridges, and overpasses;
6. the availability of land for on-dock or near-dock rail transfer facilities;
7. the geographic relationship of rail lines and marine terminals; and
8. the working relationship between the port, its ocean carrier clients, and the railroads.[22]

Several ports have reported that they do not have rail access to their ports.[23] These include the Port of Bay City Authority of Matagorda County, Port Isabel/San Benito Navigation District, and Port of Mansfield/Willacy County Navigation District.

Port of Beaumont

Four major Class I railroads have rail access to the port of Beaumont: Atchison, Topeka, and Santa Fe; Kansas City Southern; Southern Pacific; and Union Pacific. The port subcontracts the switching of all cars on the port property, a service performed 24 hours a day.[24]

Port of Brownsville

Union Pacific is the only railroad connecting the Port of Brownsville with Mexico. According to General Manager and Port Director James Kruse, UP's high switching rates and lack of equipment are severe handicaps for the transportation projects.[25]

Port of Corpus of Christi

Three rail carriers serve the Port of Corpus Christi: the Southern Pacific Lines, the Texas Mexican Railway Company, and the Union Pacific Railroad. The Corpus Christi Terminal Association (CCTA) provides rail switching within the port area.[26] The port's staff works closely with the three railroads serving the Corpus Christi area. However, they have reported difficulty in obtaining financial support from the railroads to make needed rail improvements.

Currently, the primary access problem at the Port of Corpus Christi is to the north side of the channel. The only access for railcars and heavy trucks is across the Tule Lake Lift Bridge. In addition, there currently is no access to the land west of the bulk terminal. All cars cross the Tule Lake Lift Bridge twice, inbound loads and outbound empties, and vice versa. Rail movements in 1992 amounted to 12,129 loads, or 24,258 total moves across the lift bridge.

Port of Freeport

One key issue noted by the Port of Freeport's executive director, A. J. Reixach Jr., is the lack of sufficient highway and rail infrastructure accessing the port. Other major issues for the port include Union Pacific's monopoly on all rail traffic, difficulty financing capital improvement projects, and increasing environmental impediments.[27]

Port of Galveston

Galveston Island is connected to the Texas mainland by a rail access bridge. Four railroads serve the port of Galveston--the Atchison, Topeka, and Santa Fe; Burlington Northern Railroad; Union Pacific Railroad; and the Southern Pacific Lines--and jointly operate the bridge. The container terminal at the port of Galveston occupies 1.9 million square feet of space and is served by both rail and truck with an on-terminal rail ramp.[28]

Port of Harlingen

The main intermodal challenge facing the Port of Harlingen is its rail interconnections. Port officials indicate that the rail lines servicing the port are long lines, which do not accommodate the short hauls that are necessary for port operations. Southern Pacific Lines provides intermodal connections for the Port of Harlingen.[29]

Port of Houston

Five railroad companies serve the Port of Houston: Atchison, Topeka, and Santa Fe Railway; Southern Pacific Lines; Union Pacific Railroad; Burlington Northern Railroad; and Houston Belt and Terminal Railroad Company. Until recently, Burlington Northern was offering full services to the Port of Houston. However, it has ceased its COFC/TOFC (container-on-flatcar/trailer-on-flatcar) services after deciding in February 1995 to reallocate its resources to other markets for this type of service.[30]

Although Southern Pacific Lines is the only rail carrier to have a direct connection to the Barbours Cut container-cargo handling facility, the Port Terminal Railway Association controls the rail access to the other main facilities of the port. The current condition of the rail track at the terminal for containerized cargo is poor and inadequate. Two of the port's current capital improvement projects are to construct a port-owned track that will lead to the containerized-cargo terminal (Barbours Cut) and to improve the existing rail facility at the Barbours Cut Terminal.[31]

While further expansion is needed at Barbours Cut Terminal, this study has found that the Port of Houston has sufficient capacity for handling grain, steel, breakbulk, and dry-bulk cargoes.

However, maintaining the facilities that accommodate these cargoes will continue to be a major priority for the port authority.[32]

Port of Port Lavaca-Point Comfort

There are currently two rail carriers accessing the port--Union Pacific Railroad and Southern Pacific Lines. However, it should be mentioned that the port is geographically divided by a bay into two port areas: Port Lavaca and Point Comfort. So, it would be more correct to say that Southern Pacific Lines has direct access to Port Lavaca and the Point Comfort and Northern Railway Company connects Point Comfort with the Union Pacific track.[33]

According to port officials, rail access to the port is less than adequate. Direct connection to these lines is limited to a short line operated by Point Comfort and Northern Railway. However, rail access is not considered by port officials to be an important issue for this port. Rather, pipeline and highway linkages are of greater importantance.[34]

Port of Orange

Currently, three rail carriers have access to the port--Union Pacific, Southern Pacific, and the Sabine River and Northern Railroad Company. According to port officials, the condition of the rail tracks is very poor.[35]

Port of Port Arthur

The port is served by Kansas City Southern Railroad (a north-south route) and Southern Pacific Lines under a long-term reciprocal switching agreement. According to the port officials, highway and rail access are equally important to the port. The port strives to give equal weight to both modes in its planning processes.[36]

Port of Texas City

Texas City Terminal Railway Company provides switching service to the ATSF, BN, SP, and UP railroads, providing each carrier equal access to the port. Rail tracks serving industries and the port are owned by the Texas City Terminal Railway Company. The port does not have intermodal service at the docks.[37]

Victoria Barge Canal

There is no direct rail access to the Victoria Barge Canal. Indirect access is provided by a short-line railroad linking the canal with the Union Pacific mainline track, which runs parallel to the canal. Southern Pacific Lines also has rail tracks located near the canal, although they provide no direct access from the canal to the rail line.[38]

Improvement Projects

Several ports indicated that they are currently improving highway and/or rail access as a means of improving their competitiveness. To alleviate the problems of rail and road access described in the previous section, the Port of Corpus Christi has proposed the construction of a highway and rail corridor on the north side of Inner Harbor and the replacement of the lift bridge with a fixed span bridge. The port officials believe that there are numerous ways that rail access to the port could be improved in order to enhance the international capacity and performance in the Corpus Christi bay area and South Texas.[39] The Port of Corpus Christi is currently trying to obtain federal funding for its northside facility access projects.

The Transportation Policy Council of the Houston-Galveston Area Council has recommended that $13.2 million in federal funds be awarded to the Port of Houston Authority for two capital improvement projects at Barbours Cut Terminal. This represents approximately 50 percent of the total estimated project cost. These improvements, which include the first rail project ever approved for this region utilizing ISTEA funds, would increase the capacity of the terminal's rail ramp point and add mainline rail tracks to improve access to the Barbours Cut Terminal.[40]

Mainline System Condition and Port Access

Port Access as a Competitive Element

As the amount of cargo moving between America's heartland and its ports continues to grow, efficient port access has become an increasingly critical competitive element. The need to fill ever-larger container ships is putting more emphasis on individual ports' intermodal rail and truck access. Consequently, adequate intermodal access is of vital significance in a port's quest to capture more of the containerized-cargo market. More Texas ports realize that good landside access is an integral link in the intermodal chain, which must be smooth, efficient, and timely for ports to compete as growing volumes of cargo move away from the coast and into the interior.[41]

The continuing growth in the size of the container ship means container lines must go deeper into the interior of America to fill their slots. Hence, many Texas ports start feeling the pressure to improve the landside access to their ports. This is especially true for the ports that are handling a great amount of containerized cargo and are trying to attract more customers to their ports.[42] However, the reality is that shippers are looking for fewer ports. Use of containers has created large monopolies for large ports, and as a result, many of the smaller ports ultimately may be left out.

The effectiveness of the Barbours Cut facility at the Port of Houston is a good example of the importance of adequate port access. Container handling costs at Barbours Cut container terminal are highly competitive with those at most other ports. Nevertheless, the port authority must continue to develop and expand its intermodal facilities if Houston is to see major growth in container volume over the next several years. Although landside access has been improved by separating rail and truck grades at the Port of Houston, the condition of the existing rail track leading to the containerized terminal is inadequate.

Rail Access Issues

Several infrastructure impediments are associated with rail access to ports and terminals, including poorly maintained tracks and conflicts caused by at-grade crossings. These site-specific barriers increase the cost and time of moving goods to and from ports and terminals. Rail tracks in poor condition, which directly serve the port terminal area, significantly restrict the efficiency of rail access. Another factor that causes a significantly negative impact on rail access efficiency is at-grade crossings between rail lines and truck routes in the terminal area.[43]

Intermodal Access to Major Texas Ports

Access to intermodal terminals is one of the most important issues facing the rail-freight industry in Texas. For rail freight, two types of intermodal facilities are particularly important: facilities that allow the transfer between rail and truck and facilities that allow the transfer between rail and marine shipping.

Intermodal freight movements have been increasing in recent years. Projections are that the North American Free Trade Agreement will lead to a significant increase in the demand for intermodal trailer-on-flatcar service between the United States, Canada, and Mexico. A considerable portion of this traffic will pass through Texas. Additionally, interstate trucking deregulation will further increase this demand for intermodal rail access. As a result of this increase in demand, Class I railroads and large trucking companies will likely attempt to increase their intermodal freight service to combat competition from smaller motor carriers.[44]

The purpose of a port is to serve as a transfer point between land and water transportation. Without adequate intermodal access, a port cannot meet the demands of international commerce. Ports that are unable to offer efficient loading and unloading of cargo risk losing commerce to ports that do offer these facilities. In order to stay competitive in the global marketplace, it is imperative that Texas ports have the capability of transferring cargoes in an efficient and cost-effective manner. The issue is the degree to which intermodal facilities are adequate in serving demand for freight transfers among rail, highway, and waterborne transportation modes. Many ports appear to have resolved their access problems by providing necessary equipment and facilities for double-stack train service, but problems still exist at some ports. Ports have identified a variety of strategies for solving their landside access problems:

1. develop dedicated freight corridors from the port terminals to major highways and railheads;

2. rely more heavily on rail service located on or near the terminal to reduce the need for drayage;

3. develop inland ports; and

4. rely more on barge movements for shipping containers to other coastal cities or terminals.[45]

Double-Stack Access

Ports wishing to remain competitive in handling containerized cargo must be able to accommodate the increasing demand for double-stack train service. Some ports may not receive double-stack service for economic as well as physical reasons. Escalating competition among ports will probably lead to a narrower spectrum of trade. Gulf Coast container ports may specialize in South American and African trade as Asian and European services call elsewhere.[46]

While port authorities and railroads have had a long relationship, there is one potential obstacle to obtaining port benefits from the growing double-stack network--rail access and associated container transfer facilities. Modern bulk and neo-bulk terminals still maintain their heavy reliance on rail access, but the modern ports' transition from breakbulk finger piers to contemporary container terminals has left most railroad tracks behind. Container terminals typically have little rail trackage, suitable only for occasional oversize or overweight shipments.[47]

This change is understandable, since initially the container carriage relied on trucks and chassis, not trains and tracks, to serve the local cargo market. Now, rail access is an important competitive issue. Container ports have found their roles evolving to include facilitation of intermodal transfer in order to improve, or just maintain, their relative competitive positions. Only a few ports were fortunate enough to have existing rail access on or near their container terminals.[48]

The improved efficiency of rail shipments, particularly double-stack unit trains for moving containerized cargo, has radically changed the economics of shipping. Ports served by rail lines with adequate bridge and tunnel clearances for double-stacks have a considerable advantage over ports that have been unable to establish double-stack service. Railroads, like shipping lines, have made major investments in double-stack trains; consequently, they have emphasized the importance of terminal efficiency to reduce the waiting period while trains are loaded.[49]

Rail-Truck Dedicated Freight Corridors

Dedicated freight corridors between terminals and major rail and highway connections are being planned by several major ports. These corridors would divert rail traffic from en route at-grade rail-highway crossings and thereby reduce highway congestion. Likewise, the traffic congestion caused by trucks and passenger vehicles sharing the same routes and intersections could be greatly reduced by building facilities dedicated to freight movements. Additionally, these corridors could consolidate the rail service onto single lines that would connect the port to the major railheads serving the port.[50]

Corridors are expensive, however. Corridors also require a great deal of coordination among the various units of government involved. Where the funding will come from, who should pay for the improvements, and whether the benefits are commensurate with the cost are all major issues.[51]

On- and Near-Terminal Rail Service

The typical marine terminal has a rail line next to, or within a mile, of it. Recently there has been an increase in having rail lines move nearer to, or even into, the marine terminals. This on- or near-terminal service would consequently reduce the amount of short trips to and from the docks by truck for transport of cargo between the ship and the railcars. In concept, on- or near-terminal rail service can have different configurations. In one arrangement, the rail line can be situated adjacent to the cranes used to unload the ships.[52]

With on- or near-terminal rail service, handling costs are reduced compared with having marine and rail terminals separated by several miles: drayage is greatly reduced and additional processing through gates is eliminated. These advantages are partly offset by other costs, most notable from the port's perspective, the amount of land that is consumed.[53]

Rail access is a complex issue. The ideal situation from the port's point of view is to have direct, unimpeded services from two or more major competing railroads with on-dock or near-dock facilities adequate for future growth; frequent arrivals and departures; and line clearances for double-stacked high-cube containers. Railroads, of course, prefer exclusive access, resist building excess capacity, schedule trains to suit the traffic, and invest in line-clearance projects only when justified by potential revenues.[54]

Intermodal Terminals

One area in which railroads are dramatically changing roles is in the operation of intermodal terminals. Traditionally, railroad operating departments had responsibility for intermodal terminals, along with all other terminal operations. In the 1970s and 1980s, however, some railroads began turning intermodal terminal operations over to their trucking subsidiaries or to subsidiaries created specifically for that purpose.[55]

The ability to move intermodal containers, however, depends critically on the ability of the rail intermodal infrastructure to load and unload containers, supply chassis, and organize pickup and delivery. Some railroad companies have found it necessary to go outside their own organizations to contract for terminal operations. By 1988, all but the three largest Atchison, Topeka, and Santa Fe intermodal terminals were operated by contract operators using teamster labor. Union Pacific and Southern Pacific have sought external assistance as well by having their intermodal terminal operations management contracted to Intermodal Management Services (now Pacific Rail Services).[56]

Increasingly, the operation and even ownership of rail terminals for double-stack traffic can be independent of the railroad performing the line-haul. It seems unlikely that any uniform pattern will appear in the near future, since the solution for a given terminal depends on the customers, the facilities, and the operation and commercial philosophies of the railroads.

Intermodal Terminal Efficiency

New information technologies are already being applied to port terminal operations in many ways. Bar-coded containers are being used for inventory and for reading and entering shipping documents electronically. The Association of American Railroads recently required member railroads to have electronic identification tags on railcars. Although implementation of these requirements demands significant financial investment by the railroads, the companies believe this technology will help them keep track of goods much more effectively. This new ability of the companies to easily and efficiently track cargo has tremendous customer service benefits. Railroads are expected to have 100 percent of their equipment tagged by the end of 1994.[57]

Because of the large scale of container ship and double-stack train operations, hundreds of containers may be off-loaded onto the marine terminal in a short span of time. Consequently, these containers need to be moved in a timely fashion, creating a surge in demand that often results in congestion at terminal gates and on terminal access roads. Such problems are exacerbated by terminals where local work rules result in a fixed workday of eight hours with a one-hour lunch break. For some of the container ports, expanded operating hours would reduce the delays encountered on landside routes.[58]

Because of the intense competition for freight among ports, the ports have been investing in improved terminal designs. Most of the container ports currently have either on- or off-dock transfer facilities. Additionally, most ports have rail lines either adjacent to or within a mile of marine terminals. However, very few ports have rail-highway intermodal terminals next to the marine terminal.

Intermodal Container Transfer Facilities

Modern intermodal marine terminals are the points of transfer of cargoes from sea to land and land to sea, but the transfer is less than optimal. The transfer of cargo between ports and inland transport is "one of the weakest, least efficient, and most costly links in the intermodal transportation chain."[59]

Container ports have had to refocus their business activities to encompass the total movements of land bridge containers, as well as local movements. In the early stages of intermodal development, ports were faced with the necessary conversion from breakbulk to container facilities. Now, their role has expanded from simply providing waterfront facilities to expediting container movements between ocean and domestic carriers (rail and truck) through the provision of intermodal container transfer facilities. These facilities are sometimes on dock, but they must be at least near dock for efficient and economic transfer.[60]

Intermodal Marketing

Railroad roles in marketing have evolved differently on different railroads and are likely to remain divergent for some time. Common practice in the recent past has been for railroads to market intermodal services to third parties, to ocean carriers, and to a few large national shipper accounts. Some railroads, such as SP and ATSF, continue to market intermodal service on that basis. Union Pacific, which competes in many of the same markets, has effectively turned over much of the marketing and sales functions to ocean carriers and multimodals with whom UP has hook-and-haul contracts. Regional railroads generally do not have a regular double-stack marketing effort; instead, they respond to specific opportunities from either customers or connections.[61]

As in so many areas of the intermodal field, railroad marketing seems to be moving away from the middle ground. Railroads are either launching broader or more intensive marketing efforts or simply marketing line-haul and terminal services under hook-and-haul contracts.[62]

Congestion--A Growing Problem at Texas Ports

Ports can try to reduce truck congestion on the highways that serve them by facilitating rail access, but often the problems with congestion are accentuated by rail lines that intersect local streets with at-grade crossings. This problem appears more prevalent at container ports than at other ports, but the ports concentrating on bulk or neo-bulk commodities also report problems with frequent at-grade crossings.

Some transportation planning techniques can be used to mitigate the increased traffic congestion that results when development occurs adjacent to port terminals or along access roads. Traffic throughput can be increased by such procedures as designating one-way streets, imposing turn restrictions, widening the street to add extra lanes, and better coordinating traffic signals. ISTEA requires states and metropolitan planning organizations (MPOs) to develop congestion management systems. These systems are not described in any detail in the legislation, but they are clearly meant to encourage reliance on the existing intermodal system to the extent that doing so is practical, and they are intended to encourage metropolitan areas to meet clean-air standards.[63]

Conclusion

The 1989 to 1993 period was marked by a decline of almost 9 percent in the number of rail miles operated by Class I railroads in Texas. However, when measured as a group, Class I railroad revenues actually increased, growing in excess of 10 percent. The combination of declining rail mileage and rising revenues is characteristic of a recent trend in the nation's rail industry.

Recent years have seen the rail sector characterized by merger and consolidation activity. Mergers are a key reason for the decline in the number of Class I freight-rail operators in Texas. This trend in combination with new technology can lead to a shift of some freight from truck to rail.

Most freight carried today by railroads in Texas are bulk commodities that are relatively insensitive to travel time. Although time-sensitive and containerized cargo is currently not a significant market for freight rail, the transport of containerized cargo by freight rail is projected to increase.

Intermodal freight movements have been increasing in recent years; subsequently, rail freight, as an important element of the multimodal transportation system, is expected to increase as well. To accomodate the growth in intermodal transport and remain competitive with other gulf ports, Texas ports are finding it necessary to upgrade their intermodal facilities. However, these new facilities will require extensive planning and capital. Although ISTEA funds may be used to finance projects for improvement and modernization of the intermodal facilities, they are difficult to obtain and come with certain requirements. For instance, the ISTEA requires that MPOs plan for intermodal transportation in regional transportation plans. For smaller ports with limited financial resources, the transportation plans are difficult to produce.

Notes

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[2] Ibid., p. 8.

[3] All rail profiles are from *The Texas Transportation Plan*, "Freight and Passenger Rail," sec. IV, unless otherwise noted.

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[14] Ibid., pp. 31-33.

[15]Ibid.

[16]McKenzie, North, and Smith, *Intermodal Transportation,* pp. 55-59.

[17]Ibid.

[18]Association of American Railroads (AAR), "Information Primer for State and Metropolitan Transportation Planning Officials," Washington, D.C., 1994, p. 1.

[19] Patrick Storm, "Equipment Manufacturing on the Rise," *Intermodal Shipping* (November 1994), p. 10.

[20]AAR, Information Primer, p. 3.

[21] Storm, "Equipment Manufacturing on the Rise," p. 10.

[22] USDOT, *Double Stack Container Systems,* pp. 10-11.

[23]"Freight and Passenger Rail," *The Texas Transportation Plan*, p. 9.

[24] Port of Beaumont, *Facts, Port of Beaumont*, Beaumont, Tex. (Pamphlet.)

[25]Interview by Jeffrey Stys with C. James Kruse, Port Director and General Manager, Port of Brownsville, Brownsville, Tex., March 11, 1995, Brownsville, Tex.

[26] Port of Corpus Christi Authority, *General Information*, Corpus Christi, Tex. (Brochure.)

[27]Interview by Josh La Porte and Lyudmila Stupenkova with A. J. "Pete" Reixach Jr., Executive Port Director, Port of Freeport, March 24, 1995, Freeport, Tex.

[28]Port of Galveston, *Comprehensive Annual Financial Report of the Board of Trustees of the Galveston Wharves, December 1993* (Galveston, Tex., 1994), pp. 1-17.

[29]Response by the Port of Harlingen to LBJ School of Public Affairs, University of Texas at Austin, questionnaire " Texas Port Issues Survey," March 1995.

[30]Booz-Allen and Hamilton, "Implications of Growth Opportunities on the Master Plan," in *Port of Houston Authority, Master Plan, Final Report 1994* (Houston, July 1994), p. IV-1.

[31] Ibid.

[32] "Master Plan Describes Economic Opportunities, Planning for the Future," *Port of Houston* (November 1994), pp. 2-16.

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[36] Interview by Brandon Lobb with Floyd Gaspard, Deputy Port Director, Port Arthur Navigation District, March 21, 1995. Port Arthur, Tex.

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[43] Transportation Research Board, National Research Council, *Landside Access to U.S. Ports, Special Report 238*, (Washington, D.C.: National Academy Press, 1993), pp. 41-65.

[44] "Freight and Passenger Rail," *The Texas Transportation Plan*, p. 19.

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[46] USDOT, *Double Stack Container Systems*, p. 9.

[47] Ibid.

[48] Ibid., p. 10.

[49] Transportation Research Board, *Landside Access to U.S. Ports*, p. 44.

[50] Ibid., pp. 59-61.

[51] Ibid., pp. 60-61.

[52] Ibid.

[53] Ibid.

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[55] Ibid., pp. 30-34.

[56] Ibid., pp. 6, 30-34.

[57] Lisa Harrington, "Unlocking Transportation Productivity," *Transportation and Distribution* (November 1994), pp. 49-50.

[58] Transportation Research Board, *Landside Access to U.S. Ports*, pp. 149-55.

[59] Ibid., pp. 143-59.

[60] USDOT, *Double Stack Container Systems*, pp. 37-43.

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Chapter 6. Highway Landside Access to Texas Ports

Introduction

This chapter provides an overview of the characteristics and components of the Texas highway system, with particular emphasis given to the adequacy of roadside access and problems associated with the movement of trucks into and out of the state's port facilities. The first section is devoted to describing different components of the state highway system: interstate highways, U.S. highways, state highways, farm-to-market and ranch-to-market roads, as well as the Texas trunk system. Afterward, roadside access to Texas seaports is discussed in detail. The remainder of the chapter comments on various highway issues related to roadside access such as congestion and bottlenecks, nature of physical infrastructure, land availability and cost, dedicated freight corridors, overweight containers, and intermodal containers.

Texas Roads and Highways

Texas has the most extensive highway system of all the 50 states, with approximately 300,000 public road miles.[1] The lengths of roadways typically are measured by center-lane miles (the base length of the roadway) or by lane miles (the base length of the roadway multiplied by the number of lanes). The state of Texas maintains 76,856 center-lane miles, which translates into 183,551 lane miles. Texas also leads the nation in the number of bridges as it has approximately 48,000 within its borders.[2]

The Texas Department of Transportation and individual local governments exercise jurisdiction over the different roads that comprise the system.[3] TxDOT oversees interstate highways (I), frontage roads, U.S. highways (U.S.), state highways (SH), farm-to-market (FM) roads, and ranch-to-market (RM) roads. Local governments preside over county roads and city streets.

National Highway System

The National Highway System (NHS) is the core of a relatively new federal-aid highway program that is to be developed in conjunction with the states and localities. The NHS will include the interstate highway system and various roads, including "other urban and rural principal arterials and highways which provide motor vehicle access between such an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility."[4] Components of the NHS include interstate highways, U.S. highways, and state highway systems.

Proposed routes consistent with the objectives of the NHS are made by the states, metropolitan planning organizations, and other local officials.[5] Total miles to be apportioned among the states number 158,674. Of these miles, 12,940 have been earmarked for Texas: 7,902 for rural and 5,038 for urban areas of the state.[6] Roads that provide access to seaports fall under the eligibility requirements for the National Highway System. Therefore, port communities should work together with the state, MPOs, and local officials to bring about the integration of these roads into the network.[7]

The NHS must be approved by Congress by September 30, 1995, or funding for the NHS will cease. Texas' proposed NHS, consisting of 12,737 miles, was approved by the Texas Transportation Commission on June 29, 1993. A subsequent request was made to the Federal Highway Administration (FHWA) for the addition of 574 miles, in response to public comment. As a result, a revised proposal was submitted to the FHWA and subsequently accepted on October 1, 1993.[8]

Interstate Highways

Of the four major types of highways found within the state, the interstate system is in the best condition. These highways, funded by both state and federal funds, are components of a larger nationwide system of limited-access roadways characterized by four or more lanes whereby interstate commerce and national defense movements are possible. The state of Texas contains 15 interstate routes, either wholly or in part. Greater than 7 percent of the total center-line highway miles in the United States lies within the state of Texas: 3,233 center-lane miles; or 14,509 lane miles. Additionally, frontage roads, which run parallel to the highways, within the state number 4,506 center-line miles and 9,013 lane miles. Average daily vehicle miles traveled (VMT) in 1992 on interstate routes amounted to over 100 million. For frontage roads, VMT was 5.8 million.[9]

United States Highways

U.S. highways are federally designated and supported by federal and state dollars. The portion of this nationwide system of roadways that lies within Texas is comprised of 12,099 center-lane miles and 36,036 lane miles. Traffic volume in 1992 along these roads was 78.6 million average daily VMT. Major cities connected by such roads include

1. U.S. Highway 59 Texarkana-Laredo
2. U.S. Highway 67 Texarkana-Presidio
3. U.S. Highway 77 Oklahoma border-Brownsville
4. U.S. Highway 87 Texline (near New Mexico)-Port Lavaca
5. U.S. Highway 90 Orange-Van Horn
6. U.S. Highway 281 Oklahoma border (Witchita Falls)-Hidalgo
7. U.S. Highway 287 Oklahoma panhandle-Port Arthur[10]

State Highways

Contrasted with interstate and U.S. highways, state highways receive their designation by the state of Texas. For this system, center-lane miles total 16,710, and lane miles total 40,571. Broken down into an urban/rural distinction, center-lane miles in urban areas number 3,475 whereas the total for rural areas is 12,695. In 1992, average daily VMT for state highways numbered 77 million.[11]

Texas Trunk System

This component of the Texas highway system was adopted in 1990 by the Texas Transportation Commission. The trunk system is comprised of four-lane, divided rural highways that include and complement segments of the interstate, U.S., and state highway systems. The commission's intent was to provide access to each Texas city with a population of greater than 20,000, major ports, adjacent states, Mexico, military installations, and recreational areas. Estimated completion time of the trunk system is 30 years. This system, when completed, will consist of approximately 10,230 miles and result in the upgrading of existing highways.[12]

Farm-to-Market and Ranch-to-Market Roads

These state-designated highways are intended to serve rural areas of Texas and link the rural agricultural areas to urban markets. State and local governments together are providing the funding for these roadways. In 1992, FM and RM roads totaled 40,755 center-lane miles and 83,164 lane miles. Additionally, average daily VMT for the FM and RM system in Texas amounted to 44,769 for 1992.[13] Table 6.1 outlines the annual average daily truck traffic on various trunk access routes for individual port facilities.

Table 6.1. Average Daily Truck Traffic at Major Texas Seaports and Trunk Access Routes

District	Port	Trunk Access	Annual Average Daily Truck Traffic
Houston	Freeport	SH 288	2,300
		SH 36	500
	Galveston	I-45	3,000
	Houston	Loop 610	13,000
		I-10	East: 14,500; West: 16,100
		I-45	North: 12,300; South: 7,900
	Texas City	I-45	2,400
Yoakum	Bay City	N/A	N/A
	Port Lavaca	US 87	500
Corpus Christi	Corpus Christi	I-37	3,900
		SH 44	1,700
Beaumont	Port Arthur	I-10	East: 58,000; West: 76,000
	Beaumont	I-10	East: 58,000; West: 76,000
	Orange	I-10	East: 26,900; West: 33,000
Pharr	Brownsville	US 77	2,800
	Harlingen	US 77	2,200
	Isabel	SH 100	300
	Port Mansfield	N/A	N/A

Source: Adapted from "Texas Truck Flow Map," in Texas Department of Transportation, *The Texas Transportation Plan: Modal Profiles* (Austin, Tex., 1992).

Roadside Access to Texas Ports

Not all of the deep-draft ports have access to the network of Texas roadways and highways via the trunk system; nevertheless, they are all located in cities that are nodes along the system.

Port Arthur is the only deep-draft port not currently linked to the trunk system; still, it is located within close proximity (10 to 15 miles) to Beaumont, which has access to I-10. Furthermore, the ports of Corpus Christi, Freeport, and Houston have the advantage of being served by more than one trunk component.[14] These trunk-system routes serving Texas ports are heavily traveled by motor carriers transporting cargo to and from the ports. Trunk-system routes, direct routes, and local truck routes for various Texas ports are outlined below.

Orange County Navigation District

Direct: Alabama Street
FM 1006, SH 87, U.S. 90 (Bus. 90)[15]
Approximately 8 to 15 trucks per day, or 15,000 to 25,000 tons per year, move through this port.[16]

Port of Port Arthur

Direct: Procter and Houston streets
SH 87, SH 82, U.S. 69/96/287, I-10[17]

Port of Bay City/Matagorda Harbor

Direct (Bay City): SH 60 by way of FM 521
Direct (Matagorda Harbor): FM 2031
SH 35, U.S. 59[18]
Truck traffic moves to and from the liquid cargo dock, which is leased to Way Energy.[19]

Port of Beaumont

Direct: Main and Franklin streets, leading to College Street and U.S. 90
Spur 380, U.S. 69/96/287, I-10[20]

Port of Brownsville

Direct: FM 511
SH 48, SH 4, U.S. 77/83[21]

Port of Corpus Christi

Direct: Navigation Boulevard, Port Avenue
I-37 North to San Antonio
U.S. 181 North to San Antonio
U.S. 77 South to Harlingen/Brownsville

U.S. 281 South to McAllen/Reynosa
U.S. 77, U.S. 59 North to Houston
U.S. 59 South to Laredo
SH 44 to Alice/Laredo
SH 35 to Freeport/Houston[22]
Most movement by truck here involves petroleum coke from the refineries to ground storage at the bulk terminal and truck movements to and from the grain elevator.[23]

Port of Freeport

Direct: FM 1495
SH 288, leading to the Houston Metropolitan area[24]

Port of Galveston

Direct: SH 275
SH 87, I-45[25]
Most truck traffic here occurs at the container and banana terminals.[26]

Port of Harlingen

Direct: FM 106
U.S. 77

Port of Houston

Direct: Navigation Street, SH 225
Clinton Drive, U.S. 90 Alt., I-10 (Loop 610), 45, or 47[27]
Estimated truck traffic per year is 215,000.[28]

Port Isabel

Direct: Port Road
SH 100, connecting to U.S. 77[29]

Port Mansfield/Willacy County Navigation District

Direct: Port Drive
SH 497/186, leading to U.S. 77[30]
Truck traffic mainly consists of M.I. Drilling trucks hauling Ferox to Rio Grande Valley locations; about 40-50 loads per month.[31]

Port of Port Lavaca-Point Comfort

Direct: U.S. 87
FM 1593, SH 35, U.S. 77, U.S. 59[32]
Not too much truck traffic occurs at this port as pipelines transport its top commodities.

Port of Texas City

Direct: FM 519
Loop 197, I-45

Victoria Barge Canal

U.S. 59, which feeds into the interstate highway system in Houston
U.S. 59 to U.S. 77 to Corpus Christi and Mexico
Public wharf at Pickering Basin connects to FM 1432 to SH 185[33]

Table 6.2 details the various direct and supporting access roadways and highways available to individual Texas ports.

Table 6.2. Roadway Links to Major Texas Seaports

District	Port	Direct Access	Supporting Access
Houston	Freeport	FM 1495	SH 288
	Galveston	SH 275	SH 87, I-45
	Houston	Navigation, SH 225	Clinton, U.S. 90, I-10, 45, 47
	Texas City	FM 519	Loop 197, I-45
Yoakum	Bay City	SH 60	SH 35, U.S. 59
	Port Lavaca	U.S. 87	I-35, U.S. 77, U.S. 59
Corpus Christi	Corpus Christi	Navigation, Port	I-37, U.S. 181, 77, 281, 59, SH 44, 35
Beaumont	Port Arthur	Procter, Houston	SH 87, 82, U.S. 69/96/287, I-10
	Beaumont	Main, Franklin	U.S. 90, Spur 380, U.S. 69/96/287, I-10
	Orange	Alabama	FM 1006, SH 87, U.S. 890, I-10
Pharr	Brownsville	FM 511	SH 48, 4, U.S. 77/83
	Harlingen	FM 106	U.S. 77
	Isabel	Port	SH 100, U.S. 77
	Mansfield	Port	SH 186, U.S. 77

Source: Adapted from Texas Department of Transportation, *The Texas Transportation Plan: Partnerships into the 21st Century, Modal Profiles*, 1994 ed., TxDOT (Austin, Tex., 1995).

Highway Issues

Adequacy of Landside Access

Congestion at ports of entry into the United States, including the seaports, is widely recognized as a problem by those who track trade flows.[34] If the seaports operate inefficiently or do not provide adequate access to continue along the corridor of trade, they may be bypassed entirely. Each of the links in the intermodal chain must be strong in order to ensure the smooth, uninterrupted flow of cargo.[35]

The Port of Houston regards itself as an established intermodal center. Nearly 130 trucking companies serve the Port of Houston, and traffic related to this movement is estimated at over 215,000 vehicles per year. This translates into approximately 1,000 trucks per day through the Barbours Cut Terminal (Houston's container facility). Capital improvement projects, undertaken and planned, demonstrate the port's goal of providing shippers with reliable linkages. As a result, at Barbours Cut Terminal, trucks have convenient highway access and can be "on a major throughway, heading in any direction, within 10 minutes." To accommodate the truck traffic, the port authority has made several service and facility improvements: business hours were extended; a truck entry complex at berth 5 was constructed, the total number of truck lanes and the number of scales were increased; and the computer system at Barbours Cut is constantly updated.[36]

With the proper documentation, turnaround time at the terminal may be less than one hour. For example, a steamship line can release containers by computer for pickup by the truck driver. The information about the cargo may be sent before the trucker arrives. The driver then may access the system by touch-tone phone to verify whether a container has been released.[37]

It is crucial that Texas ports pay close attention to landside access issues. Concerns surrounding landside access issues tend to be port specific. Some common concerns, however, are evident.

Congestion and Bottlenecking

Congestion along major truck routes leading to the ports is a concern for several reasons. The longer the time spent in transit on the route, the greater the time and costs associated with the movement of goods. Furthermore, as trucks sit idle while awaiting clearance, they emit fumes that degrade the air quality within the vicinity of the port. As observed by the Transportation Research Board, many metropolitan areas have developed around ports.[38] Many of the ports are served by interstate highways, state highways, and local urban streets. This means that trucks share these routes with all other forms of traffic. A resulting problem typical to many of the ports, then, is increasing congestion and delay that occurs along the routes.

Congestion may be exacerbated by further problems such as at-grade railroad crossings and bridges in poor condition. Railcars that sit on the tracks waiting to be loaded or unloaded may cause bottlenecks.[39] Bridges that are old and in unsatisfactory condition could be made worse or may not be able to withstand the weight of many heavy trucks.

Work at the Port of Brownsville to widen and reconstruct major roads at the turning basin was completed in 1994. This project was spurred by increased truck traffic due to trade with

Mexico.[40] In addition, the port is currently working to obtain a permit to build an international bridge across the Rio Grande. Such a structure would facilitate the movement of cargoes to and from the port by truck without having to travel public roadways.[41]

Physical Infrastructure

The design of roads leading to the ports and the intersections on those roads may be a concern. Typically, they should be able to accommodate the turning radii of the trucks that travel on them. Further considerations might include the number of lanes, the width of the roads, and their weight capacity.[42] Ideally, the design should reflect the standard lengths of containers that travel by sea and then are placed onto trucks for inland travel. Overhead clearances at the Port of Corpus Christi, for example, should be raised to above 30 feet on the road that directly leads from the interstate to the port. This road should be able to accommodate the oversize cargoes that move to the heavy-duty multipurpose dock.[43]

A necessary component of Port Lavaca-Point Comfort's ability to grow lies in the expansion of U.S. Highway 87. This highway will undergo a widening to four lanes from Port Lavaca to U.S. Highway 59 at Victoria. The port also views any subsequent improvements to this highway as beneficial to the smoother operation at its facility.[44] The operators of the Victoria Barge Canal are also very interested in the expansion of U.S. Highway 59 and the proposed Interstate Highway 69, which would span a route from Canada to Mexico and run straight through Victoria. As a result, the users of the barge canal could play a part in the international movement of goods.[45]

Not only should the roads be able to accommodate the dimensions of the trucks carrying the marine containers but the bridges along those roads also should be able to bear the same loads. If not, there could be adverse consequences in the forms of slowing traffic, safety problems, and the premature deterioration of the facilities.[46] At the Port of Corpus Christi, the only access to the north side of the ship channel is by way of the Tule Lake Lift Bridge. When the bridge is lifted, traffic may be held up; delays would also certainly result due to any malfunction or breakdown in its operation. A current project, then, involves the rebuilding of the bridge's mechanical, structural, and electrical systems.[47]

Finally, the inadequacy of street signs and route markings may impede the smooth flow of cargo.[48] Improvements made in this area could lead to increased time efficiency so that trucks are able to travel their routes without confusion or delay. Further, highly visible markers would ensure that trucks remain on their designated paths and not stray into adjacent neighborhoods.

At the Port of Freeport, 89 percent of the cargo moves by truck, carried primarily by eight trucking lines that serve the facility.[49] Access to the Port of Freeport could use some improvement. Currently, the port is served by State Highway 288, leading to the metropolitan area of Houston. However, this limits the ability of the users of the port to travel in many directions. The port's access to State Highway 36, which provides access to east/west interstate travel, crucially needs upgrading and widening. One of the key issues facing this port is its ability to compete at the national level. If some of the ISTEA funds were dedicated to improving the highway infrastructure that supports this facility, their ability to compete would improve.[50]

Land Cost and Availability, and Influences on Land Use

Finding funds to finance projects that are directed toward alleviating congestion along the routes leading to ports is difficult at best. Local governments might not give priority to the needs of freight transportation over other competing projects.[51] Additionally, even if funding is available, concerned neighborhoods within the communities surrounding the ports may become involved in the development of port access improvements. Neighborhood opposition resulting from scarce land availability surrounding ports may make it difficult to improve or expand landside access.

One potential source of funds for the improvement of landside access is the federal government. The mechanism by which those funds were originally made available lies in ISTEA. In particular, the program components involving the NHS, surface transportation, and congestion mitigation and air quality improvement address funding for landside access projects.[52]

Combinations of funds, both federal and local, may be used to make projects related to intermodalism or the NHS a reality. For example, plans at the Port of Corpus Christi include a $36.9 million highway and railroad corridor for the purpose of improving access to the north side of the Inner Harbor and opening additional channel-front property for industrial development. The Corpus Christi MPO approved the plan in 1993 in order for the new roadway to be incorporated into the NHS.[53]

Infrastructure already in existence might be incorporated into future plans, where possible. For example, current plans for the Port of Orange infrastructure include the development of a new industrial park. One component in the proposal for the new site is an intermodal yard which is to be served by an existing road.[54]

Regulatory Issues

Controls on Operation

The hours during which trucks may operate may be constrained by controls on operation. These constraints might arise as a result of neighborhood opposition to truck-generated noise, efforts to reduce congestion, or attempts to minimize emissions that affect air quality.[55]

Overweight Containers

An issue that is important to the consideration of landside access to seaports is that of overweight containers. Loads that are too heavy are characterized by reference to "absolute or gross weight, axle weight, bridge weight [fundamentally involving the distance between axles of the tractor and trailer], and balancing of loads."[56]

In 1989, the FHWA reported that one-third of a random sample of containers entering and leaving U.S. ports during a one-year period would surpass federal highway weight limits if transported via customary highway equipment. Federal weight limits, however, are not the only standard to be met. The states typically have their own weight restrictions and enforcement procedures. Thus the federal government has been interested in taking action to bring laws and compliance procedures to a greater level of conformity.[57]

Overweight containers pose multiple problems where landside access is concerned. Primarily, the effects of containers that exceed regulatory limits take their toll on the roadways supporting the ports.[58] More particularly, overweight shipments on trucks cause roadways to deteriorate. As a result, highways may frequently be under repair, with road crews performing maintenance on already congested routes and closing lanes as they work.[59]

Further effects of the problem with overweight containers are felt in the form of costs. These include costs incurred by trucking companies, which may, in turn, be passed on to the consumer.[60] Maintenance, equipment damage, fines, and accident liability represent some of the forms of costs borne by trucking interests. Trucking companies may be able to pass some of these costs on to the consumers down the line; however, these added costs do not necessarily indicate a reduction in service quality or greater transportation inefficiency. Likewise, trucks and related equipment may not be the only component in intermodal transport affected by overweight containers; container ships, terminals, and trains may also experience similar equipment and safety complications.[61] In totality, all of these complications and their subsequent costs may create a strain on landside access.

Overweight trucks are a chief concern of the Port of Brownsville. Because many of the trucks that move through this facility are of Mexican origin and frequently exceed U.S. weight limits, a strain on the port's infrastructure results. The port has proposed that, with its own international bridge, weights and dimensions of these trucks could be taken into account and accommodated, without the trucks having to move on the usual public roads.[62]

Strategies

Dedicated Freight Corridors

The use of dedicated freight corridors typically involves the movement of cargo along a path parallel to the usual route traveled. The benefits of the use of a dedicated roadway as an alternate route arise in several different respects. First and foremost, the amount of traffic congestion would be greatly reduced, as trucks and passenger vehicles would not necessarily continue to travel the same routes.[63] Not only would the actual capacity on the roadway be alleviated, but the traffic jams that occur at intersections would also lessen. Furthermore, through careful planning, it might be possible to avoid not only truck/passenger vehicle congestion but also truck/rail congestion on at-grade crossings.

The dedicated freight corridor could be planned to separate or close at-grade crossings. As a result, vehicular emissions would also decline, thereby alleviating some of the environmental complications associated with roadway congestion along highly traveled corridors.[64] In a related manner, the noise pollution associated with heavy truck traffic could be lessened by diverting the traffic away from neighborhoods.

One major drawback associated with dedicated freight corridors, however, is the enormous monetary costs involved in their construction.[65] Another aspect that should be taken into consideration involves the effects the corridor will have on the surrounding communities. Further costs are incurred when different governing bodies must coordinate to bring the corridor to fruition. Determining who will bear the initial costs and who will fund the maintenance and improvements is another concern. A cost-benefit analysis of the corridor should assess the actual costs associated with making the corridor a reality.

The Port of New Orleans has acted to create such a throughway. Slated for opening in 1995 is the Tchoupitoulas Corridor, which will double the roadway capacity along the riverfront.[66] This roadway will be dedicated to trucks transporting goods to and from the Port of New Orleans, resulting in greater transport efficiency as well as safety.

In New Orleans, motor carriers have traditionally been routed through small streets situated in residential neighborhoods. The new Tchoupitoulas Corridor will eliminate this practice, thereby reducing the need for road maintenance within the neighborhoods as well as vastly improving traffic conditions for residents. However, inadequate funding for the corridor is still creating obstacles for the project and might ultimately delay its completion.

Within the state of Texas, coalitions have formed for the purposes of promoting certain interstate highways as international routes of commerce. One group, the I-35 Corridor Coalition, has lobbied the state, Travis County, and politicians for their support. Another group has proposed that the funds that would be used to improve and expand I-35 go toward the creation of I-69 out of the existing U.S. 59.[67] The Texas Transportation Commission has not gone on record as backing either group.

Increased Use of Rail Service

One possibility for alleviating the costs and traffic associated with the freight moving along roads and highways is to make greater use of rail service, as seen in the previous chapter. Typically, this would involve bringing the rail lines close to the container storage areas at a port. The cranes would move the cargo directly from the ship to the train and vice versa.

The major benefit associated with this method of cargo movement lies in the area of costs.[68] Handling costs would be less than those where the marine and rail terminals are separated by a greater distance. Much of the drayage operation would no longer be required. But, one main obstacle that exists for this efficient method of operation is that space at seaports usually is at a premium.

However, the most efficient movement of cargo is not always possible. At the Port of Galveston, much of the cargo that is capable of being moved by rail, moves by truck instead. This is due to the high rates for movement by rail that arise from negotiation of rail rates with unions.[69]

Intermodal Terminals Located Inland

The idea behind this particular strategy involves the placement of the facility for sorting containers some distance inland from the port. Rather than having the intermodal terminal at the port, the bulk of the sorting for shipment to other inland locations would be done at the inland terminal. The reality of this method may depend, however, on whether the port has on- or near-terminal rail service. If so, the cargo may be unloaded from the ship, placed onto a railcar, and moved by rail to the inland terminal. Once there, the containers would be sorted and placed on trucks for further local or regional delivery, or be transported on railcar.[70]

Sorting the containers in this manner does increase the handling involved in moving them to their final destination. At the Port of Galveston, the intermodal hubs are located 45 minutes north of Houston. As a result, much of the cargo moving through the port (via intermodal operations) must travel between the port and the hub by truck.[71] However, for metropolitan areas experiencing congestion problems around their ports, this strategy would be a valuable way of reducing truck traffic and the pollution associated with it.

Greater Reliance on Barge/Intracoastal Shipment

Another method that has been suggested is that of moving goods on barges. In this case, the way traveled would be along the Gulf Intracoastal Waterway. Instead of moving containers by drayage from the ports, they would be moved by barge along the GIWW to other ports and coastal cities. The chief benefits associated with this alternate method of movement of goods are the lessening of traffic congestion and decreased pollution.[72] In particular, the roadways and bridges along the routes to the ports would experience a significant decrease in congestion. The noise and air pollution that accompany the heavy traffic would be alleviated accordingly.

In 1992, a study was conducted on freight movement along the GIWW. It found that in 1990 82.3 million tons on 38,279 barges traveled the GIWW. Putting that figure into perspective, the amount of freight moved on the waterway that year would have taken about 574,185 railcars or approximately 2.3 million semitrailer-truck loads.[73] This demonstrates the value of using the GIWW with respect to the amount of wear and tear that it saves the Texas roads and highways.

Conclusion

Texas has the most extensive highway system in the United States; yet access via the system to Texas ports is still limited in many cases. Therefore, issues of highway access to ports would benefit from greater involvement by the Texas Department of Transportation in addressing these access problems.

While ports play an integral part in the overall transportation scheme of the state, to date TxDOT has not made roadside access to the ports a priority. This lack of coordination between the department and the ports in addressing access issues has limited development at various Texas ports. The issue of roadside access to Texas ports must take an elevated position of importance with TxDOT as increasing intermodalism demands sufficient infrastructure. Likewise, Texas must effectively compete with other gulf states for foreign trade; intermodal access, or lack thereof, plays an ever increasing role in attracting shippers to Texas ports.

In addition to adequate roadside access, issues of efficiency in intermodal transport are of primary importance. Strategies for improving the efficiency of inland transport include the use of dedicated freight corridors, increased use of rail service, inland intermodal terminals, and greater reliance on barge transport. Ensuring that plans are made for improving the infrastructure and the efficiency of inland transport will greatly increase the intermodal capabilities of the ports as well as make Texas more competitive in waterborne trade.

Notes

[1]Texas Department of Transportation (TxDOT), "The Texas Transportation Plan: The Texas Multimodal Transportation System," Austin, Tex., 1994, p. 59 (discussion draft).

[2]"Highways and Bridges," in *The Texas Transportation Plan: Partnerships into the 21st Century, Modal Profiles*, 1994 ed., TxDOT (Austin, Tex., 1995), p. 3.

[3] TxDOT, Texas Multimodal Transportation System, p. 59.

[4]U.S. Department of Transportation (USDOT), Federal Highway Administration and Maritime Administration, *Land Transportation Access to Ports and Marine Terminals: Opportunities and Challenges for Ports under the Intermodal Surface Transportation Efficiency Act of 1991* (Washington, D.C.: Government Printing Office, 1993), p. 8.

[5]Ibid., p. 9.

[6]"Highways and Bridges," Modal Profiles, p. 5.

[7]USDOT, *Land Transportation Access to Ports and Marine Terminals*, p. 9.

[8]"Highways and Bridges," Modal Profiles, p. 5.

[9]Ibid., p. 6.

[10]Ibid., pp. 6-7.

[11]Ibid., p. 7.

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[13]"Highways and Bridges," Modal Profiles, p. 7.

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[70]USDOT, *Landside Access to U.S. Ports*, p. 62.

[71]Interview with B. Curran and J. L. Slocum, March 23, 1995.

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Chapter 7. Legislation Affecting Texas Ports

Introduction

This purpose of this chapter to provide an overview of the various federal and state laws and regulations that directly or indirectly affect port operations and expansion plans. Environmental laws affecting Texas ports cover a variety of statutes designed to protect water quality, endangered species, wetlands, wildlife habitats, and the like. Nonenvironmental laws affecting Texas ports cover an even more diverse range of topics: agriculture assistance, carrier conferences and antitrust immunity, harbor maintenance trust funding, and intermodal project funding.

Environmental Legislation Affecting Texas Ports

As with seaports nationwide, Texas ports are facing increasing difficulties in dealing and coping with environmental legislation and regulations, especially those relating to dredged material management. "Over the past two decades, a number of factors have complicated the development, operation, and maintenance of the nation's harbors . . . These factors include increases in the demands of commerce, rapid evolution of shipping practices (containerization and intermodalism), increasing environmental awareness and mounting environmental problems affecting coastal areas and ocean waters, heavy population shifts to coastal areas, and a general increase in non-Federal responsibilities in the development and management of navigation projects."[1] The following statutes affect port operations and management.

Clean Water Act

The Clean Water Act (CWA) is designed as a regulatory tool to improve and protect surface water quality by controlling the restoration and maintenance of the chemical, physical, and biological integrity of those waters. The significant regulatory mechanism is the National Pollutant Discharge Elimination System (NPDES) permit program, which includes various permit programs for such different operations as wetland protection or dredging and disposal. Section 404 of the CWA allows the U.S. Corps of Engineers to authorize any discharge of dredged or fill material in U.S. waters through permits;[2] and in section 401, any proposed disposal operations must comply with state water quality standards.[3] The Environmental Protection Agency (EPA) provides broad environmental management, including veto authority over any permits that may have an adverse environmental affect.

The CWA becomes most invasive to ports when they attempt to dredge, because the spoil disposal into the waters can have deleterious water quality effects.[4] These regulations limit the placement location of dredged materials because of the possible impacts. Additionally, by limiting the placement, many dredged materials must be placed on substantially higher-cost land sites. Furthermore, the EPA and Corps are authorized to predetermine the suitability of the spoil-placement location, which subsequently gives the EPA and Corps the authority to severely limit the ability of ports to perform essential operations.

The process of obtaining permits required under the CWA is tedious, expensive, and slow.[5] Even after a permit is issued, the project is not guaranteed to proceed. Environmental groups can sue to enjoin the issued permit, thereby tying up the process in the courts. For example, the courts were used to try and stop the Laguna Madre dredging.[6] These regulations apply not only to the ports but to the Gulf Intracoastal Waterway dredging as well. The Corps is charged with maintaining the GIWW and must abide by all environmental regulations when performing dredging.[7]

In addition to the dredging and spoil-disposal impact, the CWA affects wetlands destruction. Often, planned port developments entail the use of wetlands. And many land-disposal sites are classified as wetlands. Section 404 provides that no net acreage loss may occur due to development or wetlands alteration. This has the impact of requiring that wetlands creation must be equal to those being disturbed.[8]

Marine Protection, Research, and Sanctuaries Act

The Marine Protection, Research, and Sanctuaries Act (MPRSA) (also known as the Ocean Dumping Act) regulates the disposal of materials at sea, preventing or strictly limiting the dumping of materials that may have an adverse affect on "human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities." Under Title I of the act, the Corps must evaluate proposed projects that require the transportation of dredged materials for the purpose of ocean dumping and must use EPA impact criteria for determining site suitability in its permit decisions. Furthermore, the Corps is encouraged to use disposal sites that have been designated by the EPA, and any Corps-issued permits are subject to EPA review.[9]

The dredging, without suitable land-placement areas, makes the cost of disposal egregiously high, if not prohibitive. The deficiency of suitable placement areas occurs because the MPRSA is very specific about its low tolerance for ocean disposal. Ocean dumping may only be used if "there are practicable alternative locations and methods of disposal or recycling available, including without limitation, storage until treatment facilities are completed, which have less adverse environmental impact or potential risk to other parts of the environment than ocean dumping . . ."[10] Further, the MPRSA limits the cost factor in considering ocean-dumping alternatives.[11]

National Environmental Policy Act

The National Environmental Policy Act (NEPA) limits federal government actions by requiring that an impact study be conducted to consider the proposed legislation's or major action's environmental consequences. This provides public review of the proposed action and allows the EPA the opportunity to review the proposal. Again the process is not simple; the impact study is a tedious undertaking and allows the public to instigate legal proceedings prohibiting the action.[12]

Endangered Species Act

The Endangered Species Act (ESA) requires federal departments and agencies to conserve all threatened and endangered species of animals and plants. Federal departments must ensure that all activities in which they are involved--through funding, authorization, or project administration--do not threaten endangered species or critical habitats. This act requires agencies to evaluate all proposals for federal actions, including the issuance of permits for dredging and disposal, that may have an adverse affect on endangered species and habitats.[13] Consequently, the ESA can limit beneficial property uses. Texas coastal waters are home to many diverse, and often endangered, flora and fauna species; this makes port or GIWW improvements difficult to accomplish without adversely affecting any species. A negative affect could occur from various operations, including disturbance of the bottom during dredging, spoil placement, or increased water usage. This law adds to operational costs by forcing ports or the Corps to utilize more expensive areas and methods to ensure compliance.

Oil Pollution Act of 1990

The Oil Pollution Act of 1990 (OPA 90) has various provisions affecting transport methods for oil in U.S. waters. The most significant provision is the increase in liability for companies involved in oil handling, storage, and transport. The OPA 90 was enacted subsequent to the Exxon Valdez accident, an 11-million-gallon oil spill. The OPA 90 is important to Texas ports because of the enormous quantities of oil that are transported via Texas waters. The law places financial responsibility on the entity causing an oil spill. A responsible entity can be the owner or operator of a vessel, on- or offshore facilities, or pipelines, as well as a deep-water port licensee.[14] Additionally, where gross negligence is found, liablility is unlimited. This broad responsible-entities list could be troublesome for public facilities operators engaged in oil transport. Additionally, the OPA 90 exempts state and local government-owned vessels, unless the vessel is engaged in commerce.[15] The OPA's status is unclear on publicly operated landside facilities; therefore, operators could be held liable if they are responsible for a spill. This legal area could confer substantial risk on a port handling petroleum products.

If a Texas port oil spill occurs, the OPA 90 provides numerous port remedies. The OPA 90 created a fund that helps defray the cleanup cost by collecting a 5¢ per barrel fee on both domestic and imported oil.[16] This fund becomes important if a port's operations suffer as a result of an oil spill, by providing the port immediate financial assistance for cleanup.[17] The port is entitled to attempt recovery of "damages for the net loss of taxes, royalties, rents, fees, or net profit shares due to the injury, destruction, or loss of real . . . [or] personal property, or natural resources."[18] These powers, which are granted to both the state and any political subdivision (ports), provide assistance toward financial recovery for oil-spill damages.

Other provisions of the act include the placement of response planning and execution responsibilities on government entities, as well as operators of vessels and facilities, and a requirement that new prevention measures involving vessel construction and operation be implemented.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) is the law responsible for discharge of any nonpetroleum- or natural gas-related products.[19] CERCLA provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. Additionally, it provides for the clean-up of inactive hazardous waste disposal sites. CERCLA can be potentially important for Texas ports because many chemical plants are located in the vicinity of the ports. Chemicals pose a soil-leaching risk, which may contaminate the sediments to be dredged. Consequently, if these sediments are dredged, then the dredge-material transporter must abide by CERCLA.[20] CERCLA holds all former polluters jointly and severally liable for any pollution they deposited into a superfund site.[21] Joint and several liability holds each entity who contributed to the site's pollution liable for all damages, even if the other entities cannot pay or are no longer solvent.

Other Environmental Acts with Impacts on Texas Ports

Numerous other acts apply to the ports' surrounding environments as well. If the dredge material is toxin contaminated, the Toxic Substances Response, Compensation, and Liability Act; the Resource Conservation and Recovery Act; the Shore Protection Act; and the Coastal Zone Management Act (CZMA) all apply to responsible entities. These acts all add compliance layers to the ports' construction and maintenance processes.

The CZMA established a federal-state partnership for a balanced approach to comprehensive management of coastal resources. This balanced approach is accomplished by creating individual state Coastal Management Programs (CMP) to control coastal-zone development.[22] Section 307(c)(1) grants states the power to establish the CMPs, as well as to control some project approval occurring in the zone.[23] States form these management programs based on enforceable policies and mechanisms to balance resource protection and coastal development needs.[24] The federal uniformity provisions require that all activities involving federal action, funding, or permits be consistent in federally approved CMPs. In Texas, the state legislature has given the state's General Land Office responsibility for the Texas CMP creation and implementation.[25]

Further, agencies charged with environmental protection have the power to influence the permitting process. For instance, the U.S. Fish and Wildlife Service helps evaluate a proposal's impact on animal populations. Other agencies with the ability to affect the permit process are the National Marine and Fisheries Service, the U.S. Coast Guard, and the U.S. Soil Conservation Service. These agencies all have played a role in proposal planning or permitting.[26]

Texas Dredge Materials Act

The Texas Dredge Materials Act (DMA) is the Texas law regulating the dredging's spoil-materials placement.[27] The DMA, which allows the governor to enter into federal government agreements to control dredge-material disposal, is Texas' enactment of the CWA's Section 404 provisions.[28] The Texas Natural Resource Conservation Commission (TNRCC) is charged with overseeing disposal in navigable waters.

Texas Agencies with Regulatory Power

The Texas Legislature has established numerous agencies to control the state's environmental areas. The General Land Office is charged with protecting all state public lands as well as issuing coastal management plan regulations.[29] Therefore, if any public land is to be disturbed during the port operations' maintenance or expansion, the General Land Office must give permission. The Texas Parks and Wildlife Department (TPWD) is responsible for implementing the ESA in Texas and protecting native plants and animals. TPWD must give approval if any project will disturb endangered species' habitats or remove marl, sand, gravel, shell, or mudshell.[30]

Nonenvironmental Legislation Affecting Texas Ports

Enacting Legislation

The State of Texas has made numerous enactments since 1904 to establish the structure and facilitate the creation of port districts. The first change to facilitate district establishment was a constitutional amendment authorizing the legislature to create navigation districts.[31] After amendment ratification, the legislature passed an act in 1909 allowing district creations. The act empowered the districts to issue bonds upon a two-thirds voter approval by property taxpayers.[32] Inherent in the district creations was a legal limit on the indebtedness amount allowed, which was one-fourth of the district's total property value.[33]

To further assist localities in the port district creations, the legislature passed a 1917 constitutional amendment and subsequent 1921 legislation. These enactments expanded the navigation districts' powers.[34] Hereafter, districts located in a 100,000 persons or more municipality could operate widely varying facilities.[35] Subsequently, a 1925 statute was enacted allowing all districts to organize under the 1921 statute. The 1925 act also removed the indebtedness restriction and allowed simple majority bond issue approvals; currently, there are no districts operating under the 1909 act.[36] In 1932, the legislature passed an act allowing districts to issue revenue bonds and to assess, levy, and collect taxes independent of local county governments.[37]

The legislature can also pass a special act to establish districts or boundaries. The acts mentioned above allow local-level district creations; however, the legislature maintains the power to create districts independently.[38]

The Agricultural Trade Development and Assistance Act

The Agricultural Trade Development and Assistance Act of 1954, also known as Public Law 480 (PL480), established agricultural assistance to lesser-developed nations.[39] The cargo is shipped via U.S. ports with U.S. government-paid transportation.[40] This cargo has become the primary commodity of some Texas ports. These ports are able to generate revenues by charging for berthing costs, loading and unloading, and bagging of grain. Texas' Beaumont and Orange ports generate large revenues from PL480 cargo.

The Shipping Act of 1984 and the Proposed Ocean Shipping Reform Act of 1995

The 1984 Shipping Act exempted U.S. carriers from antitrust immunity. The act was passed to allow shippers to create agreements allowing them to establish sailings, charges, and routes, as well as agreements with landside transporters.[41] In the North Atlantic, an agreement was signed establishing a rate-setting cartel, which now controls 70 percent of the region's cargo. Many shippers are decrying the legislation as unnecessary and as price-fixing. The carrier agreements' status affects Texas ports by enabling the carriers to band together and set a given market's rates. As the South America and Mexico markets grow larger, carriers' incentives to band together increase. However, sweeping maritime deregulation appears assured. U.S. Representative Bud Shuster (R-PA), Chairman of the House Transportation and Infrastructure Committee, announced on June 28, 1995, that he intended to introduce the bill, "Ocean Shipping Reform Act." The bill will contain a phased implementation of amendments to the Shipping Act of 1984 that will

1. ensure a mandatory right of independent action on service contracts for all carriers operating within shipping conferences by January 1, 1997;

2. eliminate government tariff enforcement and regulation by January 1, 1997;

3. eliminate government tariff and contract filing by June 1, 1997;

4. provide authority for shippers and carriers to agree to completely confidential service contracts by January 1, 1998;

5. retain current system of oversight and filing requirements for carrier agreements; and

6. transfer the remaining responsibilities of the Federal Maritime Commission to the U.S. Secretary of Transportation between October 1, 1995, and October 1, 1997.[42]

The Intermodal Surface Transportation Efficiency Act of 1991[43]

The Intermodal Surface Transportation Efficiency Act (ISTEA) was enacted to attain a more seamless integration of the different domestic transportation modes. ISTEA demonstrates a fundamental change in the direction of national transportation policy planning and decisionmaking. The stated policy goals of ISTEA are to "develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in the global economy and will move people and goods in an energy efficient manner."

ISTEA's focus on intermodal transportation and planning makes it unique in transportation legislation. The act recognizes the significance of access to intermodal facilities, and by providing improved access to ports and airports, the United States' position in world commerce will be improved. Furthermore, the act mandates that metropolitan planning organizations and state transportation departments consider port access in their policy and infrastructure planning. ISTEA makes available financial assistance for local intermodal projects. Subsequent to project approval, however, a proposed project's impact on the surrounding infrastructure is considered.

However, the 1995 congressional session might change funding availability. Some members of Congress have already criticized ISTEA as pork and are suggesting such reforms as providing block grants to states instead. Consequently, future funding applications will need to consider these possible legal changes.

Finally, during the reauthorization phase of ISTEA in 1997, the U.S. Department of Transportation's Maritime Administration will request changes that require

1. MPO's consideration of both landside and waterside infrastructure when developing transportation plans;

2. a balance in the transportation needs of both cargo and people; and

3. consideration of local port development plans when developing regional or state transportation plans.

Under these revisions, long-term coastal and dredging planning will be linked to the long-term intermodal transportation planning goals for improved port access.

Texas Coastal Waterway Act of 1975

The 1975 Texas Coastal Waterway Act established the Texas Department of Transportation as the Gulf Intracostal Waterway's local sponsor.[44] The act allows easements and rights-of-way granting for dredge-material disposal sites.[45]

Conclusion

The previous enumerated acts cover only those laws having the most direct impact on Texas port operations. Some acts have affected ports more than others but all have induced either port limitations or regulations that must be respected. Any synopsis of the competing state and federal jurisdiction intricacies will surely leave out some legal aspects that affect operations. However, this chapter provides an awareness of both the port regulations' complex nature and the extra burdens that ports must endure.

Notes

[1] U.S. Department of Transportation, Maritime Administration, *The Dredging Process in the United States: An Action Plan for Improvement,* report to the Secretary of Transportation by the Interagency Working Group on the Dredging Process (Washington, D.C., December 1994), pp. 1-2.

[2] 40 C.F.R. § 230.10(b)(a).

[3] 40 C.F.R. § 230.10(b)(3).

[4] 40 C.F.R § 230.

[5] See Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines, February 6, 1990.

[6] Josh Lemieux, "Environmentalists Decry Using Waterway as 'Ditch,'" *Houston Post* (July 31, 1994), sec. A, p. 36.

[7] Riverside Irr. Dist. v. Andrews, 758 F.2d 508 (10th Cir. 1985).

[8] Ibid.

[9] 33 U.S.C. § 1402.

[10] 40 C.F.R. § 227.16(a)(1,2).

[11] "Waste treatment or improvements in process and alternative methods of disposal are practicable when they are available at reasonable incremental cost and energy expenditures, which need not be competitive with the costs of ocean dumping . . ." 40 C.F.R. § 227.16(b).

[12] David G. Davis, "Regulator's Perspective-Environmental Protection Agency" (paper presented at the Transportation Research Board's 73rd Annual Meeting, Washington, D.C., January 11, 1994).

[13] 16 U.S.C.A. § 1531.

[14] 33 U.S.C.A. § 1321(a)(6).

[15] See Port of Portland v. Water Quality Insurance Syndicate, 796 F.2d 1188 (9th Cir. 1986).

[16] 26 U.S.C. § 4611(c)(2)(B).

[17] 33 U.S.C.A. § 2712(d)(1).

[18] 33 U.S.C.A. § 2702(b)(2)(D).

[19] 42 U.S.C. § 9601(14)(F).

[20] 42 U.S.C. § 9607(a).

[21] Robert W. McGee, "Superfund: It's Time for a Repeal after a Decade of Failure," *UCLA Journal of Environmental Law and Policy* (1993).

[22] 16 U.S.C. § 1455(c).

[23] See Conservation Law Foundation v. Watt, 560 F. Supp. 561, 576 (D. Mass. 1983).

[24] 16 U.S.C. § 1451(f).

[25] Tex. Nat. Res. Code Ann. § 33.601 (Vernon 1995).

[26] H. Thomas Korngay, "Regulated's Perspective-Port of Houston Authority" (paper presented at the Transportation Research Board's 73rd Annual Meeting, Washington, D.C., January 11, 1994).

[27] Tex. Rev. Civ. Stat. art. 5415e-4 (Vernon 1995).

[28] Tex. Rev. Civ. Stat. art. 5415e-4, § 5(a) (Vernon 1995).

[29] Tex. Nat. Res. Code § 33.601.

[30] Tex. Parks & Wild. Code § 86.001, 86.004 (Vernon 1995).

[31] RPC, Inc. "Organizational Characteristics and Financial Capablities of Texas Deep-Draft Ports," June 1979 (draft prepared for the Texas General Land Office).

[32] Tex. Const. art. III, § 52.

[33]RPC, Inc., *Organizational Characteristics and Financial Capablities of Texas Deep-Draft Ports.*

[34]Tex. Const. art. XVI, § 59.

[35]Act of 1921, ch. 30, § 1, 1921 Tex. Gen. Laws.

[36]RPC, Inc. *Organizational Characteristics and Financial Capablities of Texas Deep-Draft Ports.*

[37]Act of 1932, ch. 27, 1932 Tex. Gen. Laws.

[38]RPC, Inc. *Organizational Characteristics and Financial Capablities of Texas Deep-Draft Ports.*

[39]7 U.S.C.A. § 1691.

[40]7 U.S.C.A. § 1431(a).

[41]Michael G. Roberts, "Don't Repeal the Shipping Act," *Journal of Commerce* (April 7, 1995), p. 6A.

[42]Committee on Transportation and Infrastructure, "Chairman Bud Shuster, Congressmen Norman Y. Mineta, Howard Coble, and Jim Traficant Announce Ocean Shipping Deregulation Plan," by U.S. House of Representatives, Washington, D.C., June 28, 1995 (press release).

[43] Texas Department of Transportation, *The Intermodal Surface Transportation Efficiency Act of 1991: An Analysis* (Austin, Tex., August 31, 1992), pp. v, 44-46.

[44]Tex. Rev. Civ. Stat. art. 5415e-2 § 6(a) (Vernon 1995).

[45]Tex. Rev. Civ. Stat. art. 5415e-2 § 6(c) (Vernon 1995).

Chapter 8. Issues Affecting Current and Future Port and Waterway Performance

Introduction

This chapter provides a synopsis of the issues affecting Texas ports, with particular emphasis given to concerns voiced by port officials during the course of scheduled interviews with members of the research project team or in their answers to port questionnaires. Chapters 5 and 6 addressed the importance of adequate highway and rail access to ports in addition to problems associated with traffic congestion and the need for intermodal connections. This chapter, instead, focuses on funding and planning, environmental regulation, and interjurisdictional cooperation issues. Also covered are diverse issues that affect port operations in a variety of ways: flag subsidies, carrier conference immunity, U.S. customs reorganization, labor work rules, and free-trade agreements.

Adequacy of Funding

The current trend in the federal government is to reduce spending, which extends to a decrease in the amount of money available for local projects. The reduction in federal spending has limited the opportunities to modernize the facilities in and around Texas ports. Even the availability of ISTEA money is uncertain; in 1995, legislation was proposed to radically change the availability of these funds.[1] Besides, ISTEA money has the limited designation of connecting the ports to the National Highway System. The growing number of ports competing for those limited funds makes the likelihood of obtaining funding from that particular source even slimmer. This increased competition for money will hurt the smaller ports as it becomes more difficult to justify expenditures on ports with less traffic.

The State of Texas has few financial options. It is simply unable to provide funds necessary to renovate maritime facilities. With more of the state budget being controlled by federal courts and federal mandates, the amount of state discretionary funding is growing smaller.[2] The inability of the state to provide assistance hurts smaller ports, which are dependent on subsidies from the surrounding areas or the federal government for daily operations. This dependence on others to remain operational illustrates the difficulty inherent in operating a smaller port.

The lack of assistance from federal or state sources has had another impact on Texas ports. Ports located in other states along the Gulf of Mexico receive state assistance in borrowing funds and in various operational areas. This disparity is most detrimental when the non-Texas ports are in direct competition with Texas ports for cargo. Newer facilities and subsidized operations allow other gulf ports to reduce fees/charges so as to attract cargo away from Texas ports.[3]

Problems with Raising Capital

Some ports have expressed difficulties in securing adequate capital-improvement funds via the private sector as a significant problem.[4] The environmental cost of compliance further exacerbates the problem by making projects more costly.[5] Lacking the financial base of larger ports, smaller ports will be unable to find private-sector funding for construction. Likewise, this inability to raise needed capital will continue to stymie the efforts of the smaller ports. Even Corpus Christi, the state's second largest port, has had difficulty in securing funding for projects that do not directly generate revenues, such as landside access improvements.[6] However, the Port of Houston has had success in convincing the residents of Houston to approve bond issues.[7] This type of success needs to be emulated so that other Texas ports will have access to much-needed capital. Roger P. Richard, current head of the Texas Ports Association and Port Director of the Port of Orange, has suggested that the State of Texas assist smaller ports in acquiring private-sector bonds by guaranteeing repayment.[8]

Increased Demands on Port Resources

Further contributing to increased costs of port operations are regulations that severely limit the activities of ports. Recently, numerous pieces of legislation have required ports to spend ever-increasing amounts of money to comply with federal and state regulations. Regulations of the Texas Parks and Wildlife Department, the Clean Air Act, the Endangered Species Act, the Federal Oil Pollution Act, and other similar mandated requirements raise the cost of port operations.[9] Mandates that increase costs simply add to the problems that must be faced by many Texas ports.

Environmental regulations, while protecting the environment, add to the port expenses but do not generate revenues as other capital improvements do. Further adding to the concerns of ports is the reduction in federal maritime funding that has been proposed by the new U.S. House of Representatives' leadership. The ports of Texas are reliant on receipts of both indirect and direct federal aid. Texas ports rely upon direct federal funding for dredging and receive indirect assistance by carrying foreign-aid cargo. Therefore, any reduction in maritime funding will have a negative impact on Texas ports.

Dredging and Disposal

One of the greatest issues facing Texas ports today is that of dredging. Dredging is a necessary component of port maintenance and expansion in order to ensure vessels' safe passage. However, many environmental regulations have severely limited the ability of ports to dredge adequately. The increased environmental regulations on dredging have raised the cost of compliance for ports. Because both sediment removal and placement are highly invasive, they are heavily regulated by state and federal agencies. To undertake dredging, regulatory agencies require permits, a tedious, costly, duplicitous, and slow undertaking. In addition, if the dredged material is contaminated with toxins, another set of regulations applies to its handling and placement. With the increased sensitivity of sophisticated monitoring equipment, which more readily identifies contaminants, environmental groups have become more active.[10] As a result, environmental groups monitor and often delay the plans of ports.[11]

The lack of a national or state dredge policy has created numerous problems for the port operators. The presence of a national mandate would signify the importance placed on the necessity of dredging. Consequently, the American Association of Port Authorities is currently pushing for a national dredge policy. The Clinton administration recently convened an interagency group to study dredging concerns, which produced the report entitled *The Dredging Process in the United States: An Action Plan for Improvement.* Unfortunately, this report did not make a strong enough case for elevating national transportation issues to the level of environmental concerns. Some Texas ports suggested that the TxDOT promulgate a state policy,[12] which would be used to offset the existing mandate for environmental concerns.[13]

Gulf Intracoastal Waterway

The necessity for continued dredging of the GIWW presents many of the same problems as in the dredging of ports. This vital lifeline for shallow-draft ports is seen as one area that needs diligent attention. The GIWW must constantly be dredged causing disturbances in environmentally sensitive areas, such as the Laguna Madre. If suitable disposal for the dredge material is not located, the GIWW will be under continuous threat of litigation from environmental concerns.

Shallow-draft ports are adversely affected by the threatened closure of the GIWW. Interviews conducted for this study have revealed concerns by small ports about the future of the GIWW. The Port of Harlingen, a shallow-draft port, depends exclusively on the GIWW for trade, and any subsequent closure would drastically affect the port's ability to operate.[14] Similarly, Port Mansfield expressed concern that simply the threat of closure has hindered their attempts to attract business.[15]

The threatened closure of the GIWW south of Corpus Christi is an issue of foremost importance.[16] The notion of closing the GIWW is disastrous to the ports of the lower Texas gulf, as many of these ports rely on the GIWW for the majority of their trade. Industry statistics indicate that the 2 million tons of cargo moved via the Laguna Madre section each year is valued at $300 million.[17] Brownsville and other shallow-draft ports in this region rely on the GIWW for the effective transportation of their goods, which account for large portions of their traffic. Not only is the idea of closure disheartening to the ports, but the threat of closure has also hurt the ports' operations.[18] With closure a serious consideration, many businesses are wary of establishing operations in a port where access might be limited.

Some deep-draft ports could be significantly affected by the closure of the GIWW as well. The Port of Port Arthur is unique in its need to have the GIWW remain open because the port sits directly on the GIWW closure in the surrounding area; therefore, closure of the GIWW would close Port Arthur as well.[19] Similarly, because most of the Port of Beaumont's domestic cargo traverses the GIWW, closure would have a significantly adverse impact on Beaumont's port operations.[20] For the Port of Texas City, closure would result in a negative financial impact also, as 60 percent of its received barge cargo traverses the GIWW.[21] In addition, the Port of Orange expressed the need for a properly maintained GIWW to assist trade expansion with Mexico resulting from NAFTA.[22] For all Texas ports, the GIWW may well become an important lifeline to Mexico.

The problems of dredging carry over from financial concerns to other areas. The largest nonfinancial problem concerned with dredging is the inability to accurately predict when the dredging project will be completed. Because the permitting process is tedious and there are numerous levels of governments to satisfy, simply getting approval to dredge is often a large hurdle.

All the ports have mentioned the threatened closure of the GIWW south of the Laguna Madre as a concern of primary importance.[23] Because the ports cannot accurately predict when the dredging will be completed, businesses are wary of locating vital parts of their business in a port that might be less accessible. This uncertainty surrounding dredging has scared businesses away from smaller ports that cannot afford to endure the delays.[24] This phenomenon was exemplified in 1991 when the mouth of the Mississippi was raised 3 feet; this affected 1 in 30 ships calling on the Port of New Orleans. At the time, the projection was a loss of 5 to 8 percent of the New Orleans' port business.[25]

Environmental Regulation

Because of strict environmental regulations, the cost for port users is increased, making waterborne freight more expensive.[26] The Texas Parks and Wildlife Department has issued numerous regulations concerning the protection of various species. These regulations have curtailed projects or increased the total cost of their completion. Another environmental regulation is the federal Endangered Species Act, which guarantees federal protection for endangered species and prohibits the disruption of their habitat.[27] This regulation protecting endangered wetland species has posed numerous problems for Texas ports.

Another concern of the ports is the Oil Pollution Act, which prohibits the discharge of any oil in U.S. waters.[28] Further, the Clean Air Act places mandates on the types of air pollution that can be dispersed into the air surrounding a port. The limits on air pollution affect the refining businesses, the types of loading equipment, and the types of vessels allowed in the ports.[29] All of these regulations have numerous impacts on the shipping industry, which in turn affect the ports. Both the Clean Air Act and the Oil Pollution Act have greater impacts on the ports of Texas than most other ports. These impacts result from the enormous number of petrochemical plants located in Texas as well as the large amount of oil transported by water to and from Texas ports.

Most of the Texas ports are directly or indirectly affected by environmental regulation. However, many ports feel that these regulations, while being restrictive and costly, do not substantially improve pollution abatement. Because the environmental regulations raise the cost of waterborne commerce, many shippers might seek other avenues of transportation. Additionally, businesses located on property leased from the ports are strongly affected by environmental regulations, which negatively affect the ports' operations.

Interjurisdictional Cooperation

Texas Department of Transportation

The Texas Department of Transportation, the state agency responsible for implementing Texas port policies, is viewed by many ports to be unresponsive to port issues. Some smaller ports have stated that TxDOT does not understand the issues of concern to smaller ports. One port director stated that TxDOT must think that ports were developed by "immaculate conception."[30] Although there appears to be a lack of communication between TxDOT and smaller ports, TxDOT seems to have a better understanding of the large ports, such as Houston and Corpus Christi. However, many ports, both large and small, have expressed concerns about TxDOT and the highway focus of the department. The department's seeming lack of understanding of maritime issues is one of the concerns that all Texas ports share. Having a department that better understands maritime concerns could help many of the smaller ports to plan, use resources effectively, and accomplish goals common among the ports. Additionally, a more open and constant dialogue between TxDOT and the Texas ports would create the level of mutual understanding necessary for efficient operation.

Centralized Coordination

If TxDOT was more knowledgeable about and responsive to the concerns of the ports, joint solutions could be attempted. By using the resources of the TxDOT, smaller ports could access state resources to effectively assist in their planning, allowing for the most beneficial use of the money to be allocated. Additionally, some ports have cited the need for TxDOT to use state resources to aid in acquiring ISTEA money for all ports.[31] This use of state resources would encourage the state to view its ports as an integral part of the state transportation scheme.

Although centralized monitoring, as stated above, of Texas ports by the state would be advantageous, port managers and directors do not want this to take place at the expense of their autonomy and flexibility in planning. Centralizing the oversight and operations of the ports would be detrimental to their efficiency. One port director proposed that TxDOT create a dialogue with the Texas Ports Association so that the TxDOT can keep abreast of current concerns of the ports.[32]

State Assistance Options

Texas ports are in direct competition with the ports of Louisiana, Alabama, and Mississippi. The State of Texas, unlike other states, does not provide funding for the ports along its coast. The State of Louisiana provides funding for its ports to develop new projects; this supplemental funding creates a competitive advantage for the Louisiana ports in attracting businesses. Moreover, the Port of New Orleans, Houston's main competitor in the gulf, has $100 million from the state committed to its capital-improvement program.[33] Roger P. Richard, Port Director of the Port of Orange, asserts that attracting commerce to Texas seaports is more difficult with Louisiana's subsidizing its ports.[34]

Flag Subsidies

The amount of money spent on shipping subsidies has an adverse impact on ports. The money distributed to shipbuilders and companies that sail U.S. flagged ships is collected from a tonnage fee imposed on all cargo transported through the port. The fee increases the cost of all goods imported; however, it disproportionately affects bulk commodities.[35] Because the fee is attached to weight, the fees disproportionately affect coal, agricultural products, and chemicals. In the most recent political battle over subsidies, some lawmakers were attempting to exempt dry-goods shippers from the tax.

Texas ports handle large amounts of grain and petroleum products, which are high-weight cargoes. The Port of Houston imports 12 times more petroleum and chemical products than its next largest category of import, which is food and farm products.[36] At the Port of Corpus Christi, grain, petroleum, and chemicals account for almost 91 percent of all import tonnage.[37] With the tax being applied to the weight of goods, Texas ports are paying a disproportionately higher portion of the subsidy for flying U.S. flagged ships. The cessation of a federal subsidy program would force many carriers to reflag their ships because of the prohibitive cost of operation under a U.S. flag.[38]

Carrier Conference Immunity

The federal government has given antitrust immunity to carrier conferences, which have rate-fixing ability.[39] The carriers are able to set rates, control sailing, and transfer cargo among the members, thereby allowing the carriers to control the market in certain areas. Seventy percent of the cargo moving in the North Atlantic is currently controlled by the Trans-Atlantic Carrier Agreement (TACA).[40] The possibility of other groups forming could allow the use of conferences to spread to the gulf. Shippers are very disgruntled about the immunity of these conferences and have proposed repealing the exemption.[41] The shippers believe that the exemption reduces competition and allows rates to be set artificially high.[42] This sort of squabble could result in the diversion of cargo if the conferences affect the ports of Texas.

As noted in the previous chapter, however, the proposed Ocean Shipping Reform Act will introduce sweeping maritime deregulation. The proposed bill resulted from negotiations between the National Industrial Transportation League (NITL) and Sea-Land Service that were spurred on by U.S. Representative Bud Shuster (R-PA), Chairman of the House Transportation and Infrastructure Committee. Two other large U.S. flag carriers--American President Lines and Crowley Maritime--joined Sea-Land in supporting the reforms. NITL President Edward M. Emmett hailed the agreement by stating that "it substantially deregulates the one remaining mode of transportation shippers use that had not been deregulated. With increasing global markets, this goes a long way toward creating a free-market atmosphere that will help everybody."[43] In contrast, Erik Stromberg, President of the American Association of Port Authorities believes that maritime deregulation may lead to shipping line rate wars that would ultimately leave the nation's ports underutilized and facing a climate unfriendly to investments. Stromberg asserted that "the Shipping Act provides stability. Without the law, cutthroat competition among shipping lines may result in a U.S.-owned or controlled fleet, fewer carriers and service options, reduced port calls, and higher rates."[44]

Set-Aside Cargo

There is concern among ports about the future of foreign aid. Currently, one of the primary changes advocated in Washington is the need to cut foreign aid. Part of this decrease in aid being advocated is a reduction of grain shipments, which are sent as part of the Agricultural Trade Development and Assistance Act of 1954, also known as Public Law 480. This law provides food to needy nations for which the U.S. government pays the shipping costs.

Much of the cargo is sent via Texas ports, such as the ports of Orange and Beaumont, which rely heavily on the handling of PL480 cargo. With such a dependence on federally subsidized cargo, any cutbacks can be devastating. Therefore, ports that rely on the cargo are particularly sensitive to proposals to repeal the law.[45] PL480 cargo is usually assigned through a bidding process; however, the law has been amended to require that some of the cargo use Great Lakes ports. This increases the total cost and excludes other ports from handling that cargo.[46]

Customs Reorganization

Recently, the U.S. Customs Service (USCS) underwent a major reorganization in an attempt to streamline the service. USCS consolidated some of its local offices into regional centers headquartered around the country. Some shippers are not satisfied with the changes and believe the reorganization has hurt, rather than helped, overall customs performance. With the transfer of operations to other locations, such ports as Houston lost their local USCS office and, consequently, lost processing speed.

Labor Issues

Texas ports currently use various methods of providing stevedores and longshoremen. Some ports contract with a union to perform all of the work at the port, while others take no part in finding labor to handle the cargo. At the Port of Port Arthur, the relationship between the port and the union has been exemplary and has served to enhance the port's operation.[47] The national standard has not been so beneficial.

Texas is a right-to-work state, in which nonunion and union labor can compete for jobs. The International Longshoreman's Association (ILA) has lost working time in the gulf because of the strict rules on conditions of work. One problem has been the lack of flexibility on crew size by the ILA, which has looked into changing the rules concerning work schedules.[48] Adequate supplies of labor are essential to the effective operation of the port; therefore, labor relations should remain open.

Free Trade

The primary effect or benefit of free trade lies in increasing foreign trade, thereby increasing cargo flowing across the Texas wharves. For example, the North American Free Trade Agreement will increase the amount of traffic coming north from Mexico. The General Agreement on Trade and Tariffs will have a similar effect on the port industry as the South American nations modernize and are better able to trade with the United States. However, one aspect of the trade that cannot be overlooked is the impact of currency valuation. Recently, the drop in the value of the Mexican peso sent shock waves throughout the trade industry. When the value of the peso fell, the cost of goods rose for Mexican importers. The peso devaluation caused many Mexican purchasers to default on payments, resulting in an indirect negative impact on Texas ports. Since Mexico started importing fewer goods, Texas has felt the repercussions as Mexico-destined cargo from Europe generally crossed Texas ports before arriving in Mexico. This loss of trade, however significant, is not expected to be long-term.[49]

Conclusion

Texas ports must face a variety of issues. The clear mandate for the protection of environmental concerns has severely handicapped port operations. Most important of these concerns, dredging is nationally, as well as locally, a flash point. Frequently what is missed in considering these issues is their interrelation. The inability to dredge affects the ability of ports to borrow by increasing investor skepticism. Additionally, difficulties in borrowing make port expansion uncertain, thereby limiting port planning capabilities. The inability to plan inhibits port expansion and improvement efforts. Another issue of great concern to ports is increasing costs of operations, such as those caused by environmental regulations, taxes, or fees, all of which make the port less attractive to carriers and shippers. The understanding of actions that affect the Texas port operations should be of paramount concern to administrators because of the various affects each action, or inaction, ultimately has on the ports.

Notes

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[3] Interview with Roger P. Richard, Port Director, Orange County Navigation District and Port District, Orange, Tex., March 21, 1995, Orange, Tex.

[4] Response by A. J. Reixach Jr., Executive Port Director, Port of Freeport, to TxDOT questionnaire, "The Texas Transportation Plan, 1994," Summer 1994.

[5] Rose Horowitz, "Ports Face Financing Challenge in Era of High-Cost Environmental Compliance," *Traffic World* (October 3, 1994), p. 24.

[6] Response by Carole Harding, Manager of Marketing, Port of Corpus Christi Authority, to TxDOT questionnaire, "The Texas Transportation Plan, 1994," Summer 1994.

[7] Response from the Port of Brownsville to TxDOT questionnaire, "The Texas Transportation Plan, 1994," Summer 1994.

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[13] Tim Shorrock, "US Task Force Urges Improvement in Federal- State Dredging Coordination," *Journal of Commerce* (January 3, 1995), p. 1b.

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[15] Interview by Jeffrey Stys with Michael Wilson, Port Director and General Manager, Port Mansfield/Willacy County Navigation District, Raymondville, Tex., March 11, 1995, Raymondville, Tex.

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[17] Lemeiux, "Environmentalists Decry Using Waterway," sect. A, p. 36.

[18] Response by the Port of Port Isabel to the TxDOT questionnaire.

[19] Interview by Brandon Lobb with Floyd Gaspard, Deputy Port Director, Port Arthur Navigation District, Port Arthur, Tex. , March 21, 1995, Port Arthur, Tex.

[20] Interview by Brandon Lobb with Chris Fisher, Deputy Port Director, Port of Beaumont, Beaumont, Tex., March 22, 1995, Beaumont, Tex.

[21] Interview by Josh LaPorte and Lyudmila Stupenkova with K. L. DeMaet, President, General Manager, and Treasurer, Texas City Terminal Railway Company, Texas City, Tex., March 24, 1995, Texas City, Tex.

[22] Interview with Roger P. Richard, March 21, 1995.

[23]Responses by Texas ports to the TxDOT questionnaire.

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[25]"Shallow Water Port," *Houston Post* (April 2, 1991) Business section, p. C1.

[26]Horowitz, "Ports Face Financing Challenge."

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[28] 33 U.S.C.A § 1321(a)(1).

[29] Clean Air Act 42 U.S.C.A. § 7401.

[30] Ibid.

[31] Responses by Ports of Freeport and Corpus Christi to TxDOT questionnaire, "The Texas Transportation Plan, 1994," Summer 1994.

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Appendix A. Port of New Orleans, Louisiana, Profile

Introduction

Location

The Port of New Orleans, Louisiana, is located at the Mississippi River's outlet to the Gulf of Mexico. The port's lifeblood is the Mississippi River and its tributaries, which provide an easy and cost-effective route for transporting cargo.[1] Over 14,500 miles of inland waterways--from the Great Lakes region in the north, the Allegheny Mountains in the east, and the plains of Oklahoma and Nebraska in the west to the Gulf Coast in the south--flow into the Mississippi River.[2] These waterways link together some of the United States' most important agricultural and industrial areas, including 13 major U.S. cities.

Controlling Depth

The Port of New Orleans is a deep-draft port located along the deep-draft portion of the Mississippi River. Controlling depths within the port are (1) Mississippi River, 45 feet; (2) Innerharbor Navigation Canal, 30 feet to mile 2.1, thence 32 feet; (3) Mississippi River-Gulf Outlet, 36 feet; (4) in-bar channel, 37 feet; and (5) Harvey Canal, 12 feet.[3]

History[4]

During the 1700s, illegal trade developed between Spanish Louisiana colonists and English (later American) settlers in the Ohio Basin, which drains present day Pennsylvania, West Virginia, Kentucky, Ohio, Indiana, and Illinois. Once farmers settled in the Ohio Valley, they found it was impractical to transport goods to the eastern seaboard and began shipping cargo by flatboat and keelboat down the Ohio River via the Mississippi River to the Port of New Orleans.

This illegal trade was overlooked by Spanish officials because the dual trade with the Ohio Valley was necessary for Louisiana to survive. In 1795, after two great fires in 1788 and 1794 virtually destroyed the city of New Orleans, Spain signed a treaty with the United States allowing Americans the "right of deposit" in the Port of New Orleans.

When this treaty expired and Spain refused to allow American vessels into the port in 1800, it ultimately led to the Louisiana Purchase in 1803. Authorized by President Thomas Jefferson, a delegation led by Robert Livingston and James Monroe went to France (which had gained ownership through negotiations with Spain in 1800) to seek the purchase of the Port of New Orleans.

For $23 million (including interest and reparations), the United States purchased the area extending between Canada and the Gulf of Mexico, from the Mississippi River west to Montana. The United States doubled in size and the acquisition led to the westward expansion of the United States, all because the United States needed the Port of New Orleans.

In 1896, the Louisiana state legislature created the Board of Commissioners of the Port of New Orleans. The board was to administer public wharves in New Orleans and regulate harbor trade and traffic. Since that time the port has steadily grown, and in its present state it is one of the most important U.S. ports. Today, the Port of New Orleans owns or controls 22 miles of wharves and terminals spread along the Mississippi River, the Industrial Canal, and the Mississippi River-Gulf Outlet.[5]

Ranking

The Port of New Orleans is ranked number 10 in the United States for total export value, with $6.6 billion in 1993. For import value, the port is ranked number 16 in the United States, with a dollar import value totaling $5.1 billion moved through the port in 1993.[6] For all services in U.S. seaborne foreign trade, the Port of New Orleans is ranked number 4, and in tanker services is ranked tenth.[7]

Operations and Services Performed

Commodities, Tonnages, and Traffic

The Port of New Orleans is billed as the top coffee and steel port in the country.[8] The port's main four commodities are iron and steel, grains, crude petroleum, and petroleum products.[9] Other important commodities include coffee, forest products, rubber, coal, sugar, vegetable oils, chemicals, fertilizers, and pharmaceuticals.[10]

Petroleum, petroleum products, grains, oilseeds, and iron and steel primary products are the top five commodities for import, export, and domestic trade at the Port of New Orleans.[11] Refer to table A.1. Export, import, and domestic trade of petroleum and petroleum products accounts for nearly 38 percent of all port activity. Grain shipments account for another 22.4 percent of total port trade, while oilseeds and iron and steel shipments combined account for another 16.4 percent. These top five commodities together account for nearly 77 percent of all cargo shipments transiting the Port of New Orleans.

Primary import commodities (excluding most bulk) include iron and steel, forest products, rubber, coffee, and aluminum. Iron and steel imports via the port increased from 1.65 million short tons in 1993 to nearly 3.8 million short tons in 1994, representing an increase of almost 130 percent. Import of forest products decreased by 6 percent over the same period. Rubber imports increased 17 percent and coffee imports decreased by 20 percent for the period.[12]

Primary export commodities (excluding most bulk) are forest products, grain and flour products, sugar, soybeans and products, and fabrics (including raw cotton). Forest product exports were down 3.8 percent in 1994, compared to 1993, with 652,000 short tons exported. Grain exports increased nearly 16 percent for the same period and sugar exports increased dramatically by 138 percent. Exports of soybeans and fabrics decreased by 15 and 18 percent, respectively, for the same period.[13]

Table A.1. Freight Traffic at the Port of New Orleans, Top Five Commodities, 1993
(In Thousands of Short Tons)

Commodities	Import	Export	Domestic	Total
Crude Petroleum	5,785	0	4,606	10,391
Petroleum Products	1,798	677	12,574	15,049
Grains	1	7,726	7,268	14,995
Oilseeds	2	3,228	3,451	6,681
Iron and Steel	2,195	163	1,956	4,314
Total	13,851	15,159	38,028	67,037

Source: Adapted from U.S. Army Corps of Engineers, *Waterborne Commerce of the United States, 1993* (Fort Belvoir, Va., 1995), pp. 319-26.

Port barge traffic (including the GIWW and the Mississippi River) ship primarily bulk product cargoes, such as grain, petroleum, and coal. However, more and more general cargoes, such as steel, rubber, and plywood, are moving through the port via barges.[14] Additionally, the Port of New Orleans handles the majority of steam coal cargo arriving by barge to be exported from the United States.[15] Over 100,000 barges move through the Port of New Orleans annually.

Market Shares

Among all Atlantic and Gulf Coast ports, New Orleans' market share of rubber imports is 42 percent. For plywood imports, the New Orleans market share is 21.2 percent, for steel imports the market share is 25 percent, and for coffee imports is 26.2 percent in 1994.[16] These market shares represent the significance of these import commodities (rubber, coffee, and steel) to the Port of New Orleans' activity.

Table A.2 denotes New Orleans' market shares of total imports and exports, among selected gulf ports, to and from regions located in the Western Hemisphere.[17] Gulf ports included in this market share profile are New Orleans, Houston, Galveston, and Mobile.

As table A.2 indicates, the Port of New Orleans has an extensive market in this hemisphere, with the port trade market shares exceeding 50 percent for both imports and exports in Central America. Currently, the Port of New Orleans is heavily dependent on Central American trade. Consequently, this trade is likely to become even more significant as NAFTA is expanded.[18]

The Port of New Orleans' import market shares from both the east and west coasts of South America are also of strategic importance, with the market shares being 46 to 49 percent each. The primary New Orleans' competitor (among gulf ports) for exports from both coasts of South America--and for that matter, all of the Western Hemisphere--is the Port of Houston.

Services and Charges

The Port of New Orleans is a full-service port capable of handling virtually any cargo type. Special project, general, and container cargo are being handled at the port's facilities with increasing efficiency as various new facilities come on-line. In addition to port facilities, a host of service-oriented stevedoring agencies, custom-house brokers, and freight forwarders handle varying aspects of cargo trade and shipment.[19] Furthermore, more than 80 steamship lines, calling on 310 ports in 124 countries, serve the Port of New Orleans, and it is home to 85 steamship agencies.[20]

The rate of wharfage on all commodities (with some exceptions) is $1.85 per ton. Wharfage charges on exceptions range from 23¢ per ton for bagged edible goods for relief purposes to $2.07 per ton for edible oils. Passenger wharfage charges are $5.50 each for one-way or round-trip tickets and $3.50 for passengers in transit.[21]

The port allows a liberal 30-day grace period for shipments before demurrage is incurred.[22] The following demurrage charges are incurred after the free-time expiration: 15¢ per ton per day for the first seven days; 40¢ per ton per day the next seven days; and $1.00 per ton per day for every day thereafter.

Table A.2. Market Shares Among Selected U.S. Gulf Coast Ports for Imports and Exports in Regions of Western Hemisphere, 1993 Excluding Most Bulk (in Percentages)

Region	New Orleans	Houston	Galveston	Mobile
Central America				
Imports	54.7	13.2	30.2	1.9
Exports	50.0	14.3	19.1	16.6
East Coast of South America				
Imports	45.8	39.1	2.5	12.5
Exports	36.2	52.5	9.5	1.8
West Coast of South America				
Imports	48.8	25.0	16.0	10.1
Exports	26.6	64.9	4.2	4.2
Caribbean				
Imports	39.3	49.5	0.0	11.3
Exports	32.7	26.3	1.1	40.0

Source: Adapted from Port of New Orleans Marketing Department, "Import and Export Market Share Analyses, 1993," New Orleans, March 1995 (computer printout).

Existing Port Facilities and Equipment

In 1993 the Port of New Orleans opened its Nashville B wharf, which is one of the largest modern multipurpose port terminals in the United States.[23] The Nashville B, located on the Mississippi River, has new container cranes and a vast open wharf area, assuring efficient quality handling and marshaling of any cargo moving through the port. The Nashville B contains 24 acres of marshaling yard, a 141,000-square-foot transit shed, 300,000 feet of open deck, truck and rail service, and cold storage facilities.[24]

In May of 1993, Silocaf, the world's largest bulk green coffee handling plant, opened at the former Public Grain Elevator site. The plant, constructed and operated by Pacorini Finanziaria spA. of Trieste, Italy, can handle 274,000 tons of coffee per year.[25]

Recently, the port unveiled its latest completed capital-improvement project: the expanded deep-water berth at Milan Street, designed to provide an additional 150,000 square feet of open wharf and additional indoor storage areas. This facility has rail access, where they have the ability to load directly from railcar to vessel.[26]

In addition to the facilities listed above, the port has numerous other facilities, which include extensive water frontage, warehousing, transit sheds, front and rear aprons, marshaling areas, open wharf areas, and direct truck and rail access. Other facilities and equipment include cold storage, RO/RO ramps, numerous container cranes (of varying configurations), reefer jacks, dry-sprinklered sheds, nitrogen chill systems, and consolidation sheds.[27]

Modernization and Expansion Plans

In 1991 a ground-breaking ceremony was held for the construction start-up of the first phase of a $215 million, five-year port improvement program.[28] The project is scheduled for completion by January 1996.[29]

Next to the recently opened Milan wharf extension, another wharf is under construction. This wharf, the Nashville C, when completed in 1995 will make the Port of New Orleans the longest (more than two miles) linear port in the world.[30] The Nashville C wharf will include 3,170 linear feet of heavy-duty wharf, 22 more acres of marshaling area, and 280,000 square feet of shedded area.[31]

Tchoupitoulas Corridor, a major portion of the Capital Improvement Program, is a new roadway being created specifically for port truck traffic.[32] The Tchoupitoulas Corridor project will double the roadway capacity along the riverfront.[33] This roadway will be dedicated solely to trucks moving along the upriver facilities, speeding their cargo movements from wharf to interstate.[34]

Other capital improvements scheduled in the five year plan include a load capacity increase from 350 to 850 pounds per square foot at the Napoleon C wharf; a new shed with 138,000 square feet at Louisiana Avenue; and the design start-up for a new port office building.

Strategic/Master Plans

A Port of New Orleans master plan was not available for this profile; however, the following information outlines a portion of the port's ongoing management planning. In April of 1994, the port embarked on an ambitious program of privatizing its Mississippi River facilities by signing long-term leases with private stevedoring companies and terminal operators. Operators assert it's an arrangement that is helping the port attract a broader cargo range, particularly delicate project cargo.[35]

Additionally, the Port of New Orleans, the Port of South Louisiana, and the Panamanian government, through its national port authority, recently entered into an agreement that creates a long-term strategic link between Louisiana and Panama. Through the agreement, the two area port authorities and the Panamanian government will work jointly on long-range plans, programs, and projects designed to enhance Panama's maritime and economic future.[36] This new relationship will put the Port of New Orleans in the unique position of linking U.S. and Louisiana companies to tremendous opportunities that exist in Panama.

Revenues and Expenditures[37]

Total operating revenues for the year ending June 30, 1994, for the Port of New Orleans were $34.4 million, while total operating expenses for same were $21.2 million. Net operating income (after depreciation and expenses) for the Port of New Orleans totaled $2.87 million.

Approximately 48 percent ($2.6 million) of the port's nonoperating revenues are derived from interest income, 8 percent ($0.5 million) from the state gasoline tax, and 44 percent ($2.8 million) from all other sources (net) combined.

Nonoperating expenses are derived from two sources, interest expense and net loss on disposal of property. During 1994, the port recorded a loss of approximately $1.65 million (61 percent of nonoperating expenses) upon decision to demolish certain capital assets, such loss representing the remaining net book value of the assets. Interest expense for the port during the period totaled $1.1 million, accounting for 39 percent of nonoperating expenses.

Intermodal Access and Land Transport

Rail Access

The Port of New Orleans is served by more railroads than any other port in the United States. Six mainland railroads, CSX Transportation, Illinois Central Railroad, Kansas City Southern Railroad, Norfolk Southern Corporation, Southern Pacific Lines, and Union Pacific Railroad together cover 77,000 miles and serve more than half the United States' population.[38] All six railroads offer intermodal facilities at the port.

In addition to the six main railroads, a city-owned railroad, the New Orleans Public Belt, offers switching services to the six railroad companies and provides rail service to port terminals on the east bank of the Mississippi River and along the Industrial Canal.[39] The Port of New Orleans Strategic Rail Plan has enabled ship/rail service packages to be efficiently and inexpensively arranged, while enlisting the Public Belt railroad's aid to do all local switching, resulting in overall savings.[40]

Truck Access

The Port of New Orleans is served by three U.S. interstates, 10, 59, and 55. Additionally it is served by state highways 90, 11, and 61. Interstate 10 is located within minutes of the port and interstates 59 and 55 are accessible via Interstate 10 within the metropolitan New Orleans area.[41] Currently, there is not good access to these interstates; however, when the new Tchoupitoulas Corridor is completed, truck access to the port will be no longer be a problem.

Container Facilities and Equipment

Facilities at the Port of New Orleans offer direct discharge to rail or truck for container cargo arriving at the port. Equipment and facilities for containerized cargo include RO/RO ramps, nearly 7 million square feet of marshaling area, four 30-ton container cranes, one 33.5-ton container crane, and four 40-ton container cranes.[42]

Economic Impacts[43]

Port Industry

The Port of New Orleans and the maritime industry are crucial parts of the New Orleans economy. The port generates over a billion dollars in income for local people and thousands of jobs. Hundreds of firms are located in the local New Orleans area or in Louisiana because of the port's existence. These firms include large steamship companies; firms providing longshoremen services; railroad, tugboat, and barge companies; law firms that employ maritime attorneys; and insurance companies. These firms are all referred to as the port industry since their port relationship is direct.

Port Users

In addition to the port industry, many firms use the port as a means of transporting cargo. These include warehouses that store goods for export or import and manufacturing firms that need the port for cargo transport. These firms are referred to as port users.

Port Tenants

Finally, many businesses in the New Orleans area lease port land and facilities. The port tenants are in various industries ranging from manufacturing to tourism.

Spending and Income

In 1991, the port industry's direct activities in the New Orleans area produced $2.1 billion in primary spending and $2.3 billion in secondary spending. Refer to table A.3. Additionally, these activities produced $1.3 billion in income and provided nearly 6 percent of all income generated in the New Orleans area.

In addition to the New Orleans area impact, the port has a statewide impact. In 1991, the port directly or indirectly produced $3.2 billion in primary spending and $3.5 billion in secondary spending. The port also produced 8.2 percent of Louisiana's gross state product and $2.1 billion in income in Louisiana, accounting for 3.6 percent of all income in the state.

Employment

The firms that are involved with the port, either directly or indirectly, employ a large number of people, in both the New Orleans area and the state of Louisiana. In 1991, the port industry produced 9,496 primary jobs and 9,279 secondary jobs in the New Orleans area. Refer to table A.3. In addition to the port industry jobs, 35,125 jobs were produced in maritime-related firms and port tenants. The port also contributed to statewide employment. The port produced, either directly or indirectly, a total of 81,714 jobs in Louisiana.

Tax Revenue

Furthermore, the port generated business activity that in turn generated tax dollars for the local and state government. In 1991, total port activities in the New Orleans area produced $79.6 million in state tax revenue and $49.2 million in local tax revenue. Total New Orleans port activities in the state produced $126.3 million in state tax revenue and $67.4 million in local tax revenue.

Table A.3. Economic Impacts of the Port of New Orleans and the New Orleans Maritime Industry, 1991

	Port Industry	Port Users	Port Tenants	Total
Employment (# of Jobs)	18,775	28,302	6,823	53,900
Earnings ($ in millions)	479.3	645.5	188.3	1,313.1
Spending ($ in millions)	1,356.7	2408.7	613.7	4,379.1
State and Local Taxes ($ in millions)	N/A	N/A	N/A	128.8

Source: Adapted from T. P. Ryan, *The Economic Impact of the Port of New Orleans and the New Orleans Maritime Industry, 1991* (New Orleans, La., 1991).

Major Issues[44]

Port Roadway

An issue of vital significance to the Port of New Orleans' efficiency is the lack of adequate roadways accessing the port. Currently, all trucks entering or leaving the port, as well as trucks traveling to upriver port facilities, must travel on narrow roadways in residential neighborhoods. Not only has this caused significant delays in transport efficiency, but it has also been a source of primary concern for neighborhood residents.

While the new Tchoupitoulas Corridor is currently under construction and is slated to be completed by early 1996, there are still some funding issues for the roadway that have not been resolved. If a solution is not found to the inadequate funding problem, and funding requirements are subsequently not met, completion of this project will eventually be delayed.

Privatization

Privatization is another major issue for the Port of New Orleans. Currently, the port is attempting to promote opportunities in the port private sector, in hopes of expanding port operations and increasing the port's competitiveness. The port is signing long-term leases with private stevedoring companies and terminal operators, such as Transocean Terminal Operators (TTO).

These long-term leases add to the private company's ability to handle cargo with greater flexibility, allowing the company to quote prices for complete cargo packages. This in turn simplifies cargo movement for the shipper. The Port of New Orleans is hoping that these privatization efforts will be seen as an additional incentive for port users to ship via the Port of New Orleans, rather than other gulf ports.

Dredging

Environmental regulations and issues are always of concern to ports, in that they affect all port planning processes relative to new construction and dredging. Currently, dredging along the GIWW is not viewed as a problem by the Port of New Orleans management. However, dredging along the Mississippi River and the subsequent dredge-material disposal is a significant problem for the port in their attempts to meet environmental regulations.

Notes

[1]"Project Cargo Proves Ideal for Port," *Port of New Orleans Record,* vol. 53, no. 3 (March 1995), p. 6.

[2]Port of New Orleans, *Mississippi River Terminal Complex,* New Orleans, La. (Brochure.)

[3]U.S. Army Corps of Engineers (Corps), *Waterborne Commerce Statistics, 1993* (Fort Belvoir, Va., 1995), p. 318.

[4]This section is adapted from the Port of New Orleans, "Highlights of the Port of New Orleans," New Orleans, La., March 1995 (draft).

[5]Port of New Orleans, "Excellent Facilities Accommodate Diverse Shipping Needs." in *1994-1995 Annual Directory* (New Orleans, La., 1994), p. 42.

[6]Global Trade Information Services, *Waterborne Trade Atlas,* (Global Trade Information Services [electronic information] 1993, 1994).

[7]U.S. Department of Transportation (USDOT), Maritime Administration, *United States Oceanborne Foreign Trade Statistics, 1992* (Washington, D.C., 1993), pp. 128-33.

[8]"Taking a Flying Leap," *Port of New Orleans Record,* vol. 53, no. 3 (March 1995), p. 14.

[9]Corps, *Waterborne Commerce Statistics, 1993*, pp. 319-26.

[10]Port of New Orleans, *Mississippi River Terminal Complex.*

[11]Corps, *Waterborne Commerce Statistics, 1993,* pp. 319-26.

[12]Port of New Orleans, Marketing Department, "Public and Private Facilities Cargo Activity Analysis Jan-Dec 1994 vs. Jan-Dec 1993," New Orleans, La., March 1995 (computer printout).

[13]Ibid.

[14]Port of New Orleans, *Mississippi River Terminal Complex.*

[15]Port of New Orleans, "Barge Lines," in *1994-1995 Annual Directory* (New Orleans, La., 1994), p. 26.

[16]The Port of New Orleans, "Public and Private Facilities Cargo Activity "

[17]Port of New Orleans, *Mississippi River Terminal Complex.*

[18]Interview by Lisa Nutt with R. Landry, Deputy Director, Marketing, the Port of New Orleans, New Orleans, La., March 10, 1995, New Orleans, La.

[19]Port of New Orleans, "Ocean Carriers," in *1994-1995 Annual Directory* (New Orleans, La., 1994), pp. 32-33.

[20]Port of New Orleans, *Mississippi River Terminal Complex.*

[21]Port of New Orleans, "Port of New Orleans Tariff Information," in *1994-1995 Annual Directory* (New Orleans, La., 1994), pp. 36-37.

[22]"Project Cargo Proves Ideal for Port," *Port of New Orleans Record,* p. 8.

[23]Port of New Orleans, *Mississippi River Terminal Complex.*

[24]Ibid.

[25]Port of New Orleans, "Highlights of the Port of New Orleans."

[26]"Milan Wharf Extension Opens," *Port of New Orleans Record,* vol. 53, no. 3 (March 1995), p. 20.

[27]Port of New Orleans, "Excellent Facilities Accommodate Diverse Shipping Needs," pp. 42-46.

[28]Port of New Orleans, "Highlights of the Port of New Orleans."

[29]Port of New Orleans, "Paving the Way for Growing Trade," in *1994-1995 Annual Directory* (New Orleans, La., 1994), pp. 10-12.

[30]"Milan Wharf Extension Opens," *Port of New Orleans Record,* p. 20.

[31]Port of New Orleans, "Paving the Way for Growing Trade," pp. 10-12.

[32]Port of New Orleans, *Mississippi River Terminal Complex.*

[33]Port of New Orleans, "Highlights of the Port of New Orleans."

[34]Port of New Orleans, "A View to the Future," in *1994-1995 Annual Directory* (New Orleans, La., 1994), pp. 14-16.

[35]"Taking a Flying Leap," *Port of New Orleans Record,* p. 14.

[36]"Port Signs Cooperative Agreement with Panama," *Port of New Orleans Record,* vol. 53, no. 3 (March 1995), p. 18.

[37]Adapted from Port of New Orleans, "Port of New Orleans: Financial Statements for the Years Ended June 30, 1994 and 1993 and Independent Auditors' Report," New Orleans, La., 1994.

[38]Port of New Orleans, *Mississippi River Terminal Complex.*

[39]Port of New Orleans, "Rail Lines," in *1994-1995 Annual Directory* (New Orleans, La., 1994), pp. 18-22.

[40]Port of New Orleans, *Mississippi River Terminal Complex.*

[41]Port of New Orleans, *Highway and Harbor Map* (New Orleans, La.) (map).

[42]Port of New Orleans, "Excellent Facilities Accommodate Diverse Shipping Needs," pp. 42-46.

[43]This section is adapted from T. P. Ryan, "The Economic Impact of the Port of New Orleans and the New Orleans Maritime Industry, 1991," New Orleans, La., 1991.

[44]This section is adapted from interview with R. Landry, March 10, 1995.

Appendix B. Port of Bay City Authority/Matagorda Harbor Profile

Introduction[1]

The Port of Bay City Authority runs two ports: the Port of Bay City and Matagorda Harbor. Bay City is located less than 100 miles southwest of Houston at the intersection of Texas highways 60 and 35 and is connected to a Colorado River feeder channel. The port was opened in the 1960s and is located about 15 miles from the Gulf Intracoastal Waterway. A shallow-draft channel, the port has a depth of 12 feet.

Matagorda Harbor is located approximately 20 miles south of Bay City, near the mouth of the Colorado River on Matagorda Bay. The harbor, which was opened in 1990, has a depth of 15 feet and is primarily a recreational facility. The harbor was first funded by Congress as a "harbor of refuge," to provide a place to which boats could retreat during storms.

Operations and Services Performed

Port of Bay City

The Port of Bay City's public facilities are used solely by one customer, Way Energy. The company imports petroleum for its manufacturers, which are located within a 100-mile radius of Bay City. Previously, the port also served Celanese Chemical when the company manufactured plastic beads. Celanese has since acquired its own private liquid dock to handle product transport. Port usage, while limited, is considered adequate to meet Bay City's current industrial situation. In addition, because Way Energy has been selling more and more product, the port financial outlook is very good.

Matagorda Harbor

The harbor is used primarily for such recreational activities as boating and fishing. It provides Gulf of Mexico access by way of the Gulf Intracoastal Waterway. The harbor has proven to be very successful in the short time it has been open. Approximately 125 boats launch from the docks each weekend, and all 100 boat slips are currently rented. The harbor is used primarily by Texans, especially Houstonians. However, tourists from San Antonio and the Dallas-Fort Worth area are also known to utilize the harbor.

Existing Port Facilities and Equipment

Port of Bay City

The port's facilities include one dock, which is equipped with pumps to allow petroleum unloaded from the barges to be pumped directly to Way Energy's storage tanks. Additionally, the port has one warehouse, which is currently being leased out to store signage; it is not utilized by the port.

Matagorda Harbor

The harbor currently consists of two launch pads and 120 boat slips for storage.

Modernization and Expansion Plans

Matagorda Harbor

A recreational-vehicle park is currently under construction at the harbor. In addition, there are plans to expand the number of boat slips beyond the current 120.

Strategic/Master Plans

Port of Bay City

The Bay City area has few industries, and there is little potential for additional industries locating in the vicinity. Therefore, port expansion is not foreseen. However, the city of Bay City is currently producing economic development plans, which may include strategies to increase port competitiveness.

Matagorda Harbor

Port of Bay City Authority's economic development plans are currently being focused on Matagorda Harbor. The greatest potential growth area is believed to be in local tourism. For this reason, capital improvements have been centered on bolstering the harbor's facilities.

Revenues and Expenditures

Port of Bay City

Revenues are generated by a 3.5 percent property tax, which is port levied. In addition, the port collects a charge-per-gallon fee from Way Energy imports, as well as fees from the warehouse storage rental.

Matagorda Harbor

While the harbor receives revenues from a Matagorda County tax, funds are primarily raised through rental fees. The harbor charges fees for boat-dock rentals and bulkhead rentals. In addition, a commercial business, located in the harbor, leases land from the port authority.

Intermodal Access and Land Transport

Port of Bay City

The port is directly accessible through FM 521, which connects to Texas Highway 60. There are no railways located in the immediate vicinity.

Matagorda Harbor

The only road directly servicing the harbor is FM 2031, which connects to Texas Highway 60.

Major Issues

Port of Bay City

Environmental Issues

Finding dredge-material disposal sites has been problematic, as available land has become scarce. The port authority recently purchased some 300 acres to be used solely for dredge-material disposal, and this should provide enough land to last for several years. However, area landowners are opposed to land usage for dredge-material storage; therefore, land purchases are expected to become more difficult.

In addition, the port is very dependent on the Gulf Intracoastal Waterway. The GIWW's continued operation is absolutely necessary for the port's existance. The port is very concerned about any difficulties that the Texas Department of Transportation may encounter in GIWW maintenance dredging.

Role of Texas State Government

TxDOT is perceived as neither helping nor hurting the port's operational ability. The most important role played by any Texas agency is the port's maintenance dredging performed by the Army Corps of Engineers. GIWW dredging is also important, but Harbor Master Harold Martin feels that TxDOT should not be the agency responsible for providing dredge-material disposal sites.

Notes

[1] All information in the Port of Bay City/Matagorda Harbor profile was obtained by an interview by Carol Kim and Charles Montgomery with Harold Martin, Harbor Master, Port of Bay City, Bay City, Tex., March 13, 1995, Bay City, Tex.

Appendix C. Port of Beaumont/Navigation District of Jefferson County Profile

Introduction

The Port of Beaumont, a deep-draft port, is located on the Neches River 42 miles from the Gulf of Mexico. In public operation since 1949, the port is governed by a six-member board, who are elected by navigation district voters and serve six-year terms. The board is responsible for the port's policies, rules, rates, and regulations.[1]

Operations and Services Performed

The Port of Beaumont is a full-service port specializing in forest products, grains, bagged goods, and military cargo (see tables C.1 and C.2). The port offers shipside packing and crating services through the subcontractor Triplex Services, and is equipped to handle containers as well.[2] Regular cargo service reaches northern Europe, Japan, the Middle East, and South America.[3]

The United States Army's 1314th Medium Port command is headquartered at the port and uses the port's facilities to layberth two fast response ships. Additionally, the port provided support in the Desert Storm operation.

Table C.1. U.S. Imports through the Port of Beaumont, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Mineral Fuel, Oil, Etc.	552	464	824
Machinery	11	0	6
Aluminum	0	0	6
Organic Chemicals	2	4	3
Salt, Sulfur, Earth, Stone	0	1	0

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Informational Services [electronic information] 1993, 1994).

Table C.2. Top Imports through the Port of Beaumont (in Tons)

Commodities	Five Year Average
Aggregate	289,000
Iron and Steel	51,000
Military Cargo	49,000

Source: Letter from Chris Fisher, Manager of Administration, Port of Beaumont, to Brandon Lobb, March 20, 1995 (via telefax).

Table C.3. U.S. Exports through the Port of Beaumont, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Cereals	102	228	276
Mineral Fuel, Oil, Etc.	54	27	50
Wood	16	31	50
Organic Chemicals	15	20	18
Milling, Malt, Starch	25	15	16

Source: Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table C.4. Top Imports through the Port of Beaumont (in Tons)

Commodities	Five Year Average
Bulk Grain	2,728,000
Forest Products	299,000
Bagged Goods	145,00
Military Cargo	48,000
Iron and Steel	10,000

Source: Letter from Chris Fisher, Manager of Administration, Port of Beaumont, to Brandon Lobb, March 20, 1995 (via telefax).

Existing Port Facilities and Equipment

The Port of Beaumont has 6,488 linear feet of general cargo docks. Eight of the berths are for general cargo and one is for grain. Additionally, one wharf has a roll on-roll off ramp to accommodate movable cargo. The port has a mobile crane with a 220-ton capacity, a 60-ton gantry crane that straddles two tracks on wharves 2 and 3, and a lift machine that is used for dockside heavy lifting and container handling.[4] The Port of Beaumont does not have a liquid-cargo dock.

Directly behind the 543-foot grain wharf is a 3.5-million-bushel grain elevator. The port leases its grain elevator to Continental Grain, a 30-year partnership. In 1993, the elevator was the number-one grain elevator along the Texas Gulf Coast, and it handled more than 23 percent of the grain along the gulf that year.[5]

The port also owns and operates five transit sheds totaling 500,000 square feet of space. These sheds are adjacent to wharves 4, 5, 6, 7, Harbor Island, and the Carroll Street Wharf.[6] Additionally, the port has 36 acres of open, surfaced, storage area.[7]

The port has a specialized 72-foot conveyor that is used in the loading and unloading of bulk goods. Behind the conveyor is a large open holding area used for storing bulk goods, such as wood chips and the like. The area is run by the Neches River Terminal. Adjacent to the Neches River Terminal is the storage area for construction aggregates. Both the Neches River facility and the aggregates' storage area have 48-foot conveyor stackers.[8]

Modernization and Expansion Plans

The Port of Beaumont recently underwent a large-scale modernization project. In 1991, the local voters approved $20 million of revenue bonds to finance the construction of a 400-foot Carroll Street Wharf extension. Further, a transit shed was constructed behind the Harbor Island Wharf. The transit shed added 30,000 square feet of additional shed space to the port. Also the port stabilized 1,400 feet of bank and constructed a new rail holding yard. The port constructed a new administration building as well and recently began occupying the site.[9]

Strategic/Master Plans

All of the recent construction will have exhausted the previous master plan. The port will soon set about creating a new master plan.[10]

Revenues and Expenditures

The information contained in tables C.5 and C.6 comes from financial statements included in the 1994 Annual Report from Beaumont. Wharf and dock services, as well as taxes, provide the Port of Beaumont with sizeable portions of their operating revenue and income. These items alone account for $9.267 million of the port's total income. For port expenses, maintenance accounts for nearly 66 percent of total expenditures. Other expenses include general and administrative costs and depreciation and amortization expenses. Thirty percent of the total annual budget for Beaumont is derived from ad valorem taxes. The current tax rate is $0.074963 per $100 valuation.[11]

Table C.5. Port of Beaumont Operating Revenues, 1994

Wharf and Dock Services	$5,920,129
Grain Elevator Rental and Services	723,893
Rental of Facilities	344,556
Interest	345,432
EDA Grant	130,746
Other	13,728
Total	**$7,478,484**

Source: Adapted from Juncker, McMillian & Bennett, *Audit Report*, (Beaumont, Tex.: Port of Beaumont Navigation District of Jefferson County, Texas, August 31, 1994).

Table C.6. Port of Beaumont Operating Expenditures, 1994

Maintenance and Operating Expense	$5,153,663
General and Administrative Expense	1,857,709
Depreciation and Amortization	1,404,430
Total Operating Expenses	**$8,415,802**

Source: Adapted from Juncker, McMillian & Bennett, *Audit Report*, (Beaumont, Tex.: Port of Beaumont Navigation District of Jefferson County, Texas, August 31, 1994)

Intermodal Access and Land Transport

Rail Access

Beaumont is serviced by the Kansas City Southern, Southern Pacific, Union Pacific, and Atchison, Topeka, and Santa Fe railroads. The port subcontracts the switching of all cars on the port property; this service is performed 24 hours a day. Additionally, the Main Street wharves and the Harbor Island Terminal have apron track for rapid loading and unloading of rail freight.[12] Currently, the trackage owned by the port can accommodate 500 railcars; up to 80 of those cars can be shipside. All of the transit sheds have railtracks extending into them, facilitating cargo transfer between shed and rail.[13]

Truck Access

The port is directly served by Main and Franklin streets, which provide access to College Street/U.S. Highway 90. Surface streets provide access to Interstate 10, a major east-west interstate. U.S. highways 69, 96, and 287 are all within port access via surface streets; 287 leads north/northwest and south, 96 leads north/northeast and south, and 69 leads north/northwest to Dallas and south.[14]

Economic Impacts

By the Port of Beaumont's own statistics, it provided the local economy with a stimulus of $142 million and 1,200 jobs in 1994.[15] The economic impact study's findings were not available for this profile.

Major Issues

Closure of the Gulf Intracostal Waterway

Most domestic cargo utilizing the Port of Beaumont traverses the GIWW. Therefore, the proper GIWW maintenance is essential to smooth port operations.[16] Any closure or operational setback of the GIWW would adversely impact the Port of Beaumont operations.

Environmental Issues

Legislation affecting wetlands has become very important to ports, as it has led to higher operational costs. These mounting expansion costs have led ports to be cognizant of impending environmental regulations. While the Port of Beaumont has its own dredge-spoil disposal area, it still must be aware of these regulations' effects on future disposal locations.[17]

Commodities Export

The port is a large handler of the Public Law 480 commodities. Foreign aid accounted for 135,943 tons of cargo through the Port of Beaumont last year alone and has been one of the port's top tonnage cargoes for many years.[18] Therefore, any reductions in foreign aid by the United States government would have an extremely adverse impact on the Port of Beaumont.

Notes

[1]Port of Beaumont, *Facts, Port of Beaumont,* Beaumont, Tex. (Pamphlet.)

[2]Ibid.

[3]Response by the Port of Beaumont to LBJ School of Public Affairs, University of Texas at Austin, questionnaire, "Texas Port Issues Survey," March 1995.

[4]Port of Beaumont, *Facts, Port of Beaumont.*

[5]Port of Beaumont, *Welcome Aboard*, Beaumont, Tex., Summer 1994. (Pamphlet.)

[6]Port of Beaumont, *Facts, Port of Beaumont.*

[7]Interview by Brandon Lobb with Chris Fisher, Deputy Port Director, Port of Beaumont, Beaumont Tex., March 22, 1995, Beaumont, Tex.

[8]Port of Beaumont, *The Port of Beaumont Map,* Beaumont, Tex. (Pamphlet.)

[9]Interview with Chris Fisher, March 22, 1995.

[10]Ibid.

[11]Ibid.

[12]Response by the Port of Beaumont to LBJ School of Public Affairs questionnaire.

[13]Port of Beaumont, *Facts, Port of Beaumont.*

[14]Response by the Port of Beaumont to LBJ School of Public Affairs questionnaire.

[15]Interview with Chris Fisher, March 22, 1995.

[16]Response by the Port of Beaumont to LBJ School of Public Affairs questionnaire.

[17]Interview with Chris Fisher, March 22, 1995.

[18] Response by the Port of Beaumont to LBJ School of Public Affairs questionnaire.

Appendix D. Port of Brownsville/Brownsville Navigation District Profile

Introduction

The Port of Brownsville, a deep-draft port, is located on Texas' southernmost tip at the end of a 17-mile channel, which meets the Gulf of Mexico at the Brazos Santiago Pass. The city of Brownsville, which is located 2 miles to the southwest, lies adjacent to the Rio Grande and provides a convenient Mexico gateway. Open since 1936, the Port of Brownsville is governed by the Brownsville Navigation District, a political subdivision of Texas. The district is guided by an elected board of commissioners, which establishes the port's policies, rules, rates, and regulations and approves all contractual obligations.[1]

Operations and Services Performed

The Port of Brownsville can be characterized as a Northern Mexican port, as the majority of its traffic movements are between the port and Monterrey, Mexico. Steel and petroleum are the major commodities moved through the port (refer to tables D.1 and D.2). The port is not equipped to handle containers.

The major user of the public facilities is Statia Terminals Southwest, which uses the 1.6-million-barrel-capacity liquid terminal. The port's major stevedore companies are Dix Shipping Company, Schaeffer Stevedoring, and Gulf Stream Marine.

Table D.1. U.S. Imports through the Port of Brownsville, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Fats and Oils	62	53	70
Mineral Fuels, Oil, Etc.	9	15	11
Iron and Steel	2	3	9
Electrical	7	0	4
Salt, Sulfur, Earth, Stone	0	1	2

Source: Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table D.2. U.S Exports through the Port of Brownsville, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Machinery	2.085	10.375	4.458
Cereals	0.000	0.000	4.129
Organic Chemicals	1.208	0.142	1.485
Mineral Fuel, Oil, Etc.	9.814	8.407	5.848
Iron and Steel	1.300	0.023	1.289

Source: Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services, [electronic information] 1993, 1994).

Gulf Intracoastal Waterway

The GIWW's commercial traffic, which consists of numerous products, exceeds 900 barge loads annually. This includes more than 350 million gallons of gasoline and diesel fuel for farmers, industries, and all lower Texas Rio Grande Valley (hereafter referred to as the Valley) citizens. Cheap, safe, and reliable, the GIWW saves the Valley millions of dollars in transportation costs. These savings protect the Valley farms' and industries' viability, since many are located great distances from their ultimate customers. Barge-related public and private infrastructure on the Valley's waterways exceed $80 million. This represents 50 years of taxpayer-supported investment. The Valley ports are economic activity centers, with good-paying jobs that provide the public year-round security. In the NAFTA era, the GIWW sets the Valley apart from other border regions by providing waterborne access to various regions.[2]

The canal's potential is unlimited. The GIWW was justified in the beginning with the hope that 300,000 tons annually would be moved to Valley ports. As this waterborne highway attracts more jobs and industry to serve a growing Valley as well as a transportation-poor Northern Mexico, the GIWW will validate the early Valley leaders' efforts, which stressed the region's multimodal transportation needs.[3] Tables D.3 and D.4 highlight the major commodities and tonnages shipped or received by the GIWW.

Table D.3. Top Commodities Received through the GIWW, 1990-94 (in Short Tons)

Commodities	1990	1991	1992	1993	1994
Farm Products	26,739.43	32,272.51	16,089.33	54,649,30	31,296.82
Nonmetallic Minerals, Except Fuels	7,099.24	18,862.65	25,281.51	24,035.90	39,636.91
Chemicals and Allied Products	22,838.72	82,408.90	65,573.20	102,494.02	47,349.80
Petroleum and Coal Products	585,829.08	756,459.13	777,786.59	913,395.15	856,562.40
Primary Metal Products	112,366.92	459,316.72	267,151.81	67,403.04	68,419.37

Source: Adapted from Brownsville Navigation District, "Annual Cargo Statistics 1990-1994, Brownsville, Texas."

Table D.4. Top Commodities Shipped through the GIWW, 1990-94 (in Short Tons)

Commodities	1990	1991	1992	1993	1994
Farm Products	0.00	0.00	0.00	0.00	0.00
Nonmetallic Minerals, Except Fuels	9,827.14	843.45	12,967.59	22,464.00	58,025.68
Chemicals and Allied Products	1,753.00	3,468.00	3,023.64	0.00	2,702.87
Petroleum and Coal Products	24,510.98	15,609.95	499.35	10,824.71	88,468.17
Primary Metal Products	3,789.64	3,239.81	3,175.76	9,934.03	68,419.37

Source: Adapted from Brownsville Navigation District, "Annual Cargo Statistics 1990-1994, Brownsville, Texas."

Existing Port Facilities and Equipment

The port's dock facilities include ten deep-sea dry-cargo docks, eight shedded, four deep-sea liquid-cargo docks, two liquid-cargo barge docks, and one dry-cargo barge dock. The six liquid cargo docks available have a total storage capacity of 3.4 million barrels. Additionally, the port has three tenant public grain storage/elevator companies, all of which have the flexibility to load and unload ships and barges. Both rail and truck loading and unloading facilities are available as well, adjoining all docks. The largest tenant grain elevator has a capacity of over 3 million bushels.[4]

The port owns and operates eight transit sheds totaling almost 444,000 square feet of space. In addition to these facilities, there are another 1.25 million square feet of public warehousing available near the docks.

Modernization and Expansion Plans

Work to widen and reconstruct major roads at the turning basin was completed in 1994. This construction was necessary to accomodate increasing truck traffic to and from Mexico. This $1.8 million project was financed with a $1.5 million Economic Development Administration grant and local funds. Additionally, a new oil/bulk liquid-cargo dock was constructed to handle the port's cargo increase, which is arriving via barge, truck, and ship.[5]

The Port of Brownsville and the U.S. Army Corp of Engineers are overseeing a current channel deepening. The existing 36-foot depth will be increased to a 42-foot depth by the spring 1995 project completion date. Additionally, the turning basin will be widened from 1,000 to 1,200 feet. This project was financed through $17 million in bonds approved by the Brownsville Navigation District citizens and $19.6 million from the federal government.[6]

The port is currently undertaking a railroad relocation program, which will establish new rail lines linked to the major Southern Pacific and Union Pacific lines just north of Brownsville. This will help remove congested railway crossings from the city's downtown area, and it will streamline port traffic.[7]

Strategic/Master Plans

A Waterfront Master Plan was completed by Gonzalez Engineering and Surveying in April 1993. According to Port Director C. James Kruse, many projects described in the plan are underway or have been completed. A new master plan will be completed in mid-May 1995.[8] Excerpts from the new plan urge complete resource dedication to the proposed international bridge's completion over the next five years, because this project will have the greatest potential port-development impact.[9]

Medium-term goals suggested include (1) upgrading the entire port rail system to a Class II system; (2) constructing refrigerated warehouses for cargo diversification; and (3) constructing roll on-roll off docks to compete for oversized-project cargo and Monterrey's growing automobile business. Longer term infrastructure goals for the port focus mainly on waterside needs. Dredging projects typically take 20 years from commencement to completion; therefore, ship channel-dimension improvement plans should be initiated by the U.S. Army Corps of Engineers to begin formal project development.[10]

Revenues and Expenditures

The port's 1994 operating revenues totaled $5.432 million. Vessel-service and port-system leases accounted for almost the entire amount, with 45 percent and 41 percent, respectively, of total operating revenues. Operating revenue breakdowns by dollar are provided in table D.5.

The port's 1994 operating expenses totaled $3.901 million. Wages consumed the bulk of expenses with 39 percent of the total. Other port operational expenditures included insurance payments, utilities, retirement fund payments, consulting fees, and other miscellaneous expenses. Table D.6 provides operational expenditure breakdowns by dollar.

In addition to the operational revenues noted above, an ad valorem tax contributes to the port's annual budget. Eight percent of the Port of Brownsville's annual budget comes from ad valorem taxes. The rate is 11.586¢ per $100 cargo valuation, of which 3.303¢ is reserved for operations and maintenance.[11]

Table D.5. Port of Brownsville Operating Revenues, 1994

Vessel Service	$2,201,326
Port Systems Rentals	2,435,337
Other Lease Rentals	281,840
Other Operating Revenue	513,295
Total	**$5,431,798**

Source: The Port of Brownsville, *Full Stream Ahead: 1994 Annual Report* (Brownsville, Tex., 1995).

Table D.6. Port of Brownsville Operating Expenditures, 1994

Wages	$1,281,299
Insurance	453,696
Utility	334,586
Retirement	275,291
Consulting Fees	190,434
Other	1,316,159
Total	**$3,901,465**

Source: The Port of Brownsville, *Full Stream Ahead: 1994 Annual Report* (Brownsville, Tex., 1995).

Intermodal Access and Land Transportation Costs

According to an estimate by C. James Kruse, approximately 90 percent of the port's traffic is moved by truck and 10 percent by rail once it reaches the port.[12]

The Port of Brownsville has over 33 miles of railroad trackage, with rail siding serving warehouses, industries, and all area docks, including dry-cargo docks. The Brownsville Rio Grande International Railroad, servicing the port, connects with the Union Pacific, Southern Pacific, and the Mexican National Railway, Ferrocariles Nacionales de Mexico.[13]

There is no interstate highway within 100 miles of the port.[14] The port has direct access to FM 511 and is located approximately 10 miles from U.S. Highway 77/83. Additionally, the port has supporting access by state highways 48 and 4.

The Port of Brownsville is trying to obtain a presidential permit to build an international bridge across the Rio Grande into Mexico (see Major Issues below.) This bridge would be cargo dedicated and would provide money and time-saving advantages to industries conducting cross-border transportation. Cargoes would be able to enter and leave the port without public-road travel. Railroad switching costs would also be reduced since the port's short-line railroad would be able to handle port-to-border movements.[15]

Economic Impacts

An economic impact study for the Port of Brownsville was completed by the University of Texas at Brownsville in 1993.[16] According to the study, the port directly generated 2,750 local jobs and both directly and indirectly generated 4,184 jobs for the local economy. The port directly generated $39.8 million in income (wages) and both directly and indirectly generated $60.3 million in income. Port users had the greatest impact with over $51.6 million in wages generated. The port directly generated $1.7 million in taxes and both directly and indirectly produced $2.59 million in taxes. Of the total amount, port users were responsible for over $2.2 million.

Major Issues

The port is trying to acquire a presidential permit for an international crossing to connect the port with Matamoros, Mexico. On the Mexican side of the project, a private toll road will be constructed.[17] However, according to Port Director Kruse, the federal government's permit process has been very frustrating. Although the funding has been arranged on the U.S. side of the border, there is no way to tell when the permit process will be completed in Washington. The U.S. Department of State, in effect, gives Mexico veto power over the U.S. project. Currently, the port is awaiting the Mexican government's response to the project.

Another issue of primary concern to the port is environmental. The port's ability to dredge is currently being threatened by environmental concerns. The GIWW currently contributes anywhere from 40 to 60 percent of the port's annual tonnage, and any subsequent canal closure would seriously damage the port's potential to recover its capital investment in facilities. Also, the port administration feels that increasing environmental regulations and restrictions are encouraging businesses to locate in Mexico.[18]

Port administrators believe that both Washington and Mexico City need to begin viewing the border region as a potential metropolitan growth area rather than some "forgotten place." The border economy will not grow if the region's education, health, and basic transportation infrastructure needs are not met.[19]

Notes

[1]Port of Brownsville, *The Port of Brownsville, Your Door to the U.S., Mexico and the World*, Brownsville, Tex. (Pamphlet.)

[2]Letter from C. James Kruse, Port Director and General Manager, the Port of Brownsville, Brownsville, Tex., to Jeffrey Stys, April 6, 1995.

[3]Ibid.

[4]Port of Brownsville, The Port of Brownsville.

[5]Port of Brownsville, *Full Stream Ahead: 1994 Annual Report/the Port of Brownsville* (Brownsville, Tex., 1995).

[6]Ibid.

[7]Ibid.

[8]Interview by Jeffrey Stys with C. James Kruse, Port Director and General Manager, Port of Brownsville, Brownsville, Tex., March 11, 1995, Brownsville, Tex.

[9]Letter from C. James Kruse, April 6, 1995.

[10]Ibid.

[11]Interview with C. James Kruse, March 11, 1995.

[12]Ibid.

[13]S. Hardebeck, L. Cabeza, and J. Cox, "Port of Brownsville Economic Impact Study 1993," University of Texas at Brownsville, Brownsville, Tex., p. 14.

[14]Response by the Port of Brownsville to the LBJ School of Public Affairs, University of Texas at Austin, questionnaire, "Texas Port Issues Survey," March 1995.

[15]Port of Brownsville, *The New Port of Matamoros and Brownsville,* Brownsville, Tex. (Pamphlet.)

[16]Hardebeck, Cabeza, and Cox, "Port of Brownsville Economic Impact Study 1993."

[17]Interview with C. James Kruse, March 11, 1995.

[18]Response by the Port of Brownsville to the LBJ School of Public Affairs questionnaire.

[19]Ibid.

Appendix E. Port of Corpus Christi Profile

Introduction

The Port of Corpus Christi is located on Texas' southeastern coast on the Gulf of Mexico. It lies approximately 150 miles north of the U.S.-Mexico border, 150 miles southeast of San Antonio, and 300 miles north of Monterrey, Mexico.[1] During its 65 years in operation, the port has cultivated a reputation for its customer service commitment, modern facilities, and efficient, productive labor force, enabling the port to compete effectively with other major ports throughout the United States.

The Port of Corpus Christi is classified as a deep-draft port, and its ship channel's authorized depth is 45 feet at mean low tide (MLT). Exact water depths at each of the docks vary. The channel measures 36 miles in length, with six turning basins. Entry to the channel is through Aransas Pass.[2] The port intersects the Gulf Intracoastal Waterway west of Aransas Pass and then continues west across Corpus Christi Bay for 10 miles to the Inner Harbor, which extends 9 more miles west. Channel widths vary between 300 and 500 feet. At a minimum, turning basins measure 1,000 feet in both length and width. Pilotage is required of oceangoing vessels operating inside the Port of Corpus Christi ship channels.[3]

The port authority is a navigation district and political subdivision of the State of Texas. A seven-member board possesses the authority to promulgate and enforce rules and regulations intended to facilitate port navigation and commerce. Four divisions form the port: Harbor Island, Port Ingleside, La Quinta, and Inner Harbor.[4]

Operations and Services Performed

The major commodities moved through the port include petroleum, chemicals, grain, and dry cargo. Petroleum is the lifeblood of the Corpus Christi ship channel. As a result, the port places high priority on maintaining the public oil docks. In 1993, a new fire protection system was installed and other measures were taken to improve dock access and ship safety. Furthermore, the port continues to move forward with its plans for Safeharbor, a proposed deep-draft oil terminal that would accommodate very large crude carriers (VLCCs) with maximum drafts up to 70 feet.[5]

Table E.1. U.S. Imports through the Port of Corpus Christi, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Mineral Fuel, Oil, Etc.	2,993	3,005	2,669
Ores, Slag, and Ash	96	113	76
Salt, Sulfur, Earth, Stone	4	3	6
Machinery	16	30	0
Copper	0	6	1

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services, [electronic information] 1993, 1994).

Table E.2. U.S. Exports through the Port of Corpus Christi, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Mineral Fuel, Oil, Etc.	363	254	279
Organic Chemicals	158	143	258
Cereals	66	73	175
Inorganic Chemicals	203	190	157
Ships and Boats	0	90	0

Source: Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services, [electronic information] 1993, 1994).

Foreign Trade

The Port of Corpus Christi aggressively seeks to attract new international commerce. With the GATT and NAFTA passages, the port foresees a favorable climate for future international business.[6] The InfoCenter in Monterrey, Mexico, a joint venture between the port authority, Corpus Christi, and Laredo, should play a role in strengthening business ties in northern Mexico. Branching out further from the Texas/Mexico region, the port hosted foreign delegations from Japan, the former Soviet Union, the Czech Republic, and the People's Republic of China in 1994. Port representatives also traveled to the Far East, Latin America, and Europe to promote port business.[7]

The Port of Corpus Christi Authority is grantee-operator of Foreign Trade Zone (FTZ) No. 122, which includes six general-purpose sites and ten subzones (six oil refinery subzones and four nonrefinery subzones).[8] The port's public facilities are all included in the zone, and additional zone site applications may be made through the port authority.[9] In addition, the port's Trade Zone Staff assists companies with analyzing the zone's benefits pertaining to their operations, as well as assisting them in streamlining customs procedures and paperwork.[10] A Foreign Trade Zone is an area in or adjacent to a customs port of entry where foreign and domestic merchandise are generally considered by the U.S. government as not being within U.S. Customs territory but as international commerce. Merchandise may be brought into a zone without formal customs entry, payment of duty or excise taxes, or the imposition of quotas and most import restrictions. Any foreign or domestic merchandise not otherwise prohibited by law may be stored in a Foreign Trade Zone for an unlimited period of time.

In 1993, the port authority submitted an application to the Foreign Trade Zone board to expand the port's FTZ with recently acquired property and the surface area of all port-owned roads. Consequently, all property storage areas are now included in the zone. This creates a clear port advantage as there will be a greater capacity to accommodate importers who wish to defer, reduce, or eliminate customs duties.[11]

Industrial Development

For years, the port's ship channel has been a catalyst for industrial development. Major expansions are currently underway along the ship channel. At the major industrial plants, renovation and construction expenditures neared $2 billion over the past five years. Relative to this, approximately 2,500 temporary jobs were created in addition to 150 permanent jobs.[12]

The port authority owns a 300-acre industrial park from which it leases space. It is located on two barge canals north of Inner Harbor and is accessible by rail or highway.[13] Additional real estate is offered for lease by the port authority for industrial development.[14] Major participants in industrial development around the port include American Chrome & Chemicals, CITGO Refining and Chemicals, Coastal Refining and Marketing, DuPont, Hitox Corporation of America, Hoechst Celanese, Koch Refining Company, Occidental Chemical Corporation, Reynold's Metals Company, Southwestern Refining Company, and Valero Refining Company.

Community Involvement

As the port is a public enterprise, it is actively involved in the Corpus Christi community. It has accomplished this by aiding in attracting more tourists to the area through the provision of the James C. Storm Pavilion site for the berthing of Columbus Fleet replicas. Furthermore, the port commission passed a resolution supporting the community's efforts to obtain federal funds that would be used to improve the U.S.S. Lexington historical museum's access.[15]

Existing Port Facilities and Equipment[16]

There are over 40 public and private docks along the Corpus Christi ship channel. The public cargo handling facilities include two general-cargo terminals, a bulk terminal, grain terminal, 11 oil docks, and a dockside open pavilion, which can be used for cruise ships. Privately-owned facilities include 11 dry-cargo docks and 21 liquid-bulk docks.

General-Cargo Terminals

Consistently ranked as one of the United States' top ten ports in terms of tonnage, the port is well known for its bulk-cargo handling ability. In recent years the port authority has invested over $35 million to become equally adept at handling breakbulk cargoes, such as steel, machinery, vehicles, heavy lifts, forest products, cotton, and project shipments. As a result, Corpus Christi now has modern, versatile general-cargo terminals located on both sides of its ship channel.

Northside General Cargo Terminal

Just east of the Inner Harbor entrance, the Northside General Cargo Terminal includes three berths, a RO/RO ramp, 178,500 square feet of shipside covered storage, and over 125 acres of open storage area.

Construction was completed in June 1995 on a $7.6 million apron widening and warehouse expansion project at Cargo Dock 9. As a result, it is now able to accommodate vessels with drafts up to 37 feet and lengths of 750 feet. The new 58-foot-wide dock apron has a deck-load strength of 750 pounds per square foot and is able to support a 220-ton mobile crane. The transit shed was expanded to 122,000 square feet, making it the port's largest single shipside storage facility. Its modern design and limited number of interior columns enable shippers to make maximum use of the space. The additional space not only allows more cargo to be stored shipside, but it also provides more room to maneuver equipment.

Three on-dock rail tracks increase the terminal efficiency by allowing cargo to be transferred directly from ship to rail or trucks. To reduce weather delays and protect such cargoes as cotton, newsprint, and bagged commodities from rain damage while they are being transferred between railcars and the warehouse, there is a covered canopy over its rail tracks at the transit shed's rear.

The Northside General Cargo Terminal expansion project also included the addition of a RO/RO ramp situated just west of Cargo Dock 9. The ramp is able to accommodate either bow- or stern-ramped vessels. Located less than a mile from the highway, a trailer can be driven off a ship and be on Interstate 37 within minutes. The combination of the RO/RO ramp and acres of open storage nearby make this a good facility for marshaling shipments of machinery, vehicles, and other wheeled equipment.

Southside General Cargo Terminal

Across the channel is the Southside General Cargo Terminal, which features a 163,000-square-foot open concrete wharf, Cargo Dock 8. With a deck-load strength of 1,500 pounds per square foot, Dock 8 is the strongest facility of its kind on the Gulf of Mexico. It also has the ability to accommodate 1,000-foot-long vessels with drafts of up to 45 feet.

Since the mid-1980s, facilities have been progressively added to the Southside General Cargo Terminal following a phased development plan. In 1985, a 6-acre storage and marshaling yard was constructed adjacent to Cargo Dock 14, which was used for project cargo and containers. A few years later construction began on Cargo Dock 8. The goal was to create a versatile, high-strength open dock capable of handling a wide variety of cargoes and serving its users well into the next century.

Shortly after the 1992 Dock 8 completion, a new 65,000-square-foot warehouse was constructed adjacent to Cargo Dock 14. This brought the covered shipside storage capacity of the Southside General Cargo Terminal to 221,000 square feet. Recent improvements have focused on creating additional open storage areas and improving the terminal's intermodal capabilities. Currently there are 10.83 acres of hard-surfaced, fenced, and lighted area located immediately behind the southside general-cargo docks. Port engineers are expected to release final plans this summer for the next improvement phase, which will result in approximately 20 acres of paved, interconnected storage area. Rail trackage will be extended through the entire yard with access to both sides of the tracks for loading and discharging railcars. Additional lighting and fire water lines will be installed, and a new stormwater control system will provide site drainage. The entire area will be enclosed by a U.S. Customs-grade fence for extra security.

Having a smooth, unobstructed backup area behind the dock allows cargo to be moved to and from the ship more efficiently. The additional space will also be used to marshal, fabricate, or refurbish cargo prior to shipment. In addition to the 20 acres of hard-surfaced, fenced area, the Southside General Cargo Terminal offers 15 acres of open storage area and 1 million square feet of off-dock warehouse space.

The cargo terminal also features over 3,675 feet of rail trackage including on-dock rails. It offers a full range of intermodal services, including the ability to transfer cargo directly between vessels, railcars, chassis, and trucks. In addition, piggyback trailers can be mechanically loaded or discharged to and from railcars. Interstate 37 is less than a mile away from the terminal.

At this terminal, the port owns and operates two 90,000-pound-capacity lift machines and a 250-metric-ton-capacity crawler crane. The terminal also includes a general-purpose bagging facility and seed-treating plant, which is capable of bagging grain, seed, pellets, and other similar products. Its two high-speed bagging lines are fed from a hopper dump.

Bulk Terminal

The Bulk Terminal consists of two docks and approximately 80 acres of improved ground storage area. It is used to transfer dry-bulk commodities, such as coal, iron ore, and other ores or minerals, to and from vessels, railcars, trucks, and the storage pads.

Bulk Dock 1

Constructed in the mid-1950s, Bulk Dock 1 is used primarily for unloading vessels. Currently, the berth is able to accommodate vessels of up to 835 feet in length. A traveling gantry crane is used to load or unload vessels using a grab bucket. The dock's productivity averages 600 tons per hour.

Bulk Dock 2

Bulk Dock 2 was built in the mid-1980s strictly for the purpose of loading vessels. Soros Associates designed the facility including its 1,500-ton-per-hour radial ship loader and conveyer systems. One of the most modern facilities of its type on the Gulf of Mexico, the dock has a 1,270-foot-long berth, which is capable of accommodating vessels with drafts of up to 45 feet. The ship loader is capable of loading vessels at an effective rate of 1,000 tons per hour from bottom-dump railcars, trucks, or conveyer systems extending to the bulk storage pads. The effective rate takes into consideration hatch opening and closing, rain delays, and other factors that affect actual productivity.

Corpus Christi Public Grain Terminal

The Corpus Christi Public Elevator (CCPE) was constructed in the early 1950s to provide local growers with an export grain terminal. Following a major explosion in 1981, the facility was completely rebuilt creating one of the most modern grain terminals in the United States. Fully automated, the elevator has a 5-million-bushel capacity and is capable of loading vessels at an effective rate of 80,000 bushels per hour. Its berth is able to accommodate 1,100-foot-long vessels with drafts of 45 feet. Grain can be received from multiple trucks at a rate of 1,000 tons per hour and from multiple railcars at a rate of 2,000 tons per hour. The grain terminal also includes a grain-bagging facility with two high-speed bagging lines fed directly from the elevator's shipping bin. Conveyer systems load the bags directly to pallets on flatbed trucks for delivery to the docks.

Liquid-Bulk Docks

The 11 public oil docks generate a major portion of the port authority's revenue. Six of the docks are deep-draft, with three of the six being capable of accommodating 150,000 DWT tankers with 45-foot drafts. There are five shallow-draft docks, which are used to load and discharge tank barges. The liquid-bulk docks are used almost exclusively by the refineries and chemical companies located along the Corpus Christi ship channel.

Modernization and Expansion Plans

By September 1995, the Northside General Cargo Terminal will include seven additional acres of hard-surfaced, secured storage area. Located immediately north of cargo docks 9 and 10, the storage yard will be fenced and surfaced to provide a secure site for marshaling cargo. There are over 100 acres of additional land, available on the north side, which can be used for a storage or fabrication yard. Additionally, in early 1996, more acreage will be added to the Southside General Cargo Terminal when a current port tenant's lease expires and they vacate the property.

Soros Associates was recently selected to develop plans and specifications for a new traveling gantry crane, which would increase productivity at Bulk Dock 1. The project has been divided into four phases. In phase I, Soros will perform a preliminary engineering study to evaluate the current structural capacity of Bulk Dock 1 and determine the design criteria for the new crane. In addition, they will analyze options for deepening and lengthening Bulk Dock 1 as well as develop estimates for constructing a possible third bulk dock. Phase II will include the final design and drawings of the traveling gantry crane and dock improvements. Phase III consists of developing the plans and specifications for the new facility. Phase IV will be implementing and monitoring the actual construction.

Preliminary concepts call for a traveling gantry grab-bucket design similar to the existing traveling gantry crane at Bulk Dock 1. However, the new crane would have a longer outreach, higher air draft, deeper digging capacity, and nominal rate of 1,600 tons per hour.

As part of phase I, Soros Associates and Goldston Engineering will evaluate methods and costs of dredging the berth to 45 feet. The deeper draft would enable shippers to achieve greater economies of scale by allowing them to transport more cargo on a single vessel.

They also will assess the benefits and costs of lengthening the berth to accommodate 100,000 DWT vessels. This would enable the new crane to unload large-bulk carriers without having to shift the vessel to reach all of the hatches. By eliminating the time spent on vessel shifting, turnarounds could be shortened and costs lowered.

The study will also include alternatives for improving rail- and truck-loading operations in order to take maximum advantage of the new crane's 1,600-ton-per-hour unloading rate. The faster the ship can be unloaded, the lower the total cost to the customer. For commodities like coal or iron ore, which have a relatively low value per ton, pennies can make the difference on whether a company gets a contract or not.

Although the primary purpose of the new facility will be for unloading dry-bulk materials, its versatile design will enable it to be used to load vessels and transfer bulk materials between trucks and railcars. Phase I of the project will be completed by the end of 1995, and if all goes according to plan, the new crane will be constructed and installed by the end of 1997.

Strategic/Master Plans

The Port of Corpus Christi has developed several master plans over the years. In the mid-1980s the port's engineering department prepared a document entitled *Project 2001*, which included concepts for converting cargo docks 1 and 2 into a "people facility," where the local community could enjoy the waterfront and which could later be converted into a cruise terminal or dockside festival marketplace. This project eventually became the James C. Storm Pavilion. It also focused on the need to expand the bulk terminals' capabilities, improve the port's general-cargo facilities, and maintain the depth of the ship channel. Additionally, it looked at concepts for a container terminal and RO/RO dock. Conceptual master plans were later developed for both the bulk terminal and the Southside General Cargo Terminal, which are still being followed to a large degree.

In the early 1990s, the port commission hired Shiner & Mosely and Booz-Allen & Hamilton to develop a strategic plan. The result was a voluminous document with plenty of background information on where the port had been, but little concrete information on what steps it should take in the future. It was developed with little participation from the port's staff and included a number of errors. The final draft was never approved by the port commission and is now fairly dated. The one recommendation made in the plan that was actually implemented was creating the position of Industrial Liaison to work more closely with local industries. In 1995, the position of Director of Strategic Planning was created for the purpose of developing and overseeing an ongoing strategic-planning process.

Revenues and Expenditures

Port of Corpus Christi's 1994 operating revenues totaled over $28 million. Of that amount, wharfage fees alone accounted for 43 percent, and bagging charges accounted for another 25 percent. Freight handling, dockage, and all other revenues contributed 12, 11, and 9 percent, respectively. Table E.3 provides a further revenue breakdown by dollar value for 1994.

Operating expenses for 1994 totaled nearly $23 million. Employee services had the highest expenditures for the port with 26 percent of the total. Maintenance costs, grain-handling costs, depreciation, and all other operating expenses accounted for the remaining expenses. Table E.4 outlines operating expenses by dollar value.

Table E.3. Port of Corpus Christi Operating Revenues, 1994

Wharfage	$12,303,245
Dockage	3.093,250
Freight Handling	3,392,552
Bagging	7,027,300
Other	2,523,737
Total	**$28,340,084**

Source: Adapted from Port of Corpus Christi Authority, *Port of Corpus Christi 1993 Annual Report* (Corpus Christi, Tex., 1994), pp. 10-20.

Table E.4. Port of Corpus Christi Operating Expenditures, 1994

Employee Services	$5,961,120
Maintenance	3,081,379
Grain Handling	3,228,888
Depreciation	3,886,075
Other	6,788,914
Total	**$22,946,376**

Source: Adapted from Port of Corpus Christi Authority, *Port of Corpus Christi 1993 Annual Report* (Corpus Christi, Tex., 1994), pp. 10-20.

Intermodal Access and Land Transport

Customers and port users control cargo transportation mode selections. The port authority, however, may allocate space and oversee cargo movements on port property.[17] Information and assistance regarding overweight or oversize shipments may also be provided by the port.

Rail Access

Three rail lines serve the Port of Corpus Christi: the Southern Pacific Lines, the Texas-Mexican Railway Company, and the Union Pacific Railroad Company. The Corpus Christi Terminal Association, composed of the three railroads and the port authority, provides rail switching within the port area. Twenty-six miles of port-owned rail lines support the public docks.[18] Shipside tracks at both of the port's open docks and three of the four covered docks facilitate direct transfers between vessels and railcars.[19]

Truck Access

The port lies less than a mile from I-37 and U.S. 181, and the roads between the port and these highways are wide and uncongested. Access to the port is possible via several key state and federal highways.

1. North to San Antonio
2. 181 North to San Antonio
3. 77 South to Harlingen or Brownsville
4. 281 South to McAllen or Reynosa
5. 77/U.S. 59 North to Houston
6. 59 South to Laredo
7. Texas Highway 44 to Alice and Laredo
8. Texas Highway 35 to Freeport and Houston

Improvements

The port places a high priority on pursuing innovative ways to improve linkages between land and sea. As a result, it is working to make a $36.9 million highway and railroad corridor on the north side of Inner Harbor a reality. The Corpus Christi Metropolitan Planning Organization approved the plan in 1993 for inclusion into the National Highway System. Justification for the corridor lies in the need to improve access to the north side of Inner Harbor and to open additional channel-front property for industrial development.[20]

Another project involves the rebuilding of the Tule Lake Lift Bridge's mechanical, structural, and electrical systems. Constructed in 1959, this lift bridge provides the only rail access to the north side. Work on this bridge is necessary to minimize disruptions to channel industries.[21]

Economic Impacts

The 1992 Economic Impact Study for the Port of Corpus Christi was released in December 1993 (see tables E.5 and E.6). A new study should be completed by the middle of 1995. Considering the direct economic impacts, port-related activities generated over 12,000 jobs and $5.2 billion in sales revenues. Benefits included an estimated payroll amounting to $316 million. State and local tax payment totaled $87 million. The port noted that its users comprised the largest category of direct impact.[22]

Table E.5. Direct Economic Impacts of the Port of Corpus Christi, 1992 (in Millions of Dollars)

	Employment	Output	Wages	Value-Added	State and Local Taxes
Port Industry	4,016	240	89	148	15
Port Capital Spending	136	5	2	3	0
Port Users	8,074	4,984	225	830	72
Total	12,226	5,229	316	981	87

Source: Adapted from Port of Corpus Christi Authority, *Port of Corpus Christi Authority 1992 Economic Impact Study* (Corpus Christi, Tex., December 1993).

Considering the total economic impact involves indirect (interindustry) and induced (household) effects. Port activities stimulated a total of over 38,000 jobs and $9.4 billion in sales revenues. Port-related payrolls added up to almost $650 million. Each port-related dollar spent in the area was matched by an additional 50¢ spent by local households and suppliers. Finally, through interindustry and household purchases, two local jobs arose from each port-related job.[23]

Table E.6. Indirect Economic Impacts of the Port of Corpus Christi, 1992 (in Millions of Dollars)

	Employment	Output	Wages	Value-Added	State and Local Taxes
Port Industry	6,075	370	120	217	22
Port Capital Spending	186	7	3	5	1
Port Users	31,975	8,974	526	2,398	219
Total	38,236	9,351	649	2,620	242

Source: Adapted from Port of Corpus Christi Authority, *Port of Corpus Christi Authority 1992 Economic Impact Study* (Corpus Christi, Tex., December 1993).

Major Issues

Environmental Issues

The Port of Corpus Christi takes pride in its reputation for maintaining and promoting a clean ship channel. Some of the port's users include charter members of Clean Industries 2000, a select group of Texas facilities identified to serve as models for other Texas companies. Complementing the efforts of its users, the port authority implemented a Stormwater Pollution Prevention Plan with the intent of reducing sediment carried into the ship channel by stormwater runoff. In 1993, the port's environmental department was expanded so that environmental considerations would be better integrated into all decisions regarding the port's facilities, services, and property. Local environmental groups that receive the support of the commissioners include the Coastal Bend Bay Foundation, the Local Emergency Planning Committee, and the Corpus Christi Oil Spill Control Association.[24]

Maintaining the 45-foot depth of the channel is a high priority. In 1993, about 2 million cubic yards of material were removed from La Quinta Channel during maintenance dredging.[25] Generally, dredging takes place every year near the mouth of the channel and less frequently as one moves up the channel. Placement of dredged materials can be problematic due to strict environmental standards and limited land availability. However, the port should be able to accommodate material placement for at least the next 30 to 40 years as long as it continues to be allowed to use the open-water areas. Eight accessible sites, which span the length of the ship channel, currently exist. The potential for increased costs of maintaining the ship channel lies in the dredging and placement costs: if accessibility should decrease or permissible areas be diminished, the effect on costs would be highly negative.[26]

International Trade Legislation

Although most trade between the United States and Mexico moves over land, the port observed "an increased awareness and interest" in its facilities and services.[27] The port seeks to play an active role in the goods movements between the countries involved in these agreements, particularly between northern Mexico and the southern United States.[28]

Closure of the Gulf Intracoastal Waterway

Approximately one-third of the total tonnage moved through the Port of Corpus Christi moves along the GIWW. Much of the waterborne commerce in this area consists of petroleum moved between Houston and Corpus Christi. Although a good amount of tonnage handled by this port moves along the GIWW, it is not perceived to be the foundation of the port.[29]

Statewide Planning

Statewide coordination of certain types of port-related policy would be helpful insofar as it would reduce any duplicative efforts by Texas seaports. However, it is important for the port to maintain its autonomy. Because ports do have characteristics indicative of private entities, they need to be able to have the flexibility to conduct their operations as they see fit. Politicizing the port operations might impede this need. One suggestion might be to have the Texas Department of Transportation work more closely with the Texas Ports Association.[30]

Notes

[1]Port of Corpus Christi Authority, *Project Cargo & Heavy Lift Facilities and Services: Information and Reference Manual* (Corpus Christi, Tex., June 1994), p. 3.

[2]Port of Corpus Christi Authority, "General Information," Corpus Christi, Tex. (document).

[3]Port of Corpus Christi Authority, *Project Cargo & Heavy Lift Facilities and Services*, p. 7.

[4]Ibid., p. 3.

[5]Port of Corpus Christi Authority, *Port of Corpus Christi 1993 Annual Report*, pp. 10-20.

[6]Interview by Jennifer Munzel and Lisa Nutt with Carole Harding, Manager of Marketing, Port of Corpus Christi Authority, March 16, 1995, Corpus Christi, Tex.

[7]Port of Corpus Christi Authority, 1993 Annual Report, p. 12.

[8]Port of Corpus Christi Authority, "Foreign Trade Zone No. 122," Corpus Christi, Tex. (document).

[9]Port of Corpus Christi Authority, "General Information."

[10]Port of Corpus Christi Authority, "Foreign Trade Zone No. 122."

[11]Port of Corpus Christi Authority, 1993 Annual Report, p. 12.

[12]Ibid., p. 8.

[13]Port of Corpus Christi Authority, *Port of Corpus Christi*, Corpus Christi, Tex. (Brochure.)

[14]Port of Corpus Christi Authority, "General Information."

[15]Port of Corpus Christi Authority, 1993 Annual Report, p. 10.

[16]All information for this and the following two sections was obtained by letter from Carole Harding, Manager of Marketing, Port of Corpus Christi Authority, Corpus Christi, Tex., to Leigh Boske, Professor, Lyndon B. Johnson School of Public Affairs, University of Texas at Austin, Austin, Texas, May 25, 1995.

[17]Interview with Carole Harding, March 16, 1995.

[18]Port of Corpus Christi Authority, "General Information."

[19]Port of Corpus Christi Authority, *Project Cargo & Heavy Lift Facilities and Services*, p. 9.

[20]Port of Corpus Christi Authority, 1993 Annual Report, p. 16.

[21]Ibid.

[22]Port of Corpus Christi Authority, "Port of Corpus Christi Authority 1992 Economic Impact Study," Corpus Christi, Tex., December 1993 (document).

[23]Ibid.

[24]Port of Corpus Christi Authority, 1993 Annual Report, p. 14.

[25]Ibid., p. 10.

[26]Interview with Carole Harding, March 16, 1995.

[27]Port of Corpus Christi Authority, *Port of Corpus Christi of Nueces County, Texas, Comprehensive Annual Financial Report For the Year Ended December 31, 1994* (Corpus Christi, Tex., 1995), p. vi.

[28]Interview with Carole Harding, March 16, 1995.

[29]Ibid.

[30]Ibid.

Appendix F. Port of Freeport/Brazos River Harbor Navigation District Profile

Introduction

The Port of Freeport, a deep-draft port, is located on Texas' central Gulf Coast, approximately 60 miles southwest of Houston, and is an important Brazos River Harbor Navigation District component. The port elevation is 3 to 12 feet above sea level. District-owned property is comprised of 150 developed acres.

Operations and Services Performed

The port's major trade areas in 1994 were Central America, South America, and the Middle East.[1] The major import commodities moved through the port in 1994 were foodstuffs and chemicals. Foodstuffs, chemicals, and miscellaneous chemical products were the major export commodities moved through the port in 1994.[2] Refer to tables F.1 and F.2.

Table F.1. U.S. Imports through the Port of Freeport, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Mineral Fuel, Oil, Etc.	762	683	741
Ships and Boats	0	0	413
Organic Chemicals	59	35	48
Edible Fruit and Nuts	26	30	31
Woven Apparel	17	10	3

Source: Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table F.2. U.S. Exports through the Port of Freeport, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Organic Chemicals	293	243	216
Plastic	68	70	73
Cereals	67	84	71
Inorganic Chemicals, RRE Earth Materials	65	47	46
Other Chemical Products	6	6	7

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas*, (Global Trade Information Services [electronic information] 1993, 1994).

Import/export tonnage moving across the public docks is on an upward trend. Bagged and bulk rice continue to lead the way with a dramatic 25 percent increase over 1993 tonnage. American Rice has penetrated new overseas markets, primarily in the Caribbean, Pacific Rim, and Mexico. Following closely behind rice is fresh fruit with a 16 percent increase over 1993. Another noticeable increase occurred in miscellaneous general cargo with a 50 percent increase over 1993 figures. Overall, import/export cargoes handled by the port in 1994 show a 26 percent increase over 1993 in loadings and unloadings. New opportunities in Mexico have come forward as a direct result of the North American Free Trade Agreement passage.[3]

Commodities with the greatest growth potential are bulk commodities, primarily liquid bulk, due to the large petrochemical complex located in and around the Freeport area. Modes of access are deep-sea vessel, pipeline, rail, barge, and truck.[4]

Major events that have and will continue to have significant impact on the Port of Freeport include Standard Fruit and Steamship Company's relocation to the Port of Freeport in 1983, for its weekly containerized fruit import and commodity export trade, and American Rice's 1985 decision to relocate to Freeport and construct a rice-processing and shipping facility on a leased port site. This facility was completed in mid-1987.[5]

Another significant event occurred in June 1988 when the Port of Freeport received a license from the U.S. Department of Commerce for the establishment and operation of a Foreign Trade Zone. The port received zone status for approximately 1,957 acres, all of which, except for a 5-acre tract located at the Brazoria County airport, is owned by the Brazos River Harbor Navigation District.[6]

Existing Port Facilities and Equipment

The Port of Freeport has 7,000 acres of deep- and shallow-draft water and highway-frontage land available for industrial development. Four general-cargo wharves are located in the inner harbor area. All wharves have a minimum dockside depth of 36 feet. Adjacent to these dock facilities are 641,000 square feet of shed areas with both rail and truck docks. All of these facilities and acreage within the inner harbor area are also within the port's Foreign Trade Zone No. 149. Additionally, these facilities are situated within the port's security system, providing controlled access and roving guards.[7]

The port's covered warehouse space comprises 642,000 square feet. In addition, 2,150 feet of dockspace is accessible to 416,000 square feet of transit storage and 60,000 square feet of long-term warehousing. A covered boxcar-loading area and 47 acres of prepared open storage are complemented by a recently completed container yard that has electrical hookups for refrigerated containers.[8] Four public docks are currently in operation at the port.

Modernization and Expansion Plans

The district contracted for the dredging of a 60-foot-deep berthing area in the Upper Turning Basin. The deep-berthing area is now being used for the loading and offloading of semisubmersible cargo vessels as well as offshore drilling platform testing.

In 1962, the district requested the U.S. Army Corps of Engineers to study the widening and deepening of the Freeport jetty system, channels, and harbor. As of September 30, 1994, the U.S. Army Corps of Engineers and the U.S. Coast Guard have awarded nine navigation and project-related contracts totaling approximately $73 million to the port. Based on the cost-sharing formulas established in the *Local Cooperation Agreement* between the Corps (as the federal sponsor) and the Navigation District (as the local sponsor), the district has contributed approximately $18.4 million toward the project's construction cost. In addition, the navigation district's costs for land acquisition, reallocations, easements, and confined dredged-material sites have been approximately $7.8 million.[9]

Improvements to district facilities include the warehouse 1-B project. This project has a total estimated cost of over $1.3 million and includes structural upgrades, roof replacement, and installation of a sprinkler system. The warehouse is currently in operation although the improvement project is not complete.[10]

A program for continued port improvements has received congressional approval and will see the harbor and channels deepened to 45 feet and the channels widened to 400 feet. Additionally, a new 1,200-foot turning basin will enable Freeport to handle large freighters and tankers.[11]

The former Canadian Millworks facility, now known as the 1-B Complex, is undergoing major access and electrical renovation, installation of a sprinkler system, and a fire water-supply line extension to the complex. The facility's warehousing is presently being heavily utilized for domestic inbound and outbound cargoes as well as for general storage.[12]

Strategic/Master Plans

In 1994, the district entered into a contract with the firm of Vickerman, Zachary, and Miller to develop a long-term strategic plan, which is now in the third and final phase.[13] Phase I of the strategic plan covered market assessment, land and facility assessment, commercial land appraisal, and cargo-handling and operations analysis. Phase II covered site development and port capital-improvement planning. The final phase focuses on marketing-plan development (microeconomics analysis), human-resource development and management planning, financing and taxation planning, and lastly, communications planning.[14] With this document, the district will be able to plan for organized development, better service its present users, and target new users into the 21st century.

Revenues and Expenditures

The revenues of the General, Debt Service, and Capital Projects funds are generated primarily from ad valorem taxes. Of the total revenue of $5.2 million recognized for fiscal year 1994, 98 percent was from ad valorem tax collections. The total tax rate for fiscal year 1994 was 8.8517¢ per $100 of valuation with 2.517¢ for interest and sinking requirements of the district's general obligation debt.

Operating revenue for the Enterprise Fund totaled $3.6 million for 1994. Wharfage, dockage, service, facility use, and other fees totaled $2,467,302, while lease income totaled $1,143,502 (see table F.3). The port had 138 ships calling during the fiscal year, an increase of 14 percent over the previous year.[15]

Table F.3. Port of Freeport Operating Revenues, 1994

Harbor Operations	
Wharfage	$764,058
Dockage	615,722
Service, Facility Use and Other Fees	1,087,522
Nonharbor operations	
Lease Income	1,143,502
Employer Contributions	71,877
Interest Revenue	50,384
Other	19,930
Total	**$3,752,995**

Source: Adapted from Port of Freeport, Brazos River Harbor Navigation District of Brazoria County, Texas, *Comprehensive Annual Financial Report for the Fiscal Year Ended September 30, 1994* (Freeport, Tex., 1994), p. 25.

Table F.4. Port of Freeport Operating Expenditures, 1994

Payroll and Related	$ 490,299
Professional Fees	102,819
Supplies and Other	198,253
Utilities	485,274
Maintenance and Repairs	307,536
Depreciation	558,233
Total	**$2,142,414**

Source: Adapted from Port of Freeport, Brazos River Harbor Navigation District of Brazoria County, Texas, *Comprehensive Annual Financial Report for the Fiscal Year Ended September 30, 1994* (Freeport, Tex., 1994), p. 25.

Table F.5. Port of Freeport Net Operating Income, 1994

Nonoperating Revenue (Expense)	
Interest Revenue	$130,280
Loss on Retirement of Assets	(88,243)
Debt Interest and Fees	(559,346)
Total	**(517,309)**
Net Income	**$1,093,220**

Source: Adapted from Port of Freeport, Brazos River Harbor Navigation District of Brazoria County, Texas, *Comprehensive Annual Financial Report for the Fiscal Year Ended September 30, 1994* (Freeport, Tex., 1994), p. 25.

Expenditures totaled $3.7 million for the General, Debt Service, and Capital Projects funds for fiscal year 1994. Professional fees, capital outlay, and debt service requirements account for $2.6 million, or 71 percent of total expenditures.

Operating expenses for the Enterprise fund totaled $2.1 million for fiscal year 1994, which resulted in a net operating income of $1.1 million (see tables F.4 and F.5). Payroll and related costs, utilities, and maintenance and repairs account for 60 percent of total expenditures and totaled $1,283,109 for fiscal year 1994. As a result of the increased warehousing activity and the increase in southbound cargo by Dole Fresh Fruit Company, union labor hours have risen, resulting in increased payroll and related expenses. Utility costs have risen sharply over the last two fiscal years due to American Rice's new flour-mill operation.[16]

Intermodal Access and Land Transport

Eight truck lines, four barge lines, and one railroad line are serving the Port of Freeport. The port has direct connections to all inland rail, highway, and barge transportation systems. Rail service is handled by the Union Pacific Railroad and provides direct connections from covered loading areas to the nation's rail system. However, 89 percent of the cargo is being moved by trucks.[17] Texas Highway 288, a limited access highway, puts the national interstate highway system at the harbor gates.[18]

The Gulf Intracoastal Waterway intersects the harbor channel less than one mile from dockside and provides barge access to all major river ports of mid-America. Additionally, access to the port has been increased dramatically with the recent completion of the widening and deepening project, offering a 45-foot draft in the main channel.

Landside access is the major challenge at this point. SH 288, recently completed, links the port with the Houston metropolitan area but goes no further. The port's access to the east/west interstate system is SH 36, which desperately needs widening and upgrading.[19]

Economic Impact

While no economic-impact study was available, this section outlines the port's potential importance to the region's economy. The port has created 500 jobs for the city of Freeport. Additionally, every ton of cargo moved through the port directly impacts the city of Freeport: $74 per ton of cargo.[20]

The Brazos River Harbor Navigation District encompasses approximately 85 percent of Brazoria County, located on Texas' central Gulf Coast. The primary economic bases of the county include chemical manufacturing, petroleum processing, offshore production maintenance services, commercial fishing, and agriculture. In addition, the area's deep-water waterway and port facilities, sport-fishing services, and tourism are major components of the county's economic base.[21]

One immediate problem addressed with the Freeport jetty and channel widening and deepening project is that the Freeport Harbor Entrance jetty structures are being extensively used for recreational activities. They are currently considered dangerous due to wave wash, poor accessibility, and lack of parking facilities. Because of these factors, included in the port's total project cost is the construction of public-use facilities adjacent to both jetties to be used by fishers and other recreational visitors.

The jetty system, channel, and harbor's widening and deepening will allow the port to provide a waterway system able to handle any size oceangoing vessel calling on the port's cargo-handling facilities or the local chemical and petroleum industries' liquid-cargo handling facilities. For example, large tankers will be able to utilize the Phillips Petroleum Company Terminal and large bulk-chemical carriers will be able to access the Dow facility. The project will place the port, and its surrounding and supporting industries, in a world-class competitive position, and it will no longer be limited by waterway depth or width restriction.[22]

Major Issues

Capital Improvements

The major issue facing the port is the widening and deepening project. To complete this project the port has to negotiate with five state and three federal agencies about project financing and land acquisition.[23]

The port understands the importance of complying with environmental regulations on any capital-improvement project. For example, a recent dredging project was redesigned due to the alleged stress put on the local crab population. The port is also cognizant of the lack of communication between the ports, the Texas Department of Transportation, and the U.S. Army Corps of Engineers as one of the problems affecting the port.[24]

Intermodalism

With the advent of the minibridge system, whereby containers and cargoes generated in and around Texas are transported east and west by rail to meet mother ships at hub ports on the east and west coasts, very little is left for Gulf Coast ports to compete for. There is a significant amount of containerized cargo generated in the port's area that is transported not by water, but by rail or truck to the rail center in Houston. The port's challenge is to find a way to participate in this business, competing with these other modes of transportation.[25]

Key issues facing the Port of Freeport today revolve around improving the problem of insufficient highway and rail infrastructure accessing the port, financing capital-improvement projects, and reducing environmental impediments.[26]

Furthermore, the port authorities believe that if a statewide initiative could be developed strictly for ports, focusing on ISTEA funds to upgrade and enhance the inland transportation infrastructure, the port would have a chance to compete regionally and nationally. Shippers today are looking not only at ocean transportation costs and port costs but also at the cost per mile to get the product from its origin point to the loading point.[27]

Notes

[1] Interview by Josh La Porte and Lyudmila Stupenkova with A. J. Pete Reixach Jr., Executive Port Director, Port of Freeport, March 24, 1995, Freeport, Tex.

[2] Port of Freeport, Brazos River Harbor Navigation District of Brazoria County, *Comprehensive Annual Financial Report for the Fiscal Year Ended September 30, 1994* (Freeport, Tex., 1994), p. 79.

[3] Ibid., pp. 5-6.

[4] Letter from A. J. Reixach Jr., Executive Port Director, Port of Freeport, to William D. Dye, Texas Department of Transportation (TxDOT), May 26, 1994.

[5] Port of Freeport, Comprehensive Annual Financial Report, p. 80.

[6] Port of Freeport, *The Star of the Mid-Coast, Foreign Trade Zone No.149*, Freeport, Tex. (Pamphlet.)

[7] Port of Freeport, *Port Facilities, Map,* Freeport, Tex. (Pamphlet.)

[8] Port of Freeport, *The Star of the Mid-Coast, Opportunity*, Freeport, Tex. (Pamphlet.)

[9] Port of Freeport, Comprehensive Annual Financial Report, p. 80.

[10] Ibid., p. 10.

[11] Port of Freeport, *The Star of the Mid-Coast, Opportunity.*

[12] Port of Freeport, Comprehensive Annual Financial Report, p. 81.

[13] Interview with A. J. Pete Reixach Jr., March 24, 1995.

[14] Port of Freeport, Comprehensive Annual Financial Report, p. 81.

[15] Ibid., pp. 10-11.

[16] Ibid.

[17] Interview with A. J. Pete Reixach Jr., March 24, 1995.

[18] Port of Freeport, *The Star of the Mid-Coast, Opportunity.*

[19] Letter from A. J. Reixach Jr. William D. Dye, May 26, 1994.

[20] Interview with A. J. Pete Reixach Jr., March 24, 1995.

[21] Port of Freeport, Comprehensive Annual Financial Report, pp. 12, 79.

[22] Port of Freeport, *The Star of the Mid-Coast, Forty-five Foot Project*, Freeport, Tex. (Pamphlet.)

[23] Interview with A. J. Pete Reixach Jr., March 24, 1995.

[24] Ibid.

[25] Letter from A. J. Reixach Jr., to William D. Dye, May 26, 1994.

[26] Ibid.

[27] Ibid.

Appendix G. Port of Galveston/Board of Trustees of the Galveston Wharves Profile

Introduction

Galveston Island, situated 2 miles off the Texas coast, is approximately 50 miles south of Houston. It is connected to the Texas mainland by two vehicular causeways, a railroad bridge on the northwest, and a third highway bridge across San Luis Pass.

The Port of Galveston facilities, located at the Galveston Bay entrance, constitute a large portion of the greater port complex. This complex is situated on Galveston Island's north side, with property and facilities located on adjacent Pelican Island as well. The Gulf Intracoastal Waterway runs alongside the Port of Galveston, and the Galveston channel provides access to the open gulf. This channel has an authorized minimum depth of 40 feet and is 1,200 feet wide at its narrowest point. Galveston port facilities are situated 9.3 miles from the open sea.[1]

The port is a separate city utility so designated by a city charter provision of Galveston. The charter provides that all city-owned wharf and terminal properties be set aside and controlled, maintained, and operated by the Board of Trustees of the Galveston wharves.[2]

Operations and Services Performed

The major commodities moved through the Port of Galveston are cereals, machinery, organic chemicals, plastic, and fresh fruit. Refer to tables G.1 and G.2. The port experienced an economic recovery in 1993, which led to a net profit of $350,556. This was the first profitable year since 1988 and the most profitable year since 1983. It was fueled primarily by increased bulk-grain shipments, although increases were also recorded in bulk sugar, bulk liquids, sacked goods, cotton, and bananas.[3]

Bulk grain remains the single largest tonnage cargo at the Port of Galveston. Total grain exports rose 189 percent to 3.965 million tons during 1993, from 1.370 million tons over the same period for 1992. Grain exports increased as new markets opened up in the Middle East, Asia, South America, and Mexico. Increases were seen at both the port's Elevator B and the Farmland/Union Equity facilities.[4]

Twenty-four thousand tons of breakbulk cotton were exported through the port during 1993, an increase of 231 percent over the 7,212 tons exported in 1992 (see table G.3). An additional 25,000 bales of cotton for export in containers were loaded at the Galveston container terminal. During 1993, 743,674 tons of bunker and diesel fuel for ships were provided by Galveston Terminals. This compared to 642,528 tons of bunker and diesel fuel for vessels during 1992.

Table G.1. U.S. Exports through the Port of Galveston, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Cereals	218	122	347
Machinery	274	262	254
Organic Chemicals	95	138	126
Plastic	127	136	118
Electrical	83	80	102

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Information Services [electronic information] 1993, 1994).

Table G.2. U.S. Imports through the Port of Galveston, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Mineral Fuel, Oil, Etc.	272	609	494
Machinery	135	148	144
Aircraft, Spacecraft	148	139	117
Organic Chemicals	94	79	91
Edible Fruit and Nuts	50	66	80

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Information Services [electronic information] 1993, 1994).

Containerized cargo in 1993 was 873,305 tons, compared to 940,096 tons in 1992. Container cranes handled 62,334 containers in 1993, compared to 74,349 containers handled in 1992. Additionally, 549 ships and 223 barges called at the port during 1993, compared to 490 ships and 122 barges in 1992.[5]

Del Monte Fresh Fruit Company and Turbana Corporation continue to provide steady jobs and produce revenue for the port. Bananas and other fresh-fruit imports totaled 258,147 tons in 1993, compared to 219,684 tons in 1992. This represents an increase of 17 percent over 1992.

Table G.3. Tonnage Handled over Facilities Owned by Galveston Wharves, 1991-94

Cargo	**1991**	**1992**	**1993**	**1994**
Bulk Grain	2,458,046	1,370,117	3,965,372	3,338,830
Bulk Sugar	440,060	417,015	471,617	321,558
Bulk Liquid	584,837	642,528	743,674	877,122
Other Bulk Cargo	22,841	8,874	0	34,181
Sacked Grain, Flour, Rice & PBL	66,726	54,358	98,875	30,330
Cotton	38,950	7,212	23,915	8,277
Bananas & other Fruit	174,132	219,684	258,147	276,600
Other General Cargo	23,651	39,722	46,071	15,656
Containerized Cargo	775,480	940,096	873,305	726,284
PBI (Rail Barge)	N/A	N/A	153,953	340,753
Total Cargo	**4,584,723**	**3,699,606**	**6,634,929**	**5,969,590**
Total Ship Calls	**474**	**490**	**549**	**483**
Total Barge Calls	**115**	**122**	**223**	**175**

Source: Response by Judy Slocum, Public Relations Manager, Port of Galveston, to the LBJ School of Public Affairs questionnaire, "Texas Ports Issues Survey," March 1995, Austin, Texas.

Imperial Sugar Company will continue to bring the majority of its domestic and all of its imported raw sugar through Galveston. During 1993, 471,617 tons of sugar passed through the port, up nearly 13 percent from the 417,015 tons of raw sugar moved through the port's facility in 1992.[6]

Existing Port Facilities and Equipment

The port owns and operates for-hire public wharves, transit sheds, open and covered storage facilities, warehouses, and freight-handling facilities. In addition, the port leases land and facilities to others, including an export bulk-grain elevator leased to Farmland Industries, an import bulk-sugar terminal leased to Imperial-Holly Corporation, a bulk-liquid dock leased to Pelican Island Storage Terminal, a fabrication facility leased to PMB/Bechtel, and an area leased to the Woodlands Corporation for tourist development.

Terminal Railway

The wharves sold their terminal railroad in 1987 to Galveston Railway (GRI). GRI leases track and other rail property and provides terminal connections to the Atchison, Topeka, and Santa Fe Railway, Burlington Northern Railroad, Southern Pacific Lines, and Union Pacific.

Warehouse and Storage Facilities

The port's developed water frontage totals 24,400 linear feet. The port has 10 open-dock ship berths and 20 other berths, with shipside warehouses having a total storage area of 1.866 million square feet. Several back-of-the-waterfront warehouses, having a storage area of 1.057 million square feet, are located on port property. In addition, there are open, shipside paved areas totaling over 10 acres and open, unpaved space of approximately 8.5 acres. All deep-draft facilities have water, shore power, and railroad and highway connections.

Multiuse Terminal

The Pelican Island Terminal, leased to PMB Engineering/Bechtel, is a full-fabrication facility serving the offshore, oil and gas, and petrochemical markets. This facility also provides fabrication enhancement to PMB/Bechtel's Engineering, Procurement, and Construction services. The facility boasts 7,900 linear feet of berthing space, access to deep-draft vessels, and 130,000 square feet of warehouse space.

Container Terminal

Operated by Container Terminal of Galveston, the container terminal has a 1,346-foot, two-berth dock with a water depth alongside of 40 feet, and 55 acres of paved storage area. The container-terminal rail ramp is located within the terminal boundaries. The port of Galveston has an operating agreement with Container Terminal of Galveston, which provides for CTG to operate the container terminal as an open, public facility and to have full operational responsibility for shoreside cargo facilities. Under the agreement, the port retains control of tariffs and waterside activities of the terminal.[7]

Modernization and Expansion Plans

The port is constructing an automated-bagging and bag-handling facility with ABT Galveston Limited Partnership. Improvements to the Port of Galveston from this project's installation are estimated at $30 million. Cargo commitments from various major suppliers have been solicited with good results. When this facility is in full operation, it will be capable of loading up to 180 tons per hour per loader compared to manual loading of 50 to 60 tons per gang hour. Subsequently, it should create substantial additional economic activity for the port, labor, and the city. The new facility is to operate 24 hours a day, 7 days a week, with 50 full time employees. ABT has also contracted with Galveston College to establish a mandatory employee training program in the daily operation and maintenance of the facility's machinery and equipment.[8]

Strategic/Master Plans

Although the master plan has been developed, it has not been yet approved. It is expected to be released later this year.

Revenues and Expenditures

Operating revenues in 1993 increased $3.345 million or 29.83 percent compared with 1992. Major increases were experienced in dockage and Elevator B revenues. Grain shipments by rail contributed as well, with a significant increase in switching revenues. Dockage revenues increased due to layberthing of grain-carrying vessels. Elevator B's revenue increase resulted from increased volume at the facility. Table G.4 presents a summary of operating revenues for the calendar year 1993.

Calendar year 1993 operating expenses increased 7.72 percent, compared to a 29.83 percent increase in revenues. Salaries and benefits costs increased as additional staff were added to handle increased business. Increased contract-labor costs reflect the increased grain volume moved through Elevator B. Repair and maintenance expenses increased due to heavier equipment usage and an increase in providing maintenance and dredging. Office and sales expenses increased as a result of intensified marketing efforts. Table G.5 presents a summary of operating expenses for the calendar year 1993.

Table G.4. Port of Galveston Operating Revenues, 1993

Switching	$1,178,659
Wharfage	2,673,900
Dockage	5,967,908
Container Terminal	872,910
Rentals	1,401,834
Elevator B	1,998,031
Other	462,866
Total	**$14,556,108**

Source: Adapted from Board of Trustees of the Galveston Wharves, Port of Galveston, *Comprehensive Annual Financial Report* (Galveston, Tex., 1994), pp. 8-9.

Table G.5. Port of Galveston Operating Expenditures, 1993

Salaries and Benefits	$2,723,835
Contract Labor-Elevator B	1,178,688
Repairs and Maintenance	702,608
Sales and Office Expense	1,441,305
Other	6,703,805
Total	**$12,750,241**

Source: Adapted from Board of Trustees of the Galveston Wharves, Port of Galveston, *Comprehensive Annual Financial Report* (Galveston, Tex., 1994), pp. 8-9.

Intermodal Access and Land Transport

Galveston Island is connected to the Texas mainland by a rail bridge. The railroads serving Galveston are the Atchison, Topeka, and Santa Fe Railway, Burlington Northern Railroad, Union Pacific Railroad, and the Southern Pacific Lines, all of which contribute to the bridge operations. The roadways accessing the Port of Galveston are Interstate 45 and State Highway 275.[9]

The Port of Galveston has rated the sufficiency of intermodal connections at the port as fair. Due to planned transportation operations by major carriers serving Galveston, terminal hubs are set up in Houston 45 minutes north. Therefore, carriers' intermodal business through the Port of Galveston is largely transloaded and trucked to Houston hubs. Highway, water, and rail connections are rated as excellent, and air connection is fair to good.[10]

Economic Impacts

The Board of Trustees believes its mission is to act as an economic catalyst to the City of Galveston and the surrounding region, generating both direct and indirect employment and cash flow. The port pays the city of Galveston $172,000 annually, and it acts as a major job creator for area citizens. Additionally, drilling rigs and layships continue to add needed port revenues and also provide good business for the city. All space not immediately needed for cargo is used for this type of activity.[11]

Major Issues

The most important issue for the Port of Galveston has been recognized as maintaining competitiveness within the port industry. Although the Port of Galveston is only 45 minutes from the open sea, most customers are attracted to the neighboring Port of Houston, even though Houston is situated further away from the Gulf of Mexico. Port officials claim that it is easier and quicker for operators to move certain cargo types through Galveston rather than Houston. Although competition with other ports continues to be intense, the port expects to aggressively seek potential customers who need long-term port facility leases and are willing to provide the capital investment required for their specific use.[12]

Closely connected with competitiveness is another issue affecting the port performance--trucking versus rail rates to Houston. According to the port officials, it is cheaper to ship cargo by trucks rather than by rail when short distances are involved.[13]

The North American Free Trade Agreement passage should generate additional trade between the Port of Galveston and Mexico. The port has established good business relations with Mexico, with five shipping lines from Mexico, South America, and Central America calling at the port at least once a month during 1993.[14]

Most environmental legislation affects the port either directly or indirectly. The port reevaluates conservation expenditures with greater focus on problems posing the largest environmental and human health risks.[15]

The issue of safety and security, according to the U.S. Coast Guard at the port, depends on the cargo types handled at the port. The U.S. Coast Guard's regulatory monitoring keeps port authorities abreast of potential problem areas and assists in enforcing regulations.[16]

Notes

[1] Port of Galveston, "Location," in *Comprehensive Annual Financial Report of the Board of Trustees of the Galveston Wharves, December 1993* (Galveston, Tex., 1994), p. 12.

[2] Ibid.

[3] Port of Galveston, "Economic Condition and Outlook," in *Comprehensive Annual Financial Report of the Board of Trustees of the Galveston Wharves, December 1993* (Galveston, Tex., 1994), pp. 1-5.

[4] Ibid., p. 2.

[5] Ibid., pp. 1-5.

[6] Ibid., p. 3.

[7] Port of Galveston, "Management of the Wharves," in *Comprehensive Annual Financial Report of the Board of Trustees of the Galveston Wharves, December 1993* (Galveston, Tex., 1994), pp. 15-17.

[8] Port of Galveston, "Economic Condition and Outlook," p. 5.

[9] Interview by Josh La Porte and Lyudmila Stupenkova with B. Curran, Director of Administration, R. C. Schulz, Manager of Operations, and J. L. Slocum, Public Relations Manager, Port of Galveston, Galveston, Tex., March 23, 1995, Galveston, Tex.

[10] Ibid.

[11] Port of Galveston, "Economic Condition and Outlook," pp. 1-7.

[12] Ibid., p. 6.

[13] Interview with B. Curran, R. C. Schulz, and J. L. Slocum, March 23, 1995.

[14] Port of Galveston, "Economic Condition and Outlook," p. 3.

[15] Response by J. L. Slocum, Public Relations Manager, Port of Galveston, to the LBJ School of Public Affairs,

University of Texas at Austin, questionnaire, “Texas Port Issues Survey,” March 1995.

[16] Ibid.

Appendix H. Port of Harlingen Authority Profile

Introduction

The Port of Harlingen is a shallow-draft port located 4 miles from the city of Harlingen on FM 106 and 25 miles west of mile marker 646 on the Gulf Intracoastal Waterway. The Harlingen channel is maintained at a width of 125 feet and a depth of 12 feet and is supplied by the Arroyo Colorado, a fresh-water river. Located in the Rio Grande Valley, the port is an important link in the south Texas transportation network. The Port of Harlingen Authority was created in 1927 and became operational in 1954.[1]

Operations and Services Performed

For the 1994 fiscal year, the port had sales and service charges for two customers, Diamond Shamrock and the Rio Grande Valley Sugar Cooperative, that amounted to 46 percent and 26 percent, respectively, of the port's total operating revenues.[2] Diamond Shamrock moves gas and diesel products through the port, while the Rio Grande Sugar Cooperative ships bulk sugar to New Orleans. Another major port customer, Varmicon Industries, ships bulk materials, such as sand and cement, through the port. Other companies, such as AM-AG and CN Terminal, use the port to ship fertilizers.[3] Refer to tables H.1 and H.2 for individual company tonnages and tariffs, from 1990 to 1994.

Table H.1. Port of Harlingen Tonnage Report by Year, 1990-94

Company	1990	1991	1992	1993	1994
AM-AG	8,769	8,459	16,358	24,950	19,343
Diamond Shamrock	405,622	428,766	418,761	521,651	557,882
Dock No. 2	57,278	109,606	97,317	133,631	143,979
Varmicon	94,583	69,669	81,467	73,573	92,047
CN Terminal	21,976	25,162	18,425	24,509	42,958

Source: Adapted from Port of Harlingen, "Tonnage & Tariff" (Harlingen, Tex., 1990-94).

Note: The port used a calendar year in 1990 through 1992 and a fiscal year in 1993 and 1994.

Table H.2. Port of Harlingen Tariff Report by Year (in Dollars)

Company	1990	1991	1992	1993	1994
AM-AG	9,476	7,787	17,730	27,873	21,789
Diamond Shamrock	83,122	121,857	112,306	136,980	145,620
Dock No. 2	31,704	65,761	57,638	78,903	84,522
Varmicon	30,814	26,590	31,520	29,392	43,927
CN Terminal	8,737	10,357	8,515	10,213	15,256

Source: Adapted from Port of Harlingen, "Tonnage & Tariff" (Harlingen, Tex., 1990-94).

Note: The port used a calendar year in 1990 through 1992 and a fiscal year in 1993 and 1994.

Existing Port Facilities and Equipment

The Port of Harlingen has a 650-foot concrete general dry-cargo wharf and a 100-foot dry bulk wharf. There are also five smaller (50 feet by 25 feet) wharves located near the turning basin, extending down the Harlingen channel. In addition, the port has 234 open storage areas.[4]

Modernization and Expansion Plans

The port hopes to invest in a drive-over hopper, which would facilitate barge loadings. However, although the equipment investment would promote port efficiency, present tonnage levels do not justify the investment.[5]

The port has recently completed a $1.3 million restoration of the general-purpose Cargo Dock #2. Additionally, the port is replacing antiquated dock cranes, which will cost approximately $50,000 per crane.[6]

Strategic/Master Plans

Currently, the port does not have a strategic or master plan.

Revenues and Expenditures

Port revenues for 1994 totaled $390,200. Wharfage fees alone accounted for 75 percent, over $290,000, of total revenues. In addition, land-lease revenues accounted for another 19 percent, or $74,000, of the total. Refer to table H.3 for port revenue breakdowns.

Port expenditures totaled $336,829 in 1994. Administrative expenses and salaries accounted for large portions of the total at 31 and 27 percent respectively. Other port expenditures included professional fees, depreciation losses, insurance, and other miscellaneous expenses. Refer to table H.4 for expanded port expenditure information.

In addition to the port revenues noted above, the port also receives an ad valorum tax of 4¢ per $100 cargo valuation. After many years of not taxing, the tax was reinstated in 1991 and generated $546,883 in 1994 alone.

Table H.3. Port of Harlingen Operating Revenues, 1994

Wharfage Fees	$291,142
Surface Fees	3,504
Land Lease	74,104
Harbor Fees	21,450
Total	**$390,200**

Source: Adapted from Port of Harlingen Authority, "Annual Report 1994" (Harlingen, Tex., 1995).

Table H.4. Port of Harlingen Operating Expenditures, 1994

Administrative Expenses	$101,127
Salaries	90,858
Professional Fees	44,606
Depreciation	38,337
Insurance	31,928
Other	29,973
Total	**$336,829**

Source: Adapted from Port of Harlingen Authority, "Annual Report 1994" (Harlingen, Tex., 1995).

Intermodal Access and Land Transport

The Southern Pacific Lines, which provides intermodal rail connections for the port, has daily mainline services to Brownsville. The port has direct highway access to FM 106 and supporting access to U.S. 77. The port is located approximately 4 miles east of the city of Harlingen.

Economic Impacts

Although there are no economic-impact figures available, the port provides a breakdown of port-using companies and their employees. Refer to table H.5.

Table H.5. Port-Using Companies and Number of Persons Employed

Company	Major Products	Seasonal Employees	Full-time Employees
Cargill	Corn and Grain	25	8
Diamond Shamrock	Gas/Diesel		3
Port Regional Gin	Cotton	20	5
Harlingen Gin	Cotton	18	4
Varmicon	Sand/Cement		4
CN Terminal	Fertilizer		4
AM-AG	Fertilizer		8

Source: Information provided by W. G. "Butch" Palmer, Port Director, The Port of Harlingen Authority, Harlingen, Texas, April 7, 1995 (interview).

Major Issues

The desire to find customers in Mexico, with NAFTA's recent passage, is a major port issue. Even though the port currently does not have business ties to Mexico, the port has hired a consultant to investigate possible service expansion into Mexico. Dry bulks, such as soybeans and corn, are potential products that could be sent to Mexico.

Environmental issues are of great concern to the port. Any potential Gulf Intracoastal Waterway closure would be a port operational disaster, because it is a shallow-draft port dependent exclusively upon the GIWW. Likewise, possible GIWW expansion could benefit the port and place it in the waterway's center, thereby making it more attractive for cross-directional traffic.

Notes

[1]Port of Harlingen Authority, *The Port of Harlingen Authority*, Harlingen, Tex. (Brochure.)

[2]Port of Harlingen Authority, “Annual Report 1994,” Harlingen, Tex., p. 15.

[3]Interview by Jeffrey Stys with W. G. "Butch" Palmer, Port Director, Port of Harlingen Authority, Harlingen, Tex., March 10, 1995, Harlingen, Tex.

[4]Port of Harlingen Authority, *The Port of Harlingen Authority*.

[5]Interview with W. G. "Butch" Palmer, March 10, 1995.

[6]Ibid.

Appendix I. Port of Houston Authority Profile

Introduction

The Port of Houston, a deep-draft port, is a 50-mile-long complex of diversified public and private facilities just a few hours' sailing time from the Gulf of Mexico.[1] It is 400 feet wide and 40 feet deep. The channel extends north-northwestward from Bolivar Road across Galveston Bay to Morgan's Point, then up the San Jacinto River to the Buffalo Bayou mouth at Lynchburg, and then up Buffalo Bayou to the Turning Basin. About half the channel goes through Galveston Bay and half through the San Jacinto River and Buffalo Bayou. The Port of Houston is an autonomous entity authorized by a 1909 act of the Texas legislature. In 1971, the legislature changed the name of the Harris County Houston Ship Channel Navigation District to the Port of Houston Authority and gave it expanded powers for fire and safety protection along the channel.[2]

Operations and Services Performed

In 1994, the Port of Houston handled an estimated 142 million tons of cargo. Port-authority revenue tonnage (cargo that moved across Houston's public docks) weighed in at 18.8 million cargo tons in 1994, up 3 percent from 1993 due to a 63 percent jump in steel imports. Container traffic moving through port-authority facilities hit an all-time high of 580,000 TEUs in 1994, up 8 percent from 1993.[3] The port is ranked first in the United States in handling petrochemicals. About 85 percent of the port's tonnage is petroleum or liquid bulk; 15 percent is general cargo.

The port has over 250 port connections throughout the world. Service schedules are large and varied with frequent services provided by 110 steamship lines. Private companies operate terminals, shipyards, towboat docks, and a wide variety of manufacturing and processing plants along the channel. The Port of Houston Authority owns and operates seven public facilities along the channel's banks. Officials feel the port's current infrastructure can easily accommodate a 50 percent increase in traffic. In 1994, 5,448 deep-draft vessels (ships) and 50,000 shallow-draft vessels (barges) called at the port.[4] Tables I.1 and I.2 indicate U.S. dollar values for tonnages moved through the port in recent years, and table I.3 indicates 1994 tonnages.

Table I.1. U.S. Imports through the Port of Houston, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Mineral Fuel, Oil	4,259	4,537	4,708
Vehicles (not Railway)	1,577	1,062	1,221
Machinery	814	808	923
Organic Chemicals	707	791	719
Iron or Steel Products	625	373	561

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table I.2. U.S. Exports through the Port of Houston, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Machinery	3,554	3,915	3,546
Organic Chemicals	2,860	2,915	2,889
Plastic	1,216	981	921
Cereals	796	933	888
Mineral Fuel, Oil	1,096	1,067	855

Source: Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

**Table I.3. Tonnage Performances for the Port of Houston, 1994
Combined Import and Export
(in Millions)**

Product	Short Tons
Petroleum and Petroleum Products	49.6
Organic Chemicals	8.4
Cereals and Cereal Preparations	6.0
Iron and Steel	3.1

Source: Adapted from Port of Houston, *Leading Commodities, Combined Import and Export, Jan-Dec 1994* (Houston, Tex., 1995).

Existing Port Facilities and Equipment

The Port of Houston has the largest facility infrastructure on the Gulf of Mexico. Its facilities include a general-cargo complex, intermodal terminal, dry-bulk-material handling plant, public grain elevator, and deep-water basin providing access to facilities for liquid-bulk cargo. The public elevator has a 6-million-bushel storage capacity. The banks of the turning basin terminal accommodate 2.5 miles of wharves, transit sheds, and warehouses. The bulk-materials handling plant is a dry-bulk import-export terminal capable of handling commodities ranging from particles as fine as sand to 8-inch lumps of material weighing as much as 200 pounds per cubic foot.[5]

The Fentress Bracewell Barbours Cut container terminal is an intermodal terminal for container, roll on-roll off vessels, and other cargo. The terminal has five 1,000 foot container berths (a sixth berth is currently being constructed), 20 yard cranes, and 10 container cranes. Marshaling areas can accommodate more than 21,500 TEUs. For trucks, 24 exit lanes are provided.[6]

Wharf No. 32, Jacintoport, and CARE are three of Houston's newest facilities. Wharf No. 32, with 806 feet of reinforced landing space and 20 acres of paved marshaling area, is designed for heavy-lift and longer-term cargo projects. The Jacintoport terminal is a 125-acre facility with 3 berths, 1,835 feet of reinforced landing space, 7.5 acres of paved cargo-marshaling area, and a 300,000-square-foot transit shed. The CARE terminal is a 34-acre facility with a 500-foot landing space and a 46,000-square-foot transit shed.[7]

The Malcolm Baldrige Foreign Trade Zone is managed by the Port of Houston Authority and includes sites located throughout Harris County. Merchandise may enter the zone without formal customs entry or the payment of customs duties or government excise taxes. Duties are not assessed until the merchandise enters U.S. commerce. Imported merchandise and certain domestic goods stored in the zone are exempt from state and local property taxes. FTZ users may apply for duty drawback, excise tax refunds, and export incentives when merchandise enters the zone. Products admitted to the FTZ may be stored, reassembled, repackaged, processed, consolidated, commingled with domestic products, tested, repaired, or manufactured. Duty may be paid on the finished product if it is lower than the component parts (also known as a duty wave).

The sites in Houston's FTZ provide a broad selection of services and facilities, including warehouse space and storage facilities for bulk-liquid chemicals. Additionally, the zone includes existing structures and unimproved land for build-to-suit projects. Companies may also apply for subzone status at their current locations or at other new locations in the area.[8]

Modernization and Expansion Plans

Heading the port authority's improvements list is the expansion of Barbours Cut Terminal's intermodal capabilities. The port requested federal funding under the Intermodal Surface Transportation Efficiency Act of 1991 to help finance intermodal projects at Barbours Cut Terminal (the first ISTEA rail project ever handled by the Texas Department of Transportation) and was approved to receive $13.2 million in funding. Two projects are planned: the expansion of existing rail-ramp facilities and construction of 2 miles of mainline tracks to improve terminal access. It is estimated that with these two improvements transportation costs will be reduced by $1.4 million.[9]

Other major projects are already underway at Barbours Cut, which currently handles 80 percent of all container trade in Texas. Construction began last year on a sixth 1,000-foot-long container berth, and eight new yard cranes were added to the Barbours Cut fleet, aiding shippers during peak traffic periods. Additionally, the turning basin terminal was recently awarded a contract for a second wharfside container crane. It should be on line in early next year.

Other improvements include a $2.5 million project to renovate Manchester Dock 3 and to build a mobile-equipment washdown-facility. This facility will ensure that no oily residue is washed into the ship channel when freight handlers clean their mobile equipment.[10] The port also plans to widen the ship channel from 400 to 530 feet and deepen it from 40 feet to 45 feet.

Strategic/Master Plans

The port authority has as its guide the master plan, a study prepared in July 1994 by Booz, Allen and Hamilton, a management consultancy. The plan recommends four areas in which the port authority can expand its business. The authority has already incorporated these recommendations into its marketing, operations, and capital improvements planning.[11]

Intermodal Development

Houston is currently favored by four major railroads: Atchison, Topeka, and Santa Fe Railway, Southern Pacific Lines, Union Pacific Railroad, and Burlington Northern Railroad. Efficient rail intermodal service to Barbours Cut could increase current rail intermodal containers handled by 73,500 per year. To realize the potential growth in container business, the port needs to overcome a number of physical barriers. Inadequate capacity at the Barbours Cut rail ramp will adversely affect the efficient container interchange between rail and ocean carriers. Likewise, inadequate physical access to the trunk line railroads serving Houston, due to Southern Pacific Lines' private ownership of one strategic rail line linking Barbours Cut, causes increased costs and inefficiencies.

Trade with Mexico

The Mexican economy's diversification and growth will present substantial opportunities for the Port of Houston with the NAFTA and GATT signings. These opportunities include direct seagoing trade, as well as transshipment to Mexico by rail from Houston. Additionally, the port is becoming a more-active consultant in aiding Mexican port efforts to privatize their operations.

All-Water Container Service to Puerto Rico

From a marketing perspective, Houston is a more natural participant than New Orleans, currently the major player, in the Puerto Rican market. A new service to Puerto Rico could provide an additional 50,000 containers per year for the port. Presently, Puerto Rico is the country's largest single containerized-cargo market in Latin America, with 5.5 million tons of cargo per year. Houston does not have ocean carrier service to Puerto Rico, in spite of the fact that the market between Houston and Puerto Rico is 2.5 times larger than that between New Orleans and Puerto Rico. Ideas to encourage such a service include attracting a major Puerto Rican carrier to Houston and having a carrier with faster ships than those currently in service. Since the Houston-Puerto Rico market is larger, it is estimated that an ocean carrier based in Houston would save Puerto Rico $2 million per year compared to one based in New Orleans.

Enhanced Use of Port Real Estate

A more aggressive real-estate policy may result in revenue enhancement opportunities, although these would not provide sufficient income by themselves to overcome the port's overall capital shortfall.[12]

Revenues and Expenditures

The operating revenues for the Port of Houston were $63.977 million in 1993, $46 million, or 73 percent, of which came from vessel and cargo services; $10.4 million from equipment and facilities rentals; and $4.1 million from grain-elevator usage. Refer to table I.4 for dollar breakdowns. The ad valorem tax rate for Harris County is 1.316¢ per $100 of valuation.[13]

Table I.4. Port of Houston Operating Revenues, 1993

Vessel and Cargo Services	$46,061,875
Rental of Equipment and Facilities	10,422,832
Grain Elevators	4,111,728
Bulk Materials	2,088,897
Other	1,291,861
Total	**$63,977,193**

Source: Adapted from Port of Houston Authority, *Comprehensive Annual Financial Report 1993* (Houston, Tex., 1994), p. 4.

Total expenditures were $60.028 million in 1993, of which $34.3 million, or 57 percent, were spent on facility maintenance and operations. Other major expenditures included depreciation and amortization, accounting for 25 percent, and general and administrative expenses, accounting for 18 percent. Refer to table I.5 for operating expenses by dollar.

Table I.5. Port of Houston Operating Expenditures, 1993

Maintenance and Operation of Facilities	$34,315,397
General and Administrative	10,513,138
Depreciation and Amortization	15,199,181
Total	**$60,027,716**

Source: Adapted from Port of Houston Authority, *Comprehensive Annual Financial Report 1993* (Houston, Tex., 1994), p. 4.

Intermodal Access and Land Transport

The Port of Houston's capital-improvement plan reflects the continuing importance of intermodal development. Rail development is strategically important, as exemplified by the intermodal Barbours Cut Terminal expansions currently taking place with ISTEA funds. Four major railroads service the port and 130 trucking companies serve the Houston area.

Rail service is handled by Atchison, Topeka, and Santa Fe Railway, Southern Pacific Lines, Union Pacific Railroad, and Burlington Northern Railroad. These rail carriers provide direct connections from loading areas and shippers, along with competitively priced transport between Houston and major Midwest and West Coast markets.

Port truck traffic is estimated at over 215,000 vehicles annually.[14] Additionally, over 1,000 trucks per day pass through the Barbours Cut Terminal, with good highway access in all directions. This highway access includes the nation's interstate highway system, with interstates 10, 45, and 59 close by.

The Gulf Intracoastal Waterway's impact on the port is significant. It is estimated that if the waterway were to shut down for any reason it would cost port businesses $1.5 million per day in lost barge traffic.[15]

Economic Impacts

Although an economic-impact study was not available, it is estimated that Houston port activity generates over $3 billion annually to the state and national economy. The port directly generates more than 29,000 jobs and indirectly generates an estimated 81,000 local jobs.[16]

Major Issues

Taxes

Compared to that of other Gulf Coast states, Texas' ad valorum taxation on goods that are temporarily in state affects Texas ports' competitiveness. Texas is one of the few states that has not adopted a free-port amendment without loopholes, thereby making its ports less competitive in the gulf. In addition to wharfage and dockage fees already charged by the port, this taxation makes Houston one of the most expensive gulf ports.[17]

Environmental Issues

Environmental regulations can seriously affect port procedures. While the port is certainly supportive of responsible environmental regulations, they should be balanced with economic benefits.[18] Recently, the port joined a private- and public-sector-organization partnership working to preserve and restore area wetlands. The project calls for smooth cordgrass planting at a 220-acre demonstration marsh being developed on Atkinson Island, a port-authority property in upper Galveston Bay. Smooth cordgrass is ideal for restoring wetlands, which are among the most productive habitats for plant and marine life. Material dredged from the Bayport Ship Channel was used to create the demonstration marsh. The effort is a precedent-setting approach, establishing beneficial uses of dredged material. It is an example of how through the port's channel-improvement project, waste materials can be utilized to enhance the environment. Over the next 50 years, the marsh will be expanded to 8,000 acres using dredged material from the ship channel.[19]

Customs

Currently, inspections and the speed at which cargo is cleared are very inconsistent. Uniformity is critical to competition (i.e., cargo clears more quickly and easily at the airports). Cargo could be cleared more quickly with more personnel; however, the consolidation of and location of a customs headquarters in Houston would better alleviate these inefficiencies and inconsistencies.[20]

Intermodal Access/ISTEA Funding

Currently, only one rail line serves the Barbours Cut Terminal, and it is privately owned by Southern Pacific Lines. Because of this virtual monopoly on the rail line, the terminal cannot be as flexible in setting schedules and rates as it would like. Therefore, ISTEA funding was sought to help expand the intermodal rail links to Barbours Cut. A consultant was hired to speed up the process of receiving funds, but it still took over a year for funding to be approved.[21]

Texas Department of Transportation

The Texas Department of Transportation should recognize and promote the fact that the state of Texas lives off of its exports, most of which pass through the state's seaports. There should be more statewide awareness of the port's importance to the Texas economy, and TxDOT should take the lead in securing federal moneys to maintain and improve the ports. Additionally, there should be more cooperation and consultation between the agency and the Texas Ports Association. Finally, the state should think about future transportation plans in a broad overview, integrating seaports, rail, and highway into one comprehensive plan with the intention of improving the links between all transportation modes.[22]

Notes

[1] Houston Ship Channel, *Economic Lifeline to the World*, Houston, Tex. (Brochure.)

[2] Port of Houston, *Facts about the Port of Houston, Fact Sheet*, Houston, Tex. (Brochure.)

[3] Port of Houston Authority, *Port of Houston Magazine* (March 1995), pp. 8-9.

[4] Port of Houston, *Facts about the Port of Houston, Fact Sheet.*

[5] Port of Houston, *Port of Houston, Handbook and Industrial Guide, 1994* (Houston, Tex., 1994), pp. 15-18.

[6] Ibid.

[7] Ibid.

[8] Ibid.

[9] "Smoothing the Seams for Intermodal Cargo," *Port of Houston Magazine* (February 1995), pp. 3-4.

[10] "Tonnage Rises at Port Facilities, 1994," *Port of Houston Magazine* (March 1995), pp. 8-10.

[11] Ibid.

[12] Booz-Allen and Hamilton, Port of Houston Authority, *Houston Master Plan, Final Report, 1994* (Houston, Tex., July 1994).

[13] Port of Houston Authority, *Comprehensive Annual Financial Report*, (Houston, Tex., 1994).

[14] Interview by Josh LaPort and Ludmilla Stupenkova with Thomas J. Heidt, Market Research Manager, The Port of Houston, Houston, Tex., March 23, 1995, Houston, Tex.

[15] Ibid.

[16] The Port of Houston Authority, *Welcome to the Port of Houston,* Houston, Tex. (Brochure.)

[17] Interview with Thomas J. Heidt, March 23, 1995.

[18]Response by Pat Younger, Legislative Affairs Director, Port of Houston, Houston, Tex., to LBJ School of Public Affairs, University of Texas at Austin, questionnaire, “Texas Port Issues Survey,” March, 1995.

[19]Alan Abrams, “Port of Houston Moving Mud for Oil Tankers and the Birds,” *Journal of Commerce* (September 8, 1994), pp. 1-2.

[20]Response by Pat Younger to LBJ School of Public Affairs questionnaire.

[21]Interview with Thomas J. Heidt, March 23, 1995.

[22]Ibid.

Appendix J. Port of Port Isabel Profile

Introduction

The Port Isabel/San Benito Navigation District was originally formed in 1929 to serve a local refinery but today serves as a base for 27 companies engaged in a variety of businesses.[1] The deep-draft port, with a controlling depth of 36 feet, is located at the southern tip of Texas, 29 miles north of the Rio Grande. The port is also located 3 miles from the Brazos-Santiago Pass and connects with the Gulf Intracoastal Waterway.[2]

Operations and Services Performed

As a nonoperating port, Port Isabel has several important industrial and fishing customers. The port provides essential services to shrimp fleets through subsidized docks. Port facilities process 40 percent of all Texas-caught shrimp, which is distributed to every state in the nation.[3] Extensive repairs to existing docks and long-term leases ensure affordable berthing to a large part of the Rio Grande Valley shrimp fleet. Additionally, there are 1,690 feet of trawler dock, all leased long-term.[4]

One long-term lease is held by the Southpoint Marine company. Over $2 million in construction has taken place in this yacht-repair and service business, including electronic and engine repair. In addition, reconstructed transit sheds, with 32,000 square feet available, are now home to seven separate enterprises.[5] Another developing port business is an orange juice blending and packaging plant, which imports frozen citrus juice from Honduras.[6]

Memory Cruise Lines, a Panamanian flagged vessel, has been operational at the port since 1988. This cruise line carries tourists on a 6-hour gambling and sightseeing trip into Mexican waters. There are six cruises weekly, for up to 400 passengers, which leave the port's dedicated cruise dock.[7]

Lone Star Shrimp Hatchery, another port business, provides larval shrimp for south Texas' Hung Shrimp Farms. The hatchery, completed at a cost of $1.4 million in 1991, employs 12 people year-round.[8]

Existing Port Facilities and Equipment

The principal cargo docks are located on the turning basin's west side. The north cargo dock contains 546 feet of steel bulkhead and is of sufficient size and structural composition to accommodate large tugs and 700-foot cargo vessels. Additionally, it has a 35-foot-wide concrete paved surface. The south cargo dock is 600 feet of concrete material and can accommodate a 550-foot vessel. These two docks are separated by a 300-foot developed storage area. Cool- and cold-storage facilities are available as well and are located near the transit sheds and main cargo dock.[9]

The port has two principal covered storage facilities that total 52,000 square feet. The main transit warehouse provides a 32,000-square-foot covered area and is adjacent to a northern 546-foot cargo dock. The west warehouse provides a 20,000-square-foot covered area and has no adjacent wharfage. The port also owns several smaller buildings in the shrimp docks' vicinity.[10]

Modernization and Expansion Plans

The port is currently planning a $1.5 million modernization and rehabilitation of its main cargo dock. This improvement will most likely be financed through the United States Department of Agriculture.

Strategic/Master Plans

No master plan is available.

Revenues and Expenditures

Port Isabel's 1994 annual revenues, over $250,000, are primarily rental and storage receipts, which account for over 70 percent of all 1994 port revenues, totaling nearly $180,000. Port fees also contribute a large revenue portion, these fees totaled 28 percent of the 1994 operating revenues, or $70,000. Refer to table J.1 for expanded 1994 revenue information.

The port's 1994 expenditures, $325,800, are primarily incurred through depreciation losses and salary payments. Salary payments accounted for 27 percent, or $88,000, of the 1994 expenditures. Depreciation losses accounted for 25 percent, or $81,000, of the 1994 total. Refer to table J.2 for 1994 expenditures.

Table J.1. Port of Port Isabel Operating Revenues, 1994

Port Fees	$70,415
Rentals and Storage	179,981
Utilities Sold	965
Miscellaneous Income	3,013
Total	**$254,375**

Source: Interview with Robert C. Cornelison, Port Director, Port Isabel/San Benito Navigation District, Port Isabel, Tex., March 10, 1995.

Table J.2. Port of Port Isabel Operating Expenditures, 1994

Depreciation	$81,000
Insurance	17,099
Salaries	88,403
Port Development	16,148
Bad Debt	45,000
Other	78,139
Total	**$325,790**

Source: Interview with Robert C. Cornelison, Port Director, Port Isabel /San Benito Navigation District, Port Isabel, Tex., March 10, 1995.

Intermodal Access and Land Transport

Currently, the port does not have rail service. The closest rail connection is located in Los Fresnos, which is several miles from the port. The port does have highway access, however, via SH 100, which is approximately 20 miles from U.S. 77.

Economic Impacts

Although there is not an economic-impact study available, the port is home to 27 companies, employing more than 600 persons.

Major Issues

The port is currently developing a relationship with a Central American frozen citrus supplier. This is being accomplished in part because of the recent GATT signing. While this and other international projects have excellent potential in the long run, they will need to be aggressively developed and have little, if any, short-term potential.[11]

Notes

[1]Interview by Jeffrey Stys with Robert C. Cornelison, Port Director, Port Isabel/San Benito Navigation District, Port Isabel, Tex., March 10, 1995, Port Isabel, Tex.

[2]Port Isabel/San Benito Navigation District, *Port Isabel/San Benito Navigation District,* Port Isabel, Tex. (Brochure.)

[3]Interview with Robert C. Cornelison, March 10, 1995.

[4]Port Isabel/San Benito Navigation District, *Port Isabel/San Benito Navigation District.*

[5]Ibid.

[6]Interview with Robert C. Cornelison, March 10, 1995.

[7]Port Isabel/San Benito Navigation District, *Port Isabel/San Benito Navigation District.*

[8]Ibid.

[9]Ibid.

[10]Ibid.

[11]Interview with Robert C. Cornelison, March 10, 1995.

Appendix K. Orange County Navigation and Port District and Industrial Development Corporation Profile

Introduction

The Port of Orange, a deep-draft port, is located on the Sabine River 36 miles from the Gulf of Mexico. The port is 19 miles from open water by the GIWW. The Orange County Navigation and Port District was created in 1957 and has two roles. Orange is unique in its dual role as both the port authority and the industrial development authority for the county. This dual role forces the port to view any activity in two perspectives: how the action would affect the port and how the action would affect the county. The Port of Orange is governed by an elected board of commissioners, which publishes the port's policies, rules, rates, and regulations.[1]

Operations and Services Performed

Orange is currently maintaining its position as a sophisticated niche port specializing primarily in agricultural bagged goods. Refer to tables K.1, K.2, and K.3. However, in recent years the port has sought to diversify its cargo. Currently the port's primary agricultural cargoes are flour, bulgar wheat, dry lentils, and dry peas. The port's location on the freshwater Sabine River has made the port able to layberth ships without fear of rust. Further, the port's location causes it to be designated as a safe harbor.[2] The port is not equipped to handle containers.

Table K.1. U.S. Imports through the Port of Orange, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Vehicles (not Railway)	0	0	0.46
Wood	0	0	0.006
Dairy, Birds, Eggs, Etc.	0	0.293	0
Mineral Fuel, Oil, Etc.	8.485	0	0
Ceramic	0	0.025	0

Source: Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table K.2. U.S. Exports through the Port of Orange, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Vegetables	4	2	4
Milling, Malt, Starch	6	3	2

Source: Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table K.3. U.S. Exports through the Port of Orange, 1991-94 (in Tons)

Commodities	1991	1992	1993	1994
Flour	54,308	65,237	5,391	16,098
Wheat	2,454	4,105	0	12,098
Lentils	2,453	2,453	7,234	7,618
Cornmeal	0	0	3,006	3,059
Dry Peas	2,445	0	0	1,851

Source: Adapted from Port of Orange, "Monthly Tonnage Reports 1991-1994," Orange, Tex., September 1994 (mimeograph).

Note: Years are fiscal years.

Existing Port Facilities and Equipment

The port facilities and equipment include four berths with a total of 2,300 feet of docking space at a depth of 30 feet, a grain elevator and bagging facility located 9 miles from the port docks, and eight warehouses with 354,400 square feet of space.[3] Additionally, the port has an open, surfaced storage area directly behind the Alabama Street terminal.[4] The port does not have a liquid-cargo dock.

Modernization and Expansion Plans

Currently proposed for development is an industrial park on port authority-owned land, a total of 192 acres. The current plan will develop 168 acres across the water from the existing facilities and about 25 acres up Alabama Street. The 168 acres sits on Dravo Peninsula, which is accessible on three sides by water.[5] In a schematic drawn by Albert H. Halff Associates, the proposed peninsular park would be serviced by an existing road and a new rail spur off the existing trunk, complete with marshaling yard and dock tracks. Also proposed for the new site is an intermodal yard and a heavy industrial tract.[6]

The preliminary master plan also provides for less-ambitious port modernization plans. These plans include the widening of the Alabama Street slip, expansion of the Alabama Street terminal, and removal of the dilapidated finger piers along Pier Road to create a layberthing area. The removal of the finger piers will be undertaken and paid for by the federal government. The piers were constructed for the Navy during WWII, and the Army Corps of Engineers has authorized their removal under the Defense Environmental Restoration Program.[7]

Strategic/Master Plans

The port is currently in the process of completing a new strategic plan with Trotter and Associates, which will stretch into a new master planning stage.[8]

Revenues and Expenditures

The information contained in tables K.4 and K.5 comes from the financial statements included in the 1994 annual report from Orange. The port's 1994 operating revenues totaled $1.232 million; of that amount, facility rentals contributed 45 percent. Dockage fees provided another 40 percent, and loading/unloading revenues, pallet rentals, and wharfage fees accounted for 11, 3, and 1 percent, respectively, of the total. Refer to table K.4 for the operating revenue dollar enumeration.

The port's 1994 operating expenses totaled $1.593 million, with salaries accounting for the greatest expenditure with 36 percent of the total. Capital outlays accounted for another 10 percent of total expenses, loading/unloading expenses 9 percent, and maintenance expenses 8 percent. All other port expenditures combined accounted for the remaining 37 percent. Table K.5 outlines operating expenses by dollar.

Table K.4. Port of Orange Operating Revenues, 1994

Rent	$544,090
Dockage	483,830
Loading and Unloading	128,110
Pallet Rental	35,428
Wharfage	8,869
Total	**$1,232,137**

Source: Adapted from Charles E. Reed & Associates, "Orange County Navigation and Port District, Financial Statements," Orange, Tex., September 30, 1994.

Twenty-seven percent of the total annual budget for Orange is derived from ad valorem taxes. The current tax rate is 1.73 ¢ per $100 valuation, the lowest in the gulf region. This is one area where the dual role of economic developer and port authority conflict; the port needs revenues, but it cannot afford to raise the tax and adversely impact the county's development.[9]

Table K.6. Port of Orange Operating Expenditures, 1994

Salaries and Benefits	$585,702
Capital Outlays	153,726
Loading and Unloading	141,010
Property and Facility Maintenance	119,719
Contract Labor	109,743
Other	483,147
Total	**$1,593,047**

Source: Adapted from Charles E. Reed & Associates, "Orange County Navigation and Port District, Financial Statements," Orange, Tex., September 30, 1994.

Intermodal Access and Land Transport

Rail Access

Orange is served by the Union Pacific Railroad, Southern Pacific Lines, and Sabine River and Northern. All warehouses have covered rail service, allowing up to 60 cars to be unloaded simultaneously.[10]

Truck Access

The port is directly served by Alabama Street, which provides access via 16th Street to Interstate 10. Alabama Street also provides access to Green Avenue, which provides access to U.S. highways 90 and 87. Highway 90 becomes Interstate 10, and 87 heads south to Port Arthur and north to Newton County.

Economic Impacts

According to the American Association of Port Authorities figures, in fiscal year 1994-95, the port will have moved $3.6 million through the Orange marketplace on current bookings alone. Additionally, it will have provided 120 jobs in Orange County.[11] In 1992 the port moved $4.6 million through the Orange marketplace.[12] Economic-impact studies were not available.

Major Issues

Gulf Intracoastal Waterway

Proper GIWW maintenance is essential to the port's smooth operations. Port Director Roger P. Richard sees trade expansion to Mexico via the GIWW; therefore, proper waterway maintenance is needed to facilitate trade.[13]

Environmental Issues

Dredge-spoil disposal is costly and the permitting process is time consuming. Because the port is attempting major facility expansion, compliance with wetlands regulations is drastically becoming an issue to the port.[14]

State Participation

The proximity of the port to Louisiana, across the river, creates extensive competition between Louisiana ports and Texas ports. The Louisiana government provides annual financial support for its ports. Therefore, some type of equalization program should be done in Texas. One area in which the state could help is to assist ports in their bond solicitation, as state government backing would facilitate capital improvements. Such assistance from the state would help balance the difference between Texas and Louisiana ports.[15]

Commodities Export

The port is a large handler of the Public Law 480 and EEP bagged commodities. Bagged goods accounted for 80 percent of the port's cargo, much of that foreign aid.[16] Additionally, bagged goods have been one of the top tonnage cargoes for many years. Any prospective cutbacks in foreign aid would certainly have an adverse affect on the Port of Orange.[17]

Notes

[1]Interview by Brandon Lobb with Roger P. Richard, Director and CEO, Orange County Navigation and Port District and Industrial Development Corporation, Orange, Tex., March 21, 1995, Orange, Tex.

[2]Ibid.

[3]Port of Orange, *Port of Orange*, Orange, Tex. (Pamphlet.)

[4]Interview with Roger P. Richard, March 21, 1995.

[5]Port of Orange, *Port of Orange Industrial Park, Orange, Texas, Deepwater Site,* Orange, Tex. (Pamphlet.)

[6]Albert H. Halff Associates, Inc., "Port of Orange Industrial Park Future Development Plan," Orange, Tex. (schematic).

[7]Trotter and Associates, Inc., "Orange County Navigation and Port District Strategy Planning Workshop," Orange, Tex., March 3, 1995 (workshop).

[8]Ibid.

[9]Interview with Roger P. Richard, March 21, 1995.

[10]Port of Orange, *Port of Orange*.

[11]"Port of Orange Update," *The Gulf Shipper Magazine* (January 23, 1995).

[12]Interview with Roger P. Richard, March 21, 1995.

[13]Ibid.

[14]Ibid.

[15]Ibid.

[16]Kathleen Dombart Bark, "Port Seeks to Diversify Cargo," *Beaumont Enterprise* (September 12, 1993).

[17]Interview with Roger P. Richard, March 21, 1995.

Appendix L. Port of Port Arthur/Jefferson County Navigation District

Introduction

The Port of Port Arthur Navigation and Port District, a deep-draft port, is located on the Gulf Intracoastal Waterway between Beaumont and the Gulf of Mexico. The port is 19 miles from open water by the GIWW. The port is actually an improved bank of the GIWW that is capable of handling numerous cargo types. In public operation since 1968, Port Arthur is governed by an elected board of commissioners, which publishes the port's policies, rules, rates, and regulations.[1]

Operations and Services Performed

The Port of Port Arthur is currently maintaining its position as a sophisticated niche port specializing in forest products, iron and steel, and breakbulk. Refer to tables L.1, L.2, and L.3. The port is actively pursuing breakbulk cargo with the ongoing construction of additional dock and shed space. Currently the port's primary breakbulk cargoes are plywood, lumber, pulp, paper, iron, and steel. Only recently have steel and iron outpaced forest products.[2] The port is equipped to handle containers.

The port has regular liner service from Star Shipping, Spliethoff's, Massan, Zim American Israel, and Clipper Americas. Monthly cargo service reaches the United Kingdom, Europe, the Mediterranean, the Canary Islands, Mexico, the Caribbean Sea, and South America.[3]

Table L.1. U.S. Imports through the Port of Port Arthur, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Mineral Fuel, Oil, Etc.	2,085	2,516	2,784
Iron and Steel	56	40	62
Food Waste, Animal Feed	9	9	17
Machinery	0	1	15
Paper, Paperboard	2	4	10

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table L.2. U.S. Exports through the Port of Port Arthur, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Mineral Fuel, Oil, Etc.	196	118	134
Cereals	50	115	93
Ships and Boats	7	0	68
Wood	50	93	63
Organic Chemicals	47	47	40

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table L.3. Port of Port Arthur Top Five Commodities, 1992-94 (in Tons)

Commodities	1992	1993	1994
Steel Slabs	140,846	246,964	229,065
Plywood	204,437	122,096	110,117
Steel Rails	0	0	54,133
Linerboard	30,750	12,020	23,113
Wood Pulp	17,328	9,908	13,918

Source: Adapted from Port Arthur International Public Port, *Port of Port Arthur Cargo History* (Port of Port Arthur, Port Arthur, Tex., 1995).

Existing Port Facilities and Equipment

The port's facilities include two berths with docking space totaling 1,200 feet with a 40-foot depth. Operating along the entire dock length, a 75-ton level luffling crane helps to unload cargo. Additionally, the port owns and operates one transit shed with 194,400 square feet of space[4] and 130,000 square feet of open, surfaced storage area.[5] The port does not have a grain elevator or a liquid-cargo dock.

Modernization and Expansion Plans

Three additional berths are under construction that will add 1,800 feet of dock. Likewise, the expansion will also construct at least 200,000 square feet of new transit sheds and 70,000 square feet of paved open storage area. Furthermore, the docks' extension, with the three existing rail lines, will bring rail service dockside.[6] The expansions are all funded by a $34 million local bond.[7]

Strategic/Master Plans

The new construction listed above will have completed the previous master plan. The port is currently developing a new master plan.[8]

Revenues and Expenditures

The information contained in tables L.4 and L.5 comes from the financial statements included in the 1994 annual report. Port of Port Arthur's 1994 operating revenues totaled \$2.445 million, of which public ocean terminal fees contributed 55 percent. Dry-dock revenues, management fees, and property sales contributed 9, 10, and 11 percent, respectively, of total revenues. All other revenues combined accounted for 15 percent. Table L.4 provides more revenue detail by dollar.

The Port of Port Arthur's 1994 operating expenses totaled \$4.469 million. Capital outlay expenditures were 43 percent of that sum, accounting for the largest single expense. Salaries, loading and unloading costs, and maintenance also accounted for sizeable operating expenses. Table L.5 outlines operating expenses.

Table L.4. Port of Port Arthur Operating Revenues, 1994

Public Ocean Terminal Operations	\$1,333,468
Interest Revenue	156,702
Rental Revenue	86,991
Dry Dock Revenue	217,617
Management Fees	252,448
Principal on Sale of Port Property	48,246
Interest on Sale of Port Property	69,670
Sale of Port Property	280,000
Total	**\$2,445,142**

Source: Adapted from Port of Port Arthur Navigation District of Jefferson County, Texas, "Report of Examination," Port Arthur, Tex., July 31, 1994.

Thirty-six percent of the port's total annual budget is derived from ad valorem taxes. The current tax rate is 5.484¢ per $100 valuation, with 3.652¢ used for operations and maintenance and the other 1.832¢ being used for the retirement of debt.[9]

Table L.5. Port of Port Arthur Operating Expenditures, 1994

Capital Outlays	$1,935,662
Other Operating Expenditures	676,159
Salaries	533,962
Loading and Unloading Subcontractor Costs	489,033
Property and Facility Maintenance	337,636
Other	497,202
Total	**$4,469,654**

Source: Adapted from Port of Port Arthur Navigation District Of Jefferson County, Texas, "Report of Examination," Port Arthur, Tex., July 31, 1994.

Intermodal Access and Land Transport

Rail Access

The Port of Port Arthur is serviced by the Kansas City Southern and Southern Pacific railroads under a long-term reciprocal switching agreement. All docks, current and under construction, have three sets of tracks running their entire length. Two of the three tracks run under a port crane; the other runs landside next to the crane. Currently, the dock rails can accommodate 60 railcars and 300 40-foot containers on the front apron. Upon completion of the dock extension, the docks will be able to spot 150 railcars simultaneously, in addition to 750 40-foot containers shipside.[10]

Truck Access

The port is directly served by Procter and Houston streets, which provide access to State Highway 73, State Highway 69/96/287 and State Highway 87. State Highway 73 leads to Houston, State Highway 69 leads to Beaumont and crosses Interstate 10, and State Highway 87 leads to Orange crossing Interstate 10 as well.

Economic Impacts

According to the port's figures, the port moved $24 million through the Port of Port Arthur marketplace in fiscal year 1993-94.[11] No other economic-impact data are available for this study.

Major Issues

Because the port actually sits on the Gulf Intracoastal Waterway, any threatened closure would adversely affect the port. The proper maintenance of the GIWW is also essential to smooth port operations. Dredge disposal appears to be a port issue, as with other ports, because the process is costly. The permitting process to undertake dredge disposal is time consuming, and numerous environmental regulations must be considered.[12]

Notes

[1]Interview by Brandon Lobb with Floyd Gaspard, Deputy Port Director, Port Arthur Navigation District, Port Arthur Tex., March 21, 1995, Port Arthur, Tex.

[2]Ibid.

[3]Port Arthur, "Port of Port Arthur, Texas," Port Arthur, Tex. (document).

[4]Port Arthur, *Small Facility, Gigantic Ability!,* Port Arthur, Tex. (Pamphlet.)

[5]Port Arthur, *Meet Big Arthur*, Port Arthur, Tex. (Pamphlet.)

[6]Port Arthur, "Port of Port Arthur, Texas."

[7]Interview with Floyd Gaspard, March 21, 1995.

[8]Ibid.

[9]Brammer, Begnaud & Lattimore, *Port of Port Arthur Navigation District of Jefferson County, Texas, Report of Examination* (Port Arthur, Tex., July 31, 1994), p. 21.

[10]Port Arthur, "Port of Port Arthur, Texas."

[11]Interview with Floyd Gaspard, March 21, 1995.

[12]Ibid.

Appendix M. Port of Port Lavaca-Point Comfort/Calhoun County Navigation District Profile

Introduction

The Port of Port Lavaca-Point Comfort is a deep-draft port located near the Texas Gulf Coast's midpoint on Lavaca Bay's eastern shore. Port facilities are located on the western terminus of the 24-mile-long Matagorda Ship Channel, which has an operating depth of 36 feet.[1]

The port is owned and operated by the Calhoun County Navigation District, which itself operates under a board of commissioners and a port director. The commissioners are elected officials who have the authority to assess taxes, govern, and designate management.[2]

Operations and Services Performed

The Port of Port Lavaca-Point Comfort primarily serves local industries and manufacturers. Key industries found in the port's area are petrochemical processing, primary metals manufacturing, oil and gas production, and agriculture.[3] The largest user of the public facilities is Formosa Plastics Corporation, a chemical manufacturer.[4] See tables M.1 and M.2 for information regarding annual imports and exports.

Table M.1. U.S. Imports through the Port of Port Lavaca-Point Comfort, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Ores, Slag, and Ash	124	92	92
Organic Chemicals	0	0	17
Salt, Sulfur, Earth, Stone	4	3	5
Machinery	5	2	4
Mineral Fuel, Oil, Etc.	0	0	4

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table M.2. U.S. Exports through the Port of Port Lavaca-Point Comfort, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Inorganic Chemicals	35.473	9.376	36.538
Machinery	0.000	10.939	31.538
Other Chemical Products	14.464	5.829	8.176
Electrical	.008	.072	.223
Iron or Steel Products	0.000	0.000	.033

Source: Adapted from Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Existing Port Facilities and Equipment

General-cargo facilities at the port include: one ship dock that can accommodate vessels up to 750 feet, with a water draft of 36 feet and unlimited air draft, one barge dock with an outloading conveyer to handle both bulk and liquid cargoes, and one general-cargo warehouse with 25,000 square feet of storage.

Bulk-liquid cargo facilities at the port include two ship berths, a remote-control firefighting system, hazardous-materials containment systems, and a stormwater collection system with temporary storage for contaminated stormwater. Additionally, the port operates a liquid-cargo barge terminal with six barge slips having an operating depth of 14 feet and dock height of 12 feet.

The port also operates a multipurpose dock, which includes the following features: one slip with an operating depth of 16 feet capable of handling project cargoes, heavy equipment, roll on-roll off, containerized, and dry-bulk shipments; a 60-foot by 380-foot concrete marshaling area that provides heavy-lift capabilities with a 1,500-pounds-per-square-foot live-loading capacity; 3 acres of open storage space; and a public barge staging area that can be used for barge storage before and after cargo transfer.[5]

Modernization and Expansion Plans

A $62 million port expansion project was completed in December 1994. The project was aimed at widening the port facilities' scope and services and was implemented as a direct result of a Calhoun County Navigation District and Formosa Plastics Corporation agreement. Under the agreement, the district constructed a new liquid-cargo ship terminal, including bulkheads, pipe-rack capabilities, and modern safety facilities. The facilities will be used to load and unload ships and barges, meeting the existing and future operational needs of Formosa and its affiliates.[6]

The project was partially financed by a $10 million grant from the Texas Department of Commerce. The district agreed to finance the project's remaining cost by issuing revenue bonds. Formosa agreed to bear responsibility for the purchase, guaranty, and financing of the bonds, as well as to provide funds for project construction until permanent bond financing was completed.[7]

Strategic/Master Plans

Although Port Lavaca-Point Comfort does not have a formal strategic plan, port officials have specific ideas for port expansion and growth. At this time, the port has developed a strong local niche market, which is helped by the healthy financial condition of Formosa Plastics. The port would like to diversify its customer base and is currently developing methods to expand into Latin American markets.[8]

Contributing to the port's plans to expand their international markets is the Foreign Trade Zone situated in Calhoun County and neighboring Victoria County. The FTZ is managed by the Calhoun-Victoria Foreign Trade Zone and includes six general-purpose sites and three subzones. Site 1 includes the Port Lavaca-Point Comfort facilities, and two other sites are located near the port.[9]

Revenues and Expenditures

The port's operating revenues primarily consist of wharfage fees, taxes, and damages. Wharfage fees alone account for 38 percent of the port's revenues, damages account for another 28 percent, taxes 22 percent, and leases another 6 percent. Total operating revenue for 1994 is $1.427 million. Table M.3 gives further 1994 revenue detail by dollar value.

In recent years, the port has decreased its dependency on the tax base for operating revenues. Instead, over 80 percent of its revenues now come from user fees, which has put the port in a much stronger financial condition.[10]

The port's operating expenses are made up almost entirely of warehouse dock expenditures, accounting for 71 percent of the total. Administrative costs and maintenance expenditures account for an additional 13 and 8 percent, respectively. Total operating expenses for 1994 were $1.596 million. Refer to table M.4.

Table M.3. Port of Port Lavaca-Point Comfort Operating Revenues, 1994

Taxes	$320,997
Leases	92,693
Dockage and Wharfage	523,896
Damages	401,364
Interest	70,286
Other	18,585
Total	**$1,427,821**

Source: Adapted from Calhoun County Navigation District, *General Purpose Financial Statements* (Point Comfort, Tex., June 30, 1994).

Table M.4. Port of Port Lavaca-Point Comfort Operating Expenditures, 1994

Administrative	$215,281
Operations	11,994
Maintenance Costs	125,980
Security	10,155
Warehouse Dock	1,124,306
Conveyer Barge Dock	24,067
Maintenance	27,597
Grounds and Facilities	30,904
Tax Collection	9,262
Other	16,234
Total	**$1,595,780**

Source: Adapted from Calhoun County Navigation District, *General Purpose Financial Statements* (Point Comfort, Tex., June 30, 1994).

Intermodal Access and Land Transport

Rail Access

Railway access to the port is less than adequate. While both Union Pacific and Southern Pacific have rail lines in Calhoun County, direct connection to these lines is limited to a shortline operated by the Point Comfort and Northern Railway.[11] Unfortunately, the shortline is very expensive to use, and port customers have raised concerns about its costs. The Port of Port Lavaca-Point Comfort's attempts to improve the railway connection service have so far proven unsuccessful.[12]

Truck Access

Highway access to the Port of Port Lavaca-Point Comfort is sufficient. It is directly served by State Highway 35, which also connects to U.S. Highway 87. Highway 35 has been identified as a National Highway System component and a priority for expansion under the federal Intermodal Surface Transportation Efficiency Act of 1991.

According to Port Director Robert H. Van Borssum, the port's ability to expand would be served by a U.S. Highway 87 expansion. In the near future, this highway will be widened to four lanes from Port Lavaca to U.S. Highway 59 in Victoria. A demonstration project to expand U.S. Highway 59 is also currently under consideration, and has potential to favorably impact the port.[13]

Major Issues

Role of Texas State Government

Port officials believe that the Texas Department of Transportation could play a much more important and supportive role in its interactions with Texas seaports. Better promotion of Texas ports on a statewide level by either TxDOT or the Texas Department of Commerce could significantly boost the Texas seaports' ability to grow and compete, both nationally and internationally. The port would also like to see more financial investment in seaports by the state and federal governments.[14]

Environmental Issues

The port currently engages in open-bay disposal of dredge material. As long as it is able to continue this practice, the port should have no difficulty continuing its dredging operations. Due to a lack of available land that could be used for upland disposal, without open-bay disposal, the port has few cost-effective alternative disposal options. While not a problem at this time, the port is keeping a close watch on this situation.[15]

Notes

[1] Calhoun County Navigation District, *The Port of Port Lavaca-Point Comfort,* Point Comfort, Tex. (Brochure.)

[2] Calhoun County Navigation District, *General Purpose Financial Statement* (Point Comfort, Tex., June 30, 1994), p. 5.

[3] Calhoun County Navigation District, *The Port of Port Lavaca-Point Comfort.*

[4] Interview by Carol Kim and Charles Montgomery with Robert H. Van Borssum, Port Director, Port of Port Lavaca-Point Comfort, Point Comfort, Tex., March 14, 1995, Point Comfort, Tex.

[5] Calhoun County Navigation District, *The Port of Port Lavaca-Point Comfort.*

[6] Calhoun County Navigation District, *General Purpose Financial Statements,* p. 9.

[7] Ibid.

[8] Interview with Robert H. Van Borssum, March 14, 1995.

[9] Calhoun County Navigation District, *The Port of Port Lavaca-Point Comfort.*

[10] Interview with Robert H. Van Borssum, March 14, 1995.

[11] Calhoun County Navigation District, *The Port of Port Lavaca-Point Comfort.*

[12] Interview with Robert H. Van Borssum, March 14, 1995.

[13] Ibid.

[14] Ibid.

[15] Ibid.

Appendix N. Port of Port Mansfield/Willacy County Navigation District Profile

Introduction

Created in 1948, by voters' action in the district, Port Mansfield has traditionally been dependent on offshore drilling. At one time there were 60 to 70 offshore drilling rigs located off the port.[1] Today, the port's recreational facilities are active; the small-craft basin is 80 percent leased, while the industrial basin is 80 percent vacant.[2] The Port of Mansfield leases residential property to approximately 450 Port Mansfield residents. The navigation board functions as the town's governing body and makes decisions on paving, improvement, and issuing building permits.[3]

This shallow-draft port is maintained at a 16-foot depth and has a 1,500-foot by 400-foot dock space. The industrial basin has only one customer, M.I. Drilling Fluids, which brings in two Ferox drilling-mud barges per month totaling about 1,000 tons.[4] This mud is used to seal off oil wells damaged through salt water leakage. Once it reaches the port, Ferox mud is shipped throughout the Rio Grande Valley and Mexico. The port's primary marina users are sport fishers. The marina has a total of 144 covered and open boat stalls.

Modernization and Expansion Plans

Because Port Mansfield operates as a town or city, many projects are road and drainage improvements, along with continued maintenance of the harbor itself.[5] The port administration is currently trying to attract on-site manufacturing that needs waterborne transportation access.

Strategic/Master Plans

A port master plan is presently being completed. This plan will determine potential development areas and provide marketing strategies for the port. The port will try to attract a niche market of recreational users who need easy air access to their homes. This will be accomplished in 1996 by extensive renovation and expansion of Port Mansfield's existing 3,200-foot public airfield.[6] The port is considering golf course development to make the area more attractive to recreational users.

Revenues and Expenditures

Port Mansfields' 1994 revenues totaled $657,685. Lease income accounted for the port's revenue majority with 51 percent, or $340,567, contributed in 1994. Taxes accounted for a large revenue proportion as well, with 34 percent, or $221,284, of 1994 revenues. Refer to table N.1 for dollar revenue breakdowns.

The port's expenditures totaled $624,925 in 1994. Payroll, materials and supplies, and capital expenditures consumed the bulk of expenses, accounting for 36, 24, and 22 percent of the total respectively. Refer to table N.2 for dollar breakdowns.

Table N.1. Port of Port Mansfield Operating Revenues, 1994

Taxes	$221,284
Lease Income	340,567
Charges for Services	8,539
Miscellaneous	69,421
Interest Income	17,874
Total	**$657,685**

Source: Adapted from Willacy County Navigation District, "Audited Financial Statements," Port Mansfield, Tex., May 31, 1994.

Table N.2. Port of Port Mansfield Operating Expenditures, 1994

Payroll and Related Expenditures	$224,934
Professional Fees	21,429
Consumable Supplies and Materials	147,331
Recurring Operating Expenditures	96,210
Capital Expenditures	135,021
Total	**$624,925**

Source: Adapted from Willacy County Navigation District, "Audited Financial Statements," Port Mansfield, Tex., May 31, 1994.

Intermodal Access and Land Transport

The port has no rail service. The port is located approximately 20 miles from U.S. Highway 77 on State Highway 186. The port's highway industrial traffic consists of approximately 40 to 50 Ferox drilling-mud truckloads per month.[7]

Economic Impacts

The port directly generates approximately 70 jobs. Because of its recreational nature, the port supports three motels, three restaurants, and one private club. Also located at the port are sport-fishing facilities that include three boat-repair shops, two boat marinas, three boat-storage barns, and three fish houses. Other local employers that are port supported include a shrimp hatchery, three RV parks, a cable TV company, two construction companies, and a bar.[8] There is not an economic-impact study available at this time.

Major Issues

The threatened Gulf Intracoastal Waterway closure south of Corpus Christi has made it difficult for any long-range port planning or marketing attempts. The port administrator feels that the GIWW is an important resource that must be protected by state officials. The GIWW can and should play a major role in the large bulk transportation of various products, and Port Mansfield would like to be actively involved in this function.

The Laguna Madre Bay's health is also of vital significance to the port. The port's heavy recreational use requires the area's environmental health to be sound. This environmental maintenance is necessary to attract sport fishers, boaters, bird watchers, as well as temporary and permanent residents to promote economic stability in the area.

The port has both business and recreation development potential. The port administrator asserts that inadequate information access has limited port development abilities. He believes the port has much to offer businesses with nontraditional needs that require waterborne transportation access.[9]

Notes

[1]Interview by Jeffrey Stys with Michael Wilson, Port Director and General Manager, Willacy County Navigation District and Port Mansfield Public Utility District, Raymondville, Tex., March 11, 1995, Raymondville, Tex.

[2]Response by Michael Wilson to request for information by the LBJ School of Public Affairs, University of Texas at Austin, March, 1995.

[3]Interview with Michael Wilson, March 11, 1995.

[4]Response by Michael Wilson to request for information by the Texas Department of Transportation (TxDOT), June 6, 1994.

[5]Response by Michael Wilson to request for information by TxDOT, June 6, 1994.

[6]Interview with Michael Wilson, March 11, 1995.

[7]Response by Michael Wilson to request for information by TxDOT, June 6, 1994.

[8]Telephone interview by Jeffrey Stys with Michael Wilson, Port Director and General Manager, Willacy County Navigation District and Port Mansfield Public Utility District, Raymondville, Tex., April 12, 1995.

[9]Interview with Michael Wilson, March 11, 1995.

Appendix O. Sabine Pass Port Authority Profile

Introduction

The Sabine Pass Port Authority was created in 1973 under House Bill 94. The port authority is basically an area marina. The port authority itself is not a port that engages in waterborne commerce but instead functions as a marina.[1]

Existing Port Facilities and Equipment

The facility has dock space for 60 vessels that are 100 feet or shorter.[2]

Overview

Sabine Pass is an area that is mentioned in most statistics as one of the major Gulf Coast harbors. This statistic is misleading when considering the physical ports themselves. The data used most often are collected by the U.S. Army Corps of Engineers, and they are most misleading because of the collection manner. The Corps of Engineers counts tonnages going to or from a given area of the Gulf Intracoastal Waterway. The data are then attributed to the local port. Because there are many local refineries surrounding the port area, the amount of tonnage attributed to Sabine Pass artificially creates port cargo.

Notes

[1] Letter from J. M. DuBose, Director, Sabine Pass Port Authority, Sabine Pass, Tex., to Brandon Lobb, March 20, 1995.

[2] Ibid.

Appendix P. Port of Texas City/Texas City Terminal Railway Company Profile

Introduction

The Port of Texas City is a private port and has no affiliation with any government or public agency. Texas City Terminal Railway Company acts as port authority and coordinates all port functions with the port users. The port has been in operation since 1893. The railroad and the port were built and continue to operate as private entities.[1]

The Port of Texas City is located on Galveston Bay 11 miles inland from the Gulf of Mexico, 5 miles north of Galveston. The port channel is approximately 6 miles long with 400-foot bottom width and 40-foot depth at mean low tide, navigable day or night. The turning basin is approximately 4,200 feet long and 1,200 feet wide with a depth of 40 feet at MLT, has fronting of all slips, and is protected by a manmade island. An industrial canal extends westward approximately 2 miles, with a depth of 40 feet at MLT and width of 250 feet.[2]

Operations and Services Performed

The number of oil refineries and chemical-processing plants located on port property results in the major imported and exported commodities being bulk oils and chemical products (see tables P.1, P.2, and P.3).

Existing Port Facilities and Equipment

The Texas City Terminal Railway Company coordinates the port activities and operates a joint facility for the four railroads that serve the port: Atchison, Topeka, and Santa Fe Railway, Union Pacific Railroad, Southern Pacific Lines, and Burlington Northern Railroad.[3]

Of the 43 berths available, 22 are privately owned by such companies as Amoco Oil, Union Carbide, Sterling Chemicals, and ARCO Pipeline. The remaining 21 are owned by Texas City Terminal Railway Company and are utilized as public berths by Marathon Oil, Amoco Chemical, Phibro Refining, Stan Trans, and other users.[4] The port also provides two supertanker docks for crude petroleum, as well as a dry bulk facility operated by AIMCO. The two supertanker docks, numerous tanker docks, and barge docks handle 39.2 million tons of bulk-liquid cargo annually, with an average of 4,970 barges and 831 ships. The dry-bulk facilities handle 1.8 million tons on 156 barges and 117 ships.[5]

Table P.1. U.S. Imports through the Port of Texas City, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Mineral Fuel, Oil, Etc.	2,267	2,296	2,191
Beverages	11	33	65
Organic Chemicals	42	32	34
Ores, Slag, and Ash	0	0	3
Plastic	0	0	1

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services, [electronic information], 1993, 1994).

Table P.2. U.S. Exports through the Port of Texas City, 1991-93 (in Millions of Dollars)

Commodities	1991	1992	1993
Organic Chemicals	267	178	136
Mineral Fuel, Oil Etc.	227	126	128
Wadding, Felt, Twine, Rope	48	63	28
Other Chemical Products	43	36	25
Inorganic Chemicals, Earth Materials	15	17	6

Source: Adapted from Global Trade Information Services, *Waterborne Trade Atlas* (Global Trade Information Services [electronic information] 1993, 1994).

Table P.3. Distribution of Net Tonnage Handled at All Port of Texas City Facilities, 1992-94

Cargo	1992	1993	1994
Imported Crude Oil	29,027,458	31,989,503	33,147,687
Domestic Crude Oil	3,204,120	2,794,382	3,026,704
Bulk Oil Refined	10,483,516	10,365,969	10,107,503
Liquid Chemicals	8,744,074	8,364,951	9,442,591
Bunkers to Ships	1,464,218	694,631	637,252
Dry Bulk (Various)	1,911,977	1,653,597	1,446,141
Dry Cargo	0	100	6,629
Total Net Tons	54,835,363	55,863,133	57,814,507
Ships with Cargo	1,161	1,112	1,294
Barges with Cargo	6,455	6,480	6,748

Source: Adapted from Texas City Terminal Railway Company, *Port of Texas City, 1994*, Texas City, Tex. (handout).

Note: Total railroad cars handled in 1994 totals 58,971.

The port owns five off-waterfront warehouses for lease, and areas are available to construct warehouses according to potential clients' specifications. The port also has numerous easements covering pipelines, which traverse the property serving industries and port areas.[6]

Additionally, a 20-foot-high seawall, under county control, encircles the city and industrial areas. This seawall provides substantial protection from the occasional storms that visit the Gulf Coast.[7]

Modernization and Expansion Plans

The year 1994 witnessed a continuation of Texas City Terminal Railway Co.'s port rehabilitation program, which began in early 1992. Currently, the port is in the fourth year of a seven-year project to rebuild and upgrade most of the port's 43 docks. This includes redesigning docks and installing a fender system to prevent dock damage.[8]

Some docks have been demolished and replaced by modern steel and concrete docks to provide better accessibility and a much safer berthing configuration. Dock size was also increased to allow substantial increases in vessel traffic.[9]

Several high-efficiency railroad tracks were constructed to replace lighter trackage, and maintenance was performed on numerous tracks to provide greater rail safety. Likewise, a new rail-crossing signal protection system was installed on the main line at Loop 197 to improve train-approach warnings to motorists. In addition, the port installed 10,000 feet of fiber-optic cable, allowing remote observation of trains and transmission of data.[10]

Strategic/Master Plans

The Port of Texas City is currently developing a master plan and expects it to be published in summer of 1995.[11]

Revenues and Expenditures

Since the Port of Texas City is a private port, the port officials could not provide the operating revenue and expenditure data.

Intermodal Access and Land Transport

The port does not have intermodal service at the docks. Nevertheless, the port rates the rail and truck access to the port as sufficient. Currently, four railroads have equal access to the port. The rail tracks serving the industries and port are owned by the Texas City Terminal Railway Company.[12]

Economic Impacts

Today the city of Texas City has a population of over 40,000. The port is one of the largest in the state, and the industrial area is comprised of nine national and international oil and chemical companies, with numerous adjunct and satellite firms.[13]

Although Texas City Terminal Railway Company began with 10,000 acres, it has dedicated most of those lands to the city's development, attracting business and industrial concerns, as well as port and railroad establishment.[14]

Local industries benefit from the port's structure and maintain cooperation. Likewise, the city of Texas City has historically been a willing and helpful partner. Today, new industries are planning important projects, while existing industries and businesses are expanding.[15] According to Port General Manager K.L. DeMaet, 40 percent of the Texas City population is affected directly or indirectly by port activities.[16]

Major Issues

The port users are all domiciled within the port's perimeter area, thus making the recent passages of NAFTA and GATT relatively unimportant for the port's relationship with Mexico.[17]

The port considers restrictive and costly environmental regulations, which do not substantially improve pollution abatement, as unnecessary and hurtful. They restrict area oil-refinery and chemical-plant construction, since 97 percent of the port's cargo is oil and chemical-related products. The port is trying to find a reasonable balance between the environmental regulations and economic planning.

The Gulf Intracoastal Waterway plays an important role in cargo transfer through the Port of Texas City. The port receives more than 6,500 barges a year, and approximately 60 percent traverse the GIWW, generating a large impact on the port. Consequently, the GIWW dredging impacts the port significantly. It is the vehicle for large barges, which provide improved safety, operational efficiency, and monetary savings.

Safety and security measures, according to the Coast Guard at the port, are very important. Since the port has no authority to control or regulate the vessels' speeds through the port, while the Coast Guard does have such authority, the port cannot reduce speed limits to ensure safety. Furthermore, the Coast Guard has the jurisdiction to inspect and shut down the port in emergency situations, such as vessel accidents.

Another important issue affecting the port is fire fighting-capability improvements. The series of segmented fire-fighting systems are currently owned by companies located on-site. The port proposes having one centralized fire-fighting system, tying the water lines together, allowing for increased and redundant water support. Safety issues are always the first-priority action items of the port.

Finally, although the Port of Texas City is a private entity, the port authorities believe that a mutually beneficial relationship with the Texas Department of Transportation could prove helpful.

Notes

[1] Texas City Terminal Railway Company, *Texas City Terminal Railway Company*, Texas City, Tex., 1994. (Brochure.)

[2] "U.S. Gulf Ports," *World Wide Shipping* (December 1989), p. 90.

[3] Texas City Terminal Railway Company, *Texas City Terminal Railway Company.*

[4] Ibid.

[5] "U.S. Gulf Ports," *World Wide Shipping,* p. 90.

[6] Texas City Terminal Railway Company, *Texas City Terminal Railway Company.*

[7] Ibid.

[8] Interview by Josh La Porte and Lyudmila Stupenkova with K. L. DeMaet, President, General Manager, and Treasurer, Texas City Terminal Railway Company, Texas City, Tex., March 24, 1995, Texas City, Tex.

[9] "Equipment Improvements Mark Busy Year for Railway," *Texas City Sun* (February 26, 1995), p. 11D.

[10] Ibid.

[11] Interview with K. L. DeMaet, March 24, 1995.

[12] Ibid.

[13] Texas City Terminal Railway Company, *Texas City Terminal Railway Company.*

[14] Ibid.

[15] Ibid.

[16] Interview with K. L. DeMaet, March 24, 1995.

[17] The information in this section is based on the March 24, 1995, DeMaet interview.

Appendix Q. Victoria Barge Canal/Victoria County Navigation District Profile

Introduction

The Victoria Barge Canal is a 36-mile-long shallow-draft channel that is 100 feet wide and 9 feet deep. It extends from the Gulf Intracoastal Waterway in San Antonio Bay near Seadrift and ends at Pickering Basin, about 15 miles from Victoria.[1] The city of Victoria is located on the Texas midcoast, halfway between Houston and Corpus Christi. The canal has been operating since 1966 and is governed by the Calhoun County West Side Navigation District and the Victoria County Navigation District.[2]

Operations and Services Performed

Victoria County's economy is significantly impacted by the Victoria Barge Canal, which services the oil and gas petrochemical industries that are the region's main industries. Commodities moved on the canal are primarily sand and gravel, petrochemical products, and industrial chemicals.[3]

The opening of the barge canal made it possible for the area's rich gravel deposits to be mined. Previous to the canal's construction, sand and gravel production took place in Victoria's western and northern sections and were moved by rail. Other deposits far from the rail lines remained untapped because no alternative economical transport method for the material existed. By 1989, 96 percent of all sand and gravel shipped on the Gulf Intracoastal Waterway originated in the Victoria area.[4]

Major users of the public facilities include Fordyce Sand/Gravel, Precon Structures, and Willard Fertilizer. Other industrial and chemical industries located along the canal are DuPont, BP Chemicals, Carbide/Graphite Group, OxyChem, and Union Carbide.[5] Refer to table Q.1 for barge traffic information.

Table Q.1. Barge Traffic through Victoria Barge Canal, 1992-94

Barges	**1992**	**1993**	**1994**
Total Barges Inbound	1,504	1,384	1,529
Total Barges Outbound	1,505	1,381	1,543
Total Number of Barges	3,009	2,765	3,072
Mean Number Barges Daily	8	7	8
Total Loaded Barges	1,485	1,335	1,597
Total Empty Barges	1,524	1,430	1,475
Commodities			
Sand and Gravel	844	724	848
Chemicals	538	496	648
Fertilizer (Liquid)	41	44	45
Ammonia	55	46	55
Concrete Metal	0	21	0

Source: Adapted from Victoria Navigation District, "Barge Traffic Report," Victoria, Tex., April 1995.

Existing Port Facilities and Equipment

Port facilities include one concrete wharf, 330 feet by 136 feet, which is located on the turning basin's north side and accommodates two barges tied parallel to the wharf's edge.[6] Additionally, a conveyer allows sand and gravel to be transferred directly from mining site to barge.

Modernization and Expansion Plans

Plans are currently underway to expand and deepen the barge canal from its current dimensions of 100 feet wide and 9 feet deep to 125 feet wide and 12 feet deep. This expansion will bring the canal's dimensions in line with the Gulf Intracoastal Waterway's dimensions.[7] The project is expected to cost $32.5 million, of which the federal government will pay $25 million. The remaining project cost will be financed by a $5.6 million bond approved by Victoria County voters, and $2 million will come from the West Side Calhoun County Navigation District.[8] The canal's current dimensions cause barges using the canal to be light loaded. Generally, this has resulted in barges being loaded to approximately two-thirds of their capacity.[9]

Before dredging can take place, the navigation districts are required to purchase about 1,000 acres of property to be used for future dredge-material disposal. While the right-of-way for the canal has been purchased, negotiations for disposal sites are ongoing. The project is expected to be completed by mid-1998.[10]

Strategic/Master Plans

The Victoria County Economic Development Corporation (VEDC) has focused much of its economic expansion plans on the Victoria Barge Canal. The VEDC has been working closely with Calhoun County to develop the region because the two counties share both labor and infrastructure.[11] One major cooperative effort was the establishment of the Calhoun County/Victoria Foreign Trade Zone. The VEDC believes the FTZ's access to the barge canal and rail lines makes it especially attractive for area manufacturers.[12]

The recent NAFTA and GATT signings are also seen as a potential boost to the Victoria Barge Canal's economic expansion. The VEDC is developing plans with these trade agreements in mind, as there are many companies located along the canal that are currently engaged in international trade. The VEDC has been making annual trips to both Canada and Mexico and also exploring opportunities in the Pacific Rim and Western Europe.[13]

Intermodal Access and Land Transport

Rail Access

The Victoria County Navigation District recently took action to improve railway access to the barge canal. In 1988, a shortline railroad was constructed to link the canal with the Union Pacific main-line track that runs parallel to the canal. The navigation district purchased a 1.5-mile by 200-foot-wide right-of-way strip before building the 8,000-foot railroad spur.[14]

Although Southern Pacific Lines has rail lines located near the canal, there is presently no direct access from the canal to this line. Prior to the shortline railroad's construction, all products arriving at the Pickering Basin public wharf had to be transported by truck or pipeline.[15]

Truck Access

The most accessible major highway to the barge canal is U.S. Highway 59, which connects with the interstate highway system in Houston.[16] Access to U.S. Highway 77 is also provided by way of Highway 59 and serves to connect the barge canal to Corpus Christi and Mexico. The public wharf at Pickering Basin is connected to these main highways by a farm road that connects to State Highway 185.

The Victoria navigation district is very interested in the proposed demonstration project to expand U.S. Highway 59 and in the proposed Interstate 69, which would stretch from Canada to Mexico and run directly through Victoria. Both of these projects would greatly enhance international market access for the barge canal.[17]

Economic Impacts

The barge canal is viewed as providing an important role in the local economy. According to the Victoria Economic Development Corporation, it is estimated that 3,000 people are employed by industries that rely heavily on the barge canal. This translates into approximately $80 million in income generated annually. The VEDC also sees the canal as contributing to Victoria County's petrochemical industry growth. This growth has helped to offset the decline in gas, oil, and agriculture trade, which are the area's primary industries.[18]

Major Issues

The primary issue for the port involves the environment. The barge canal's expansion project is dependent upon the purchase of sufficient disposal acreage for dredge material storage. The project is progressing smoothly because the district has had success in working with the regulatory agencies and no local environmental groups have questioned the project's environmental impact. However, because problems with dredging have been known to derail similar projects, the district recognizes that eventual delays might occur due to environmental concerns.[19]

Notes

[1] Calhoun County Navigation District, *The Port of Port Lavaca-Point Comfort,* Point Comfort, Tex. (Brochure.)

[2] Don Brown, "Commissioners Run Canal Like a Business," *Victoria Advocate* (January 11, 1989), p. 8.

[3] Interview by Carol Kim and Charles Montgomery with Fran Irwin, Executive Director, Victoria Economic Development Corporation, Victoria, Tex., March 14, 1995, Victoria, Tex.

[4] Greg Bowen, "Canal Opened Rich Gravel Deposits," *Victoria Advocate* (January 11, 1989), p. 26.

[5] Interview with Fran Irwin, March 14, 1995.

[6] "District Operates Public Wharf," *Victoria Advocate* (January 11, 1989), p. 22.

[7] Interview with Fran Irwin, March 14, 1995.

[8] Robert R. Griffin, "Agreement Launches Barge Canal Project," *Victoria Advocate* (November 18, 1994), sec. A, p. 1.

[9] "District Operates Public Wharf," *Victoria Advocate*, p. 22.

[10] Griffin, "Agreement Launches Barge Canal Project," sec. A, p. 1.

[11] Interview with Fran Irwin, March 14, 1995.

[12] Greg Bowen, "New Rail Link Seen as Giving Boost to Foreign Trade Zone," *Victoria Advocate* (January 11, 1989), p. 13.

[13] Interview with Fran Irwin, March 14, 1995.

[14] Don Brown, "Shortline Links Water and Rail Transport Nets," *Victoria Advocate* (January 11, 1989), p. 3.

[15] Ibid.

[16] Calhoun County Navigation District, *The Port of Port Lavaca-Point Comfort*.

[17] Interview with Fran Irwin, March 14, 1995.

[18] David Tewes, "Barge Canal a Boon to Area Economy," *Victoria Advocate* (January 11, 1989), p. 10.

[19] Interview with Fran Irwin, March 14, 1995.

Appendix R. Port Tonnages, Waterborne Commerce Statistics, 1993 (in Thousands of Tons)

Port or Waterway	Import	Export	Domestic
Orange	0	20	559
Beaumont	8,208	3,679	13,523
Port Arthur	28,044	4,416	5,867
Sabine Pass	0	0	394
Houston	51,446	25,701	64,329
Texas City	33,908	2,307	17,437
Galveston	1,428	4,519	3,808
Freeport	7,404	1,243	5,377
Matagorda Channel	4,325	137	1,431
Victoria	0	0	3,937
Corpus Christi	27,915	6,990	23,504
Brownsville	529	67	1,337
Port Isabel	0	0	232

Source: U.S. Army Corps of Engineers, *Waterborne Commerce of the United States, Calendar Year 1993,* part 2 (Fort Belvoir, Va., 1995), pp. 348-414.