

GALVESTON RAIL TERMINAL BASELINE DATA STUDY

Prepared for

THE RAILROAD COMMISSION OF TEXAS

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EXECUTIVE SUMMARY

The report is directed to rail terminal operations on Galveston Island, primarily those of the Galveston Wharves. It is not possible, however, to examine one segment of the rail system without being aware of other parts of the system. Nor is it feasible to discuss rail operations and traffic without an understanding of the basic economic environment of the area. With these thoughts in mind the various sections of this report develop the relationship in rail operations and service at both Houston and Galveston, the basic economic activity at Galveston, and the role of the Galveston Wharves Railroad Operations in meeting current and projected user demands on the Island.

The objectives of this study were to (1) identify the characteristics of rail service at Galveston, (2) identify the degree of economic and industrial growth in Galveston and determine the impact of such growth on rail terminal operations, (3) develop data needed to identify potential capital and non-capital efficiency improvement opportunities, and (4) develop role, scope, and method of rail terminal project involvement recommendations for consideration by the Railroad Commission of Texas.

The report is divided into six chapters which are directed to the above objectives. Chapter 1 introduces the study objectives and study area. Chapter 2 examines the economics and industrial base of Galveston Island. The Third Chapter describes the Houston-Galveston rail corridor. Information is presented in this Chapter regarding current and projected train movements in this corridor. The relation between rail terminal activity at Houston and Galveston in this Chapter. Chapter 4 presents information on the Galveston Wharves Railroad Operation. Data on traffic levels, major rail commodities.

and rail yard capacity are contained in this Chapter. The Fifth Chapter describes the development plans of the Galveston Wharves with particular emphasis on those which will result in an increase in rail service demand and those which are direct to rail improvements in facilities and equipment. The last chapter contains the conclusions of the report and the recommendations developed by the project staff.

The information developed during this project and presented in the body of the report indicated a tremendous potential increase in rail traffic on and off Galveston Island. The projected traffic increases indicate a continuing need for improved operational efficiencies. There is, right now, a relation between the Houston and Galveston rail terminal complexes. This relation, which is basically interdependent, will become increasingly critical in the future. Currently grain is the major commodity arriving by rail at Galveston and represents 69.3 percent of all revenue traffic handled by Galveston Wharves Railroad Operation. This traffic segment is projected to increase in the future. The planned development of an export coal terminal will result in unit coal train movements on to the Island.

The concluding chapter also reemphasizes the interdependency of Houston and Galveston and discusses one method of cooperation for the mutual benefit of each terminal. Specifically, the expansion of the labor/management cooperation concept, as illustrated by the Houston Terminal Project appears to offer benefit to each operation that could conceivably be greater than the "sum of the parts." This could result from the potential for multi-terminal problem identification and experimental solutions.

Recommendations of the project staff are divided into two groups. The first deal with perceived opportunities for the labor/management projects

should this concept be extended to Galveston. Recommendation to the Railroad Commission of Texas comprise the second group. These recommendations, which are contained in Chapter 6, are:

- State support of programs, such as the HTP, should be encouraged. Since State involvement and support in this area must be mutually agreeable to the State, rail management and rail labor, no specific procedure is recommended. There are, however, several methods both direct and indirect which can be used to support and assist in rail terminal improvement programs. A mechanism for such support and assistance is available within the Railroad Commission through the Rail Planning Staff.
- Additional "baseline" projects such as this should be commissioned by the Railroad Commission in order to develop similar information in other locations. Due to the importance of ports to the economy of the State and the interdependency of rail and waterborne at these locations projects should be considered for Beaumont, Port Arthur and Corpus Christi. In addition, there are several major multi-carrier rail terminal cities in Texas. In some of these, such as Dallas, El Paso and Laredo, the Commission has funded specific purpose projects. A general "baseline" project may be of greater value for policy considerations and direction.

Acknowledgements

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GALVESTON RAIL TERMINAL BASELINE DATA STUDY

1.0 Introduction

Texas' economic and industrial growth has been paralleled by increases in rail terminal congestion problems resulting from rising rail traffic levels along many of the states major rail corridors. Terminal cities such as Houston and Galveston have experienced an aggravation of congestion-related problems such as car shortages and delays which increase terminal operating costs and adversely affect rail service reliability. Efficiency gains have however been realized in Houston as a result of cooperative efforts involving labor, management, and regulatory governmental agencies. Such efforts have facilitated the development and implementation experimental projects which have resulted in improved availability and exchange of car movement information as well as the identification of opportunities to alleviate capacity constraints.

The Railroad Commission of Texas (RCT), in appreciation of the significance of rail terminal operations and in an effort to identify problems and possible solutions, has identified and analyzed previous attempts to improve service to rail users by reducing terminal congestion. The RCT has noted the successes of the labor/management cooperative problem solving approach as employed in terminal cities such as Houston and it is felt that such a program might be applicable in part or whole to other terminal cities such as Galveston. A necessary prerequisite however to the development of a cooperative labor/management program in Galveston is the development of a rail terminal operations data base upon which management and labor groups can base a determination of the feasibility of and possible potential for such a program. This study was designed to provide specific base data within a relatively short time period.¹

¹See: Texas Transportation Institute. "Galveston Rail Terminal Complex Study Proposal." College Station, Texas: TTI, September 1980, p. 3.

1.1 Study Objectives

As previously noted, the overall goal of this study was to develop baseline information relative to rail terminal operations in Galveston, Texas. This baseline information is intended to provide Galveston's railroad management and labor groups, the Federal Railroad Administration, the American Association of Railroads, Texas state governmental agencies including the Railroad Commission of Texas State Rail Planners, and the Houston Terminal Project a basis for evaluation of future activities and programs at Galveston. Specifically, the objectives of this study were to:

- identify the characteristics of rail service at Galveston;
- identify the degree of economic and industrial growth in Galveston and determine the impact of such growth on rail terminal operations;
- develop data needed to identify potential capital or non-capital efficiency improvement opportunities; and
- develop role, scope, and method of rail terminal project involvement recommendations for consideration by the RCT.

1.2 Study Area Background

The study area as defined for purposes of this project includes (1) the Galveston Wharves Rail Terminal area, (2) Galveston Island and surrounding urban areas, and (3) direct (Houston-to-Galveston) and bypass route rail corridors. Each of these study area sub-regions is examined separately and in detail in this report with particular emphasis placed on Galveston and the Galveston Wharves Rail Terminal.

In a 1980 report entitled, "The Economic Strength of the City of Galveston," Dr. Warren Rose observed:

"Very limited growth has occurred in Galveston relative to the total economy of the decade of the 1970's. Almost every economic indicator has shown that the City's total economic growth can be described as lackluster in performance. Whether one uses population, employment, income, bank clearings,

*building permits, utility bills rendered, retail sales, effective buying income, or postal service receipts, the results are virtually the same. Annual growth rates for these indicators have ranged from 1 to 14 per cent, but when current dollar figures are employed, the inflation factor greatly deflates these rates. After adjusting for inflation, the real growth figures are much less pronounced."*²

Galveston's future economic picture appears to be much brighter however, particularly when one considers the potential for growth in the waterborne commerce industry-- Galveston's primary economic base and largest source of both employment and income. This optimism is based upon several factors, including the following:

- recent and planned improvements to both Galveston's on-land port facilities and the ship channel;*
- the ports expected role with regard to future world energy demands. Galveston will play an increased role in the transportation of crude oil and oil related products. In addition, as domestic energy alternatives begin to be more fully utilized, demand for export of such alternatives will grow. Specifically, U.S. coal reserves are expected in the coming decades to be a major source for energy both here and abroad and some of the coal bound for export will move by rail to Galveston for export;
- the level of bulk grain exports, which currently ranks number one among commodities handled at Galveston, is expected to continue its steady growth pattern; the growing number and scope of foreign markets, together with planned export elevator capacity improvements, suggests the likelihood of continued grain export level increases;
- a relatively stable flow of other import/export commodities such as sugar, bulk cement, bananas, cotton, plywood, various "sacked" goods, and other miscellaneous break bulk commodities including chemicals, iron and steel, motor vehicles, wood, and pulp and paper products; and
- technological advances, such as containerization, which increase capacities and improve port efficiencies.

In terms of the available work force, the population of the City of Galveston continues to grow at an annual rate of 1.5 per cent and, while this growth

²Warren Rose. "The Economic Strength of the City of Galveston." College Station, Texas: City of Galveston, March, 1980, p. 3-4.

*Port and channel improvement projects are discussed in detail in Chapter 5 of this report.

rate represents only a modest growth pattern which lags behind the 2.75 percent growth rate of Galveston County as a whole, full-time employment in the city is growing at an annual rate of just above 4 percent. Meanwhile, the State of Texas reports a 2 percent annual growth rate. The population of the City of Galveston grew from 61,000 in 1974 to 67,000 in 1978 and the County population exceeded 200,000 in 1978.

2.0 Economic and Industrial Overview of Galveston

2.1 Major Sources of Employment

As illustrated in Table 1, the six year period between 1973 and 1978 saw a rise of approximately 21% in the Galveston County level of employment. During that same period, annual County employment exceeded 50,000 persons as levels rose at a 4.17 percent annual rate. Hence, it can be concluded that during the 1970's, Galveston County experienced a healthy and steady rise in employment levels. The County's major employment categories, each of which is characterized by annual employment of over 10,000 persons, include manufacturing, public administration (government), and retail trade.

During that same 1973 and 1978 period, the City of Galveston's average annual employment neared 33,000 people, ranging from 27,000 to 37,000 and reflecting a 4.25 percent annual increase. The City, like the Country, saw employment levels rise from the previous year during this period, with the exception of 1976. The City's major employing industries, shown in Table 2, were public administration, with over 10,000 employees; and services; finance, insurance, and real estate; transportation, communication, and utilities; and retail trade with respective and individual annual totals ranging from 2,000 to 6,000 persons. A closer look at employment in Galveston, along with an in-depth examination of each of Galveston's major economic foundations, is provided in Appendix A.

2.2 The Basic Economic Foundations of the City of Galveston

In the Executive Summary of his 1981 report on the Galveston economy, Warren Rose made the following observation:

The economic strength of Galveston today lies in four distinct segments. These components are represented by waterborne commerce, medical and health care services, financial services, and tourism...The economic base of the City rests on these four found-

TABLE 1: EMPLOYMENT DISTRIBUTION FOR GALVESTON COUNTY
1973-1978

| Employment Category | Year | | | | | |
|---|--------|--------|--------|--------|--------|-------------------|
| | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 ^P |
| Contract Construction | 2,572 | 2,582 | 2,962 | 3,125 | 3,725 | 3,539 |
| Manufacturing | 10,761 | 10,926 | 11,121 | 11,719 | 11,586 | 11,648 |
| Transportation, Communication, and Utilities | 4,915 | 4,584 | 4,148 | 3,643 | 5,449 | 4,612 |
| Wholesale Trade | 1,030 | 1,281 | 1,286 | 1,304 | 1,549 | 1,601 |
| Retail Trade | 9,240 | 10,883 | 10,660 | 11,233 | 11,734 | 11,983 |
| Finance, Insurance, & Real Estate | 4,326 | 12,769 | 13,449 | 5,403 | 5,760 | 6,649 |
| Services | 7,345 | 8,022 | 8,116 | 8,751 | 8,883 | 8,988 |
| Other (agriculture, mining, & non classifiable activities) | 3,357 | 4,125 | 4,597 | 3,546 | 3,222 | 4,017 |
| Public Administration (government) | 11,358 | 13,728 | 13,986 | 12,422 | 13,086 | 13,308 |
| Total Employment | 54,904 | 68,810 | 70,325 | 61,146 | 65,044 | 66,345 |

^PPreliminary data

The data include all employees covered by the Federal Insurance Contributions Act, self-employed persons, railroad employees subject to the Railroad Retirement Act, farm workers, and domestic service workers.

Sources: United States Department of Commerce, Bureau of the Census, County Business Patterns, 1973-1979; Economic Study Questionnaire for City of Galveston 1979; and Texas Employment Commission data.

TABLE 2: EMPLOYMENT DISTRIBUTION FOR THE CITY OF GALVESTON
1973-1978

| Employment Category | 1973 | 1974 | 1975 | <u>Year</u> | 1976 | 1977 | 1978 ^P |
|---|--------------|--------|--------|-------------|--------|--------|-------------------|
| Contract Construction | 514 | 516 | 592 | | 625 | 745 | 708 |
| Manufacturing | 2,152 | 2,185 | 2,224 | | 2,344 | 2,317 | 2,330 |
| Transportation, Communication, and Utilities | 3,686 | 3,438 | 3,111 | | 2,732 | 4,087 | 3,459 |
| Wholesale Trade | 309 | 384 | 386 | | 391 | 465 | 480 |
| Retail Trade | 2,772 | 3,265 | 3,198 | | 3,370 | 3,520 | 3,595 |
| Finance, Insurance & Real Estate | 3,461 | 10,215 | 10,759 | | 4,322 | 4,608 | 5,319 |
| Services | 4,899 | 5,351 | 5,413 | | 5,837 | 5,925 | 5,995 |
| Other (agriculture, mining, & non classifiable activities) | 504 | 619 | 690 | | 532 | 483 | 603 |
| Public Administration (government) | <u>9,086</u> | 10,982 | 11,189 | | 9,938 | 10,469 | 10,646 |
| Total Employment | 27,383 | 36,955 | 37,562 | | 30,091 | 32,619 | 33,135 |
| <p>^P Preliminary data.</p> <p>The data includes all employees covered by the Federal Insurance Contributions Act, self-employed persons, railroad employees subject to the Railroad Retirement Act, farm workers, and domestic service workers.</p> <p>Sources: United States Department of Commerce, Bureau of the Census, <u>County Business Patterns, 1973-1979</u>; <u>Economic Study Questionnaire for City of Galveston, 1979</u>; Texas Employment Commission Data; <u>Table 2</u>; and <u>County and City Data Book</u>.</p> | | | | | | | |

ations. Collectively, they account for 90 per cent or more of the total employment and income on the Island. Their combined annual employment ranges from 29,000 to 32,000, out of a total employed work force in the City of over 33,000 persons, based on 1978 data. The combined total income from these segments is approaching \$450 million annually, compared to total Galveston income from all sources of approximately \$478 million.³

Significantly, Rose's report then points out that:

Waterborne commerce is the major and largest source of employment and income... Approximately one out of every two persons employed on the Island obtains work in port-related activities, either primary or secondary, employment. Between 15,000 and 17,000 persons find full-time employment in waterborne commerce annually, based on 1978 data. These figures represent from 47 to 51 per cent of the total employment in the City. The combined total income from all sources in waterborne commerce exceeds \$211 million annually, accounting for between 44 and 47 per cent of the total annual income generated in Galveston. More than two out of every five dollars of total income comes from waterborne commerce.⁴

Because of the significance of the waterborne commerce industry both in terms of the economy of the City of Galveston and existing rail and port facilities operations in Galveston, it is examined in detail in this report.

2.3 The Waterborne Commerce Industry at Galveston

2.3.1 Waterborne Commerce Introduction

The Maritime Administration of the United States Department of Commerce broadly defines waterborne commerce as, "...the collection of economic activities which is needed in the movement of waterborne cargo."⁵ Implied in this definition are the criteria for a wide range of activities, both direct and supportive, which are the consist of the waterborne industry. These criteria include having (1) a basic requirement/dependence of being near waterways, and (2) a natural relationship to the national defense and economy which

³Rose, p. 6.

⁴Ibid.

⁵United States Department of Commerce, Maritime Administration. What U.S. Ports Mean to the Economy, Washington D.C: GPO, Sept. 1978, pp. 12-13.

requires government support services.⁶

Of direct or primary waterborne services it can be said that, without the port, these activities either would not be required and hence not exist, or would exist only on a very modest basis. In other words, the port is the primary if not exclusive reason for the existence of these services. Obviously, the loading and unloading of ships can be classified as a primary waterborne commerce service. Less visible but still primary services include cargo documentation, freight forwarding, marine insurance, international banking, and related governmental services. Without the port, even inland transportation services such as trucking and railroading would need only to exist for domestic market purposes; hence, they too can be classified as primary services.

Supportive or secondary services are those activities that are performed for a port dependent firm by a non-port dependent firm. Warren Rose cites two examples of such services:

A building materials supplier gears his business to meeting the local housing and construction markets. His manpower requirements and expected profits are predicated upon satisfying the local housing and construction markets. Waterborne commerce, however, creates additional demands for export packing materials or building supplies for a warehouse addition. More employees are needed to meet this increased demand, and extra profit gains are realized. Secondary income thus arises in the form of wages and salaries and corporate or proprietorship profits.

The second example relates to Texas A&M University's Moody College at Galveston. Without this complex, there would be no students. Although they do not participate in waterborne commerce directly, their presence and their needs increase the demand for services. These services consist of rental facilities, financial services, and retail trade. Providing these services produces all forms of income to the suppliers. This income is considered secondary income. Similar to the medical and health care sector, the presence of students contributes to secondary income for both waterborne commerce and medical and health care services, respectively.⁷

⁶U.S. Department of Commerce.

⁷Rose, p. 118.

In Galveston, combined primary and secondary service-related profits resulting from waterborne commerce annually ranged from \$173 million to over \$185 million in wages and salaries, or from 47 to 51 per cent of all wages and salaries earned on the island; from \$19 million to \$21 million, or between 46 and 49 percent of the Island's corporate income; more than \$10 million, or 29

TABLE 3: ESTIMATED TOTAL EMPLOYMENT IN WATERBORNE COMMERCE
CITY OF GALVESTON (1978)

| Employment Category | Number of Employees | |
|--|---------------------|---------------|
| | Low Estimate | High Estimate |
| Transportation, Communication, and Utilities | 3,184 | 3,417 |
| Manufacturing | 2,170 | 2,304 |
| Public Administration (government) | 3,799 | 4,068 |
| Business and Professional Services | 2,688 | 2,849 |
| Other Services (not elsewhere classified) | 466 | 545 |
| Retail and Wholesale Trade | 2,925 | 3,109 |
| Finance, Insurance, & Real Estate | 176 | 204 |
| Contract Construction | <u>356</u> | <u>430</u> |
| Total Employment | 15,764 | 16,926 |
| Total Employment for City of Galveston | 33,135 | |
| Total Employment in Waterborne Commerce as a Per Cent of Total City Employment | 47.6% | 51.0% |

Sources: Economic Study Questionnaire for City of Galveston, 1979; Texas Employment Commission Data; and Interviews with labor and business officials in waterborne commerce.

to 33 percent of the Island's proprietors' income; and from \$1 million to \$8 million in interest and rental income.⁸ Combined primary and secondary employment levels, as shown in Table 3, range from estimated highs of 430 contract construction employees to over 4,000 public administrative (government)

⁸Rose, pp. 120-121.

employees. The nerve center of Galveston's waterborne commerce industry, the Galveston Wharves, is examined forthwith.

2.3.2 The Port of Galveston/Galveston Wharves

● History and Location

Texas' oldest commercial enterprise, the Port of Galveston was used for shipping as long ago as 1820. On October 17, 1825, the Port became a provisional and customs entry port via an Act of Congress in Mexico. Between 1836 and 1845, Galveston remained the principal port of the Republic of Texas. In 1854, nine years after Texas joined the Union as the 28th state, local interests joined together in an effort to strengthen the port and formed a single waterfront facilities management authority. The port's natural channel was deepened by Congress in 1889 and a protective jetty system developed. In 1940, the port became municipally owned via a citizen vote, and has since been officially known as the Galveston Wharves.

The Wharves, which constitute a large portion of the Port of Galveston complex, are located at the entrance to Galveston Bay and are situated on the north side of the City with property and facilities also located on adjacent Pelican Island. The Wharves has access to the open Gulf through the Galveston Channel which has a prevailing depth of 40 feet and, at its narrowest point is 1,200 feet wide. The greatest distance from pier to open sea is ten miles, equivalent to thirty minutes steaming time.

● Facilities and Services

The following synopsis of present services and facilities at Galveston Wharves is taken from the Annual Report, for the year 1979, of the Board of Trustees of the Wharves.

The Wharves owns and operates for hire public wharves, transit sheds, operates for hire public wharves, transit sheds, open and covered

storage facilities, warehouses, a terminal railway and freight handling facilities. In addition, the Wharves leases land and facilities to others, including the \$37,000,000 Farmers Export Co. grain elevator and Elevator B leased by Bunge Corporation. Discussion of particular facilities follows:

Terminal Railway: Galveston is one of the few ports in the United States offering a complete terminal service from the railroad car to the steamer berth. The Wharves owns and operates the 50-mile terminal railway, with seven diesel switch engines. Shipline and dock warehouses also come under its jurisdiction. The Wharves performs the switching of all port traffic for the six railroad companies serving Galveston.

Warehouse and Storage Facilities: Developed water frontage of the Wharves totals 25,000 linear feet. The Wharves has shipline warehouses with a total storage area of 2,160,000 square feet, and several back-of-the-waterfront warehouses, with a storage capacity of 1,101,000 square feet, which are located on Wharves property. In addition, there are shipline, open, paved areas totalling 2,280,000 square feet, special industrial warehouse space of 200,000 square feet and open, unpaved space owned by the Wharves of 6,400,000 square feet.

Cargo Services: The Wharves Loading and Unloading Department performs all rail car and truck loading and unloading for most break-bulk cargos shipped through the port. The Pier Point Packers Division of the Wharves performs export crating services on a contract basis at a dockside location. Galveston's Foreign Trade Zone offers 884 acres and 200,740 square feet of warehouse space.

Barge Terminal: Pier 34-35, the Wharves' covered barge terminal, is the only facility on the Gulf which can work LASH and SEABEE barges in all types of weather. Equipment includes two 35-ton bridge cranes with 5-ton auxiliary hooks, and one 5-ton bridge crane. The 35-ton bridge cranes have the capability of rotating pickup. The covered barge loading terminal is served by a shipline warehouse.

Container Terminal: The Pier 10 Container Terminal, officially opened in May, 1972, has a 983-foot berth with a depth of 40 feet and 28 acres of open, paved storage area. For on or off-loading, the terminal is equipped with one IHI Container Crane capable of handling containers of up to 40-foot length at a rate of 20-on and 20-off per hour, or, to 60 tons per lift. A second container crane will be added late in 1980. For loading or unloading from storage, five, 80,000-lb. capacity lift trucks equipped with adjustable 20 to 40-foot container spreader attachments are available. Other container handling equipment includes tractors and trailers for conveying containers to and from storage, and smaller lift machines for handling 20-foot containers.

On Pier 14, a 50-ton Gantry Crane is equipped with self-leveling spreaders to accommodate 20 to 40-foot containers. Ships with self-contained cranes can load and unload at other berths in the port.

Farmers Export Co. Grain Elevator: A modern \$37,000,000 grain elevator re-opened during the summer of 1980 on property owned by the Wharves adjacent to a 1,000-foot loading berth which has a depth of 44 feet. The entire facility, consisting of the grain handling and vessel loading equipment, 3,000,000 bushel grain storage facilities, rail tracks, rail car unloading facilities, a warehouse and shop, was originally financed through the issuance of \$26,000,000 City of Galveston, Texas, Special Contract Revenue Bonds, Series 1977 and by advance rental paid by the lessee. The reconstruction costs to date have been financed from proceeds of property insurance. A portion of the balance of the reconstruction costs may be financed through the issuance of additional Special Contract Revenue Bonds. Farmers Export Co., an agricultural marketing cooperative organized under the laws of the State of Kansas and composed of seven regional and two inter-regional cooperatives, has leased this facility for a primary term ending May 1, 2007, with optional secondary terms aggregating 35 additional years. The basic rent payments by Farmers Export Co. are pledged solely to the payment of the Special Contract Revenue Bonds, Series 1977, and are not available to the Wharves for inclusion in the computation of Net Revenues. However, the lessee is obligated to pay to the Wharves \$280,105 annually as berth and ground rents plus 75% of dockage fees collected. These additional sums are available to the Wharves for inclusion in the computation of Net Revenues.

Bunge Corporation: Bunge Corporation leases from the Wharves and operates Elevator B, an export elevator with a 6,000,000 bushel storage capacity. The grain gallery extends 1,100 feet along the face of the berth with eight grain loading spouts and a marine leg, with an average loading rate of 50,000 bushels per hour. The grain gallery is fronted by an 850-foot loading berth with 45-foot water depth and a barge unloading berth on the west end. Rail unloading facilities and the rail storage yard receive grain at an average rate of 42,000 bushels per hour. A truck scale and truck unloading facilities are also available for receipt of truck grain.⁹

A summary of the characteristics of the Galveston Wharves facilities is provided in Table 4.

⁹Board of Trustees of the Galveston Wharves. Port of Galveston, Total Operating Port. [1979 Annual Report.] Galveston, Texas: BTGW, 1980, pp. 8-12.

TABLE 4: GALVESTON WHARVES FACILITIES DATA

| Pier No. | Shed Area [Sq. Ft.] | Open Area [Sq. Ft.] | Apron Length [Feet] | Berthing Capacity | Shed Construction | Apron Construction |
|------------------------------|--------------------------|---------------------|---------------------|-------------------|--------------------------------|--------------------|
| Pier 10 (Container Terminal) | 121,702 | 950,830 | 983 | 1 Vessel | Steel frame—steel clad | Concrete |
| Pier 12 | | | 845 | 2 Vessels | | Concrete |
| Pier 14 East (Gantry Crane) | | 39,192 | 664 | 1 Vessel | | Concrete |
| Pier 14 West | | 164,400 | 689 | 1 Vessel | | Concrete |
| Pier 15 | 84,916 | 30,544 | 664 | 1 Vessel | Concrete | Concrete |
| Pier 16-18 | 109,012 | 52,200 | 1,203 | 2 Vessels | Concrete | Concrete |
| Pier 19 | | | 600 | 1 Vessel | -- | Wood |
| Pier 21 | 55,596 | 12,600 | 650 | 1 Vessel | Wood frame | Wood |
| Pier 23-26 | 296,423 | 45,280 | 1,415 | 3 Vessels | Concrete | Concrete |
| Pier 27 | 94,768 | | 300 | | Wood frame—steel clad | |
| Elevator "B" | 6 million bushel storage | 12,030 | 850 | 1 Vessel | Storage Concrete & steel tanks | Concrete |
| Pier 29 | | 62,028 | 130 | 1 Barge | | Wood |
| Farmers Export Elev. | 3 million bushel storage | | 1,000 | 1 Vessel | Concrete storage | Concrete |
| Pier 30-33 | 184,795 | 31,877 | 385 | 1 Vessel | Concrete & Wood frame | Concrete |
| Pier 34 | | 141,920 | 878 | 1 Vessel | | Concrete |
| Pier 35 (Cov. Barge Term.) | 92,173 | 25,208 | 771 | 1 Vessel | Concrete | Concrete |
| Pier 35-36 (T-Head) | | 30,800 | 642 | 1 Vessel | | Concrete |
| Pier 36 | 238,753 | 40,749 | 1,206 | 2 Vessels | Wood frame—steel clad | Concrete |
| Pier 37-38 | 75,000 | 348,500 | 1,163 | 2 Vessels | Steel frame—steel clad | Concrete |
| Pier 39 | 234,304 | 44,809 | 1,180 | 2 Vessels | | Concrete |
| Pier 39-40 (T-Head) | | 30,142 | 787 | 1 Vessel | Concrete | Concrete |
| Pier 40 | 223,816 | 46,303 | 1,163 | 2 Vessels | Concrete | Concrete |
| Pier 41 (Two Story) | 471,283 | 41,706 | 1,195 | 2 Vessels | Concrete | Concrete |
| Pier 41 (T-Head) | | 13,017 | 373 | 1 Vessel | | Concrete |
| Warehouse #3 (Two Story) | 183,252 | | | | Concrete | |
| Warehouse #4 | 99,729 | | | | Wood frame—steel clad | |
| Warehouse #9 (Two Story) | 364,164 | | | | Concrete | |
| Warehouse #11-1 | 41,989 | | | | Wood frame—steel clad | |
| Warehouse #11-2 | 46,212 | | | | Wood frame—steel clad | |
| Warehouse #12-1 | 173,865 | | | | Met. & Wd. frame—steel clad | |
| Warehouse #12-2 | 49,306 | | | | Metal frame—steel clad | |
| Warehouse #12-3 | 50,205 | | | | Steel frame—steel clad | |
| Cotton Unloading Shed | 44,530 | | | | Steel frame—steel clad | |

Source: Board of Trustees of the Galveston Wharves. Port of Galveston, Total Operating Port. [1979 Annual Report.] Galveston, Texas: BTGW, p. 10.

● Commerce and Commodities

Bulk grain, bulk sugar, other bulk cargoes, sacked grain, flour, and rice, cotton, plywood, bananas, and other general cargo constitute the array of commodities handled over Galveston Wharves owned facilities. Primary among these is bulk grain, particularly hard red winter wheat. A 1980 study which focussed on export-destined grain pointed out the significance of these exports both in terms of volume and the importance of such exports at Texas ports:

Exports of hard red winter wheat have, on a national basis, taken 43 to 93% of the annual production...These exports grew from a low of 336 million bushels in 1969 to a high of 775 million bushels in 1973. Since 1973, annual export volume has fluctuated between 418 and 625 million bushels...During the past decade, Gulf ports were responsible for 50 to 62% of the nation's total wheat exports and from 76 to 86% of the hard red winter wheat exports. Texas Gulf ports, North Texas ports (Beaumont, Port Arthur, Houston, and Galveston) in particular, are the principal hard red winter wheat export centers.¹⁰

Grain exports, as illustrated in Table 5, accounted for 81.1 percent of the Port's total exports and over half of the total port activities including all

TABLE 5: EXPORT GRAIN FROM THE PORT OF GALVESTON, 1974-1978
(SHORT TON)

| Year | Total Grain Exports | Percent of Total Exports | Percent of Total Activity* |
|------|---------------------|--------------------------|----------------------------|
| 1974 | 2,223,539 | 54.1 | 30.9 |
| 1975 | 2,067,777 | 66.9 | 34.6 |
| 1976 | 3,007,074 | 70.5 | 41.2 |
| 1977 | 4,800,309 | 81.1 | 50.2 |
| 1978 | 2,839,443 | 72.5 | 36.5 |

*"Total activity" refers to all channel-wide waterborne commerce related activities including shipping, receiving, and handling.

Source: U.S. Army Corp of Engineers, Waterborne Commerce of the United States, Part 2, 1975, 1976, 1977, 1978, and 1979.

shipping, receiving, and handling. Most of that grain was handled by facilities owned by the Port of Galveston, which as shown in Table 6, is where the majority of the area's waterborne commerce-related functions occur; in 1979, the number of short tons handled over such facilities neared 5 million is continuing an upward trend begun in the early 1970's.

¹⁰Texas Transportation Institute. Rail-Based Transportation of Export-Destined Wheat, An Efficiency Study. College Station, Texas: DOT, July, 1980, p. 3.

TABLE 6: WATERBORNE COMMERCE HANDLED OVER FACILITIES OWNED BY
PORT OF GALVESTON

| YEAR | NUMBER OF SHORT TONS | PERCENT OF GALVESTON CHANNEL ACTIVITY |
|------|-------------------------|---|
| 1975 | 3,134,864 | 52.5 |
| 1976 | 4,348,437 | 59.5 |
| 1977 | 6,242,102 | 65.3 |
| 1978 | 4,155,952 | 53.4 |
| 1979 | 4,774,190 | N.A. |

Source: See Source of Table 7.

TABLE 7: SUMMARY OF WATERBORNE COMMERCE ACTIVITY GALVESTON CHANNEL,
TEXAS, 1974-1978 (SHORT TONS)

| Year | Total | FOREIGN | | DOMESTIC | | | |
|------|-----------|-----------|-----------|----------|-----------|----------|-----------|
| | | Imports | Exports | COSTWISE | | INTERNAL | |
| | | | | Receipts | Shipments | Receipts | Shipments |
| 1974 | 7,171,226 | 1,093,402 | 4,110,327 | 99,645 | 976,209 | 351,123 | 540,520 |
| 1975 | 5,971,160 | 854,359 | 3,091,981 | 59,694 | 1,157,845 | 338,074 | 468,831 |
| 1976 | 7,302,900 | 867,165 | 4,267,829 | 116,271 | 1,170,138 | 404,013 | 475,027 |
| 1977 | 9,563,626 | 1,653,236 | 5,921,565 | 405 | 1,289,976 | 446,129 | 250,278 |
| 1978 | 7,786,146 | 1,542,021 | 3,918,115 | 35,263 | 1,508,864 | 295,414 | 486,469 |

Source: U.S. Army Corp of Engineers, Waterborne Commerce of the United States, Part 2, 1975, 1976, 1977, 1978, and 1979.

Channel-wide, foreign trade-related functions, export activities in particular, continued through the 1970's to dominate the Channel in terms of waterborne commerce activity. (See Table 7.) Grain export activity alone accounted for 103 of the ships loaded at Galveston Wharves in 1979. By 1980, that figure had risen to 135 ships loaded with grain activity. This upward trend is continuing; the first nine weeks of 1981 saw 51 ships loaded with grain for export, 25 more ships than were loaded for grain export during the same period in 1980.

● Significance of Rail Operations

Almost all of the grain arriving at Galveston (99.9 percent) is delivered to the Wharves by rail. As noted, Galveston Wharves owns and operates the 50-mile terminal railway which provides terminal service from the railroad car to the steamer berth. Much of the cargo entering and existing the Wharves, including virtually all of the leading commodity - grain, is shipped in rail cars. The significance of rail operations is most clearly stated however in terms of revenue cars; the Wharves received 39,777 cars in 1980, up 5,203 cars from 1978. During that same year, nearly 8,500 cars were delivered by Galveston Wharves.

Rail operations at the Wharves are examined in greater detail in Chapter 4, while the strategically significant relationship between rail operations in Houston and similar operations at Galveston is analyzed in Chapter 3.

3.0 Houston-Galveston Rail Corridor Description

Galveston, because of its location and its natural attributes, is a unique rail terminal city in that much of the rail traffic terminating in Galveston moves through another major terminal city - Houston, which is less than 90 miles away. Hence, there is an inevitable relationship between Galveston originating/terminating through traffic operations in Houston and rail operations in Galveston. The following examinations of the Galveston-study area rail operations consequently takes into account the entire (13 county) Houston-Galveston Area Rail Network. Only those rail operations specific to the Houston-Galveston (H-G) Gateway and other routes to Galveston which bypass Houston are however examined in detail. In addition, an overview of Houston Terminal rail capabilities is provided; Galveston terminal activities are detailed in Chapter 4.

3.1 Houston Terminal Overview

The Houston terminal area contains 30 rail yards. These yards receive or dispatch 183 trains per day serving the Houston terminal area. The yards in 1979 had a standing operating capacity of 16,000 cars per day. Weekly car movements ranged between 40,000-45,000 cars. Many rail shipments originating at or destined for Houston are processed through yards of each handling railroad. Approaching its full physical capacity, this terminal is presently attempting to increase capacity through increased efficiencies in operation. Increases in productivity will be accomplished by use of TV, remote control switches, computerized operations, and data processing. The Houston Terminal Project Task Force is also presently addressing Houston's yard capacity restraint problems using joint management-labor problem solving techniques designed to increase operating efficiencies and effectiveness.

In 1980, Houston terminal constraints have caused railroads to implement satellite yards to intercept movements prior to reaching Houston. This is evidenced by Southern Pacific yards at Flatonia, Eagle Lake, Mont Belvieu, and Dayton; Missouri Pacific yards at Angleton and Spring; and Sante Fe yards at Bellville and Alvin. Still, yard capacity in Houston is expected to be a major problem during the next 20 years.

Since a large percent of Galveston originating and terminating traffic competes for track and yard space in Houston, improvements in terminal operations at the Houston gateway have a positive impact on rail performance and service at Galveston. Also, as traffic demand increases at Galveston terminal operations on the island must improve in efficiency. If efficiencies in operations and information systems are not maintained and if investments in facilities and equipment does not occur, Galveston bound traffic will encounter delays at intermediate terminals. Therefore, while this report focuses on the Galveston Rail Terminal Complex, these facilities cannot be viewed in a vacuum. It is not possible to isolate Galveston from either the rail corrior into the gateway or from activities at the Houston rail terminal.

3.2 H-G Area Rail Network and Carrier Overview

The railroads operating in the 13-county Houston-Galveston area include six Class I railroads Atchison, Topeka, and Santa Fe (SF), Fort Worth & Denver, (FWD), Missouri, Kansas, and Texas (MKT or "KATY"), Missouri Pacific (MP), Rock Island (RI), and Southern Pacific (SP) ; however, the Rock Island ceased operation in March 1980 upon filing for bankruptcy in Federal Court. Four of the 11 railroads in the study area are classified as terminal railroads Houston Belt and Terminal (HB&T), Port Terminal (PTRA), Texas City Terminal

(TCT), and Galveston Wharves (GWF).

The 13-county rail network totals 1,404 route miles and only 2.5 percent of this mileage is double track. Joint rail operations or trackage rights exist on portions of 11 rail routes. The 13-county rail network is presently maintained by the railroads to a level commensurate with the traffic demand and operating speeds. The network is, however, expected to expand to offset future demand increased and maintenance efforts will likely increase to compensate for both the larger network needs and the accelerated wear of existing structures resulting from additional movements.

In 1979, there were 219 trains per day which entered or left the 13-county H-G area which moved 212,183,700 gross tons of freight per year (approximately 1,000,000 gross tons of freight per year per daily train). Average train length is 63 cars per train with the range between 3 and 207 cars per train. Freight car weights and lengths have about reached the maximum practical limits and little increase in these limits is expected to occur. Freight train lengths are expected to be similar to the existing operations (up to 100 car lengths) as additional pulling power and crossing delay time are involved with trains over 100 cars.

There are 2,428 railroad/highway grade crossings on the main lines, spurs, and leads in the H-g area, or 2.2 crossings per route mile (twice the national average of 1.1 crossings per route mile). Public grade crossings constitute 65.9 percent of the total grade crossings. On the 41 rail routes in the H-G area, there are 165 grade separations between rail and highway networks, with 52 percent of the grade separations being overpasses of the railroad. Grade separation locations constitute 6.4 percent of the total locations where rail/motor vehicles interface.

Galveston's Rail Terminal is presently connected by rail to Houston via three direct routes. Two additional routes lead to Galveston but bypass Houston. Both direct and bypass routes leading to Galveston are discussed in detail in the following subsections.

3.3 Direct Routes

3.3.1 Tonnage, Cars Per Day, and Track Mileage Data

The three Houston-to-Galveston direct rail routes and route numbers, along with the operating carrier, originating and terminating yards, and total track mileage (Houston to Galveston) are listed in Table 8¹¹; the routes are geographically depicted in Figure 1. Each of these direct routes leads into the Galveston Wharves rail line (GH 95) which serves the Galveston Terminal. Table 9 provides present and projected trains per day data, along with corresponding tonnage information, for each direct route segment in the study area. Congestion problems along each segment can be expected to worsen and the demand for remedial actions become more pronounced upon realization of the increased rail traffic projected in Table 9.

Of course, not all rail traffic along these routes moves solely between the Galveston and Houston Terminals as there are many industrial sites and/or smaller terminal locations served by these routes as well. In addition, the busiest direct-route segments shown in Table 9 handle a great deal of Houston-bound or originating traffic which did not originate in or is not bound for Galveston. Houston-bound SF traffic for example, regardless of its origin, enters Houston from the southeast traveling north on SF 72. Likewise, the SP 16 Houston-to-Lomax segment handles a large number of trains with diverse

¹¹For more detailed study area train route information, including grade crossing location and accident data, see: Turner, Collie & Braden, Inc., and the Texas Transportation Institute. Regional Rail Study (Prepared for the H-G Area Council.) October, 1980.

TABLE 8 : HOUSTON-TO-GALVESTON DIRECT ROUTE DATA

| ROUTE NO.* | OPERATING COMPANY | ORIGINATING YARD (HOUS.) AND YARD OPERATOR | TERMINATING YARD (GALV.) AND YARD OPERATOR | TOTAL TRACK MILEAGE (HOUSTON-GALV.) |
|----------------------|--|---|--|---|
| SP 16 | SOUTHERN PACIFIC TRANSPORTATION COMPANY (SP) | ENGLEWOOD (SP) | SOUTHERN PACIFIC YARD (SP) | 55.6 |
| GHH 30 | GALVESTON, HOUSTON, & HENDERSON RAILROAD (GHH) (JOINTLY OWNED BY THE MISSOURI PACIFIC RAILROAD (MP) AND THE MISSOURI-KANSAS AND TEXAS RAILROAD (MKT)) | 1) SETTEGEST (MP) 2) EUREKA (MKT) | GALVESTON, HOUSTON & HENDERSON YARD (GHH) | 49.0 |
| SF 72 TO SF 70 | 1) ATCHISON, TOPEKA, AND SANTA FE RAILWAY (SF) 2) FORT WORTH & DENVER (FWD) | SOUTH YARD (HB&T) | 1) 59TH STREET YARD (SF) 2) ROCK ISLAND FORT WORTH & DENVER (FWD) | 47.7 |

*Route numbers used in this report were developed for and contained in a Regional Rail Study done for the H-G Area Council by Turner, Collie & Braden, Inc. and the Texas Transportation Institute. (October, 1980.)

TABLE 9 : DIRECT ROUTE PRESENT AND PROJECTED NUMBER OF TRAINS PER DAY AND TONNAGE*
(IN GROSS TONS)

| ROUTE AND SEGMENT NAME AND NO. | PRESENT (1980) TRAINS PER DAY AND TONNAGE | PROJECTED TRAINS PER DAY AND TONNAGE | | | |
|---------------------------------|---|--------------------------------------|------------------------------|------------------------------|--------------------------------|
| | | 1985 | 1990 | 1995 | 2000 |
| SP 16 Houston to Lomax | 27 trains 27 million tons | 35 trains 35 million tons | 41 trains 41 million tons | 46 trains 46 million tons | 52 trains 52 million tons |
| Lomax to Seabrook | 21 trains 21 million tons | 27 trains 27 million tons | 32 trains 32 million tons | 35 trains 35 million tons | 40 trains 40 million tons |
| Kemah to Galveston | 5 trains 5 million tons | 8 trains 8 million tons | 9 trains 9 million tons | 9 trains 9 million tons | 10 trains 10 million tons |
| GHH 30 Houston to Texas City | 7 trains 7 million tons | 10 trains 10 million tons | 12 trains 12 million tons | 13 trains 13 million tons | 14 trains 14 million tons |
| Texas City to Galveston | 6 trains 6 million tons | 9 trains 9 million tons | 11 trains 11 million tons | 12 trains 12 million tons | 13 trains 13 million tons |
| SF 72 Houston to Alvin | 53 trains 53 million tons | 67 trains 67 million tons | 77 trains 77 million tons | 88 trains 88 million tons | 100 trains 100 million tons |
| SF 70 Alvin to Galveston | 8 trains 8 million tons | 11 trains 11 million tons | 13 trains 13 million tons | 14 trains 14 million tons | 16 trains 16 million tons |
| GW 95 | 21 trains 21 million tons | 27 trains 27 million tons | 31 trains 31 million tons | 35 trains 35 million | 40 trains 40 million tons |

*Tonnage based on 1 million tons per train formula.

origin or destination points. Still, the vast majority of trains which travel the SF 70 Alvin-to-Galveston segment, the GHH 30 route, and the SP Kemah-to-Galveston segment is Galveston traffic.

3.3.2 Segment Trackage Rights and Speed Restrictions

SP 16, the Galveston subdivision of the Houston division, operates primarily over the route of the former Galveston, Harrisburg, and San Antonio Railway and follows a circuitous route to Galveston which first heads east from Houston through Pasadena, Deer Park, and Lomax, then turns south at Strang Yard near La Porte. The route joins at Virginia Point with the SF 70 and GHH 30 to cross the Galveston Causeway on common trackage. The Galveston Causeway tracks are jointly owned by the SP and SF railroads. Through the port and industrial areas this line is subject to very frequent train and switching movements at low speeds. Between Kemah and Galveston the speeds are higher but the traffic frequency much lower. Still, the speed limit along the SP 16 route at no point exceeds 30 mph. Direct route operating speeds are shown in Table 10 and further speed restrictions are presented in Table 11.

As noted, the SF's primary line into Houston (SF 72) runs from Alvin north along Mykawa Road to New South Yard just inside South Loop 610 in Houston. SF Route 72 is also used by trains of the MP, RI, and FWD. As illustrated in the Operating Speeds and Speed Restrictions Tables, both SF main lines SF 70 and SF 72 are subject to extremely heavy and frequent train movements at speeds as high as 55 mph. The SF 72-to-SF70 (Houston-to-Galveston) speed limit never exceeds 55 mph.

The GHH generally parallels State Highway 3 from Galveston to Houston. GHH 30 is owned by the GHH, which is in turn is owned jointly by the IGN (now

Table 10: Direct Route Operating Speeds

| Route Name and Number | Segment | Speed Limit (In Miles Per Hour) |
|-----------------------|---|---------------------------------|
| SP 16 | Englewood Yard (Hous.) to East Loop | 15 |
| | East Loop to South Street | 20 |
| | South Street to Boggy Bayou | 10 |
| | Boggy Bayou to Center Street | 20 |
| | Center Street to Galveston/Harris County-- Line | 30 |
| | Galv./Harris Co. Line to Lift Bridge (near Virginia Point) | 25 |
| | Lift Bridge into Galveston Yards | 20 |
| GHH 30 | Settegest (Hous.) to I 610 Loop | 20 |
| | 610 Loop to Winkler | 30 |
| | Winkler to Virginia Point | 35 |
| | Virginia Point into Galveston | 20 |
| SF 72 TO | HBT Yard to South Loop | 20 |
| | South Loop to Highway 6 (outside Alvin) | 55 |
| | Highway 6 to Alvin | 10 |
| SF 70 | Alvin to Galveston/Brazoria County Line | 55 |
| | Galv./Brazoria County Line to Virginia Pt. | 50 |
| | Virginia Point to 59th Street Yard | 20 |

the MP) and the MKT railroads. The GHH owns no terminal facilities in Houston; the line is entered in Houston by trains coming directly from MKT, MP, and HB&T lines. It serves as a bridge route for MP and MKT access to the port in Galveston. GHH 30 is subject to moderately heavy trains at low frequency and train speeds which average 26.3 mph.

3.4 Bypass Routes

3.4.1 Tonnage, Cars Per Day, and Track Mileage Data

In addition to the three direct rail routes connecting Houston and Galveston, two additional routes which lead to Galveston bypass Houston. These bypass routes (SF 70 and MP 64 to SF 70) along with their associated feeder

TABLE 11: DIRECT ROUTE LOCAL SPEED RESTRICTIONS (≤ 25 MPH)

| ROUTE NAME AND NUMBER | LOCATION | DESCRIPTION |
|-----------------------|-----------------------|---|
| SP 16 | Pasadena** | M.P. 12.61 - 16.15, 20 MPH, Corporate Speed Limit |
| | Galveston Subdivision | M.P. 52.90 - 56.58, 10 MPH, Yard, Wharves* |
| | Galveston Subdivision | M.P. 51.77 - 52.90, 20 MPH, Lift Bridge* |
| | Galveston Subdivision | M.P. 51.75 - 51.77, 10 MPH, Lift Bridge* |
| | Galveston Subdivision | M.P. 50.73 - 51.75, 20 MPH, Lift Bridge* |
| | Galveston Subdivision | M.P. 31.99 - 50.73, 25 MPH* |
| | Galveston Subdivision | M.P. 11.40 - 17.00, 20 MPH* |
| | Galveston Subdivision | M.P. 10.84 - 11.40, 10 MPH* |
| | Galveston Subdivision | M.P. 7.81 - 10.84, 20 MPH* |
| | Galveston Subdivision | M.P. 7.80 - 7.81, 15 MPH* Interlocking Plant, R.R. Jct. |
| | Galveston Subdivision | M.P. 7.30 - 7.80, 20 MPH* |
| GHH 30 | Houston | M.P. 0.19, Buffalo Bayou Bridge, 10 MPH |
| | Houston | M.P. 0.0 - 7.1, 20 MPH* |
| | Causeway Bridge | M.P. 43.6, 10 MPH, Lift Bridge |
| | Galveston | M.P. 42.2 - 49.0, 15 MPH* |
| SF 72 TO | Houston District | M.P. 18.0 - 19.4, 20 MPH* |
| | Alvin | East Leg of Wye (Bellville Side) 10 MPH |
| SF 70 | Bellville | Virginia Point to Galveston, 20 MPH* |
| | Island | M.P. 4.7, Galveston Lift Bridge, 10 MPH* |
| | Galveston Yard | 10 MPH* |

*Timetable Restriction

**City Ordinance

Source: Turner, Collie and Braden, Inc., and the Texas Transportation Institute Regional Rail Study Volume II - Appendix. (Prepared for the H-G Area Council.) October, 1980.

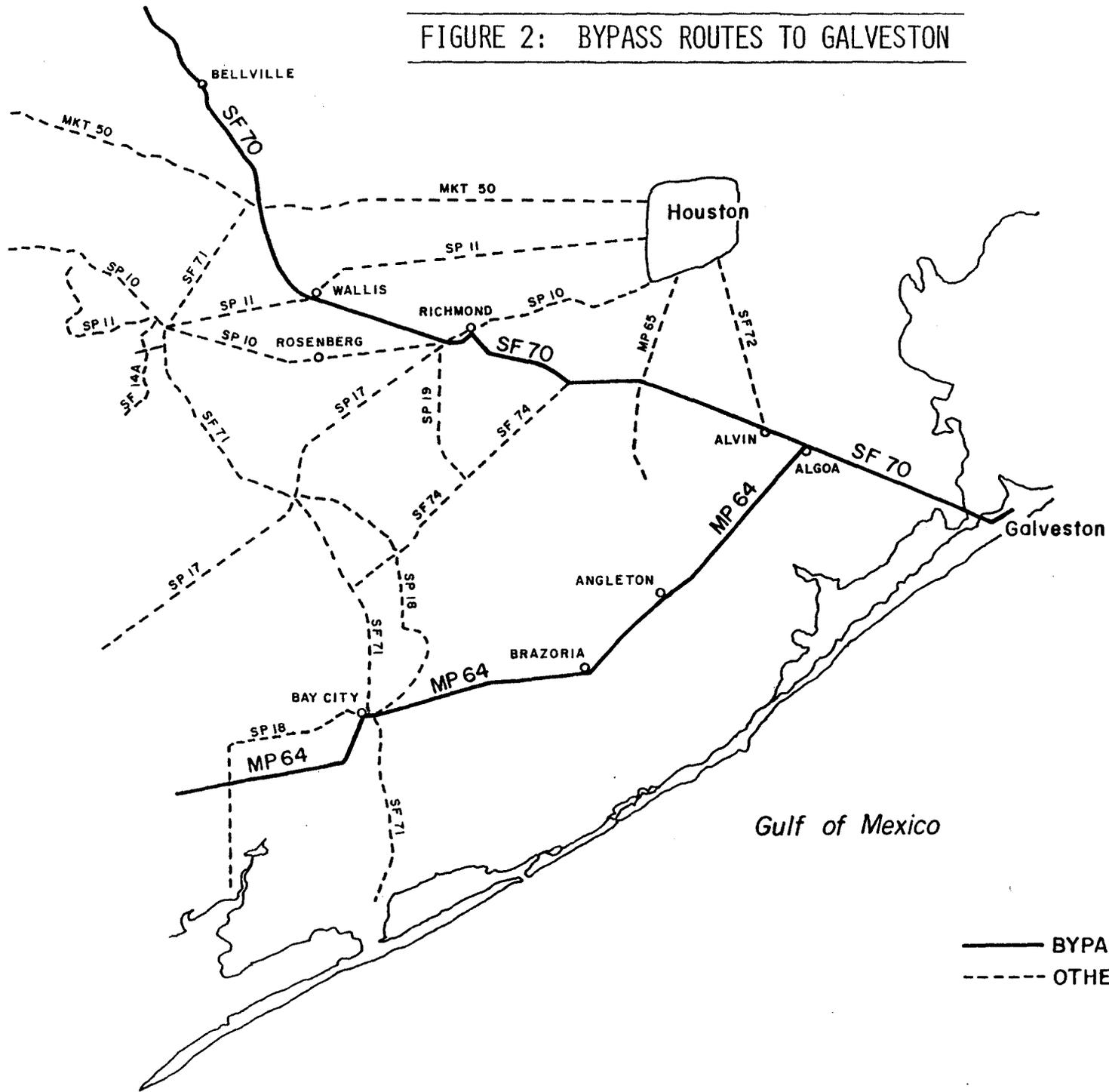
routes are shown in Figure 2. Table 12 presents current and forecasted trains per day/tonnage data for the bypass routes, while segment speed restrictions and total track mileage information is provided in Table 13. From Rosenberg to the 59th Street Yard in Galveston, there are 65.8 miles of track along SF 70, and from Bay City to that same yard in Galveston, the MP 64 track mileage totals 59.4.

3.4.2 Segment Trackage Rights and Speed Restrictions

As illustrated in both Tables 13 and 14, both SF main lines SF 70 and SF 72 are subject to extremely heavy and frequent train movements at high speeds, with maximum speeds of 55 mph along each route. The SF enters the 13-county H-G area in Austin County and runs southeast through Bellville. At Bellville, the SF has a major freight yard and crew change point. This route (SF 70) leads southeast from Bellville through Sealy and Wallis and crosses the MKT 50 at Sealy and the SP 11 at Wallis. The line then turns more easterly in direction to Rosenberg and Richmond. At Rosenberg, the SF has a major crossing and interchange with the Southern Pacific. Houston-bound Amtrak trains coming from SF 70 change over to SP trackage (SP 10) for the more direct routing into downtown Houston. SF also has trackage rights for freight service into Houston over SP 10 from Rosenberg to Houston. The SF tracks within a SF right-of-way parallels the Southern Pacific for approximately three miles and turns southeast through Arcola, Manvel, Alvin, Algoa, and Hitchcock, and over the Galveston causeway bridge into the Port of Galveston. SP has trackage rights to serve Galveston over the SF 70 from Rosenberg to Virginia Point.

The second bypass route, MP 64, is subject to heavy and frequent train movements at speeds as high as 55 mph. (See Table 13) MP 64 is the former St. Louis, Brownsville & Mexico Railway, later the Gulf Coast Lines, that

FIGURE 2: BYPASS ROUTES TO GALVESTON



—— BYPASS ROUTES
----- OTHER "FEEDER" LINES

TABLE 12 : BYPASS ROUTE PRESENT AND PROJECTED NUMBER OF TRAINS PER DAY AND TONNAGE* (IN GROSS TONS)

| ROUTE AND SEGMENT NAME AND NUMBER | PRESENT (1980) TRAINS PER DAY AND TONNAGE | PROJECTED TRAINS PER DAY AND TONNAGE | | | |
|---|--|--------------------------------------|------------------------------|------------------------------|------------------------------|
| | | 1985 | 1990 | 1995 | 2000 |
| MP 64** Bay City to Brazoria | 12 trains 12 million tons | 17 trains 17 million tons | 20 trains 20 million tons | 22 trains 22 million tons | 24 trains 24 million tons |
| Brazoria to Angleton | 12 trains 12 million tons | 15 trains 15 million tons | 18 trains 18 million tons | 20 trains 20 million tons | 22 trains 22 million tons |
| Angleton to Algoa | 11 trains 11 million tons | 14 trains 14 million tons | 16 trains 16 million tons | 18 trains 18 million tons | 20 trains 20 million tons |
| SF 70** Eagle Lake to Richmond (SP 10 into SF 73) | 25 trains 25 million tons | 32 trains 32 million tons | 37 trains 37 million tons | 42 trains 42 million tons | 48 trains 48 million tons |
| Richmond to Alvin | 33 trains 33 million tons | 41 trains 41 million tons | 48 trains 48 million tons | 54 trains 54 million tons | 62 trains 62 million tons |

* Tonnage based on 1 million ton per train formula.

** Trains per day and tonnage information for the Alvin to Galveston segment of SF 70 is provided in Table 11.

TABLE 13: BYPASS ROUTE OPERATING SPEEDS AND TOTAL TRACK MILEAGE

| ROUTE NAME AND NUMBER | SEGMENT | SPEED LIMIT IN MILES PER HR. | TOTAL TRACK MILEAGE |
|-----------------------|--|------------------------------|---------------------|
| SF 70 | Rosenburg to Brazos River Bridge | 50 | 65.8 |
| | On Brazos River Bridge | 30 | |
| | End of Bridge to Fort Bend/Brazoria County Line | 50 | |
| | Fort Bend/Brazoria County Line to Brazoria/Galveston County Line | 55 | |
| | Galveston/Brazoria County Line to Virginia Point | 50 | |
| | Virginia Point to 59th Street Yard | 20 | |
| MP 64 | Bay City to Galveston/Brazoria County Line at Algoa | 50 | 59.4 |
| TO | MP 64 at Algoa to SF 70 at Algoa | 25 | |
| SF 70 | SF 70 at Algoa to Galveston/Brazoria County Line | 55 | |
| | Galveston Brazoria County Line to Virginia Point | 50 | |
| | Virginia Point to 59th Street Yard | 20 | |

TABLE 14: BYPASS ROUTE LOCAL SPEED RESTRICTIONS
(Speed Restriction = 25 mph)

| ROUTE NAME AND NUMBER | LOCATION | DESCRIPTION |
|-----------------------|--------------------------|-------------------------------------|
| SF 70 | Second District* | M.P. 105.5-106.8, 20 MPH |
| | Brenham* | M.P. 126.0, 25 MPH, Interlocking |
| | Bellville* | Virginia Point to Galveston, 20 MPH |
| | Galveston Yard* | 10 MPH |
| MP 64 | Brownsville Subdivision* | M.P. 308.06-309.17, 25 MPH |
| | Brownsville Subdivision* | M.P. 318.19-320.08, 20 MPH |
| | Brownsville Subdivision* | M.P. 342.28-343.09, 25 MPH |
| | Algoa | 25 MPH on WYE |

*Timetable Restriction

Source: Turner, Collie and Braden, Inc., and the Texas Transportation Institute Regional Rail Study Volume II - Appendix. (Prepared for the H-G Area Council.) October, 1980.

operates between Brownsville and Houston. The line was once an important route for Texas Rio Grande Valley citrus and produce traveling north through Houston to midwestern and northern markets. The route remains active however as the decline in rail shipment of perishable has been offset by the heavy concentration of petrochemical plants located southwest of Houston along the Gulf Coast.

MP 64 runs generally northeast through Bay City, Brazoria, Angleton, and Liverpool to Algoa. Trains using MP 64 turn northwest at Algoa onto SF 70 to Alvin and turn north at Alvin, using SF 72. The MP has trackage rights on SF 72 to link the Houston Belt and Terminal New South and Settlegast yards to MP 64. Freeport, Texas is served from the route over the Freeport Industrial Lead between Angleton and Freeport.

3.5 The Galveston-to-Mainland Causeway

3.5.1 Historical Background*

Prior to the construction in 1859 of the first rail bridge connecting Galveston to the mainland, goods arriving or leaving the Island moved via steamship. When this bridge was destroyed by the hurricane of 1867, steamships were again pressed into service while the bridge was repaired. It reopened on June 5, 1868. By 1875, a second rail bridge had been built and was in service.

Railroads continued to build separate bridges, or construct one, two, or three joint rail company bridges and by 1890 three rail-oriented structures spanned the Channel. Yet another bridge appeared in 1892, primarily to serve as a right-of-way for steel wagons. The bridge building trend was halted abruptly in 1900 however by the famous hurricane which leveled Galveston and

*Historical data provided by the Railroad Commission of Texas.

swept away all four bridges to the mainland. The hurricane of 1900 devastated Galveston's economy and recovery was slow and painful.

Still, the least damaged of the bridges, which was originally built in 1875, was repaired. Its service life was shortlived however as it was condemned on February 2, 1907 by the RCT which ordered the affected railroad to construct a new causeway. That same year, the citizens of Galveston County approved a special tax to pay the interest and provide sinking funds on causeway bonds which were eventually issued by the County. In 1909, the J. F. Blodgett Construction Company of Kansas City, Missouri was contracted to design and build a new bridge.

The bridge, which remains in use to this day was completed in 1911. It is a bascular structure facility complete with a patented Scherzer Rolling Lift Bridge which, when risen, completely clears the channel vertically, providing approximately 100 feet for boat clearance through the channel (water depth is approximately 15 feet, with some slight seasonal and/or wind variance.)

3.5.2 Current Status

The causeway constructed in 1910, which included a two lane highway, an electrified interurban railroad right-of-way and two steam railroad tracks, is currently used only for railroad freight service. Interurban service was discontinued in November, 1936, while a modern highway facility completed in 1953 presently serves automobile traffic. The structure is still owned by Galveston County, but County operation and maintenance participation ended with the construction in the 1930's of the original highway causeway.

Currently, causeway operations and maintenance costs are shared by the SF, SP, and the lines of the GH&H (FWD has operating rights from the SF.)

The SP currently operates the lift bridge. Causeway signals and switches are located at Galveston and Virginia Point. Barge traffic, which has the right-of-way over rail/causeway traffic, is not currently at levels which adversely affect rail traffic.

Grain trains are the predominant commodity train flowing over the causeway. The SP averages 2 to 4 trains per day; GH&H carriers also average 2 to 4 trains per day, while the SF averages 4 to 8 trains per day over the causeway. Flow levels are of course seasonal, and causeway operations indicated that the heaviest traffic are those winter months when the Great Lakes are frozen, usually December through April. Barge traffic on the other hand consists predominantly of tugs, often with barge tows, and to a lesser extent, pleasure boats.

4.0 Galveston Wharves Rail Terminal Operational Overview

The Galveston Wharves Railroad operations makes up but one part, albeit a vital part, of the total Galveston Wharves operation.* The rail function is that of a terminal carrier and serves the port traffic of the Galveston Wharves. It should be pointed out that not all industries requiring rail transportation are served by the GWF. Some industries on Galveston Island are served by the line haul carriers such as the SF, SP, FWD, and GH&H (MP and MKT). The GWF is also available to provide service to industrial development on Pelican Island as future demand warrants. Currently there is no rail traffic moving over the bridge to Pelican Island. Industrial development plans for Pelican Island indicate a need for rail service in the near future.**

4.1 Management and Labor Review

Galveston Wharves is a separate utility of the City of Galveston and is governed by a seven member Board of Trustees. A member of the City Council is one of the seven and the remaining six are appointed by the City Council. Trustees serve a three year staggered term with two members appointed yearly. Executive officers are appointed by the Board of Trustees and Mr. C. S. Devoy is the Executive Director. Since the railroad operation is part of the entire Galveston Wharves operation, the railroad administration and management structure are one in the same. There is, however, a Superintendent and Assistant Superintendent of Railroad Operations on the Galveston Wharves.

Railroad employees of Galveston Wharves are represented by several railroad labor organizations. These include:

- United Transportation Union (UTU)

*The Galveston Wharves Railroad (GWF).

**Future development plans for both Galveston and Pelican Island are presented in Chapter 5 of this report.

- Brotherhood of Railway, Airline and Steamship Clerks, Freight Handlers, Express and Station Employees (BRAC)
- Brotherhood of Railroad Carmen (BRC)
- Brotherhood of Maintenance of Way Employees (BMWE)
- Railroad Yardmasters of America

Respective union representatives, along with GWF membership totals (not including carrier union members) are provided in Table 15.

TABLE 15: GWF UNION REPRESENTATIVES AND TOTAL MEMBERS

| Organization | Representative | Number of Employees |
|--------------|-------------------------------------|---------------------|
| UTU | Tom Dubois, International V.P. | 50 |
| BRAC | J. E. Mazzantini, Division Chairman | 12 |
| BRC | Nick Contreras, General Chairman | 5 |
| BMWE | J. P. Self, General Chairman | 15 |
| Yardmasters | L. B. Shirley, General Chairman | 5 |

4.2 Existing Facilities and Service Function

The GWF currently operates over approximately fifty (50) miles of track with seven (7) switch engines. In addition, they control two hundred (200) 50 foot box cars. The GWF performs switching of all port originating and terminating traffic. Figure 3 presents the entire rail plant on Galveston and Pelican Islands. Three rail lines converge on Galveston Island and leave the mainland on a common single track causeway. Once on the Island the lines diverge towards their own yards. The SF, FWD (CRIP), SP, and GH&H each have their own yard as well as some support facilities on the Island.

Most revenue traffic arriving and departing Galveston Island is interchanged with the GWF. However, each carrier has some customers on the Island which they directly serve. Many of the cotton compresses and warehouses for

DEPARTMENT

PELICAN ISLAND INDUSTRIAL
U. S. FOREIGN TRADE ZONE
202 AC.

PELICAN



TEXAS AT

GALVESTON UNIVERSITY

SEAWOLF PARKWAY

MARSHALLING YARD 16 AC

TODD SHIPYARD CORP.
35 AC

VAL-CAP G.O.T., INC.
35 AC

PHILIPP BROS. OPTION
35 AC

MILCHEM 10 AC

KGBC 4 AC

VAL-CAP MARINE SERVICES 11 AC

GALVESTON WHARVES
BARGE FLEETING AREA
185 AC.

H.C. PRICE CO.
75 AC.

DIVAL CORP.
85 AC.

BLUESONNET-GALV WHARVES
MARSHALLING YARD
18 AC.

DRESSER MINERALS

GALVESTON WHARVES
COVERED BARGE TERMINAL

FARMERS EXPORT CO.

MARINE

INDUSTRIAL BLVD

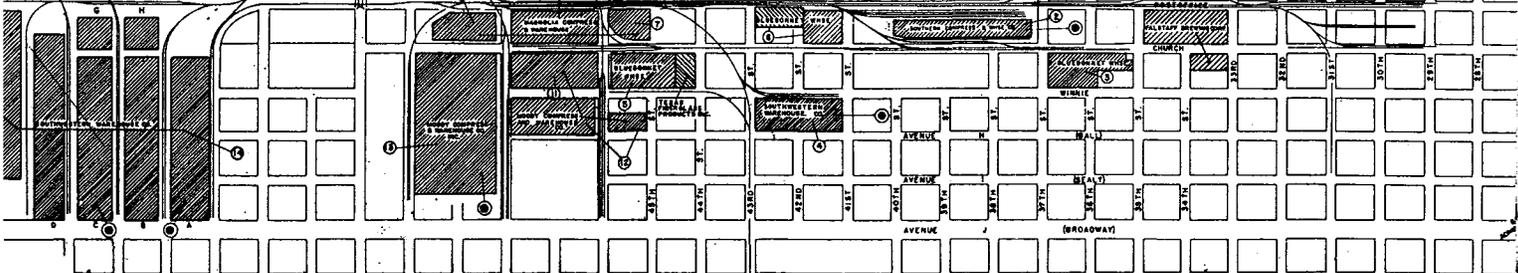
L. V. VAN EMPRISES

S.P.R.R.

AT & SF

AT & SF

CH&H



ENT OF THE ARMY

IND INDUSTRIAL PARK
TRADE ZONE NO. 36
02 AC

ISLAND

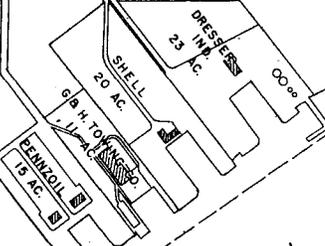
PELICAN TERMINAL CORP.
256 AC



ROAD R.O.W. 8' 40' DRAINAGE EASEMENT

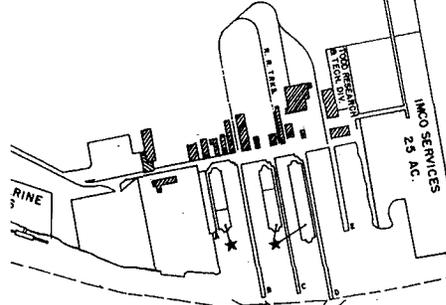
GALVESTON WHARVES OPTION
75 AC.

DD SHIPYARDS CORP.-GALV. DIV.
240 AC.



GALVESTON WHARVES
96 AC.
SITE OF PROPOSED COAL TERMINAL

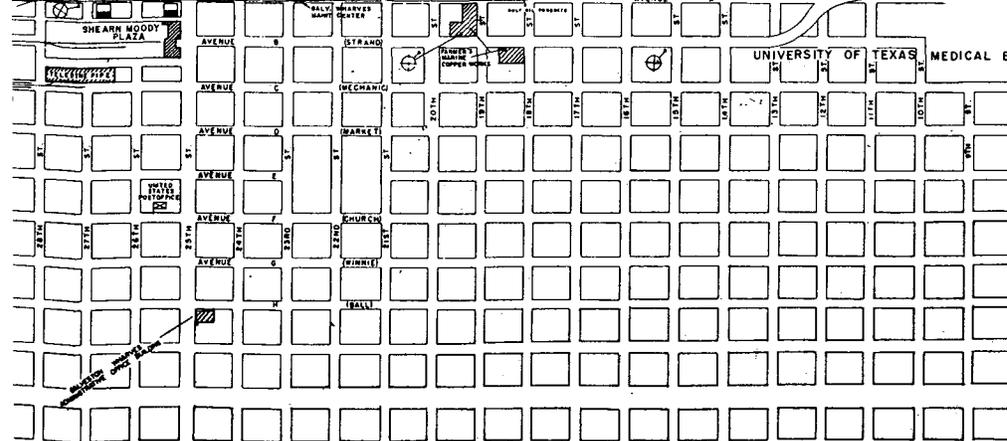
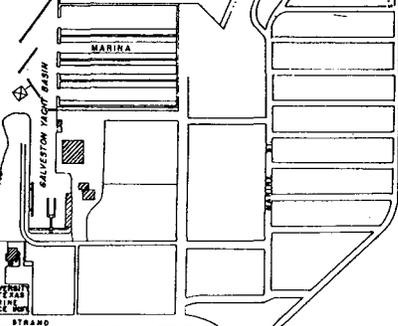
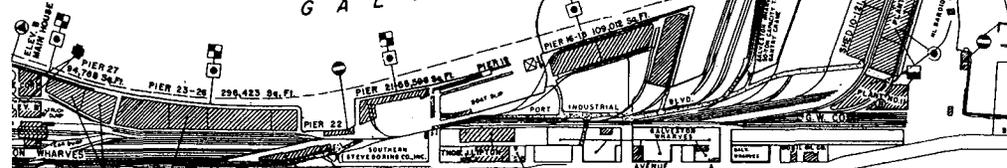
PIER 5



EAST END
CONTAINER
TERMINAL

CHANNEL (40')

GALVESTON



INDUSTRIAL DEVELOPMENT SUPPLEMENT NO. 15
PORT FACILITIES
PORT OF GALVESTON, TEXAS

"AMERICA'S PORT OF QUICK DISPATCH"

PREPARED BY
BOARD OF TRUSTEES
GALVESTON WHARVES

JULY 1980



DRAWING NO. R-L-1-1

example are not on Galveston Wharves property. Also, industries sited west of Pier 41 are served by the linehaul carriers. During on-site visits to Galveston Island the project staff toured some of the facilities of the linehaul carriers and interviewed some operating personnel. However, the major thrust of the project and this report is to describe the GWF operations and not the linehaul carriers at the Galveston terminal.

It should be re-emphasized that the Galveston Wharves railroad operation is that of a terminal carrier. Its' operations are confined to a relatively small area of Galveston Island. It serves port industries and warehouses from Pier 41 (41st Street) on the West to East End Container Terminal (Pier 9 approximately 9th Street). In addition to serving the port industries the GWF also performs transfer service between the SF and GH&H and from the FWD to the SF. The fifty (50) miles of track are primarily yard and industrial spur track. Traffic arriving at Galveston and destined for port industries is delivered by the linehaul carriers. Deliveries by the linehaul carriers are delivered to one of three GWF yards according to pier destinations. Outbound traffic is delivered by the GWF to the linehaul carrier yards.

Table 16 describes the four rail yards of the GWF. "B Yard" has the largest car capacity and is the designated receiving yard for grain cars destined to the two export grain elevators at the Port of Galveston. The "East Yard" serves, among others the East End Container Terminal. In addition to the yards specified in the table Galveston Wharves leases "C Yard", which is composed of 10 tracks, to Farmers Export Elevator. Under the lease agreement Farmers Export is responsible for maintenance in C Yard.

Rail cars destined to Galveston Wharves are currently "side carded." This is done primarily to insure that the appropriate cars are returned to the

TABLE 16: GALVESTON WHARVES YARD INVENTORY AND DESCRIPTION

| Yard Name | Number of Tracks | Capacity in Number of Cars (50' equil.) | Primary Function (Storage, Classification, etc.) | Additional Comments |
|--------------------------------------|------------------|--|--|--|
| "B Yard" Tracks 10-14 | 5 | 10 - 47 11 - 47 12 - 47 13 - 47 14 - 47 Total 235 | Designated receiving tracks for cars destined to Piers 25 thru 41 (Inc. both Elevators). | All railroads deliver to these tracks. |
| "Star Yard" 15 Lead/Oil Main Line | 2 | 15 Lead - 8 Old ML - 9 Total 17 | Designated receiving tracks for cars destined to Piers 25 thru Pier 9. | All railroads deliver to these tracks. |
| "East Yard" Tracks 3-7 | 5 | 3 - 10 4 - 11 5 - 12 6 - 13 7 - 14 Total 60 | Designated receiving tracks for cars destined to Piers 25 thru Pier 9. | All railroads deliver to these tracks. |
| "Mallory Yard" Tracks 9-17 | 9 | 9 - 21 10 - 21 11 - 21 12 - 20 13 - 21 14 - 21 15 - 21 16 - 21 17 - 21 Total 188 | Classification | |

delivering linehaul carrier. "Side carding" of cars is a practice which, with the introduction of computer systems has been discontinued at almost all locations. Some linehaul carriers have indicated a desire to discontinue this practice in favor of a more sophisticated system. At this time discontinuance would place a burden on GWF since they do not have access to a computerized information system.

4.3 Freight Activities

4.3.1 Freight Traffic Levels

Table 17 shows the number of revenue cars handled by the GWF. The "Received" column refers to the number of cars received from the linehaul carriers, while the "Delivered" column refers to the number the GWF delivered to the linehaul carriers for outbound movement. In 1980 a total of 48,216 revenue cars were handled by GWF. This was the third highest traffic volume during the eleven years period, 1970-1980. In 1977 the peak traffic year GWF

TABLE 17: NUMBER OF REVENUE CARS RECEIVED AND DELIVERED
BY GALVESTON WHARVES: 1970-1980

| Year | Received | Delivered | Total |
|------|----------|-----------|--------|
| 1970 | 29,358 | 10,762 | 40,120 |
| 1971 | 21,909 | 10,294 | 32,203 |
| 1972 | 21,049 | 11,681 | 32,730 |
| 1973 | 43,206 | 10,529 | 53,735 |
| 1974 | 32,091 | 11,114 | 43,205 |
| 1975 | 24,390 | 8,139 | 32,529 |
| 1976 | 33,921 | 8,487 | 42,408 |
| 1977 | 52,346 | 9,372 | 61,718 |
| 1978 | 29,755 | 9,022 | 38,777 |
| 1979 | 34,574 | 9,778 | 44,352 |
| 1980 | 39,777 | 8,439 | 48,216 |

Source: Galveston Wharves

handled 61,718 revenue cars, of which 84.8 percent were received and 15.2 percent were delivered. Historically the GWF has received more revenue cars than it has delivered. Galveston Island and the Port of Galveston is basically a traffic terminating area rather than a traffic originating area.

As illustrated in Figure 4 the traffic trends have been somewhat mixed. Received revenue traffic has exhibited an upward movement while delivered revenue traffic has been relatively static. Figure 4 also illustrates that there have been some large yearly variation in received revenue traffic. In part this variation can be attributed to factors such as the "1973 Russian Grain Sale," the closing of Cook Grain due to financial reasons, the subsequent leasing of the elevator formally leased to Cook by Farmers Export, the loss of the elevator in 1978 due to an explosion, and its re-opening in mid 1980.

4.3.2 Commodity Types

A review of revenue traffic received as presented in Table 18 indicates

TABLE 18 : DISTRIBUTION OF REVENUE CARS RECEIVED BY THE GALVESTON WHARVES RAILROAD OPERATION BY COMMODITIES 1970-1980

| <u>Year</u> | <u>Total Cars</u> | <u>Commodities (Percent)</u> | | | |
|-------------|-------------------|------------------------------|---------------|-----------------|-------------------|
| | | <u>Grain</u> | <u>Cotton</u> | <u>Sk Goods</u> | <u>All others</u> |
| 1970 | 29358 | 43.0 | 19.0 | 24.0 | 14.0 |
| 1971 | 21909 | 48.0 | 22.0 | 17.0 | 13.0 |
| 1972 | 21049 | 47.0 | 18.0 | 24.0 | 11.0 |
| 1973 | 43206 | 73.0 | 14.0 | 10.0 | 2.5 |
| 1974 | 32091 | 72.0 | 12.5 | 10.5 | 5.0 |
| 1975 | 24390 | 70.0 | 9.5 | 14.5 | 6.0 |
| 1976 | 33921 | 79.0 | 4.0 | 7.5 | 9.5 |
| 1977 | 52346 | 89.5 | 3.0 | 4.0 | 3.5 |
| 1978 | 29755 | 87.0 | 4.0 | 4.0 | 5.0 |
| 1979 | 34574 | 86.0 | 4.0 | 4.0 | 5.0 |
| 1980 | 39777 | 84.0 | 7.0 | 5.0 | 4.0 |

Source: Galveston Wharves

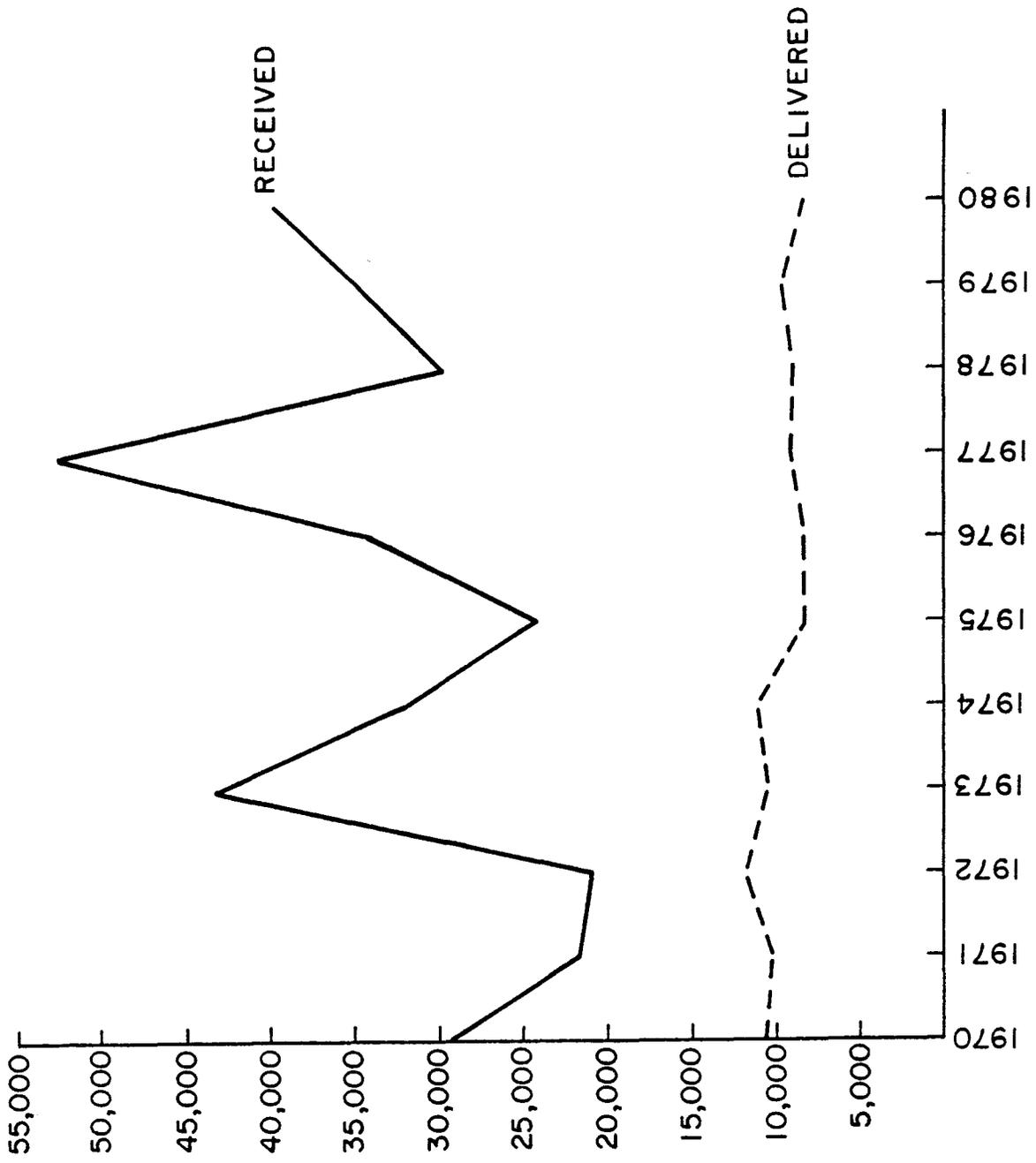


Figure 4: Number of Cars Delivered and Received By The GWF, 1970-1980

that the major commodity handled by the GWF during the eleven year period 1970-1980 has been grain destined to the two export elevators. In 1980, 84 percent of all revenue cars received contained grain. In 1977 grain traffic represented almost 90 percent of all received revenue traffic handled by the GWF.

The significance of grain traffic to the GWF terminal operations is illustrated by the data presented in Table 19. Currently this commodity segment accounted for 75.8 percent of all revenue cars. It is apparent that grain represents a major traffic segment for the GWF and that the efficient movement of this traffic, both inside the terminal as well as on the linehaul, is an area of major concern and activity.

TABLE 19: GRAIN CARS HANDLED BY GALVESTON WHARVES RAILROAD OPERATION: 1975-1980

| Year | Number of Grain Cars | Grain As A Percent of All Revenue Cars |
|------|----------------------|--|
| 1975 | 17115 | 52.6 |
| 1976 | 26739 | 63.1 |
| 1977 | 46810 | 75.8 |
| 1978 | 26379 | 68.0 |
| 1979 | 29800 | 67.2 |
| 1980 | 33394 | 69.3 |

Source: Developed from data supplied by Galveston Wharves.

Table 20 presents information on the arrival of grain cars at Galveston by month for the years 1979 and 1980. These data are representative of only the one elevator which was in operation during the entire two year period. During this two year period, the late 1979 and early 1980 months were peak periods. The Russian embargo and reduced grain movements in late 1980 appear to have had an impact on the grain car arrival pattern. Recently realized other foreign markets, such as mainland China, are expected to pick up much of the slack caused by the Russian embargo.

TABLE 20: DISTRIBUTION OF GRAIN CAR ARRIVALS AT GALVESTON EXPORT ELEVATORS
BY MONTH: 1979-1980

| Month | Percent Arrivals | |
|-----------|------------------|-------|
| | 1979 | 1980 |
| January | 6.5 | 14.0 |
| February | 5.8 | 13.1 |
| March | 8.2 | 14.5 |
| April | 8.3 | 13.2 |
| May | 3.2 | 5.6 |
| June | 5.6 | 9.8 |
| July | 8.1 | 4.7 |
| August | 9.9 | 5.4 |
| September | 9.3 | 5.5 |
| October | 15.0 | 5.2 |
| November | 9.9 | 4.6 |
| December | 10.2 | 4.3 |
| TOTAL | 100.0 | 100.0 |

TABLE 21: DISTRIBUTION OF REVENUE CARS DELIVERED BY THE GALVESTON WHARVES
RAILROAD OPERATION BY COMMODITIES: 1970-1980

| Year | Total Cars | Commodities Percent | | | | |
|------|------------|---------------------|---------|-------|-----|------------|
| | | Cotton | Plywood | Sugar | Tea | All Others |
| 1970 | 10762 | 15.0 | 12.0 | 55.0 | 5.0 | 13.0 |
| 1971 | 10294 | 8.0 | 22.0 | 54.0 | 6.0 | 10.0 |
| 1972 | 11681 | 9.0 | 25.0 | 54.0 | 6.0 | 6.0 |
| 1973 | 10529 | 12.0 | 17.5 | 60.0 | 7.0 | 3.5 |
| 1974 | 11114 | 9.0 | 10.5 | 65.0 | 6.5 | 9.0 |
| 1975 | 8139 | 4.5 | 12.0 | 64.0 | 8.0 | 11.5 |
| 1976 | 8487 | 5.5 | 12.0 | 58.0 | 8.0 | 16.5 |
| 1977 | 9372 | 6.5 | 8.5 | 64.5 | 6.5 | 15.0 |
| 1978 | 9022 | 6.0 | 9.0 | 59.0 | 6.0 | 20.0 |
| 1979 | 9778 | 6.0 | 5.0 | 59.0 | 4.0 | 26.0 |
| 1980 | 8439 | 4.0 | 3.0 | 69.0 | 5.0 | 19.0 |

Source: Galveston Wharves

Table 21 shows the distribution, by commodities, of the revenue traffic delivered by the GWF. Historically the major outbound traffic has been sugar. Historically this commodity has represented over 50 percent of the traffic delivered to the linehaul carriers and accounted for 69 percent of this traffic in 1980. At the time during the last eleven years, both cotton and plywood have been significantly outbound commodities. Recently, however, these commodities have represented only a small percentage of the delivered revenue traffic of the GWF; 4 and 3 percent respectively.

4.3.3 Container Traffic

In 1980 approximately 26,000 boxes moved through container terminal facilities and, according to the Galveston Wharves, the projected 1981 volume is 33,000. Currently the rail share of this traffic segment represents a small percentage of the total volume. The Manager of the Container Terminal and officials of the GWF both however anticipate increased railroad participation in this movement. (Information regarding future container terminal and facilities construction is presented in Chapter 5.)

A 1979 report of loaded container rail cars received and delivered by the GWF indicates that only 859 such cars were handled.* Of this total, 28.3 percent were received and 71.7 percent were delivered. Table 22 summarizes this traffic movement by linehaul carrier. Almost 50.0 percent of the inbound loaded container cars received by the GWF arrived on the Island via the SF. The GH&H was the major outbound carrier of loaded container cars, accounting for 43.8 percent of the total delivered by the GWF.

*It is emphasized that these 859 were loaded container cars and not loaded containers or van trailers. It is assumed that more than 859 revenue containers were handled by the GWF.

TABLE 22: DISTRIBUTUION OF CONTAINER RAIL CARS RECEIVED AND DELIVERED
 BY GALVESTON WHARVES RAILROAD OPERATION BY CARRIER: 1978
 (by percent)

| Direction | Carrier | | | | | Total |
|-----------|---------|------|------|------|------|-------|
| | AT&SF | GH&H | SP | FWD | CRIP | |
| Received | 49.8 | 30.9 | 12.3 | 1.2 | 5.8 | 100.0 |
| Delivered | 38.5 | 43.8 | 2.3 | 11.2 | 4.2 | 100.0 |

4.4 The Linehaul Carriers Connection

As previously noted there are currently five linehaul railroads on Galveston Island, the SF, MP, MKT, SP, and FWD. Prior to mid-1980 the CRIP was also on the Island. Table 23 shows the percent of revenue traffic received from each of these carriers over the past eleven years. The percent shown for the GH&H represents combined MP and MKT traffic. Also for 1980 the CRIP is combined with the FWD. Historically, the GWF has received the vast majority of its revenue traffic from the SF and the GH&H. In 1980, 80.0 percent of the revenue cars were received from these two.* The predominance of these railroads at Galveston is not surprising since the SF, MP, and MKT have significant operations in grain producing regions and since grain cars represent the major commodities received by the GWF.

The outbound movement of traffic delivered to the linehaul carriers by the GWF is presented in Table 24. Historically the major outbound movement has been over the GH&H. In 1980, 83 percent of the outbound cars were handled by the GH&H. Sugar traffic (See Table 24) moving from Galveston Wharves to Sugarland, Texas via the M.P. accounts for the predominance of the GH&H in the outbound

*It is reemphasized that these data in Table 22 do not represent the total movement of revenue traffic on to the Island by any of the linehaul carriers. These data refer to those received by the GWF from the carriers.

TABLE 23: DISTRIBUTION OF REVENUE CARS RECEIVED BY THE GALVESTON WHARVES RAILROAD OPERATION BY DELIVERING CARRIERS: 1970-1980

| Year | Total of Cars | CARRIER | | | | |
|------|---------------|---------|------|----|-----|------|
| | | SF | GH&H | SP | FWD | CRIP |
| 1970 | 29358 | 44% | 27% | 6% | 9% | 14% |
| 1971 | 21909 | 37% | 32% | 8% | 12% | 11% |
| 1972 | 21049 | 34% | 32% | 6% | 12% | 16% |
| 1973 | 43206 | 38% | 36% | 2% | 13% | 11% |
| 1974 | 32091 | 32% | 36% | 7% | 13% | 12% |
| 1975 | 24390 | 38% | 31% | 9% | 9% | 13% |
| 1976 | 33921 | 31% | 31% | 9% | 14% | 15% |
| 1977 | 52346 | 32% | 35% | 6% | 11% | 16% |
| 1978 | 29755 | 35% | 42% | 3% | 10% | 10% |
| 1979 | 34574 | 34% | 38% | 6% | 14% | 8% |
| 1980 | 39777 | 31% | 49% | 5% | 15% | ** |

*Combined percentage for M.P. and MKT.

**Ceased operation mid-1980. Data combined with FWD.

TABLE 24: DISTRIBUTION OF REVENUE CARS DELIVERED BY THE GALVESTON WHARVES RAILROAD OPERATION BY RECEIVING CARRIERS: 1970-1980

| Year | Total Cars | CARRIER | | | | |
|------|------------|---------|------|-----|-----|------|
| | | SF | GH&H | SP | FWD | CRIP |
| 1970 | 10762 | 8% | 59% | 29% | 2% | 2% |
| 1971 | 10294 | 10% | 63% | 22% | 2% | 3% |
| 1972 | 11681 | 11% | 67% | 18% | 1% | 3% |
| 1973 | 10529 | 12% | 59% | 25% | 3% | 1% |
| 1974 | 11114 | 9% | 62% | 26% | 2% | 1% |
| 1975 | 8139 | 14% | 57% | 26% | 2% | 1% |
| 1976 | 8487 | 15% | 55% | 25% | 2% | 3% |
| 1977 | 9372 | 11% | 63% | 21% | 2% | 3% |
| 1978 | 9022 | 18% | 66% | 12% | 3% | 1% |
| 1979 | 9778 | 8% | 68% | 20% | 2% | 2% |
| 1980 | 8439 | 8% | 83% | 8% | 1% | |

See Notes in Table 23.

TABLE 25: GRAIN CAR ARRIVALS AT TEXAS GULF PORTS: 1970-1980
(In Number of Cars)

| Year | PORT | | | | | | | | | | | |
|------|-----------|------|-----------|------|------------------|------|----------|------|----------------|-----|-----------|-------|
| | Houston | % | Galveston | % | Corpus Christ | % | Beaumont | % | Port Arthur | % | Total | % |
| 1970 | 90,741 | 65.0 | 13,947 | 10.0 | 12,664 | 9.1 | 21,598 | 15.5 | 753 | 0.5 | 139,703 | 100.0 |
| 1971 | 100,392 | 69.0 | 12,514 | 8.6 | 12,856 | 8.8 | 16,815 | 11.6 | 2,969 | 2.0 | 145,546 | 100.0 |
| 1972 | 77,440 | 63.4 | 10,141 | 8.3 | 10,823 | 8.9 | 21,632 | 17.7 | 2,165 | 1.8 | 122,201 | 100.0 |
| 1973 | 177,024 | 58.0 | 31,668 | 10.4 | 43,171 | 14.2 | 40,008 | 13.1 | 12,633 | 4.1 | 304,493 | 100.0 |
| 1974 | 99,529 | 54.3 | 22,663 | 12.4 | 24,110 | 13.2 | 26,910 | 14.7 | 10,125 | 5.5 | 183,337 | 100.0 |
| 1975 | 108,824 | 58.7 | 17,328 | 9.4 | 28,606 | 15.4 | 25,372 | 13.7 | 5,142 | 2.8 | 185,272 | 100.0 |
| 1976 | 75,766 | 47.4 | 26,087 | 16.3 | 24,385 | 15.2 | 28,529 | 17.8 | 5,254 | 3.3 | 160,031 | 100.0 |
| 1977 | 75,337 | 44.5 | 48,151 | 28.4 | 25,701 | 15.2 | 17,634 | 10.4 | 2,600 | 1.5 | 169,423 | 100.0 |
| 1978 | 111,416 | 54.0 | 26,779 | 13.0 | 36,635 | 17.8 | 27,595 | 13.4 | 3,903 | 1.9 | 206,328 | 100.0 |
| 1979 | 132,946 | 61.1 | 29,603 | 13.6 | 28,257 | 13.0 | 21,228 | 9.7 | 5,667 | 2.6 | 217,701 | 100.0 |
| 1980 | 116,688 | 59.9 | 33,289 | 17.1 | 22,042 | 11.3 | 16,285 | 8.3 | 6,549 | 3.4 | 194,853 | 100.0 |
| | 1,166,113 | 57.5 | 272,170 | 13.4 | 269,250 | 13.3 | 263,606 | 13.0 | 57,749 | 2.8 | 2,028,888 | 100.0 |

Source: Association of American Railroads, Car Service Division, PT Reports Nos. 6 and 6A.

movement from Galveston Island.

4.5 Grain Traffic Comparisons: Various Texas Ports

The importance of Galveston as a grain export port is evidenced by the data presented in Table 25. Since 1970 the percent of grain cars arriving at Galveston has steadily increased when compared to other Texas ports. In 1977 Galveston hit a high mark in both the absolute number of grain car arrivals (48,151) as well as the percentage of total arrivals (28.4) at Texas gulf ports. The explosion at the Farmers Export Elevator is the primary factor contributing to the reduced car movements in 1978 and 1979. The availability of this elevator which resumed operations in mid 1980 has already resulted in increased grain traffic at Galveston. Currently, Galveston is second only to Houston in grain car arrivals. Together, Houston and Galveston are the termination ports for more than three-quarters of all grain cars moving to Texas gulf ports.

4.6 Galveston Port Efficiency (Grain Embargo Levels)

An embargo on rail grain cars is a device used by the railroads and export elevators in the event of terminal congestion or, on unique occasion to satisfy a requirement of an elevator. In grain movements the embargo may be applied to all cars or individual grain types destined for a specific destination. Several factors which may result in a port or individual export elevator embargo include:

- work stoppage,
- weather,
- equipment breakdown,
- failure of grain ship arrivals or loading delays,
- elevator track capacity or unloading delays,

- rail terminal congestion or similar problems, or
- a combination of these and other factors, including natural disasters.

Table 26, presents a comparison of grain car embargoes at Texas gulf ports for 1978.* During 1978 Galveston was embargoed on four (4) times. Houston was under an embargo for a total of thirty-three (33) weeks during this same period. A review of available data revealed that Galveston was placed under an embargo three (3) weeks during 1979 and nine (9) weeks during 1980.

TABLE 26: GRAIN CAR EMBARGOES AT EXPORT ELEVATORS IN HOUSTON, GALVESTON, BEAUMONT, AND PORT ARTHUR 1978

| Port City | Potential Number of Embargoes* | Number of Elevator Weeks Embargoed** | Percent of Potential | Number Weeks Embargo At Port*** | Percent of Year |
|-------------|--------------------------------|--------------------------------------|----------------------|---------------------------------|-----------------|
| Houston | 166 | 38 | 22.9 | 33 | 63.5 |
| Galveston | 52 | 4 | 7.7 | 4 | 7.7 |
| Beaumont | 52 | 20 | 38.5 | 20 | 38.5 |
| Port Arthur | 52 | 22 | 42.8 | 22 | 42.3 |

*Potential Number of Embargoes is defined as the maximum number of embargoes which can be placed on a port. If more than one elevator is located at a port, the potential is the number of elevators multiplied by 52 or the number of weeks in operation. Houston was the only port with more than one elevator operating during 1978.

**Elevator Weeks Embargoed is defined as a reported embargo, either total or partial, at any elevator. If two elevators are embargoed during a week two embargoes are recorded.

***Maximum 52 weeks.

Source: Texas Transportation Institute, Texas A&M University. "A Study Identifying and Analyzing Certain Impacts on Other Texas Ports Resulting from The Diversion of Export Grain Shipments From Corpus Christi." (Prepared for Nueces County Navigation District No. 1) College Station, Texas: July 1979.

*The export elevators at the Port of Corpus Christi are under a "permit system" and are not subject to embargoes. The "permit system" is in force at all times.

5.0 The Future At Galveston: Projects and Projections

Based upon an identification of both present and planned physical port improvements and estimated commodity projections, an overview of the Port of Galveston's future is provided in this chapter. This chapter draws heavily on the Port of Galveston Action Plan 1980-1990.¹² The reader is referred to this document for detailed discussion of the information presented in this section.

5.1 Cargo Projections

5.1.1 General Review: Projections at Galveston

Galveston Wharves cargo projections for the period 1980-1990 are presented in Table 27. As shown in Table 8, 1978 grain exports of approximately 2.8 million tons are projected at 14.0 million tons by 1990. In addition the volume of coal and minerals is expected to reach 6.9 million tons by 1990. Both of these commodities will move to Galveston via rail.

5.1.2 Rail-Grain Projections at Galveston and Other Texas Ports

The staff did not attempt to develop projections of rail traffic during the course of this project. Indeed, future development plans being formulated by Galveston Wharves tend to make the reliability of any projections of rail traffic to or from Galveston Island questionable. As a result of planned developmental time schedules and the possibility of time lags, there are several unknowns which would need to be addressed prior to development of meaningful projections for the entire rail traffic mix at Galveston.

Nevertheless, grain rail traffic projections which are predicated on estimated grain productions in the "grain belt" were identified and are presented in Table 28. These projections, which are shown as a range of rail grain

¹²Port of Galveston (Staff). Port of Galveston Action Plan 1980-1990. Galveston, Texas: September, 1980.

TABLE 27: CARGO PROJECTIONS 1980-1990
(1000 TONS)

| DESCRIPTION | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|--------------------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| BULK COMMODITIES: | | | | | | | | | | | |
| Crude Oil | 0 | 0 | 0 | 19,600 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 |
| Grain | 4,350 | 7,200 | 7,200 | 8,300 | 8,300 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 |
| Coal & Minerals | 475 | 500 | 525 | 3,000 | 5,400 | 6,900 | 6,900 | 6,900 | 6,900 | 6,900 | 6,900 |
| Raw Sugar | 340 | 340 | 340 | 340 | 340 | 340 | 350 | 350 | 350 | 350 | 350 |
| Cement | 0 | 0 | 250 | 290 | 330 | 370 | 405 | 440 | 480 | 520 | 600 |
| Total Bulk | 5,165 | 8,040 | 8,315 | 30,430 | 47,670 | 60,610 | 60,655 | 60,690 | 60,730 | 60,770 | 60,850 |
| BREAK BULK COMMODITIES: | | | | | | | | | | | |
| Bananas | 250 | 262 | 274 | 286 | 298 | 310 | 322 | 334 | 346 | 358 | 370 |
| Cotton | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| Plywood | 75 | 75 | 70 | 70 | 65 | 65 | 60 | 60 | 55 | 55 | 50 |
| Sacked Goods | 350 | 370 | 390 | 410 | 440 | 470 | 490 | 520 | 560 | 590 | 620 |
| Project Cargo | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| Misc. Break Bulk | 50 | 80 | 120 | 190 | 300 | 460 | 720 | 1,130 | 1,760 | 2,754 | 4,300 |
| Containers | 300 | 470 | 640 | 810 | 980 | 1,150 | 1,320 | 1,490 | 1,660 | 1,830 | 2,000 |
| Total Break Bulk | 1,495 | 1,727 | 1,964 | 2,236 | 2,553 | 2,925 | 3,382 | 4,004 | 4,851 | 6,057 | 7,810 |
| TOTAL | 6,600 | 9,767 | 10,279 | 32,666 | 50,223 | 63,535 | 64,037 | 64,694 | 65,581 | 66,827 | 68,660 |

Source: Port of Galveston Action Plan 1980-1990. September 1980.

traffic, indicate that the anticipated increase at Galveston is second only to that at Corpus Christi. It should be pointed out that these projections do not include additional export facilities nor changes in the competitive positions of the several ports. It is suggested that, in identifying the significance of these data, major emphasis be placed on the relative increase of traffic to the various ports.

TABLE 28: ESTIMATED NUMBER OF ADDITIONAL GRAIN CARS AT TEXAS PORTS FOR 1985, 1990, 2000: BASE 1973-1978 AVERAGE

| Port City | BASE 1973-1978 (6 yr. average) | Estimated Range of Additional Grain Cars | | |
|------------------|--------------------------------------|--|---------------|---------------|
| | | 1985 | 1990 | 2000 |
| Houston | 107,984 | 7,800-11,600 | 13,900-17,800 | 26,600-30,800 |
| Percent Increase | | 7.2%-10.7% | 12.9%-16.5% | 24.6%-28.5% |
| Galveston | 28,778 | 3,500-13,200 | 5,100-15,400 | 8,600-19,900 |
| Percent Increase | | 12.2%-45.9% | 17.7%-53.5% | 29.9%-69.2% |
| Beaumont | 27,508 | 2,000-2,100 | 3,500-3,600 | 6,600-6,700 |
| Percent Increase | | 7.3%-7.6% | 12.7%-13.1% | 24.0%-24.4% |
| Port Arthur* | 6,608 | 300+ | 700+ | 1400+ |
| Percent Increase | | 4.5% | 10.6% | 21.2% |
| Corpus Christi | 30,435 | 7,800-15,600 | 9,600-17,800 | 13,000-21,900 |
| Percent Increase | | 25.6%-51.3% | 31.5%-58.5% | 42.7%-72.0% |

Source: Texas Transportation Institute, Texas A&M University. "A Study Identifying and Analyzing Certain Impacts at Other Texas Ports Resulting From the Diversion of Export Grain Shipments From Corpus Christi." College Station, Texas: Nueces County Navigation District No. 1, July 1979.

5.2 Improvement Projects at Galveston

In order to achieve these projected tonnage volumes Galveston Wharves has undertaken and will expand an impressive construction program. A recap of various projects envisioned in this program, along with respective costs, is presented in Table 29. It is assumed that all of these projects will increase the demand for rail service, some more than others. Also, several of these

TABLE 29: DEVELOPMENT PROJECTS: GALVESTON WHARVES

| PROJECT | START CONSTRUCTION | MONTHS TO COMPLETE | COST |
|---|---------------------|--------------------|----------------|
| Pier 34-35 | Second Quarter 1981 | 18 | \$6.0 million |
| Crude Oil Terminal and Deep Draft Channel | Mid 1981 | 24 | -- |
| Bulk Cement Terminal | Fourth Quarter 1981 | 12 | -- |
| Access Facilities | Second Quarter 1981 | 6 | \$0.7 million |
| Pier 23-27 | Third Quarter 1981 | 15 | \$2.6 million |
| Parking, Security and Fencing | Third Quarter 1981 | 12 | \$0.25 million |
| Railroad Improvements | Second Quarter 1981 | 24 | \$4.5 million |
| Construction and Maintenance Dept. | Third Quarter 1981 | 12 | \$0.6 million |
| Coal Terminal | Third Quarter 1981 | 24 | -- |
| Pelican Island Railroad | First Quarter 1982 | 18 | \$3.0 million |
| 200 Acres-Pelican Island | Fourth Quarter 1982 | 12 | \$4.0 million |
| Pelican Island Industrial Barge Canal | Third Quarter 1982 | 6 | -- |
| Pier 38-40 | First Quarter 1983 | 24 | \$9.6 million |
| Farmers Export Elevator | Third Quarter 1982 | 24 | -- |
| Bunge Elevator | Third Quarter 1982 | 24 | -- |
| Container Terminal | Second Quarter 1983 | 36 | \$25.3 million |
| Grain Elevator-Pelican Island | First Quarter 1983 | 30 | -- |
| Banana Terminal | Third Quarter 1984 | 18 | \$4.75 million |
| Pier 19 | Second Quarter 1986 | 8 | \$1.0 million |
| Pier 36 | Second Quarter 1985 | 36 | \$6.6 million |
| Pier 40-41 | Second Quarter 1986 | 30 | \$7.2 million |

Source: Port of Galveston (Staff.) Port of Galveston Action Plan 1980-1990. Galveston, Texas, September 1980.

projects are directed to improvements in the physical plant of the Galveston Wharves Railroad Operation as well as equipment acquisition. A brief discussion of railroad projects as well as those which will generate significant rail traffic volumes is presented below. The map presented in Section 4.0 will aid the reader in locating these projects, which are categorized by location and nature in the following subsections of this report.

5.2.1 Galveston Channel Dredging

Work will begin in the near future to increase the Galveston channel to 50 foot deep draft. The availability of this increase will have a significant impact on waterborne commerce at Galveston and Pelican Islands. Dredging operations are scheduled to begin in May 1981. One of the obvious effects of the deep draft channel and associated increase in waterborne commerce is the impact on the GWF and linehaul carriers serving Galveston Island. As these changes occur, additional demands will be placed on the operation of all of these activities.

5.2.2 Pelican Island Projects

● Grain Elevator

Studies are currently being conducted in order to determine the feasibility of this project. There are no estimates of throughput for this elevator. However, preliminary drawings indicate a "balloon" track configuration suitable for handling unit grain trains.

● Coal Terminal

According to spokesmen for Galveston Wharves, the prospects for the proposed coal terminal are very good. It is projected that 6.0 million tons of coal per year will move through this facility. Sources at Galveston indicate that three (3) unit trains of coal per day will be required to service this

terminal. If that develops, six (6) trains per day will enter and leave Galveston and Pelican Island. The coal terminal will also be served by a "balloon" track.

- Bulk Cement Terminal

There are no estimates available as to rail traffic increase due to this facility. However, as shown in Table 29, 1990 projected volume is 600 thousand tons.

5.2.3 Bridge to Pelican Island

The Pelican Island Railroad Bridge will be upgraded to handle the 100 ton hopper cars serving the coal terminal, the grain elevator, the cement terminal and industrial developments on Pelican Island. Track leading to the bridge from the Galveston Island side will have to be relocated so as to provide direct access from the west. Track must be constructed on Pelican to serve the coal terminal, grain elevator, the cement terminal and industry. A 600-car marshalling yard will be constructed on Pelican.

5.2.4 Projects on Galveston Island

The following projects scheduled for Galveston Island are anticipated to generate increased rail traffic. In presenting only these projects it is not assumed that the other projects currently under consideration by Galveston Wharves will have no impact on rail traffic.

- East End Container Terminal

This is the most ambitious project under consideration by Galveston Wharves. There will be six container cranes at this terminal. A revised railroad track configuration will be required with increased yard track in East Yard. Currently, container tonnage at Galveston is 300 thousand tons. Projected 1990 container tonnage is 2 million tons. While rail participation in

container traffic at Galveston is relatively minor in relation to total container handling, officials of Galveston Wharves feel that an increase of rail participation in this traffic would result from this project. The growth of container traffic via rail on a nationwide basis lends credence to this optimism.

- Farmers Export and Bunge Elevators

Additional grain storage and improved ship loading system are anticipated at these facilities. These projects will enable the elevators to take full advantage of the deep draft channel and the resulting larger ships which can call at the Port of Galveston.

Farmer Export expects to ship 180 million bushels per year once it reaches full operating capacity this year. The deep draft channel is expected to increase their throughput by 30 percent to 234 million bushels. Officials of the Bunge Corporation which operates Elevator B have indicated that with an improved ship loading system and the deep draft channel, they could handle 200 million per year. This represents a 65 percent increase over the current 120 million bushels handled.

- Rail Improvements

In order to accommodate the increased traffic resulting from these projects as well as to improve current GWF operations, several rail facility improvements and equipment needs' projects have been specified. These projects, which are in addition to those described previously for Pelican Island, include:

- Roundhouse for switch engine maintenance and repair. Currently, the GWF leases space from the GH&H for this function.
- Railroad office building. The current facility is located in the most congested part of the rail terminal and work space is at a premium.
- Four switch engines to serve the coal terminal, grain elevator cement terminal and other users on Pelican Island.

- Track Work. Many of the projects described in this section will require accompanying track work.

5.3 The Railroad Perspective

The projected cargo growth at Galveston and the development program to support this growth will place increased demands on the rail systems at, and serving Galveston. It is important that any constraints and inefficiencies in the system be identified and corrected. The rail traffic increases anticipated within the next ten years at Galveston will have an impact on the entire Houston-Galveston system and require a high degree of coordination and cooperation among all participants.

6.0 Conclusions and Recommendations

6.1 The Houston-Galveston Connection

6.1.1 The Nature of the Relationship

In the same way that the degree of efficiency of rail operations on the Island effects the quality of Galveston's overall waterborne commerce industry, the nature and level of efficiency of rail operations at Houston effects the scope and quality of rail service at Galveston. Upon examination of the relationship between rail operations at Houston's terminal and port service at Galveston, the 50 mile distance between the two terminal cities seems miniscule and relatively insignificant. All carriers serving Houston for example also serve Galveston and, with the exception of one railroad, all carriers entering Galveston from the north presently must first transit Houston.

In terms of day to day rail operations, the relationship between Houston and Galveston is illustrated by the fact that most of the Galveston bound or originating traffic must inevitably compete for track and yard space in Houston. Hence, congestion and/or delays will either directly or indirectly impact the effectiveness of rail operations in Galveston. Conversely, similar terminal problems at Galveston will have a definite and identifiable impact on rail terminal efficiency at Houston. It is consequently necessary, in analyzing operations at either terminal, to view the two ports as part of the same larger rail system. This view does not necessarily contradict the inherently competitive relationship between the Ports of Galveston and Houston, nor undermine their individual independence. This analytical "system" approach does however recognize the significance of the relationship between programs and facilities in strategically located port terminal cities such as Houston and Galveston. For that matter, there are relationships between these and

other terminal cities such as Dallas and Kansas City which are likewise significant, but not in terms of the focus of this report.

A final note regarding the Houston-Galveston relationship should be made here - both port terminal cities share the distinction of being major exporters of the Gulf's primary export commodity, grain. As such, Houston and Galveston share in experiencing both the benefits and problems associated with the vagaries of this trade. Both ports also share in the knowledge and experience of dealing in large scale bulk grain shipments and consequently share many common grain-related interests, as well as the insights needed to identify problems and facilitate system improvements.

6.1.2 Shared Opportunities

As noted in the introduction to this report, the Houston terminal has realized gains in efficiency resulting in productivity level increases as a result of experiments designed and monitored by a cooperative labor/management task force, the Houston Terminal Project (HTP). As a result of significant benefits being realized through cooperative efforts in cities such as Houston, St. Louis, Chicago, and Buffalo, industry-wide attention has been focused on the complexity of both terminal operations and associated problems. Effected rail using industries have likewise taken an active interest in efforts designed to alleviate terminal problems.

The philosophy of the HTP's labor/management experimental approach is that experimental changes are implemented only after they have been approved by local management and labor officials and the Task Force. An experimental change, by its nature, is temporary but can be made permanent after its value has been established by mutual agreement of the parties concerned. Experiments,

*See Appendix B. for HTP background information and activities data.

by definition, cover a specific change in operations for a defined time period. The experiments conducted in MoPac's St. Louis Terminal have for example involved temporary waivers of labor agreements, carrier practices, and agreements, or government regulations.

Experimental changes are evaluated quantitatively. Comparisons are made before and after and documented in a completion report. In this way the improvement in the speed, reliability, and efficiency of car movement is measured in quantitative terms. As for effected employees and terminal operations, an incremental operating fund is used to protect the railroad and its employees against any operating or wage losses incurred as a result of the experiment.

Because of proximity and the commonality in carrier and organizational identities and because both terminals can be viewed as part of the same export system, problems being experienced at the Galveston's rail terminal complex may represent an opportunity for the logical extension of the labor/management task force concept presently being employed in Houston. From a technical standpoint many of the concepts and programs that have been successfully implemented in Houston are readily transferable to Galveston.

In July and August of 1980, members of the HTP staff conducted preliminary discussions with Galveston rail officials who indicated their receptiveness to cooperating in a study which addresses the feasibility of establishing a rail research program in Galveston. Data developed for this report will serve as a basis for the HTP's feasibility study. Based upon the preliminary findings of this study however, the potential for benefits realized both at Galveston and on a system-wide basis which would result from an extension of the Houston Task Force concept to Galveston appears promising.

6.2 Observations on The Rail Industry at Galveston

6.2.1 The Railroad/Waterborne Commerce Relationship

Based upon the findings of this study, the following observations regarding rail industry visavis the overall waterborne commerce industry at Galveston are made:

- Galveston was first a major port and next a major railroad center. Although there have been numerous segmental changes and additions to the economic base of Galveston, these mutually dependent waterborne commerce related activities have been a consistent economic anchor on the Island and have continued to expand. While conditions have altered the mix of products and commodities entering and leaving Galveston Island and crossing the docks of Galveston Wharves, the Port has always remained viable and met the challenge of adapting as circumstances warrant. Waterborne commerce traffic and related functions, including rail service at the Port, continue to grow and evolve to meet present and projected demands.
- Waterborne commerce is the major economic activity of Galveston Island. The importance of efficient rail facilities, and information systems service, in support of this sector and cannot be overemphasized.
- Current rail traffic arriving at Galveston is predominantly grain. Galveston is second only to Houston in the volume of grain car traffic. Grain traffic projections and plans to construct an additional export elevator on Pelican Island indicate continued growth of this traffic segment. The importance of export grain to the well-being of both the state and nation is firmly established and well recognized. Improvements in both the road haul and terminal movement of grain traffic and increased throughput tend to benefit all participants.
- Development plans of Galveston Wharves indicate an increased rail traffic volume for Galveston and Pelican Islands. Unit coal trains are expected to represent a significant part of this increase. In addition to the grain traffic previously mentioned, traffic increases as well as new traffic are anticipated in several areas, including containers. Cargo projections by Galveston Wharves show 60.85 million tons of bulk commodities for 1990, up from 5.165 million in 1980 while break bulk commodities are projected to increase from 1.495 to 7.81 million tons during this same period.

6.2.2 Rail Operations

The following observations regarding railroad operations at Galveston are made from an overall operational significance standpoint:

- It is recognized that the linehaul carriers serve some industries direct and the importance of this traffic to both the railroads and the economy of Galveston is significant. However, the majority of traffic at Galveston is interchanged with the GWF.
- It is apparent that significant demands will be placed on both the linehaul carriers and the Galveston Wharves Railroad Operations if the previously discussed projections are to be achieved. Although not addressed in this report a modal shift, which is certainly not inconceivable at this time, could allow rail participation in port traffic currently moving via motor truck.
- The Galveston Wharves Railroad Operation provides service to industries located on Galveston Wharves property in a relatively confined area. Operations are conducted over approximately 50 miles of tracks.
- Computerization has not yet arrived on the GWF. Linehaul carriers continue to "side card" cars destined for the GWF. These carriers have indicated that they would prefer to discontinue this practice. If this practice is discontinued, an information system must be available to the GWF.
- The Development Plans of Galveston Wharves contain several rail projects. Plans for Pelican Island in particular require significant investments in rail facilities, primarily the bridge connecting Galveston and Pelican Islands and a large marshalling yard on Pelican Island.
- Currently, Galveston Island is connected to the mainland by a single track causeway which is used by all carriers. The capacity of this causeway, which crosses the Gulf Intercoastal Waterway, was not determined. However, barge traffic does have the right-of-way and increases in this traffic could adversely impact causeway access. In addition, increases in rail traffic may necessitate the double tracking of the causeway at some time in the future. Regardless of demand or access levels, if extensive damage to the causeway should occur, the rail users on the Island would be without service.

6.3 Recommendations

The following recommendations were developed based upon (1) the findings of this study, and (2) the project staff's experiences regarding railroad terminal problem solving techniques. The purpose for presenting these recommendations are presented for the consideration of all involved parties including members of the Houston Terminal Project, rail management and labor, and

representatives of associated governmental agencies. A second set of more specific recommendations is directed to the Railroad Commission of Texas; these recommendations suggest the role that the State of Texas, through the RCT, might play with regard to future rail terminal projects.

6.3.1 General Recommendations

Although this project did not specifically examine opportunities for the labor/management concept, there are several activities which have met with success in Houston that appear transferrable to Galveston; the several areas of commonality between Houston and Galveston suggest a logical extension of the labor/management concept currently in Houston and under the direction of the Houston Terminal Project. It is of course recognized that projects such as this can only be initiated at the invitation of both rail labor and rail management. It is the opinion of the project staff however that if the labor/management concept is extended to Galveston, opportunities for coordinated multi-terminal experiments designed to improve terminal performance would be identified. To that end, the project staff makes the following recommendations regarding the initial stages of the development of labor/management projects at Galveston:

- Steps be taken to extend the Terminal Information Exchange System (TIES), developed at and for the Houston Terminal, to include the Galveston Wharves Rail Terminal facilities.
- An identification of specific areas of joint concern regarding the transportation of grain should be made to determine and define possible mutual Houston-Galveston efforts which can be taken to improve grain rail flows to both ports.
- Steps be taken to initiate the process of developing and implementing a joint labor/management alcoholic workshop at Galveston. The workshop would in actuality be an extension of the Houston Terminal's previously developed alcoholic workshop program.

In addition to these specific suggestions, it is further recommended that

steps be taken to identify other specific areas of joint concern for future experimental project consideration.

6.3.2 Recommendations to the Railroad Commission of Texas

Rail terminals are the keystones of the rail system. Efficiencies, as well as inefficiencies, which are encountered in terminal operations have a "ripple effect" throughout the system. Rail congestion and delays impact not only the large and small rail users and railroads located in major terminal cities, but the general public and local economy as well. Looking at the positive side, programs designed to improve rail terminal performance, as demonstrated in Houston, have had high payoffs for rail labor and management as well as users. With these facts in mind, the project staff makes the following recommendations:

- State support of programs, such as the HTP, should be encouraged. Since State involvement and support in this area must be mutually agreeable to the State, rail management and rail labor, no specific procedure is recommended. There are, however, several methods both direct and indirect which can be used to support and assist in rail terminal improvement programs. A mechanism for such support and assistance is available within the Railroad Commission through the Rail Planning Staff.
- Additional "baseline" projects such as this should be commissioned by the Railroad Commission in order to develop similar information in other locations. Due to the importance of ports to the economy of the State and the interdependency of rail and waterborne at these locations projects should be considered for Beaumont, Port Arthur and Corpus Christi. In addition, there are several major multi-carrier rail terminal cities in Texas. In some of these, such as Dallas, El Paso and Laredo, the Commission has funded specific purpose projects. A general "baseline" project may be of greater value for policy considerations and direction.

There is no doubt regarding the importance of the entire rail system to the entire rail system to the State of Texas. A role for public-private cooperation in rail planning and problem solving has been established at the federal level and in several states. Policy-makers in Texas should identify

and evaluate appropriate methods in assisting the railroads in meeting shipper demand requirements of the future. Assistance in rail terminal improvement programs appear to be one such method.

APPENDIX A

Economic and Industrial Overview of Galveston:

A Closer Look

A.0 Economic and Industrial Overview of Galveston: A Closer Look

A.1 Major Sources of Employment

As illustrated in Table 30, the six year period between 1973 and 1978 saw a 21 per cent approximate rise in the Galveston County level of employment. During that same period, annual County employment exceeded 50,000 persons as levels rose at a 4.17 per cent annual rate. Hence, it can be concluded that during the 1970's, Galveston County experienced a healthy and steady rise in employment levels.

Galveston County's major employment categories, each of which is characterized by annual employment of over 10,000 persons, include manufacturing, public administration (government), and retail trade. Service industries such as health, hotel, personal, educational, and legal account for 8,200 persons annually while industries such as (1) finance, insurance, and real estate, and (2) transportation, communication, and utilities both employ over 4,000 persons annually. The retail trade, public administration, and manufacturing employment categories are however consistently the largest employing industries, usually combining to employ over 50 per cent of the County's total employment (See Table 31).

During that same 1973 to 1978 period, the City of Galveston's average annual employment neared 33,000 people, ranging from 27,000 to 37,000 and reflecting a 4.25 per cent annual increase. The City, like the Country, saw employment levels rise from the previous year during this period, with the exception of 1976. The City's major employing industries, shown in Table 32, public administration, with over 10,000 employees; and services; finance, insurance, and real estate; transportation, communication, and utilities; and retail trade with respective and individual annual totals ranging from 2,000 to 6,000 persons. In contrast to the County-wide employment picture, manufacturing employed only a

TABLE 30: EMPLOYMENT DISTRIBUTION FOR GALVESTON COUNTY
1973-1978

| Employment Category | Year | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|-------------------|
| | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 ^P |
| Contract Construction | 2,572 | 2,582 | 2,962 | 3,125 | 3,725 | 3,539 |
| Manufacturing | 10,761 | 10,926 | 11,121 | 11,719 | 11,586 | 11,648 |
| Transportation, Communication, and Utilities | 4,915 | 4,584 | 4,148 | 3,643 | 5,449 | 4,612 |
| Wholesale Trade | 1,030 | 1,281 | 1,286 | 1,304 | 1,549 | 1,601 |
| Retail Trade | 9,240 | 10,883 | 10,660 | 11,233 | 11,734 | 11,983 |
| Finance, Insurance, & Real Estate | 4,326 | 12,769 | 13,449 | 5,403 | 5,760 | 6,649 |
| Services | 7,345 | 8,022 | 8,116 | 8,751 | 8,883 | 8,988 |
| Other (agriculture, mining, & non classifiable activities) | 3,357 | 4,125 | 4,597 | 3,546 | 3,222 | 4,017 |
| Public Administration (government) | <u>11,358</u> | <u>13,728</u> | <u>13,986</u> | <u>12,422</u> | <u>13,086</u> | <u>13,308</u> |
| Total Employment | 54,904 | 68,810 | 70,325 | 61,146 | 65,044 | 66,345 |

^PPreliminary data

The data include all employees covered by the Federal Insurance Contributions Act, self-employed persons, railroad employees subject to the Railroad Retirement Act, farm workers, and domestic service workers.

Sources: United States Department of Commerce, Bureau of the Census, County Business Patterns, 1973-1979; Economic Study Questionnaire for City of Galveston 1979; and Texas Employment Commission data.

TABLE 31: RELATIVE EMPLOYMENT DISTRIBUTION FOR GALVESTON COUNTY
1973-1978
(In Per Cent)

| Employment Category | Year | | | | | |
|---|--------|--------|--------|--------|--------|-------------------|
| | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 ^P |
| Contract Construction | 4.7% | 3.7% | 4.2% | 5.1% | 5.7% | 5.3% |
| Manufacturing | 19.1 | 15.9 | 15.8 | 19.2 | 17.8 | 17.6 |
| Transportation, Communication, and Utilities | 9.0 | 6.7 | 5.9 | 6.0 | 8.4 | 7.0 |
| Wholesale Trade | 1.9 | 1.9 | 1.8 | 2.1 | 2.4 | 2.4 |
| Retail Trade | 16.8 | 15.8 | 15.2 | 18.4 | 18.0 | 18.1 |
| Finance, Insurance, & Real Estate | 7.9 | 18.4 | 19.1 | 8.8 | 8.9 | 10.0 |
| Services | 13.4 | 11.7 | 11.5 | 14.3 | 13.7 | 13.5 |
| Other (agriculture, mining, & non classifiable activities) | 6.1 | 6.0 | 6.5 | 5.8 | 5.0 | 6.1 |
| Public Administration (government) | 20.7 | 20.0 | 19.9 | 20.3 | 20.1 | 20.1 |
| Total Employment (in per cent) | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Notes: | | | | | | |
| p preliminary data | | | | | | |
| Totals may not add because of rounding. | | | | | | |
| Source: Table | | | | | | |

TABLE 32: EMPLOYMENT DISTRIBUTION FOR THE CITY OF GALVESTON
1973-1978

| Employment Category | Year | | | | | |
|---|--------|--------|--------|--------|--------|-------------------|
| | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 ^P |
| Contract Construction | 514 | 516 | 592 | 625 | 745 | 708 |
| Manufacturing | 2,152 | 2,185 | 2,224 | 2,344 | 2,317 | 2,330 |
| Transportation, Communication, and Utilities | 3,686 | 3,438 | 3,111 | 2,732 | 4,087 | 3,459 |
| Wholesale Trade | 309 | 384 | 386 | 391 | 465 | 480 |
| Retail Trade | 2,772 | 3,265 | 3,198 | 3,370 | 3,520 | 3,595 |
| Finance, Insurance & Real Estate | 3,461 | 10,215 | 10,759 | 4,322 | 4,608 | 5,319 |
| Services | 4,899 | 5,351 | 5,413 | 5,837 | 5,925 | 5,995 |
| Other (agriculture, mining, & non classifiable activities) | 504 | 619 | 690 | 532 | 483 | 603 |
| Public Administration (government) | 9,086 | 10,982 | 11,189 | 9,938 | 10,469 | 10,646 |
| Total Employment | 27,383 | 36,955 | 37,562 | 30,091 | 32,619 | 33,135 |

^P Preliminary data.

The data includes all employees covered by the Federal Insurance Contributions Act, self-employed persons, railroad employees subject to the Railroad Retirement Act, farm workers, and domestic service workers.

Sources: United States Department of Commerce, Bureau of the Census, County Business Patterns, 1973-1979; Economic Study Questionnaire for City of Galveston, 1979; Texas Employment Commission Data; Table 2; and County and City Data Book.

modest 2,200 persons annually, which at no time reflected more than 7.9 (see Table 33) per cent of the entire work force as compared to a County high of 19.1 per cent for that same employment category. All told however, the City of Galveston's employment level accounts for almost one-half of the total employment for the County.

Percentage wise, the public sector accounts for approximately 33 percent of the Island's employment; one out of every three employed persons is either a local, state, or federal worker. Health, legal, hotel, personal, and other service industries combine to employ almost one out of every five, or 18 per cent of all working Islanders, while the finance, insurance, and real estate fields together employ 16 to 18 per cent, or one-sixth of the work force. In the city proper however, the only individual industries to account for more than 10 per cent of the total City employment picture were (1) retail trade, (2) transportation (both focusses of this study), (3) communications, and (4) utilities. Combined with the services industry, another major City employer, these industries employ 88 per cent of the City's total employment. Overall, employment in the City of Galveston accounted for almost one-half of the total County employment. Between 1973-1978, both the County-wide geographical employment distribution pattern and moderate employment growth rate (4.25 per cent) remained constant.

A.2 The Basic Economic Foundations of the City of Galveston

A.2.1 Tourism

Because of its mild climate due to its coastal location and latitude, Galveston enjoys "Year Round Resort" temperatures with very few weather extremes. The City also possesses thirty-two miles of Gulf-front beaches and a state park. Combine these features with Galveston's historical landmarks and nearness to a major metropolitan area (Houston), and you have a natural

TABLE 33: RELATIVE EMPLOYMENT DISTRIBUTION FOR THE CITY OF GALVESTON
1973-1978
(In Per Cent)

| Employment Category | <u>Year</u> | | | | | |
|---|-------------|--------|--------|--------|--------|-------------------|
| | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 ^P |
| Contract Construction | 1.9% | 1.4% | 1.6% | 2.1% | 2.3% | 2.1% |
| Manufacturing | 7.9 | 5.9 | 5.9 | 7.8 | 7.1 | 7.0 |
| Transportation, Communications, and Utilities | 13.5 | 9.3 | 8.3 | 9.1 | 12.5 | 10.4 |
| Wholesale Trade | 1.1 | 1.0 | 1.0 | 1.3 | 1.4 | 1.4 |
| Retail Trade | 10.1 | 8.8 | 8.5 | 11.2 | 10.8 | 10.8 |
| Finance, Insurance, & Real Estate | 12.6 | 27.6 | 28.6 | 14.4 | 14.1 | 16.1 |
| Services | 17.9 | 14.5 | 14.4 | 19.4 | 18.2 | 18.1 |
| Other (agriculture, mining, & and non classifiable activities) | 1.8 | 1.7 | 1.8 | 1.8 | 1.5 | 1.8 |
| Public Administration (government) | 33.2 | 29.7 | 29.8 | 33.0 | 32.1 | 32.1 |
| Total Employment (in per cent) | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| ^P Preliminary data | | | | | | |
| Totals may not add because of rounding. | | | | | | |
| Source: Table 3 | | | | | | |

tourist draw of significant value. It's nearness to the "Golden Triangle" (Beaumont, Port Arthur, and Orange) only enhances its tourism value. Hence, despite its inability to display a growth trend since 1975, tourism remains a strong and viable industry for Galveston with a conservative estimate of annual Island visitors being 1.2 million persons.¹³

The Galveston tourist industry employs an average of 2,600 person annually with annual direct wages and salaries ranging from \$18 million to almost \$24 million. Tourism adds from \$53 million to \$24 million. Tourism adds from \$53 million to \$70 million annually in revenue dollars to the City; total "net" income from tourism amounts to between \$34 million and \$41 million annually with annual corporate and proprietorship incomes being enhanced by \$4 million to \$5 million and \$9 million to \$10 million, respectively. Meanwhile, tourist-related rental income and interest individually amount to between \$1 million and \$2 million annually.¹⁴ Because of (1) continuing historical preservation and redevelopment efforts in Galveston, (2) the continuing growth of several nearby metropolitan centers, and (3) the continuing prosperity of the State of Texas as a whole, it is felt that the tourism industry in Galveston will, at worst, remain a viable economic force, but more likely will soon begin a slow but steady growth pattern.

A.2.2 Medical and Health Care Industry

A major medical educational facility which has graduated almost one-third of the practicing physicians in Texas is located in Galveston and serves as the hub of a vast medical and health care industry on the Island. The University of Texas Medical Branch (UTMB) is a nationally reknown institute specializing both in patient care and medical research. Recent years have seen over

¹³Rose, p. 72.

¹⁴Ibid, p. 83.

175,000 persons served annually by the UTMB's health care services. Five hospitals and over 1,200 beds are presented available are both actual and planned building projects having added over \$100 million to the complex since 1964. In addition to UTMB facilities, the County runs a hospital (St. Mary's) which is adjacent to the University complex.

Primary services relating to research, medical education, and patient care, along with secondary services relating to economic activities which accompany, assist, and are dependent upon the primary economic function, combined to employ between 6,800 and slightly over 7,200 full-time workers annually. Employment in medical and health care services generates more than \$90 million annually in wages and salaries with additional annual revenue being generated in the form of corporate profits (\$6 million to \$7 million), proprietor's income (\$4 million to \$5 million), rental income (near \$4 million) and interest income (\$12 million to \$13 million). Hence, medical and health care services provide a total combined income from sources which varies from \$118 million to \$124 million each year, which constitute between 24 to 26 per cent of all income generated in the City of Galveston.¹⁵ Students, along with their visitors, along with their visitors, along with contract construction employees further solidify the medical and health care services industry as a viable long term economic strength on the Island.

A.2.3 Financial Services Industry

Banking and financial institutions combine with insurance and real estate organizations to constitute a third major sector of economic activity and strength in the City of Galveston. Galveston is the home of seven banking institutions and three savings and loans as well as the American National Insurance Company (ANICO) and the American Indemnity Financial Corporation, a

¹⁵Rose, p. 99.

holding company with several subsidiary insurance companies. In addition, more than seventy real estate firms assist in real estate transactions and property exchange in Galveston, with thirty-one organizations of this total serving as members of the Galveston Board of Realtors. Other less evident but active members of the financial community include the personnel of firms such as holding or investment groups, brokerage firms, personal credit institutions, credit agencies, and insurance agents.

Total annual employment in the financial services industry exceeds 5,000 persons, or one out of every six or seven employed Galvestonians, representing between 15 and 16 per cent of the City's total employment. Related wages and salary payments from financial institutions exceeds \$52 million annually, accounting for between 14 and 15 per cent of the City wage/salary total. Financial services annually provide \$7 million, \$5.5 million, and \$2 million to corporate, interest, and rental income, respectively.¹⁶

It is of course recognized that the development of financial services will closely parallel to economic development of a city. The City of Galveston's financial services development and continued growth reflects Galveston's historical role as a major commercial and trading center; presently, Galveston has one financial institution (bank or savings and loan association) for every 7,000 persons, a ration much higher than the rates for many comparably-sized urban areas. It is consequently anticipated that this industry will continue to prosper and grow and remain an important economic base in Galveston's future.

A.2.4 Waterborne Commerce

For a detailed discussion of the waterborne commerce industry at Galvestons, see Chapter 2 of this report.

¹⁶Rose, pp. 106-107.

APPENDIX B

Houston Terminal Project Overview

B.1 Background Information

This experimental program is a labor, management and government undertaking directed by the Task Force on Rail Transportation. Three Gateways - St. Louis, Chicago and Houston - have been selected as locations for testing innovative experiments in terminal operations. Temporary experimental changes are being considered for various operational and regulatory aspects of rail terminals. It is believed that the results of these projects will have wide spread application throughout the industry.

Inefficiencies in terminal operations affect the quality and cost of rail service. These conditions have also contributed to the decline in the railroad share of the overall transportation market. Some of the major terminal problems are caused by those labor agreements, operating practices, rates and regulations that retard the movement of cars. Representatives of labor management and government, therefore, joined together in an attempt to address the inefficiencies associated with terminal operations.

The Houston Terminal Project, established in February of 1977, is part of the continuing expansion of a concept that had its origin in the action taken by the Labor/Management Committee in 1970. An initial study conducted by a Labor/Management Task Force on Terminals, now known as the Task Force on Rail Transportation, identified major terminal problems and recommended an experimental program to effect changes which could assist in the resolution of these problems. This recommended program was then established in 1973 by the Labor/Management Committee with the following major objective:

Increase the reliability, speed and efficiency of car movements through a major existing railroad terminal so that the quality and saleability of rail transportation is improved, thereby attracting additional traffic and

improving employment opportunities. The improvements are to be made without capital expenditures.

The Houston Terminal Project is jointly sponsored by the Association of American Railroads, Houston Railroads, Labor Organizations, and the Federal Railroad Administration. The Project also involves state participation, with Texas A&M University assisting the industry effort to improve the efficiency of the center of the Texas rail network.

The Houston Team is managed by a full-time Project Director, responsible to the Task Force on Rail Transportation; as well as, a half-time Co-Director, representing rail labor. The Project Team also includes an Assistant to the Director, an Operations Research Analyst, consultants working part-time under contract and an Administrative Assistant. The Project Team has established a working relationship with local operating officers and labor representatives of the railroads in the Houston area.

B.2 Selected Activities

B.2.1 Transportation Information Center

The proper handling of railroad equipment, whether it be loaded or empty, railroad or privately owned, is dependent upon the availability of complete and accurate car movement data. Information on the disposition of cars is often incomplete and inaccurate because of: a lack of coordination between railroads, a lack of data exchange, and the inability of railroads to use the data in a timely manner. The end result is that cars are often mishandled in terminals such as Houston, thereby increasing operating costs as well as reducing equipment utilization and the quality of rail service.

In an effort to address the problems associated with the mishandling of rail traffic because of information deficiencies, the Houston Terminal

Project established a Transportation Information Center. The Center, which is located in the Customer Service Center of the HB&T, presently operates 2 shifts per day, 5 days per week. Clerical forces from the HB&T, PTRA and the SP man the Center. Computer terminals provide access to the SP's TOPS System, the HB&T's CARS System as well as the MoPac's TCS. Car movement information is reviewed and updated prior to interchange at Houston. Substantial savings are realized through the reduction of cars being diverted to hold tracks, set back in error or placed in error at the wrong industry because of inadequate car movement information.

B.2.2 Terminal Information Exchange System (TIES)

The culmination of the activities of the Houston Project in the area of experimentation involving information exchange has been its role in the development of TIES. The TIES Program, which includes federal funding to offset implementation costs, involves replacing HB&T's current computer hardware with new state-of-the-art hardware. Following installation, a computerized inventory control system will be implemented on the PTRA using the HB&T computer hardware. In addition to this process, computer-to-computer communications via the AAR Train II System will be established with the various roadhaul carriers serving the Houston area.

Recommended initially in 1978 by the Houston Terminal Project, TIES will improve speed, reliability and costs of moving cars through the Houston Gateway by upgrading the capabilities of the information systems used to support operations; improving the quality of car movement instructions, and providing information on cars enroute to be interchanged, prior to physical delivery.

B.2.3 Industrial PICL Foremen Experiment

This experiment involved modification to contractually stipulated reporting procedures for engine foreman footboard yardmasters. The experiment was designed to improve the quality and timeliness of feedback on work performed by switch crews in industrial zones of the Houston Belt and Terminal Railway. The experiment had a favorable impact on the movement of many cars to and from industry. Industry PICL Clerks were able to keep more current and accurate yard and industrial inventories; customers received better response to their inquiries; management had access to better inventory information; and the quality of data used for demurrage and switching accounting was improved.

B.2.4 Expediting Santa Fe Grain Traffic at Houston

In order to expedite the outbound movement of empty grain cars out of Houston's Basin Yard, as well as reduce the number of Santa Fe road crews expiring under the hours-of-service law, an experiment involving the complete assembly of trains at HB&T's Basin Yard has been implemented and is presently being monitored. Based on a reduction of terminal detention time of 3 hours per train, annual savings approaching half a million dollars are estimated.

B.2.5 Missouri-Kansas-Texas Railway Company (MKT) and Houston Belt & Terminal (HBT) Interchange at Houston

During this experiment, which involved the temporary waiving of interchange crew rules, management and labor became convinced of the potential benefits of the new interchange arrangement in eliminating back hauls and negotiations for a permanent agreement based on the experiment are being conducted under the provisions of the Railway Labor Act.

B.2.6 Expediting Empty Private Cars

This experiment involved establishing a new position on a terminal switch carrier to monitor and control the movement of empty private cars in Houston and surrounding areas. Lines of communication were set up whereby an Empty Private Car Controller received information from all participating carriers, either in the form of lists or as response to inquiries, on cars destined to Houston or released empty in the Houston Terminal. The Empty Private Car Controller checked the billing of these cars against information he had available, such as pool assignment lists or billing instructions, to determine the cars that were moving in accordance with the users instructions. For those cars that were not, proper dispositions were obtained by contacting the private car users. All changes in destination were forwarded to the railroads for implementation through their car distribution systems.

The experiment significantly reduced the number of private empty cars moving in error due to car movement information deficiencies. The experimental technique tested in Houston has been incorporated into the day-to-day operations of the Houston Belt and Terminal Railway Company.