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This report is one of a series developed in response to S.R. 269 and H.S.R. 82, which called for a comprehensive assessment of current activities, problems and opportunities regarding marine commerce in Texas by the Texas Coastal and Marine Council.

The series includes:

**Report to the 65th Texas Legislature
on Marine Commerce
Texas Port Fact Book
Public Port Financing in Texas
Economic Impact of Marine Commerce
in Texas
Gulf Intracoastal Waterway in Texas**

The above reports can be obtained from:

Texas Coastal and Marine Council
P.O. Box 13407
Austin, Texas 78711
(512/475-5849)

ABOUT THE COUNCIL

The Texas Coastal and Marine Council is a statutory body established by the Legislature for the purpose of assisting in the comprehensive assessment and planning for coastal and marine-related affairs. The Council is a mixed legislative-executive body composed of members independently appointed by the Governor, Lt. Governor, and Speaker. The Council serves in a "brokerage" capacity by bringing together groups with corresponding interests and acting as a catalyst by focusing legislative attention on issues and suggesting remedies which may be implemented by existing line agencies. The basic statutory mission of the Council has been supplemented/focused by Legislative resolutions calling for specific investigations.

10454



TEXAS COASTAL AND MARINE COUNCIL



January 1977

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Dear Fellow Texans:

This report contains the principal findings and recommendations developed by the Council pursuant to S.R. 269/H.S.R. 82 on Marine Commerce. In developing these recommendations, the Council received assistance from many sources and carefully deliberated the major recommendations. I, along with other legislative members of the Council, will be sponsoring bills to implement those recommendations calling for legislative action.

Besides this topic, the Council has also examined a number of other marine and coastal-related subjects important to Texas. Reports can be obtained from the Council on the following:

- Hurricane Resistant Building Standards and Natural Hazards (S.R. 268/H.S.R. 80)
- Dredge Spoil Disposal and Mitigation (H.S.R. 81)
- Financing of Fresh Water Inflows for the Bays and Estuaries (S.R. 267/H.S.R. 83)
- Fisheries Management
- Artificial Reefs

Your ideas on these matters would be much appreciated. Also, if you have any thoughts about other topics relating to the Texas coast, please contact me.

Sincerely,

A. R. Schwartz
Chairman

U. S. DEPARTMENT OF COMMERCE NOAA
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MARINE
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Pursuant SR269/HSR82
January 1977

Texas Coastal + Marine Council
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**Legislative
Recommendations**



FINDINGS AND RECOMMENDATIONS

Lack of adequate coordination and cooperation between state agencies, and with local and/or the federal government, often causes conflicts and leads to misunderstandings and costly delays on navigation projects. The absence of a state agency with significant marine commerce/navigation involvement frequently results in port-related matters receiving little consideration when state agencies make decisions that may greatly impact the ports. Historically, this system has worked well; but recently, regulations have become much more complex and relations have deteriorated, especially over dredging, spoil disposal, and fish and wildlife mitigation.

Strengthen the Interagency Council on Natural Resources and the Environment, and give it additional responsibility to coordinate agency policies and activities, by a statutory clarification of goals and responsibilities.

Address the complex and emotional issue of fish and wildlife mitigation, including issues, costs, benefits, beneficiaries, institutional goals, etc., by (a) authorizing the Governor, with the advice and recommendations of the Interagency Council on Natural Resources and the Environment, to resolve any differences of positions between various state agencies in order that federal requirements for coordination can be satisfied, and (b) conduct an interim study of the problems, benefits and costs of mitigation.

Authorize the Texas Department of Highways and Public Transportation to work with and assist the ports, upon the ports' request, in dealing with state agencies on matters relating to dredging and spoil disposal resulting from navigation activities conducted in state waters.

An estimated \$3.5 million is required for the state to acquire spoil disposal sites along the Gulf Intracoastal Waterway as authorized by the Texas Coastal Waterway Act.

Fund the Texas Department of Highways and Public Transportation the approximately \$3.5 million they are requesting to obtain the needed spoil disposal sites.

Congress is considering a program to help the nation's public ports pay for the cost of facilities and programs resulting from federal government actions. It is not known whether such funds would flow directly to the ports; however, in the event Congress sends funds to the states, Texas should be in a position to receive and administer such funds on a pass-through basis to the ports.

Authorize the Texas Department of Highways and Public Transportation to receive and administer port finance assistance that Congress may provide for "mandated costs" if such funds must be channeled through the state.

Implementation of the Texas Oil and Hazardous Substances Spill Prevention and Control Act has been slow, because the Legislature did not appropriate the \$5 million authorized for that purpose. Yet, as increasing volumes of oil and chemicals move over coastal waters, the threat of accidents and damage continues, as attested to by 32 spills totalling almost 50,000 barrels since January 1975.

Appropriate money to the state "Coastal Protection Fund" created by the 64th Legislature, to assist in the cleanup of oil or hazardous substance spills and the restoration of beaches and marine resources.

The "mini-bridge" rate tariffs approved by the federal government have and continue to adversely impact Texas ports by illegally diverting cargoes.

The state should continue legal action to fight mini-bridge and other discriminatory tariff practices.

Congress is considering amending the 1972 Water Pollution statute to allow states to administer the controversial dredging and fill permitting program required by Section 404 of the Act.

Set up a mechanism to administer, at the state level, delegation of the non-navigation elements of the Section 404 dredge and fill permits if the Congress passes the necessary authorizing legislation.

The U.S. Maritime Administration of the U.S. Department of Commerce is conducting cooperative programs on the assessment of marine commerce problems and opportunities with ports and states, and has indicated willingness to conduct such a program in the Texas Gulf beginning in the fall of 1977.

Authorize the Texas Coastal and Marine Council to enter into a cooperative agreement with the Texas ports, and the U.S. Maritime Administration and appropriate state agencies to undertake an evaluation of the problems and opportunities facing the maritime industry in the western Gulf.

DID YOU KNOW THAT TEXAS PORTS:

- **Are the busiest of any state in the U.S., moving 237 million tons in 1974...**
- **Contribute an estimated \$6 billion to Texas economy...**
- **Are publicly owned and managed by local, special purpose governments called Navigation Districts...**
- **Are self-supporting on local revenues. Local tax support varies from negligible amounts to over \$100.00 per capita...**
- **Are authorized by the Legislature under provision of the Constitution and created by local voters...**
- **Are facing major challenges to meet new demands in the face of stricter government regulations...**

Texas Ports

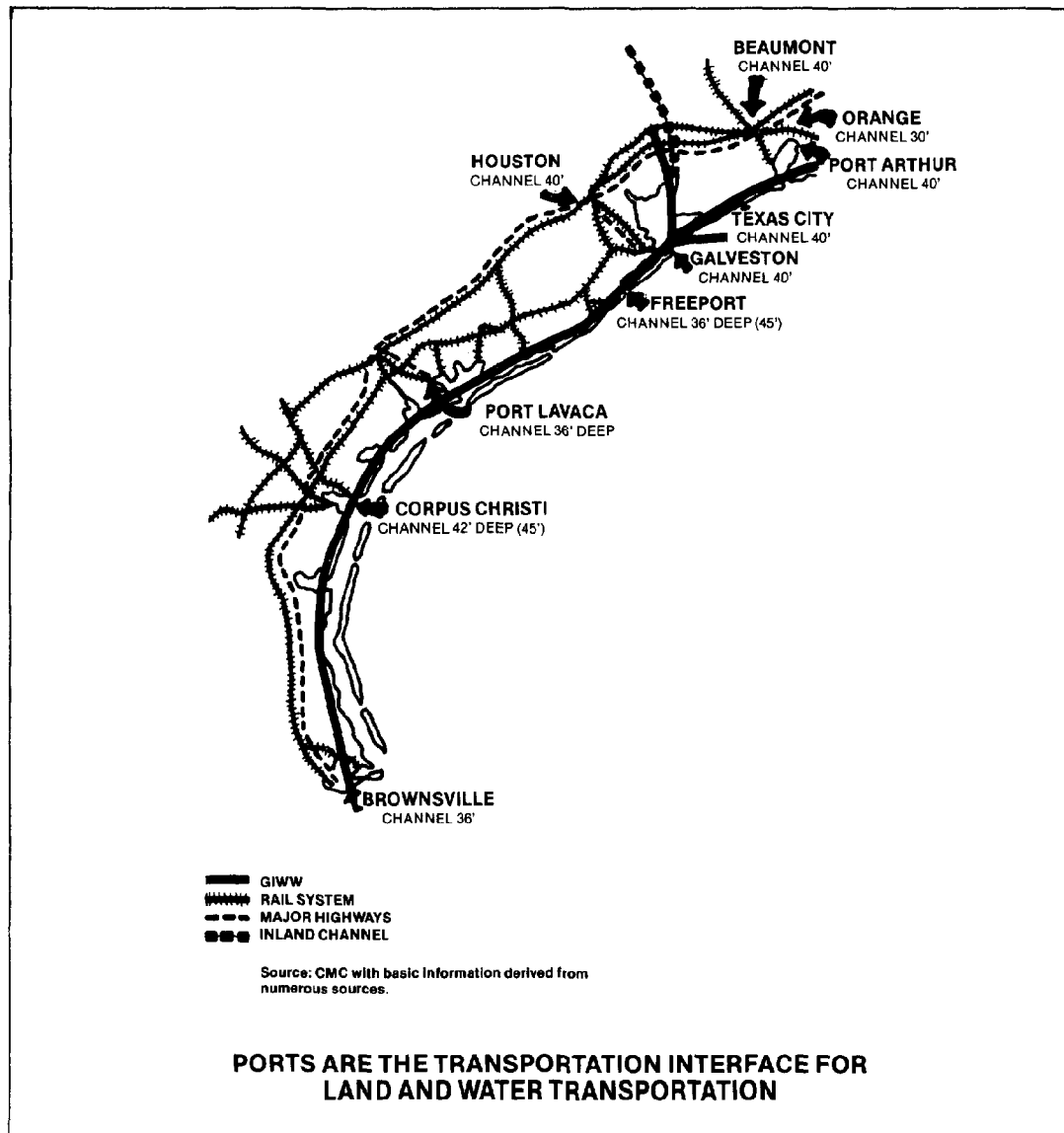
TEXAS PORTS

Texas marine commerce is a dynamic mixture of public and private endeavor affected not only by world commerce, but by government at many levels. A healthy port system is vital to the state and regional economy.

The role of state government in marine commerce—though primarily indirect—is complex and subject to change. There are, however, activities fixed by law which have become integral parts of the system.

Physically, Texas waterborne transportation system consists of three principal components, with a fourth proposed:

- The Gulf Intracoastal Waterway and its tributaries;
- Shallow-draft ports (fishing and recreation);
- Deep-water ports (30-45 feet deep, for heavy commerce);

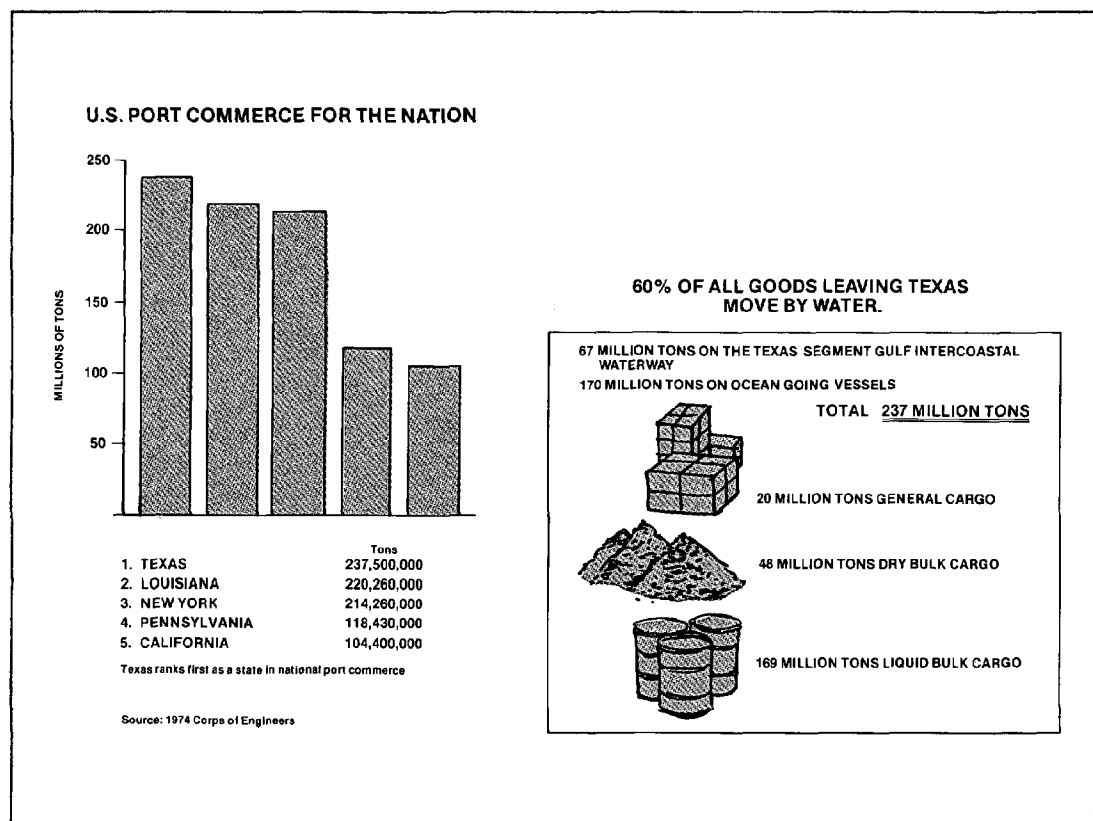


Institutionally, Texas' marine commerce system directly or indirectly involves a gamut of private enterprise, navigation districts (port authorities), state agencies, federal authorities, and other interests.

The general condition of Texas' marine commerce is regarded as healthy and is expected to remain so. Texas' ports are the busiest of any state: in 1974, 237 million tons of goods were handled by the Texas ports, with a total impact on the Texas economy of over \$6 billion and a direct impact of over \$2 billion. (1974 was latest year for which statistics were available when this report was done.) However, some problems do exist which could cause significant difficulties.

While most early Texas settlers came overland, some came by water. Thriving ports sprang up at Indianola (near Port Lavaca) and Valasco (near Freeport). Galveston has been a maritime center for over 150 years, and claims to be Texas oldest commercial venture.

The Gulf Intracoastal Canal Association was formed in 1905 by a group of South Texas bankers and promoters as a means of connecting Texas coastal communities with the vast Mississippi River Inland waterway system through an intracoastal waterway, protected from the Gulf of Mexico. Congress endorsed the concept in 1910. Construction began in the 1920's and was finally completed to Brownsville in 1949. Now the GIWW is 12 feet deep, 125 feet wide and runs from Brownsville to western Florida.



60% of all goods leaving Texas move by water. Texas' ports move more tonnage than those of any other state, followed by Louisiana, New York, Pennsylvania, and California.

The state does no actual management of the marine commerce system. This is the role of navigation districts. The state's involvement is indirect, through authorizing legislation, environmental regulations and submerged lands.

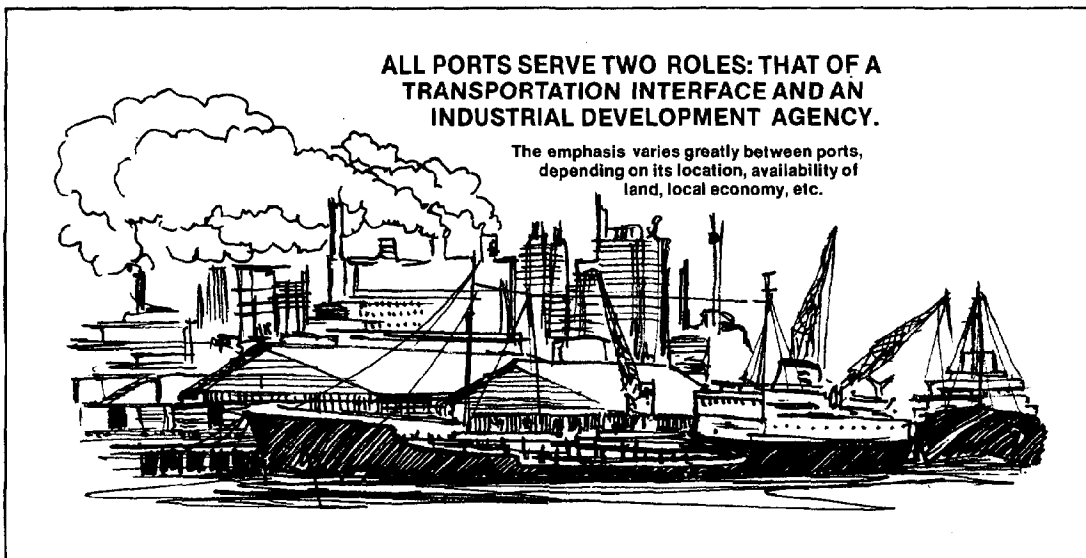
In coping with actions impacting responsible management of the Texas marine commerce system, state government will find some relationships simple and others very complex. Considerations involve local political realities, federal government regulation, state agency participation, and various statutory authorities and responsibilities.

In many cases, the relationships between state government and the Texas Ports are limited. Unfortunately, relations between state government and ports are sometimes strained, usually as a result of lack of communication and coordination which contributes most to inefficiency and misunderstanding.

Tension between ports and state agencies is created by some of the following conditions:

- Ports have historically dealt principally with the federal government and have had minimal dealings with the state.
- Some state agencies apparently don't appreciate the broad, general purpose of ports to promote economic and industrial development, as well as to serve as an intermodal interface between land and water carriers.
- Some state agencies dealing with environmental matters often cite ports as the cause of many evils in the area, when a port usually has no control over the entity that may be causing a particular problem.
- Ports believe themselves autonomous and independent of state agencies.
- Some state agencies may believe ports have greatly abused their privilege to acquire the use of state lands, which in the past could be acquired for \$1 an acre.

The deep-water ports are the principal element of the state's marine transportation system, and an understanding of their role, organization, resources, impact, and problems is vital to any Legislative examination of marine commerce in Texas. They handle 98% of all goods moved by water in Texas. With the exception of Texas City and Galveston, the deep water ports are owned and operated by navigation districts created by the Legislature.



Ports serve two main functions: as exchange points between water and land transportation modes, and as promoters of industrial and general economic development.

Some ports concentrate on the transportation function, while others emphasize their role as promoters of regional economic development. Ports in more developed areas such as Galveston generally are more involved with the conventional transportation role, while ports such as Brownsville or Corpus Christi—located in less developed areas with more land available—are more oriented toward industrial development.

In many respects, ports behave more like private corporations than public agencies. In the U.S., ports are fiercely competitive with one another and try to operate on the basis that their revenues will be adequate to meet their expenses. Thus, supposedly, a minimal burden will be borne by local taxpayers; in Texas the tax burden varies from negligible amounts to over \$100.00 per capita. (See Finance Section.)

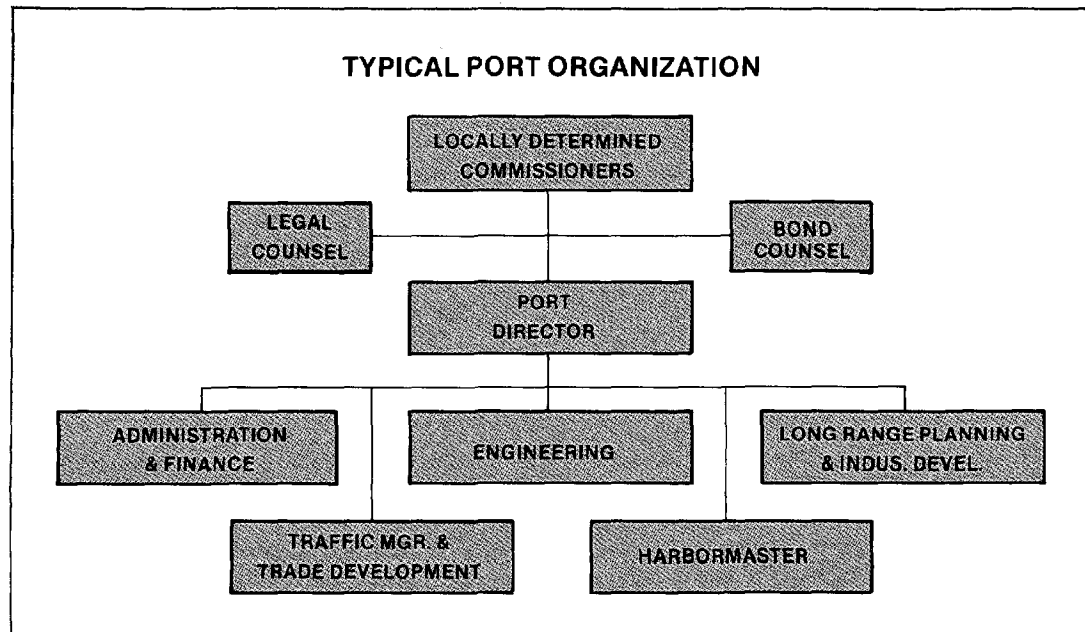
Texas ports are generally landlord ports interested in providing non-federal requirements for development and maintenance of channels, new industries and private marine terminals. Revenues are principally derived from leases on both land and/or special facilities rather than services such as stevedoring. Traditional services such as stevedoring, haulage, and other associated activities, are usually provided by private companies on a contract basis. While most landlord ports own some public facilities, they are usually minimal. Galveston, a municipal port, is the only Texas port which owns virtually all its port facilities and provides all port services.

Along the industrialized channels, individual industries own and operate their own docks for their exclusive use. Tonnage across such docks is, however, included in the tonnage figures for a port.

Private industries located within the political jurisdiction of a landlord port may directly compensate the district for the use of land belonging to the district by leasing land or facilities. Since the district has taxing authority, the presence of such industries also serves to raise the tax base within the district.

Texas ports—except Galveston and Texas City—are run by navigation districts, which are special-purpose political subdivisions of the state. In other parts of the U.S. ports may be state agencies, municipal entities, or interstate compacts such as the New York/New Jersey Port Authority.

As public bodies, ports are run by Commissions determined locally either by election, or appointment by local elected officials. The commission sets policy and hires a director who serves as general manager and is responsible for management of the port. The port director generally has several principal deputies who are responsible for specific functions which include administration and finance, long-range planning and industrial development, engineering, traffic and trade development, and the duties of the harbormaster.



Locally-oriented management is consistent with the state's approach to management of water-related resources. Special-purpose districts similar to navigation districts include river authorities, water conservation districts, and levee improvement districts. All draw their authority from the Texas Constitution and various subsequent enabling legislation.

The constitutional authority for navigation districts is found in two articles of the Texas Constitution. A 1904 amendment to Article III, Section 59 of the Constitution authorized the formation of districts for public improvements, including navigation. In 1916 an amendment to Article XVI, Section 59, declared the conservation and development of the state's natural resources, including navigation development, to be public rights and duties. The amendment went on to authorize the establishment of special districts for that purpose. General statutes relating to navigation districts enacted pursuant to this Constitutional authority have been codified in Chapters 60-63 of the Texas Water Code.

Texas has 22 navigation districts, but not all are active in developing and operating port facilities. Eight operate deep-draft ports for oceangoing shipping. Others maintain commercial fishing or recreation ports, and some serve as local sponsors for barge channels. Some are essentially defunct.

Specific legislative provisions and institutional characteristics differ considerably from district to district, depending upon under which chapters of the Water Code a district is organized and according to the specific enabling legislation under which each district operates.

Most districts have a number of common characteristics such as the following:

- Governed by a locally-determined citizen commission;
- Managed by a port director hired by the commission who is responsible for day-to-day operation and administration.
- Have authority to purchase or condemn private or public land, and to develop and maintain facilities for the furtherance of navigation and related purposes;
- Have the ability to levy taxes for operation and maintenance, and, subject to voter approval, for the payment of general obligation debt;
- Have authority to borrow money for their lawful purpose; and

- Have “the authority to exercise the rights, privileges, and functions which are essential to the accomplishment of those purposes” (promotion of maritime trade and navigation).

This last provision is potentially very far-reaching, but it has never been vigorously used to the point of major challenge; nevertheless, it is potentially important.

There are a number of fairly common differences between the various districts and these differences include the following:

- The number of commissioners may vary from three to six, and they may be either elected or appointed.
- Taxing powers vary considerably. Districts can levy taxes both for operation and maintenance, and for capital improvements. Operation and maintenance tax is approved at the time of a district's creation, and maximum rates vary from 10 cents to 15 cents per \$100 assessed valuation. General obligation bonds must be approved on an individual issue basis by election of voters in the district. There is no statutory limit on these bonds—only voter approval.
- There are no uniform geographic boundaries for navigation districts and districts can be sub-county, county-wide, or multi-county; however, voter approval is required.
- Promotion and development funds are authorized for some districts. These “P&D” funds receive a specified portion—often 5%—of the district's non-tax revenue which can be expended for any activity that promotes the port's purposes.

State and federal activities with regard to ports and navigation involve literally dozens of subject areas and agencies. One port official estimated that they must deal with more than three dozen state and federal agencies. In order to focus the evaluation required by S.R. 269, it was necessary to focus on those areas where the State of Texas has a substantial involvement—and thus the Legislature might have some reasonable possibility of bringing about solutions.

Major areas of involvement include dredging and spoil disposal, air and water quality regulation not related to dredging, promotion and development, economic (rate) regulations, custom collections, occupational safety and health, and many more. It was decided to focus on the first three of these.

Texas has shallow coastal waters and bays, so channels must be dredged for both shallow-draft barges and ocean-going ships. Silting and shoaling occur so that maintenance dredging is required on a periodic basis varying from one or two years up to ten years or more.

Primary responsibility for constructing and maintaining navigation channels rests with the U.S. Corps of Engineers. The federal government pays the cost of actual dredging; however, those activities are contingent upon certain “local sponsorship” requirements being met by other, non-federal parties. The local sponsor (usually a navigation district) must provide all necessary rights-of-way, relocate pipelines and other obstructions, and provide adequate disposal sites for the deposition of materials dredged from the channel.

In the past, local sponsorship was not particularly difficult since coastal land was relatively inexpensive and there were very few environmental restrictions on spoil disposal. However, as land prices and environmental regulations increased, so has the cost of fulfilling the local sponsorship role. The number of state and federal agencies actively involved in regulating dredging activities has increased; but more importantly, the conditions imposed by these agencies have become much more severe.

Regulation of dredging and disposal activities is oriented toward controlling three major undesirable environmental effects: destruction of submerged habitat; increased turbidity in coastal waters; and resuspension of polluted sediments in the water column. Control is effected by diking existing spoil areas, limiting the deposition of spoil on submerged sites, and restricting the placement of polluted material.

Beginning recently, a requirement for compensatory mitigation is being recommended by both federal and state fish and wildlife agencies. Mitigation means any action to lessen the adverse impact of a project; compensation means provision of additional land to be dedicated for fish and wildlife habitats. While the term “mitigation” is being commonly used, what these agencies are seeking is compensatory mitigation where for each acre destroyed/used by a project, an equal amount of similar habitat should be purchased and dedicated, in perpetuity, to be used as a fish and wildlife habitat.

This has been met with strenuous objections from the ports and other affected bodies. Because supplying acceptable disposal areas is a local responsibility, these restrictions have significantly increased the costs of local sponsorship. In some instances, it is questionable if “acceptable” areas exist at any price.

The number of governmental agencies involved in the regulatory process and an overall lack of interagency communication significantly increase the difficulty of dredging and acquiring and utilizing disposal sites. Six different agencies (three federal and three state) have major responsibilities regarding the regulation of dredging activities. They include the U.S. Corps of Engineers, the Environmental Protection Agency, U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department, Texas Water Quality Board and the Texas General Land Office. This subject is discussed further in the Environmental Section of this report and in a separate report entitled, "Spoil and Mitigation," by the Texas Coastal and Marine Council, pursuant to H.S.R. 81.

Air and water quality regulations have direct and indirect implications for port operations. Ports are directly affected because regulations often require modifications or additional investment in port-owned facilities. In some cases, ports build waste treatment facilities and lease them to area industries; more than \$100 million worth of such facilities have been financed.

Because Texas ports also have a role in attracting industrial development, air and water quality regulations affecting industry impact port development programs. New approaches to environmental management, such as EPA's "trade-off policy" for controlling air pollution, are likely to ultimately have a major impact on growth within the various port areas.

Although there is a significant body of Texas air and water pollution regulations, state agency roles in air and water quality regulation could be described as reactive, in that most state actions fall within a framework of federal laws, regulations, and guidelines. The federal government plays the critical role in determining water and air quality regulations, while state agencies promulgate their own regulations pursuant to state laws and within parameters set by the EPA. Two state agencies, the Texas Air Control Board and the Texas Water Quality Board, have direct responsibilities for enforcing air and water quality laws.

While all the ports have felt the impact of the air and water quality regulations, few, if any, appreciate long-term consequences of new and emerging federal programs, such as non-point source water pollution control, and the non-degradation provisions or emissions trade-off policies. Ultimately these laws will determine how—if at all—a port may grow.

Promotion and development of navigation has been largely a federal-local responsibility in the past, with no active state role. The state's most valuable contribution to port activity growth was the maintenance of a healthy climate for business expansion. At one time, navigation districts were permitted to purchase state-owned lands for one dollar per acre (Acts 1930, 41st Legislature, 4th C.S. p. 47, Ch. 27, § a). Most of the state's navigation districts availed themselves of this provision before a 1969 moratorium and its repeal in 1973. Other districts simply had special laws granting them large amounts of submerged lands.

SUBMERGED LAND ACQUIRED BY NAVIGATION DISTRICTS UNDER ART. 8225 AT \$1.00/ACRE

In addition, various tracts were granted
directly to the districts by the Legislature.

NAVIGATION DISTRICT	ACREAGE
Port of Beaumont	66,547
Chambers & Liberty Co.	28,013.830
Matagorda No. 1	115,287
Matagorda No. 2	1885.58
Calhoun County	47,765.00
West Side Calhoun County	2,347.6
Jackson County	1,082.83
San Patricio No. 1	229,505
Aransas County	1,787.896
Nueces County	20,022.14
Willacy County	3,997.34
Brownsville	7,390.35
Port Isabel San Benito	1,644.41

Source: David French, *Comments on Navigation Districts of Texas*, Texas Transportation Institute, Texas A & M University, May 28, 1973; Unpublished Research Report.

At present, only one state agency, the Texas Department of Highways and Public Transportation, has direct involvement in the development of navigation, and this is a new role. In 1975, the Department was given the responsibility of serving as the non-federal sponsor of the Texas portion of the Gulf Intracoastal Waterway. In terms of dollar expenditures, agency involvement is still minor; however, it is a significant first step in obtaining commitments to navigation development.

The Texas Industrial Commission becomes peripherally involved through its responsibility of attracting new industry to Texas. The Texas Coastal and Marine Council has carried out several investigations mandated by the Legislature, such as this one involving marine commerce. Other agencies, such as the Texas Department of Agriculture, recognize that a viable port system is necessary to their constituents, and when the occasion arises, will be supportive of port interests. State educational institutions, most notably Texas A&M's Texas Transportation Institute and Sea Grant Program, have conducted studies relating to marine commerce in Texas.

A number of federal agencies are involved in promoting navigation and port development. The three with the most significant responsibilities are the Corps of Engineers, the Maritime Administration, and the Coast Guard.

The Corps is the traditional federal navigation development agency. It has the primary authority for construction and maintenance of navigation channels, including funding.

The Maritime Administration has traditionally been more involved in the shipping aspect of navigation than in port facilities and operation. However, in recent years MARAD has increased its involvement in the promotion and development of port operations, especially on a regional level.

The Coast Guard is not directly involved in the promotion of navigation, but its activities in navigation safety and large expenditures on its primary interest in the aids to navigation make its role vital to marine commerce. Major responsibilities include: traffic control, maintenance of navigation safety devices, and security.

Two federal agencies, the Federal Maritime Commission and the Interstate Commerce Commission, regulate rates for international and interstate shipping. Ports must deal with both, and as a result can get caught in jurisdictional disputes. Such matters are clearly in the federal domain; however, the Shipping Act of 1916, as amended, provides a state the specific opportunity to lodge complaints and bring legal action if the state believes its maritime industry is adversely impacted by ICC or FMC actions.

COASTAL ZONE Management Newsletter

February 2, 1977

WHAT IS THE OUTLOOK FOR WATERBORNE TRANSPORTATION IN THE YEAR 2000?

In a recent policy document, former Transportation Secretary William T. Coleman explored "National Transportation Trends & Choices (to the year 2000)," wrapping up the 407-page report with the following assessment of technological possibilities for coping with projected transportation issues:

"Waterborne transportation will see continued technological development, on the domestic inland, Great Lakes, coastal waterways, and on the open seas." Among the advances are "increasingly sophisticated terminal facilities," handling both containerized and bulk shipments; "unit" barge tows, consisting of one towboat pushing linked barges with the same cargo to a single destination; and a nationwide Loran linked with radio and telecommunications to improve control and scheduling of barges.

"Space will be at a premium at coastal ports and the rail marshalling yards are likely to move inland with good rail and highway connection to link the waterfront with these backup terminals. Real-time computer systems will track shipments to minimize shipping time, as well as pilferage and incorrect routing..."

"Extensive undersea mining and oil recovery will require bulk raw-material movement. Large cargo-carrying submarines are likely for liquid or slurry materials to provide a capability for very efficient movement and for loading and unloading away from wave action. Offshore deepwater ports may have both surface and subsurface hookup facilities with materials piped across the ocean floor. Coastal land is likely to be preserved for ecological and recreational reasons so that pumpable cargoes will move via undersea pipeline to inland storage and processing plants..."

"Small, high-speed, highly-maneuverable ships will service the many offshore facilities and marine farming operations. Surface-effect vessels, both hovercraft types and sidewall types as well as hydrofoil, will see limited service in special passenger applications. Hovercraft capable of traversing iced-over rivers may come into use in Alaska and other far-north locations."

By issuing the 18-chapter, "first of its kind" report, Coleman hoped to initiate public discussion as a "first step" toward developing a national transportation plan, realizing that his successor, Brock Adams would not be tied to the views expressed in the document. Formal briefings and hearings on the plan, with national organizations and with the appropriate state and local agencies, are to be held in the next few months. Public briefings are planned for Atlanta, Boston, Chicago, Denver, Fort Worth, Kansas City, New York City, Philadelphia,

Nautilus Press

San Francisco, Seattle and Washington DC later this year. Among the topics discussed are the future of the automobile in the U.S., interstate transportation (highways, railroads, air, waterways and pipelines), international aviation and marine transportation, and "alternative transportation futures and contingencies." Copies of the document, with maps, are available for \$8.50 from the Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402. Stock No. 050-000-00124-5.

Few "major changes" are forecast for inland waterways and the Great Lakes between now and 1990. Channel depths, which the Transportation Dept. planners predict will not increase, will limit any increases in cargo capacity or barge dimensions; however, waterborne traffic is expected to grow almost 40% in this period and commodity flows by more than 200 million short tons. Other than the possible extension of the navigation season from the present nine or 10 months, no changes are planned or authorized for the Great Lakes-St. Lawrence Seaway, the report notes. A "dramatic increase" in pelletized iron ore cargoes will lead to one change in the Great Lakes domestic fleet: "It is anticipated that all new additions to the fleet will be self-unloaders." Other shifts will be to larger, more economic vessels, with the fleet projected to decline in numbers and increase in trip capacity.

"Widening and deepening of coastal ports and of harbor channel dimensions will be limited due to a number of considerations, not the least of which are the high cost of such projects and serious environmental concerns," the report continues. However, port facilities will continue to expand where land and funding are available. None except Puget Sound and the proposed deepwater ports in the Gulf of Mexico will be accessible to very large crude carriers or to the even larger, ultra large crude carriers. Shipment of petroleum from Valdez AK to west coast ports is likely to affect some changes; for example, the transportation of oil from the Trans-Alaskan Pipeline System will require a fleet of 35 tankers, 27 of which have yet to be built. Domestic ocean trade generally is expected to increase because of petroleum product shipments, "particularly within the North Atlantic region." Also noted is the trend toward use of vessel traffic services in congested harbors. These guidance systems now are in operation in Puget Sound, San Francisco, and Houston/Galveston, and are planned to be completed for Valdez and New Orleans this year and for New York in 1978. Other areas "being examined and analyzed" for potential systems are the Chesapeake Bay and portions of the Gulf Intracoastal Waterway.

A "thorough analysis" of the nation's public ports is called for in the report, which notes that the "underlying problem concerning the Federal role in port planning and development is, quite obviously, the lack of clearly defined national policy for either water resources or water transportation. A unified government approach to port planning will be necessary, particularly to evaluate the competitive impact on ports as a result of federal actions." Port policy now is divided among numerous agencies and congressional committees, among them the Transportation Dept., the Water Resources Council, Council on Environmental Quality, Army Corps of Engineers, Environmental Protection Agency, Maritime Administration, Office of Coastal Zone Management, and the Interstate Commerce Commission.

Economic regulation—i.e., rate regulation for ocean commerce and the overland feeder systems—is a major factor in determining whether a port will prosper and grow. An unfavorable rate can cripple a port, especially if it has a narrow cargo base.

The so-called "mini-bridge" tariffs begun in the early 1970's are a prime example. They have resulted in the diversion of significant amounts of cargo previously passing through Texas ports, mainly Houston and Galveston, directly to the East and West coasts, causing a substantial loss in revenues. Texas first protested these rates before the FMC, and then joined the ports in bringing suit in federal court trying to get the mini-bridge rates ruled illegal. To date, not much success has been achieved, and as of January 1977, litigation continues.

Port interaction with state and federal agencies on environmental matters is principally issue-oriented and reactive.

Texas ports work with agencies at the state and federal levels on an independent basis, and on specific issues of interest to the individual port. There is often inadequate communication both between individual ports and between the ports and state and federal agencies. Intense competition prevents cooperation on competitive measures, an attitude which unfortunately often carries over into other areas.

Although a trade organization for Texas ports exists (the Texas Ports Association), it has not been particularly effective in developing lines of communication between governmental agencies and the Texas ports.

No mechanism currently exists whereby an agency can obtain a uniform port position on a specific issue. Conflicting opinions may be voiced to an agency by different ports, and this can make it difficult for an agency to render a decision on what should be a simple matter without fending some port.

Ports tend to be naturally independent, due largely to the competitive nature of their business, and this is especially noticeable in port directors and promotional staffs. However, those port staffs and legal

counsels who handle the majority of the liaison and work with state and federal agencies, tend to be cooperative with each other. This, not unexpectedly, comes as a result of their being continually faced with similar problems and a realization that by sharing information and using common approaches they can be more successful.

Increasing such communication and cooperation both between ports and between the port community and the state and federal agencies can only help by reducing conflicts, and, hopefully result in all concerned better executing their public duties. After all, all those concerned—navigation districts, state agencies, federal agencies—are public bodies striving to do a job that's supposed to reflect society's needs and preferences.

Better cooperation between the various state and federal agencies would be helpful to marine commerce interests. As things now exist, a port that is trying to do something often has difficulty getting a definitive answer to a question, or worse yet getting conflicting answers. In the latter case, which frequently arises in dredging and spoil disposal projects, there is no place to turn to get the conflict resolved. One state body, the Interagency Council on Natural Resources and the Environment, has provided a discussion forum, but has been ineffective in resolving conflicting positions. Statutorily strengthening of this body might help resolve such difficulties. However, with Texas' system of independent, autonomous agencies, such a Council's role can only be dination and advisory. The Governor, although he has relatively few explicit powers, could use advisory information from the Council in dealing with the federal government, or "leaning" on state agencies to be more cooperative.

A complimentary approach would be to authorize a state agency, most logically the Department of Highways and Public Transportation, to work with the ports in dealing with state agencies on matters relating to dredging and spoil disposal. The DH&PT would become involved only if a port requested their assistance.

The possibility of establishing a work group or "task force" composed of technical staff from the ports, or their consultants, and the state port-related agencies to identify and classify common problems and develop possible solutions should be explored. Such "solutions" could take a variety of forms including:

- Technical options and actions that would satisfy state/federal regulations while minimizing added costs; and
- Policy recommendations to the appropriate administrative/legislative entity to alter requirements if the costs of such requirements seem vastly disproportionate to the benefits

A specific legislative directive, probably in the form of a resolution, would be helpful in getting such a task force organized and moving. Such an approach would likely be valuable in other states; thus, since the Maritime Administration is providing matching funds for such "methodology development" projects, the feasibility of obtaining such cooperation and assistance should be explored provided, however, that project control would not be sacrificed.

Recommendations

The state should continue legal action to fight mini-bridge and other discriminatory tariff practices.

Legislation should be passed to strengthen the Interagency Council on Natural Resources and the Environment by giving it additional responsibility to coordinate agency policies and activities. If the ICNRE structure concept is well received, some consideration should also be given to a similar structure for the Interagency Transportation Council. Some mechanism should be devised to provide a voice for port interests on these Councils.

The statutory authorities of state agencies on matters directly impacting navigation and port developments should be analyzed to ensure that such statutes clearly define state policy and each agency's role in carrying out that policy. Where conflicts exist, some resolution mechanism should be ensured.

State agencies should strive to establish adequate communication channels with the Texas Ports. A coherent record of policies and programs affecting navigation should be maintained. The new State Register seems to be a fair start for formal matters; only time will tell if it is adequate for this purpose. Informal communications are equally as important.

The Texas Ports Association should designate a state contact to maintain communication between state agencies and Texas ports on matters of mutual concern and to provide state agencies with positions reflective of the membership of the Texas Ports Association on matters regarding navigation and port development.

The Coastal Waterway Act should be amended to authorize the DHPT to work with and assist the ports on problems relating to dredging and spoil disposal resulting from activities conducted in state waters. Such assistance would be provided only upon request of the individual port and should be limited to acquisition of permits, those actions that would not alter the competitive posture between the ports, and development of a site-specific "spoil disposal plan" for Texas coastal waters, if financing is provided.

A legislative resolution should be considered authorizing a joint effort between the Texas Coastal and Marine Council and the Department of Highways and Public Transportation, in cooperation with the Texas Ports and the Maritime Administration to undertake an evaluation of the problems and opportunities facing the maritime industry in the western Gulf. Focus should be on finding solutions to common problems, with an emphasis on both technical solutions and possible alteration of policies or programs.

Finance



FINANCE

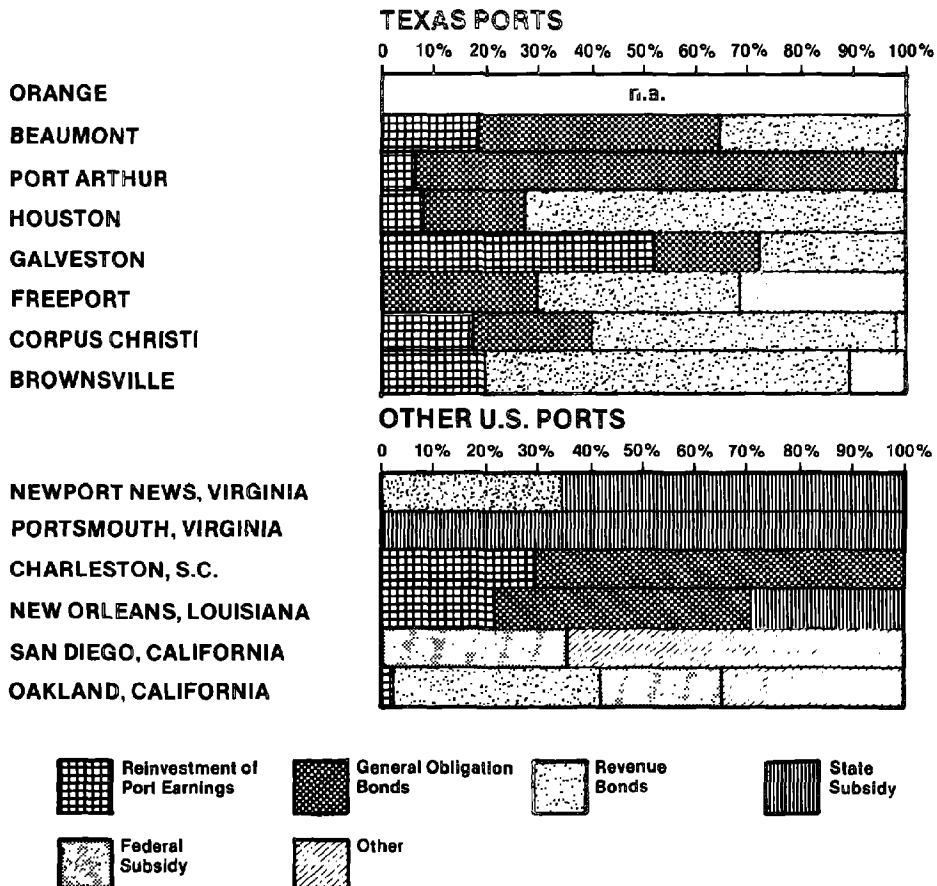
Independence and local control are key points in financial characteristics of Texas ports. Their competitive nature leads to innovative mixtures of public and private financial arrangements to keep the basically sound system progressive.

Investment by local and public agencies comprising the U.S. seaport system are drawn from—in descending order—bond issues (general obligation and revenue), reinvestment of earnings, local taxes and appropriations by state and city government.

Revenue sources and amounts vary considerably between ports, depending upon the size of the port, facilities owned by the port, services provided by the port and current economic conditions. The ports of Corpus Christi and Galveston derive considerable revenue from port-owned facilities, but other ports may not have many public docks and hence most cargo moves across private docks. In such cases there is a mixture of financial responsibilities.

PORT DEVELOPMENT FINANCING SOURCES

- (1) Percent of total capital investment for 1955-1974
(Tx. ports)
(2) Percent of development expenditures for 1956-1972
(MARAD)



Port authorities and navigation districts serve as local sponsors for federal projects and as such are responsible for rights-of-way, utility relocations and spoil disposal areas. They also provide some docking facilities and services as well, and in many cases serve as general promoters of the port, often even in the role of real estate agent, providing both land and other services such as docks and pollution control facilities, all for a fee.

The federal government pays for channel dredging and maintenance, and navigation aids.

Private enterprises are very active in most ports in the areas of docking facilities, especially in conjunction with specialized industries, such as refineries, and also may provide specialized cargo-handling facilities. 90% of tonnage through Texas ports moves over private docks.

Navigation districts have the authority to levy taxes both for repayment of long-term debts and for operation and maintenance based on specific limitations set out in the establishment of the district, and subject to voter approval.

Texas ports have no explicit statutory restraint on the amount of long-term debt they can incur. The only legal constraint on such bonds for capital expansion is required voter approval of general obligation bonds. The bond market greatly affects both the revenue bonds and general obligation bonds.

Statutory limit on taxes for operation and maintenance varies from 10 cents to 15 cents per \$100 valuation on property in the district, variable by district. 1974 revenues were, on the average, approximately three times the amount needed for servicing long-term debts, but varied greatly between ports.

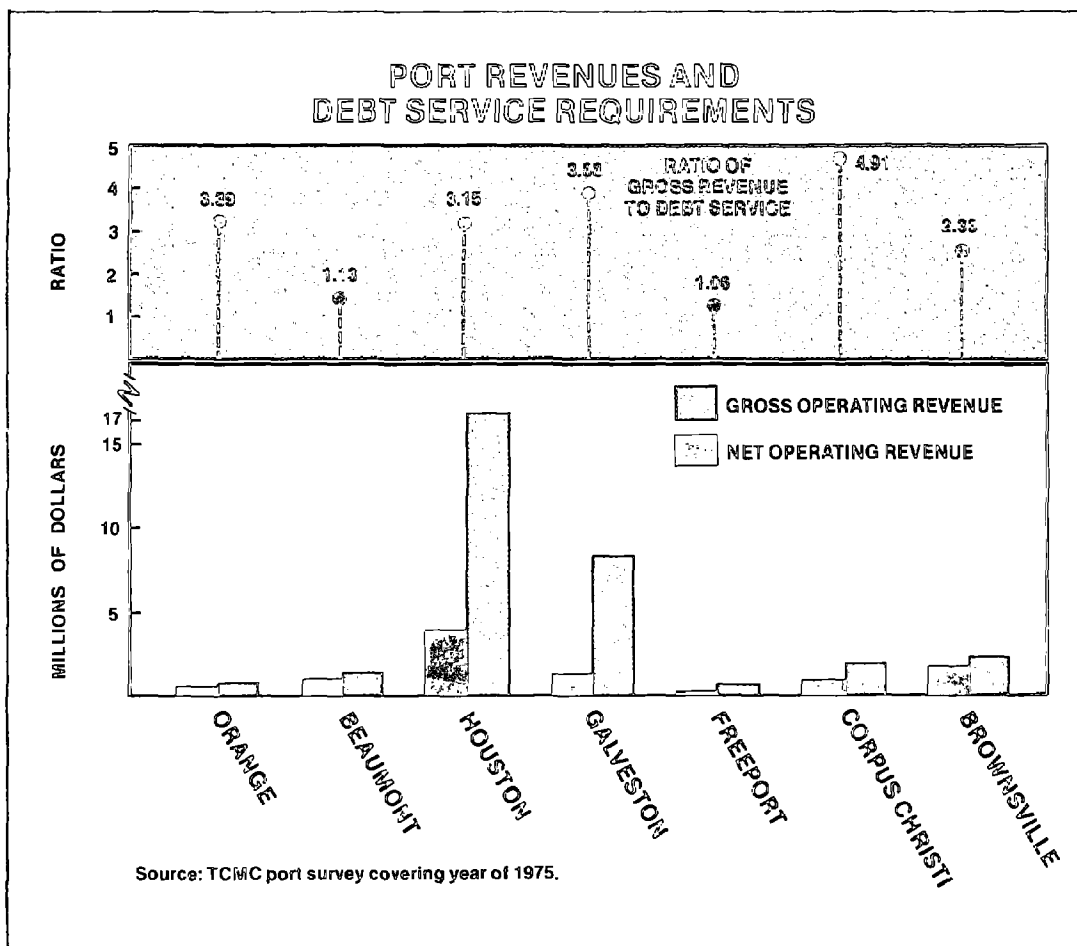
TAX STRUCTURE FOR TEXAS PORTS IN 1974.

Port	Assessed Valuation (\$000's) 1974	1974 Tax Rate Structure (\$/100 A.V.)				1974 Tax Collections (\$000's)		1974 Per Capita G.O. Debt Requirement
		AUTHORIZED		ACTUAL		Maintenance and Operation	Interest and Sinking	
		Maintenance and Operation	Interest and Sinking	Maintenance and Operation	Interest and Sinking			
Port Arthur	\$ 167,682	\$0.10	\$unl	\$0.10	\$0.31	\$168	\$ 520	\$113.72
Orange ¹	171,548 ¹	0.15	unl	0.15	-0-	257	-0-	28.17
Beaumont	215,809	0.10	unl	0.10	0.42	216	906	89.85
Houston	5,761,114	unl	unl	-0-	0.099	-0-	5,703	27.92
Galveston	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Texas City								
Freeport	378,000	0.10	unl	0.10	-0-	378	-0-	-0-
Port Lavaca	62,012	0.15	-0-	0.05	-0-	31	-0-	-0-
Corpus Christi	851,472	unl	unl	-0-	0.03	-0-	255	0.71
Brownsville	142,315	0.10	unl	0.10	-0-	142	-0-	-0-

Generally, trends in port revenues are rather difficult to assess because they depend upon many things including the tonnage across public docks, through the entire port area and fluctuation in tax base/assessment rates. Nearly all Texas ports showed considerable increases in net income between the years of 1972 and 1973, due in part to improving regional economy and increases in grain shipments.

There is a great deal of variation between port financing techniques. As a rule, the larger, more established ports, such as the Port of Houston, tend to rely more heavily on revenue bonds as a source of financing. Ports striving for expansion will often use general obligation bonds for capital improvements.

U.S. ports, as a group, pride themselves for being self-supporting, and generally rely on federal government assistance only for channel construction and maintenance and navigation aids—items which are very expensive, but supposedly do not upset the “competitive balance” between ports.



Financial capability is, of course, a major limiting factor in a port's capital improvement program. The ability to expand varies between ports: revenue bonds are limited by revenue inflows and tax bonds by the mood of voters.

The availability of general obligation bonding power makes it impractical to accurately predict future financing limits and hence assess the adequacy of existing financial resources for Texas ports. It is also difficult to identify port facilities which might be developed for new cargoes from those which could be justified by improving competitive position—i.e., luring somebody else's cargo away.

With the exception of established finance mechanisms, only one other potential source realistically exists: direct support by state or federal government.

Indirect subsidies are common. Not only do Texas ports have taxing powers, navigation districts were once permitted to purchase state-owned lands for a dollar an acre. Federal grants and loans exist in some cases for landside port development, primarily to stimulate economically-depressed areas. In some other states—for example, Virginia—ports are operated and financed by the state, which pays all the bills, but also receives all the revenue. And, in Louisiana, one cent of the state highway gasoline tax goes to support ports: 8/10 to New Orleans and 1/10 each to ports of Baton Rouge and Lake Charles.

Ports have two principal ways to finance capital improvements: by utilizing current and accumulated revenues from operations, or long-term indebtedness: the latter is most common.

For long-term indebtedness, navigation districts usually utilize one or more of three techniques: general obligation, general revenue, and/or special revenue bonds.

General obligation bonds are repaid by district tax revenues, and under the Texas Constitution, may not be issued without the approval of a majority of those voting in a special election called by the district. Bonds do not have to be issued immediately when authorized, but must mature within 40 years, with 25 to 30 years being much more common.

Debt service on a general revenue bond is paid from non-tax district revenue such as wharfage, hence no voter approval is required. Creditors generally set a debt ceiling limitation on the district for the duration of a particular revenue bond issue. For example, in a revenue bond issue, it may be specified that no additional revenue bonds be issued until the district has shown annual earnings of at least 2.5 times the amount of the bond issue.

Special revenue bonds are issued with a pledge of repayment from revenues from a specific facility, usually the facility for which the bonds are intended. This is common when a navigation district or port

constructs a facility for exclusive use by a particular private industry. The port negotiates a long-term lease agreement with the principal user of the facility, with lease proceeds paying for debt service and facility maintenance.

To date, more than \$100 million in bonds have been issued to finance pollution facilities for area industry on the Texas coast. This figure excludes the highly industrial Houston-Galveston area where the special Gulf Coast Waste Disposal Authority performs this function. (See the Environment Section for further information.)

Some districts maintain a promotion and development fund for advertising, etc., which fund cannot exceed five percent of district's non-tax revenues. The promotion and development fund can be used for the following purposes: advertising and promotion; "furthering the general welfare of the district and its facilities" [W.C. 60.201(2)]; and for the betterment of the district's relations with steamship and rail lines, consignees of freight, government officials or others. Other districts may simply issue warrants "to pay all expenses incident to operation of the district" [W.D. 62.152(3)].

Problems with port finance involve several main points: the idea of "unnecessary duplication;" whether ports operate without constraints on expansion; and definition of criteria in investment decisions.

If unnecessary duplication is defined as the construction of repetitive facilities to an extent that they cannot operate at or above a "break-even" point, then unnecessary duplication among Texas ports is negligible. If unnecessary duplication is defined as the construction of facilities not utilized to their maximum capacity most of the time, some persons might argue that some duplications do exist.

For example, just because a dock is not used some—or even a good portion—of the time, the assumption should not necessarily be made that a port is "overbuilding." A given dock in one port is only one small part of a total waterborne transportation system which involves ships, other docks elsewhere in the world, other dockside storage facilities and feeder transportation networks. While debt service and maintenance costs of an idle dock may run \$1,000 per day, it may cost ten times or more than that to keep each of many ships afloat that use that dock. Thus, the dock becomes relatively more important and ships will likely pay a big premium rate for its use, in order to avoid expensive idle anchorage while awaiting dock space.

Many port facilities are privately owned and serve as necessary components of a major industry. Since these facilities are privately owned, there are no grounds for government involvement with their financial feasibility.

Electorate constraint is a major factor when ports attempt to utilize general obligation bonds. If the general electorate feels facilities are unprofitable or not needed, the bond issue likely will be rejected. At this time, voters have been reluctant to approve most bonds, in all areas, requiring additional taxes.

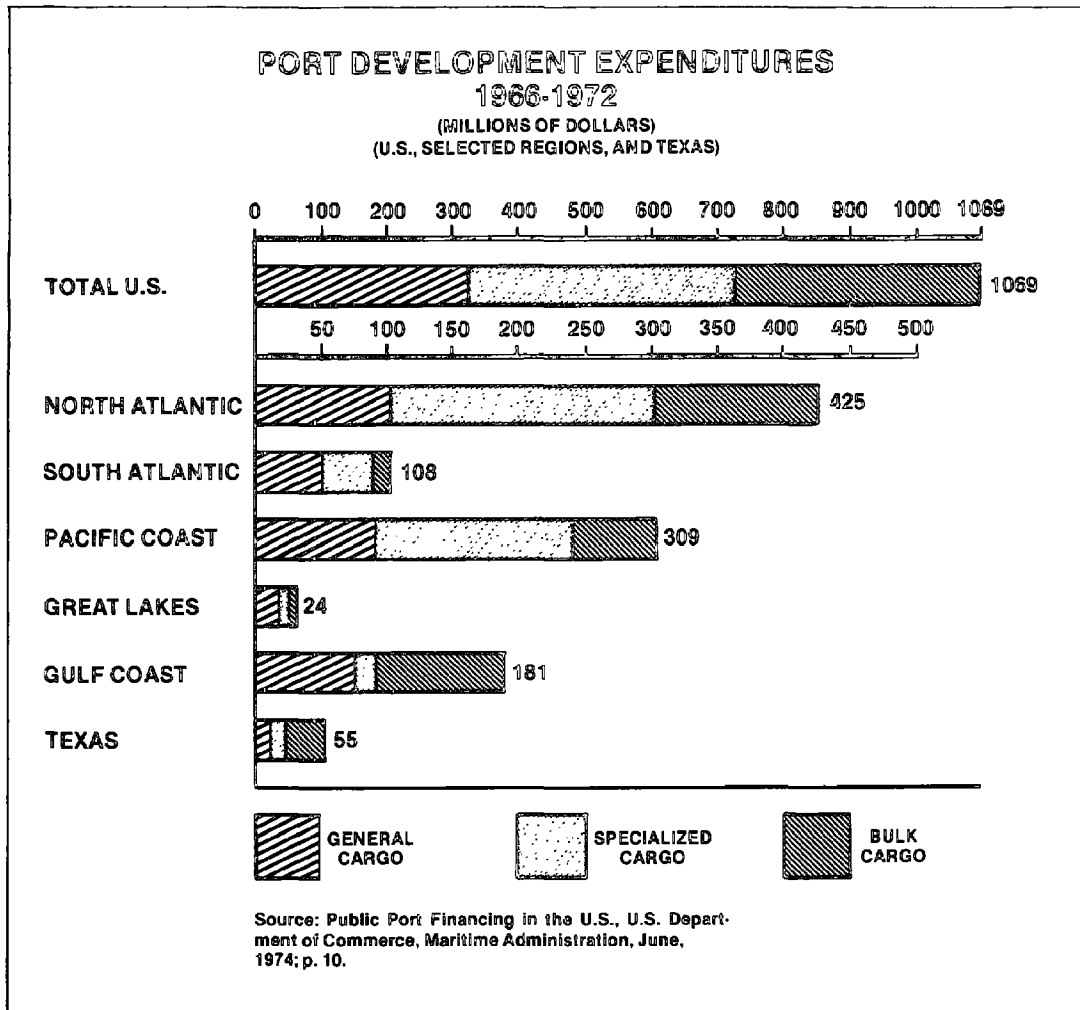
Financial profitability, while important, must be considered along with such factors as employment and revenues generated by increased tonnage, stimulation of local business and maintenance of a competitive port system.

Built-in mechanisms help prevent port overbuilding. A basic benefit/cost-ratio test is prerequisite to authorization of federal investment in channels, for example. Local investment in facilities is subject to open market conditions. Competition and stringent economic analysis are required for issuance of general revenue bonds.

Implications of continuing direct government subsidy are much the same whether money stems from federal or state sources. Two aspects of the system which stand to be most affected are the balance of interport competitiveness and autonomy at the local level.

Any government subsidies—with careful differentiation between channels and cargo facilities—could greatly affect competitive balance between ports unless equally available to all ports. Under present financing practices, major financial barriers to port expansion are limitations imposed by the ability to sell revenue bonds and/or convince district's electorate that additional general obligation bonds are needed. If subsidy money were made available to only certain ports, it would give those ports a significant advantage over other ports, potentially bypassing local voter approval or general market constraints.

Ability to finance port development is a major element in the ability to control the rate and direction of a port's growth. Texas' ports are primarily organized and controlled for response to local needs. State or federally-controlled funds would inevitably take away from local responsiveness and/or control.



Any financial assistance should meet two criteria if Texas ports expect continued local responsibility: First, no state or federal dollars should be expended to finance competitive facilities on a discriminatory basis. In addition, funds made available for port development should be free of state or federal controls, with the exception that projects should meet required environmental or other standards—i.e., “mandated costs.”

Texas ports are generally financially sound. No port has expenditures in excess of revenues although some rely much more on tax income than do others. The average rate of return on original investment of three to four percent annually, while low by private industry standards, is in keeping with the ports’ roles as public entities.

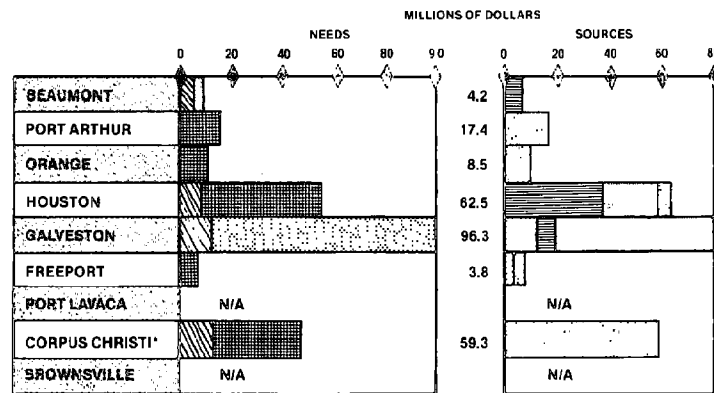
If historical and traditional assistance are excluded, such as Corps of Engineers dredging activities, Coast Guard functions, and state lands acquisition programs, ports receive no significant federal or state assistance. This is especially true with regard to the funding of capital plant and equipment acquisition programs.

The current mix of public and private investment in port facilities appears to be adequate for meeting current and anticipated port needs in Texas. Public investment in port facilities has resulted in no significant long-term redundancies. Facilities appear to be adequate for most current cargo movement needs, and in those cases where a major new facility is being proposed, it seems that environmental objections are more formidable than financing problems.

The future, with substantial shifts in worldwide shipping patterns, is made more uncertain by the advent of new technology—such as more mechanization in cargo handling and larger ships—which require a port to make very large capital expenditures to remain competitive.

Port-related expenditures for new projects can be generally put into three categories: capital expenditures for competitive facilities such as new container terminals; historical U.S. government support for navigation, such as channel dredging or aids to navigation; and the so-called “mandated costs,” which require ports to make significant expenditures to comply with government laws and regulations mainly involving pollution control and security. To date, mandated costs have not posed an insurmountable obstacle to port development, at least in Texas. However, as federal regulations on air and water quality and cargo security become more stringent, so do the costs of compliance.

ESTIMATED CAPITAL NEEDS AND PROBABLE SOURCES



*Excludes costs of deep draft facilities at Harbor Island

	NEEDS			SOURCES		
	REHABILITATION	NEW CONSTRUCTION	TOTAL NEEDS	EARNINGS	GENERAL OBLIGATION	REVENUE BONDS
BEAUMONT	2.3	1.9	4.2		4.2	
PORT ARTHUR		17.4	17.4			17.4
ORANGE		8.5	8.5			8.5
HOUSTON	8.0	54.5	62.5	36.5	21.3	4.7
GALVESTON	10.3	86.0	96.3	10.3	5.7	80.3
FREEPORT		3.8	3.8	0.4		3.4
PORT LAVACA						
CORPUS CHRISTI	14.8	44.5	59.3			59.3
BROWNSVILLE						

Source: Texas Ports own estimates

Regarding the above-described three areas of port expenditures, the Texas ports have generally taken a clear position:

- Competitive facilities should be paid for by each port without subsidy or assistance.
- The U.S. government should continue its historic function in dredging, channel maintenance, and navigation aids, and
- Federal assistance should be provided to help pay for a substantial part or all of the "mandated costs" resulting from government regulation; however, it should be equitably managed so as not to upset the competitive stance between the ports.

Congressional actions regarding federal legislation to financially reimburse ports for the additional costs mandated by federal actions should be closely monitored: many such proposals were introduced before the 94th Congress, and the 95th has already received several. Passage of such legislation might require the development of a state mechanism for funneling funds to the ports through the state instead of the assistance going directly from the federal government to the ports. The latter seems desirable; nevertheless there have been several proposals to send these funds to the state which would then have to apportion the monies among the ports. Two possible alternatives exist to act in this allotment role: the Department of Highways and Public Transportation could act as the state clearinghouse for these funds, or the Texas Ports Association could be chartered to fulfill this function.

Recommendations

Direct state financial assistance to the Texas ports is neither desirable nor necessary, thus Texas should maintain a policy of not providing direct financial assistance to port development and operation.

New legislation having the potential of adversely affecting Texas' ports financially should be closely scrutinized, and the potential impact precisely defined and assessed.

As a result of possibility of federal action to establish a mandated costs assistance program, the Texas Legislature should direct a continuing evaluation of the impact of such financial programs, and authorize the Texas Department of Highways and Public Transportation to receive and administer such funds if the Congress enacts measures requiring direct state involvement.

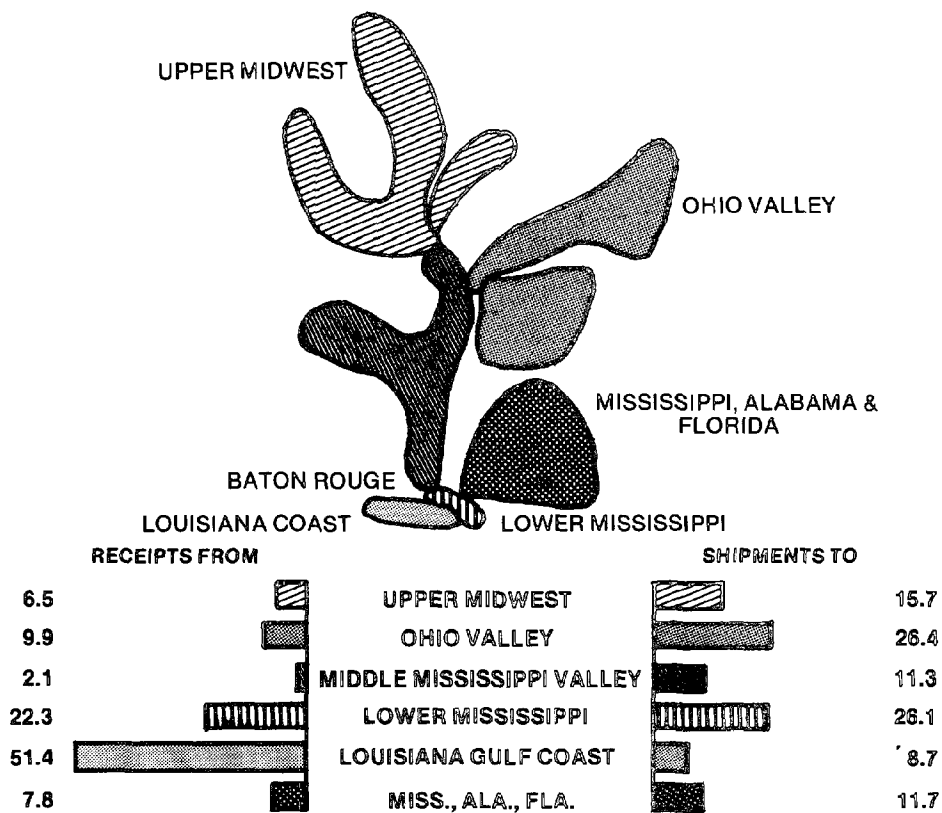
Commodity Flows and Forecasts

90% of all tonnage handled by Texas ports is bulk cargo. 90% of all tonnage on the Gulf Intracoastal Waterway is liquid cargo—mainly petroleum or petro-chemical products.

Domestic trade includes both barge traffic in shallow-draft waterways, and oceangoing merce. Domestic oceangoing commerce in Texas is mainly petroleum goods and chemicals shipped to the Northeastern states. Shallow-draft barges operate along the Gulf Intracoastal Waterway and up the Mississippi system. Over three-quarters of all goods coming to Texas over the inland waterways originate in the lower Mississippi River region. Over forty percent of Texas' outgoing shipments ultimately reach inland to the Midwestern states beyond the junction of the Mississippi and Ohio rivers.

Foreign trade is also mostly bulk commodities. During the past five years, foreign trade tonnage through Texas ports has increased over 100%, primarily as a result of increased demand for foreign-produced raw materials and increased exports of U.S. agricultural products, particularly grain.

INTERSTATE TRADING AREAS FOR COMMODITIES ON THE G.I.W.W.



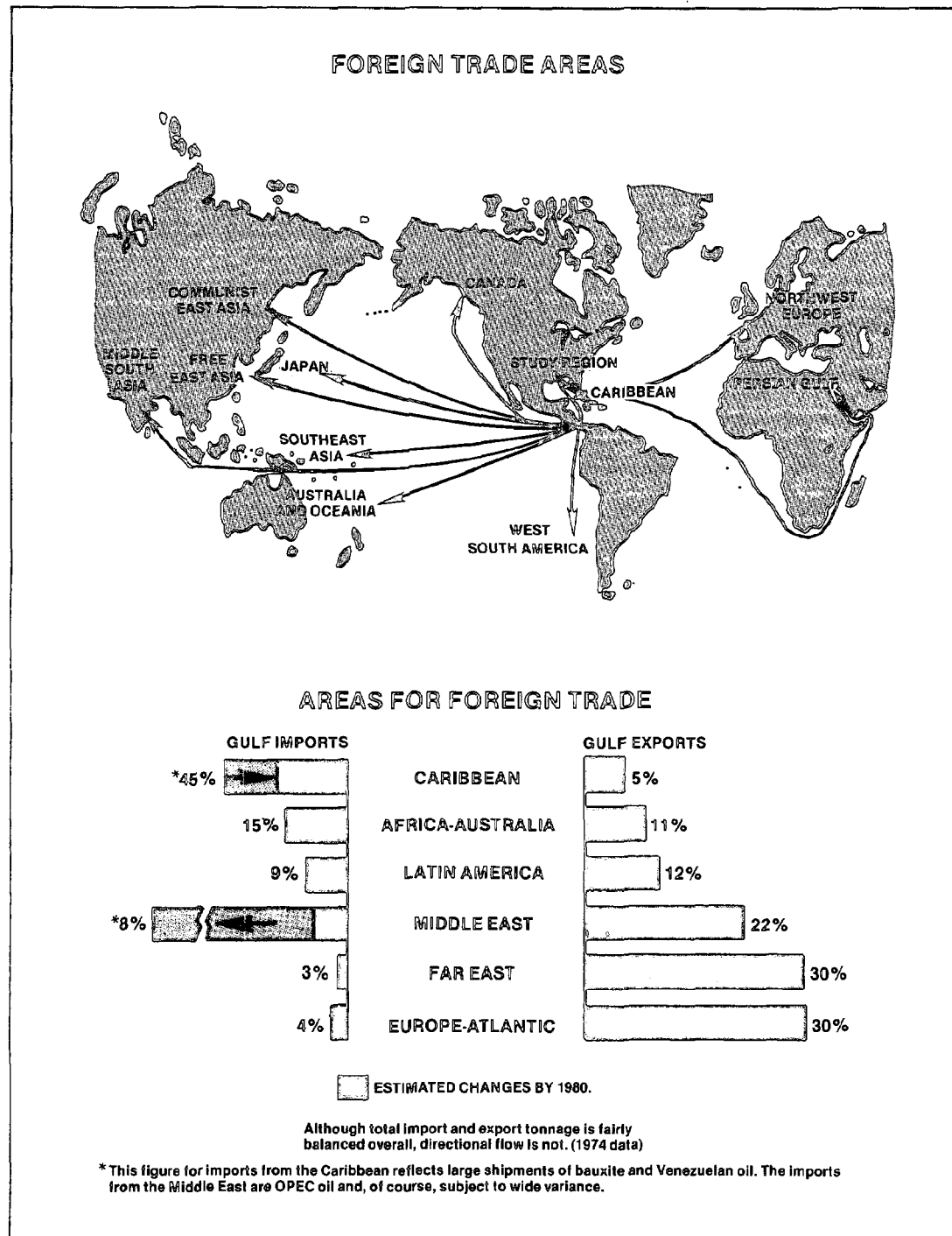
1974 Data: Total receipts of 11,769,995 tons
& shipments of 19,209,212.

Unfortunately, detailed information and statistics for foreign trade flows are maintained only at regional levels, and origin-destination data for individual Texas ports is not readily available.

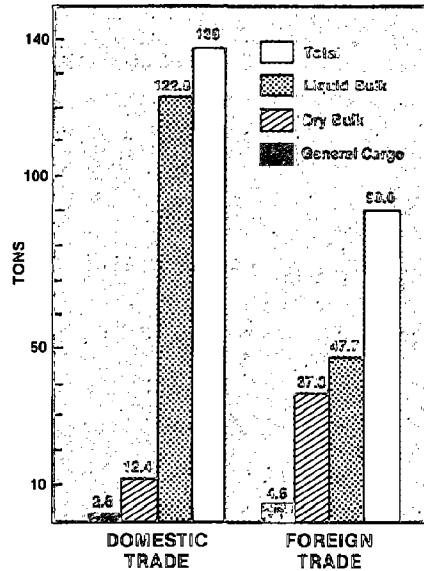
Future growth of Texas marine commerce involves three factors: growth of the general economy, changes in competitive environment, and changes in technology.

Forecasts can be more accurate in the aggregate than if broken down by individual ports; so these forecasts of future trade flows emphasize the Texas system as a whole rather than individual ports. Also, the Texas ports, which cooperated on this effort recognized the shortcomings of forecasts and were reluctant to be a party to any project that would attempt to estimate future activities/facility requirements at individual ports.

Foreign trade growth forecasting is based largely on a Maritime Administration (MARAD) "Portcast" model, which utilizes anticipated growth in the Gross National Product as the major determining variable.



COMPONENTS OF DOMESTIC & FOREIGN TRADE (1974)



Source — USCE Waterborne Stats.

Indications are that foreign commerce using conventional facilities in Texas will grow at an average annual rate of about 3.5 % through 1990.

PRINCIPAL WATER BORNE COMMODITIES MOVING THROUGH TEXAS PORTS

These 19 commodities comprise over 99.9% of all goods moving through Texas Ports

COMMODITY	1960	1973	1990
		(SHORT TONS)	
CHEMICALS & CHEMICAL PRODUCTS	6,843,000	25,852,000	106,079,000
PETROLEUM FUELS & LUBRICANTS	76,862,000	75,206,000	71,348,000
CRUDE PETROLEUM	37,813,000	43,607,000	64,102,000
CASH GRAINS	3,597,000	29,070,000	17,105,000
NONFERROUS METALLIC ORES	5,853,000	8,319,000	14,897,000
PRIMARY IRON & STEEL PRODUCTS	2,017,000	3,450,000	10,145,000
MINING PRODUCTS, NEC	7,992,000	14,123,000	10,139,000
NONDURABLE MANUFACTURES, NEC	2,520,000	1,069,000	5,902,000
DURABLE MANUFACTURES, NEC	522,000	1,331,000	4,347,000
IRON ORE	205,000	1,065,000	2,038,000
AGRICULTURAL PRODUCTS, NEC	1,638,000	1,230,000	1,895,000
COAL	219,000	934,000	1,770,000
RAW & REFINED SUGAR PRODUCTS	551,000	881,000	1,707,000
PULP AND PAPER PRODUCTS	214,000	362,000	1,422,000
GRAIN MILL PRODUCTS	923,000	784,000	883,000
LUMBER PRODUCTS	44,000	220,000	795,000
FABRICATED METAL PRODUCTS	89,000	490,000	538,000
PRIMARY NONFERROUS METAL PRODUCTS	431,000	272,000	365,000
CANNED FRUITS AND VEGETABLES	43,000	30,000	42,000

Historical figures are USCE Waterborne stats., 1990 forecasts were developed from MARAD projections and GNP forecasts.

The MARAD forecast incorporates import and export tonnage for conventional facilities only. Forecasts obtained from SEADOCK and others promoting deep-draft onshore and offshore facilities indicate increases in petroleum imports of about 150 million tons per year.

Domestic trade forecasts hinge upon three areas of trade: demands for chemical, petroleum products and non-metallic minerals; future grain exports; and possible coal movement by barge, either to power plants in Texas, or for export. Although numerous other commodities are transported domestically, these three commodities constitute over 90% of all domestic marine commerce. The greatest expected growth is in non-metallic minerals. Movements of domestic petroleum products are expected to slightly decline in volume due to decreases in domestic oil production and increases in imports. This is based on a questionable assumption that there will be a trend toward refining oil at points closer to local markets, in order to reduce transportation costs. This assumption could easily prove false and the result would be an increase in domestic movements—if oil is imported to Texas, then refined and shipped by water to other U.S. points.

Grain exports are a function of U.S. agriculture policy and foreign production. Such activities are difficult to forecast, but when opportunities for trade exist, the Texas marine commerce system must be ready to serve that contingency. MARAD anticipates a lower "single-year" export volume, but an average export of increased tonnage—i.e., stabilization of grain exports.

MAJOR COMMODITIES — HISTORICAL PATTERNS AND FORECASTED FUTURE FLOWS.

COMMODITY	YEAR					MILLION SHORT TONS						
	'60	'67	'73	'80	'90	10	20	30	40	50	60	70
PETROL PRODUCTS												
DOMESTIC	73.5	61.3	69.1	67.3	55.7	-----						
FOREIGN	3.2	2.6	6.0	9.8	15.6	-----						
CRUDE NOT GAS												
DOMESTIC	37.2	40.9	26.4	27.9	29.0	-----						
FOREIGN	.6	3.6	22.2	20.5	35.1	-----						
CHEMICALS												
DOMESTIC	5.5	14.1	19.3	27.9	50.5	-----						
FOREIGN	1.3	4.6	6.5	23.1	55.5	-----						
GRAIN												
DOMESTIC	.2	.2	.4	.2	.4	-----						
FOREIGN	8.8	10.6	28.7	14.0	16.7	-----						
MINING PRODUCTS												
DOMESTIC	6.5	8.9	12.4	4.5	7.0	-----						
FOREIGN	1.4	1.4	1.8	1.6	3.1	-----						
NON FERRIC METALLIC ORES												
DOMESTIC	2.0	.3	.4	—	—	-----						
FOREIGN	3.9	6.1	6.3	9.7	14.9	-----						
PRIMARY IRON & STEEL												
DOMESTIC	1.4	1.4	1.6	2.2	3.2	-----						
FOREIGN	.6	1.3	1.8	3.4	7.0	-----						

Sources: USCE Waterborne Statistics, MARAD, National Petroleum Council. Certain forecasts are subject to wide variance depending upon future national policies, etc. In 1973 the above 7 commodities accounted for more than 96% of all goods shipped through Texas ports. Data on historical flows and forecasts is summarized in Texas Port Fact Book, Texas A&M for T.C.M.C, 1976.

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Currently, there are extensive plans to bring coal from northern Rocky Mountain states to Texas by rail and/or pipeline for electric generating plants. Although options are uncertain, it is believed that some opportunities may develop for the movement of that coal by barge.

Foreign trade is anticipated to continue to increase much more rapidly than domestic trade. However, even the most sophisticated forecasts of world commerce movements must be cautiously used. Circumstances can change "overnight" with the sudden opening of a new foreign or domestic market, or the closing of an existing market. World trade always has been subject to such changes, often resulting from political rather than economic forces. Experienced human judgment inevitably plays the major role in port management decision making, and not detailed computer models and statistics, though the latter are certainly helpful.

The forecasts presented are discussed at length in "Economic Impact of Texas Ports and Commodity Forecasts" prepared for the Texas Coastal and Marine Council by Texas A&M University, along with the "Texas Port Fact Book." U.S. Maritime Administration forecasts were used to estimate foreign trade activity, and domestic trade was developed from projections of growth in the GNP and various portions thereof, assuming a constant transportation market share for Texas. Considering the state's rapid economic growth in recent years, it can be argued that these domestic figures are apt to be much too low.

Economic Impact

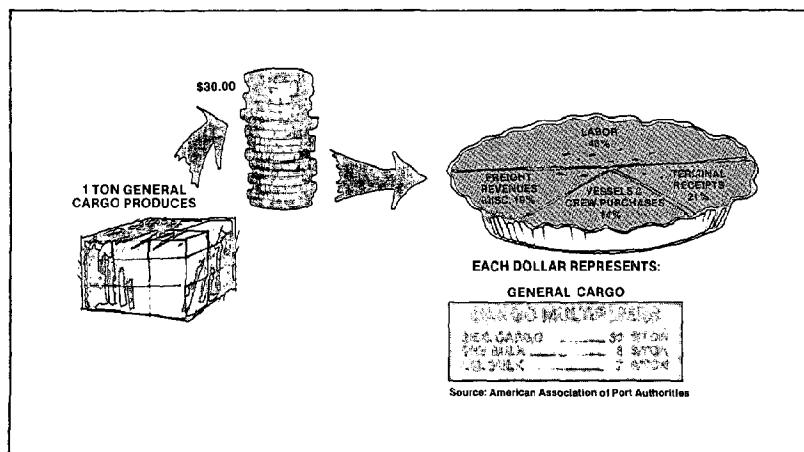
Tonnage figures and forecasts are not the whole story. Texas ports play a vital role in ensuring the economic well-being of the citizens of Texas by stimulating local and regional economies.

Low-cost water transportation is one of the key reasons Texas has and can continue to experience rapid economic growth. Most goods produced in Texas are marketed elsewhere, and Texas' heavy industry is becoming increasingly dependent on imported raw materials. Water is the least expensive mode of transportation for bulk cargoes on many routes; and on some routes it is the only alternative—i.e., grain export and oil import.

Deep water ports on the Texas coast are industries in themselves, hubs of world exchange. Locally, they provide jobs and help support communities, while stimulating even more world economic activity.

Texas marine commerce has been estimated to contribute over \$2 billion directly to the Texas economy. Total impact per annum is over \$6 billion, or a total average impact of \$500 per capita on a statewide basis. Sixty percent of all goods transported from Texas move by water; liquid bulk and dry bulk cargoes together accounted for over 90% of the total 237 million tons of waterborne cargo moved through the ports in 1974.

Determination of the overall economic impact is a two-step process involving the computation of direct impact and subsequent total economic impact. Cargo "multipliers" and an economic Input-Output analysis can be used to quantitatively estimate how marine commerce affects the states economy.



ECONOMIC IMPACT

$$\left[\begin{array}{c} \text{DIRECT IMPACT} \\ \text{PRIVATE DOCKS} \end{array} \right] = \left[\begin{array}{c} \text{TONNAGE} \\ \text{PRIVATE} \end{array} \right] \times \left[\begin{array}{c} \text{AAPA} \\ \text{MULTIP.} \end{array} \right] \quad \dots \text{FOR EACH CARGO TYPE}$$

$$\left[\begin{array}{c} \text{DIRECT IMPACT} \\ \text{PUBLIC DOCKS} \end{array} \right] = \left[\begin{array}{c} \text{TONNAGE} \\ \text{PUBLIC} \end{array} \right] \times \left[\begin{array}{c} \text{AAPA} \\ \text{MULTIP.} \end{array} \right] \quad \dots \text{FOR EACH CARGO TYPE}$$

$$\left[\begin{array}{c} \text{TOTAL} \\ \text{IMPACT} \end{array} \right] = \left[\begin{array}{c} \text{I-O} \\ \text{MULTIPLIER} \\ \text{(2.96)} \end{array} \right] \times \sum \text{FOR ALL CARGOS} \left[\left(\begin{array}{c} \text{DIRECT IMPACT} \\ \text{PRIVATE DOCKS} \end{array} \right) + \left(\begin{array}{c} \text{DIRECT IMPACT} \\ \text{PUBLIC DOCKS} \end{array} \right) \right]$$

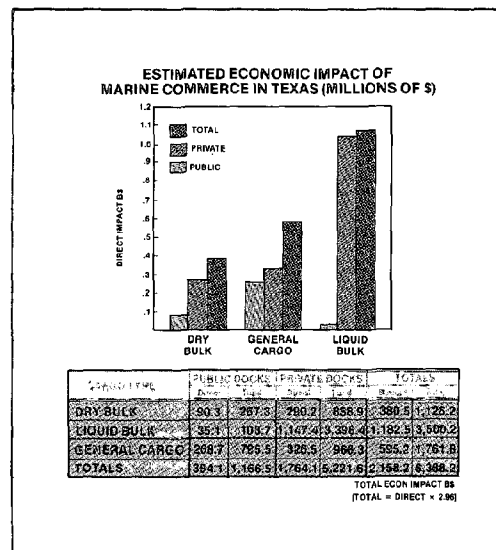
Direct economic impact is obtained by multiplying the cargo tonnage by the AAPA mult. for that type of cargo. Total impact is computed by multiplying the direct impacts by the multiplier from the state I-O model for waterborne transportation.

Innovations in transportation technology show an increasing interdependence between water and other transportation modes. The trend toward containerization is a good example. Standardized boxes, usually 8' x 8' x 20', are used to transport many types of general cargo. They are easily transported by specially-designed ships, rail cars or trucks, and significantly reduce handling time and labor, thereby reducing cost of transportation. Standardized containers also aid in the security of valuable cargoes such as electronic instruments and fragile merchandise. There has been substantial reduction in losses due to pilferage and theft.

After initially opposing containerization, organized labor has accepted it as inevitable, but is insisting upon contract clauses to protect existing jobs. Management and labor are now cooperating well on this matter in Texas.

Another new technique occurrence is "project cargoes," wherein a whole project, such as a petrochemical plant, is built at a fabrication facility in the United States and then packed and shipped to another place for assembly.

Progress in cargo handling, and new techniques in container design not only helps create a more economical system, but also improves the interface between transportation modes, a consideration of great importance to the success of all transportation systems in the state.



Tonnage moves across either publicly owned or privately owned facilities. 99.99% of all cargo is privately-owned, but much of that moves across public docks. In Texas, private docks handle the majority of all cargo—90% of the 1974 tonnage.

PUBLIC PORT ECONOMIC IMPACT

	Thousands of Tons TONNAGE			Thousands of Dollars ECONOMIC IMPACT				TOTAL ECONOMIC IMPACT
	Dry Bulk	Liquid Bulk	General Cargo	Dry Bulk (\$8)	Liquid Bulk (\$7)	General Cargo (\$30)	Sum	(2.96)x
Beaumont	2,739	-0-	277	21,912	-0-	8,310	30,222	89,457
Port Arthur	-0-	-0-	171	-0-	-0-	5,130	5,130	15,185
Orange	-0-	-0-	72	-0-	-0-	2,160	2,160	6,393
Houston	2,235	2,360	6,838	17,880	16,660	205,140	239,680	709,453
Galveston	2,501	-0-	1,224	20,008	-0-	36,720	56,728	167,915
Texas City	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Freeport	-0-	-0-	105	-0-	-0-	3,150	3,150	9,324
Port Lavaca	-0-	-0-	12	-0-	-0-	360	360	1,066
Corpus Christi	2,564	1,345	n/a	20,512	9,415	n/a	29,927	88,584
Brownsville	1,251	1,282	259	10,008	8,974	7,770	26,752	79,186
Grand Totals	11,230	5,007	8,958	90,320	35,049	268,740	384,109	1,166,563

n/a — Not Available

Source: Questionnaire Survey

ECONOMIC IMPACT OF PRIVATE FACILITIES

	Thousands of Tons TONNAGE			Thousands of Dollars ECONOMIC IMPACT				TOTAL ECONOMIC IMPACT
	Dry Bulk	Liquid Bulk	General Cargo	Dry Bulk (\$8)	Liquid Bulk (\$7)	General Cargo (\$30)	Total	(2.96)x
Beaumont	1,791	28,369	22	14,328	198,583	660	213,571	632,170
Port Arthur	1,358	22,668	3,599	10,864	158,676	107,970	277,510	821,430
Orange	693	409	156	5,544	2,863	4,680	13,087	38,737
Houston	19,256	52,063	6,334	154,064	364,441	190,020	708,525	2,097,234
Galveston	1,165	1,615	667	9,320	11,305	20,010	40,635	120,280
Texas City	68	20,052	17	544	140,364	510	141,418	418,597
Freeport	216	8,513	-0-	1,728	59,591	-0-	61,319	181,504
Port Lavaca	4,128	796	-0-	33,024	5,572	-0-	38,596	114,244
Corpus Christi	7,595	28,436	87	60,760	206,052	2,610	269,422	797,489
Brownsville	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Grand Totals	36,272	163,921	10,882	290,176	1,147,447	326,460	1,764,083	5,221,686

Source: Questionnaire Survey

TOTAL PORT AREA ECONOMIC IMPACT

	Thousands of Tons TONNAGE			Thousands of Dollars DIRECT ECONOMIC IMPACT				TOTAL ECONOMIC IMPACT
	Dry Bulk	Liquid Bulk	General Cargo	Dry Bulk (\$8)	Liquid Bulk (\$7)	General Cargo (\$30)	Total	(2.96)x
Beaumont	4,530	28,369	299	36,240	198,583	8,970	243,793	721,627
Port Arthur	1,358	22,668	3,770	10,864	158,676	113,100	282,640	836,614
Orange	693	409	228	5,544	2,863	6,640	15,247	45,131
Houston	21,493	54,443	13,172	171,944	381,101	395,180	948,205	2,806,687
Galveston	3,666	1,615	1,891	29,328	11,305	56,730	97,363	288,194
Texas City	68	20,052	17	544	140,364	510	141,418	418,597
Freeport	216	8,513	105	1,728	59,591	3,150	64,469	190,828
Port Lavaca	4,128	796	12	33,024	5,572	360	38,956	115,310
Corpus Christi	10,159	30,781	87	81,272	215,467	2,610	299,349	886,073
Brownsville	1,251	1,282	259	10,008	8,974	7,770	26,752	79,186
Grand Totals	47,562	168,828	19,840	380,496	1,182,496	595,200	2,158,192	6,386,248

Because ports are responsible for local sponsorship of federal channel maintenance projects, usually by the U.S. Corps of Engineers, a close, sometimes almost indistinguishable, relationship exists between public and private activities at Texas ports. This dual role involves maintenance, development management of various aspects of marine commerce, land-lord functions and extends into virtually every activity necessary to support industrial and commercial growth and seaport operations.

The accompanying illustrations summarize how the economic impact was estimated and what that impact was calculated to be for 1974—\$2 billion direct and \$6 billion total. The impact is given by port area and by cargo type.

Recommendations

The \$6 billion dollar per year economic importance of the Texas ports should be specifically recognized by state coastal management efforts and other state agency programs and policies impacting on the ports. This recognition should be fully incorporated into the overall decision-making framework.

Future updating of the Input-Output Model of the Texas economy should provide more specific information with regard to the various components of the marine commerce system.

If and when a comprehensive state transportation study is undertaken, it should include a thorough analysis of intermodal relationships within the state, and an investigation of inter-regional commodity flows.

The need for a university-based marine transportation/commerce research group should be examined. Such a group could serve as a focal point for information and assistance on port and maritime matters.

Any future state transportation or coastal management activities should recognize the major impact of rate regulation and how it "drives" many port-related decisions.



Environment

ENVIRONMENTAL CONSIDERATIONS

Marine commerce, including port development, channel construction and maintenance, vessel operations, and associated industrial-commercial development, necessitates the execution of various activities that can, and do, have some adverse environmental effect. Such effects must be recognized and accepted as a consequence of economic activity.

Since such impacts are unavoidable, the crucial question thus becomes, "How can the adverse effects be minimized and reduced to an 'acceptable' level, and, where possible, can the various activities be conducted so as to have a positive impact?"

When considering the possible environmental effects of marine commerce, one must keep in mind that ports, especially in Texas, perform a role that is much broader than just goods transfer between land and water transportation.

Ports are frequently an area's principal promoter of economic development. In this role, the ports necessarily become involved in many matters, often acting as an agent/landlord for the private industrial concerns. This practice is widely accepted to be a vital and legitimate function for a public port. Nevertheless, it is for this activity that some Texas ports have been criticized. It should be recognized that most of these comments are indicative of a bigger debate over "growth vs. no-growth."

Much has been written, said, and argued on the specific aspects of environmental impacts of ports and related activities. For the purposes of this report, attention will be focused on those aspects that may be of most interest to the 65th Legislature:

- **Dredging and Spoil Disposal**
- **Oil and Hazardous Materials Handling**
- **Waste Disposal**
- **Emerging Requirements**

Dredging and Spoil Disposal

The removal and deposition of dredge materials from Texas coastal waters, especially the bays and their tributaries, has long been a controversial and emotional issue.

Unfortunately, from a navigation standpoint, Texas coastal bays and their tributaries are shallow and dredging is required to provide the necessary depth for barges and ocean-going vessels. Such dredging is very costly; new projects are being bid as high as \$2.00-\$4.00 per cubic yard when significant pumping is required.

Extensive maintenance dredging of existing projects totals about 50 million cubic yards with approximately 80 % coming from federal projects. Completion of Congressional-authorized new work would generate an estimated 89 million cubic yards of virgin material.

Pipeline dredges are used for all work except the channels through the jettied passes into the Gulf, which are done by hopper dredges. Pipeline dredges remove the material and pump it through pipelines to either a landside disposal site or a submerged site near the channel. Smaller dredges such as most of those in use along the Texas coast can only pump material about one mile, and larger ones about twice that distance. (Exact distance depends on many things such as type of material, percentage of solid in the mixture, rate, horsepower, etc.) Distances in excess of these require booster pumps and this greatly increases costs.

Actual dredging costs for channels are paid by the Corps of Engineers. However, the local sponsors, who are responsible for disposal sites, have likewise experienced significant cost increases. These have resulted from several factors. Open water disposal has generally been stopped, and, since these

were state-owned bay bottoms, the costs were minimal. Tighter environmental restrictions eliminate many of the less expensive sites because they were frequently wetlands, grassflats, or other ecologically productive areas. As all types of growth along the coast have occurred, available sites are simply getting scarcer and those that are available are becoming more expensive.

Dredging can produce several adverse environmental impacts: temporary increase in turbidity and suspended solids, remixing into the water of pollutants that have become entrapped in the sediments, and habitat consumption. However, the principal impact, by far, comes not from the dredging itself, but rather from the disposal of the dredged material, commonly called spoil, whether or not it should be contained, and, if so, how to contain it.

Dredging and spoil disposal can also have environmentally beneficial effects. These include the improvement of circulation in shallow bays due to channelization, improvement of habitat by creating shallow areas that may be more productive than deeper areas, and provisions of better access for fishermen to large shallow areas such as the Laguna Madre. Also, emergent spoil islands can make good bird nesting grounds. It has been suggested that a careful program of spoil disposal could create improved circulation to the extent that fresh water inflow requirements for the bays and estuaries might be reduced.

The spoil islands along the Gulf Intracoastal Waterway have become the site of many small cabins built by fishermen for shelter on a weekend or seasonal basis. Even though such cabins have no waste disposal facilities, it is generally agreed that they have no direct adverse environmental impact.

Such cabins can often cause a serious problem with spoil disposal. These places are still legally designated spoil disposal sites; however, the Corps of Engineers and their dredging contractors are very reluctant to place the discharge end of a pipeline next to somebody's cabin and start pumping—even though they have the legal right to do so. Instead, they usually discharge in an adjacent area and the result is the covering of more bay bottom.

Although such cabins are technically "squatters" on state-owned lands, the Legislature in 1973 passed a law which recognized their existence, and set up a permit and fee system. The law was written so that no new cabins can be built and permits given only to existing ones; rebuilding, except for minor repairs, is not allowed. Thus, eventually nature will "remove" most by hurricanes.

One of the biggest controversies over disposal has been whether or not to confine spoil by diking or leveeing. Environmentalists generally advocate containment on the grounds that less area will be required. Navigation interests usually balk because containment adds significant costs. If the site is on uplands, the landowner may object because the material on a contained site may take several years to dry to the extent that the site can be used for other purposes, whereas unconfined spoil will usually spread out and often vegetate within one year.

The Department of Highways and Public Transportation, who now have the local-sponsor responsibility for the Gulf Intracoastal Waterway, have stated that in the future containment will be a requirement for almost all dredge material disposal. They also recognize that containment is not without its problems.

Studies indicate that in the past, many disposal sites have been poorly located from an engineering standpoint. The material is usually located to one side of the channel or the other with openings at intervals to permit water exchange. Unfortunately, when initial dredging was done there was little, if any, data available on the predominant bay currents. Consequently, the disposal site was often located "up-current" from the channel with the result that the material may be transported back into the channel more quickly than if it had been placed on the other side. Such information is now available for improving site selection.

Many studies and investigations are now being conducted on dredging and dredge material disposal. Most are aimed at technical solutions to the environmental problems. A few are examining the institutional arrangements. The Waterways Experiment Station of the Corps of Engineers is about to complete a multi-year, multi-million dollar series of studies on all aspects of dredging. The General Land Office, as part of its Texas Coastal Management Program development, has a contract study relating to Texas waters. This project took the following approach: All Texas navigation channels were segmented into two-mile reaches, environmental problems of each noted, current and future spoil volumes were estimated, and disposal site capacities projected. Then a comparison was made of the requirements and available sites; the result is an identification of current and future critical spots. The project also presents options for dealing with such problem areas. The Texas Coastal and Marine Council, pursuant to H.S.R. 80, is doing an evaluation of spoil disposal and mitigation, and the results are reported separately.

There is now a proposal before the Congress to authorize the states to handle the controversial "Sec. 404" dredge and fill permits, now handled by the Corps of Engineers. This seems a logical action for most activities. However, since all navigation projects require other Corps approval, the "404 permit

authority" over all bona fide navigation projects should continue to be with the Corps. If the state sets up a mechanism to accept "404" responsibility, two things should be recognized: (i) the administrative costs will be significant, and (ii) the state will not have a "free hand" because the federal government would issue guidelines and the state would be handling "administration" not "policy."

Unfortunately, there is no single nor simple solution to dredging and spoil disposal. The problems aren't ever going to go away. Care and prudent judgment will have to be exercised by all. Technological improvements will help, but they won't "solve" the problems.

WASTE HANDLING

Port areas, as the focus of transportation and industrial activities, are also the site of numerous wastes that must be coped with, including:

- Ship-cleaning wastes;
- Sewerage and garbage, both from landside and onboard;
- Industrial discharges and emissions;
- Unique problems associated with the intermodal transfer of goods—i.e., dust from grain loading into ships from elevators; and
- Stormwater run-off.

Each of these specific technical problems has been studied and engineering solutions do exist. Not unexpectedly, some of these remedies are very expensive, but most of those engaged in maritime transportation activities recognize that the application of the best pollution-control technology is inevitable. Some are more willing to proceed than others, but according to federal studies, progress is being made.

There are several significant institutional barriers to rapidly eliminating waste discharges from marine commerce operations.

Most ships calling on U.S. ports are foreign-registry vessels; currently more than 90% of imports/exports move in foreign flag vessels. Some of these ships are as new and as modern as any in the world, others are not; however, the same can be said about the U.S.-flag fleet.

The U.S. could take aggressive unilateral action and impose stringent restrictions on all vessels entering U.S. waters. However, this would cause chaotic conditions and is not considered a feasible course of action. Several international agreements have been "in progress" for nearly a decade, but are still not ratified. Even if they were agreed upon tomorrow, it would be a long time before their conditions became standard practice because so much of the world's fleet is old vessels that it would not be economical to upgrade most such ships to meet stricter standards.

The fierce competitive nature of U.S. ports often makes a single port hesitant to consider environmental matters. Such reluctance usually stems from a desire to put available funds into projects to improve the port's competitive posture, or the fear that potential clients will go elsewhere because of conditions/restrictions. However, some ports have been able to develop and use an "environmental consciousness" to their advantage by bringing about improved relations with the community, regulatory agencies and potential clients. The advantages to the latter can be significant, especially if this image can be translated into reduced time for permit acquisition and fewer problems once operations commence.

Texas ports have, to date, spent an estimated \$4 million on pollution control facilities directly in support of port operations. This includes facilities to receive and treat shipborne wastes, sewerage facilities for persons working within the port, and control devices on port-owned projects such as grain elevators.

Most of the facilities in Texas are privately owned—i.e. refinery docks, and there is no estimate on the private expenditures made on them for pollution control purposes. One port engineer speculated that the amount was at least 10 times the expenditures made by the public ports.

Ports can substantially aid present or prospective industrial clients by financing and building industrial treatment plants. Under existing arrangements, the port sells tax-exempt port revenue bonds that are guaranteed by an industry to build treatment facilities for the sole use of that industry. The port

then leases the treatment facility to the industry who operates it and pays the port enough in leases to retire the bonds.

To date, Texas ports have financed over \$100 million in industrial air and water pollution control facilities using revenue bonds. This does not include the more than \$305 million in similar financing in the Houston-Galveston area where the Gulf Coast Waste Disposal Authority, a special district created by the Legislature, performs a similar function.

ENVIRONMENTAL-RELATED EXPENDITURES BY PORTS:

POLLUTION CONTROL BONDS				DIRECT ENVIRONMENTAL EXPENDITURES (MILLIONS \$)			
PORT	COMPANY	TYPE	TOTAL	PORT	WATER	AIR	TOTAL
Freeport	Dow	Air	13.125	Orange	—	—	—
Freeport	Dow	Air	17.400	Beaumont	—	0.790	0.790
Port Lavaca	Alcoa	Air	7.750	Port Arthur	—	—	—
Port Lavaca	Alcoa	Air	4.175	Houston	0.102	0.800	0.902
Corpus Christi	Sun	Air	1.000	Galveston	0.525	—	0.525
Corpus Christi	CP&L	Air	1.000	Freeport	—	—	—
Corpus Christi	CP&L	Water	2.325	Corpus Christi	0.060	0.105	0.165
Corpus Christi	Sun	Combined	3.560	Brownsville	1.550	0.040	1.590
Corpus Christi	Champlin	Combined	12.900				
Port Arthur	Texaco	Air	25.400				
Port Arthur	Texaco	Air	1.000				
Brownsville	Union Carbide	Water	4.600				
TOTAL (MILLIONS)			100.735	Total	2.237		3.972

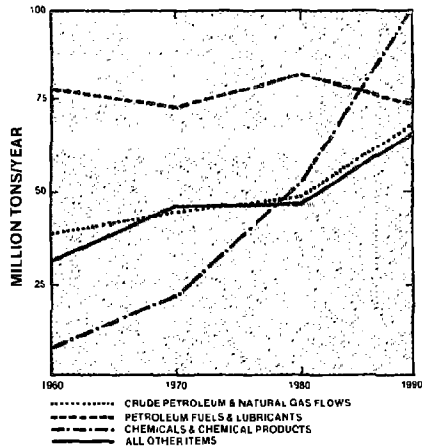
OIL AND HAZARDOUS SUBSTANCES

Over 70% of the nearly quarter of a billion tons shipped through Texas ports each year is bulk liquid substances that, if spilled into waterways, would be classified as pollutants. These products are oil, refined products, and a wide variety of chemicals. Some of these are extremely dangerous to both man and the aquatic environment.

Some spills are inevitable. Records from the Texas Water Quality Board indicate the following:

- Since 1973, there have been 82 spills with a total volume of 75,000 barrels (vessels and pipelines).
- Most spills occur where movements are the heaviest: the Galveston Bay complex with 30 incidents (58,000 barrels) and the Sabine-Neches Waterway with 21 incidents (7,000 barrels).
- The largest spill off Texas to date has been 12,000 barrels (approximately 200 tons). With barges of several thousand tons, and most tankers in the 30,000-60,000 ton class, Texas has never had a truly "catastrophic" spill, although a tanker, the *Globtik Sun*, hit an oil platform off Louisiana en route to Baytown and spilled over 6,000 barrels.
- SEADOCK is expected to handle at least 2.5 million barrels per day (430,000 tons/day), thus greatly increasing oil movements adjacent to and under state waters.
- Human error accounts for approximately 35% of all incidents, with equipment failure accounting for the remainder.

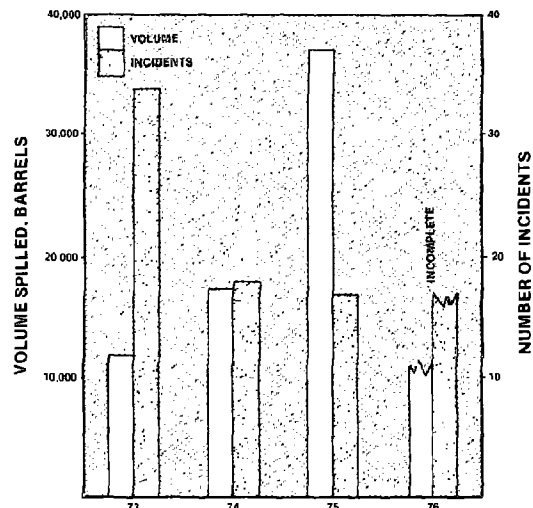
TRANSPORTATION OF HAZARDOUS MATERIALS



COMMODITY	1960	1970	1980	1990
CRUDE & NATURAL GAS	37.8	40.8	48.4	64.1
PETROLEUM FUELS & LUBRICANTS	76.7	73.0	77.2	71.3
CHEMICALS & CHEMICAL PRODUCTS	6.8	21.4	51.0	108.1
ALL OTHER ITEMS	31.1	41.8	42.2	63.8

INCREASE IN WATERBORNE MOVEMENT OF HAZARDOUS CARGOES IN TEXAS WATERS

OIL AND HAZARDOUS SUBSTANCE SPILLS IN TEXAS COASTAL WATERS SINCE 1972



SPILLS	73	74	75	76
VOLUME (BARRELS)	11,445	16,400	36,800	10,285
INCIDENTS	33	17	16	16

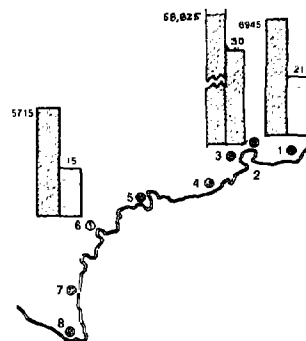
Worldwide, it has been estimated that maritime transportation (spills and deliberate discharges) is the source of 31% of oil entering the oceans. Other sources are: river runoff (27%), municipalities (10%), industrial wastes (10%), atmospheric rain-out (10%), natural seeps (10%), and offshore oil production (2%).

Thus, spills into Texas coastal waters have averaged about 1/100 of 1% of the materials transported.

REGIONAL DISTRIBUTION OF TEXAS' OIL SPILLS

SECTION	1973		1974		1975		1976		TOTAL	
1. JEFFERSON, ORANGE	2360	13	2396	5	100	1	1810	2	6946	21
2. CHAMBERS	500	2	200	1	0	0	200	1	900	4
3. GALVESTON, HARRIS, MONTGOMERY	6360	8	11,768	6	34,640	10	6070	6	58,825	30
4. MATAGORDA, BRAZORIA	955	5	50	1	0	0	250	1	1235	7
5. ARANSAS, CALHOUN, VICTORIA, JACKSON	1,100	3	0	0	0	0	400	2	1500	5
6. NUECES, SAN PATRICIO	200	2	1600	4	2160	5	1555	4	5715	15
7. WILLACY, KENEDY, KLEBERG	0	0	0	0	0	0	0	0	0	0
8. CAMERON	0	0	0	0	0	0	0	0	0	0

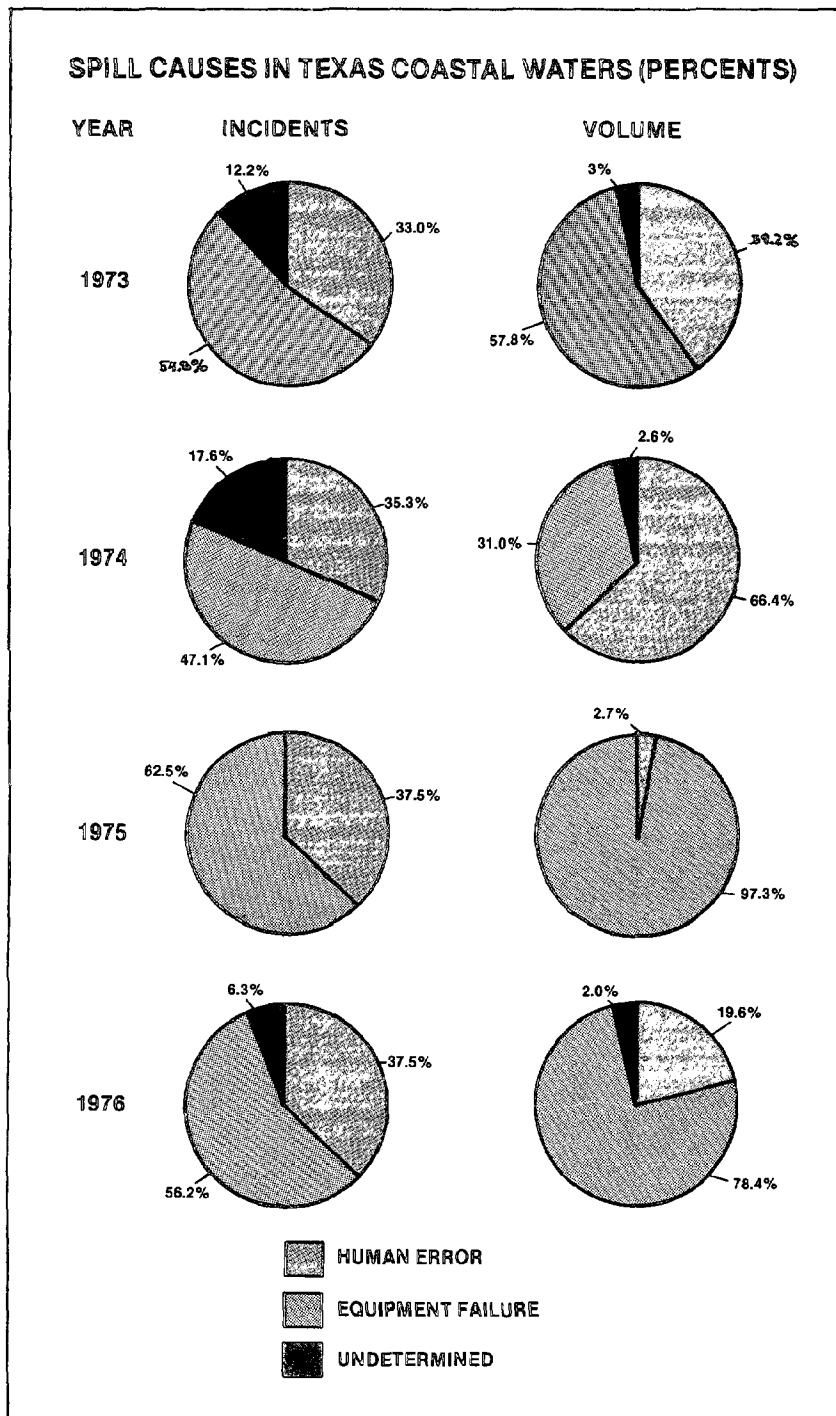
☐ VOLUME (BARRELS)
☐ NUMBER OF INCIDENTS



The Coast Guard has principal authority over spills in all coastal waters, but they have very limited equipment and manpower to conduct cleanup operations. Their "strike force" for the Gulf of Mexico is based at Bay St. Louis, Mississippi.

Most cleanup operations are conducted by private contractors. Sometimes the principal industries in an area will pool their resources, in conjunction with such specialized contractors, to form an association. In the Corpus Christi area there is the Corpus Christi Oil Spill Association which is composed of members from both government and industry.

In 1975, the Texas Legislature passed the "Texas Oil and Hazardous Substances Spill Prevention and Control Act." This measure established a \$5-million Coastal Protection Fund; however, no money was ever appropriated to the fund. Implementation of the Act to date has been rather limited.



The responsible agencies under the Act, the Texas Water Quality Board and the Department of Highways and Public Transportation, have now begun to implement the measure even though hindered by inadequate funding. This Act is unique in that it sets up a mechanism to enable large amounts of manpower and equipment to be quickly mobilized to combat major spills by utilizing the resources of the Department of Highways and Public Transportation. The costs of cleanup operations would be covered from the Texas Coastal Protection Fund, which in turn could be reimbursed from either the existing federal contingency fund or a proposed expansion of federal funds.

The Congress is considering enacting a comprehensive National Oil Spill Liability Act, the so-called "Superfund" bill. The recent rash of tanker accidents is likely to hasten its passage. The existing Texas law would compliment such a federal "Superfund" without significant conflict.

Since neither man nor machine is infallible, some spills will inevitably occur. Increased waterborne movements will increase the likelihood of accidents and spills. Steps should be taken to minimize the occurrence of such spills, but realizing that *there will be some spills*, adequate precautions must be taken to provide clean-up and restoration capabilities.

CONSEQUENCES AND IMPLICATIONS

Few ports seem to realize the long-term consequences that existing federal air and water quality legislation and other measures such as flood insurance, disaster planning, and coastal management can have over their future growth and development.

Most port management seems to avoid facing up to the fact that many of those involved in administering air and water quality measures view the laws as a means of controlling growth and land use. Both the Clean Air Act and the Water Pollution Control Act Amendments contain some very stringent provisions that can be manipulated to control growth or even restrict existing practices.

One example is indicative of what the future may hold. The license originally offered to SEADOCK contained a stringent air quality measure. It is recognized that SEADOCK would contribute a specific amount of air emissions. EPA has insisted that a "trade-off" policy be implemented. This would require each company using the facility to reduce the emissions from its industrial processing facilities by an amount proportional to their usage of SEADOCK. Thus, if EXXON were to move 20% of the crude through SEADOCK, it would have to reduce the emissions at its Baytown refinery by an amount equal to 20% of the projected SEADOCK emissions. This provision was removed in the final license as the result of a study indicating that a new type of storage tank would reduce emissions by 90% and SEADOCK agreed to use it.

Such a policy of requiring a port, in order to get permission to build a facility, to get the potential users to reduce their air/water emissions would undoubtedly do more than raise a few eyebrows. How the "pollution budget" issue will be ultimately handled is still very uncertain. However, most ports do not want to be in the position of having to place tight environmental restrictions on growth activities.

Exactly how these laws will be administered by the new administration remains to be seen. But one thing is certain, those promoting port and related industrial-commercial development now must consider a whole new spectrum of environmental laws and regulations.

These can be major impediments to port development; however, as demonstrated by several cases, they can also be used to a port's advantage.

RECOMMENDATIONS

Because the ultimate authority for navigation matters rests with the federal government, Texas should not attempt to interpose another permitting layer by requesting the transferral of federal responsibilities under Section 404 to the state for navigation projects. Rather, it should support modifying Section 404 to give the state authority only over waters not used for commercial navigation, leaving such commercially navigable waters under Corps of Engineers' jurisdiction. The Legislature should consider enacting legislation authorizing the Governor to direct the Texas Water Quality Board to begin this function if the Congress makes the necessary modifications to the existing federal law; however, the costs and flexibility of such action should be carefully examined.

The state should adopt a consistent posture toward, and policy on, dredging for commercial navigation projects.

The Texas Coastal Protection Fund, established by the 64th Legislature to assist in the cleanup of oil spills, should have adequate money appropriated to it. The fund has an authorized limit of \$5 million, but currently has no money appropriated to it.

Ports, in promoting industrial growth, should look beyond conventional air and water pollution control concerns and consider the impact of ancillary growth, including such things as "pollution budgets" and "trade-off policies." The secondary implications of growth should also be considered by coastal management processes and state regulatory agencies dealing with air and water quality management.



Superships

"SUPERSHIPS"

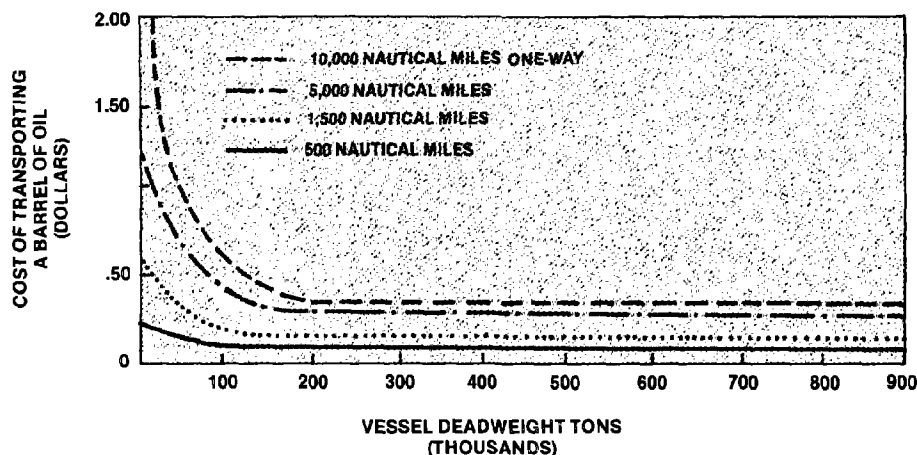
The Gulf coast has long been the principal candidate for one or more facilities to handle Supertankers or VLCC's (Very Large Crude Carriers) for importation of crude from the Middle East. The argument for facilities to handle VLCC's is based on two principal points: economics and environment.

Economically, considerable savings can be achieved using these superships. On the 12,500 mile run from the Persian Gulf to the Gulf of Mexico, it is possible to realize a transport cost saving of 65% using a 300,000-ton VLCC instead of a typical large 60,000-ton tanker.

Environmentally, the use of VLCC's presents two advantages. First, ship movements are greatly reduced, thus relieving congestion and this reduces the probability of collisions and groundings. Secondly, many of the smaller tankers are getting old and have mechanical problems. For example, the *Argo Merchant* which ran aground off Nantucket in December 1976 was 25 years old and had a history of problems. Apparently it was a pair of these which caused the accident: first, the gyrocompass failed and the ship got 25 miles off course; and, secondly, when it ran aground and the engines were reversed to try and back off the shoals, pipes burst, flooding the engine room, totally disabling the vessel. It is argued that the VLCC's have the latest sophisticated navigation aids and are in good condition because they are new.

SIGNIFICANTLY LOWER TRANSPORTATION COSTS ARE ACHIEVED BY USING LARGER VESSEL SIZES.

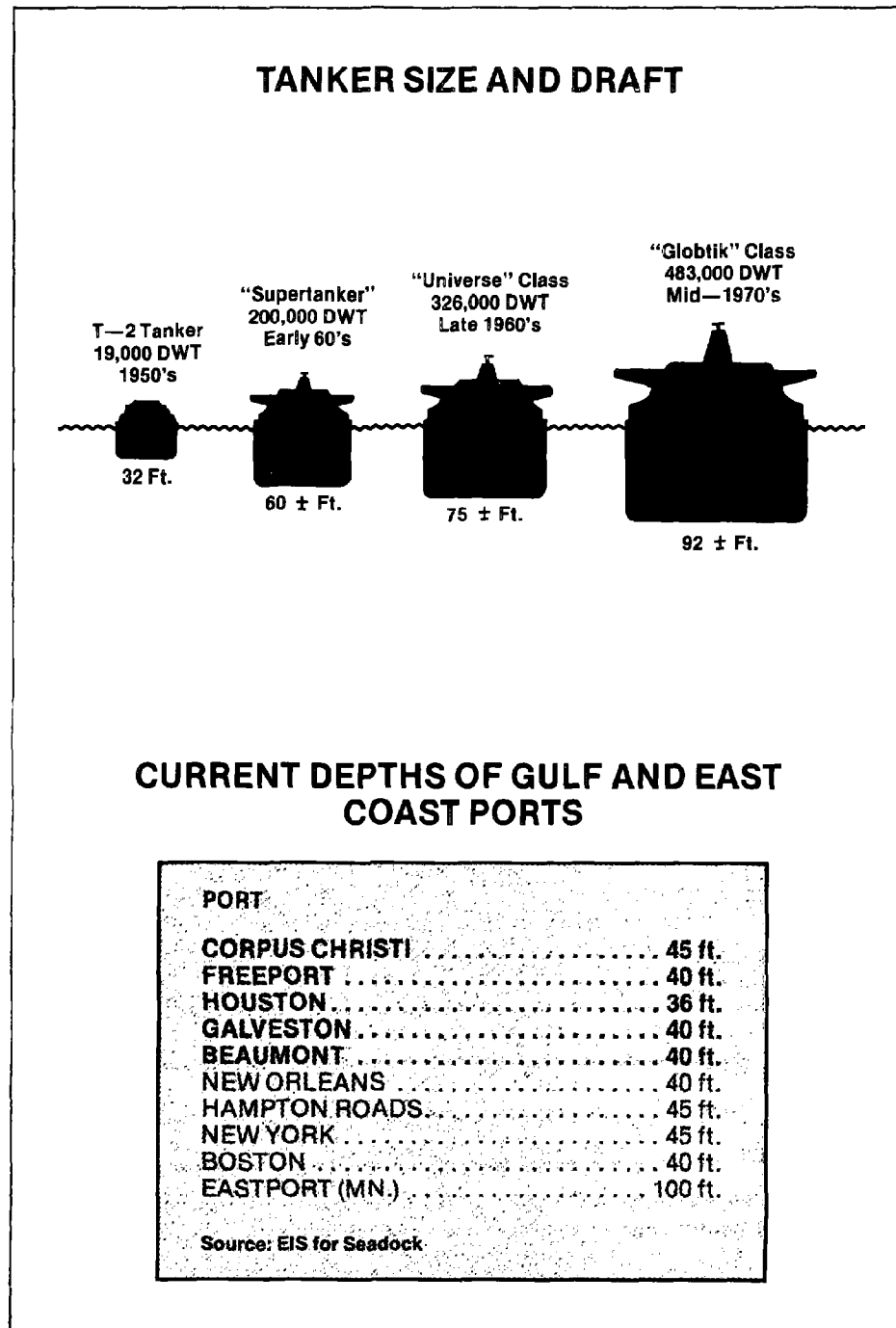
Considerable dollar savings can be realized by using tanker of 200,000 DWT or more on the 12,500 mile trip from the Persian Gulf to the Texas coast.



These very large ships have drafts of 50-80 feet or more, but no Texas port is deeper than 45 feet. Thus, either an offshore facility must be built, on-shore ports deepened, or the oil transferred at sea to smaller vessels and "lightered" to port. The latter alternative has been considered as only an emergency measure.

Plans have been underway to build port facilities for VLCC's since early 1972. The conflicts have sometimes been very pointed—such as the 1975 Legislative fight over whether or not the state should follow the Texas Offshore Terminal Commission's recommendation and build a state-owned facility.

The proposal was defeated and a bill was passed to establish a licensing procedure to compliment the procedures of the 1974 Federal Deepwater Port Act. There has also been a controversy over whether such a facility should be an offshore terminal only for VLCC's or should be an onshore port capable of accommodating super-sized ships carrying other cargoes, such as grain or ore.



Meanwhile, three entities—two Texas public ports and a consortium of oil companies—have been pursuing plans for facilities capable of handling supertankers:

- The Port of Corpus Christi is advocating a 72 ft. draft multi-purpose facility at Harbor Island adjacent to Aransas Pass which connects the Corpus Christi-Redfish-Aransas Bay systems to the Gulf.
- The Galveston Wharves has proposed a 67-foot deep dredged port on Pelican Island near the mouth of Galveston Bay. This, like Harbor Island, would be multipurpose and thus capable of handling cargoes other than crude oil.

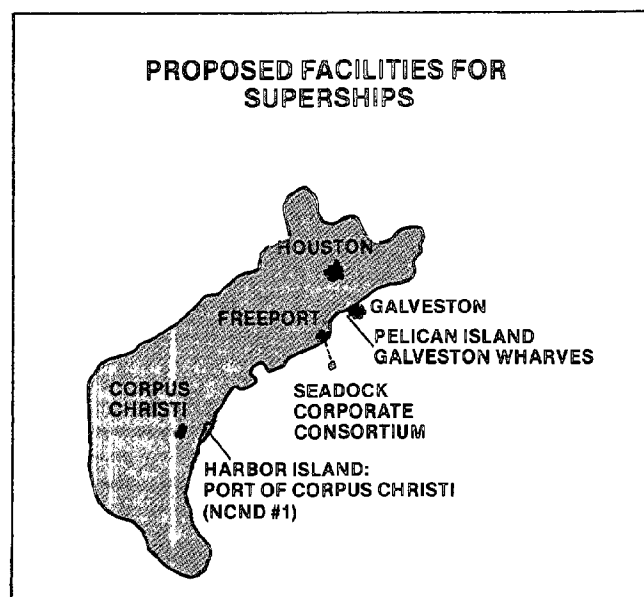
• SEADOCK, a consortium of 8 oil companies plus Dow Chemical, plans to build an offshore crude oil off-loading facility in 110 feet of water 26 miles out in the Gulf off Freeport. Construction has not started at any of the facilities. All are still trying to get the necessary permits and licenses, and their status varies.

Corpus Christi is currently waiting for the USCE to complete an environmental impact statement on the project. Even though Corpus proposes to fund the entire project, including dredging, with revenues bonds, the U.S. Corps of Engineers (USCE) permit would still be considered a major federal action and thus require an Environmental Impact Statement (EIS). After the EIS is completed a lengthy procedure can still be anticipated while various federal and state agencies review the project. It is uncertain at this time exactly what state actions are necessary to see this project initiated. However, one major state action is uncertain: the project will require approximately 340 acres of state-owned submerged land; this land can be leased by the State Lands Board to the port (Art. 5415e-1), or it could be patented to the port by a special act of the Legislature.

Galveston Wharves was denied preference over SEADOCK in a recent Department of Transportation (DOT) ruling. The USCE has the authority to issue permits for construction of onshore, dredged ports such as the Galveston and Corpus Christi proposals. However, the 1974 Deepwater Port Act requires the Secretary of Transportation to analyze all alternatives to any proposed offshore port. Under this requirement, when DOT was deciding whether or not to issue SEADOCK a license, they had to examine the Galveston proposal as an alternative. In deciding to issue SEADOCK a license, DOT ruled that Galveston's proposal did not offer as much public benefit as SEADOCK does, this decision alone would not necessarily preclude the Galveston proposal from being built; however, it would still be necessary to get the USCE permit and raise the necessary financing. The latter could be particularly difficult if SEADOCK is built, because both would be competing for the same crude oil. While Galveston could handle other types of cargoes, the oil revenues would be very important in financing the project. Corpus Christi's Harbor Island project is distant enough that it would not be competing for these cargoes, but instead would supply a completely different market area in the South Texas refineries.

SEADOCK was formally offered a 20-year deepwater port license by DOT on January 17, 1977. SEADOCK now has 180 days to accept or reject the license. Although SEADOCK has worked for 5 years and spent over \$15 million in planning and engineering, company spokesmen have voiced concern over the stringent economic, anti-trust and environmental conditions placed on the proposed licenses. Despite such reservations, SEADOCK officials are maintaining optimism that they will be able to proceed. They must make their decision by mid-August. State action to clear SEADOCK is limited. Under the Deepwater Port Procedures Act of 1975, the state has already approved SEADOCK's proposal; however, several individual agencies still have limited jurisdiction over specific parts of the project—i.e., it will be necessary for SEADOCK to get an easement from the General Land Office to bring its pipeline ashore across state-owned submerged lands.

At the time DOT announced the offering of a license to SEADOCK, they also announced a similar license to LOOP (Louisiana Offshore Oil Port), a consortium of 6 oil companies, for a similar facility 18 miles south of Grand Isle, Louisiana. It is important to note that all concerned stress that SEADOCK and LOOP are complimentary and not competitive facilities, having different owners and serving completely different market areas.



In a related matter, the State of Florida has brought suit to be declared an "affected state" and thus be able to impose conditions on tankers going to or from SEADOCK and LOOP. The suit is still pending in Federal District Court in D.C. There is also a possibility that a Washington-based public interest group—Energy Action—may challenge the license on the grounds that SEADOCK and LOOP would violate anti-trust laws and create monopolistic situations.

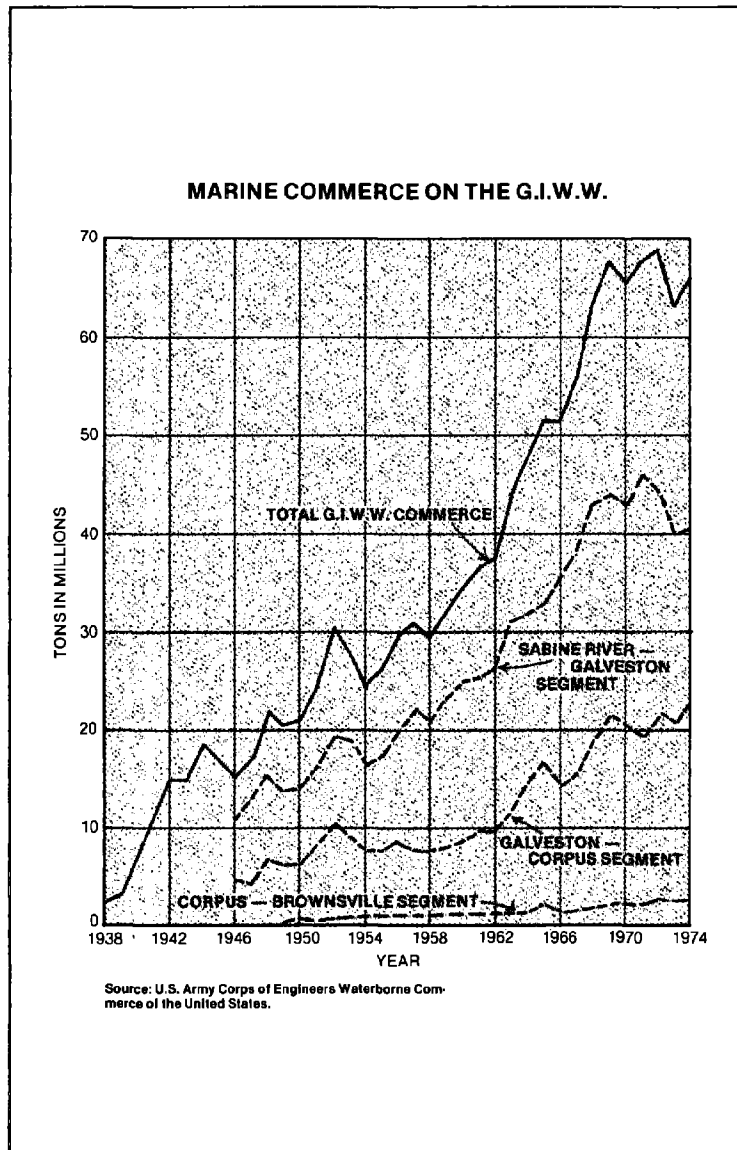
Recommendations

The outcome of these many pending developments is now very uncertain. There is relatively little Texas can do to hasten the construction of facilities for supertankers, except to maintain a sympathetic posture toward the expedient construction of such facilities. A proposal has recently been introduced to allow the state to build an offshore deepwater port if SEADOCK rejects the license and drops their plans.

GULF INTRACOASTAL WATERWAY

In 1975 the Legislature passed the Texas Coastal Waterway Act. This measure directed the Department of Highways and Public Transportation (DHPT) to serve as the local, non-federal sponsor of the Gulf Intracoastal Waterway, for right-of-way easements, spoil disposal areas, and utilities relocation. Prior to this time, the non-federal sponsorship duties had been performed by a mixture of local entities and had recently led to considerable difficulty, especially in finding and acquiring suitable spoil disposal sites.

The Gulf Intracoastal Waterway is a vital artery linking the Texas Gulf coast with much of the rest of the U.S. by providing shallow-draft barge transportation. Traffic on the GIWW has doubled since 1960, now totalling almost 70 million tons/year. Yet the Waterway has been at a constant size, 125 feet wide by 12 feet deep since the late 40's.



One part of the Texas Coastal Waterway Act directs the DHPT to conduct an evaluation of the importance of the Waterway including an identification of problems and possible solutions; and, if appropriate, specific recommendations for Legislative action. The DHPT has completed their report to the 65th Legislature; their major findings and recommendations include:

- The Waterway is vital to the state economy—35% of the total commerce through the state's ports moves on the GIWW. Petroleum products, chemicals and crude oil constitute over 75% of all commodities on the GIWW.
- Maintenance dredging is necessary to keep the GIWW operative.
- Large amounts of dredge spoil (11 million cubic yards) must be dredged annually.
- Indiscriminate disposal of such materials can have a major adverse impact on fish and wildlife. The channels have often had a beneficial effect by improving circulation and allowing easier access to remote areas by fishermen.
- The possibility of abandoning the GIWW (including allowing it to become inoperative due to siltation) seems completely unrealistic at this time.
- The Waterway is going to become more crowded, and the safety of marine commerce on the GIWW will be adversely affected by the increased congestion. Accidents pose potential threats to human life, equipment, and environmental protection.
- Containment is now the best available alternative for protecting the marine environment from the adverse impact of dredged material disposal. Despite the positive features there are problems with containment facilities such as lack of good construction material for levees, preclusion of alternative uses of significant land areas for many years, maintenance against erosion, seepage and settlement, and cost.
- Open water disposal of dredged spoil should be done only in those areas where the GIWW crosses bays in relatively deep water.
- The issue of "mitigation and compensation" for fish and wildlife enhancement purposes will place increasing demands for additional costs on all public works projects including navigation. In the future, the state will have to be prepared for such requests on GIWW projects.
- The state, acting through the DHPT, should acquire those lands needed by the USCE for spoil disposal purposes in fee simple title. Generally, easements are a relatively poor second choice, because they usually do not provide adequate control of the disposal sites to prevent damage to adjacent wetlands. Such acquisition will require significant expenditures.
- The estimated one-time cost of acquisition is \$3.5 million; this would provide adequate spoil areas for long-term maintenance of the GIWW at its present dimensions.
- The GIWW should be deepened and widened. The entire Waterway should be deepened to 16 feet and the Texas portion from the Sabine River to Corpus Christi should be widened by 250 feet. The floodgates at the Brazos River crossing should be replaced with locks.
- The DHPT should offer its services to the sponsoring agencies of all commercial shallow-draft channels to coordinate channel maintenance and improvement.
- Texas should develop a continuing working relationship with Louisiana to expedite actions on the GIWW of mutual benefit to both states.

Recommendations

The Texas Coastal and Marine Council was an initial proponent of state sponsorship through the DHPT of the GIWW. The Council recognizes the continuing importance of the Waterway and the need for its future maintenance and improvement.

Consequently, the Council urges the 65th Legislature to provide funding in the amount of \$3.5 million to acquire the necessary spoil disposal sites.

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