The Economic Impact of Connecticut's Deepwater Ports:

An IMPLAN and REMI Analysis

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Executive Summary: The Economic Impact of Connecticut's Deepwater Ports

The Connecticut Coastline Port Authority requested the Connecticut Center for Economic Analysis (CCEA) to conduct a detailed study of the economic impact of Connecticut's deepwater seaports on its economy. Using REMI, the State dynamic economic model, and a static model, IMPLAN, CCEA estimated the total (direct, indirect and induced) impact on the State economy. CCEA measured the impact as the output resulting from the employment of labor and capital related to ongoing port activity in Connecticut. The economic activities affected by Connecticut port activity are deliveries of bulk materials (gasoline, heating oil, steel, zinc, and lumber) and fruit through the ports of Bridgeport, New Haven and New London. The activities of Connecticut firms that depend on these materials for input or on the ports for shipping their output, and, the economic activity generated by the ferries in New London and Bridgeport are included as well. The myriad other maritime activities that connect Connecticut's economy to Long Island Sound and our rivers—e.g., recreational boating and fishing—are not included in this study.

The critical insights to take away from this study are that the operation of Connecticut's seaports directly and indirectly accounts for almost 2% of the State's total employment and 2.6% of the State's total output (GSP) in 1997. Their operation contributes almost 2.5% of the State's total taxes including municipal taxes. Connecticut's ports significantly reduce truck traffic and congestion on our highways and thus directly improve our environment. In fact, Connecticut believes that significant truck traffic could be diverted from Fairfield and New Haven Counties by barging truck trailers from New York City to Bridgeport, New Haven or New London. ***These results come from a strongly conservative assessment of the continuing significance of the State's deepwater ports. Consider the relative cost to Connecticut's metal working industry of steel delivery by truck versus ship. A ship carrying 26,000 tons of steel crosses the Atlantic in seven days at a daily rate of $12,000. A truck carrying 20 tons of steel from Burns Harbor, Indiana makes the 900-mile trip to Connecticut in 1.4 (12-hour) days at $60 per hour. The 1,300 truck trips cost Connecticut's steel users $1,300,000 versus***

$84,000 for the same quantity by ship. And we keep 1,300 trucks off the road for each steel-carrying vessel docking in New Haven. According to the Bureau of Labor Statistics, in 1998 Connecticut had 120,000 jobs in steel consuming industries. Were it not for Connecticut's seaports, many of these jobs would be lost because of higher costs for firms that employ them.

Connecticut is the beneficiary of the Buckeye Pipeline, built in 1961 at the request of President Kennedy as a national defense initiative to deliver jet fuel to Westover and other Air Force bases in New England. Today the Pipeline delivers over 2.7 million gallons of gasoline, heating oil and jet fuel daily, keeping an estimated 560 trucks off Connecticut's roads ***every day***. CCEA estimates are conservative because the benefits of fuel delivery points in the ports of Stamford, Bridgeport and New London are not included in our analysis.

These results argue that continued public support for our privately owned and operated ports is essential to Connecticut's future economic health and competitiveness. The shape of such support could be in the form of secured loans for capital expansion in the face of competition from other East Coast ports that are publicly owned and operated (see Appendix 3 for nine port financing case studies). And it must surely include a strong State initiative to support dredging, insuring uninterrupted access to the ports for the largest ships calling on Connecticut ports.

This summary reports only REMI results; the full report also provides IMPLAN results, which are consistent with the REMI results. The following table shows changes in the principal economic variables in average changes per year for the study period 2000 to 2035 that REMI produces as a consequence of employment by port service providers and port users. The study period represents the time it takes for the Connecticut economy to reach a long-run equilibrium as a result of port activity. ***The results are reported as positive contributions to the State economy reflecting the positive impact of ongoing port operations.*** Gross regional product (GRP) is the value of all final goods and services produced in a region in one year.

Changes in Selected Economic Variables for Connecticut

	Average Incremental Change over Baseline
Employment (Thousands)	27.051
GRP (Billions 92 $)	$1.941
Personal Income (Billions Nominal $)	$2.698
Population (Thousands)	46.221

These average numbers are the ***total*** (direct, indirect and induced) changes accumulated over 36 years divided by 36, and represent additions to the baseline or status quo forecast each year for the Connecticut economy. The table below shows the secondary employment impact of the ports, that is, the employment and output in other important sectors of our economy. Firms in these sectors gain employment to the degree that they depend on Connecticut's seaports for delivery of inputs or shipment of output.

Changes in Employment and Output for the State of Connecticut:

Selected Sectors

Sectors	Average Change in Employment Over Base Line	Average Change in Output Over Base Line (Billions $1992)
Durable Manufacturing	4,260	0.433
Non-Durable Manufacturing	1,230	0.226
Mining	20	0.001
Construction	2,240	0.111
Trans./Public Utility	5,160	0.438
Fin/Ins/Real Estate	800	0.147
Retail Trade	2,940	0.105
Wholesale Trade	1,160	0.156
Services	6,510	0.242

The table below reports the average annual fiscal impacts of Connecticut's seaports.

Average Changes in Tax Revenues in Connecticut
(Nominal $)

	Average Tax Revenue Change
Average State Tax Revenue	$ 161.48 million
Average Local Property Taxes	$135.41 million
Average Induced Government Spending	$300.77 million
Average Total Taxes	$297.09 million

REMI output drives our proprietary tax calculation that produces the above table. The numbers reported are the sum of yearly tax revenue increases due to the operations of the ports and all dependent industries divided by 36. The thirty-six year study period allows time for the economy to reach a new long-run equilibrium following the formation and evolution of port and dependent activity in the state. We assume there is no alternative use of the ports and no alternative, short term mode of transporting goods and people. To include such alternative uses and modes would involve much conjecture and a variety of (speculative) positive and negative costs. The following table presents the fiscal impact in present value terms, using a 6.5% discount rate (a 30-year Treasury note rate) for the 36-year study period.

Present Value of New Tax Revenues and New Expenditures
(Nominal $)

REVENUES AND RELATED EXPENDITURES	PRESENT VALUE
PRESENT VALUE OF STATE TAX REVENUES	$2.086 billion
PRESENT VALUE OF PROPERTY TAXES	$1.734 billion
PRESENT VALUE OF TOTAL TAX REVENUES	$3.820 billion

CCEA followed the methodology of other studies, in particular the approach taken by the U.S. Maritime Administration (MARAD). In the 1970s, MARAD developed a simple input-output model based on the local economy and derived input data such as

employment, sales, taxes and degree of port dependency from surveys. This approach generates the most detailed and accurate input for any model. The problem is that most businesses are inundated with surveys and have neither time nor energy to respond. CCEA requested information from the group of primary port service providers who operate at the waterfront, and from their customers whom we labeled "port users." Port service providers were asked to supply the identities of their customers. The response rate was quite low. It did not improve much even with a significantly abbreviated survey instrument (see Appendix 3). The most important variable the survey sought was employment. Using the surveys CCEA did receive, CCEA identified relevant sectors at the four-digit SIC level and the corresponding employment levels from the Minnesota IMPLAN Group, Inc. data files. CCEA then estimated the degree of dependence on the ports for users, based on the limited number of surveys received. Table 1 in the report details the employment picture. ***In aggregate, the estimated share of total non-farm employment in Connecticut's port-related industries is about 3% or just under 10,000 jobs for 1997.*** This estimate is conservative because it does not include several supportive groups such as inspectors, safety, clean up, legal, or financial and other intermediaries who are directly involved with port operations. And, as noted, it does not include any of the employment in the larger array of activities within the maritime cluster.

The methodology used in this study estimates the impact of Connecticut's deepwater ports' ongoing operations of by *simulating* their absence. In order to properly assess the impact of our ports on the State economy, we need to quantify the opportunity cost of their absence. This is the standard method used to assess the impact of an existing operation. Were it not for Connecticut's seaports, port users whose degree of dependence on them is high would relocate or close due to unbearably high operating costs. Were it not for Connecticut's seaports, port users whose degree of dependence is low would use alternative means of transporting inputs or outputs, and would likely reduce activities due to higher costs. The increase in road and rail traffic as the alternative mode for goods moved through Connecticut ports would dramatically increase congestion, fuel costs, delays in commuting, accidents and environmental damage. *In a positive sense, this set*

of impacts collectively measure invisible benefits flowing from the use of the ports, benefits that CCEA measures as an amenity value. Because CCEA did not estimate the costs of environmental damage, the amenity value estimate is conservative.

The employment identified above, and the capital (buildings and equipment) that supports that employment, and the opportunity costs (that is, the disamenity) of relying on alternative transport methods for petroleum products, construction materials, metals, fruit and people, account for the largest portion of the economic impact of our deepwater seaports. CCEA estimated that there would be a 10% increase in the price of petroleum products in the State due to their more costly distribution were it not for the ports and the pipeline. These estimates do not account for the lost business that Connecticut would experience were it not for our deepwater ports. Military interests aside, many firms would leave, stagnate or not locate in Connecticut due to higher transportation costs. Connecticut would simply lose competitiveness in the global marketplace. Because Connecticut's ports provide cost-efficient means of moving goods and people, businesses and people find Connecticut a more attractive place to locate.

In the REMI analysis, CCEA forces the State's operational budget to remain balanced, as required by statute. This balance reveals itself in the approximate equality of the rise in induced government spending and rise in total tax revenue. It reflects how the operations of the State's deepwater ports result in an expansion of the private sector of the State's economy, an expansion matched by an expansion of the public sector. For purposes of this study, CCEA assumed that there is no substitute activity or alternative use of the port areas, such as for high-rise apartments. Moreover, we assume that there is no short-term mode other than trucks to deliver petroleum products to the State. There are several alternatives for delivering petroleum to the State, including extending the Buckeye Pipeline into Long Island Sound or to Port Elizabeth in New Jersey. We have not considered any novel approaches to address petroleum delivery, which, in any case, would likely be long-term solutions.

As shown in Appendix 5, Connecticut ranked between 30th and 32nd out of 48 states and other U.S. ports of entry during 1996, 1997 and 1998 in total tonnage of material moved through its ports. In 1996, New Haven has ranked 60th and Bridgeport 81st out of 150 U.S. ports in total tonnage moved. Those rankings improved to 58th and 80th respectively the following year. New Haven improved further to 56th position, while Bridgeport slipped to 84th in 1998. ***These figures illustrate Connecticut's and New Haven's significant position relative to some of the United States' largest seaports and further argue for vigorous support.***

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ECONOMIC IMPACT ANALYSIS

I. INTRODUCTION

This report presents the results of static and dynamic analyses of the economic impact of Connecticut's deep-water seaports on the State economy. The Connecticut Coastline Port Authority (CCPA) requested the Connecticut Center for Economic Analysis (CCEA) at the University of Connecticut to conduct this study. The Center houses the State Economic Model, (the REMI model), a sophisticated 53-sector replication of the State's economic structure that can project economic impacts out to the year 2035. The Center also houses a State Economic Model (IMPLAN), which is a static input-output model. The following analysis presents the economic impact of seaports in Connecticut over a period of thirty-five years, with the year 2000 as the starting point. This period allows the Connecticut economy to arrive at a long-run equilibrium as a result of the current economic activity of its deep-water ports. The objective is to measure the gain to the State economy in terms of employment, gross regional product (GRP), personal income, and total tax revenues, of the ongoing operations of seaports Connecticut. We arrive at the positive contribution of the Connecticut's port using a counterfactual approach to measuring economic impact. We assume no alternative activity replaces that generated by Connecticut's deepwater ports.

To measure the economic impact of deepwater seaports on the State economy, the Center conducted a survey (see Appendix 2 for the instrument) of several port users and port service providers in Connecticut. The survey was similar to one developed by the Maritime Administration (MARAD) as described in the literature review, and was designed to acquire employment and sales revenue of port-related industries, and to measure the degree of port dependency of the industries that are either directly or indirectly related to seaports in Connecticut. Because of low responses to the mail and phone survey, the Center adopted an alternative approach to measure the economic impact of Connecticut seaports on the State economy. We present the results derived from IMPLAN and REMI to check the consistency of the results derived from each model.

To measure the potential economic impact of Connecticut seaports on the State's economy, this analysis measures the statewide economic impact and not the impacts on any specific county. As mentioned earlier, this analysis presents two types of results derived from two different state economic models, IMPLAN and REMI. IMPLAN is a static model and does not provide economic impacts over time and reflects a once-and-for-all change in the economy. It explicitly measures the direct, indirect, and the induced economic impacts of an economic shock. A discussion of direct, indirect, and induce impacts of seaport are presented in the literature review attached to this study. On the other hand, REMI, a dynamic model, provides economic impacts over time but does not explicitly delineate direct, indirect, and induced impacts. Unlike IMPLAN, REMI can also take into account changes in amenity values in the economy resulting from an economic shock. Our analysis presents both REMI and IMPLAN results. The REMI results of the economic impacts of Connecticut's seaports are presented over the period 2000-2035, with REMI's terminal year representing the approximation to the once-and-for-all steady state of the IMPLAN results.

II. INPUT ESTIMATION

As an input to the state economic models, we estimate employment in port-related industries. Employment is the most powerful variable in determining the health of an economy. Wages earned by workers are the engine for economic growth. Therefore, this analysis uses employment data as the most critical input to measure the economic impact of seaports in the State of Connecticut. The Center was able to acquire employment data for Connecticut by industry at the four-digit SIC code level from Minnesota IMPLAN Group, Inc.

Identification of industries that are directly or indirectly related to seaports and their degree of dependency on the seaports are the first steps to measure the seaports' economic impact on Connecticut. Based on the surveys and other available port impact studies, we identified port-related industries and estimated their degree of dependency on Connecticut's seaports. In Connecticut, there are many industries that are either partly or fully dependent on our seaports. The industries that are fully dependent on the seaports

are considered to be primary (port service provider) industries. They include water transportation and passenger services such as, marine cargo handling, towing and tug boating, stevedoring, terminals and warehousing, and docking, pipelines and petroleum or crude oil bulk stations that are directly connected to our seaports. Similarly, industries that are indirectly related to the seaports are considered to be secondary (port user) industries. Several industries in the manufacturing, construction, mining, transportation, service, retail, and wholesale sectors fall into this category.

Employment in the construction and manufacturing sectors depends to some extent on the seaports in Connecticut. For example, some fraction of the construction materials for highways such as asphalt and concrete, and, construction materials such as lumber and steel arrive through our seaports. The employment in these sectors is therefore to some extent dependent on Connecticut's seaports. Similarly, in the manufacturing sector, steel industries are among the leading port users in Connecticut. Some portion of employment in the steel and metal fabricating industries in Connecticut is port-dependent. The degree of port dependency of these industries is based on the surveys of some of the steel companies in Connecticut. Table 1 presents the port-related industries in Connecticut, their estimated degree of dependency on the seaports, and, a sectoral employment estimation. We assume that an opportunity cost of the ports is the significant additional truck traffic on Connecticut highways as land transport substitutes for waterborne transport. The costs of increased highway congestion, pollution, maintenance and time lost are described below (environmental costs are omitted). These costs are accumulated for REMI input that measures an amenity value that in turn affects population migration. In the analysis, we assume that direct, port employment in Connecticut would continually increase by 1% annually over the period 2000-2035 more than REMI actually forecasts. This growth improvement was a consensus assumption. In addition, we assume that the opportunity cost of truck and rail delivery as the alternative to waterborne delivery, increases gasoline and heating oil prices by 10% each year on average above the baseline forecast.

Table 1

	Port Related industries	Connecticut Employment (Units)	Estimated Degree of Port Dependency	Estimated Employment
SIC codes	**Sector Names**			
1521	General contractors single family houses	6258	0.02	125
1522	General contractors residential bldg.	290	0.02	6
1611	Highway and street construction	2511	0.2	502
1771	Concrete work	2232	0.2	446
1791	Structural steel erection	726	0.1	73
2834	Pharmaceutical preparations	5414	0.1	541
289	Miscellaneous chemical products	2064	0.1	206
3444	Sheet Metal work	1383	0.2	277
3471	Plating and Polishing	2956	0.2	591
3479	Metal Coating and allied services	788	0.2	158
3499	Fabricated Metal services	1065	0.2	213
3731	Shipbuilding and repairing	8865	0.2	1773
3732	Boatbuilding and repairing	62	0.2	12
4212	Local Trucking without storage	4759	0.4	1904
4222	Refrigerated warehousing and storage	11	1	11
4226	Special warehousing and storage, nec	247	0.2	49
4231	Trucking terminal facilities	258	0.1	26
4482	Ferries	187	1	187
4489	Water passenger transportation	67	1	67
4491	Marine Cargo Handling	256	1	256
4492	Towing and Tugboat Services	239	1	239
4499	Water Transportation services, nec	105	1	105
4613	Refined petroleum pipelines	18	1	18
4731	Freight transportation arrangement	2010	0.1	201
4931	Electric and other services combined	62	0.6	37
4953	Refuse systems	1403	0.3	421
5093	Scrap and waste materials	1709	0.6	1025
5171	Petroleum bulk stations and terminals	198	1	198
	Total Employment	**46138**		**9667**

Source: Minnesota IMPLAN Group, Inc. Note: nec=not elsewhere classified.

Figure 1

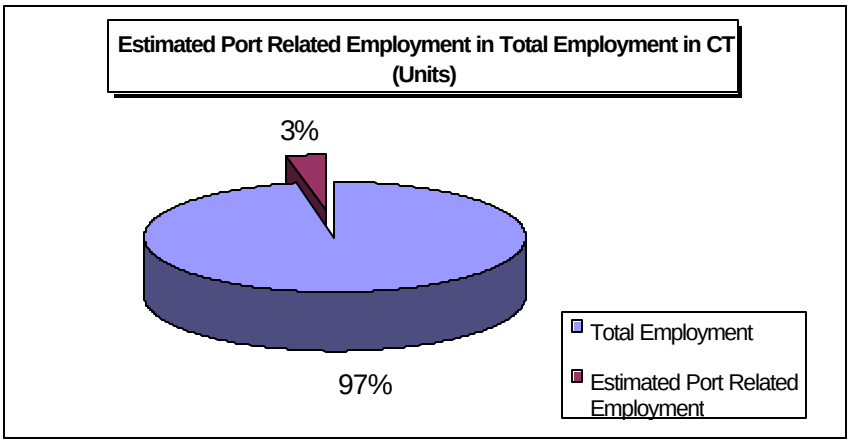


Figure 1 shows the share of port-related industries in Connecticut's total non-farm employment for 1997, which accounts for 3% of the total non-farm employment in the State. This implies that due to its seaports, Connecticut gains about 9,667 jobs in direct port-related industries. This estimation should considered to be conservative, as it does not take into account several other sectors such as inspectors, safety, and clean up companies which depend, to some extent on Connecticut's seaports. This estimation possibly excludes employment in several hidden (unobservable) groups of steel industries that receive input via Connecticut's seaports. We also assume that port-related employment is restricted to State residents and excludes workers commuting from out of state as their employment, income, taxes, and personal expenditures are likely to create economic impact in other states.

III. IMPLAN RESULTS:

Table 2 presents the direct, indirect, and induced impacts of Connecticut's seaports on the State economy. The table presents the effects on employment, output, personal income, total value added, property income, and indirect business taxes in the state due to ongoing port operations. These results assume that the State budget is not balanced. That is, the rise in tax revenue is not matched by a corresponding rise in State

spending. Therefore, these results understate the effect of the employment gain in all port-related industries.

Table 2

IMPLAN Economic Impacts of Connecticut Seaports

(Results based on Employment data for 1997**)**

Description	**Direct Impacts**	**Indirect Impacts**	**Induced Impacts**	**Total Impacts**
Employment (jobs)	10,452	5,130	7,182	22,765
Output ($1995 mil.)	$1522.689	$531.523	$567.667	$2,621.867
Personal Income ($1995 mil)	$531.409	$210.460	$223.515	$965.385
Total Value Added ($1995 mil)	$792.857	$307.456	$371.125	$1,471.639
Other Property Income ($1995 mil)	$209.050	$72.420	$107.655	$389.126
Indirect Business Taxes ($1995 mil)	$52.397	$24.575	$40.154	$117.127

The results show that the long-run impact of Connecticut's seaports on total employment is 22,765 jobs. This implies that Connecticut's seaports generate 22,765 jobs in the economy of which 10,452 jobs are fully port-dependent. The indirect and induced employment impacts of Connecticut seaports are 5,130 and 7,182 jobs respectively. Figure 2 graphically illustrates the employment impacts of Connecticut seaports. In addition to employment, this analysis presents the economic impacts of Connecticut ports on the output (GSP), income, and taxes of the State economy. Figure 3 illustrates the long-run economic impacts of Connecticut's seaports on gross state product (GSP), personal income, total value added, other property type income and indirect business taxes in the State of Connecticut.

Figure 2: Employment Impacts of Connecticut Seaports

(Results based on 1997 Employment)

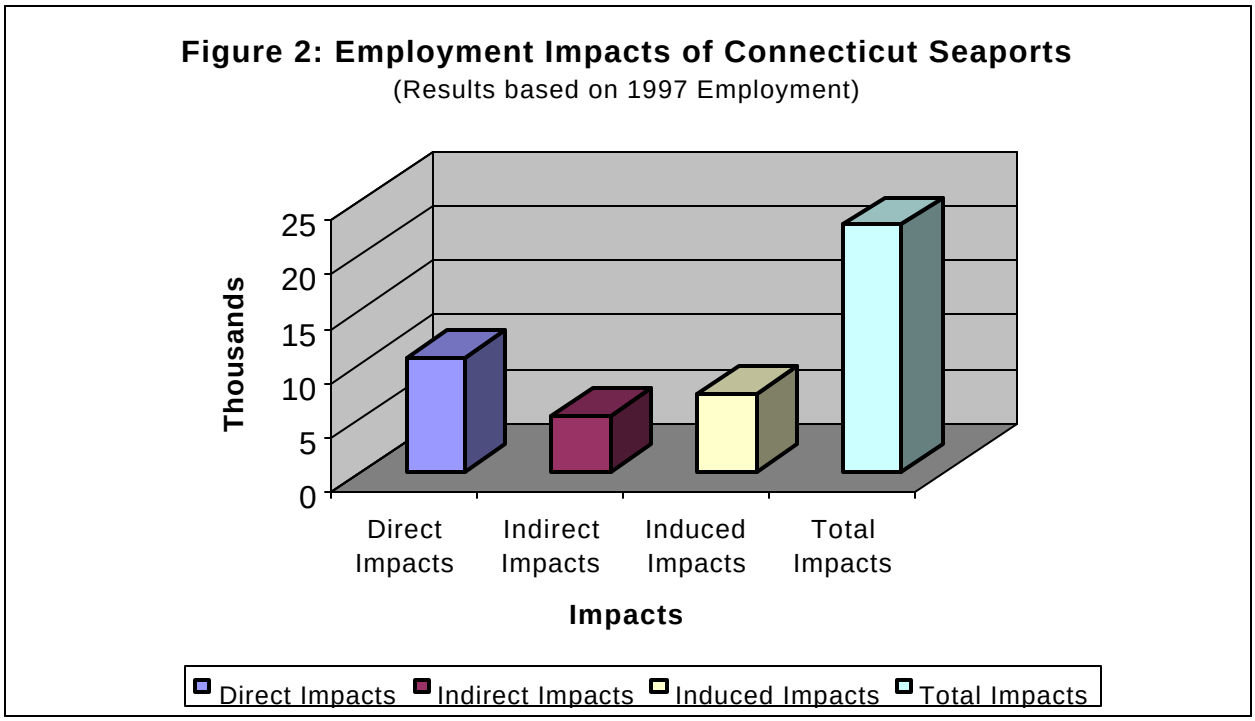


Figure 3: Economic Impacts of Connecticut Seaports: Key Economic Variables

(Results based on 1997 Employment)

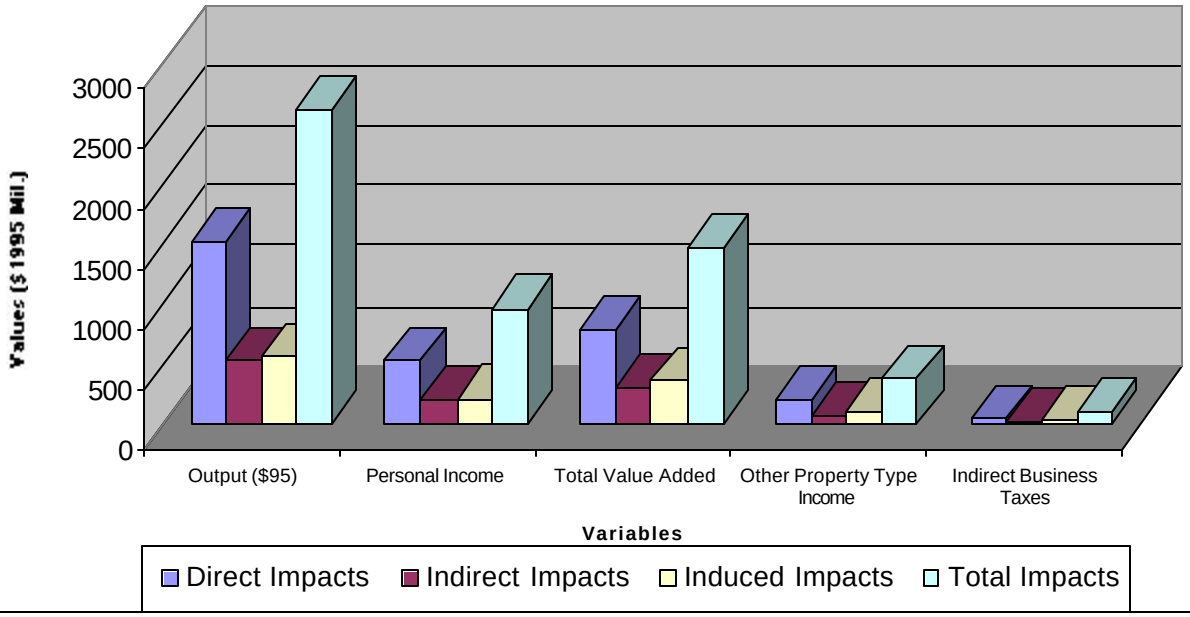


Figure 3 shows that Connecticut's seaports have the largest positive impact on the State's output (GSP) relative to other variables. The total output of the State rises by $2.62 billion due to Connecticut's ports ongoing operations. Of the total output impact, $1.522 billion accounts for fully port-dependent industries and $531.52 and $567.67 million for industries that are indirectly related to the ports, or industry activity induced by the ports, respectively. Similarly, total personal income rises by $965.38 million, of which $531 million arises from the impact on directly port-related industries. The indirect and the induced impacts account for $210 million and $223 million, respectively.

IMPLAN also provides the economic impact of Connecticut's seaports on the total value added in the State economy. The total value added consists of employee compensation, proprietor and other property type income, and indirect business taxes. It represents the value added to the cost of intermediate goods and services. The impact of total value added on the State economy is the second largest long-run impact of Connecticut's seaports. The result suggests that Connecticut's ports generate a total value added to the State economy of $1.47 billion. The IMPLAN results show that Connecticut's seaports have favorable effects on other property income of the State. The other property income category includes corporate income, rental income, interest, and corporate transfer payments. The result shows that, due to Connecticut's seaports, other property type income in the State increases by $389 million, of which $209 million arises from the industries that are directly related to the seaports in the State.

Connecticut's seaports have a significant impact on indirect business taxes in the State. Indirect business taxes include sales, excise, and other taxes paid during the normal operation of industry. These taxes, however, do not include taxes paid based on net income. The results show that the total gain for the State from indirect business taxes amounts to $117.12 million due to Connecticut seaports' ongoing operations. Of this amount, $52 million can be attributed to the direct impact and $24 million and $40 million respectively to the indirect and induced impacts.

IV. REMI RESULTS:

Unlike IMPLAN, REMI does not separate the total economic impacts into direct, indirect, and induced impacts. However, REMI, a dynamic model, derives economic impacts over time and incorporates changes in amenity values. This analysis presents the economic impacts of Connecticut's seaports on the State economy over the period 2000-2035. The average annual numbers reported below are the sum of yearly tax revenue or employment increases due to the operations of the ports and all dependent industries divided by 36. The thirty-six year study period allows time for the economy to reach a new, long run equilibrium following the formation and evolution of port and dependent activity in the state. We present results for certain key economic variables: employment, gross state product (GSP), personal income, and population. We present the impacts of Connecticut's seaports on tax revenues for the State as well. In this case, we did balance the State budget so that net taxes are zero. That is, the increase in tax revenue due to port-generated jobs and population is matched by a corresponding increase in State spending, as statute requires of the State's operational budget.

For purposes of this study, CCEA assumed that there is no substitute activity or alternative use of the port areas, such as for high-rise apartments. Moreover, we assume that there is no short-term mode other than trucks to deliver petroleum products to the State. There are several alternatives for delivering petroleum to the State, including extending the Buckeye Pipeline into Long Island Sound or to Port Elizabeth in New Jersey. We have not considered any novel approaches to address petroleum delivery, which, in any case, would likely be long-term solutions.

a. Employment, Output, Income and Population Impacts

Table 3 summarizes the impacts of Connecticut's port operations on the employment, GSP, personal income, and population of Connecticut.

Table 3

Net Changes in Selected Economic Variables for the State of Connecticut

2000-2035

	Average Incremental Change over Baseline
Employment	27,051
GSP (Billions 92 $)	$1.941
Personal Income (Billions Nominal $)	$2.698
Population	46,221

The results show that, due to ongoing operations of Connecticut's seaports, the average annual increase (not cumulative) in employment in the State economy above the status quo forecast (no port scenario) is about 27,051 jobs. The average annual numbers reported here are the sum of yearly employment increases due to the operations of the ports and all dependent industries divided by 36. The thirty-six year study period allows time for the economy to reach a new, long run equilibrium following the formation and evolution of port and dependent activity in the state. The total employment impact includes increases in employment in the industries that are directly and indirectly related (dependent on) to Connecticut's seaports. Similarly, because of Connecticut's seaports, GSP would on average increase by $1.941 billion, personal income would on average increase by $2.698 billion, and State population would on average increase by 46,221. The average annual numbers reported here are the sum of yearly GSP, personal income and population increases due to the operations of the ports and all dependent industries divided by 36. The thirty-six year study period allows time for the economy to reach a new, long run equilibrium following the formation and evolution of port and dependent activity in the state. Table 4 presents the impacts of Connecticut's ports on the employment and output at a detailed sectoral level. The results indicate that the impact of Connecticut's ports has the largest impact on the transportation and public utility sector followed by the durable manufacturing and service sectors. Because of Connecticut's seaports, the employment in the transportation and public utility sectors increases on

average by 5,160 annually. Employment in the durable manufacturing and service sectors increases by 4,269 and 6,510 jobs respectively. Similarly, output in the transportation and public utility sectors increases by $438 million a year due to Connecticut's seaports. The State enjoys an annual average increase in output in the durable manufacturing and service sectors by $433 million and $242 million, respectively due to Connecticut's seaports' ongoing operations.

Table 4

Net Changes in Employment and Output for the State of Connecticut

2000-2035

Sectors	Average Change in Employment Over Base Line (No port scenario)	Average Change in Output Over Base Line (Billions $1992)
Durable Manufacturing	4,260	0.433
Non-Durable Manufacturing	1,230	0.226
Mining	20	0.001
Construction	2,240	0.111
Trans./Public Utility	5,160	0.438
Fin/Ins/Real Estate	800	0.147
Retail Trade	2,940	0.105
Wholesale Trade	1,160	0.156
Services	6,510	0.242

Connecticut's seaports have a significant impact on the State's population. The result shows that State's population continually rises overtime. This increase can be attributed to the increase in amenity value (attractiveness) due to Connecticut's waterborne services, lower costs of living for State residents resulting from lower transportation costs and decreased congestion, pollution and environmental damage. Connecticut's waterborne transportation enhances the State's competitiveness relative to its neighbors. The cost of allowing our seaports to deteriorate would become a deterrent to business investors, as the cost of doing business is likely to increase in the absence of lower cost waterborne transportation.

b. Tax Impacts

The study evaluated the impacts of Connecticut's seaports on state and local tax revenues. State taxes consist of income taxes, sales and use taxes, and corporate profit taxes. Table 5 shows the average annual increase in tax revenues for the State and local governments for the thirty-five year period beginning in 2000.

Table 5

Average Annual Changes in Tax Revenues in Connecticut

(Nominal $)

2000-2035

	Average Tax Revenue Change
Average State Tax Revenue	$161.48 million
Average Local Property Taxes	$135.41 million
Average Induced Government Spending	$300.77 million
Average Total Taxes	$296.89 million

The REMI results show that State tax revenues increase by an average of $161.48 million each year for thirty-six years (not cumulative) above the baseline or status quo forecast due to Connecticut seaports' ongoing operations. The average annual numbers reported below are the sum of yearly tax revenue increases due to the operations of the ports and all dependent industries divided by 36. The thirty-six year study period allows time for the economy to reach a new, long run equilibrium following the formation and evolution of port and dependent activity in the state. Similarly, local property taxes would increase by an average of $135.41 million annually statewide. This is likely to reflect the increase in population, employment and output in the State due to our seaports' ongoing operations. The average increase in total tax revenues would amount to $296.89 million. As a result of attracting new population, Connecticut's seaports' operations increase government spending for public safety and education by an average of $300.77 million annually above the baseline forecast. Table 6 computes the present values of the tax gain over thirty-five years. The present values of tax revenue increases show that the State would gain about $2.085 billion in State tax revenue and $1.734

billion in local property taxes. The present value of the total tax gain for the State is approximately $3.819 billion over thirty-five years due to the continuing operations of Connecticut's seaports. These results use a 6.5% discount rate (the 30-year Treasury note rate) over the 36-year study period.

Table 6

Present Value of New Tax Revenues and New Expenditures

(Nominal $)

REVENUES AND RELATED EXPENDITURES	PRESENT VALUE
PRESENT VALUE OF STATE TAX REVENUES	$2085.57 million
PRESENT VALUE OF PROPERTY TAXES	$1734.41 million
PRESENT VALUE OF TOTAL TAX REVENUES	$3819.98 million

V. IMPLAN AND REMI RESULTS: A COMPARISON

Table 7 summarizes the impacts of Connecticut's seaports on employment, output, and personal income of the State derived from the IMPLAN and REMI models. This analysis compares the IMPLAN results with the REMI results for the year 2035. We assume the economy settles down to a steady state (long-run equilibrium) after 35 years.

Table 7

Variables	IMPLAN	REMI (2035)
Employment (jobs)	22,765	35,850
Output (Bill. $95)	$2.621	$3.17
Personal Income (Bill. $95)	$0.965	$4.82

The IMPLAN and REMI models show slightly different but consistent results. The comparison of IMPLAN and REMI results suggests that the economic impacts derived from the REMI model are greater than those derived from the IMPLAN model.

We expected such discrepancies in the results, as the IMPLAN results represent a static analysis and the REMI results represent dynamic analysis. IMPLAN is likely to underestimate the impacts, as it does not take into account changes in amenity factors that capture the non-pecuniary value of Connecticut's seaports. Similarly, IMPLAN ignores any potential changes in consumer prices and changes in the level of employment in the long run due to the ongoing operation of Connecticut's seaports. Moreover, while we forced REMI results to reflect the assumption that the State's operational budget is balanced; our IMPLAN analysis does not explicitly balance the State's budget. Balancing the State's budget forces the economy to a higher equilibrium.

The comparison indicates that the personal income impact from REMI is significantly larger than the personal income impact in IMPLAN. This can be explained by the different definitions of personal income in IMPLAN and REMI. The REMI definition of personal income is much broader than the IMPLAN definition. The REMI definition is based on the BEA concept according to which personal income is the sum of wage and salary disbursement, other labor income, proprietor's income, rental income, personal dividend income, personal interest income, and transfer payments. However, the IMPLAN definition of personal income is much narrower than the REMI definition and understates the personal income impact relative to REMI. The IMPLAN definition of personal income is the sum of employee earnings and proprietor's income.

VI. OTHER IMPACTS

The significance of Connecticut's seaports can be evaluated from several other points of view. Other than the output, employment, and personal income impacts, a state economy can significantly benefit from the presence of seaports. Other major impacts of seaports include cost savings to the state from highway maintenance, potential changes in cost of goods and services, productivity, congestion, pollution, highway accidents, and so on. The following analysis estimates the annual savings for Connecticut in highway maintenance costs due to the presence of fuel pipelines and savings in congestion costs due to Connecticut's seaports' ongoing operations.

a. Annual Cost Savings from Pipelines

We now estimate the annual savings to the State from lower highway maintenance costs because of fewer trucks on the highways. We take into account cost savings by estimating the number of trucks on Connecticut highways in the absence of Connecticut's seaports. Almost 65% of all petroleum products for the State are delivered through the Port of New Haven. Pipelines are another major transportation mode for petroleum products in Connecticut. The Buckeye Pipeline Co. located in South Windsor is the major petroleum pipeline service provider in the State. This company alone delivers more than 50,400 barrels (2.772 million gallons) of gasoline, jet fuel and heating oil per day to Connecticut and Southern Massachusetts. In the absence of pipelines and the seaports in Connecticut, trucks would have to transport the entire gasoline, jet fuel and heating oil supply for the State. Based on the total number of gallons delivered in Connecticut and Southern Massachusetts, we estimate that there will be about 560 additional trucks per day on Connecticut highways, if Connecticut's seaports vanished. We estimate that due to the existence of our seaports, the State is currently saving about $2.206 million annually in highway maintenance costs by keeping almost 600 trucks off the highways per day. The present value of total cost savings for the state over the period 2000-2035 amounts to $36.523 million.

b. Annual Savings in Congestion Costs

We now estimate the increase in congestion costs that is avoided due to the increased number of trucks on Connecticut highways if our seaports vanished (an opportunity cost idea). We use the congestion costs estimated by the Federal Highway Administration (FHWA) for different metropolitan areas in the United States. Congestion costs consist of delay cost and wasted fuel cost. The delay cost is estimated by travel speed on the freeways and principal arterial streets, and the total hours lost due to delay. The fuel cost measures the extra fuel consumed because of slower speeds due to congestion. The estimation procedure of congestion cost is presented in Appendix 2. This procedure omits environmental and accident costs that may be substantial; our estimate is therefore conservative. Further, the congestion costs avoided below include only a conservative estimate of the truck traffic required to offset the (counterfactual) lack of the Buckeye Pipeline. The truck traffic required to deliver all the steel, zinc and wood products to the state, as well as the additional petroleum products currently imported through Stamford, Bridgeport and New London, are not included in our estimate below.

Based on the congestion costs for Hartford estimated by the FHWA, we estimate that the State is currently incurring total congestion costs of $84 million a year. The congestion costs for the State are estimated by multiplying the congestion cost for Hartford by five to capture the effect of four other major metropolitan areas in the State (New Haven, Bridgeport, Stamford, and Waterbury). We estimate that Connecticut's ports avoid ***additional*** congestion costs in the State amounting to $2.2 million per year. This is based on the estimated reduction in the number of trucks on Connecticut highways ***only to deliver the petroleum products imported through New Haven and sent up the Buckeye Pipeline.*** Our estimate assumes that only 5% of total congestion costs are attributable to commercial vehicles and 95% to passenger vehicles, and that the increased truck traffic affects all vehicles, not just other trucks.

Together these cost avoidances represent an increase in the amenity value of the State in terms of its quality of life resulting in further increases in our population.

VII. CONCLUSIONS AND POLICY IMPLICATIONS

This analysis has demonstrated the dramatic contribution of Connecticut's seaports to the State economy. The economy of Connecticut is connected to Long Island Sound via many channels. Our construction, metal fabrication and coating, and pharmaceutical industries, as well as our thirst for petroleum depend heavily on the State's deepwater ports for survival and growth. The alternative to delivery and shipment of goods through our ports is vastly increased truck traffic on Connecticut's roads and highways. Connecticut would likely have to make significant investments in road and rail transport to provide equivalent transport capacity of the ports driving up business costs. To the extent that Connecticut's ports reduce transport costs, many firms do not stagnate or go out of business because their costs do not increase unacceptably. Otherwise, firms looking to locate in Connecticut would notice our uncompetitive transport costs resulting from more costly delivery and shipment modalities and from higher fuel costs. The latter would drive up the price of heating oil for many firms, homes and schools and, in general, have a pervasive negative effect on Connecticut's economy.

Connecticut's ports have a history of private ownership and operation that is different from many East Coast seaports, which are managed by a public port authority. With the exception of the State Pier in New London, all of Connecticut's port facilities are privately owned and operated. Operators at the three deepwater ports are seeking a partnership with the State to provide support for critical capital expansions in competitive situations and, most importantly, support for dredging the harbors to allow access for the largest ships calling on Connecticut ports. In addition, existing road and rail access to port facilities needs to be improved. As Connecticut port facilities are not blessed with much land area, they must move large quantities of material through the facilities quickly. The State could assist with secured loans, grants and bond issues to provide for a tighter integration of the three transport modalities allowing more rapid transit of goods through the ports alleviating storage costs. A 1997 report by the Lyndon B. Johnson School of Public Affairs at the University of Texas at Austin outlined various port-

financing programs from across the country. Funds provided to ports were in the form of grants or loans. Both state and local governments often provided the money for grants, though the fraction supplied by each varied by program. The funds were usually allocated to specific projects approved by an advisory board and most funding programs had a focus such as infrastructure development, economic studies, or, dredging. An interesting grant program in Oregon provided money to ports for "formulating strategic business plans,….facility plans,….and….marketing plans". California proposed establishing a special Maritime Infrastructure Bank that would provide low-interest loans and bond proceeds to ports (as of publication, this program was still in need of funding). Finally, the Florida Trade Data Center was created to provide ports with information about trading opportunities (through mailing lists of importers and/or distributors, databases, etc.), and, provide funds for economic research studies.[1] Nine port-financing case studies from the report are presented in Appendix 4.

The firms that own and operate our deepwater ports are part of a larger marine cluster of industries that provide recreational boating and commercial fishing in the State. Connecticut is in competition with neighboring states for these export activities that generate additional economic and fiscal returns. The State should promote these industries with aggressive regional marketing and fiscal policies that help them grow. Appendix 3 contains several case studies of innovative ways states and localities around the country have financed port development and growth. Connecticut should imitate or synthesize these initiatives for its own ports' health and sustainability.

Connecticut's deepwater ports are intimately linked with its past and its future and deserve scrupulous attention for their continued survival and growth.

1 Boske, Leigh B., *State Programs for Financing Port Development*. Lyndon B. Johnson School of Public Affairs, University of Texas at Austin, 1997.

Appendix 1

PORT ECONOMIC IMPACT STUDIES: A LITERATURE REVIEW*

Abstract

Sea port economic impact studies have increasingly been important as they measure the direct and indirect impact of the ports on patterns of jobs, incomes, and tax revenues in the local economy. Measurement of such impact of seaports on the local economy becomes even more crucial from the view point of state and local government, because it can serve as an important educational tool to the community in understanding the structure of a port as well as its immediate economic effects. Several existing port studies have used different approaches to measure the economic impact of a port. This literature review explores the existing port studies in terms of their methodology to estimate the impact of a port on local economy, definitions of port economic impact, and also points out the shortcomings of earlier studies.

- The objective of this literature review is to provide background in terms of methodologies and definitions of seaport economic impact on the local economy, for the port study conducted by the Connecticut Center for Economic Analysis, University of Connecticut. The study intends to measure the economic impact of Connecticut's deepwater ports on the State's economy

INTRODUCTION

Seaport economic impact studies have increasingly been important as they measure their direct and indirect impact on patterns of jobs, incomes, and tax revenues in the regional economy. Measurement of such impact of seaports on the local economy becomes even more crucial from the viewpoint of state and local governments, because it can serve as an important educational tool to the community in understanding the structure of a port as well as its immediate economic effects.

There have been several port impact studies that attempt to measure the impact of seaports on a local economy in terms of employment, sales, income, and taxes [Pearson (1964), Water (1977), Chang (1978), Hoffman (1980), Davis (1983), Yochum and Agarwal (1980), Groseclose and Brass and Colbert (1989), Warf and Cox (1989), DeSalvo, J. (1994), Gripaios and Gripaios (1995), Verbeke and Debisschop (1996), Castro and Milan (1997)]. However, there is no standard methodology that accurately measures the economic impact of a seaport. The earlier studies differ from each other in methodology and their definition of the economic impact of a port. While some studies measure this impact by using traditional methods that primarily measure only the direct impact by surveying a limited number of port-dependent industries, others propose new and improved methodologies to measure the total economic impact of a port. The Maritime Administration (MARAD) has attempted to provide guidelines to measure a port's economic impact on a local economy by publishing the Port Economic Impact Kit and building a computer model called the Port Kit Model. Despite its critics (Davis, 1983), the approach described by MARAD has been widely used to measure the economic impact of a port. There are several studies as well that point out the shortcomings in earlier methodologies and suggest more appropriate approaches. This literature review explores existing port impact studies and methodologies adopted by the earlier studies, definitions of port economic impact, and, points out the shortcomings of earlier port studies.

LITERATURE REVIEW

The majority of existing port impact studies begin with definitions of port impacts, as an improper notion of port impact might well lead to an entirely wrong estimation of the total economic impact of a port. One of the major challenges in port impact studies is to identify the port-related industries and find out the degree of port dependency of these industries. Furthermore, the impact of a port is not only limited to identifying port industries and their degree of port dependency, but ultimately extends to consumers who sell or purchase goods exported and imported through the ports. In general, the total impact of a port on the local economy can be divided into the primary and secondary impact.

I. Primary and Secondary Impact

The impacts on the local and regional economies are the primary or direct, and secondary or indirect and induced impact. The primary or direct impact consists of the initial round of spending and employment generated by port activities such as, port industry services associated with moving cargo through the port system, and capital spending on new port construction, expansion or rehabilitation projects (MARAD, 1987). A major part of the direct impact arises from local port user industries. The local port user industries may be dependent on the port, in the sense that the port's existence is assumed to be a major factor in the initial decision of the firm to locate near it. In this case, the whole value of the economic activity can be linked to the port. However, it can also be argued that if there are other ports available, port users may only derive economic advantage by using one port versus another and the whole economic activity of the port user may not be linked to one particular port. As a result, a careful investigation of port user industries and their degree of port dependency is important. Another part of the direct impact of the port comes from port capital spending and port expansion projects, which include creation of storage and handling areas for containers, automobiles, or bulk commodities, construction of warehouses and other buildings, construction of new piers, dredging of channels or seaside berths, and the purchase and installation of new equipment.

The secondary impact (indirect and induced) is generally defined as all activities in the region which are economically dependent on the primary activity (Davis, 1983). The indirect impact includes the effect of labor, services, materials, and other items purchased by firms that supply the direct activities. Similarly, the induced impact includes economic activity that comes from household purchases of goods and services made possible because of wages generated by the primary and secondary economic activities. In another words, the secondary impact consists of the multiplier effect generated in the regional economy by activities included in the primary impact of the port. For example, the multiplier effect may measure how much money is earned in the form of wages, salaries, profits, and tax revenues, or how much business volume or employment is generated in an economy by the continuous re-spending of money initially generated by primary impact activities.

A significant amount of literature on port studies has been devoted to the discussion of primary and secondary impacts of ports. Davis (1983) attempts to point out some weaknesses in terms of defining the impact of a port in existing port studies, which are associated with the designation of economic activities to be included in the primary impact of a port. He argues that the primary impact typically includes all the activities necessary for the operation of port facilities, as well as those activities that directly rely on the use of the port facilities for shipping and receiving commodities. Davis (1983) argues that there is no single Standard Industrial Classification (SIC) category or set of economic activities that can be thought to comprise the primary or direct port impact. He points out the definitional problem that arises in the U.S. national input-output (I-O) model. In the U.S. input-output model, port activities are primarily included in water transportation which is exclusively based on SIC code 44. The water transportation sector excludes other potential port activities. For example, SIC codes 373 (Ship and Boat Building and Repair), 471 (Arrangement of Transportation), 4782 (Inspection and Weighting Services Connected with Transportation), 4783 (Packing and Crating), and 5551(Marine Supply Dealers-Retail) might well be included in water transportation. Similarly, SIC 44 (Water Transportation) includes activities such as 443 (Great Lakes-St. Lawrence Seaway

transportation and canals), which may be largely or totally inappropriate to the particular seaport under study.

Because there exists no standard set of economic activities that comprise the primary impact of the port, some studies attempt to estimate the primary impact by surveying the "factors of community income directly generated by services to vessels and by port operations." For this purpose, Brockel (1972) lists sixty-four factors directly generated by port operations and aggregates these factors into five categories, namely (1) vessel disbursements while in port (dockage, stevedoring, repairs, foodstuffs, bunkering); (2) port and terminal income (demurrage, handling, storage, etc.); (3) inland transport (barge, rail, truck, local cartage, local switching); (4) vessel crew expenditures (food, gift shopping, haberdashery and clothing, transportation, etc.); and, (5) port services (banking, communications, commodity brokerage, marine insurance, etc.).

Similarly, Kaufmann (1979) sets out five broad categories of economic activities necessary for port operations: (1) direct port operation (the loading and unloading of goods, their storage and similar activities); (2) services provided for the shipping agencies (ship-building and repairs, as well as sales of such necessities as fuel and foodstuffs for ship operation); (3) crew expenditures (hotel services, restaurant services, and other consumer expenditure categories); (4) transportation services (services for the shipping industry such as navigation aids, and customs services).

The variation in definition of the primary impact of ports from study to study can be considered as a result of a lack of thorough investigation of the degree of dependency on the port of the various activities. While defining the primary impact, careful attention is necessary. For example, it is inappropriate to include all regional activity associated with trade flows through the port because some of these trade flows might well be shipped in and out at some other shipping points were the existing port services in question are not available. Similarly, many commercial activities located on port land (e.g., restaurants, parkades, and warehouses) might well function at their current level of operations were the port to close completely. Therefore, the lack of a proper definition of the primary impact might lead to over- or under- estimation of the port impact.

Furthermore, an improper definition of primary impact is likely to generate a wrong estimation of secondary impact as well, because the secondary impact is the product of the primary impact and an appropriate multiplier.

As a part of the secondary impact, the indirect impact includes the effects on other industrial and service sectors caused by the direct or primary activity. Davis (1983) argues that the indirect impact also consists of those activities that are dependent on the primary activities through technical (sales/purchase) relationships, that is, changes in the level of primary activities will directly affect those sectors that supply inputs to these activities. For example, the wholesaler who supplies foodstuffs to the dockside chandlery is included in the secondary impact to the extent that his production is dependent on the chandlery. Included in the secondary impact are also local food processors that supply wholesalers, farmers in the region who supply processors, local farm machinery distributors who supply farmers, and so on.

As mentioned earlier, the induced impact on the other hand, is composed of those regional activities that are dependent on the primary impact activities through consumption linkages. These economic activities come from the household purchase of goods and services that are dependent on the wages and salaries of persons directly and indirectly employed by the port. For example, the local barber who serves the employees of the chandlery and the food processing plants is considered to be partially dependent on the port. Other examples include local movie theaters, hardware stores, grocery markets, and so on.

Youchum and Agarwal (1988) provide further discuss the definition of the primary port impact. Their definition is consistent with the definition provided by MARAD and they divide port-related industries into three groups namely, port-required, port-attracted, and port-induced industries. Port-required industries provide transportation and port services. Transportation services industries include terminal freight forwarding, and transport of cargo by rail and road. Port services include terminal operations, stevedoring, vessel supply, pilotage, towage, launch services, container service and other functions necessary for the movement of waterborne commerce across the piers.

Similarly, port-attracted industries are those firms that are attracted to the region because of the presence of a port. The port-attracted firms would consider moving from a region if port facilities were closed down. [Note: recent studies, as well as the US Maritime Administration's guidelines for these studies, have failed to account for the primary economic impact of port-attracted industries]. These firms can be categorized into two groups, exporters of commodities and importers of raw materials for assembly or distribution. Total employment, payroll, and tax revenues from such industries are linked to the port because, in the absence of port facilities, attracted industries would not locate in the region. Finally, port-induced industries, are those industries in the region which have expanded their markets (demand for their products) by exporting through the port. For these industries, the port is a source of reduced transportation costs that results in industry expansion.

II. Methodology

After defining the primary and secondary impacts of a port, the next step in measuring its economic impact is to find an appropriate methodology to estimate this impact. The procedure to estimate the total impact of port on the local economy can be divided into two parts. The first requires the estimation of the direct or primary impact of the port, which mainly explains the impact of port on port service industries and local port user industries in terms of sales, employment, income and taxes. The second part requires the estimation of secondary or indirect and induced impacts of the port. The estimation of the primary impact can be used as an input to estimate the secondary impact. The overall impact of a port constitutes the total of both primary and secondary impacts.

There are primarily two standard approaches to measure the direct economic impact of a port. A researcher can use a limited survey to determine a few variables that serve as input to *computer software* to estimate the direct impact. On the other hand, the port impact in terms of sales, revenues, employment and taxes can be estimated by a *detailed survey* of both port service providers and port user industries. One of the most widely used computer software used

in port impact studies is Regional Input-Output Modeling System II (RIMS II), developed by Bureau of Economic Analysis (BEA). MARAD developed its own computer software in 1987, called the Port Kit Model, to measure the economic impact of a port. The Port Kit model incorporates the national input-output table (1987), an estimating procedure to adjust the national table for the port's local economy, a series of default values for each state to help calculate state and local taxes, and, parameters to translate cargo tons and port expenditures into economic effects. Several port studies have used the methodologies described by MARAD (Yochum and Agarwal, 1987, 1988, Groseclose, Brass and Colbert, 1989, Castro and Millan, 1997). Hoffman, 1980, followed the MARAD method detailed in a 1978 publication by the United States Department of Commerce Maritime Administration. The Port Economic Impact Kit describes the procedures to estimate the direct, indirect and induced impacts of a port. The following sections briefly summarize the procedures recommended by some earlier studies.

(i) Measuring Primary (Direct) Impact: Maritime Administration Approach

(a) Primary impact of port industry

The Port Economic Impact Kit produced by MARAD recommends four different procedures to measure the primary impact of port industries. Each procedure can be distinguished by the inputs required. The procedures are namely, manual per-ton estimate; microcomputer model using standard values; microcomputer model with limited survey; and, the detailed survey option.

(i) Manual per-ton estimate**:** A manual estimate of the direct sales revenue impact can be prepared based on per ton impact figures. This involves:

(a) Obtaining the most recent year's cargo tonnage, by vessel/cargo type such as container, break bulk, autocarrier, dry bulk, and liquid bulk. Or, for a new facility, obtaining a forecast of its expected annual cargo handling.

(b) Obtaining relevant estimates of direct spending for port industry services on a per-ton of cargo basis. Multiplying the tonnage by the per ton impact figures to obtain total

direct sales revenues impact. (Note: The estimated average values for the port industry direct impact expenditures per ton of cargo have been developed and stored in the Port Kit model)

(c) Estimating the level of employment, payroll, and taxes associated with these sales revenues.

(ii) Microcomputer model using standard values: The model calculates the port industry primary impact on the basis of input tonnage, estimated average per-ton expenditures stored in the model, and input regarding the average inland transportation costs for cargo moved through the port. The model accepts inputs for up to ten cargo/vessel types—container, break bulk, autos, dry bulk, liquid bulk, and five "other" types that can be defined by the analyst. For each cargo/vessel type used, the model requires the following inputs:

(a) Cargo tonnage-moved through the port, which can be in long tons, short tons, revenue tons, metric tons, etc.

(b) Revenue tons/cargo ton-converts the cargo tonnage input (e.g., short tons) into the revenue tons used in the model calculations.

(c) Share of vessels bunkering - a percentage estimate of what share of vessels calling the port purchase bunker oil in the port.

(d) Inland transportation: tonnage share by mode—a percentage estimate of how much cargo moves inland from the port (percent by rail, truck, or barge and percent with no inland transportation)

(e) Inland transportation: average haul by mode - the average distance (approximate miles) cargo is moved inland by each mode (e.g., rail, barge, truck, and pipeline)

(f) Inland transportation: average rate by mode—the average cost per ton-mile for moving cargo inland.

When this information is not immediately available, it can be collected in brief phone interviews with the major shippers using the port, with trucking companies, and with railroad or barge operators. Based on the inputs, the model computes total direct sales revenue impact. It

applies the average per-ton expenditure data stored in the model to the cargo tonnage, and computes special items such as inland transportation and bunkers using the inputs provided by the analyst. The expenditure categories are also translated into the 30 industrial sectors used later on in the input-output section of the model. The sum of these expenditures is equal to the direct sales revenue impact. Employment, payroll, and tax impact are then computed using the county economic input data.

(iii) Microcomputer (Port Kit) with Limited Survey

The limited survey approach primarily involves telephone interviews or written surveys with shippers, terminal operators, stevedoring firms, trucking companies, and steamship agencies in the study area to collect port-call cost information and cost-per-cargo-ton information for port activity and inland transportation. This can be done on the basis of typical spending per port call, and then dividing by average tonnage handled. Or, annual data can be used, divided by annual cargo throughput.

(iv) Detailed Survey

The purpose of such a survey would be to tabulate all the revenues, employment, payroll, and taxes partly paid by firms that are part of the "port industry". A list of all the relevant firms must be drawn up, a questionnaire developed and a mailing is prepared. However, these firms should be only those selling services directly to the cargo or vessel owner because other indirect services are captured using the economic multiplier. The major tasks in applying the detailed survey approach are the following.

(i) Development and distribution of the questionnaire;

(ii) Follow up to obtain complete data especially from major port industry firms;

(iii) Analysis and summary of the survey results;

(iv) Extrapolation of data to cover any non-responses, using tonnage or other indicators as bases for estimates;

(v) Summary of port industry revenue, employment, payroll, and tax data for the base year.

(b) Primary impact of local port users

The local port user's impact refers to the sales revenues, employment, payroll, and taxes generated by industries that make heavy use of the ports for shipping their products or receiving their inputs. Measuring the impact of a port on local port users is controversial. The controversy arises from the degree of port dependency of the port user industries. Inclusion of all the economic activities of port user industries is likely to overstate the economic impact of port, if the local port is not available but other modes of transportation or alternative ports are available. It is because some industries would still exist in a particular location, if the local port were unavailable given alternative modes of transportation. The Port Economic Impact Kit considers the port impact of only that proportion of individual businesses that are tied to the inputs or outputs moving cargo via the port. To avoid double counting, the Kit suggests that port user activities should not include the transportation expenditures that already have been captured in the direct impact of the port industry. For this reason, a detailed transportation cost analysis would ideally be required to determine the actual impact of the port on local port users' industries. The Kit explicitly distinguishes between import and export oriented port users.

According to the Port Economic Impact Kit, a large import-based facility receiving bulk commodities and located close to a port, well within the study area, can be considered as a local port user if the study area is small. Similarly, in a medium sized county, a petroleum refinery or other plant depending upon waterborne inputs is an incremental economic activity in the local area, closely tied to the port and should be considered as a local port user. The most common export oriented port user industries suggested by the Port Impact Kit include wood products industries, agricultural producers, coal and other mineral producers, and manufacturing industries.

The Kit also provides some rationale for excluding some industries from the category of port users' industries. For example, importers of consumer goods through the port, e.g., large department store chains, can never be considered local port users, because they are likely to

have national distribution systems and thus are not necessarily located within a county or region defined as the study area.

In terms of methodology, surveys are generally required to measure local port user impact. There is a choice, however, between detailed surveys or using a simple employment count coupled with standard assumptions about the ratio of employment to income and output. MARAD recommends three different procedures that use different inputs to estimate the direct impact of local port users. These three procedures are: limited survey with manual estimates; limited survey as input to the Port Kit; and, the detailed survey option.

(i) Limited survey with manual estimates: This procedure is solely based on employment data. This approach uses a telephone or mail survey of possible local port users (shippers or receivers), requesting data on employment, on SIC code (2 digit SIC code identifying industrial sectors), and on the proportion of revenues attributable to exports or imports via the port. Once the employment data is collected, the direct revenue, wages, and tax impacts can be estimated.

(ii) Limited survey as input to Port Kit: This procedure also estimates port user employment using a limited survey as described earlier. Input to the computer model is provided in terms of employment, by SIC code, to estimate the output in term of direct sales, revenues, payroll, and taxes associated with the employment.

(iii) Detailed Survey Option: The procedure requires a detailed survey of several hundred companies over a period of 6 to 8 weeks to collect data on port user sales revenues, employment, payroll and taxes. On the basis of survey information, standard percentages of total employment, payroll and sales for particular industries are estimated and combined with the total employment, payroll and sales to estimate the total direct impact.

(c) Primary Impact of Port Capital Spending

One of the economic impacts of the port can come from port capital spending. This impact includes the activities and expenditures involved in constructing or upgrading port

facilities. A consideration of this type of impact is most relevant for a port authority or terminal operator planning new port construction, or an enlargement or rehabilitation project (MARAD, 1987). Such impact consists of an estimate of the temporary impact during the construction phase of a port expansion or improvement. This impact counts on the one-time capital expenditure effects and can be estimated by using mainly two procedures: Port Kit estimates based on the spending level and detailed construction estimates.

Port Kit Estimates: The Port Kit model calculates the port capital spending impact based on inputs identifying the dollar costs of the project and the percentage of labor for the project work that is from the study area. Based on the port capital spending inputs, the model assigns the project costs to the 30 industry sectors used in the model based on average expenditure data stored in the model. These industry demands are then reduced by the regional purchase coefficients to reflect the local industry share in each sector of the total demand. The Port Kit model thus automatically accounts for the local-content issues mentioned earlier; for instance, the direct impacts of spending for a container crane will be reduced in accordance with the representation of that manufacturing activity within the study area. In addition, the model reduces the household spending component of total impact by applying the percentage of construction workers residing in the area to household expenditures. The model converts dollars of expenditure to employment, payroll, and taxes.

(ii) Construction estimates: Because port capital spending is generally authorized and carefully tracked by port management, it is usually possible to compile detailed data for estimating the local direct impacts. Typically, employment and expenditure information is public information and available from the contractors involved and local and state agencies.

The methodology and guidelines provided by MARAD have been widely used in port economic studies. The Port Kit Computer Model developed by MARAD has also been used by some port authorities in the U.S. to estimate the economic impact of a port on the local economy. These studies include Port of Longview, Washington; Massachusetts Port Authority (Boston, MA);

Georgia Ports Authority: and South Carolina State Ports Authority. Some studies, however, use different models consistent with the MARAD approach to estimate the port economic impact.

(ii) Measuring Primary Impact: Other Approaches

There are other studies that attempt to develop a methodology to estimate the primary and secondary impacts of a port. Yochum and Agarwal (1988) estimate the primary impact by conducting a survey of port related firms. In a preliminary step, they identify the linkages of industries to the port and functional categories of port-required firms, because ports in general differ not only in size, but also in the mix of cargoes loaded and unloaded at port facilities. As a result, the process of estimating payroll, revenues, and employment differ by type of cargo. To identify the functional categories of port-required firms, the authors focus on the movement of bulk and general (break-bulk and container) cargo and demonstrate broad guidelines organized according to service functions. The primary impact of a port is graphically presented in figure 1. Linkages and functional categories of port-required firms in terms of employment are presented in figures 2 and 3.

Fig. 1

PRIMARY IMPACT OF A SEAPORT

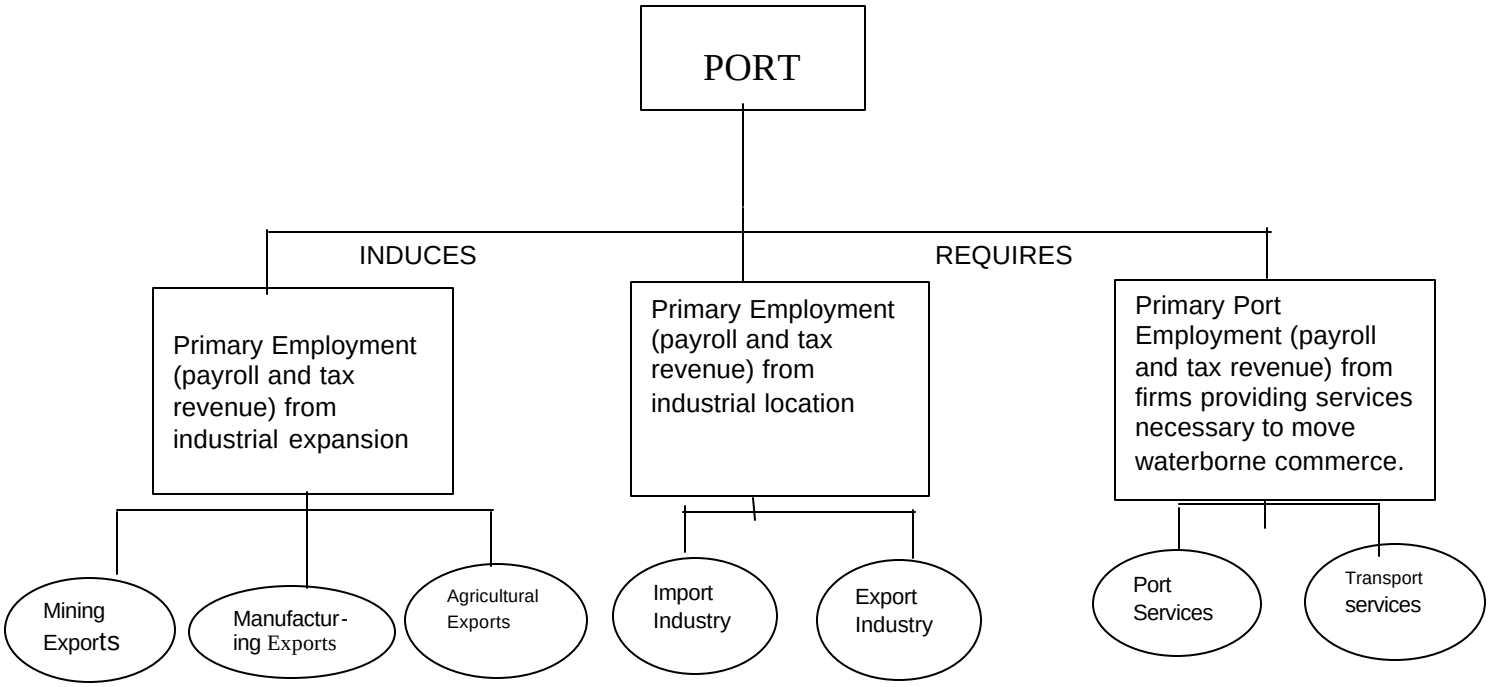
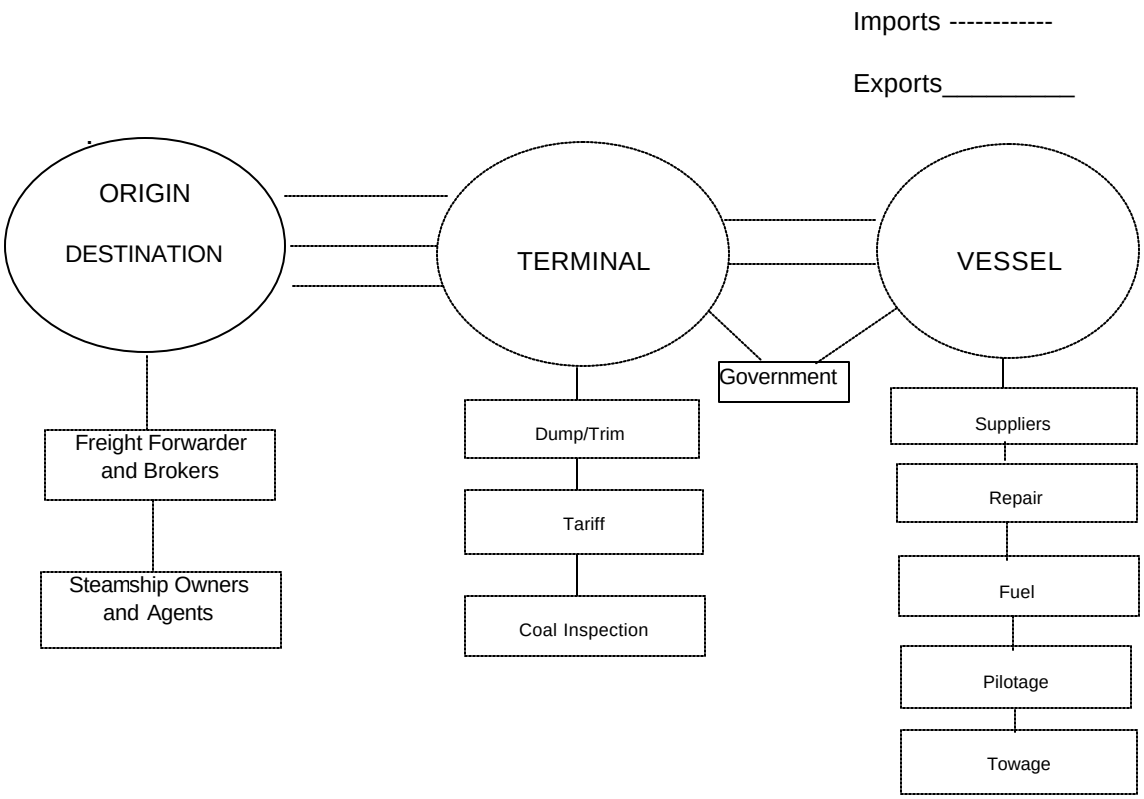


Figure 2: Bulk Cargo: Port-required employment categories



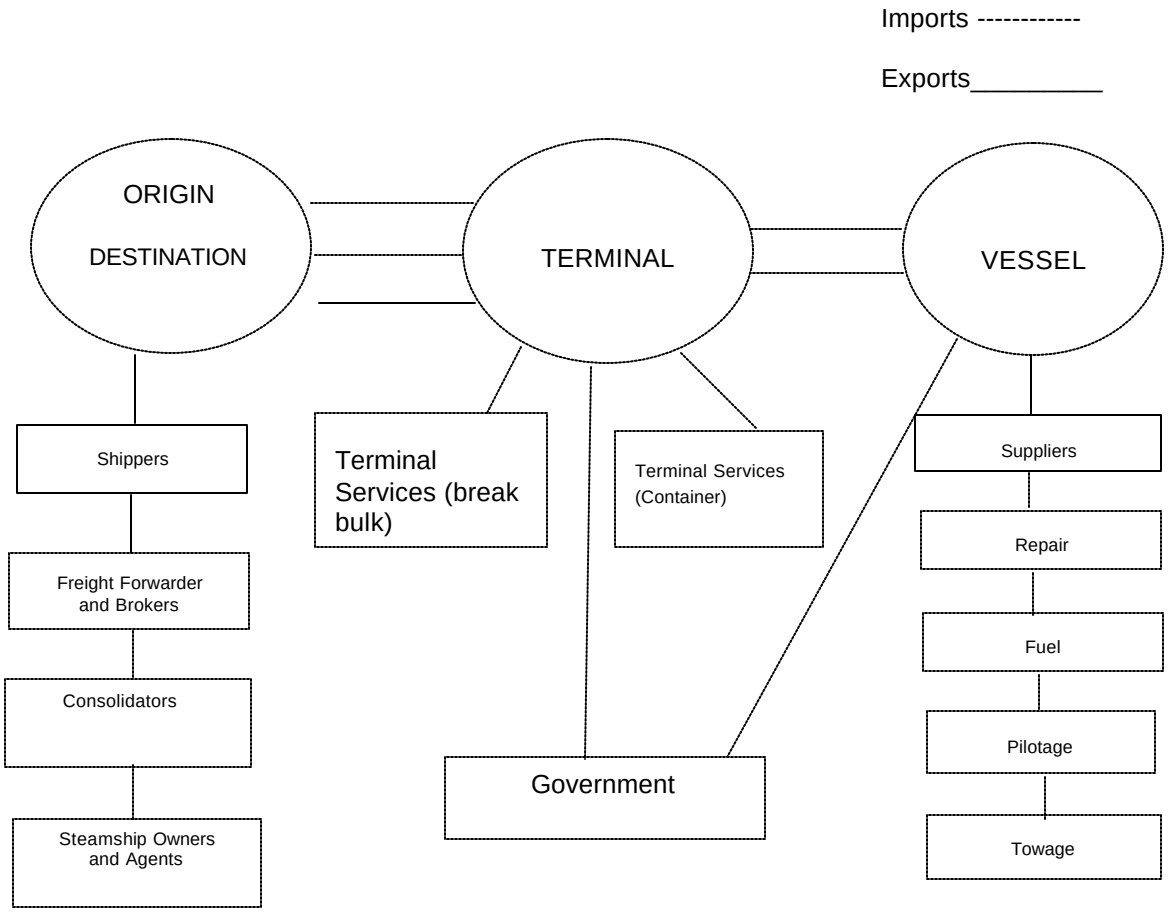
According to the approach developed by Yochum and Agarwal (1988), the movement of bulk cargo is dependent upon three general types of services: transport, terminal, and vessel. Agents and brokers arrange for the movement of bulk cargo transport services. In addition, the mode of transportation for the actual movement of bulk cargo must be taken into account. Many U.S. ports employ rail and barges as the primary method for transporting bulk commodities such as grain, coal, oil, and chemicals. In the case of some ports, pipelines and trucks may also be important for the movement of bulk cargo.

Similarly, terminal services, using coal as an example, include dumping, dockage, and inspection. For grain, services are required for storage, handling and loading/unloading of vessels. In addition, a tariff or service charge is levied that generates revenue and employment.

Finally, a vessel entering a harbor to load or discharge bulk cargo also requires services which include pilotage, towage, fuel, supplies, and repair services. The government also provides grain inspection, customs, and coast guard services.

In the terms of the movement of general cargo, transport, terminal, and vessel services are needed as seen in figure 3. The specific transport and terminal services needed to move break bulk and container cargo, however, tend to differ significantly from those needed to move bulk-(dry and liquid) cargo. Vessel services are the same for bulk and general cargo. Transport services needed to move general cargo include those provided by shippers, freight forwarders, brokers, steamship agents, and vessel owners, in addition to the truck and railroad workers who actually move the cargo.

Fig. 3: Break-bulk and container cargo: port-required employment categories



At the terminal, somewhat different services are required for break-bulk and container cargo. In the case of break-bulk cargo, revenue and employment are created by such services as packing and crating, marking, pier demurrage, and handling/warehousing as well. These activities are more labor intensive than those required in the processing of containers. Container cargo requires services such as receiving and interchanges, portainer and transtainer, refrigeration, ramping and deramping. Services common to both break bulk and container cargo include wharfage, dockage, storage, fumigation, lay berthing, line handling, and cargo handling by longshoremen.

The methodology adopted by Yochum and Agarwal (1988) uses a survey of port users and agents directly involved in port activities as input. Once the information is obtained from the survey of economic agents, economic impact is estimated by appropriate aggregation. While the questions asked in the survey can be very specific, the major intention of the survey is to get answers on mainly two questions: (1) Would your firm still be at your present location if port facilities in the region were not available? (2) What percentage of your business is dependent on the movement of your inputs or product through the port? Yochum and Agarwal (1988) use this approach to estimate the primary impact of the port of Hampton Road, VA.

An earlier study of the Hampton Road area adopted a different methodology. In Pearson's study (1964), the economic impact of the port was measured by first determining a list of firms who would cease to exist or relocate if the port was not available. Pearson divides these firms into nine categories according to the services they use or provide: basic water transport services; ancillary water transportation services; loading and unloading services; clearing and routing services; storage services; supply services; miscellaneous services; firms dependent on the importing and exporting through the port; and, common carrier land transportation services. The study accounted for businesses whose commerce only partially depended on port availability. Finally, using employment, income, and tax data from state agencies, the researchers determined how each component of impact changed between 1953 and 1961 and then from 1961 to 1962. The study presents the changes in employment, income, and taxes

separately and expresses the changes as simple quantitative changes and as percentage changes. Finally, the study presents the change in each component as a percentage of the aggregate (i.e. the percentage of total state and area wages deriving from waterborne commerce), both regionally and statewide.

The next step in measuring the economic impact of a port is the estimation of secondary or indirect and induced impacts that occur as a result of primary activities.

(iii) Measuring Secondary (Indirect and Induced) impacts

The secondary or indirect and induced impacts of a port are linked to its direct impact. The secondary port impact is considered to be of substantial size in all port impact studies. In many studies it is considered to be larger than the primary impact [Kaufmann (1979)]. Three different approaches to measure the secondary impact of a port have been identified in the studies. These are input-output (I-O) analysis, economic base analysis, and income expenditure analysis. The input-output model is used to estimate both the primary and secondary impacts of a port. According to the input-output methodology (in which imports are considered as "primary inputs"), the economic impact is based on the final export demand. Therefore, in order to estimate the direct economic impact of port users, it is necessary to have detailed information available on the value of exports carried out by such users. To estimate the primary impact of the activity developed by the users of the port, the respective direct multipliers are applied to the value of exports. The values of multipliers and the respective impacts provide the primary impact of the users of the port. Further, given the direct or primary impact, a similar approach is used to estimate the indirect and induced impact of the port. This analysis estimates the economic impact of the port in terms of employment, household income, taxes and value added generated by port activities.

The I-O model is designed to yield a distinct multiplier for each of the model's economic sectors. The basic idea of a multiplier is that it expresses the total effect relative to the direct effect. It is a shorthand way of summarizing the magnitude of the indirect and induced effects

generated by a given direct change in the economy (MARAD, 1987). The number of economic sectors varies for a nation, state or a region. The input-output table used in the MARAD Port Kit Model consists of 30 sectors or industries. However, a regional input-output model is required to correctly estimate the total impact of port on the regional or state economy. Recommended regional I-O models include Regional Input-Output System produced by Regional Science Research Institute, RIMS-II produced by BEA, IMPLAN produced by the Minnesota IMPLAN Group, and, the REMI model developed by Regional Economic Models, Inc.

The economic base analysis approach divides the regional economy into two parts: the base sector and the service sector. The base sector produces goods and services for export from the region and earns income for the region from outside the region. The service sector (usually) produces goods and services for local consumption. The exogenous variable and driving force of the two-sector model is the export sector that includes all economic activity whose ultimate market lies outside the region. The relation in size between the base sector for the economy and the service sector is used to determine the regional multiplier for basic activities. The basic and non-basic (service) sectors are commonly measured in terms of employment and income.

Employment and income data are extremely important to determine the secondary impact of a port, because all employees of firms included in the primary impact of the port are assumed to live in the local area. So it is assumed that they spend a high portion of their income in the local area. This effect is used in economic theory to determine employment generated by the expenditure of wages earned in firms included in the primary impact of the port. The generation of employment figures is relatively inexpensive for port impact studies. In the majority of studies, employment is estimated based on surveys and total employment is divided by basic employment to generate the size of the multiplier.

An alternative to the economic base analysis is income-expenditure or Keynesian multiplier analysis. This approach uses employment data to generate wage earnings data, which are then used to determine expenditures in the regional economy due to the primary impact of the

ports. Keynesian multipliers are constructed on the basis of assumptions concerning the relationships between gross regional product and regional consumption, investment, government spending, and exports. The study of the ports of Los Angeles and Long Beach uses the income expenditure approach to determine the multiplier effect generated by the primary impact of these ports [Kaufmann (1979)].

Despite other approaches to estimate the impact of a port on the regional economy, the I-O model is most widely preferred to other approaches, because of its strong theoretical foundation. Compared with the base and income-expenditure analysis, the I-O model, through its detailed exposition of intersectoral linkages, offers the advantages of yielding individual sector multipliers and including within these multipliers the indirect effect as well as the induced effect [Davis, (1983)].

III. DISCUSSION

While there are several studies that attempt to estimate the impact of a port on local economy, these estimates are static and these studies fail to estimate period-to-period changes in economic impact. For example, the existing port impact studies do not measure the incremental benefit of additional port investments. Similarly, the earlier port studies do not take into account impact of the change in technology in estimating port economic impact (technology is held constant). Some of the critiques have pointed out these limitations in existing port studies. Waters (1977) argues that port impact studies do not provide useful guidance for planning incremental effects of changes in public investments. Chang (1978) states that port impact studies are static in that they measure the economic impact of port operation for one year during which collected data are relevant. These studies are not intended to measure the incremental impact of port investments, however, comparative static analysis, though periodic updating of the port impact studies may enable one to overcome some of the problems inherent in static analysis. This all suggests that an improved version of the earlier approach or a completely new approach which incorporates factors such as technological change, change in investment, and extends

more sectoral linkages within the economy is required to estimate the economic impact of a port on local economy more accurately. One of the alternatives that incorporates these factors in measuring the economic impact of a port on the local economy is the REMI model developed by Regional Economic Models, Inc. Unlike the *static* RIMS-II model, REMI provi des a *dynamic* I-O analysis of the economic impact of multifarious shocks on the local economy. The REMI model takes into account the gradual return to equilibrium, as the regional economy responds to shocks. For example, subtraction of an existing port from the local economy can be considered as a external shock to the regional economy and the response of the local economy to this kind of shock can be well measured by the use of a dynamic model such as REMI. However, the importance of Port Economic Impact Kit produced by MARAD can not be underestimated as it provides guidelines that are necessary to generate inputs for REMI or any other port impact model.

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APPENDIX 2

FHWA Methodology:

Congestion Cost = Delay Cost + Wasted Fuel Cost

Delay Cost:

Daily Passenger Vehicle Recurring Cost	Passenger Recurring = Vehicle Hours of Delay	* Value of Person Time ($/hour)	* Vehicle Occupancy (persons/vehicle)
Daily Truck Recurring Cost	Truck Recurring = Vehicle Hours of Delay	* Average Peak Period System Speed (miles/hour)	* Truck Operating Cost ($/mile)
Daily Recurring Delay Cost	= Daily Passenger Vehicle Recurring Cost	+ Daily Truck Recurring Cost	

Fuel Cost:

Daily Recurring Fuel Cost	Recurring = Vehicle Hours of Delay	* Average Peak Period Congested System Speed	/ Average Fuel Economy * Fuel Cost

Assumptions:

Constant	Value
Vehicle Occupancy	1.25 persons per vehicle
Working days	250 days per year
Average Cost of Time	$11.70 per person hour
Commercial Vehicle Operating Cost	$2.55 per mile
Vehicle Mix	95 cents passenger & percent commercial
Percent of Daily Travel in Peak Periods	45 percent

APPENDIX 3: Survey Forms

Connecticut Coastline Port Authority
Economic Impact Study
Conducted by
Connecticut Center for Economic Analysis
Survey for Port Service <u>PROVIDERS</u>

Firm Name:_____
Address:_____
_____
_____
What is the SIC code of your main operation (if you know)_____? Please provide the data requested below.
Please provide a brief description of your Connecticut operations:

---

1. For your Connecticut operations, please provide data for your most recent fiscal year 199__:

Revenues (optional) $_____million Payroll (optional) $_____million

Employment _____

2. What percent of your waterborne business is conducted through the ports of Bridgeport, New Haven, New London or other ports? Allocate so the total is 100%.

Bridgeport ☐ New Haven ☐ New London ☐ Other ☐
(total=100%)

3. What percent of your Connecticut labor force is related to export/import activity via Connecticut waterborne transport? ___% Note: this includes waterborne shipments to other states.
Remarks (if desired):
_____

_____

If you have any questions or if you need further information, please call Stan McMillen at the Connecticut Center for Economic Analysis at 860-486-0485. Thank you for your assistance with this project.

Prepared by:_____ Phone: _____

Date:_____

Connecticut Coastline Port Authority
Economic Impact Study
Conducted by
Connecticut Center for Economic Analysis
Survey for Port Service <u>USERS</u>

Firm Name:_____
Address:_____
_____
_____

---

1. What is the SIC code of your main operation (if you know)____? Does your firm use waterborne transport? ☐ Yes ☐ No

If you checked 'Yes', please continue; otherwise do not. In either case, please return this questionnaire in the self-addressed, stamped envelope. Thank you.

Please provide a brief description of your Connecticut operations:

---

2. For your Connecticut operations, please provide data for your most recent fiscal year 199__:

Revenues (optional) $_____million Payroll (optional) $_____million

Employment _____

3. What percent of your waterborne trade goes through the ports of Bridgeport, New Haven, New London or other ports? Allocate so the total is 100%.

Bridgeport ☐ New Haven ☐ New London ☐ Other ☐
(total=100%)

4. What percent of your Connecticut labor force is related to export/import activity via Connecticut waterborne transport? ___% Note: this includes waterborne shipments out of state.

5. During normal economic conditions, what percentage of your sales is an import/export related activity dependent on Connecticut ports? (If you import, what percentage of your firm's business volume is dependent on the receipt of imports, i.e., raw or salable finished products?) _____%

6. If you could not receive or ship through Connecticut's ports how much would your transportation costs increase? _____%

7. How would you reallocate your present Connecticut ports' waterborne shipments in the absence of Connecticut's ports? Allocate so the total is 100%.

1. Other Port (name) _____ _____%

2. Other Port (name)_____ _____%

3. Rail ____%

4. Truck ____%

5. Air ____% (Total=100%)

Remarks (if desired):
_____
_____
_____

If you have any questions or if you need further information, please call Stan McMillen at the Connecticut Center for Economic Analysis at 860-486-0485. Thank you for your assistance with this project.

Prepared by:_____ Phone: _____

Date:_____

APPENDIX 4: Port Financing Case Studies

Wisconsin Harbor Assistance Program

The Wisconsin Harbor Assistance Program has been in existence since 1980 and has provided over $22 million in state grants to ports on an 80 percent state/20 percent local matching basis. Currently, the state provides four million dollars to the program each biennium. Project selection and program administration takes place within the Wisconsin Department of Transportation based on the recommendations of an advisory council that consists of representatives from the state's department of transportation, department of commerce, coastal management council, and two to three other waterborne commerce experts. The program is focused mainly on infrastructure improvement and dredging activities.

Minnesota Port Development Assistance Program

The Minnesota Port Development Assistance Program was established by the Minnesota State legislature in 1991, but did not receive its initial funding from the state until the 1996 legislative session. Because of this delay in funding, it is just now beginning to approve its first applications for funding. This program, administered totally within the Minnesota Department of Transportation, may either grant or loan money to eligible projects. Those projects which will be directly generating revenue are considered for loans, while those which will be generating revenue only through increased port economic activity are considered for grants (on an 80 percent state! 20 percent local matching basis). The program is focused mainly on funding infrastructure improvements, equipment purchases, and dredging for new commercial navigation facilities.

Oregon Port Revolving Fund Loan Program

The Oregon Port Revolving Fund began in 1977 and since that time has disbursed over $20 million in loans for nearly 150 projects while taking in only nine million dollars in state funding. In addition to funding these projects, proceeds from the fund completely finance the activities of a five-person Ports Division in the Oregon Economic Development Department that administers the program. The proceeds have also been used to finance large portions of the two other Oregon programs outlined in this report—the Oregon Marine Navigation Improvement Fund and the Oregon Port Planning and Marketing Fund Grant Program. The main focus of this program is to provide Oregon ports with the financial assistance they need to encourage economic

development. To accomplish this objective, both the guidelines for project selection and the funding limit have been flexible. At the present time, the limit for a single loan is $700,000. The Oregon Economic Development Commission makes decisions on which projects are to be funded.

Oregon Marine Navigation Improvement Fund

The Oregon Marine Navigation Improvement Fund provides state grants to finance the nonfederal portion of project costs that, in the past, were completely funded by the U.S. Corps of Engineers or other federal entities. The Ports Division of the Oregon Economic Development Department administers the program. Funding under this program is approved only for federally authorized studies, dredging, and construction of new navigation improvement projects. To date, the state has not required local matching because the purpose of the program is to provide assistance to those ports which would otherwise not be financially capable of undertaking development projects. Since 1991, ten projects totaling approximately $6.7 million have been funded or are projected to be funded.

Louisiana Port Construction and Development Priority Program

The Louisiana Port Construction and Development Priority Program was designed to create structure and guidance in the financing of the state's port programs. Prior to its creation, port projects were funded directly from the state's capital outlay program requiring feasibility studies or project evaluation. This program has established strict guidelines that require both compliance with the port's initial proposals, and fiscal auditing by the state during construction to ensure the proper use of state funds. Approximately $15 million per year in excess revenues from state taxes levied on gasoline, motor fuels, and other special fuels is made available to the program from the state's Transportation Trust Fund. An additional $5 million is available from fees and self-generated revenues for a total of $20 million in funding annually. This program focuses exclusively on infrastructure improvements. The Louisiana Department of Transportation and Development prioritizes the requests; however, the ultimate decision as to which projects will be funded is determined in the state legislature's Joint Legislative Committee on Transportation, Highways, and Public Works. Grants are made up to 90 of the project cost with the local port providing the remaining percentage in matching funds.

Florida Seaport Transportation and Economic Development Funding

The Florida Seaport Transportation and Economic Development Funding Program was created to finance port transportation or port facilities projects which will improve the movement and intermodal transportation of cargo or passengers in commerce and trade the state of Florida. The program was originally funded by an annual state contribution of $8 million from state gasoline, aviation fuel, license plate fees and other sources. In 1996, the dollar amount was increased to $15 million per year and authorization was granted to issue bonds and to use this yearly allocation as debt service for them. By issuing bonds, the state was able to leverage this annual amount into over $222 million in port financial assistance. The Florida Department of Transportation and the ports have developed a system under which a council submits annually to the legislature a five-year plan for port improvements. This program provides grants on a 50 percent state/50 percent local matching basis to ports for a variety of projects including infrastructure improvements, land acquisition, construction and rehabilitation, equipment purchase, and even those environmental projects that the state requires to be undertaken.

California Maritime Infrastructure Bank

The California Maritime Infrastructure Bank is a program that shows promise, but has not yet found a funding source. Its chartered purpose is to establish a funding mechanism for the financing and development of port infrastructure for participating ports or harbor districts. In theory, it will function much like a credit union for ports. Some of the Maritime Infrastructure Bank's potential tools for financing include long-term, low-interest loans and bonds. It is modeled after other California initiatives that have leveraged both public and private monies into a large pool of funds from which improvement funding may be disbursed. The program intends to promote further growth in international trade for the state of California. It is included in this report because it is the first statewide, maritime-specific public investment bank in the United States.

Port Planning and Marketing Case Studies

Florida Trade Data Center

The Florida Trade Data Center provides Florida's ports and business community access to a multitude of databases, reports, and research services that can enhance international trade and business opportunities. Established as a nonprofit private entity, the Trade Data Center receives state funding for the purpose of increasing the economic viability of Florida. In 1992, the state legislature set aside $1 million to fund the Trade Data Center. This state grant was matched with $1.4 million in private-sector financial contributions and the center opened in June of 1994. Designed to be eventually a self-sustaining information broker, the center sells mailing lists of overseas importers, distributors, and agents in a variety of industries to Florida exporters, growers, and seaports. It also stands ready to perform contracted market research on particular products and industries. Businesses can obtain information on the characteristics and tonnage breakdown of goods and products flowing through each port in the state. Many ports receive the data center's services free of charge because they contributed to the start-up costs of the center.

Oregon Port Planning and Marketing Fund Grant Program

The Oregon Port Planning and Marketing Fund Grant Program was designed to provide financial assistance to Oregon ports in order to allow them to perform the studies which are required to apply for several federal aid programs. Between 1985 and 1997, the Port Planning and Marketing Fund Grant Program awarded a total of $1,326,465 to 22 of Oregon's 23 ports. Each grant is limited to $25,000 or 75 percent or the total cost of the project (whichever is the lesser amount). The local port authority is responsible for providing the remaining 25 percent of project costs. The program awards an average of $160,000 per year in grants to support approximately ten projects. Of the grants allocated by the fund, 33 percent go to formulating strategic business plans, 60 percent to facility plans, and seven percent to marketing plans.

Appendix 5: State and Selected Port Rankings by Total Tonnage 1996 - 1998

CY 1996 Waterborne Tonnage by State (In Units of 1000 Tons)						
Sorted by Tons						
STATE	GRAND	SHIPPING TO:		RECEIVING FROM:		INTRA
	TOTALS	DOMES	FOREIGN	DOMESTIC	FOREIGN	STATE
Louisiana	494,249	99,374	114,616	133,560	104,692	42,007
Texas	385,585	48,533	53,765	23,943	209,355	49,988
California	181,165	6,779	46,925	52,100	48,075	27,285
Ohio	123,459	24,247	13,535	61,193	5,762	18,722
Florida	117,430	13,718	18,337	58,352	23,056	3,968
Washington	116,931	12,772	43,110	30,176	15,654	15,219
Illinois	113,938	79,335	825	18,653	3,540	11,584
Pennsylvania	108,162	14,607	967	39,013	35,734	17,840
New Jersey	98,985	25,845	5,962	26,594	36,243	4,342
Alaska	96,015	77,105	10,231	3,165	860	4,654
New York	95,213	19,648	3,798	21,671	33,979	16,116
Virginia	85,894	12,314	50,604	4,164	10,897	7,914
West Virginia	82,925	53,483	0	16,335	0	13,107
Kentucky	81,605	44,607	0	24,043	0	12,955
Indiana	80,341	21,581	555	52,342	2,663	3,200
Michigan	80,309	27,474	6,229	23,392	7,984	15,230
Alabama	73,932	10,496	12,368	19,673	13,135	18,261
Other	59,565	8,047	0	9,274	42,096	148
Minnesota	52,195	37,970	5,451	5,957	1,000	1,816
Maryland	47,885	5,184	15,259	9,181	14,313	3,948
Mississippi	46,177	13,619	3,626	9,147	18,749	1,035
Tennessee	43,963	7,592	0	32,878	0	3,493
Virgin Islands	42,464	19,402	1,120	2,892	18,613	436
Wisconsin	37,966	24,279	4,895	6,683	1,765	343
Oregon	36,742	3,506	16,541	7,634	3,204	5,859
Puerto Rico	29,958	2,176	1,464	7,813	13,524	4,981
Missouri	28,822	13,474	0	7,515	0	7,834
Massachusetts	25,960	1,130	686	9,406	12,432	2,307
Delaware	25,799	13,765	526	1,502	7,502	2,504
Hawaii	21,250	1,250	950	6,128	6,289	6,632
Georgia	19,979	759	7,935	2,747	8,340	197
Connecticut	18,324	1,516	177	12,591	2,547	1,493
Maine	18,323	74	337	2,749	14,935	227
South Carolina	16,345	257	5,892	4,103	5,994	100
Iowa	14,713	10,265	0	3,713	0	735
North Carolina	13,983	409	3,561	3,274	3,611	3,127
Arkansas	13,695	5,948	0	5,092	0	2,655
Rhode Island	8,250	232	418	4,128	3,400	72
New Hampshire	3,709	65	128	859	2,650	7
Oklahoma	3,376	2,042	0	1,296	0	38
Trans-Shipment	2,359	1,101	0	1,258	0	0
Idaho	1,346	763	0	12	0	572
District of Columbia	747	0	0	747	0	0
Kansas	744	670	0	74	0	0
Nebraska	449	262	0	178	0	9
Guam	437	26	0	410	0	0
Pacific Islands	116	12	0	105	0	0
Vermont	0	0	0	0	0	0
TOTALS	2,284,063	767,715	450,794	767,715	732,592	332,962
	Total					INTRASTATI
	Excluding					
	Duplication					
This document was last revised 20 January 1998						

CY 1997 Waterborne Tonnage by State (In Units of 1000 Tons)						
Sorted by Tons						
		Shipping To:		Receiving From:		
State	Total*	Domestic	Foreign	Domestic	Foreign	Intrastate
Total	**2,333,142**	**782,250**	**432,313**	**782,250**	**788,303**	**330,277**
Louisiana	492,952	104,634	104,483	131,692	110,682	41,461
Texas	422,592	47,405	54,604	22,682	246,057	51,845
California	171,806	6,368	43,089	48,132	54,178	20,040
Ohio	134,244	30,365	15,821	61,474	6,407	20,178
Florida	124,456	14,152	19,513	61,541	25,609	3,640
Pennsylvania	119,151	17,450	844	38,306	42,121	20,430
Washington	117,799	12,403	40,261	32,448	15,919	16,768
Illinois	109,346	76,696	592	19,312	3,271	9,474
New York	103,479	21,593	3,254	23,250	39,907	15,474
New Jersey	97,939	29,817	6,426	26,864	30,364	4,469
Alaska	94,383	72,131	11,234	2,896	929	7,194
Kentucky	87,292	47,681	-	27,077	-	12,535
Michigan	82,865	29,240	5,569	23,798	8,230	16,029
Indiana	82,074	20,892	252	54,983	2,305	3,642
West Virginia	79,472	49,806	-	16,678	-	12,988
Virginia	77,683	12,326	43,697	5,105	9,703	6,852
Alabama	71,551	9,991	11,691	19,651	13,169	17,049
Minnesota	55,264	39,508	5,755	7,067	848	2,087
Maryland	49,807	6,037	15,092	9,217	15,047	4,413
Mississippi	49,775	13,993	4,097	10,857	19,607	1,221
Other	47,523	8,513	-	8,400	30,609	1
Tennessee	47,472	7,649	-	36,399	-	3,424
Virgin Islands	45,303	18,217	1,384	1,723	23,491	488
Wisconsin	38,530	23,810	5,137	7,553	1,742	288
Oregon	36,696	3,659	15,946	7,799	3,529	5,764
Missouri	31,459	15,694	-	7,738	-	8,027
Puerto Rico	28,200	2,242	1,288	8,250	13,188	3,232
Massachusetts	27,460	1,437	684	10,188	12,780	2,372
Delaware	24,299	14,239	557	1,313	5,065	3,125
Hawaii	21,348	954	1,019	5,278	7,345	6,751
Georgia	20,991	889	8,301	2,678	8,914	210
Maine	19,999	10	317	2,671	16,761	240
Connecticut	19,741	1,413	225	13,426	3,112	1,564
South Carolina	19,512	325	7,260	4,407	7,427	93
Iowa	13,598	9,076	-	3,816	-	706
North Carolina	13,540	296	3,447	3,304	3,655	2,838
Arkansas	13,404	5,735	-	4,943	-	2,726
Rhode Island	9,457	461	415	5,053	3,471	56
Oklahoma	4,014	2,298	-	1,685	-	31
New Hampshire	3,954	39	59	990	2,862	3
Idaho	1,647	1,011	-	90	-	546
Trans-Shipment	1,467	1,292	-	175	-	-
District of Columbia	706	-	-	706	-	-
Guam	427	29	-	398	-	-
Nebraska	348	230	-	113	-	-
Kansas	307	242	-	65	-	-
Pacific Islands	60	2	-	58	-	-
Vermont	-	-	-	-	-	-
* Excludes duplication.						
** Ports and offshore anchorages where cargo is moved from one vessel to another. These are St. Lucia, Virgin Islands, Heald Bank off LA-TX coast, Cherique Grande, Panama, Puerto Amuelles, Panama and Hondo Platform-Pacific Ocean.						
This document was last revised 01/10/2000						

CY 1998 Water borne Tonnage by State (In Units of 1000 Tons)						
Sorted by Tons						
		Shipping To:		Receiving From:		
State	Total*	Domestic	Foreign	Domestic	Foreign	Intrastate
TOTALS	2,339,500	768,945	404,708	768,945	840,680	325,167
Louisiana	492,743	107,976	100,087	126,311	115,361	43,009
Texas	427,296	46,761	56,837	20,002	250,376	53,320
California	170,197	6,129	39,491	38,374	70,157	16,045
Ohio	136,176	26,361	18,165	65,417	7,212	19,021
Florida	133,763	14,952	19,450	64,989	29,621	4,752
Pennsylvania	127,086	18,569	1,104	39,435	46,813	21,164
Illinois	114,067	80,200	540	20,338	4,677	8,311
New York	107,858	22,032	3,106	22,413	43,034	17,272
Washington	102,466	12,925	28,881	28,600	17,643	14,417
New Jersey	95,625	28,300	5,555	25,110	31,798	4,863
Kentucky	89,605	51,587	-	27,258	-	10,760
Michigan	84,603	28,788	6,128	23,066	9,283	17,339
Alaska	79,629	60,585	9,352	2,765	901	6,027
Indiana	77,560	19,344	271	53,952	358	3,636
Virginia	76,998	12,196	42,560	4,975	11,013	6,254
West Virginia	76,275	47,080	-	16,148	-	13,047
Alabama	73,222	10,154	10,003	20,825	15,133	17,108
Minnesota	55,014	39,984	5,135	6,999	760	2,135
Other	52,871	8,480	-	8,582	35,579	231
Tennessee	47,180	6,626	-	36,464	-	4,090
Maryland	46,043	5,745	10,521	9,215	16,229	4,333
Mississippi	44,992	11,997	3,235	11,621	17,008	1,131
Virgin Islands	44,523	19,573	662	237	23,575	476
Wisconsin	40,499	24,404	6,457	7,620	1,580	438
Oregon	36,292	2,776	16,323	8,360	4,286	4,547
Missouri	31,703	15,198	-	8,131	-	8,374
Puerto Rico	29,157	2,191	1,092	9,101	13,485	3,288
Massachusetts	28,004	1,086	713	11,288	12,771	2,146
Delaware	25,530	14,420	615	1,919	7,291	1,285
Hawaii	20,644	682	804	5,941	6,341	6,875
South Carolina	20,612	346	6,482	5,015	8,671	97
Georgia	20,488	785	7,254	2,569	9,658	221
Connecticut	18,809	1,002	114	12,216	3,934	1,542
Maine	18,451	44	307	2,784	15,246	69
Iowa	14,404	9,180	-	4,122	-	1,102
North Carolina	13,708	205	3,368	2,988	3,917	3,229
Arkansas	13,448	5,559	-	5,329	-	2,560
Rhode Island	8,141	158	50	4,324	3,597	12
Oklahoma	4,454	2,365	-	2,071	-	18
New Hampshire	4,194	1	42	781	3,370	-
Idaho	1,993	1,351	-	17	-	625
District of Columbia	607	-	-	607	-	-
Guam	410	35	-	375	-	-
Kansas	368	303	-	64	-	-
Nebraska	345	213	-	132	-	-
Trans-Ship**	332	260	-	72	-	-
Pacific Islands	61	36	-	25	-	-
Vermont	-	-	-	-	-	-
* Excludes duplication.						
** Ports and offshore anchorages where cargo is moved from one vessel to another. These are St. Lucia, Virgin Islands, Heald Bank off LA-TX coast, Cherique Grande, Panama, Puerto Amuelles, Panama and Hondo Platform-Pacific Ocean.						
This document was last revised 01/1 0/00						

Tonnage for Selected U.S. Ports in 1996 Ranked by Total Tons						
Sorted by Tons						
Rank	Port Name	Total	Foreign	Imports	Exports	Domestic
1	Port of South Louisiana, LA	189,814,564	83,769,483	25,172,134	58,597,349	106,045,081
2	Houston, TX	148,182,876	87,058,288	58,041,465	29,016,823	61,124,588
3	New York, NY and NJ	131,601,244	56,485,614	48,472,360	8,013,254	75,115,630
4	New Orleans, LA	83,726,470	46,912,501	20,840,444	26,072,057	36,813,969
5	Baton Rouge, LA	81,009,253	35,786,563	24,803,274	10,983,289	45,222,690
6	Corpus Christi, TX	80,460,088	56,618,145	49,158,007	7,460,138	23,841,943
7	Valdez, AK	77,116,459	2,154,315	28,006	2,126,309	74,962,144
8	Port of Plaquemines, LA	66,910,237	20,689,130	6,394,967	14,294,163	46,221,107
9	Long Beach, CA	58,395,243	36,027,801	17,586,084	18,441,717	22,367,442
10	Texas City, TX	56,393,758	35,331,019	32,895,245	2,435,774	21,062,739
11	Pittsburgh, PA	50,874,367	-	-	-	50,874,367
12	Mobile, AL	50,863,944	25,495,470	13,133,946	12,361,524	25,368,474
13	Tampa, FL	49,292,651	16,837,566	6,503,848	10,333,718	32,455,085
14	Norfolk Harbor, VA	49,260,972	38,887,811	5,831,442	33,056,369	10,373,161
15	Lake Charles, LA	49,096,325	29,350,839	24,779,328	4,571,511	19,745,486
16	Los Angeles, CA	45,689,232	27,758,490	14,303,313	13,455,177	17,930,742
17	Baltimore, MD	43,552,356	29,557,103	14,297,979	15,259,124	13,995,253
18	Philadelphia, PA	41,882,200	28,866,925	28,221,332	645,593	13,015,275
19	Duluth-Superior, MN and WI	41,398,293	11,151,163	1,087,294	10,063,869	30,247,130
20	Port Arthur, TX	37,157,786	30,658,294	26,945,691	3,712,603	6,499,492
21	Beaumont, TX	35,705,109	18,819,234	15,806,368	3,012,866	16,885,875
22	St. Louis, MO and IL	30,161,905	-	-	-	30,161,905
23	Portland, OR	29,733,913	16,548,355	3,058,501	13,489,854	13,185,558
24	Pascagoula, MS	29,342,671	20,292,753	17,450,158	2,842,595	9,049,918
25	Chicago, IL	27,886,169	4,365,807	3,540,314	825,493	23,520,362
26	Huntington, WV	27,478,215	-	-	-	27,478,215
27	Paulsboro, NJ	25,038,524	14,915,599	14,610,448	305,151	10,122,925
28	Newport News, VA	24,787,261	18,637,855	1,904,438	16,733,417	6,149,406
29	Freeport, TX	24,570,954	19,198,104	17,474,251	1,723,853	5,372,850
30	Seattle, WA	23,546,789	17,017,012	6,876,446	10,140,566	6,529,777
31	Richmond, CA	21,802,748	5,367,424	3,344,985	2,022,439	16,435,324
32	Tacoma, WA	21,490,783	14,235,966	4,087,540	10,148,426	7,254,817
33	Boston, MA	20,103,978	10,689,422	10,035,099	654,323	9,414,556
34	Port Everglades,FL	18,896,571	7,542,792	5,884,738	1,658,054	11,353,779
35	Detroit, MI	18,603,745	6,293,640	5,646,698	646,942	12,310,105
36	Savannah, GA	17,598,389	14,397,088	7,296,269	7,100,819	3,201,301
37	Memphis, TN	17,299,836	-	-	-	17,299,836
38	Indiana Harbor, IN	16,892,858	807,145	645,409	161,736	16,085,713
39	Jacksonville, FL	16,736,773	7,471,907	5,970,161	1,501,746	9,264,866
40	Cleveland, OH	16,720,837	3,977,549	3,367,610	609,939	12,743,288
41	Lorain, OH	15,977,949	121,947	121,947	-	15,856,002
42	Portland, ME	15,242,802	13,369,237	13,289,315	79,922	1,873,565
43	San Juan, PR	15,112,223	4,788,159	3,991,274	796,885	10,324,064
44	Anacortes, WA	13,843,669	2,014,037	547,053	1,466,984	11,829,632

45	Toledo, OH	13,031,631	5,994,167	1,459,893	4,534,274	7,037,464
46	Cincinnati, OH	12,803,247	-	-	-	12,803,247
47	Marcus Hook, PA	12,365,946	5,165,837	5,125,343	40,494	7,200,109
48	Honolulu, HI	12,010,003	1,659,833	1,470,971	188,862	10,350,170
49	Galveston, TX	11,640,754	7,659,777	2,726,346	4,933,431	3,980,977
50	Oakland, CA	11,229,862	8,649,532	2,948,029	5,701,503	2,580,330
51	Charleston, SC	11,082,558	6,823,960	3,253,047	3,570,913	4,258,598
52	Two Harbors, MN	10,661,655	-	-	-	10,661,655
53	Burns Waterway Harbor, IN	9,847,873	2,361,217	1,967,706	393,511	7,486,656
54	Ashtabula, OH	9,523,147	3,806,599	592,865	3,213,734	5,716,548
55	New Castle, DE	9,377,080	4,288,651	4,233,769	54,882	5,088,429
56	Escanaba, MI	9,253,402	70,840	-	70,840	9,182,562
57	Matagorda Ship Channel, TX	9,151,450	6,548,011	5,722,175	825,836	2,603,439
58	Presque Isle, MI	8,958,976	1,261,385	66,652	1,194,733	7,697,591
59	Gary, IN	8,882,164	50,021	50,021	-	8,832,143
60	New Haven, CT	8,838,093	2,006,101	1,846,490	159,611	6,831,992
61	Louisville, KY	8,779,342	-	-	-	8,779,342
62	Barbers Point, Oahu, HI	8,745,039	5,304,468	4,545,080	759,388	3,440,571
63	Calcite, MI	8,669,387	1,778,174	7,896	1,770,278	6,891,213
64	Taconite, MN	8,408,145	-	-	-	8,408,145
65	Kalama, WA	8,222,919	7,225,597	17,211	7,208,386	997,322
66	Stoneport, MI	7,989,550	838,620	37,959	800,661	7,150,930
67	Providence, RI	7,802,779	3,608,791	3,193,689	415,102	4,193,988
68	Vancouver, WA	7,703,713	5,719,911	844,785	4,875,126	1,983,802
69	Wilmington, NC	7,581,853	4,063,779	2,876,506	1,187,273	3,518,074
70	Mount Vernon, IN	6,985,531	-	-	-	6,985,531
71	Albany, NY	5,767,708	1,265,364	812,769	452,595	4,502,344
72	Camden-Gloucester, NJ	5,765,260	3,304,474	2,788,871	515,603	2,460,786
73	Miami, FL	5,719,107	4,656,607	2,153,209	2,503,398	1,062,500
74	Conneaut, OH	5,714,402	2,260,877	86,280	2,174,597	3,453,525
75	Morehead City, NC	5,540,766	3,108,865	734,975	2,373,890	2,431,901
76	St. Clair, MI	5,426,565	-	-	-	5,426,565
77	Silver Bay, MN	5,240,398	-	-	-	5,240,398
78	Longview, WA	5,162,634	4,297,973	495,498	3,802,475	864,661
79	Port Inland, MI	5,062,723	459,193	31,215	427,978	4,603,530
80	Nikishka, AK	5,049,883	1,549,999	-	1,549,999	3,499,884
81	Bridgeport, CT	4,862,015	649,763	632,980	16,783	4,212,252
82	St. Paul, MN	4,755,765	-	-	-	4,755,765
83	Vicksburg, MS	4,728,437	-	-	-	4,728,437
84	Victoria, TX	4,351,045	-	-	-	4,351,045
85	Wilmington, DE	4,323,864	3,165,016	2,693,467	471,549	1,158,848
86	Marine City, MI	4,116,212	-	-	-	4,116,212
87	Everett, WA	4,007,238	1,204,825	594,527	610,298	2,802,413
88	Nashville, TN	3,777,854	-	-	-	3,777,854
89	Portsmouth, NH	3,708,169	2,777,478	2,649,738	127,740	930,691
90	Port Canaveral, FL	3,566,630	1,951,214	1,510,143	441,071	1,615,416
91	Sandusky, OH	3,408,357	2,613,171	17,641	2,595,530	795,186

92	Anchorage, AK	3,400,568	1,136,032	297,897	838,135	2,264,536
93	Coos Bay, OR	3,322,218	2,935,381	68,713	2,866,668	386,837
94	Port Dolomite, MI	3,318,441	159,844	-	159,844	3,158,597
95	Fall River, MA	3,180,225	1,047,104	1,044,153	2,951	2,133,121
96	Panama City, FL	3,123,941	594,907	141,462	453,445	2,529,034
97	Kansas City, MO	3,009,981	-	-	-	3,009,981
98	Port Jefferson, NY	2,988,115	130,694	130,694	-	2,857,421
99	Milwaukee, WI	2,858,231	1,433,037	1,168,619	264,418	1,425,194
100	Kahului, Maui, HI	2,827,806	76,193	76,193	-	2,751,613
101	Marblehead, OH	2,816,540	203,004	-	203,004	2,613,536
102	Port Angeles, WA	2,780,081	882,329	216,033	666,296	1,897,752
103	Fairport Harbor, OH	2,770,276	306,610	105,791	200,819	2,463,666
104	Chattanooga, TN	2,717,613	-	-	-	2,717,613
105	Guntersville, AL	2,597,760	-	-	-	2,597,760
106	Greenville, MS	2,543,382	-	-	-	2,543,382
107	Chester, PA	2,402,491	2,008,128	1,810,586	197,542	394,363
108	Brownsville, TX	2,401,280	1,228,807	585,472	643,335	1,172,473
109	Alpena, MI	2,345,044	181,585	47,885	133,700	2,163,459
110	Palm Beach, FL	2,293,615	813,328	265,314	548,014	1,480,287
111	Helena, AR	2,285,638	-	-	-	2,285,638
112	Biloxi, MS	2,266,417	-	-	-	2,266,417
113	Green Bay, WI	2,176,192	442,101	428,827	13,274	1,734,091
114	Muskegon, MI	2,172,075	504,177	364,681	139,496	1,667,898
115	Gulfport, MS	2,123,671	1,999,266	1,252,114	747,152	124,405
116	Brunswick, GA	2,063,388	1,878,515	1,044,121	834,394	184,873
117	Grays Harbor, WA	1,990,077	1,634,465	85,947	1,548,518	355,612
118	San Francisco, CA	1,982,145	1,416,928	345,640	1,071,288	565,217
119	Tulsa, Port of Catoosa, OK	1,909,574	-	-	-	1,909,574
120	Olympia, WA	1,893,029	160,780	21	160,759	1,732,249
121	Buffalo, NY	1,864,256	1,140,541	834,191	306,350	723,715
122	San Diego, CA	1,842,040	1,001,888	305,361	696,527	840,152
123	Monroe, MI	1,794,335	30,176	5,626	24,550	1,764,159
124	Drummond Island, MI	1,681,900	301,068	6,062	295,006	1,380,832
125	Charlevoix, MI	1,665,865	64,205	-	64,205	1,601,660
126	Marquette, MI	1,598,125	-	-	-	1,598,125
127	Minneapolis, MN	1,567,477	-	-	-	1,567,477
128	Richmond, VA	1,499,218	563,494	296,248	267,246	935,724
129	Hilo, HI	1,441,507	85,004	83,729	1,275	1,356,503
130	Erie, PA	1,433,725	266,054	266,054	-	1,167,671
131	Searsport, ME	1,432,945	988,956	960,635	28,321	443,989
132	Salem, MA	1,431,771	928,259	928,063	196	503,512
133	Bellingham, WA	1,419,257	1,023,795	668,343	355,452	395,462
134	Hopewell, VA	1,394,904	516,266	3,654	512,612	878,638
135	Georgetown, SC	1,379,408	1,223,047	1,154,038	69,009	156,361
136	Pensacola, FL	1,378,971	127,632	37,330	90,302	1,251,339
137	Ketchikan, AK	1,340,609	227,745	60,641	167,104	1,112,864
138	Hempstead, NY	1,329,385	-	-	-	1,329,385
139	Weedon Island, FL	1,300,587	-	-	-	1,300,587
140	Buffington, IN	1,242,522	-	-	-	1,242,522

141	Sacramento, CA	1,239,858	1,032,004	133,638	898,366	207,854
142	Ludington, MI	1,236,834	143,869	94,400	49,469	1,092,965
143	Nawiliwili, Kauai, HI	1,203,276	6,517	6,517	-	1,196,759
144	Humboldt, CA	1,196,796	579,705	19,554	560,151	617,091
145	Stockton, CA	1,142,608	946,946	521,142	425,804	195,662
146	Marysville, MI	1,067,783	281,942	122,440	159,502	785,841
147	Stamford, CT	1,036,791	-	-	-	1,036,791
148	Bucksport, ME	1,029,135	690,829	668,789	22,040	338,306
149	Huron, OH	1,003,830	13,485	10,178	3,307	990,345
150	Redwood City, CA	985,392	513,392	227,175	286,217	472,000
This document was last revised 13 February 1998						

Tonnage for Selected U.S. Ports in 1997 Ranked by Total Tons						
Sorted by Tons						
Rank	Port Name	Total	Foreign	Imports	Exports	Domestic
1	Port of South Louisiana, LA	183,628,353	76,782,064	26,414,598	50,367,466	106,846,289
2	Houston, TX	165,456,278	102,846,554	72,640,589	30,205,965	62,609,724
3	New York, NY and NJ	135,266,431	56,713,855	48,122,399	8,591,456	78,552,576
4	New Orleans, LA	89,441,772	52,438,422	23,924,557	28,513,865	37,003,350
5	Corpus Christi, TX	86,843,760	62,218,692	54,215,016	8,003,676	24,625,068
6	Baton Rouge, LA	84,023,102	38,406,994	28,575,663	9,831,331	45,616,108
7	Valdez, AK	73,647,151	3,540,109	36,761	3,503,348	70,107,042
8	Port of Plaquemines, LA	63,607,222	16,648,172	5,495,185	11,152,987	46,959,050
9	Long Beach, CA	57,255,301	38,356,545	21,175,723	17,180,822	18,898,756
10	Texas City, TX	56,645,675	37,430,678	35,061,311	2,369,367	19,214,997
11	Tampa, FL	55,333,607	18,603,685	7,255,497	11,348,188	36,729,922
12	Pittsburgh, PA	51,662,378	-	-	-	51,662,378
13	Lake Charles, LA	51,278,579	29,710,037	25,190,443	4,519,594	21,568,542
14	Mobile, AL	49,120,007	24,844,100	13,169,050	11,675,050	24,275,907
15	Beaumont, TX	48,665,380	33,626,741	28,234,027	5,392,714	15,038,639
16	Norfolk Harbor, VA	46,322,012	35,417,051	5,933,603	29,483,448	10,904,961
17	Philadelphia, PA	44,967,869	29,957,511	29,490,353	467,158	15,010,358
18	Duluth-Superior, MN and WI	41,928,885	10,774,747	847,587	9,927,160	31,154,138
19	Los Angeles, CA	41,774,252	28,579,542	16,201,305	12,378,237	13,194,710
20	Baltimore, MD	40,028,849	25,222,074	14,971,414	10,250,660	14,806,775
21	Port Arthur, TX	37,318,229	29,728,939	26,946,644	2,782,295	7,589,290
22	St. Louis, MO and IL	31,287,584	-	-	-	31,287,584
23	Pascagoula, MS	31,270,055	21,249,144	18,081,418	3,167,726	10,020,911
24	Portland, OR	29,560,776	16,538,732	3,370,151	13,168,581	13,022,044
25	Seattle, WA	26,564,230	18,650,546	7,848,268	10,802,278	7,913,684
26	Freeport, TX	26,280,731	21,140,066	19,172,508	1,967,558	5,140,665
27	Huntington, WV	25,175,459	-	-	-	25,175,459
28	Chicago, IL	24,867,996	3,862,968	3,271,231	591,737	21,005,028
29	Paulsboro, NJ	24,391,944	13,696,249	13,516,240	180,009	10,695,695
30	Richmond, CA	21,705,683	5,220,841	3,446,500	1,774,341	16,484,842
31	Marcus Hook, PA	21,520,244	11,567,652	11,394,793	172,859	9,952,592
32	Boston, MA	20,892,983	10,989,456	10,317,904	671,552	9,903,527
33	Newport News, VA	20,755,282	14,645,859	1,378,593	13,267,266	6,109,423
34	Tacoma, WA	20,683,326	13,079,680	4,202,695	8,876,985	7,603,646
35	Port Everglades, FL	19,924,784	7,965,562	6,126,585	1,838,977	11,959,222
36	Jacksonville, FL	18,186,104	8,890,487	7,398,244	1,492,243	9,295,617
37	Detroit, MI	18,135,326	6,114,276	5,614,244	500,032	12,021,050
38	Cleveland, OH	18,113,321	3,339,500	3,165,069	174,431	14,773,821
39	Memphis, TN	18,015,173	-	-	-	18,015,173
40	Savannah, GA	17,929,269	14,701,939	7,386,671	7,315,268	3,227,330
41	Charleston, SC	17,874,161	13,123,246	5,939,086	7,184,160	4,750,915
42	Indiana Harbor, IN	16,523,799	516,774	457,414	59,360	16,007,025
43	Portland, ME	16,333,742	14,648,885	14,575,783	73,102	1,684,857

44	Lorain, OH	15,954,569	540,980	540,980	-	15,413,589
45	Toledo, OH	14,421,587	6,912,550	1,839,616	5,072,934	7,509,037
46	San Juan, PR	14,067,151	4,939,606	4,316,317	623,289	9,127,545
47	Anacortes, WA	13,903,514	1,719,226	672,316	1,046,910	12,184,288
48	Two Harbors, MN	13,507,844	70,116	-	70,116	13,437,728
49	Cincinnati, OH	12,878,606	-	-	-	12,878,606
50	Honolulu, HI	12,703,903	3,037,476	2,890,906	146,570	9,666,427
51	Ashtabula, OH	11,928,900	6,288,294	710,453	5,577,841	5,640,606
52	Presque Isle, MI	11,200,514	1,235,191	7,805	1,227,386	9,965,323
53	Oakland, CA	10,857,892	8,530,951	3,089,563	5,441,388	2,326,941
54	Gary, IN	10,417,015	256,854	129,755	127,099	10,160,161
55	Burns Waterway Harbor, IN	10,414,413	1,783,423	1,717,402	66,021	8,630,990
56	Galveston, TX	10,126,322	6,105,617	3,184,405	2,921,212	4,020,705
57	Calcite, MI	10,036,159	2,149,867	149,216	2,000,651	7,886,292
58	New Haven, CT	9,593,835	2,261,549	2,053,454	208,095	7,332,286
59	Matagorda Ship Channel, TX	9,428,731	6,670,465	5,938,788	731,677	2,758,266
60	Louisville, KY	9,043,176	-	-	-	9,043,176
61	Providence, RI	8,813,884	3,634,263	3,278,953	355,310	5,179,621
62	Taconite, MN	8,606,953	-	-	-	8,606,953
63	Kalama, WA	8,300,698	7,276,119	58,077	7,218,042	1,024,579
64	Barbers Point, Oahu, HI	8,161,884	5,131,901	4,259,366	872,535	3,029,983
65	Stoneport, MI	8,100,939	307,542	5,512	302,030	7,793,397
66	Vancouver, WA	7,838,282	5,222,049	770,283	4,451,766	2,616,233
67	New Castle, DE	7,469,503	1,485,608	1,457,593	28,015	5,983,895
68	Wilmington, NC	7,441,358	3,889,449	2,744,548	1,144,901	3,551,909
69	Escanaba, MI	7,260,911	-	-	-	7,260,911
70	Albany, NY	6,818,912	1,324,301	1,252,443	71,858	5,494,611
71	Miami, FL	6,612,206	5,323,417	2,787,669	2,535,748	1,288,789
72	Nikishka, AK	6,608,630	1,982,725	145,154	1,837,571	4,625,905
73	Camden-Gloucester, NJ	6,570,495	4,197,577	3,481,435	716,142	2,372,918
74	Conneaut, OH	6,205,402	2,000,180	59,229	1,940,951	4,205,222
75	Mount Vernon, IN	5,863,403	-	-	-	5,863,403
76	St. Clair, MI	5,699,364	-	-	-	5,699,364
77	Vicksburg, MS	5,627,234	-	-	-	5,627,234
78	Longview, WA	5,539,857	4,433,363	408,985	4,024,378	1,106,494
79	Silver Bay, MN	5,488,727	698,364	-	698,364	4,790,363
80	Bridgeport, CT	5,340,257	936,449	919,498	16,951	4,403,808
81	Port Inland, MI	5,304,842	404,973	30,281	374,692	4,899,869
82	Morehead City, NC	5,200,583	3,212,517	910,112	2,302,405	1,988,066
83	Victoria, TX	4,999,658	-	-	-	4,999,658
84	St. Paul, MN	4,866,033	-	-	-	4,866,033
85	Sandusky, OH	4,403,328	2,549,123	4,964	2,544,159	1,854,205
86	Wilmington, DE	4,400,881	3,287,179	2,815,426	471,753	1,113,702
87	Marine City, MI	4,000,903	-	-	-	4,000,903
88	Port Dolomite, MI	3,991,727	251,232	-	251,232	3,740,495
89	Portsmouth, NH	3,953,875	2,921,233	2,862,022	59,211	1,032,642
90	Nashville, TN	3,904,419	-	-	-	3,904,419

91	Everett, WA	3,639,638	1,035,190	569,444	465,746	2,604,448
92	Marblehead, OH	3,619,300	206,345	-	206,345	3,412,955
93	Anchorage, AK	3,424,079	1,045,489	410,581	634,908	2,378,590
94	Kansas City, MO	3,417,348	-	-	-	3,417,348
95	Fall River, MA	3,393,547	941,689	933,337	8,352	2,451,858
96	Fairport Harbor, OH	3,296,405	383,709	79,610	304,099	2,912,696
97	Milwaukee, WI	3,265,042	1,525,604	1,344,722	180,882	1,739,438
98	Coos Bay, OR	3,163,720	2,780,773	82,196	2,698,577	382,947
99	Port Canaveral, FL	3,146,996	1,865,660	1,310,592	555,068	1,281,336
100	Port Manatee, FL	3,107,582	898,669	591,231	307,438	2,208,913
101	Chattanooga, TN	3,031,139	-	-	-	3,031,139
102	Palm Beach, FL	2,921,709	1,089,357	402,455	686,902	1,832,352
103	Alpena, MI	2,901,331	261,069	74,610	186,459	2,640,262
104	Kahului, Maui, HI	2,894,803	28,587	28,587	-	2,866,216
105	Panama City, FL	2,878,245	683,011	166,384	516,627	2,195,234
106	Greenville, MS	2,808,368	-	-	-	2,808,368
107	Port Jefferson, NY	2,792,591	90,480	90,480	-	2,702,111
108	Guntersville, AL	2,764,521	-	-	-	2,764,521
109	Monroe, MI	2,749,560	12,494	12,494	-	2,737,066
110	Brunswick, GA	2,697,924	2,512,741	1,526,934	985,807	185,183
111	Biloxi, MS	2,521,187	-	-	-	2,521,187
112	Gulfport, MS	2,448,429	2,366,223	1,493,183	873,040	82,206
113	Port Angeles, WA	2,377,086	653,505	141,750	511,755	1,723,581
114	Brownsville, TX	2,284,248	891,735	662,539	229,196	1,392,513
115	Green Bay, WI	2,129,681	238,857	223,226	15,631	1,890,824
116	Tulsa, Port of Catoosa, OK	2,107,393	-	-	-	2,107,393
117	Muskegon, MI	2,061,110	290,370	290,370	-	1,770,740
118	Olympia, WA	1,996,607	131,573	5,449	126,124	1,865,034
119	Buffalo, NY	1,894,025	823,215	771,115	52,100	1,070,810
120	Helena, AR	1,810,133	-	-	-	1,810,133
121	San Diego, CA	1,724,493	787,589	417,913	369,676	936,904
122	Pensacola, FL	1,674,188	205,033	51,437	153,596	1,469,155
123	Stockton, CA	1,647,036	1,463,517	683,079	780,438	183,519
124	Klawock, AK	1,636,816	123,000	-	123,000	1,513,816
125	Minneapolis, MN	1,619,328	-	-	-	1,619,328
126	Salem, MA	1,599,442	732,107	731,900	207	867,335
127	Drummond Island, MI	1,559,995	267,613	-	267,613	1,292,382
128	Bellingham, WA	1,555,242	1,049,981	690,807	359,174	505,261
129	Searsport, ME	1,537,484	1,256,920	1,223,564	33,356	280,564
130	Georgetown, SC	1,535,040	1,464,829	1,412,793	52,036	70,211
131	Charlevoix, MI	1,528,883	75,708	-	75,708	1,453,175
132	Buffington, IN	1,499,961	-	-	-	1,499,961
133	Hilo, HI	1,489,206	79,138	79,138	-	1,410,068
134	Grays Harbor, WA	1,485,991	1,189,976	131	1,189,845	296,015
135	Weedon Island, FL	1,455,343	-	-	-	1,455,343
136	Hopewell, VA	1,362,311	522,462	48,285	474,177	839,849
137	Hempstead, NY	1,293,850	-	-	-	1,293,850
138	Redwood City, CA	1,293,426	696,678	346,654	350,024	596,748

139	Ketchikan, AK	1,241,301	333,357	11,809	321,548	907,944
140	Humboldt, CA	1,175,109	646,929	4,508	642,421	528,180
141	Kelleys Island, OH	1,170,252	-	-	-	1,170,252
142	Erie, PA	1,162,953	94,886	91,930	2,956	1,068,067
143	Bucksport, ME	1,152,571	776,823	776,823	-	375,748
144	Penn Manor, PA	1,150,602	1,020,686	987,831	32,855	129,916
145	Sacramento, CA	1,143,083	1,007,609	232,964	774,645	135,474
146	Marysville, MI	1,142,100	267,239	248,339	18,900	874,861
147	Trenton, NJ	1,124,266	-	-	-	1,124,266
148	Richmond, VA	1,121,156	515,267	239,219	276,048	605,889
149	Nawiliwili, Kauai, HI	1,090,722	-	-	-	1,090,722
150	Charlotte, FL	1,066,881	-	-	-	1,066,881
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This document was last revised 10 January 2000						

Tonnage for Selected U.S. Ports in 1998 Ranked by Total Tons						
Sorted by Tons						
Rank	Port Name	Total	Domestic	Foreign	Imports	Exports
1	Port of South Louisiana, LA	196,645,563	108,624,243	88,021,320	30,602,117	57,419,203
2	Houston, TX	169,070,334	60,520,562	108,549,772	75,118,513	33,431,259
3	New York, NY and NJ	137,543,784	75,997,178	61,546,606	53,518,545	8,028,061
4	New Orleans, LA	88,768,246	40,653,099	48,115,147	26,383,831	21,731,316
5	Corpus Christi, TX	86,179,780	25,949,210	60,230,570	52,595,352	7,635,218
6	Baton Rouge, LA	66,835,290	44,309,440	22,525,850	15,349,494	7,176,356
7	Port of Plaquemines, LA	65,805,601	42,024,594	23,781,007	14,070,160	9,710,847
8	Valdez, AK	61,946,136	58,864,602	3,081,534	1,925	3,079,609
9	Beaumont, TX	60,051,844	16,638,123	43,413,721	38,693,075	4,720,646
10	Long Beach, CA	57,745,093	18,220,604	39,524,489	25,322,180	14,202,309
11	Lake Charles, LA	53,568,060	21,229,452	32,338,608	28,372,581	3,966,027
12	Tampa, FL	53,223,253	35,006,832	18,216,421	6,882,276	11,334,145
13	Pittsburgh, PA	52,904,388	52,904,388	0	0	0
14	Texas City, TX	49,477,401	18,105,401	31,372,000	28,494,653	2,877,347
15	Mobile, AL	49,229,731	24,108,050	25,121,681	15,131,990	9,989,691
16	Norfolk Harbor, VA	47,748,758	10,772,893	36,975,865	6,885,575	30,090,290
17	Philadelphia, PA	47,465,958	15,040,679	32,425,279	31,653,864	771,415
18	Los Angeles, CA	44,144,241	9,482,545	34,661,696	22,439,312	12,222,384
19	Duluth-Superior,MN and WI	42,442,971	30,497,385	11,945,586	766,877	11,178,709
20	Baltimore, MD	40,114,301	14,355,390	25,758,911	15,937,952	9,820,959
21	St. Louis, MO and IL	31,757,671	31,757,671	0	0	0
22	Portland, OR	29,973,660	12,227,238	17,746,422	4,234,584	13,511,838
23	Port Arthur, TX	29,557,282	6,904,360	22,652,922	20,489,844	2,163,078
24	Freeport, TX	29,013,797	5,051,222	23,962,575	21,948,236	2,014,339
25	Pascagoula, MS	26,403,862	8,346,872	18,056,990	15,830,773	2,226,217
26	Chicago, IL	25,957,888	20,739,965	5,217,923	4,677,446	540,477
27	Huntington, WV	24,738,617	24,738,617	0	0	0
28	Paulsboro, NJ	23,504,197	10,520,829	12,983,368	12,928,963	54,405
29	Marcus Hook, PA	22,743,087	11,671,490	11,071,597	10,979,579	92,018
30	Seattle, WA	22,593,656	7,126,253	15,467,403	8,568,552	6,898,851
31	Port Everglades, FL	21,782,375	12,667,305	9,115,070	7,125,001	1,990,069
32	Boston, MA	21,221,634	9,785,754	11,435,880	10,727,069	708,811
33	Jacksonville, FL	21,189,504	10,943,759	10,245,745	8,717,307	1,528,438
34	Detroit, MI	19,453,754	12,542,282	6,911,472	6,386,885	524,587
35	Newport News, VA	19,075,074	5,749,408	13,325,666	1,674,035	11,651,631
36	Richmond, CA	19,019,855	12,909,211	6,110,644	4,102,650	2,007,994
37	Charleston, SC	18,689,079	5,419,285	13,269,794	6,889,578	6,380,216
38	Cleveland, OH	17,864,667	13,558,231	4,306,436	3,942,808	363,628
39	Savannah, GA	17,710,606	3,135,699	14,574,907	8,278,552	6,296,355
40	Tacoma, WA	17,400,196	7,467,565	9,932,631	3,874,073	6,058,558
41	Memphis, TN	17,210,885	17,210,885	0	0	0
42	Ashtabula, OH	15,601,745	8,322,995	7,278,750	1,523,938	5,754,812
43	San Juan, PR	15,278,621	9,480,323	5,798,298	5,278,284	520,014
44	Portland, ME	15,063,835	1,643,191	13,420,644	13,335,990	84,654

45	Indiana Harbor, IN	14,909,598	14,791,362	118,236	82,809	35,427
46	Lorain, OH	14,166,459	14,059,840	106,619	106,619	0
47	Honolulu, HI	13,722,717	9,771,671	3,951,046	3,473,674	477,372
48	Toledo, OH	13,228,591	6,445,261	6,783,330	1,538,238	5,245,092
49	Two Harbors, MN	13,222,545	13,222,545	0	0	0
50	Cincinnati, OH	11,987,060	11,987,060	0	0	0
51	Anacortes, WA	11,947,777	10,008,225	1,939,552	1,116,066	823,486
52	Oakland, CA	11,148,294	2,408,358	8,739,936	3,451,102	5,288,834
53	Galveston, TX	11,049,013	3,635,780	7,413,233	4,900,126	2,513,107
54	Presque Isle, MI	10,482,586	8,547,163	1,935,423	51,751	1,883,672
55	Calcite, MI	9,388,736	7,432,637	1,956,099	121,805	1,834,294
56	New Haven, CT	9,192,721	6,528,263	2,664,458	2,569,187	95,271
57	Stoneport, MI	9,113,958	8,746,767	367,191	0	367,191
58	Gary, IN	9,083,070	9,083,070	0	0	0
59	Burns Waterway Harbor, IN	9,006,079	8,523,549	482,530	275,192	207,338
60	Taconite, MN	8,760,586	8,760,586	0	0	0
61	Louisville, KY	8,616,878	8,616,878	0	0	0
62	Escanaba, MI	8,529,848	8,529,848	0	0	0
63	Matagorda Ship Channel, TX	8,040,410	2,301,848	5,738,562	5,404,371	334,191
64	Providence, RI	8,027,544	4,426,579	3,600,965	3,550,737	50,228
65	Vancouver, WA	7,849,489	2,481,852	5,367,637	903,770	4,463,867
66	Conneaut, OH	7,785,565	4,994,639	2,790,926	5,318	2,785,608
67	Wilmington, NC	7,409,749	3,462,941	3,946,808	2,753,974	1,192,834
68	Miami, FL	7,391,938	1,696,183	5,695,755	3,108,064	2,587,691
69	Nikishka, AK	6,938,522	4,263,131	2,675,391	73,864	2,601,527
70	Albany, NY	6,723,116	5,514,652	1,208,464	1,130,186	78,278
71	Barbers Point, Oahu, HI	6,658,061	3,579,211	3,078,850	2,759,750	319,100
72	Vicksburg, MS	5,824,652	5,824,652	0	0	0
73	Mount Vernon, IN	5,577,100	5,577,100	0	0	0
74	St. Clair, MI	5,532,649	5,523,929	8,720	8,720	0
75	Camden-Gloucester, NJ	5,492,206	2,677,061	2,815,145	2,531,218	283,927
76	Port Inland, MI	5,488,819	5,155,501	333,318	0	333,318
77	New Castle, DE	5,340,138	4,519,897	820,241	815,311	4,930
78	Victoria, TX	5,297,710	5,297,710	0	0	0
79	Morehead City, NC	5,259,844	2,166,348	3,093,496	920,396	2,173,100
80	Silver Bay, MN	5,181,865	5,110,840	71,025	0	71,025
81	St. Paul, MN	5,014,235	5,014,235	0	0	0
82	Wilmington, DE	4,997,547	1,388,394	3,609,153	3,018,123	591,030
83	Kalama, WA	4,716,916	1,030,877	3,686,039	293,909	3,392,130
84	Bridgeport, CT	4,626,030	3,360,836	1,265,194	1,250,713	14,481
85	Sandusky, OH	4,333,530	1,048,826	3,284,704	90,419	3,194,285
86	Longview, WA	4,279,140	858,587	3,420,553	398,366	3,022,187
87	Marine City, MI	4,251,951	4,251,951	0	0	0
88	Portsmouth, NH	4,193,692	781,380	3,412,312	3,370,479	41,833
89	Port Dolomite, MI	4,094,673	3,833,260	261,413	26,519	234,894

90	Nashville, TN	4,019,135	4,019,135	0	0	0
91	Marblehead, OH	3,975,324	3,330,556	644,768	0	644,768
92	Port Canaveral, FL	3,794,726	1,578,833	2,215,893	1,943,619	272,274
93	Fall River, MA	3,776,000	3,159,596	616,404	613,506	2,898
94	Anchorage, AK	3,588,629	2,209,526	1,379,103	531,629	847,474
95	Kansas City, MO	3,451,378	3,451,378	0	0	0
96	Chester, PA	3,388,372	486,637	2,901,735	2,743,985	157,750
97	Everett, WA	3,320,729	2,492,306	828,423	431,770	396,653
98	Greenville, MS	3,254,825	3,254,825	0	0	0
99	Palm Beach, FL	3,149,274	2,158,497	990,777	314,674	676,103
100	Milwaukee, WI	3,108,428	1,706,454	1,401,974	1,082,303	319,671
101	Alpena, MI	3,077,744	2,880,110	197,634	12,233	185,401
102	Guntersville, AL	2,920,505	2,920,505	0	0	0
103	Fairport Harbor, OH	2,879,552	2,702,707	176,845	0	176,845
104	Kahului, Maui, HI	2,851,405	2,848,762	2,643	2,585	58
105	Port Jefferson, NY	2,841,676	2,841,676	0	0	0
106	Brownsville, TX	2,798,665	1,400,809	1,397,856	1,356,939	40,917
107	Biloxi, MS	2,782,702	2,781,590	1,112	0	1,112
108	Coos Bay, OR	2,772,824	507,602	2,265,222	15,691	2,249,531
109	Chattanooga, TN	2,743,034	2,743,034	0	0	0
110	Panama City, FL	2,683,473	2,046,468	637,005	212,973	424,032
111	Ponce, PR	2,676,608	22,885	2,653,723	2,535,681	118,042
112	Brunswick, GA	2,614,796	277,386	2,337,410	1,379,598	957,812
113	Port Manatee, FL	2,418,987	1,265,713	1,153,274	1,090,265	63,009
114	Port Angeles, WA	2,417,136	1,462,209	954,927	372,526	582,401
115	Tulsa, Port of Catoosa, OK	2,367,486	2,367,486	0	0	0
116	Green Bay, WI	2,352,925	1,958,265	394,660	376,887	17,773
117	Buffalo, NY	2,341,027	1,304,942	1,036,085	913,964	122,121
118	Gulfport, MS	2,206,931	79,594	2,127,337	1,155,753	971,584
119	Weedon Island, FL	2,091,902	2,091,902	0	0	0
120	Helena, AR	2,033,325	2,033,325	0	0	0
121	Muskegon, MI	1,935,952	1,788,695	147,257	147,257	0
122	Monroe, MI	1,929,494	1,702,475	227,019	212,388	14,631
123	San Diego, CA	1,873,334	549,171	1,324,163	676,447	647,716
124	Buffington, IN	1,823,250	1,795,005	28,245	0	28,245
125	Kivilina, AK	1,800,261	1,112,316	687,945	0	687,945
126	Charlotte, FL	1,749,123	1,749,123	0	0	0
127	Salem, MA	1,691,858	749,084	942,774	942,301	473
128	Penn Manor, PA	1,686,230	182,039	1,504,191	1,432,920	71,271
129	Minneapolis, MN	1,660,628	1,660,628	0	0	0
130	Georgetown, SC	1,630,728	44,719	1,586,009	1,508,317	77,692
131	Hilo, HI	1,630,148	1,519,077	111,071	103,153	7,918
132	Drummond Island, MI	1,582,209	1,401,830	180,379	14,330	166,049
133	Pensacola, FL	1,580,465	1,282,693	297,772	65,900	231,872
134	Grays Harbor, WA	1,488,271	404,281	1,083,990	344,295	739,695

135	Klawock, AK	1,474,147	1,409,526	64,621	0	64,621
136	Olympia, WA	1,423,424	1,321,153	102,271	11,030	91,241
137	Stockton, CA	1,338,576	142,509	1,196,067	700,004	496,063
138	San Francisco, CA	1,330,186	545,704	784,482	544,165	240,317
139	Searsport, ME	1,328,790	369,664	959,126	929,891	29,235
140	Port Hueneme, CA	1,328,037	162,003	1,166,034	1,030,690	135,344
141	Trenton, NJ	1,307,438	1,307,438	0	0	0
142	Erie, PA	1,296,024	1,200,492	95,532	83,515	12,017
143	Marysville, MI	1,282,338	1,020,528	261,810	251,908	9,902
144	Charlevoix, MI	1,280,675	1,212,909	67,766	0	67,766
145	Bellingham, WA	1,244,375	715,362	529,013	274,269	254,744
146	Sabine Pass, TX	1,200,000	1,073,962	126,038	90,496	35,542
147	Huron, OH	1,192,192	1,187,039	5,153	5,108	45
148	Hopewell, VA	1,182,861	706,053	476,808	14,153	462,655
149	Kelleys Island, OH	1,173,182	1,173,182	0	0	0
150	Hempstead, NY	1,112,952	1,112,952	0	0	0