

2013

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI



Port of Greater Cincinnati

DEVELOPMENT AUTHORITY

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TABLE OF CONTENTS

I. INTRODUCTION AND OVERVIEW	1
1. IMPACT DEFINITIONS	1
2. METHODOLOGY	3
3. ECONOMIC IMPACT MODELS.....	4
4. SUMMARY OF RESULTS	5
II. ECONOMIC IMPACTS OF WATERBORNE CARGO ACTIVITY	7
1. IMPACT STRUCTURE	9
1.1. <i>The Surface Transportation Sector</i>	9
1.2. <i>The Maritime Services Sector</i>	9
1.3. <i>Port Terminals and Dependent Shipper/Consignees Sector</i>	11
1.4. <i>Port of Greater Cincinnati Development Authority</i>	11
2. COMMODITIES INCLUDED IN THE ANALYSIS	11
3. MARITIME CARGO EMPLOYMENT IMPACTS	12
3.1. <i>Direct Cargo Job Impacts</i>	13
3.1.1. <i>Job Impacts by Category</i>	13
3.1.2. <i>Direct Job Impacts by Commodity</i>	14
3.1.3. <i>Distribution of Direct Jobs by Place of Residency</i>	14
3.2. <i>Induced Jobs</i>	15
3.3. <i>Indirect Jobs</i>	15
3.4. <i>Related User Jobs</i>	15
4. TOTAL ECONOMIC OUTPUT, BUSINESS REVENUE, INCOME AND TAX IMPACTS.....	16
4.1. <i>Revenue Impact – Total Economic Activity</i>	17
4.1.1. <i>Revenue Impacts by Economic Sector/Category</i>	17
4.1.2. <i>Revenue Impacts by Commodity</i>	18
5. PERSONAL EARNINGS IMPACT	19
6. TAX IMPACTS	19

TABLE OF EXHIBITS

EXHIBIT I-1 ECONOMIC IMPACT OF THE PORT OF CINCINNATI CARGO ACTIVITY 2011* 5

EXHIBIT II-1 FLOW OF ECONOMIC IMPACTS GENERATED BY MARITIME ACTIVITY..... 7

EXHIBIT II-2 CARGO EMPLOYMENT IMPACTS BY SECTOR AND JOB CATEGORY 13

EXHIBIT II-3 DISTRIBUTION OF DIRECT JOB IMPACT BY COMMODITY 14

EXHIBIT II-4 DISTRIBUTION OF DIRECT JOBS BY PLACE OF RESIDENCY 15

EXHIBIT II-5 DIRECT REVENUE GENERATED BY PORT CARGO ACTIVITY 18

EXHIBIT II-6 CARGO REVENUE IMPACTS BY COMMODITY 18

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

I. INTRODUCTION AND OVERVIEW

Martin Associates was retained by the Port of Greater Cincinnati Development Authority (Port Authority) to measure the local, regional and state economic impacts generated by maritime activity of the U.S. Army Corps of Engineers Port of Cincinnati District (Port) defined by Mile Markers 465-491 along the Ohio River. Economic impacts generated at the cargo and industrial facilities include the impacts generated by steel products, cement, coal fertilizer, grain/soybean products, limestone, as well as other dry and liquid bulk cargoes. Companies included in the economic impact analysis operate public, private and proprietary facilities within the Port and have a significant connection with port-related businesses, facilities and river operations.

The study employs methodology and definitions that have been used by Martin Associates to measure the economic impacts of activity at more than 250 ports in the United States and Canada, and at the leading airports in the United States. It is to be emphasized that only measurable impacts are included in this study. In order to ensure defensibility, the Martin Associates' approach to economic impact analysis is based on data developed through an extensive interview and telephone survey program of the Port terminals and the firms providing cargo and logistics services within the Port. Specific re-sponding models have been developed for the Greater Cincinnati MSA area to reflect the unique economic and consumer profiles of the regional economy. To further underscore the defensibility of the study, standardized impact models, such as the MARAD Port Kit are not used. Instead, the resulting impacts reflect the uniqueness of the individual Port operations, as well as the surrounding regional economy.

1. IMPACT DEFINITIONS

The impacts are measured separately for the Port's cargo activity and industrial activity.

The impacts are measured in terms of:

- Jobs [direct, induced, indirect and related shipper/consignee (related users)];
- Personal income;
- Business revenue; and
- State and local taxes.

Each impact measurement is described below:

➤ **Direct, Induced and Indirect Jobs**

Direct jobs are those that would not exist if activity at the Port's cargo and industrial facilities were to cease. Direct jobs created by maritime cargo activity at the Port's terminals are those jobs with the firms directly providing cargo handling and vessel services, including trucking companies, terminal operators and stevedores, members of labor unions, line haul barge operators, and tug assist companies.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

Induced jobs are jobs created in the region by the purchases of goods and services by those ***individuals*** directly employed by each of the Port's lines of business. These jobs are based on the local purchase patterns of each Port's area residents. The induced jobs are jobs with grocery stores, restaurants, health care providers, retail stores, local housing/construction industry, and transportation services, as well as with wholesalers providing the goods to the retailers.

Indirect jobs are created throughout the area as the result of purchases for goods and services by the ***firms*** directly impacted by Port activity, including the terminal operators and the firms providing services to cargo – which includes steel, general cargo, dry bulks and liquid bulks. The indirect jobs are measured based on actual local purchase patterns of the directly dependent firms, and occur with such industries as utilities, office supplies, contract service providers, maintenance and repair, and construction.

Related user jobs are jobs with shippers and consignees including the tri-state's (Ohio, Kentucky and Indiana) manufacturing, farming, retail, wholesale, distribution industries, and the industries within these states which are supporting the movement and distribution of cargo imports and exports using the Port terminals for shipment and receipt of cargo. While these impacts occur for all commodities, the majority of Port's shippers and consignees impacts involve the import and export of steel, grain, fertilizers, and miscellaneous dry and liquid bulk commodities. ***Related jobs are not dependent upon the Port marine terminals to the same extent as are the direct, induced and indirect jobs since it is the demand for the final products, which creates the demand for the employment with these shippers/consignees, not the use of a particular port or maritime terminal, and therefore these firms can and do use other ports.*** For example, when hurricane devastation renders a port's container and breakbulk terminals inoperable, essentially suspending operations at the port, the direct, induced and indirect jobholders are immediately affected with similar consequence. However, the jobs held with related users such as manufacturing as well as wholesale and retail distribution throughout the unaffected areas of state will continue to operate. These firms are required to find alternative ports to ship and receive cargo in order to maintain given levels of operation. Therefore, viable port operations are essential to long-term retention of import and export related jobs throughout the state.

- **Personal Income Impact** consists of wages and salaries received by those directly employed by Port activity, and includes a respending impact which measures the personal consumption activity in the region of those directly employed as the result of Port cargo and industrial activity. Indirect personal income measures the wages and salaries received by those indirectly employed.
- **Business Revenue** consists of total business receipts by firms providing services in support of the cargo activity. **Local purchases for goods and services** made by the directly impacted firms are also measured. These local purchases by the dependent firms create the indirect impacts. Revenues from Port terminals and dependent shippers and consignees are included.
- **State and Local Taxes** include taxes paid by individuals as well as firms dependent upon Port cargo activity.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

2. METHODOLOGY

The impacts of the Port of Cincinnati presented in this report were estimated based on telephone and personal interviews with 56 firms in the respective Port facility region. This represents the universe of the cargo-related terminals and businesses (with the exception of trucking firms) in the Port region, as defined in the Port Authority- provided terminal contact list and the "2013 Inland River Guide". It is to be emphasized that a 99% response rate was achieved from these firms located in the Port terminal list. The direct impacts are measured at the firm level of detail, and aggregated to develop the impacts for each of the Port's commodities. Each firm surveyed provided Martin Associates with detailed employment levels (both full time and part time), annual payroll, local purchases and the residence of the employees. Tonnage was based on 2011 U.S. Army Corps of Engineers Waterborne Commerce Statistics for the Port of Cincinnati.

The induced impacts are based on the current expenditure profile of residents of the Ohio, Kentucky and Indiana tri-state region as estimated by the U.S. Bureau of Labor Statistics, "Consumer Expenditure Survey." This survey indicates the distribution of consumer expenditures over key consumption categories for Ohio/Kentucky/Indiana residents. The consumption categories are:

- Housing;
- Food at Restaurants;
- Food at Home;
- Entertainment;
- Health Care;
- Home Furnishings; and
- Transportation Equipment and Services.

The estimated consumption expenditure generated as a result of the respending impact is distributed across these consumption categories. Associated with each consumption category is the relevant retail and wholesale industry. Jobs to sales ratios in each industry are then computed for Greater Cincinnati MSA, and induced jobs are estimated for the relevant consumption categories. It is to be emphasized that induced jobs are only estimated at the retail and wholesale level, since these jobs are most likely generated in each port area. Further levels of induced jobs are not estimated since it is not possible to defensibly identify geographically where the subsequent rounds of purchasing occur.

The "Consumer Expenditure Survey" does not include information to estimate the job impact with supporting business services, legal, social services, state and local governments, and educational services. To estimate this induced impact, a ratio of State employment in these key service industries to total State employment is developed. This ratio is then used with the direct and induced consumption jobs to estimate induced jobs with business/financial services, legal, educational, governmental and other social services.

The indirect impacts are estimated based on the local purchases by the directly dependent firms, combined with indirect job, income and revenue coefficients for the supplying industries in the Greater

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

Cincinnati MSA as developed for Martin Associates by the U.S. Bureau of Economic Analysis, Regional Input/Output Modeling System (RIMS II).

3. ECONOMIC IMPACT MODELS

The impacts are measured for 2011, and computer models for cargo and industrial operations have been developed to test the sensitivity of the impacts to changes in economic conditions and facility utilization. It is to be emphasized that this study is designed to provide a framework which the Port Authority can use in formulating and guiding the future development of port facilities.

The cargo impact model is designed to test the sensitivity of impacts to changes in such factors as maritime tonnage levels, port productivity and work rules, new port facilities development, inland distribution patterns of cargo, number of vessel/barge calls and the introduction of new carrier service. The cargo impact model can also be used to assess the impact of developing a parcel of land as a maritime terminal versus other non-cargo land uses. Finally, the maritime cargo impact model can be used to assess the economic benefits of increased maritime activity due to infrastructure development and the opportunity cost of not undertaking specific maritime investments such as dredging, new terminal development or warehouse development.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

4. SUMMARY OF RESULTS

Exhibit I-1 provides the economic impact analysis of the Port of Cincinnati facilities.

Exhibit I-1 Economic Impact of the Port of Cincinnati Cargo Activity 2011*

IMPACT CATEGORY	
JOBS	
DIRECT	2,216
INDUCED	2,449
INDIRECT	1,371
TOTAL JOBS	6,036
PERSONAL INCOME (1,000)	
DIRECT	\$119,693
INDUCED	\$262,642
INDIRECT	\$88,774
TOTAL PERSONAL INCOME	\$471,109
BUSINESS SERVICES REVENUE (1,000)	
	\$532,444
LOCAL PURCHASES (1,000)	
	\$310,157
TOTAL STATE AND LOCAL TAXES (1,000)	
	\$45,185
RELATED USER IMPACTS	
RELATED USER JOBS	13,237
RELATED USER INCOME	\$731,798
RELATED USER OUTPUT	\$3,276,085
RELATED USER TAXES	\$70,189

*Totals may be rounded.

In 2011, the Port of Cincinnati supported 6,036 jobs in the region. Of these jobs, 2,216 jobs are directly created by Port cargo activities, while another 2,449 induced jobs are generated in the Ohio, Kentucky and Indiana tri-state area as a result of local purchases made by those directly employed by Port cargo activity. In addition, there are 1,371 indirect jobs supported in the region as the result of \$310.2 million of local purchases. In addition, the waterborne cargo moving via the Port facilities supports 13,237 jobs throughout the tri-state region. The majority of these jobs are associated with the processing and movement of steel products, fertilizer, grain and dry bulk cargoes. ***Related jobs are not dependent upon the port marine terminals to the same extent as are the direct, induced and indirect jobs. It is the demand for the final products, which creates the demand for the employment with these shippers/consignees, not the use of a particular port or maritime terminal, and therefore these firms can and do use other ports.***

The 2,216 direct jobs received \$119.7 million of direct wage and salary income, for average earnings of \$54,000 per direct employee. As a result of local purchases with this \$119.7 million of direct wages and

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

salaries, an additional \$262.6 million of income and local consumption expenditures were created in the Port region. It is this re-spending impact that supported the 2,449 induced jobs.¹ The indirect jobs holders received \$88.8 million in personal income. In total, \$471.1 million of direct, induced and indirect personal income was created as the result of Port operations. In addition, related user in the states received another \$731.8 million of personal income.

Local businesses received \$532.4 million of revenue from providing services to the cargo activity. In addition, nearly \$3.3 billion of output was generated throughout Ohio, Kentucky and Indiana by related users using the Port facilities for shipment and receipt of cargo.

As a result of the cargo activity at the Port of Cincinnati, a total of \$45.2 million of state and local tax revenue was generated. Related users created another \$70.2 million in state and local taxes to the tri-state region.

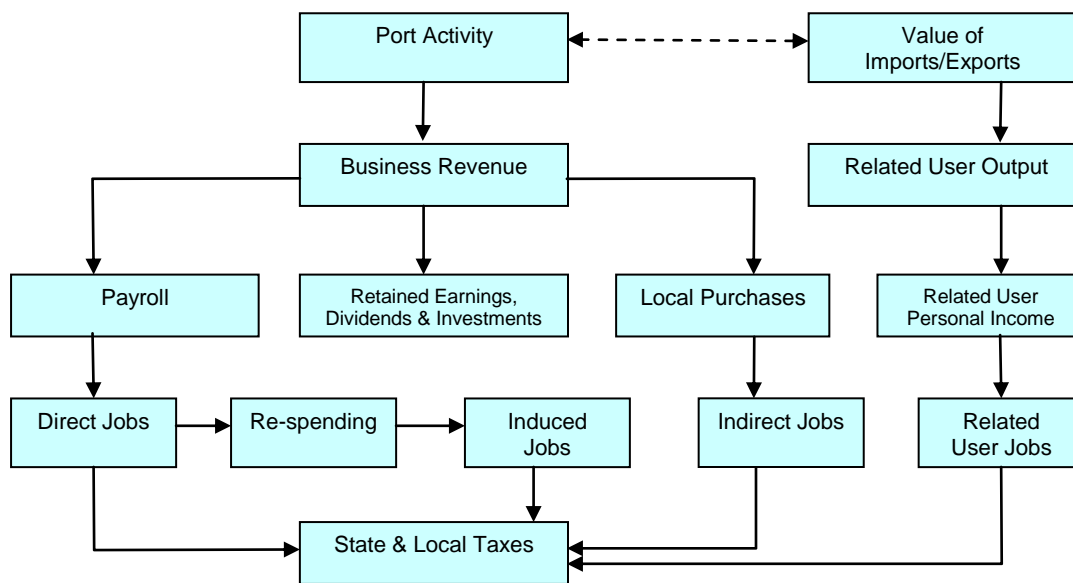
¹The induced income impact also includes local consumption expenditures and should not be divided by induced jobs to estimate the average salary per induced job. This re-spending throughout the region is estimated using a regional personal earnings multiplier, which reflects the percentage of purchases by individuals that are made within each port area. Hence, the average salary would be overestimated.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

II. ECONOMIC IMPACTS OF WATERBORNE CARGO ACTIVITY

Waterborne cargo activity at a port contributes to the local and regional economy by generating business revenue to local and national firms providing vessel and cargo handling services at the port terminals. These firms, in turn, provide employment and income to individuals, and pay taxes to state and local governments. Exhibit II-1 shows how activity at port terminals generates impacts throughout the local, state and national economies. As this exhibit indicates, the impact of a port on a local, state or national economy cannot be reduced to a single number, but instead, the port activity creates several impacts. These are the revenue impact, employment impact, personal income impact, and tax impact. These impacts are non-additive. For example, the income impact is a part of the revenue impact, and adding these impacts together would result in double counting. Exhibit II-1 shows graphically how activity at the Port's maritime terminals generates the four impacts.

Exhibit II-1 Flow of Economic Impacts Generated by Maritime Activity



At the outset, activity at the Port generates business revenue for firms which provide services. This business revenue impact is dispersed throughout the economy in several ways. It is used to hire people to provide the services, to purchase goods and services, and to make federal, state and local tax payments. The remainder is used to pay stock-holders, retire debt, make investments, or is held as retained earnings. It is to be emphasized that the only portions of the revenue impact that can be definitely identified as remaining in the local/regional economy are those portions paid out in salaries to local employees, for local purchases by individuals and businesses directly dependent on the port, in contributions to state and local taxes.

The employment impact of port activity consists of four levels of job impacts:

- **Direct employment impact** -- jobs directly generated by port activity. Direct jobs generated

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

by cargo include jobs with railroads and trucking companies moving cargo between inland origins and destinations and the port terminals, dockworkers, freight forwarders, stevedores, etc. It is to be emphasized that these are classified as directly generated in the sense that these jobs would experience near term dislocation if the activity at the Port maritime terminals were to be discontinued.

- **Induced employment impact** -- jobs created throughout the local economy because individuals directly employed due to port activity spend their wages locally on goods and services such as food, housing and clothing. These jobs are held by residents located throughout the region, since they are estimated based on local and regional purchases.
- **Indirect Jobs** -- jobs created locally due to purchases of goods and services by firms, not individuals. These jobs are estimated directly from local purchases data supplied to Martin Associates by the companies interviewed as part of this study, and include jobs with local office supply firms, maintenance and repair firms, parts and equipment suppliers, etc.
- **Related shipper/consignee (related user) jobs** -- jobs with shippers and consignees (exporters and importers) supported in the state's manufacturing, agriculture, construction, energy, retail and wholesale distribution industries, and the in-state industries supporting the movement and distribution of all commodities, primarily steel, grain, fertilizer and dry bulk movements using the port terminals. ***Related jobs are not dependent upon the port marine terminals to the same extent as are the direct, induced and indirect jobs. It is the demand for the final products, which creates the demand for the employment with these shippers/consignees, not the use of a particular port or maritime terminal, and therefore these firms can and do use other ports.***

The personal earnings impact is the measure of employee wages and salaries (excluding benefits) received by individuals directly employed due to Port activity. Re-spending of these earnings throughout the regional economy for purchases of goods and services is also estimated. This, in turn, generates additional jobs -- the induced employment impact. This re-spending throughout the region is estimated using a regional personal earnings multiplier, which reflects the percentage of purchases by individuals that are made within each port facility area. The re-spending effect varies by region -- a larger re-spending effect occurs in regions that produce a relatively large proportion of the goods and services consumed by residents, while lower re-spending effects are associated with regions that import a relatively large share of consumer goods and services (since personal earnings "leak out" of the region for these out-of-regional purchases). The direct earnings are a measure of the local impact since they are received by those directly employed by Port activity.

Tax impacts are payments to the state and local governments by firms and by individuals whose jobs are directly dependent upon and supported (induced jobs) by activity at the Port terminals.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

1. IMPACT STRUCTURE

Economic impacts are created throughout various business sectors of the state and local economies. Specifically, four distinct economic sectors are impacted as a result of activity at the Port terminals. These are the:

- Surface Transportation Sector;
- Maritime Services Sector;
- Port Terminals and Dependent Shippers/Consignees Sector; and
- Port of Greater Cincinnati Development Authority.

Within each sector, various participants are involved. Separate impacts are estimated for each of the participants. A discussion of each of the economic impact sectors is provided below, including a description of the major participants in each sector.

1.1. The Surface Transportation Sector

The surface transportation sector consists of both the railroad and trucking industries. The trucking firms and railroads are responsible for moving the various cargoes between the Port terminals and the inland origins and destinations.

1.2. The Maritime Services Sector

This sector consists of numerous firms and participants performing functions related to the following maritime services:

- Maritime Cargo Transportation;
- Vessel Operations;
- Cargo Handling; and
- Federal, State and Local Government Agencies.

A brief description of the major participants in each of these four categories is provided below:

- Maritime Cargo Transportation

Participants in this category are involved in providing and arranging for inland and water transportation for inbound and outbound freight. For example, freight forwarder/customhouse broker arranges for the freight to be delivered between the terminals and inland destinations, as well as the freight transportation, while the line haul barge operator provides the transportation on the river system to the Port facilities.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

- Vessel/Barge Maritime Service Operations

This category consists of several participants. The steamship agents provide a number of services for the vessel as soon as it enters the port. The agents arrange for medical and dental care of the crew and for ship. The agents are also responsible for vessel documentation. In addition to the steamship agents arranging for vessel services, those providing the services include:

- Chandlers - supply the vessels/barges with ship supplies (food, clothing, nautical equipment, etc.);
- Towing firms - provide the tug service to guide the barges to and from dock;
- Bunkering firms - provide fuel to the vessels;
- Barge Fleeting/Cleaning – provide fleeting services for barges;
- Marine surveyors - inspect the vessels/barges and the cargo; and
- Shipyards/marine construction firms - provide repairs (either emergency or scheduled) as well as marine pier construction and dredging.

- Cargo Handling

This category involves the physical handling of the cargo at the terminals between the land and the vessel/barge. Included in this category are the following participants:

- Terminal Employees/Dockworkers - include those dockworkers that are involved in the loading and unloading of cargo from the vessels/barges, as well as handling the cargo prior to loading and after unloading;
- Stevedoring firms - manage the longshoremen and cargo handling activities;
- Cargo terminal operators - provide services to operate the maritime terminals, track cargo movement and provide security where cargo is loaded and off-loaded;
- Warehouse operators - store cargo after discharge or prior to loading and consolidate cargo units into shipment lots. In many cases the freight forwarders and consolidators are also involved in warehousing activity if necessary.

- Government Agencies

This service sector involves federal, state and local government agencies that perform

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

services related to cargo handling and vessel/barge operations at the Port. Department of Homeland Security (DHS), which includes Customs and Border Protection (CBP), and U.S. Coast Guard, U.S. Department of Agriculture (grain inspection) and the U.S. Army Corps of Engineers, are involved. These services are provided by the government offices located in the Great Lakes and Ohio River regions.

1.3. Port Terminals and Dependent Shipper/Consignees Sector

Port terminal jobs consist of jobs with dependent shippers/consignees shipping and receiving cargo through the cargo terminals at Port facilities. The Port is unique in the fact that all of the terminals operate independently of each other within – that is the Port Authority does not govern or collect revenues (wharfage and dockage) from these terminals. Nonetheless, it is the advantage of having the availability of the Inland River System and the low cost option of vessel and barge shipments, as well as the presence of other complementary that is a key attribute in attracting and maintaining such a strong marine terminal base at the Port.

1.4. Port of Greater Cincinnati Development Authority

The Port Authority includes those individuals employed whose purpose is to oversee and promote port activity within the Port of Cincinnati.

2. COMMODITIES INCLUDED IN THE ANALYSIS

A major use of an economic impact analysis is to provide a tool for port development planning. As a port grows, available land and other resources for port facilities become scarce, and decisions must be made as to how to develop the land and utilize the resources in the most efficient manner. Various types of facility configurations are associated with different commodities. For example, containers, automobiles and RO/RO require a large amount of paved, open storage space, while certain types of break bulk cargoes such as steel coils, lumber and plywood may require covered storage. Perishable commodities require temperature controlled warehouses and some dry bulk cargo requires covered storage and special dust removing equipment, while tank farms are needed to store liquid bulk cargo.

An understanding of the commodity's relative economic value in terms of employment and income to the local community, the cost of providing the facilities, and the relative demand for the different commodities is essential in making future port development plans. Because of this need for understanding relative commodity impacts, economic impacts are estimated for the following commodities handled at the waterborne cargo terminals:

- Steel;
- Coal;
- Miscellaneous breakbulk;
- Grain/soybeans;
- Bulk metals/scrap;
- Chemicals/fertilizer;
- Cement;
- Aggregates/limestone/other dry bulk;
- Petroleum products; and
- Other liquid bulk.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

It should be emphasized that commodity-specific impacts are not estimated for each of the economic sectors described in the last section. Specific impacts could not be allocated by individual commodities with any degree of accuracy for maritime construction, ship repair, or the state and federal government due to the fact that it is difficult to estimate the percentage of resources that are dedicated to one commodity over another. For example, maritime construction or dredging may occur at a terminal that is multi-use and cannot be attributed to a specific commodity. Similarly, governmental operations cannot be attributed to a single commodity.

3. MARITIME CARGO EMPLOYMENT IMPACTS

The employment generated by maritime cargo activity within the Port of Cincinnati is estimated.

- First, the total employment that is in some way related to the activities within the Port of Cincinnati is estimated from the interview process of 56 terminals and service providers as well as 2011 data obtained from the Waterborne Commerce Statistics as described in the methodology;
- Second, the subset of total employment that is judged to be totally dependent (i.e., direct jobs) on Port activity is analyzed as follows:
 - The direct job impact is estimated by detailed job category, i.e., trucking, dockworkers, barge operators, chandlers, surveyors, etc;
 - The direct job impact is estimated for each of the key commodities/commodity groups;
 - The direct job impact is estimated based on the residency of those directly employed;
- Induced and indirect jobs are estimated;
- Finally, jobs related to the maritime activity at the cargo terminals are described.

It is estimated that 19,273 jobs are directly or indirectly generated by port activities at the cargo terminals at the Port. Of the 19,273 jobs:

- 2,216 jobs are directly generated by activities at the cargo terminals and if such activities should cease, these jobs would be discontinued over the short term.
- 2,449 jobs (induced jobs) are supported by the local purchases of the 2,216 individuals directly generated by Port activity at the cargo terminals. An additional 1,371 indirect jobs were supported by \$310.2 million of purchases in the local and regional economy by firms providing direct cargo handling and barge services.
- 13,237 jobs are related to inbound and outbound cargoes through the Port facilities. These jobs are supported in the states' processing, manufacturing, farming, construction, retail, wholesale and

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

distribution industries, and the in-state industries supporting the movement and distribution of all commodities, primarily concentrated with steel, grain, cement and fertilizer cargo movements using the Port terminals.

3.1. Direct Cargo Job Impacts

In 2011, a total of about 11.7 million tons of waterborne cargo and raw materials was loaded and discharged at the Port of Cincinnati. As a result of the 11.7 million tons of cargo activity, 2,216 full-time equivalent jobs were directly created². In this section the jobs are analyzed in terms of:

- Distribution by job category;
- Distribution by commodity group; and
- Distribution by county and state of residency.

These distributions are developed in more detail below.

3.1.1. Job Impacts by Category

Exhibit II-2 presents the distribution of the 2,216 direct jobs by type of job. The exhibit indicates that the majority of direct jobs are with terminals operators, trucking operations moving cargo to and from the terminals and then line haul barge operators.

Exhibit II-2 Cargo Employment Impacts by Sector and Job Category

SECTOR	DIRECT JOBS
SURFACE TRANSPORTATION	
RAIL	40
TRUCK	887
MARITIME SERVICES	
TERMINAL EMPLOYEES	1,059
MARITIME SERVICES	53
GOVERNMENT	32
LINE HAUL BARGE	128
PORT AUTHORITY	17
TOTAL	2,216

² Jobs are measured in terms of full-time worker equivalents. If a worker is employed only 50 percent of the time by activity at Port cargo terminals, then this worker is counted as .5 jobs.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

3.1.2. Direct Job Impacts by Commodity

Most of the 2,216 jobs considered to be generated directly by Port activity can be associated with the handling of specific commodities or commodity groups. Certain employment categories such as government employees cannot be identified with a specific commodity. As a result, employment in these groups (which totaled 178) was not allocated to commodity groups. Exhibit II-3 presents the relative employment impacts in terms of commodity groups.

Exhibit II-3 Distribution of Direct Job Impact by Commodity

COMMODITY	DIRECT JOBS
AGGREGATES	191
COAL	117
CEMENT	60
GRAIN	301
CHEMICALS/FERTILIZER	737
PETROLEUM PROD	343
STEEL	90
OTHER BREAKBULK	12
OTHER DRY BULK	187
NOT ALLOCATED	178
TOTAL	2,216

**Impacts represented in NOT COMMODITIES-SPECIFIC are those that cannot be attributed to a single commodity described in the previous line items*

The movement of chemicals and fertilizers creates the largest number of direct jobs, 737, followed by the movement of petroleum products (343 jobs), followed by movement of grain and soybean products (301). Again, it is necessary to stress that these job figures include companies located at the Port that are associated with the manufacturing and processing of these commodities, in addition to the physical movement and distribution of the commodities.

3.1.3. Distribution of Direct Jobs by Place of Residency

To underscore the geographic scope of the impacts generated by the cargo terminals, Exhibit II-4 presents the distribution of the 2,216 direct jobs by place of residency. The geographic employment analysis is based on the results of the interviews with 56 firms in the Port's maritime community. As this exhibit indicates, over 46% of the direct jobholders reside in Hamilton County - 24% in Cincinnati, while another 22% live in other areas of the county. About 13% of employees live in Boone County and 4% in Clermont County. Nearly 21% reside in Indiana.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

Exhibit II-4 Distribution of Direct Jobs by Place of Residency

JURISDICTION	SHARE	DIRECT JOBS
Cincinnati	24.4%	541
Other Hamilton County	22.2%	492
Butler County, OH	5.1%	113
Clermont County, OH	3.9%	86
Boone County, KY	13.2%	293
Kenton County, KY	4.9%	108
Campbell County, KY	0.8%	17
Dearborn County, IN	11.4%	253
Ohio County, IN	2.1%	47
Switzerland Co., IN	3.7%	83
Other OH	2.5%	56
Other KY	2.0%	44
Other IN	4%	82
TOTAL	100%	2,216

3.2. Induced Jobs

The 2,216 directly employed individuals due to activity at the cargo terminals received wages and salaries, a part of which was used to purchase local goods and services such as food, housing, clothing, transportation services, etc. As a result of these local purchases, 2,449 jobs in the regional economy were supported. The majority of the induced jobs are with local and regional private sector social services, business services, educational services and state and local government agencies, followed by jobs in the food and restaurant sector, and then jobs in the construction and home furnishings sector.

3.3. Indirect Jobs

In addition to the induced jobs generated by the purchases by directly employed individuals, the firms providing the direct services and employing the 2,216 direct jobs make local purchases for goods and services. These local purchases by the firms dependent upon the cargo facilities generate additional local jobs – indirect jobs. Based on interviews, these firms made \$310.2 million of local and in-state purchases. These direct local purchases created an additional 1,371 indirect jobs in the local economy.

3.4. Related User Jobs

It is estimated that about 13,237 jobs are supported in the region with shippers/consignees that use the Port of Cincinnati terminal facilities. To estimate the related user impact for cargo, the following methodology was used. First, the average value per ton of each commodity was estimated using Bureau of Census *USA TradeOnline* Data Base.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

Next, for each commodity, the associated consuming and producing industries were identified with each commodity. For example, for imported iron and steel products, relationships were developed to convert the dollar value of these imported materials into a dollar value of output in the key consuming industries, which include construction and metal fabrication industries. Relationships between the values of inputs to the value of outputs in these industries were estimated using data from the U.S. Bureau of Census, Census of Manufacturing and Census of Construction. These ratios were then used to convert the dollar value of the imported breakbulk and bulk cargoes into a dollar value of output in the consuming industries in the states.

The employment, earnings and output to value of output coefficient for the each industry sector related to each commodity was then obtained from Bureau of Economic Analysis, Regional Input-Output Model for the Greater Cincinnati MSA. Using the respective jobs to value of output multipliers for these industries from the Bureau Of Economic Analysis, Regional Input-Output Modeling System (RIMS II) model, the value of the breakbulk and bulk cargoes moving via the port and remaining in (or produced in) the states of Ohio, Kentucky and Indiana was converted into related shipper/consignee jobs with these users and associated supporting industries within the tri-state region. A similar methodology was used in estimating related user jobs for agricultural products.

Finally, the direct, induced and indirect port sector job impacts (port companies and dependent shippers) associated with each of the cargoes for which related user jobs were estimated were subtracted from the total related jobs (by commodity and cargo type) to avoid double counting. The related user jobs include job impacts at each stage of handling the imported and exported cargo, such as the port activity and the trucking and rail activity to move the cargo to and from the Port and the induced and indirect jobs associated with the direct Port activity.

4. TOTAL ECONOMIC OUTPUT, BUSINESS REVENUE, INCOME AND TAX IMPACTS

The 11.7 million tons of general and bulk (dry and liquid) cargo handled at the Port cargo terminals included in the study generated revenue for firms in each of the economic sectors. For example, revenue is received by the railroads and the trucking companies within the surface transportation sector as a result of moving export cargo to the Port terminals and distributing the imported commodities inland after receipt at the cargo terminals. The firms in the maritime services sector receive revenue from arranging for transportation services, cargo handling, providing services to vessels/barges in the Port and repairs to vessels/barges calling on the Port facilities. In addition, revenue is received by dependent shippers/consignees from the sales of cargo shipped or received via the port cargo terminals and from the sales of products made with raw materials received through the terminals.

The revenue generated by Port activity consists of many components. For example, gross revenue is used to pay employee salaries and taxes, it is distributed to stockholders of the companies providing the vessel and cargo handling services, and it is used for the purchases of equipment and maintenance services. Of these components, only three can be isolated geographically with any degree of accuracy. These are the personal income component of revenue, which can be traced to geographic locations based on the residence of those receiving the income, the payment of state and local taxes, and the local purchases made by firms

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

dependent upon the maritime activity. The balance of the revenue is distributed in the form of payments to firms located outside the region providing goods and services to the economic sectors and for the distribution of company profits to shareholders. Many of these firms and owners are located outside of the region and, thus, it is difficult to trace the ultimate location of the distributed revenue (other than personal income, taxes and local purchases). The value of output created by in-state related shippers/consignees of the port is attributed to the state, and the local purchases from other firms within the state are also included in this user output measure, as defined by the in-state output coefficients (for the user industries) developed from the U.S. Bureau of Economic Analysis, Regional Input-Output Modeling System (RIMS II).

4.1. Revenue Impact – Total Economic Activity

The revenue impact is a measure of the *total economic activity* in the states that is generated by the cargo moving via the Port of Cincinnati. In 2011, maritime cargo activity at the Port generated a total of \$3.8 billion of total economic activity in the states. Of the \$3.8 billion, \$532.4 million is the direct business revenue received by the firms directly dependent upon the Port and providing maritime services and inland transportation services to the cargo handled at the maritime terminals and the vessels calling on the Port while another \$3.3 billion of revenue is generated by the Port terminals and on-site dependent shippers/consignees. The remaining \$3.3 billion represents the value of the output to the Ohio, Kentucky, Indiana tri-state that is created due to the cargo moving via the Port. This includes the value added at each stage of producing an export cargo, as well as the value added at each stage of production for the firms using imported raw materials and intermediate products that flow via the Port and are consumed by industries within the tri-state. The balance of the discussion focuses on the \$532.4 million of direct business revenue generated from the provision of services to the cargo and barges handled within the Port of Cincinnati.

4.1.1. Revenue Impacts by Economic Sector/Category

Exhibit II-5 presents the total revenue estimated to have been generated by Port activity in 2011. This revenue includes the revenue received by firms providing services to the commodity and vessel activity at the cargo terminals, and includes revenue received by trucking firms, stevedores, maritime service providers, towing companies, line haul barge operators, etc. Not included is the revenue from the use/value of the cargo moving via the maritime terminals, as this is included in the related user output.

The terminal operations sector receives the largest revenue impact, followed by line haul barge operations and then trucking.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

Exhibit II-5 Direct Revenue Generated By Port Cargo Activity

SECTOR	REVENUE (1,000)
SURFACE TRANSPORTATION	
RAIL	\$12,664
TRUCK	\$58,133
MARITIME SERVICES	
TERMINAL OPERATIONS	\$358,961
MARITIME SERVICES	\$4,158
WAREHOUSING/CONSOLIDATORS/FORWARDERS	\$3,750
GOVERNMENT	NA
LINE HAUL BARGE	\$82,577
NOT ALLOCATED	\$12,202
TOTAL	\$532,444

4.1.2. Revenue Impacts by Commodity

Exhibit II-6 shows the direct revenue impact by commodity. It is to be emphasized that the revenue received by shippers/consignees from the sales of the products (value of the commodities) moving via the Port terminals is not included, since product value is determined by the demand for the product, not the use of the cargo terminals.

Exhibit II-6 Cargo Revenue Impacts by Commodity

COMMODITY	REVENUE (1000)
AGGREGATES	\$53,810
COAL	\$23,569
CEMENT	\$10,213
GRAIN	\$27,925
CHEMICALS/FERTILIZER	\$221,572
PETROLEUM PROD	\$98,252
STEEL	\$20,878
OTHER BREAKBULK	\$4,374
OTHER DRY BULK	\$51,094
NOT ALLOCATED	\$20,759
TOTAL	\$532,444

As this exhibit indicates chemicals/fertilizer generate the largest direct revenue impacts, followed by petroleum products and aggregates.

ECONOMIC IMPACT OF THE CARGO ACTIVITY OF THE PORT OF CINCINNATI

5. PERSONAL EARNINGS IMPACT

The income impact is estimated by multiplying the average annual earnings (excluding benefits) of each Port participant, i.e., truckers, steamship agents, pilots, towing firm employees, longshoremen, warehousemen, etc., by the corresponding number of direct jobs in each category. The individual annual earnings in each category multiplied by the corresponding job impact resulted in \$119.7 million in personal wage and salary earnings. It is important to emphasize that the average annual earnings of a Port-dependent job is about \$54,000. Therefore, these relatively high paying jobs will have a much greater economic impact in the local economy through stimulating induced jobs than will a job paying lower wages.

The impact of the re-spending of this direct income for local purchases is estimated using a personal earnings multiplier. The personal earnings multiplier is based on data supplied by the Bureau of Economic Analysis (BEA), Regional Input-Output Modeling System (RIMS II). The BEA estimates that for every one dollar earned by direct employees generated by activity at the cargo terminals, an additional \$2.19 of personal income and consumption expenditures would be created as a result of re-spending the direct income for purchases of goods and services produced locally. Hence, a personal earnings multiplier of \$3.19 was used to estimate the total income and consumption impact of \$262.6 million, inclusive of the re-spending effect. This additional re-spending of the direct income generates the 2,449 induced job impacts.

The 1,371 indirect job holders earned \$88.8 million in indirect wages and salaries. The 13,237 related user jobs of the cargo moving via the ports received about \$731.8 million of personal income.

Therefore, the total personal income impact and consumption impact created by Port of Cincinnati cargo activity is estimated at \$1.2 billion.

6. TAX IMPACTS

State and local tax impacts are based on per employee tax burdens which are developed at the county, local and state jurisdictional levels. These tax-per-employee burdens are essentially tax indices that are used to allocate total taxes at each level of government to economic activity generated by the cargo terminals. To estimate the per employee tax indices, total taxes received at each governmental level in Ohio, Kentucky and Indiana was developed from the Tax Foundation, which reports total state and local taxes from all sources as a percent of total personal income. A weighted average of each tax percentage was developed and applied to the number of employees.

Cargo activity generated \$45.2 million of state, county and local taxes. As a result of the economic activity created by the related users, an additional \$70.2 million of state and local taxes were generated for a total cargo tax impact of \$115.4 million.