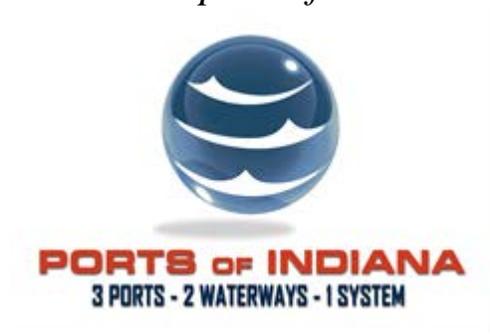


The Economic Impacts of the Indiana Maritime Industry

Study Completed 2015

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EXECUTIVE SUMMARY

Martin Associates was retained by the Ports of Indiana to measure the local, regional and state economic impacts generated by maritime activity at Indiana’s public and private maritime terminals along the 400 miles of navigable waterways bordering the state on the Ohio River and Lake Michigan. Economic impacts generated at the cargo and industrial facilities include the impacts generated by steel products, steel input commodities such as iron ore and coal/coke, cement, fertilizer, grain/soybean products, limestone, as well as other dry and liquid bulk cargoes. In 2013, according to the U.S. Army Corps of Engineers Waterborne Commerce Statistics, about 64.9 million tons of foreign and domestic maritime cargoes were handled by Indiana terminals on Lake Michigan and the Ohio River. Approximately 34.6 million tons of cargo were handled by Indiana terminals on the Ohio River and 30.3 million tons were handled by the state’s Lake Michigan terminals. It should be noted that 2013 was the most current year of data available for all shipping modes at the time of this study. One-Hundred-Forty-Seven terminals, industrial tenants, and service providers on Lake Michigan and the Ohio River were interviewed. Tonnages were estimated based upon these interviews and U.S. Army Corps of Engineers statistics.

Indiana waterways are unique in the fact that three separate modes of waterborne commerce are currently used in the shipment and receipt of raw materials and finished product. These include: international ships moving cargo through the St. Lawrence Seaway (“salties”), lake ships moving international and domestic shipments throughout the Great Lakes (“lakers”), and barges of international and domestic cargoes moving along the Inland Waterways System. It is this unique convergence of water transportation modes that provides steel mills and other industries with the ability to use cost-effective methods for receiving raw materials such as iron ore, coal and limestone and for shipping finished products to domestic and international markets. Without water transportation, production costs would undoubtedly increase and therefore potentially hinder future operations and negatively impact the state’s levels of manufacturing.

While the balance of this report details the economic impact of Indiana waterway’s waterborne shipping activity, key findings from the CY2013 analysis include the following:

Annual Economic Impact of Waterborne Shipping on Indiana’s Waterways:

- 155,169 direct, induced, indirect and related jobs;
 - 115,613 jobs dependent upon marine terminals
- \$9.9 billion of total income and re-spending;
- \$21.5 billion of total economic activity to the state; and
- \$936.9 million of total state and local tax revenue.

Exhibit ES-1 Economic Impacts of Waterborne Shipping Activity on Indiana’s Waterways¹
*Based on economic data from CY2013**

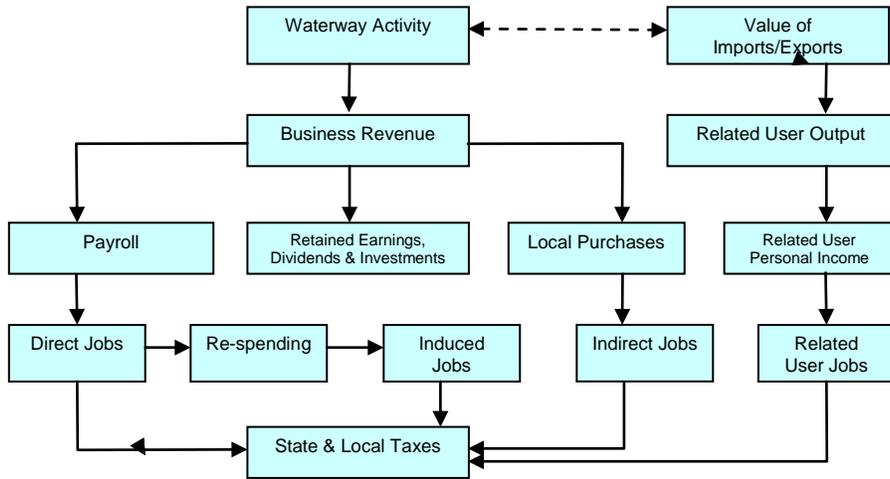
	LAKE MICHIGAN	OHIO RIVER	TOTAL INDIANA
DEPENDENT JOBS	84,112	31,501	115,613
RELATED JOBS	<u>27,634</u>	<u>11,922</u>	<u>39,557</u>
TOTAL JOBS	111,746	43,423	155,169
DEPENDENT PERSONAL INCOME	\$6,443,928,082	\$2,043,103,649	\$8,487,031,730
RELATED PERSONAL INCOME	<u>\$1,028,237,591</u>	<u>\$346,999,353</u>	<u>\$1,375,236,944</u>
TOTAL INCOME/RE-SPENDING	\$7,472,165,673	\$2,390,103,002	\$9,862,268,674
LOCAL PURCHASES	\$2,802,772,293	\$1,047,406,579	\$3,850,178,872
DEPENDENT STATE & LOCAL TAXES	\$612,173,168	\$194,094,847	\$806,268,014
RELATED STATE & LOCAL TAXES	<u>\$97,682,571</u>	<u>\$32,964,939</u>	<u>\$130,647,510</u>
TOTAL STATE & LOCAL TAXES	\$709,855,739	\$227,059,785	\$936,915,524
DEPENDENT VALUE OF ECONOMIC ACT	\$11,769,336,407	\$2,907,270,917	\$14,676,607,325
RELATED VALUE OF ECONOMIC ACTIVITY	<u>\$4,021,814,057</u>	<u>\$2,798,599,038</u>	<u>\$6,820,413,096</u>
TOTAL VALUE OF ECONOMIC ACTIVITY	\$15,791,150,465	\$5,705,869,955	\$21,497,020,420

*Totals may be rounded.

Waterborne cargo activity at a port contributes to the state economy by generating business revenue to local and national firms providing vessel and cargo handling services at the maritime terminals. These firms, in turn, provide employment and income to individuals, and pay taxes to state and local governments. Exhibit ES-2 shows how activity at maritime terminals generates impacts throughout the local, state and national economies. As this exhibit indicates, the impact of waterborne shipping on a local, state or national economy cannot be reduced to a single number, but instead, 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.

¹ The total impacts include related jobs which 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 related shippers/consignees, not the use of a particular port or maritime terminal, and therefore these firms can, and do use other ports.

ES-2 Flow of Economic Impacts of Waterway Activity through the Economy



I. INTRODUCTION

Martin Associates was retained by the Ports of Indiana to measure the local, regional and state economic impacts generated by maritime activity at Indiana's maritime terminals, including the Port of Indiana-Burns Harbor, Jeffersonville and Mount Vernon tenants. Economic impacts generated at the cargo and industrial facilities include the impacts generated by steel products, steel input commodities such as iron ore and coal/coke, cement, fertilizer, grain/soybean products, limestone, as well as other dry and liquid bulk cargoes. In 2013, according to the U.S. Army Corps of Engineers Waterborne Commerce Statistics, about 64.9 million tons of foreign and domestic cargoes were handled on the 400 miles of navigable waterways bordering the state on Lake Michigan and the Ohio River. It should be noted that 2013 was the most current year of data available for all shipping modes at the time of this study. One-Hundred-Forty-Seven terminals, industrial tenants, and service providers on Lake Michigan and the Ohio River were interviewed. Tonnages were estimated based upon these interviews and U.S. Army Corps of Engineers statistics.

The study employs methodology and definitions that have been used by Martin Associates to measure the economic impacts of port activity at more than 500 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, Martin Associates' approach to economic impact analysis is based on data developed through an extensive interview and telephone survey program of the port tenants and the firms providing cargo and logistics services on Indiana waterways. Specific re-spending models have been developed for the state of Indiana 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 were not used. Instead, the resulting impacts reflect the uniqueness of the state's port and maritime operations, as well as the surrounding regional economy.

It is important to note that this paper is part of a larger study to measure the economic impacts of maritime activity occurring throughout the State of Indiana along with maritime activity occurring exclusively within Ports of Indiana harbors. The impacts presented in this paper represent the economic activity associated with all maritime activity within the state, including at the public docks and waterways. It is also important to note that, due to data availability limitations the statewide report is based upon 2013 tonnages while the impacts contained in the paper for the Ports of Indiana facilities are based upon 2014 tonnages. Furthermore, it should be emphasized that the impacts presented in both reports represent snapshots in time following a multi-year economic recession that significantly impacted maritime shipments and related economic activities. As the economy continues to recover, demand for commodities and goods moving via Indiana waterways will increase as will the economic impacts associated with that cargo.

Indiana waterways are unique in the fact that three separate modes of waterborne commerce are currently used in the shipment and receipt of raw materials and finished products. These include: international ships moving cargo through the St. Lawrence Seaway (“salties”), lake vessels carrying international cross-lake and domestic intra-lake shipments (“lakers”), and barges moving international and domestic cargoes along the Inland Waterways System. It is this unique convergence of water transportation modes that provides steel mills and other industries with the ability to use cost-effective methods for receiving raw materials such as iron ore, coal and limestone and shipping finished products to domestic and international markets. Without water transportation, production costs would undoubtedly increase and therefore potentially hinder future contracts and levels of manufacturing.

While the balance of this report details the economic impact of Indiana waterborne shipping activity, key figures from the CY2013 analysis include the following:

Annual Economic Impact of Waterborne Shipping in Indiana:

- 155,169 direct, induced, indirect and related jobs;
 - 115,613 jobs dependent upon marine terminals
- \$21.5 billion of economic activity to the state; and
- \$936 million of state and local tax revenue.

The following university professors provided input and peer reviews of the analysis (Letters of Endorsement can be found in Appendix C):

- Bruce Jaffee, Professor/Chairperson, Dept. of Economics & Public Policy, Indiana University
- Richard Jensen, Professor of Economics, Dept. of Economics, University of Notre Dame
- Amlan Mitra, Professor of Economics, Dept. of Finance and Economics, Purdue University Calumet; Member, Transportation Research Board, National Academy of Sciences Exhibit

1. IMPACT DEFINITIONS

The impacts are measured separately for Indiana waterway 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, Indirect and Related Jobs:**

Direct jobs are those that would not exist if activity at Indiana waterway terminals were to cease. Direct jobs created by cargo activity at the maritime terminals are those jobs with the firms directly providing cargo handling and vessel services, including trucking companies, terminal operators and stevedores, members of the International Longshoremen's Association (ILA), International Union of Operating Engineers, International Brotherhood of Teamsters and United Steelworkers, vessel agents, pilots and tug assist companies.

Induced jobs are jobs created in Indiana by the purchases of goods and services by those *individuals* directly employed by each of the terminals' lines of business. These jobs are based on the local purchase patterns of 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 Indiana maritime activity, including the tenants, 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 (exporters and importers) including the state's manufacturing, farming, retail, wholesale, distribution industries, and the in-state industries 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 Indiana's maritime shippers and consignees impacts involve the import and export of steel, coal, grain, fertilizers, salt, limestone and miscellaneous dry

and liquid bulk commodities. A large number of dependent steel users are already accounted for in the port tenant/dependent user category due to the fact that the Ports of Indiana's Burns Harbor and Jeffersonville facilities maintain a large steel manufacturing and processing presence. *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 break bulk 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 and waterway activities, and includes a re-spending impact which measures the personal consumption activity in Indiana of those directly employed as the result of Indiana waterway 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 tenants, dependent shippers and consignees and waterway terminals are included.
- **State and local taxes** include taxes paid by individuals as well as firms dependent upon Indiana waterway cargo and industrial tenant activity.

2. METHODOLOGY

The methodological approach to this study is designed to provide highly defensible, as well as accurate results. This same methodology has been used by Martin Associates in the last 25 years to assess the economic impacts of cargo and passenger activity at seaports including:

Los Angeles, CA
Long Beach, CA
Oakland, CA

Portland, OR
Seattle, WA
Sacramento, CA

San Francisco, CA
Vancouver, BC
Vancouver, WA

THE ECONOMIC IMPACTS OF THE INDIANA MARITIME INDUSTRY

Houston, TX
Corpus Christi, TX
Freeport, TX
New Orleans, LA
Texas City, TX
Baton Rouge, LA
Port Everglades, FL
Palm Beach, FL

Miami, FL
Jacksonville, FL
Wilmington/Morehead City, NC
Virginia/Hampton Roads, VA
Baltimore, MD
Philadelphia, PA
Wilmington, DE
Brunswick, GA

Richmond, VA
Providence, RI
Montreal, QC
Quebec City, QC
Prince Rupert, BC
Halifax, NS
Saint John, NB
18 U.S. Great Lakes Ports

The economic impacts of Indiana waterways presented in this report were estimated based on telephone and personal interviews with 147 firms in Indiana. This represents the universe of cargo and related industrial businesses (with the exception of trucking firms) on Indiana waterways including Burns Harbor, Indiana Harbor, Buffington Harbor and Gary as well as the length of the Indiana bank of the Ohio River. It is to be emphasized that a 93% response rate was achieved from these firms located on Ports of Indiana property as well as those on the privately-held lands along the Ohio River and Lake Michigan coast.

The direct impacts are measured at the firm level of detail, and aggregated to develop the impacts for each of the terminals' lines of business. Each Ports of Indiana tenant surveyed provided Martin Associates with detailed employment levels (both full time and part time), annual payroll, local purchases and the residence of the employees. Additional data collected from the private Indiana waterway terminals includes: employment, vessel and barge tonnage, vessel and barge calls, revenues and expenditures.

The induced impacts are based on the current expenditure profile of residents of Indiana 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 Indiana residents. The consumption categories are:

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

The re-spending impact is developed by deriving an implied marginal propensity to consume from income multipliers for the water transportation industry, as developed by the Bureau of Economic Analysis. The estimated consumption expenditure generated as a result of the re-

spending impact is distributed across the above 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 Indiana, 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 terminal's region. 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 of Indiana employment in these key service industries to total state of Indiana 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 state of Indiana as developed for Martin Associates by the U.S. Bureau of Economic Analysis, Regional Input/Output Modeling System (RIMS II).

3. ECONOMIC IMPACT MODEL

The impacts are measured for CY2013 – based on interviews and the **latest USACE data available at the time of this report**, 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 Ports of Indiana can use in formulating and guiding future development of shipping facilities and policies for the state of Indiana.

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 services. 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.

4. SUMMARY OF RESULTS

Exhibits I-1a and I-1b provide a breakdown by region for the economic impact analysis of the maritime activity on Indiana waterways. In Table I-1a, only **dependent** jobs, income, revenue and tax impacts are included. If access to Indiana marine terminals were to be cut off, the 115,613 direct, induced and indirect job holders would be immediately affected. Table I-1b includes **related** impacts in addition to the dependent direct, induced, and indirect impacts. The related job holders are employed in industries such as steel processing, agriculture and construction. They would not suffer the same level of disruption if marine activity at Indiana terminals were to cease because they would have the ability to route their cargo through other ports. When these impacts are included there are 155,169 jobs that are **in some way related** to, but not necessarily dependent upon, Indiana marine terminal activity. These impact summaries are shown separately to emphasize the fact that related jobs are not dependent upon the Indiana marine terminals to the same extent as the direct, induced and indirect impacts. The 39,557 related job holders benefit from lower shipping costs afforded by using the Ports of Indiana marine terminals and could suffer longer term disruptions if terminal activity were to cease. However, due to their ability to use other ports, they are not considered to be dependent upon the state’s marine facilities.

Exhibit I-1a Dependent Economic Impact of Indiana Waterborne Shipping Activity CY2013*

	LAKESHORE	OHIO RIVER	TOTAL INDIANA
JOBS			
DIRECT	20,383	11,252	31,635
INDUCED	29,593	10,854	40,447
INDIRECT	<u>34,136</u>	<u>9,395</u>	<u>43,531</u>
TOTAL JOBS	84,112	31,501	115,613
PERSONAL INCOME			
DIRECT	\$1,294,028,440	\$435,147,701	\$1,729,176,141
INDUCED/RE-SPENDING	\$3,715,932,070	\$1,249,570,138	\$4,965,502,208
INDIRECT	<u>\$1,433,967,571</u>	<u>\$358,385,810</u>	<u>\$1,792,353,381</u>
TOTAL PERSONAL INCOME	\$6,443,928,082	\$2,043,103,649	\$8,487,031,730
VALUE OF ECONOMIC ACTIVITY			
BUSINESS SERVICES REVENUE	\$903,499,607	\$1,147,156,935	\$2,050,656,543
TENANT/DEPENDENT SHIPPER REVENUE	<u>\$10,865,836,800</u>	<u>\$1,760,113,982</u>	<u>\$12,625,950,782</u>
TOTAL VALUE OF ECONOMIC ACTIVITY	\$11,769,336,407	\$2,907,270,917	\$14,676,607,325
LOCAL PURCHASES	\$2,802,772,293	\$1,047,406,579	\$3,850,178,872
STATE & LOCAL TAXES	\$612,173,168	\$194,094,847	\$806,268,014

*Totals may be rounded.

Exhibit I-1b Related Economic Impact of Indiana Waterborne Shipping Activity CY2013*²

	LAKESHORE	OHIO RIVER	TOTAL INDIANA
JOBS			
DIRECT	20,383	11,252	31,635
INDUCED	29,593	10,854	40,447
INDIRECT	34,136	9,395	43,531
RELATED	<u>27,634</u>	<u>11,922</u>	<u>39,557</u>
TOTAL JOBS	111,746	43,423	155,169
PERSONAL INCOME			
DIRECT	\$1,294,028,440	\$435,147,701	\$1,729,176,141
INDUCED/RE-SPENDING	\$3,715,932,070	\$1,249,570,138	\$4,965,502,208
INDIRECT	\$1,433,967,571	\$358,385,810	\$1,792,353,381
RELATED INCOME	<u>\$1,028,237,591</u>	<u>\$346,999,353</u>	<u>\$1,375,236,944</u>
TOTAL PERSONAL INCOME	\$7,472,165,673	\$2,390,103,002	\$9,862,268,674
VALUE OF ECONOMIC ACTIVITY			
BUSINESS SERVICES REVENUE	\$903,499,607	\$1,147,156,935	\$2,050,656,543
TENANT/DEPENDENT SHIPPER REVENUE	\$10,865,836,800	\$1,760,113,982	\$12,625,950,782
<i>Dependent Revenue Subtotal</i>	<i>\$11,769,336,407</i>	<i>\$2,907,270,917</i>	<i>\$14,676,607,325</i>
RELATED REVENUE	<u>\$4,021,814,057</u>	<u>\$2,798,599,038</u>	<u>\$6,820,413,096</u>
TOTAL VALUE OF ECONOMIC ACTIVITY	\$15,791,150,465	\$5,705,869,955	\$21,497,020,420
LOCAL PURCHASES	\$2,802,772,293	\$1,047,406,579	\$3,850,178,872
STATE & LOCAL TAXES			
DIRECT, INDUCED AND INDIRECT	\$612,173,168	\$194,094,847	\$806,268,014
RELATED TAXES	<u>\$97,682,571</u>	<u>\$32,964,939</u>	<u>\$130,647,510</u>
TOTAL STATE & LOCAL TAXES	\$709,855,739	\$227,059,785	\$936,915,524

*Totals may be rounded.

In 2013, waterborne shipping at Indiana waterway facilities in some way supported 155,169 jobs in the region. Of these jobs, 31,635 jobs were directly created by cargo shipping and dependent industrial activities, while another 40,447 induced jobs were generated in the state as a result of local purchases made by those directly employed by Indiana waterway terminals and Ports of Indiana cargo and tenant activity. In addition, there were 43,531 indirect jobs supported in Indiana as the result of nearly \$3.9 billion of local purchases. A further 39,557 jobs were in some way related to Indiana maritime cargo. The majority of these jobs were associated with the processing and movement of steel products, fertilizer, grain and dry bulk cargoes at the individual terminals. It

² The total impacts include related jobs which 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 related shippers/consignees, not the use of a particular port or maritime terminal, and therefore these firms can, and do use other ports.

must be emphasized that only the 115,613 direct, induced, and indirect jobs are generated by, and thus dependent upon, the Indiana maritime and associated industrial activity.

The 31,635 direct jobs received \$1.7 billion of direct wage and salary income, for average earnings of \$54,660 per direct employee. As a result of local purchases with this \$1.7 billion of direct wages and salaries, nearly \$5 billion of additional income and local consumption expenditures were created in Indiana. It is this re-spending impact that supported the 40,447 induced jobs.³ The indirect jobs holders received nearly \$1.8 billion in personal income. Related users in the state received another \$1.4 billion of personal income. In total, \$9.8 billion of personal income is in some way related to Indiana waterborne shipping operations.

Local maritime service businesses received more than \$2 billion of revenue from providing services supporting cargo activity. Port tenants and dependent shippers generated \$12.6 billion of revenue from processing and manufacturing activities at their facilities. In addition, \$6.8 billion of output was generated throughout the state by related users using the marine terminal facilities for shipment and receipt of cargo.

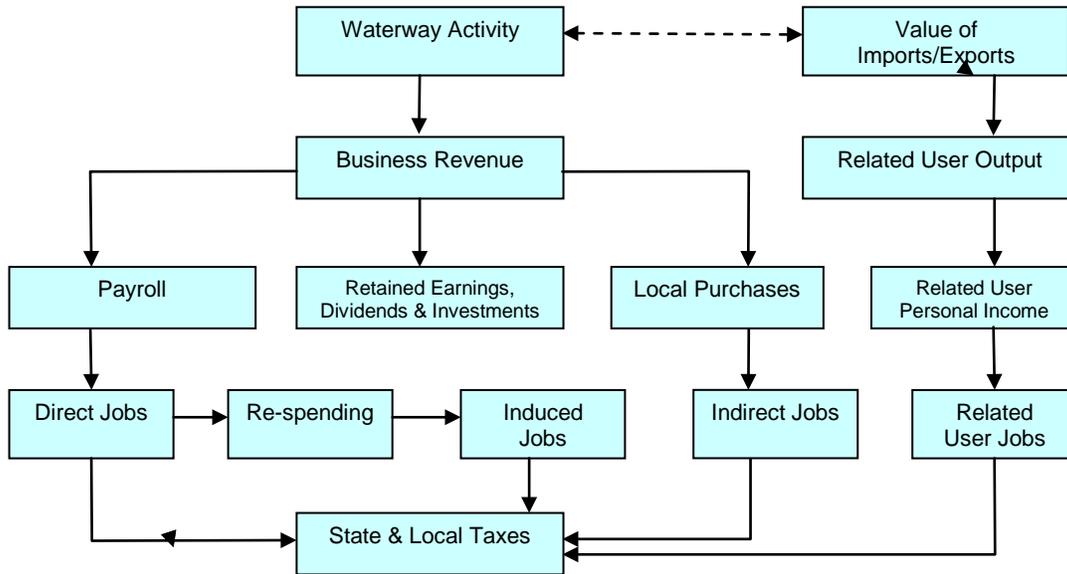
As a result of the cargo and industrial activity at Indiana waterway terminal facilities, a total of \$806.3 million of state and local tax revenue was generated. A further \$130.6 million of related taxes bring the total state and local taxes that are in some way related to maritime and cargo activity to over \$936.9 million.

³The 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 the area. For instance, when a dockworker purchases groceries, the entire value of his purchase is included in the re-spending impact, but only a portion of that is used to pay the wages of grocery store employees. The rest of that money is applied to the wholesale cost of goods purchased, used to pay the grocery store's utility bills, etc. Hence, to divide the re-spending by induced employees would result in an overestimated average salary.

II. ECONOMIC IMPACTS OF INDIANA WATERBORNE ACTIVITY

Waterborne cargo activity at a port or cargo terminal contributes to the state economy by generating business revenue to local and national firms providing vessel and cargo handling services at the 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 maritime terminals generates impacts throughout the local, state and national economies. As this exhibit indicates, the impact of waterborne shipping on a local, state or national economy cannot be reduced to a single number, but instead 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 Indiana waterway facilities generates the four impacts.

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



At the outset, activity at the maritime terminals 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 stockholders, 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, in lease payments by tenants, and wharfage and dockage fees paid to a port.

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

- ***Direct employment impact*** -- jobs directly generated by waterway activity. Direct jobs generated by cargo include jobs with railroads and trucking companies moving cargo between inland origins and destinations and the terminals, longshoremen and dockworkers, steamship agents, 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 Indiana maritime terminals were to be discontinued.
- ***Induced employment impact*** -- jobs created throughout the local economy because individuals directly employed due to maritime 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 in-state purchases.
- ***Indirect Jobs*** -- are 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 User jobs*** are jobs with shippers and consignees (exporters and importers) including the state's manufacturing, farming, retail, wholesale, distribution industries, and the in-state industries 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 Ports of Indiana shippers and consignees impacts involve the import and export of steel, coal, grain, fertilizers, salt, limestone and miscellaneous dry and liquid bulk commodities. A large number of dependent steel users are already accounted for in the port tenant/dependent user category due to the fact that the Ports of Indiana's Burns Harbor and Jeffersonville facilities maintain a large steel manufacturing and processing presence. ***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 break bulk 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 the 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.

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 the 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 local maritime 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 marine terminals.

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 marine terminals. These are the:

- Surface Transportation Sector;
- Maritime Services Sector;
- Port Tenants, Waterway Terminals and Dependent Shippers/Consignees Sector; and
- Ports of Indiana (Central Office/Administration).

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 marine 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 major participants in 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, a freight forwarder/customs house 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 transportation on the river system to port facilities.
- 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 a port. The agents arrange for medical and dental care of the crew, for ship supplies as well as payment of various expenses including port charges. 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 with ship supplies (food, clothing, nautical equipment, etc.);
 - Towing firms - provide the tug service to guide the vessel to and from port;
 - Pilots - assist in navigating the vessels to and from the maritime terminals;
 - Bunkering firms - provide fuel to the vessels;
 - Barge Fleeting/Cleaning – provide fleeting services for barges at the terminals;
 - 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:
 - Longshoremen & dockworkers - include members of the International Longshoremen's Association (ILA), International Union of Operating Engineers, International Brotherhood of Teamsters and United Steelworkers as well as those dockworkers with no union affiliation 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; and
 - Foreign Trade Zone (FTZ) tenants - operate facilities in the Ports of Indiana Foreign Trade Zones.
- Government Agencies: This service sector involves federal, state and local government agencies that perform services related to cargo handling and vessel/barge operations at the port. Department of Homeland Security (DHS), which includes Customs and Border Protection (CBP), U.S. Immigration and Customs Enforcement (ICE) and U.S. Coast Guard, U.S. Department of Agriculture (grain inspection) and the U.S. Army Corps of Engineers (USACE), are involved. These services are provided by the government offices located in the Great Lakes region.

1.3. Tenants, Terminals and Dependent Shipper/Consignees Sector

Tenant, terminal and shipper/consignee jobs consist of jobs with dependent shippers/consignees that operate cargo terminals on or near Indiana waterways, including steel mills and petroleum refineries as well as port tenants shipping and receiving cargo through the cargo terminals at the Port of Indiana facilities. The Ports of Indiana is unique in the fact that many of the tenants of each facility are users of the waterborne cargo handled at the ports docks. Furthermore, many of the operations performed by these tenants, specifically in the steel manufacturing and steel processing are inter-dependent upon each other. It is to be noted that only a portion of the raw materials and finished products used and produced by the port's tenants is received/shipped via

vessel or barge. There is also a large portion of this cargo that enters/leaves the port via rail and truck. However, the advantage of having access to the Great Lakes and Inland River System with the low-cost option of vessel and barge shipments, as well as the presence of other complementary tenants, is a key attribute in attracting and maintaining such a strong tenant base at Ports of Indiana facilities. The Ports of Indiana has, over the years, been successful in creating a steel processing campus at Burns Harbor and Jeffersonville, and therefore, for the purpose of this analysis, all of the port tenant and dependent shipper/consignee jobs are included.

1.4. Ports of Indiana

The Ports of Indiana includes those individuals employed by the port whose purpose is to oversee port activity at the port's cargo and industrial terminals.

2. COMMODITIES INCLUDED IN THE ANALYSIS

A major use of an economic impact analysis is to provide a tool for terminal development planning. As a port or terminal grows, available land and other resources for 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 RoRo 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 development plans. Because of this need for understanding relative commodity impacts, economic impacts are estimated for the following commodities handled at the public and private cargo terminals:

- Steel coils;
- Ore;
- Steel slabs;
- Plate and other steel;
- Coal and coke;
- Project Cargo and miscellaneous break bulk;
- Grain and soybeans;
- Bulk metals and scrap;
- Fertilizer;

- Cement;
- Limestone and other dry bulks;
- Salt; and
- Other liquid bulks.

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 may occur at a terminal that is multi-use and cannot be attributed to a specific commodity. Similarly, law enforcement and security operations cannot be attributed to a single commodity.

3. MARITIME CARGO EMPLOYMENT IMPACTS

Employment generated by maritime cargo activity on Indiana waterways is estimated.

- First, the total employment that is in some way related to maritime activity is estimated from the interview process of 147 Indiana waterway terminals, Port of Indiana tenants and service providers as well as data provided by the Ports of Indiana and USACE 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, steamship agents, chandlers, surveyors, etc;
 - The direct job impact is estimated for each of the key commodities/commodity groups;
- Induced and indirect jobs are estimated; and
- Finally, jobs related to the maritime activity at the cargo terminals are described.

It is estimated that 155,169 jobs are in some way related to the maritime activity at the cargo terminals on Indiana waterways. Of the 155,169 jobs:

- 31,635 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.
- 40,447 jobs (induced jobs) are supported by the local purchases of the 31,635 individuals

directly generated by port activity at the cargo terminals. An additional 43,531 indirect jobs were supported by nearly \$3.9 billion of purchases in the state of Indiana by firms providing direct cargo handling and vessel/barge services. Direct, induced and indirect categories total 115,613 jobs. These are the jobs that may be considered dependent upon Indiana waterway activity and would experience immediate disruption if that activity were to cease.

- 39,557 jobs are related to inbound and outbound cargoes transiting Indiana waterway facilities. These jobs are supported in the state's steel processing, manufacturing, farming, construction, retail, wholesale and distribution industries, and the in-state industries supporting the movement and distribution of all commodities, primarily concentrated with steel, coal, grain, limestone, salt and fertilizer cargo imports and exports using Indiana waterway terminals.

3.1. Direct Maritime Cargo Jobs

In CY2013, about 64.9 million tons of domestic and foreign waterborne cargo moved via Indiana waterways. As a result of this activity, 31,635 full-time jobs were directly created⁴. These jobs would vanish immediately if shipping operations on Indiana waterways were to cease.

Most of the 31,635 jobs considered to be generated directly by maritime activity can be associated with the handling of specific commodities or commodity groups. Certain employment categories such as government employees and maritime construction firms cannot be identified with a specific commodity. As a result, employment in these groups (which totaled 2,401) was not allocated to specific commodity. Exhibit II-2 presents the relative employment impacts in terms of commodity groups.

⁴ Jobs are measured in terms of full-time worker equivalents. If a worker is employed only 50 percent of the time by activity at a cargo terminal, then this worker is counted as .5 jobs.

Exhibit II-2 Direct Employment by Commodity, 2013*

	LAKESHORE	OHIO RIVER	TOTAL INDIANA
STEEL COILS	6,909	757	7,666
ORE	7,511	0	7,511
PLATE/OTHER STEEL	414	80	494
SLAB	248	0	248
COAL/COKE	2,493	1,068	3,561
OTHER BREAKBULK/PROJECT CARGO	14	988	1,002
GRAIN/SOYBEANS	37	1,272	1,309
BULK METALS/SCRAP	346	48	394
FERTILIZER	49	547	596
CEMENT	0	60	60
LIMESTONE/OTHER DRY BULK	1,192	2,617	3,809
SALT	12	57	69
LIQUID BULKS	1,079	1,435	2,514
NOT COMMODITY SPECIFIC	80	2,321	2,401
TOTAL	20,383	11,252	31,635

*Totals may be rounded.

As this exhibit shows, steel coils and iron ore generate the largest employment impacts followed by limestone/other dry bulks and coal/coke.

3.2. Induced Jobs

The 31,635 directly employed individuals due to activity at the cargo terminals received \$1.7 billion of 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, 40,447 induced jobs in the regional economy were supported. The majority of the induced jobs are with 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 via purchases by directly employed individuals, the firms providing the direct services and employing the 31,635 direct jobs make in-state purchases and capital expenditures for goods and services. These purchases by the firms dependent upon the cargo facilities generated additional Indiana jobs – indirect jobs. Based on interviews, these firms made \$3.9 billion of local and in-state purchases and capital expenditures. These purchases created an additional 43,531 indirect jobs in the local economy.

3.4. Related User (Shipper/Consignee) Jobs

It is estimated that 39,557 jobs are supported in Indiana with shippers/consignees that use Indiana waterway facilities. To estimate the related user impact for cargo, the average value per ton of imports and exports was estimated using U.S. Maritime Administration, Foreign Trade Statistics and data from Ports of Indiana. The employment to value of output coefficient for the retail sector related to the exported and imported cargoes was then computed from Bureau of Economic Analysis, Regional Input-Output Model for the state of Indiana.

For break bulk cargoes, the associated consuming and producing industries were identified with each commodity. For example, for inbound iron and steel products, relationships were developed to convert the dollar value of these materials into a dollar value of output in the key consuming industries, which include construction and metal fabrication. 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 break bulk and bulk cargoes into a dollar value of output in the consuming industries in the state. 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 break bulk and bulk cargoes moving via the maritime terminals and remaining in (or produced in) the state of Indiana was converted into related shipper/consignee jobs with these users and associated supporting industries within the state. A similar methodology was used in estimating related user jobs for agricultural products.

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

It is to be further emphasized that when the impact models are used for planning purposes and sensitivity analysis, related jobs should not be used to judge the economic benefits of a particular project. Related jobs are not estimated with the same degree of defensibility as are the direct, induced and indirect jobs. Therefore, only these three types of job impacts should be used in evaluating port investments. The purpose of the related jobs estimate is to provide a proxy for the magnitude of the more general economic development impact of the private and public port facilities.

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

The 64.9 million tons of steel, general cargo and bulk (dry and liquid) cargo handled on Indiana waterway 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 outbound cargo to the terminals and distributing the inbound 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 and repairs to vessels/barges calling on the terminals. The Ports of Indiana receives revenue from terminal leases and port charges such as wharfage and dockage assessed on cargo and vessels. In addition, revenue is received by dependent shippers/consignees from the sales of cargo shipped or received via the cargo terminals and from the sales of products made with raw materials received through the terminals. Since this chapter is concerned with the revenue generated from providing maritime services, the shipper/consignee revenue (i.e., the value of the cargo shipped or received through the waterway terminals, as well as the value of the products produced by the port-dependent shippers/consignees) will be excluded from the remaining discussion.

The revenue generated by port and waterway terminal activity consists of many components. For example, gross revenue is used to pay employee salaries and taxes. It is also 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 dependent upon the maritime activity. The balance of the revenue is distributed in the form of payments to firms located outside the state of Indiana 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 state of Indiana 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 of Indiana, 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).

The revenue impact is a measure of the *total economic activity* in the state that is generated by the cargo moving via Indiana waterways. In 2013, maritime cargo and port industrial activity on Indiana waterways and related activities generated a total of \$21.5 billion of total economic activity in the state. Of the \$21.5 billion, \$2 billion is the direct business revenue received by the firms directly dependent upon the terminals and providing maritime services and inland transportation services to the cargo handled at the maritime terminals and the vessels calling on the

terminals, while another \$12.6 billion of revenue is generated by the waterway shippers, port tenants and on-site dependent shippers/consignees. The remaining \$6.8 billion represents the value of the output to the state of Indiana that is created due to the cargo moving via the port and waterway terminals. 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 marine terminals and are consumed by industries within the state of Indiana.

Exhibit II-3 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-3 Direct Revenue by Commodity, 2013*

	LAKESHORE	OHIO RIVER	TOTAL INDIANA
STEEL COILS	\$285,645,963	\$40,972,901	\$326,618,865
ORE	\$334,198,075	\$0	\$334,198,075
PLATE/OTHER STEEL	\$20,810,174	\$6,996,809	\$27,806,983
SLAB	\$12,891,369	\$0	\$12,891,369
COAL/COKE	\$101,323,560	\$269,201,662	\$370,525,222
OTHER BREAKBULK/PROJECT CARGO	\$374,716	\$1,100,833	\$1,475,549
GRAIN/SOYBEANS	\$5,272,735	\$194,550,244	\$199,822,979
BULK METALS/SCRAP	\$15,784,859	\$5,975,109	\$21,759,968
FERTILIZER	\$4,144,747	\$45,238,545	\$49,383,292
CEMENT	N/A	\$3,804,159	\$3,804,159
LIMESTONE/OTHER DRY BULK	\$84,926,384	\$137,426,197	\$222,352,580
SALT	\$1,136,216	\$4,642,464	\$5,778,680
LIQUID BULKS	\$25,777,811	\$31,818,661	\$57,596,472
NOT COMMODITY SPECIFIC	\$11,212,999	\$405,429,352	\$416,642,350
TOTAL	\$903,499,607	\$1,147,156,935	\$2,050,656,543

*Totals may be rounded.

As this exhibit indicates coal and coke generate the largest direct revenue impacts, followed by iron ore and steel coils.

5. PERSONAL EARNINGS IMPACTS

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 \$1.7 billion in personal wage and salary earnings. It is important to emphasize that the average annual earnings of a marine terminal-dependent job is \$54,660. By comparison, based on data

available from the Bureau of Labor Statistics (BLS), the annual mean wage for all occupations in Indiana was \$41,470 in 2013.⁵ 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 re-spending 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 \$2.87 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 \$3.87 was used to estimate the total income and consumption impact of nearly \$5 billion, inclusive of the re-spending effect. This additional re-spending of the direct income generates the 40,447 induced jobs.

The 43,531 indirect job holders earned \$1.8 billion in indirect wages and salaries. The 39,557 related shipper/consignee jobs tied to cargo moving via marine terminals received nearly \$1.4 billion of personal income.

Therefore, the total personal income impact and consumption impact created by Indiana waterway cargo shipments and related industrial activity is estimated at just under \$10 billion. However, it must again be emphasized that the \$1.4 billion received by the related shipper/consignee jobs cannot be said to be dependent upon Indiana's maritime industry.

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 Indiana was developed by applying indices from the Tax Foundation⁶ to dependent and related incomes. These indices represent total state and local taxes paid by residents as a percent of total personal income.

Cargo and marine terminal activity generated \$806.3 million of state, county and local taxes. As a result of the economic activity created by the related shipper/consignees, an additional \$130.6 million of state and local taxes were generated for a total cargo tax impact of \$936.9 million. The State of Indiana receives approximately 64.4% of the tax revenues while local governments received

⁵ May 2013, State Occupational Employment and Wage Estimates, Indiana. Bureau of Labor Statistics.

⁶ Tax Foundation, *Indiana's State and Local Tax Burden*, < <http://taxfoundation.org/article/indianas-state-and-local-tax-burden>>

35.6% of the tax impact as illustrated in Exhibit II-4.⁷

Exhibit II-4 CY2014 Distribution of State and Local Tax Revenue*

TAXES BY CATEGORY	STATE	LOCAL	TOTAL
DIRECT, INDUCED & INDIRECT	\$519,236,601	\$287,031,413	\$806,268,014
RELATED	\$84,136,996	\$46,510,513	\$130,647,510
TOTAL TAXES	\$603,373,598	\$333,541,927	\$936,915,524

*Totals may be rounded

⁷ United States Census Bureau, 2012 *Census of Governments: State & Local Finances*.

APPENDIX A - TONNAGES BY COMMODITY AND BY MODE OF TRANSPORTATION

Exhibit A-1 breaks down the mode of transportation of the 64.9 million tons of maritime cargo handled at Indiana facilities. It also includes other related truck and rail movements. It is important to note that many commodities are handled multiple times, and thus this method can duplicate counts of certain commodities. For instance, steel coils may be trucked in, processed and then trucked out, or grain may be received by truck and shipped out by water. *The table reflects the total waterborne and inland moves at Indiana marine facilities and is included to solely provide the reader with greater context concerning movement of cargoes to and from the state's terminals.*

Exhibit A-1 Tons by Mode of Transportation to or from Indiana Maritime Facilities, 2013*

TONNAGES (1,000)	WATER TONS	TRUCK TONS	RAIL TONS
STEEL COILS	985	12,275	6,229
ORE	22,962	156	0
PLATE/OTHER STEEL	172	593	583
SLAB	197	398	171
COAL/COKE	19,627	146	12,404
OTHER BREAKBULK/PROJECT CARGO	12	38	1
GRAIN/SOYBEANS	4,089	3,704	2,063
BULK METALS/SCRAP	248	1,015	324
FERTILIZER	1,668	1,653	215
CEMENT	169	169	0
LIMESTONE/OTHER DRY BULK	11,653	4,060	396
SALT	244	147	0
LIQUID BULKS	<u>2,929</u>	<u>411</u>	<u>431</u>
TOTAL	64,955	24,766	22,819

*Totals may be rounded.

Source: U.S. Army Corps of Engineers, Indiana State Profile; Martin Associates

APPENDIX B – IMPACTS OF BARGE TRAFFIC

Exhibits B-1 depicts the economic impacts generated by barge traffic at terminals located on the Indiana Lakeshore of Lake Michigan. In 2013, just over 2 million tons of cargo was shipped to or from Lakeshore terminals by barge through the Chicago Area Waterway System (CAWS.) Barge tonnage moving via the CAWS was isolated based on interviews with terminal operators/tenants, Ports of Indiana barge data, and historical United States Army Corps of Engineers Waterborne Commerce Statistics. The isolated tonnages for each were then used as the input in the Martin Associates sensitivity model to attain these impacts. These results can be interpreted as the immediate impact that would occur should the CAWS be closed to barge traffic.

It is important to note that subtracting the CAWS and St. Lawrence Seaway (Appendix C) impact subsets from the total Indiana Lakeshore impact does not equate to the laker impact. Due to the complexities of the port industries, especially steel manufacturing, multiple modes may be used to source materials or deliver finished product. Also, these impact summary tables do not include related impacts since they are not dependent upon maritime activity to the same extent as the direct, induced and indirect impacts. For instance, we cannot assume that steel manufacturers or grain farmers would cease operating in the short term due to the loss of the ability to ship their products by river barge. By diverting their goods to rail or truck, they would be subjected to higher transportation costs. Over the medium to long term these costs could render their operations less competitive which could result in dislocation of Indiana jobs, however these impacts cannot be measured defensibly.

Exhibit B-1 Economic Impact of Barge Traffic to the Indiana Lake Michigan, 2013*

	LAKE MICHIGAN CAWS IMPACTS
JOBS	
DIRECT	3,175
INDUCED	3,839
INDIRECT	5,094
TOTAL JOBS	12,107
PERSONAL INCOME	
DIRECT	\$162,317,709
INDUCED/RE-SPENDING	\$466,111,533
INDIRECT	\$214,291,739
TOTAL PERSONAL INCOME	\$842,720,980
VALUE OF ECONOMIC ACTIVITY	
BUSINESS SERVICES REVENUE	\$363,813,817
TENANT/DEPENDENT SHIPPER REVENUE	\$760,608,576
TOTAL VALUE OF ECONOMIC ACTIVITY	\$1,124,422,393
LOCAL PURCHASES	\$423,634,107
STATE & LOCAL TAXES	\$80,058,493

*Totals may be rounded.

APPENDIX C – IMPACTS OF INTERNATIONAL SEAWAY TRAFFIC

Exhibit C-1 depicts the economic impacts generated by international “salties” at terminals on the Indiana Lakeshore of Lake Michigan. In 2013, over 176,000 tons of cargo moved on internationally-flagged “salties” via the Saint Lawrence Seaway. Salty tonnages moving through the Seaway were isolated based on interviews with terminal operators/tenants, Ports of Indiana barge data, and historical United States Army Corps of Engineers Waterborne Commerce Statistics. The isolated tonnages for each were then used as the input in the Martin Associates sensitivity model to attain these impacts. These results can be interpreted as the immediate impact that would occur should the Saint Lawrence Seaway be closed to international “salty” traffic.

It is important to note that subtracting the CAWS (Appendix B) and St. Lawrence Seaway impact subsets from the total Lakeshore impact does not equate to the laker impact. Due to the complexities of the port industries, especially steel manufacturing, multiple modes may be used to source materials or deliver finished product. Also, these impact summary tables do not include related impacts since they are not dependent upon maritime activity to the same extent as the direct, induced and indirect impacts. For instance, we cannot assume that steel manufacturers or grain farmers would cease operating in the short term due to the loss of the ability to ship their products through the Seaway. By diverting their goods to rail or truck, they would be subjected to higher transportation costs. Over the medium to long term these costs could render their operations less competitive which could result in dislocation of Indiana jobs, however these impacts cannot be measured defensibly.

Exhibit C-1 Economic Impact of Salty Traffic to Lake Michigan, 2013*

LAKE MICHIGAN SALTY IMPACTS	
JOBS	
DIRECT	479
INDUCED	595
INDIRECT	<u>768</u>
TOTAL JOBS	1,841
PERSONAL INCOME	
DIRECT	\$25,287,072
INDUCED/RE-SPENDING	\$72,614,357
INDIRECT	<u>\$32,309,655</u>
TOTAL PERSONAL INCOME	\$130,211,085
VALUE OF ECONOMIC ACTIVITY	
BUSINESS SERVICES REVENUE	\$49,776,684
TENANT/DEPENDENT SHIPPER REVENUE	<u>\$108,658,368</u>
TOTAL VALUE OF ECONOMIC ACTIVITY	\$158,435,052
LOCAL PURCHASES	\$63,873,073
STATE & LOCAL TAXES	\$12,370,053

*Totals may be rounded.

APPENDIX D – PEER REVIEW LETTERS



**KELLEY SCHOOL
OF BUSINESS**

INDIANA UNIVERSITY
Institute for International Business

Mr. Jody Peacock, Vice President
Ports of Indiana
150 West Market Street, Suite 100
Indianapolis, IN 46204

November 18, 2015

Dear Mr. Peacock:

Thank you for the opportunity to review the May 8, 2015, draft reports "The Local and Regional Economic Impacts of the Ports of Indiana" and "The Local and Regional Economic Impacts of the Indiana Maritime Industry," both prepared by Martin Associates of Lancaster, Pennsylvania. These are comprehensive and in-depth analyses of the three commercial ports in the state. Based primarily on 2014 data, the studies find that the direct, induced, and indirect jobs that are associated with the three ports total 40,504. Personal incomes from these three job categories totaled approximately \$2.8 billion in 2014 and were responsible for \$268 million in state and local taxes. These are significant amounts, and the fact that these are impacts that continue each year indicates the important place that the ports and related activities have on their nearby communities and the state as a whole.

The study also assigns 19,428 "related jobs" to the ports, but this concept is less well-accepted as a component of most economic impact studies. In its final version of the reports, Martin Associates makes the distinction clear and indicates that it is likely that these jobs would continue to exist even if companies find alternative shipping options.

I find the reports to be well organized and clearly written with excellent summary tables and charts. Martin Associates generally explains its methodology clearly and presents its results in an effective way. I am impressed with the study, its approach, and the clarity of the results. It is a professional analysis, and the authors were responsive to suggestions and concerns that I raised in an earlier draft. In particular, they now include summary results from their earlier study of Burns Harbor, which allows the reader to see how the port has developed in the last decade.

I have conducted more than 10 economic impact studies of organizations, sports events, and other economic activities in the state, and I am familiar with published theoretical and empirical studies of economic impact. The Martin Associations studies are "standard" in this regard. However, unlike published academic studies, which generally require that the underlying detailed data and methodology be shared with other scholars, for both verification and replication purposes, Martin Associates, as a private organization, does not share details about responses, aspects of its methodology, or even the survey questions that are used to collect information from businesses at or associated with port operations.

Thank you for the opportunity to review and evaluate these studies.

Sincerely yours,

Bruce L. Jaffee
Professor of Business Economics
Executive Director Emeritus
Institute for International Business



Richard A. Jensen
Gilbert F. Schaefer Professor
Department of Economics
Notre Dame, IN 46556
email: rjensen1@nd.edu

December 15, 2015

Peer Review Letter of Endorsement

In response to a request from Mr. Jody Peacock, Vice President, Ports of Indiana, I reviewed and provided comments on of the following studies: "The Economic Impacts of the Ports of Indiana," dated September 8, 2015; and "The Economic Impacts of the Indiana Maritime Industry," dated May 8, 2015.

My comments included suggestions for improvement during the process, including adding more explanations for complex issues and terms which are well-known to economists, but might seem mysterious to the non-specialist. They also included requests for more detailed explanations for why the data across the two studies presented might seem contradictory, but are not when one understands the different time periods considered in each study. These suggested changes were incorporated into the final versions of these studies, which I also have thoroughly reviewed.

These studies use standard, well-accepted techniques to measure the economic benefits that result from the operations of the ports of Indiana. There is nothing controversial about the methodology used. The studies also use data that is readily available, so their results can be easily replicated by anyone who wants to verify them.

My expertise in this area of economics arises from 40 years of publishing original research and teaching in the area of industrial economics. For 19 years I served on the editorial board of the *International Journal of Industrial Organization*, an academic journal that publishes peer-reviewed studies on industrial economics. For six of these years I served as a co-editor, making final decisions about which articles this journal published. I also served as chair of Economics at Notre Dame from 2001-2014.

Martin Associates appears to have extensive experience in conducting studies of the economic benefits of maritime activities, and uses best-practice methods and data. The results are presented clearly and should provide valuable information for future discussions of the economic benefits of maritime shipping for the State of Indiana.

A handwritten signature in cursive script that reads "Richard A. Jensen".

Richard A. Jensen
Gilbert F. Schaefer Professor of Economics
Department of Economics
University of Notre Dame

PURDUE
UNIVERSITY
CALUMET

November 9, 2015

Peer Review Letter of Endorsement

To Whom It May Concern:

I am very pleased to review the following economic impact studies conducted by Martin Associates of Lancaster, titled:

- "The Local and Regional Economic Impacts of the Indiana Maritime Industry"
- "The Local and Regional Economic Impacts of the Ports of Indiana"

The first study evaluated the economic impacts of the shipping volumes and economic activities during 2014 of the state's three public ports on the Ohio River and Lake Michigan: Port of Indiana-Burns Harbor; Port of Indiana-Mount Vernon; and, Port of Indiana-Jeffersonville. The second study focused on all Indiana's maritime terminals (public and private) along the Ohio River and Lake Michigan shorelines, based on 2013 shipping data, which is the most recent available data from the U.S. Corps of Engineers.

My review of the two studies consisted of two sections. First, general comments applicable to both the studies were made. These were related to the scope of the studies, definitions of port and terminal activities, and methodologies. Second, specific comments for each study were made related to data on trucking activities, capital investment, commodity flows, and sensitivity analyses. The overall goal of this review was to help improve the reports on the different types of economic impacts. The author satisfactorily responded and revised both the reports. I have reviewed the final reports and can endorse these studies as sound measurements for the economic impacts of the Ports of Indiana and the Indiana Lakeshore shipping activities.

My background and expertise are in the fields of transportation and economic development. My past research experience includes economic impact studies of the transportation, distribution and logistics industry in Northwest Indiana. Recently, I was a Co-PI of a U.S. DOT study on the estimation of economic impacts of improved freight reliability and security and of natural and man-made disruptions to inter-modal freight systems. The economic impacts of the Ports of Indiana are an integral component of the total economic impacts in the Indiana freight network system.

Please do not hesitate to contact me if you have any questions. Thank you.

Respectfully submitted by:



Amlan Mitra, Ph.D.
Professor of Economics
Member, Transportation Research Board, National Academy of Sciences

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