

**ECONOMIC IMPACTS OF WATERBORNE SHIPPING  
ON THE INDIANA LAKESHORE**

**August 2010  
Calendar Year 2008**

**Prepared for:  
PORTS OF INDIANA**

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# **ECONOMIC IMPACTS OF WATERBORNE SHIPPING ON THE INDIANA LAKESHORE**

*Study prepared by Martin Associates – August 2010*

*Peer Reviewed by Economics Professors from the Universities of Indiana, Notre Dame and Purdue*

## **I. EXECUTIVE SUMMARY**

Martin Associates was retained by the Ports of Indiana to measure the local, regional and state economic impacts generated by maritime activity of the Indiana Lakeshore terminals including the Port of Indiana-Burns Harbor tenant base. 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 2008, according to the U.S. Army Corps of Engineers Waterborne Commerce Statistics, about 32 million tons of foreign and domestic cargo shipments were handled on the Indiana Lakeshore including facilities located at Burns Harbor, Indiana Harbor, Buffington Harbor and Gary (this includes 1.9 million tons that moved via the Inland Waterways System through O'Brien Lock). The majority, about 78% of this tonnage, was iron ore pellets discharged by laker vessels to the various steel mills along the Indiana Lakeshore. It should also be noted that 2008 was the most current year of data available for all shipping modes at the time of this study and that the 32 million tons of cargo handled that year were less than the previous 4-year average of 34.2 million tons. Similarly, the 1.9 million barge tons were less than the average of 3.0 million tons over the same 2004-2007 period.

The study employs methodology and definitions that have been used by Martin Associates to measure economic impacts at more than 250 ports in the United States and Canada, and at the leading U.S. airports. 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 port tenants, lakeshore shippers and firms providing cargo and logistics services on the Indiana Lakeshore. Specific re-sponding models have been developed for the Indiana 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 were not used. Instead, the resulting impacts reflect the uniqueness of the individual port operations, as well as the surrounding regional economy.

The Indiana Lakeshore is unique in the fact that three separate modes of waterborne commerce are currently used in the shipping 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 contracts and levels of manufacturing.

While the balance of this report details the economic impact of the Indiana Lakeshore waterborne shipping activity, key findings from the CY2008 analysis include the following:

**Annual Economic Impact of Waterborne Shipping on Indiana’s Lakeshore:**

- 104,567 direct, induced, indirect and related jobs;
- \$14.2 billion of economic activity to the state;
- \$567 million of state and local tax revenue; and
- 17,655 jobs and \$1.9 billion in economic activity attributed to Indiana barge movements through the O’Brien Lock

**Economic Impacts of Waterborne Shipping Activity on Indiana’s Lakeshore**

*Based on economic data from CY2008\**

| CATEGORY                         | SHIP ACTIVITY<br>(LAKER & SALTY) | BARGE ACTIVITY<br>VIA O'BRIEN LOCK | TOTAL MARITIME<br>SHIPMENTS |
|----------------------------------|----------------------------------|------------------------------------|-----------------------------|
| DIRECT JOBS                      | 17,443                           | 3,394                              | 20,837                      |
| TOTAL JOBS                       | 86,912                           | 17,655                             | 104,567                     |
| DIRECT PERSONAL INCOME           | \$781,620,212                    | \$141,502,699                      | \$923,122,911               |
| TOTAL PERSONAL INCOME            | \$5,145,679,348                  | \$890,168,403                      | \$6,035,847,751             |
| LOCAL PURCHASES                  | \$1,889,242,899                  | \$227,006,700                      | \$2,116,249,599             |
| TOTAL STATE & LOCAL TAXES        | \$483,693,859                    | \$83,675,830                       | \$567,369,689               |
| TOTAL VALUE OF ECONOMIC ACTIVITY | \$12,287,459,456                 | \$1,909,005,610                    | \$14,196,465,066            |

\*Totals may be rounded.

*This study was conducted by Martin Associates, 941 Wheatland Ave., Ste. 203, Lancaster, PA 17603.*

*The following university professors provided input and peer reviews of the analysis:*

- 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

## **II. INTRODUCTION AND OVERVIEW**

Martin Associates was retained by the Ports of Indiana to measure the local, regional and state economic impacts generated by maritime activity of the Indiana Lakeshore terminals including the Port of Indiana-Burns Harbor tenant base. 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 2008, according to the U.S. Army Corps of Engineers (USACE) Waterborne Commerce Statistics, about 32 million tons of foreign and domestic cargo shipments were handled on the Indiana Lakeshore including facilities located at Burns Harbor, Indiana Harbor, Buffington Harbor and Gary (this includes 1.9 million tons that moved via the Inland Waterways System through the O'Brien Lock). The majority, about 78% of this tonnage, was iron ore pellets discharged by laker vessels to the various steel mills along the Indiana Lakeshore. It should also be noted that 2008 was the most current year of data available for all shipping modes and that the 32 million tons of cargo handled in 2008 was less than the previous 4-year average of 34.2 million tons. Similarly, the 1.9 million barge tons were less than the average of 3.0 million tons over the same 2004-2007 period.

The study employs methodology and definitions that have been used by Martin Associates to measure the economic impacts of port 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 tenants and the firms providing cargo and logistics services on the Indiana Lakeshore. Specific re-spending models have been developed for the Indiana 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 were not used. Instead, the resulting impacts reflect the uniqueness of the individual port operations, as well as the surrounding regional economy.

The results of the economic impact studies are used not only to identify the importance and job generation aspects of the maritime community, but the cargo impact models are used to assess the impacts of alternative master plan development recommendation, the impact of changing tonnage levels, annual updates, the impact of new cargoes/services, and the justification of capital development projects.

The Indiana Lakeshore is unique in the fact that three separate modes of waterborne commerce are currently used in the shipping and receipt of raw materials and finished product. 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 the Indiana Lakeshore waterborne shipping activity, key figures from the CY2008 analysis include the following:

**Annual Economic Impact of Waterborne Shipping on Indiana’s Lakeshore:**

- 104,567 direct, induced, indirect and related jobs;
- \$14.2 billion of economic activity to the state;
- \$567 million of state and local tax revenue; and
- 17,655 jobs and \$1.9 billion in economic activity attributed to barge movements through the O’Brien Lock.

## 1. IMPACT DEFINITIONS

The impacts are measured separately for the Indiana Lakeshore 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, Related Jobs**

**Direct jobs** are those that would not exist if activity at the port cargo and lakeshore 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 Lakeshore 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 shipper/consignee (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 Lakeshore 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 Indiana Lakeshore’s facilities, including the Port of Indiana-Burns Harbor, 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 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 and lakeshore activity, and includes a respending impact which measures the personal consumption activity in Indiana of those directly employed as the result of Indiana Lakeshore 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 lakeshore terminals are included.

- **State and local taxes** include taxes paid by individuals as well as firms dependent upon Indiana Lakeshore 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 more than 250 seaports including:

*Los Angeles, CA  
Long Beach, CA  
Oakland, CA  
Portland, OR  
Seattle, WA  
Sacramento, CA  
San Francisco, CA  
Vancouver, BC  
Vancouver, WA  
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 impacts of the Indiana Lakeshore presented in this 2008 report were estimated based on telephone and personal interviews with 94 firms in the respective region. This represents the universe of cargo and related industrial businesses (with the exception of trucking firms) on the Indiana Lakeshore including Burns Harbor, Indiana Harbor, Buffington Harbor and Gary. It is to be emphasized that a 99% response rate was achieved from these firms located in the port as well as those on the Indiana Lakeshore reporting significant maritime cargo volumes.

In order to estimate the share of impacts in terms of lake activity (laker traffic and international cargo through the St. Lawrence Seaway) and O'Brien Lock (cargo moving by barge via the Inland Waterway System), Martin Associates estimated the percentage of waterborne tonnage throughputs by commodity as identified by the USACE for the CY2008 period. This share of lake versus O'Brien Lock tonnage was then appropriated to each commodity group and resulting lakeshore shipper/consignee, as well as commodity-specific job sectors such as terminal employees, dockworkers and maritime service providers. The results of this analysis provide an estimation of the economic impacts for lake shipments versus O'Brien Lock shipments.

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 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. Additional data collected from the Indiana lakeshore 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:

- 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 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 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 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 CY2008 – based on the latest USACE data available, 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 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.

#### 4. SUMMARY OF RESULTS

Exhibit I-1 provides a breakdown by shipping on the lake and through the O'Brien Lock for the economic impact analysis of the maritime activity at Indiana Lakeshore facilities.

Exhibit I-1 Economic Impact of Indiana Lakeshore Waterborne Shipping Activity CY2008\*

| CATEGORY                                | LAKE<br>ACTIVITY        | THROUGH<br>O'BRIEN LOCK | TOTAL<br>LAKESHORE      |
|---|-------------------------|-------------------------|-------------------------|
| <b>JOBS</b>                             |                         |                         |                         |
| DIRECT                                  | 17,443                  | 3,394                   | 20,837                  |
| INDUCED                                 | 23,845                  | 4,351                   | 28,197                  |
| INDIRECT                                | 23,896                  | 2,871                   | 26,768                  |
| RELATED USER                            | 21,728                  | 7,038                   | 28,766                  |
| <b>TOTAL JOBS</b>                       | <b>86,912</b>           | <b>17,655</b>           | <b>104,567</b>          |
| <b>PERSONAL INCOME</b>                  |                         |                         |                         |
| DIRECT                                  | \$781,620,212           | \$141,502,699           | \$923,122,911           |
| INDUCED                                 | \$2,657,039,750         | \$481,024,275           | \$3,138,064,025         |
| INDIRECT                                | \$994,721,789           | \$119,523,281           | \$1,114,245,071         |
| RELATED USER INCOME                     | \$712,297,597           | \$148,118,147           | \$860,415,744           |
| <b>TOTAL PERSONAL INCOME</b>            | <b>\$5,145,679,348</b>  | <b>\$890,168,403</b>    | <b>\$6,035,847,751</b>  |
| <b>VALUE OF ECONOMIC ACTIVITY</b>       |                         |                         |                         |
| BUSINESS SERVICES REVENUE               | \$431,756,656           | \$371,520,213           | \$803,276,869           |
| TENANT/DEPENDENT USER REVENUE           | \$9,761,986,933         | \$853,334,510           | \$10,615,321,443        |
| RELATED USER OUTPUT                     | \$2,093,715,867         | \$684,150,887           | \$2,777,866,754         |
| <b>TOTAL VALUE OF ECONOMIC ACTIVITY</b> | <b>\$12,287,459,456</b> | <b>\$1,909,005,610</b>  | <b>\$14,196,465,066</b> |
| <b>LOCAL PURCHASES</b>                  | <b>\$1,889,242,899</b>  | <b>\$227,006,700</b>    | <b>\$2,116,249,599</b>  |
| <b>STATE &amp; LOCAL TAXES</b>          |                         |                         |                         |
| DIRECT, INDUCED AND INDIRECT            | \$416,737,885           | \$69,752,724            | \$486,490,609           |
| RELATED USER TAXES                      | \$66,955,974            | \$13,923,106            | \$80,879,080            |
| <b>TOTAL STATE AND LOCAL TAXES</b>      | <b>\$483,693,859</b>    | <b>\$83,675,830</b>     | <b>\$567,369,689</b>    |

\*Totals may be rounded.

In 2008, waterborne shipping at Indiana Lakeshore facilities supported 104,567 jobs in the region. Of these jobs, 20,837 jobs were directly created by cargo shipping and related industrial activities, while another 28,197 induced jobs were generated in the state as a result of local purchases made by those directly employed by Indiana Lakeshore terminals and Ports of Indiana cargo and tenant activity. In addition, there were 26,768 indirect jobs supported in Indiana as the result of \$2.1 billion of local purchases. The waterborne cargo moving via the Indiana Lakeshore facilities supported 28,766 jobs throughout the State of Indiana. 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.

The 20,837 direct jobs received \$923.1 million of direct wage and salary income, for average earnings of \$44,300 per direct employee. As a result of local purchases with this \$923.1 million of direct wages and salaries, an additional \$3.1 billion of income and local consumption expenditures were created in the respective regions. It is this re-spending impact that supported the 28,197 induced jobs.<sup>1</sup> The indirect jobs holders received \$1.1 billion in personal income. Related users in the state received another \$860.4 million of personal income. In total, \$6.0 billion of personal income was created as the result of the Indiana Lakeshore waterborne shipping operations.

Local businesses received \$803.3 million of revenue from providing services to the cargo activity. Also, the terminal operators and port tenants generated nearly \$10.6 billion of revenue from processing and manufacturing activities at their facilities. In addition, \$2.8 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 the Indiana Lakeshore waterborne terminal facilities, a total of \$567.4 million of state and local tax revenue was generated.

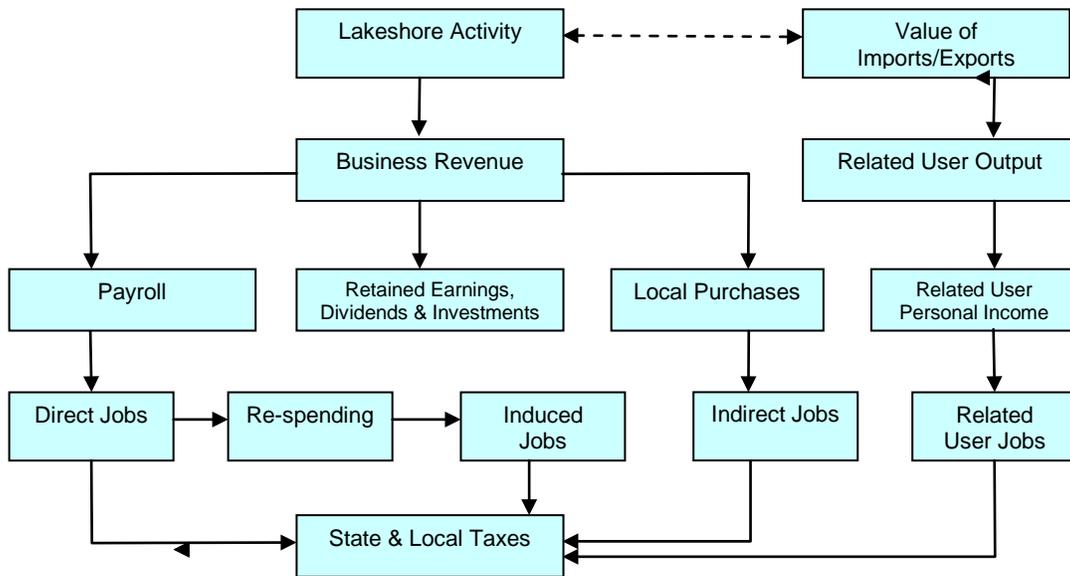
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<sup>1</sup>The induced income impact also includes local consumption expenditures and should not be divided by induced jobs to estimate the average salary per induced job. This re-spending throughout the region is estimated using a regional personal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

### III. ECONOMIC IMPACTS OF INDIANA LAKESHORE WATERBORNE ACTIVITY

Waterborne cargo activity at a port or cargo terminal contributes to the local and regional 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 the Indiana Lakeshore 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 port activity consists of four levels of job impacts:

- **Direct employment impact** -- jobs directly generated by lakeshore 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 Lakeshore 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 local and regional 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 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, coal, grain, fertilizer, limestone and salt imports and exports using the cargo terminals. ***Related jobs are not dependent upon the 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 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, Lakeshore 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/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 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.
  - Foreign Trade Zone (FTZ) tenants - operate facilities in the Ports of Indiana Foreign Trade Zone.
- 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. Port Tenants, Lakeshore Terminals and Dependent Shipper/Consignees Sector**

Port tenant and lakeshore terminals jobs consist of jobs with dependent shippers/consignees that operate cargo terminals on the Indiana Lakeshore including steel mills and petroleum refineries as well as port tenants shipping and receiving cargo through the cargo terminals at the Port of Indiana-Burns Harbor facilities. The Ports of Indiana is unique in the fact that many of the tenants of each facility, specifically at Burns Harbor, 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 of 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 therefore, for the purpose of this analysis, all of the port tenant 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 RO/RO require a large amount of paved, open storage space, while certain types of breakbulk 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;
- IRON ORE;
- WIRE/STRUCTURAL STEEL;
- STEEL SLABS;
- COAL/COKE;
- PROJECT CARGO/MISCELLANEOUS BREAKBULK;
- GRAIN/SOYBEANS;
- BULK METALS/SCRAP;
- FERTILIZER;
- PETROLEUM PRODUCTS;
- CEMENT;
- LIMESTONE/OTHER DRY BULK;
- 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 at the Indiana Lakeshore is estimated.

- First, the total employment that is in some way related to the activities at the individual ports is estimated from the interview process of 94 Indiana Lakeshore terminals, Port of Indiana tenants and service providers as well as data provided by the Ports of Indiana 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, handlers, 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 104,567 jobs are directly or indirectly generated by activities at the cargo terminals on the Indiana Lakeshore. Of the 104,567 jobs:

- 20,837 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.
- 28,197 jobs (induced jobs) are supported by the local purchases of the 20,837 individuals directly generated by port activity at the cargo terminals. An additional 26,768 indirect jobs were supported by \$2.1 billion of purchases in the local and regional economy by firms providing direct cargo handling and vessel/barge services.
- 28,766 jobs are related to inbound and outbound cargoes through Indiana Lakeshore 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 the Indiana Lakeshore terminals.

### **3.1. Direct Maritime Cargo Jobs**

In CY2008, about 32 million tons of domestic and foreign waterborne cargo moved via the Indiana Lakeshore terminals in Burns Harbor, Indiana Harbor, Buffington Harbor and Gary. As a result of this activity, 20,837 full-time jobs were directly created<sup>2</sup>. These jobs would vanish immediately if shipping operations on the Indiana Lakeshore were to cease. About 16 percent of the direct jobs are attributed to cargo activity moving into the Inland Waterway System through the O'Brien Lock.

### **3.2. Induced Jobs**

The 20,837 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, 28,197 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 via purchases by directly employed individuals, the firms providing the direct services and employing the 20,837 direct jobs make local purchases for goods and services. These local purchases by the firms dependent upon the cargo facilities generated additional local jobs – indirect jobs. Based on interviews, these firms made \$2.1 billion of local and in-state purchases. These direct local purchases created an additional 26,768 indirect jobs in the local economy.

### **3.4. Related User (Shipper/Consignee) Jobs**

It is estimated that 28,766 jobs are supported in Indiana with shippers/consignees that use the Indiana Lakeshore 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 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 breakbulk cargoes, 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

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<sup>2</sup> 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.

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 breakbulk 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 (RIMSII) model, the value of the breakbulk 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 (lakeshore 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 lakeshore terminals and the induced and indirect jobs associated with the direct terminal activity.

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

The 32 million tons of steel, general cargo and bulk (dry and liquid) cargo handled at the Indiana Lakeshore 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 lakeshore 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 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 lakeshore 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 lakeshore 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 (RIMSII).

The revenue impact is a measure of the *total economic activity* in the state that is generated by the cargo moving via the Indiana Lakeshore. In 2008, maritime cargo and port industrial activity on the Indiana Lakeshore generated a total of \$14.2 billion of total economic activity in the state. Of the \$14.2 billion, \$803.3 million 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 \$10.6 billion of revenue is generated by the lakeshore shippers, port tenants and on-site dependent shippers/consignees. The remaining \$2.8 billion represents the value of the output to the State of Indiana that is created due to the cargo moving via the port and lakeshore 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.

## **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 \$923.1 million in personal wage and salary earnings. It is important to emphasize that the average annual earnings of a marine terminal-dependent job is about \$44,300. By comparison, based on data supplied by the Bureau of Labor Statistics (BLS), the average wage earner in Indiana in Q1 2009 was \$739/week or annual 52-week average of \$38,428. 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 \$3.39 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 \$4.39 was used to estimate the total income and consumption impact of \$3.1 billion, inclusive of the re-spending effect. This additional re-spending of the direct income generates the 28,197 induced jobs.

The 26,768 indirect job holders earned \$1.1 billion in indirect wages and salaries. The 28,766 related shipper/consignee jobs tied to cargo moving via marine terminals received about \$860.4 million of personal income.

Therefore, the total personal income impact and consumption impact created by Indiana Lakeshore cargo shipments and related industrial activity is estimated at \$6.0 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 Indiana was developed from the Tax Foundation, which reports total state and local taxes from all sources as a percent of total personal income.

Cargo and marine terminal activity generated \$486.5 million of state, county and local taxes. As a result of the economic activity created by the related shipper/consignees, an additional \$80.9 million of state and local taxes were generated for a total cargo tax impact of \$567.4 million.

## APPENDIX A: PEER REVIEW LETTERS

INDIANA UNIVERSITY



July 9, 2010

**KELLEY**  
School of Business

Mr. Jody W. Peacock  
Director of Corporate Affairs  
150 W. Market Street, Suite 100  
Indianapolis, IN 46202

RE: Economic Impacts of the Ports of Indiana  
Economic Impacts of Waterborne Shipping on the Indiana Lakeshore

Dear Mr. Peacock,

I would like to thank you and the Ports of Indiana for the opportunity to review these studies. Overall, I think they are carefully designed studies following standard economic impact approaches. I found the studies to be well written and organized. I am very impressed that Martin Associates was able to get such a high response rate from the firms that they interviewed. The location specific data provided by phone interviews coupled with Martin Associates' knowledge of the maritime industry enhance the accuracy of these results.

During my review of these studies, I provided comments and suggestions for a few specific areas including the explanations of economic models used in the analysis, types of data collected for the study, RIMS II modeling considerations, evaluation of related user jobs, and historical comparisons with 2009 data, especially because that was a recession year.

I personally have conducted economic impact studies of various individual events (e.g., the Indianapolis 500 and the Final Four basketball tournament) and industries. As a result, I feel qualified to recognize methodologically appropriate studies such as these.

Sincerely,

A handwritten signature in black ink, appearing to read "Bruce L. Jaffee".

Bruce L. Jaffee  
Professor and Chairperson

BLJ:rg

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### Peer Review Letter of Endorsement

To Whom It May Concern:

I reviewed and provided comments on the following studies:

“Economic Impacts of the Ports of Indiana,” and  
“Economic Impacts of Waterborne Shipping on the Indiana Lakeshore.”

I provided suggestions for improvement during the process, including adding more explanations for various complex issues and terms which are well-known to economists, but might seem mysterious to the non-specialist. 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 only 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 30 years of conducting and publishing original research and teaching in the area of industrial economics. For the last 17 years I have served on the editorial board of the *International Journal of Industrial Organization*, an academic journal that publishes peer-reviewed studies on industrial economics. For the last six years I have served as a co-editor, making final decisions about which articles this journal publishes.

In summary, Martin Associates appears to have extensive experience in conducting studies of the economic benefits of maritime activities, and uses best-practice empirical methods and data in these studies. 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  
Professor of Economics  
Department of Economics  
University of Notre Dame



July 12, 2010

Peer Review Letter of Endorsement

Ladies and Gentlemen,

I am very pleased to review the economic impact studies conducted by Martin Associates for the Ports of Indiana titled:

- Economic Impacts of the Ports of Indiana
- Economic Impacts of Waterborne Shipping on the Indiana Lakeshore

The studies focused on the local, regional, and state economic impacts generated by maritime and industrial activities for two different areas: 1) The state's three public ports located at Burns Harbor, Jeffersonville, and Mount Vernon; and 2) Indiana's Lake Michigan shoreline. Direct, indirect, and induced impacts of jobs, personal income, business revenue, and tax revenue were measured. The various exhibits demonstrate the flow of economic impacts generated by maritime activities at the various terminals of the Ports of Indiana and the Indiana Lakeshore. The overall reports show the significant economic impacts these activities have on Indiana's economy.

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. Currently, I am working on projects focusing 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.

Based on my review of this material, I made several observations and suggestions that were included in the study related to the sections on direct and induced impacts. I have reviewed both 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.

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

Respectfully submitted by:



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

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