

# RURAL INLAND WATERWAYS ECONOMIC IMPACT KIT

## USER GUIDE

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## ACKNOWLEDGMENTS

The primary objective of the project was to develop a PC-based Kit allowing users to evaluate the economic impact of existing rural inland waterways ports and terminals. By using the Kit the importance to a community of a port and terminals can be quantified. The Kit is designed so that users can follow a step-by-step procedure focusing on the economic impact of the totality of a port or terminal operation and linkage to the community's industrial structures and transportation systems. The origin of the design is Maritime Administration Port Economic Impact Kit developed in the 1970s.

Two documents accompany the Rural Inland Waterways Kit. A User Guide has been prepared to guide the user through the operation of the Kit. By following the step-by-step procedures in the Guide, the user is led through an economic impact analysis of the various activities at a port or terminal. An Analysis Manual has also been prepared to assist the user. The Analysis Manual focuses on the details and processes that will be necessary when using the Kit to perform an economic impact analysis of a port or terminal. Included in the discussion are data collection requirements, methodology issues, and the interpretation of the findings.

Several people and institutions provided valuable support to this project. David Rasmussen preformed the computer programming tasks and the industrial classification details. Xiaogin Zeng a graduate student assistant, worked on data collection. Appreciation is expressed to the Planning and Research Division of the Arkansas Highway and Transportation Department for initiating and supporting for the project. Last but certainly not least, I am grateful to the Mack-Blackwell National Rural Transportation Study Center at the University of Arkansas for their financial support.

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# USER'S GUIDE

## INTRODUCTION

The User's Guide is a systematic procedural guide. The guide leads a user through the steps that are necessary to have the Port Kit estimate the economic impacts associated with cargo flow activities, port users activities, and capital expenditure activities. In this guide, each screen of the Port Kit is displayed, discussed, and the procedures to activate the implicit subroutine of the Port Kit are explained. The end results of following the guide's procedures are the summary and itemized reports of the economic impacts.

The user's guide is divided into nine sections. The topics included in these sections are

- ◆ Getting Started
- ◆ Data Requirements, Model Selection, and Regionalization Screens
- ◆ Main Menu Screen
- ◆ Regional Data Input Screens
- ◆ Cargo Flows Screens
- ◆ Port Users Screens
- ◆ Capital Expenditure Screens
- ◆ Multipliers Display Screens
- ◆ Printing and Saving: File Commands

Throughout the guide, Pulaski County, Arkansas is used for illustration purposes.

The software is designed to run on a PC with a Windows® operating system. The Port Kit runs within Windows, as a window application. The Port Kit was developed using Visual Basic programming language and operates as a stand-alone program; that is, you do not need to have Visual Basic to run the program.

## **1. GETTING STARTED**

### **1.1. Setup Program**

To install the Rural River Inland Waterways Kit, run the setup program found in the deploy directory on the CD-ROM. The setup program creates a folder in the program files directory called RPPEI Kit and installs all the necessary programs to run the Kit.

Start the installation by placing the CD-ROM in the drive and choosing “RUN” from the program manager pull-down menu. Type the drive letter, colon, and setup to run the setup program, i.e. E:SETUP if “E” is the drive containing the CD-ROM. Alternatively, choose the browse option, and double click on SETUP.EXE after the appropriate drive is chosen.

### **1.2 Starting the Kit: The RRPEI.exe Application File**

The installation program creates a subdirectory called RRPEI Kit and installs the Port Kit’s program files in that directory. Within the directory, there is an executable program and icon called RRPEI. Clicking on this icon activates the Port Kit. Alternatively, after running the setup program, the Kit can run with the programs found on the CD in a folder called Deploy. Open the Deploy folder to find a copy of the RRPEI executable program. Clicking on this program activates the Port Kit.

## 2. DATA REQUIREMENTS, MODEL SELECTION, AND REGIONALIZATION

This section of the manual describes the steps necessary to construct a new model and open a previously constructed model. Before beginning an economic impact analysis, there are a number of preparatory steps. These steps include defining the study area, choosing a level of industrial aggregation, and entering the appropriate study area data.

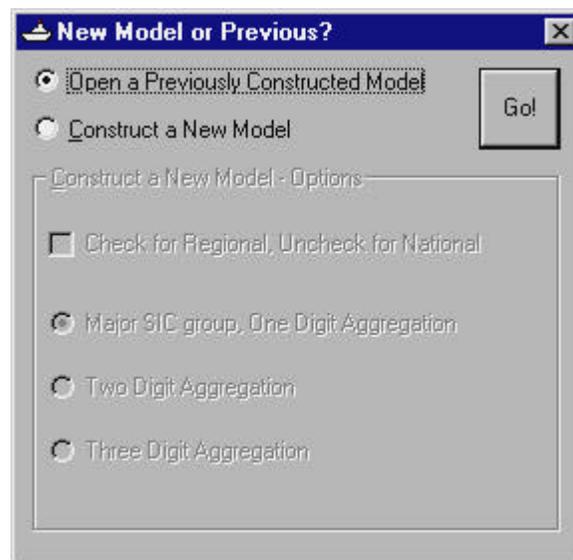


Figure 2.1.1

### 2.1 New Model or Previous Screen

After starting the Port Kit program, a New Model or Previous screen (Figure 2.1.1) appears. This screen enables the user to select a previously constructed model or start the procedure to construct a new model. Figure 2.1.1 shows the Open a Previously Constructed Model selection, which is discussed in section 2.3.

## 2.2 Constructing a New Model

By clicking on the Construct a New Model selection button, the option box shown in Figure 2.2.1 is activated. Selections in this option box activate subroutines to define the study area and create the areas input-output model. The two selections in the “Construct a New Model-Options” box are

1. The choice to regionalize the national model to match the study area or use the national model.
2. The choice of a level of industrial aggregation to use throughout the study.



**Figure 2.2.1**

### 2.2.1 Regional Model or National Model

When users check the “Check for Regional, Uncheck for National” option box, they are in fact selecting a subroutine that regionalizes a national Input-Output (I-O) model to reflect the economy of their study area. If the box is left unchecked, the Kit defaults to a national I-O

model.<sup>1</sup> Choosing to regionalize the model activates a data entry subroutine. In this data entering subroutine, the user enters employment and earnings data based upon their selected level of industrial aggregation.

### **2.2.2 Level of Industrial Aggregation**

Users must choose a level of industry aggregation by clicking the appropriate selection button. The levels of industrial aggregation correspond to the 1987 Standard Industrial Classification (SIC) codes 1-digit, 2-digit, and 3-digit industries.<sup>2</sup> A list of these SIC-industry groups can be found in Appendix I. Careful consideration must be given to the choice of the level of aggregation. There is a trade-off between the availability of the data and the precision in the estimates of the economic impacts. Generally, 1-digit industry data have greater availability, and the Kit requires less data than the 2-digit level of aggregation. Likewise, the 2-digit industry group has greater availability than the 3-digit industry group, and the Kit requires less data entry for a 2-digit industry group than a 3-digit industry group. The disadvantage of using aggregate data is the loss of many of the unique characteristics of a study area's economic structure and interindustrial relationships. Because of this suppression, the economic impacts derived for aggregated models are less precise than those derived from more detailed industry information. Consequently, users must choose between the availability and detail of data and the precision in the estimation of the impacts.

### **2.2.3 Saving a New Model**

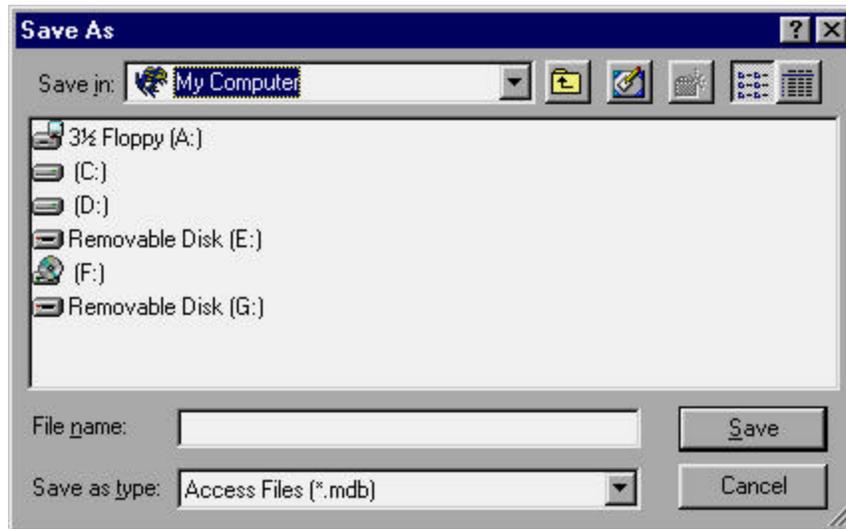
Once the regionalization and aggregation choices are made, clicking on the "Go" button takes the user to a dialog box shown in Figure 2.2.3.1. In the "Dialog" box, users name their

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<sup>1</sup> Lawson, Ann. Benchmark Input-Output Accounts for the U.S. Economy, 1992. *Survey of Current Business*, U.S. Department of Commerce, Volume 77, November 1977, and Volume 77, December 1997.

<sup>2</sup> Standard Industrial Classification Manual 1987, Executive Office of the President, Office of Management and Budget.

model and save it to the location of their choice. The file should be saved as an Access database and have an mdb-extension. Once saved the user advances to the Choose a Year screen.



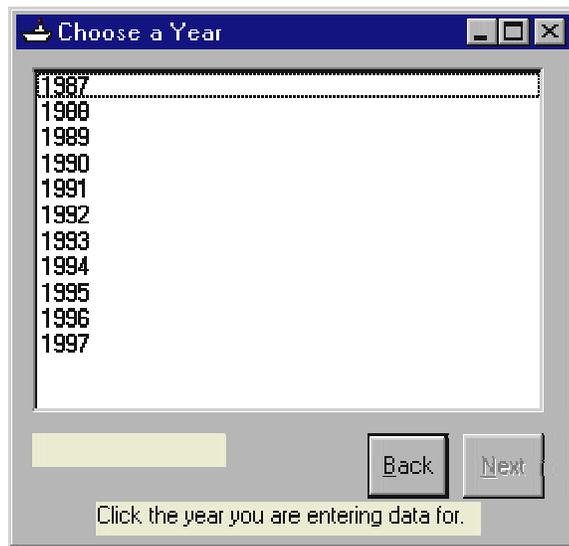
**Figure 2.2.3.1**

## **2.2.4 Choose a Year**

In the Choose a Year screen (Figure 2.2.4.1), users select a year corresponding to the year of their study. This selection invokes a subroutine to adjust nominal dollar values into 1992 constant dollar values. The Kit contains a database of price indexes constructed from several published price indexes.<sup>3</sup> The database contains price indexes for the 1987-1997 period. When a year is selected, a subroutine uses the year's price indexes to adjust the nominal values into 1992 constant dollar amounts. After choosing a year and clicking on the "Next" button, the model proceeds to a Choose a State screen.

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<sup>3</sup> Producer Price Indexes. U.S. Department of Labor, Bureau of Labor Statistics, various years. Agricultural Statistics, 1998. U.S. Department of Agriculture.



**Figure 2.2.4.1**

**2.2.4.1 Missing Year:** If users choose to use a year not included in the price index database, then the users must adjust their nominal dollar values into 1992 constant dollar equivalents outside the Kit. Given this conversion, the appropriate year for the study is 1992, and 1992 should be selected as the study year. Alternatively, users can adjust nominal values to one of the years in the Choose a Year screen and then select that year as their study year. The Kit would then convert the dollar values to the 1992 base year.

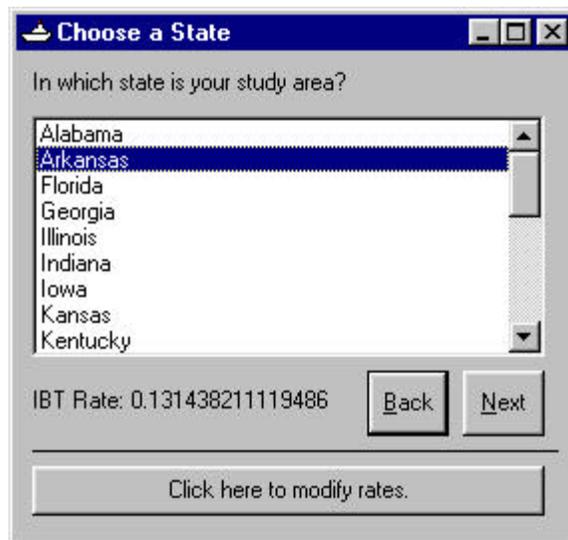
**2.2.4.2 Multiple Year Study:** For a multiple year study, the user must do each year separately.

## **2.2.5 National Default Model and Other National Models**

To use a default national model, make sure the “Check for Regional, Uncheck for National” option box is unchecked, choose a level of industry aggregation, and then select 1992 as the study year. The Kit defaults to a 1992 national I-O mode that requires no data entry. To select a national model for another period, select a year, and be prepared to enter the appropriate national data in a Regional Data Input screen. This screen is discussed in the main menu section of the guide.

## 2.2.6 Choose a State

In the Choose a State screen (Figure 2.2.6.1), users choose the state that corresponds to their study area. Selecting a state invokes a subroutine to retrieve the appropriate state tax rate. The



**Figure 2.2.6.1**

state's indirect business tax rate (IBT) appears on the screen after the user's selection. In Figure 2.2.6.1, Arkansas is the selected state, and it has a 13.14% indirect business tax rate. The Kit's IBT rate is a state's ratio of indirect business taxes to employee compensation for 1992. This ratio enables the estimation of indirect business tax revenues.<sup>4</sup> Appendix II lists the states contained in the IBT database and the corresponding IBT rates. Clicking the "Next" button takes a user to the Regional Data Input screen where the user is prompted to enter the appropriate data. The Regional Input screen is discussed in the main menu section of this manual. At the completion of the data entry process, the Kit advances to the Main Menu screen.

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<sup>4</sup> Comprehensive Revision of Gross State Product by Industry, 1977-94. Survey of Current Business, U.S. Department of Commerce, Bureau of Economic Analysis, Vol. 77, Number 6, June 1997.

**2.2.6.1 Modifying Indirect Business Tax Rates:** Click on the “Click here to modify rates” button in the Choose a State screen to advance to the State Level: Compensation and Tax screen.

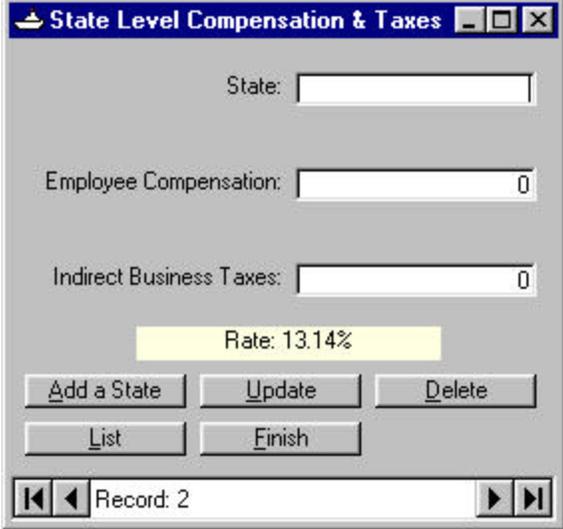
**2.2.6.2 State Level Compensation and Tax Screen:** This screen shown in Figure 2.2.6.2. gives the user several ways of changing the IBT rate:

1. **Changing the IBT Rate Directly:** By entering amounts for employee compensation and indirect business tax, the Kit will compute an indirect business tax rate and use that rate in estimating the economic impacts on indirect business taxes.
2. **List:** For the inland waterway states, the Kit has a database of indirect business tax rates for 1992. By clicking on the “List” button, users can view these states in the Select a Record screen shown in Figure 2.2.6.3. By clicking on a state and the “OK” button, the record is loaded into the State Level Compensation screen.

The screenshot shows a software window titled "State Level Compensation & Taxes". It features three input fields: "State" with "Arkansas" entered, "Employee Compensation" with "27,861,000", and "Indirect Business Taxes" with "3,662,000". A yellow highlighted box displays "Rate: 13.14%". Below these are five buttons: "Add a State", "Update", "Delete", "List", and "Finish". At the bottom, there are navigation arrows and a "Record: 2" indicator.

**Figure 2.2.6.2**

3. **Adding A State:** To add a new state or study area, the indirect tax rate database clicks on the “Add a State” Button. Users enter a name for a study area, amounts for employee compensation, and indirect business taxes. The Kit computes



**Figure 2.2.6.3**

the indirect business tax rate and adds the study area to the database.

3. **Deleting:** A record can be deleted from the indirect business direct tax database by selecting the study area in the State Level Compensation and Taxes screen and then clicking on the “Delete” button. Deletion removes a record from the database permanently and should be done with caution.
4. **Update:** Before ending the IBT modification subroutine, users need to update the database by clicking on the “Update” button. By updating the database, users are creating a new record in the database for the newly added state or region. To verify this addition, the user can view the list of states and regions in the database by clicking on the “List” button.

5. **Finish:** Clicking on the “Finish” button returns the user to the State Level Compensation and Taxes screen.

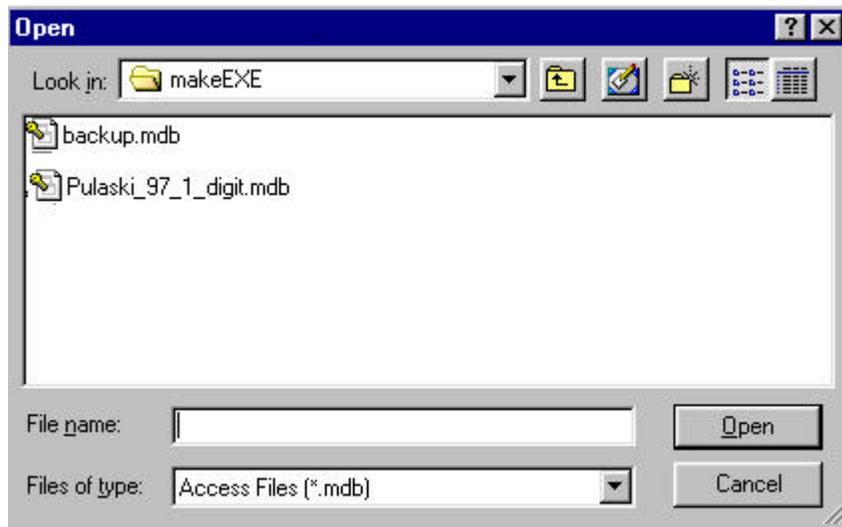
**2.2.6.3 Multiple State Study:** No direct provisions have been made in the Kit for multiple state study areas. The IBT rate is the only rate in the model that is state specific, and since the user can change the IBT rate, multiple state studies are possible. Users can follow the steps required to add a state IBT rate, but in this case, they can enter a multiple state IBT rate. The IBT rate for a multiple state region could be a weighted average of state IBT rates that are included in the multiples state region.

### **2.3 Open a Previously Constructed Model**

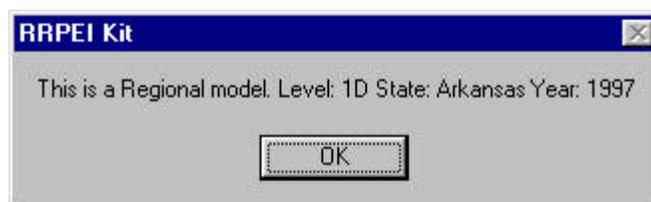
To retrieve a previously constructed model, click on the “Open Previously Constructed Model” selection as shown in Figure 2.2.1. Clicking on the “Go” button causes a dialog box to appear as in Figure 2.3.1. Click the name of a model and then the “Open” button, to retrieve and open an existing model. These steps are demonstrated in Figure 2.3.1 where a Pulaski County model is opened. Once a model is opened, the user sees a screen (Figure 2.3.2) describing the characteristics of the model. Pulaski County is a regional model, at a 1-didit level of industrial aggregation and is based on 1997 data. Click the “OK” button to advance to the Main Menu screen.

### **2.4 The Kit’s Database File**

Figure 2.3.1 also shows a file entitled backup.mdb. This is a very important file because it contains the various databases used by the Kit. Without this file the Kit will not run. If this file is not present in the current directory, the user is prompted to locate the file. In the event the file cannot be found, there is a copy on the CD-ROM in the MAKEEXE subdirectory. Appendix 3 gives a list of the databases found in this file.



**Figure 2.3.1**



**Figure 2.3.2**

## **2.5 Editing a Previously Constructed Model**

To edit an existing model, select the model and go to the Main Menu screen as shown in Figure 3.1. Click on the “Regional Data Input” button and then the “OK” button brings up the Regional Data Input screen. This screen is the gateway for editing previously entered values.

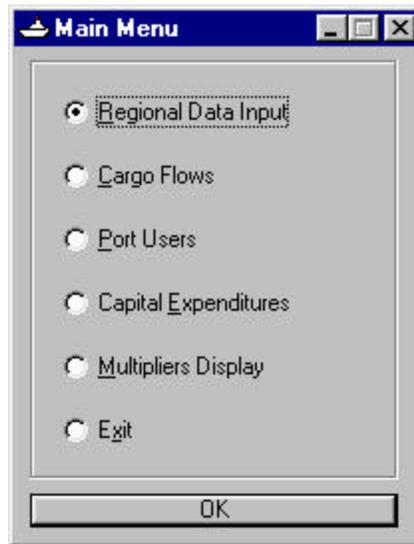
1. **Modifying Industry, Employment, and Income Data:** The database of regional and national data can now be edited directly in the Regional Input Screen. To add a previously excluded industry to the study area, change the “false” to a “true” in the present column, and then enter the appropriate industry data. If “true” is changed to “false,” the industry is excluded from the analysis.

2. **Modifying the Indirect Business Tax Rate in a State:** Click on the “Back” button and return to the Choose a State screen. (For a national model, this option is not available.) Click on the “click here to modify Rates” button and then modify the indirect business tax rate as was discussed in that section of the manual. To return to the Main Menu screen, click on the “Next” button to return to the Regional Data Input screen, and then click the “Next” button again to return to the Main Menu screen.
3. **Modifying the Study Year:** Click on the “Back” button to return to the Choose a Year screen, and then select a new year. To return to the main menu, click on the series of “Next” buttons as advancing through the screens until the Main Menu screen is reached.

For more detail on these modifications, see the corresponding section in this guide.

### 3. Main Menu Screen

The Main Menu screen shown in Figure 3.1 has several options leading to different submenus and analysis subroutines. These options include

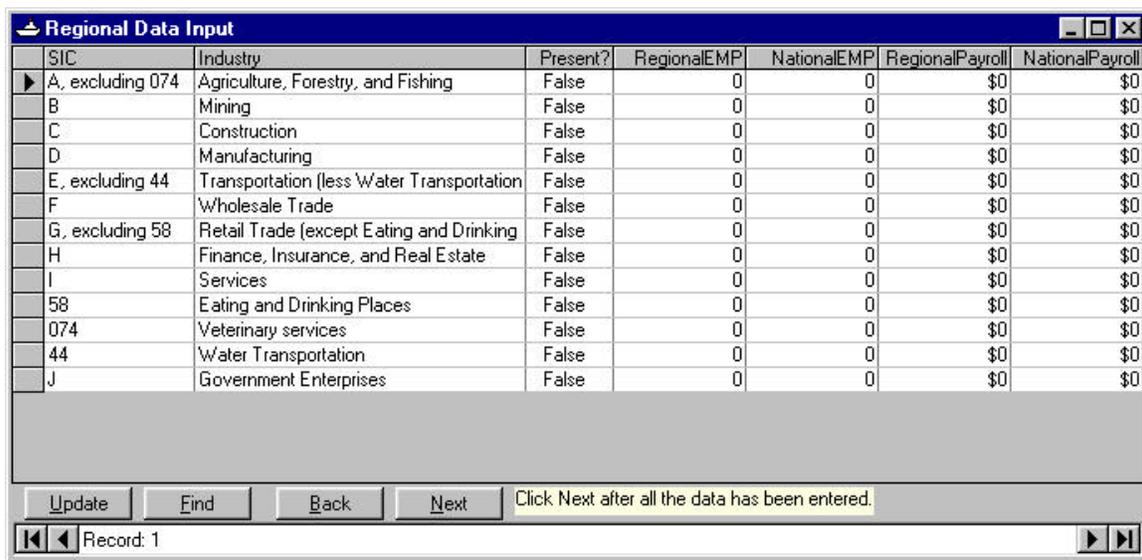


**Figure 3.1**

1. Editing and modifying a study area: By clicking on the “Regional Employment Input” button, users can edit and modify their study area’s database.
2. Economic impact analysis: The economic impact analysis of cargo flows, port users, and capital expenditures can be shown by clicking on the appropriate button.
3. Multiplier’s Display: A display of a study area’s economic multipliers can be shown by clicking on the “Multipliers Display” button.

#### 4. Regional Data Input Screen

By checking the “Regional Data Input” option as shown in Figure 3.1 and clicking the “OK” button, the user will advance to a Regional Data Input screen like in Figure 4.1. The Regional Data Input screen is where the study area’s data and national data are entered into the model. In addition, specific industries can be selected for inclusion in or exclusion from the analysis.



The screenshot shows a software window titled "Regional Data Input" with a table of industry data. The table has columns for SIC, Industry, Present?, RegionalEMP, NationalEMP, RegionalPayroll, and NationalPayroll. The data is as follows:

SIC	Industry	Present?	RegionalEMP	NationalEMP	RegionalPayroll	NationalPayroll
▶ A, excluding 074	Agriculture, Forestry, and Fishing	False	0	0	\$0	\$0
B	Mining	False	0	0	\$0	\$0
C	Construction	False	0	0	\$0	\$0
D	Manufacturing	False	0	0	\$0	\$0
E, excluding 44	Transportation (less Water Transportation)	False	0	0	\$0	\$0
F	Wholesale Trade	False	0	0	\$0	\$0
G, excluding 58	Retail Trade (except Eating and Drinking)	False	0	0	\$0	\$0
H	Finance, Insurance, and Real Estate	False	0	0	\$0	\$0
I	Services	False	0	0	\$0	\$0
58	Eating and Drinking Places	False	0	0	\$0	\$0
074	Veterinary services	False	0	0	\$0	\$0
44	Water Transportation	False	0	0	\$0	\$0
J	Government Enterprises	False	0	0	\$0	\$0

Below the table are buttons for "Update", "Find", "Back", and "Next", along with a text box containing "Click Next after all the data has been entered." At the bottom left, there is a "Record: 1" indicator and navigation arrows.

Figure 4.1

##### 4.1 Exclusion/Inclusion of an Industry

The SIC code and Industry displayed in the first two fields (columns) and the industry records (rows) are the consequence of the earlier users choice of the level of industrial aggregation. Often a study area’s economy will not have an industry listed in the industry list, or the user will lack the information for a particular industry. In any case, the user may wish to exclude the industry from the study. The user has this option in the field labeled "Present?" Clicking on the industry's record in the "Present?" field, causes a selection button to appear. By

clicking on this “Selection” button, the users can indicate whether they want to include an industry (True) or exclude the industry (False) from the analysis. The default value is to exclude the industry, which means the user need not enter data for that industry. To include an industry in the study, the user must change the “False” value to a “True” value and then proceed to enter the appropriate data for the industry.

## **4.2 Data Requirements and Enter**

The impact analysis requires users to enter two types of data when they opt to regionalize. Employment data by industry are needed to regionalize the industrial sectors of the model. Earnings by industry are necessary to regionalize the personal consumption expenditures.

The Kit's data requirements have been designed to match the data available in annual Census Bureau County Business Patterns (CBP) publication.<sup>5</sup> The CBP reports national, state, and county level data on the number of establishments, number of employees, payrolls, and the number of establishments by employee-size class by SIC industry. Users are not restricted to CBP and may use alternative data input databases if they wish. Another database that fits nicely into the format of the Kit is the Regional Economic Information System.<sup>6</sup> Users are restricted to the industrial aggregation schemes of the Kit.

**4.2.1 Regional Employment:** When the users select an industry for inclusion in the analysis, they are required to enter employment data for that industry in the study area. Because of the regionalization computation, the study area’s employment and the national employment counterpart must be entered. Employment data for a multistate or multicounty study area must be aggregated by industry and then entered. If users opt not to use CBP and instead use another employment database, the study areas and national employment estimates should be consistent.

**4.2.2 Regional Payroll:** Users are required to enter payroll data for the industries in their study area and at the national level. Again, both study area and national data are required because of the regionalization of personal consumption expenditures. As with employment, multistate or a multicounty study area income must be aggregated by industry and then entered. If users opt not to use CBP and instead use another income database, there must be consistency between the study areas and national industries.

**4.2.3 Example:** Figure 4.2.3.1 shows a completed Regional Data Input screen for Pulaski county in Arkansas for the 1-digit aggregation level in 1997. All 1-digit industries have been included except government enterprises. If a user wants to include this in the study but has no data, then the default values of the Kit may be used. The Kit's default values are explained in the next section.

### **4.3 Default Values**

The Kit defaults to national values. If a user checks the "Check for regional, Uncheck for National" option and opts not to enter an industry's employment or income levels, the Kit will not regionalize that industry and instead will use a national value. There are several possible ways to use the Kit's default values.

1. **1992 Default Values:** When a study area is a region and an industry is selected to be included in the study, but neither employment or payroll datum is entered at the national level, the Kit defaults to the 1992 national value for that industry.

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<sup>5</sup> County Business Patterns (CBP), U.S. Department of Commerce, Bureau of the Census.

<sup>6</sup> Regional Economic Information System (REIS), Bureau of Economic Analysis, U.S. Department of Commerce,

SIC	Industry	Present?	RegionalEMP	NationalEMP	RegionalPayroll	NationalPa
A, excl	Agriculture, Forestry, and Fishing	True	995	542,320	\$5,473,806,000	11,511,649,000
B	Mining	True	299	586,227	\$12,870,000	27,816,879,000
C	Construction	True	10,193	5,512,547	\$271,463,000	75,935,361,000
D	Manufacturing	True	21,217	18,632,696	\$652,329,000	88,629,401,000
E, excl	Transportation (less Water Transportation)	True	20,044	6,068,312	\$657,431,000	19,644,937,000
F	Wholesale Trade	True	16,065	6,810,072	\$514,726,000	55,865,313,000
G, excl	Retail Trade (except Eating and Drinking)	True	27,777	14,405,426	\$484,385,000	57,922,191,000
H	Finance, Insurance, and Real Estate	True	15,308	7,366,687	\$566,754,000	13,257,446,000
I	Services	True	88,309	37,380,074	\$2,173,102,000	13,965,048,000
58	Eating and Drinking Places	True	14,215	7,597,133	\$188,149,000	72,411,910,000
074	Veterinary services	True	271	1,850,240	\$4,738,000	13,851,491,000
44	Water Transportation	True	20	178,281	\$1,006,000	\$6,381,147,000
J	Government Enterprises	False	0	0	\$0	

**Figure 4.2.3.1**

2. **Default values for a selected year and industry:** If the user has national employment and payroll data for selected industries and the year of the study, this data can be entered, and the Kit will use the national values as default values for calculations.

#### 4.4 Find, Update, and Next Buttons

The regional input screen contains the following items to assist with the data enter subroutine.

**4.4.1: Find Button:** Clicking on the “Find” button allows the user to search the industry list for a particular industry.

**4.4.2: Update Button:** Clicking on the “Update” button saves any changes to the employment and payroll database. Clicking on this button results in overwriting existing data in the database.

**4.4.3: Next Button:** Clicking on the “Next” button has the same effect on the database as clicking on the “Update” button, plus it advances the Kit to the Regional Purchase Coefficient screen.

#### 4.5 Regional Purchase Coefficients

A regional purchase coefficient is an estimate of the amount of an industry output that is purchased within the study area. For a dollar of demand for an industry’s output, the RPC is the value of the industry output supplied by regional firms within the industry. After the employment and income data are entered in the Regional Data Input screen, clicking on the “Update” and “Next” buttons invokes a subroutine that computes the RPC by industry including the households. The results of the calculations are displayed in the Regional Purchase Coefficient screen.

The screenshot shows a software window titled "Regional Purchase Coefficients". The window contains the following data:

Industry:	Water Transportation
Industry Code:	65C
RPC:	5.58683984669306E-02
Household RPC:	4.38126381910005E-02

Below the data are three buttons: "List", "Back", and "Next". At the bottom of the window, there are navigation arrows and the text "Record: 1".

**Figure 4.5.1**

The Kit uses national and study area employment and earnings data to compute RPC for the household sector and industry sectors. The computations of RPCs are discussed in Appendix I of the *Analysis Manual*. The Kit enables users to modify the estimates of the RPCs. Click on the “next” button to advance to a Production Function screen.

## 4.6 Production Function

A production function is the description of the technical requirements and relationships between the inputs required to produce a product or output. When a production function is expressed in terms of its technical coefficients, it measures the dollar amounts of various industry inputs needed to produce a dollar of a given industries output. Technical coefficients are computed by the Kit for each industry and can be viewed in the Production Functions screen (Figure 4.6.1).

IndustryCode	Industry	65C
A	Agriculture, Forestry,	1.76216975060162E-04
B	Mining	2.05820894998836E-04
C	Construction	9.0108527159226E-04
D	Manufacturing	4.40147067468954E-02
E	Transportation (exce	4.89690486914147E-02
F	Wholesale Trade	1.59072844085169E-02
G	Retail Trade	3.79292256767971E-03
H	Finance, Insurance,	4.92109884812395E-02
I	Services	0.104332052959227
J	Government Enterpri	1.03019322399821E-02
65C	Water Transportatior	3.23343855864842E-02
84	Household Industry	0
88	Compensation of Em	7.33381731653003E-04

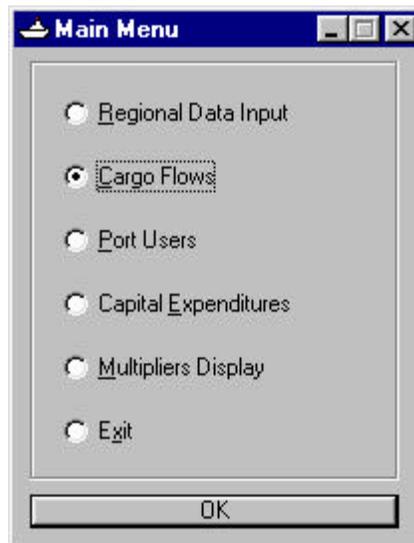
**Figure 4.6.1**

Each industry has a production function that can be accessed by selecting a particular industry from the list on the left. A selected industry's technical coefficients are shown in the

right-hand column. The numeric values are the amounts of interindustry purchases required to produce a dollar of the selected industry output.

## 5. Cargo Flows

Cargo flows in and about a port or terminal can be very complex. Cargoes may be moved many times within a port as they are transferred from terminals to warehouses and other storage facilities, between port users and to locations inside and outside the study area. The Kit breaks the analysis of cargo flows into internal flows or on site flows and external cargo flows or inland flows (offsite flows). To analyze the economic impact of cargo flows, the user chooses the Cargo Flows option in the Main Mmenu screen as shown in Figure 5.1. After the user clicks on the “OK” button, the Kit will advance to the Cargo Input screen.



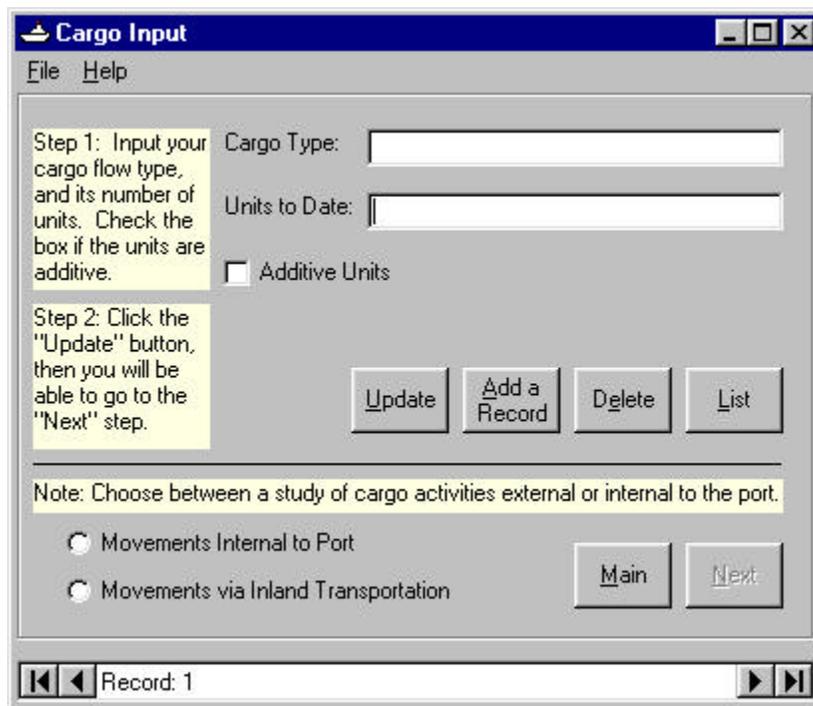
**Figure 5.1**

### 5.1 Cargo Input Screen

To begin an impact analysis of cargo flows, users must identify the type of cargo, the amount handled, the direct impact per unit of cargo type, and mode of transportation. The Kit computes the direct impact of cargo type by converting the cargo units into cargo revenue earned by shipping and handling the cargo, or equivalently, the dollar cost of handling and

shipping the cargo. The Kit is designed to analyze cargo types one at a time, cumulate the economic impact findings, and give a summary report.

A Cargo Input screen is shown in Figure 5.1.1. This screen is divided into three parts. At the bottom of the screen are data control indicating the record number which corresponds to a cargo type. The upper section of the screen is the data entry section where the information about the cargo types is entered and records manipulated. Each cargo type is given a record number that is displayed in the data control section of the screen. The middle section of the Cargo Input screen contains option boxes to indicate whether a particular cargo is transported inland or transported internally within the port.



**Figure 5.1.1**

**5.1.1. Cargo Type:** Users must name a cargo type. This will create a record for the particular cargo in the cargo database. The cargo type record numbers are displayed in the

data control box. Clicking on the arrows in the data control box cycles through the cargo types records.

**5.1.2 Units to Date:** For the time period under consideration and particular cargo type, users must enter the amount of the cargo that has been handled and shipped. For example, the cargo type to be analyzed could be the annual amount of aggregates shipped through the Port. The Kit is indifferent to the weight of the units, so tonnage can be in long tons, short tons, or metric tons, etc. Instead of tons, an alternative approach is to count units such as railcars, containers, truckloads, or barges moved by the port industries. The Kit is capable of carrying out the analysis in terms of the number of containers moved, or railcars moved for example.

**5.1.3 Update:** Once the cargo type and units to date are entered, click on the “Update” button to create and save a record for the cargo. An example is shown in Figure 5.1.2. In this example, the first record refers to 15 jumbo hopper railcars.

**5.1.4 Add a Record:** Clicking on the “Add a Record” button enables the user to enter a new cargo type and add a new cargo to the analysis as shown in Figure 5.1.3. In this case, a second record has been created for dry bulk cargoes.

**5.1.5 Additive Units:** The purpose of the “Additive Check” box is to sum the cargo types when they are measured in similar units. Checking this box causes the amounts in the “Units to Date” box to be summed across the cargo type records, and the total displayed in a Total Units display as shown in Figure 5.1.3. This example shows that there are two records, with the second record being 2,500 tons of dry bulk cargo. The combined tonnage to the two cargo types is 3,500 tons implying that the first record or cargo type must be 1,000 tons.

**Cargo Revenues**

File Help

Step 1: Input your cargo flow type, its tonnage, and dollar per unit amount.

Cargo Type: Jumbo Hopper Railcars

Units to Date: 15

Additive Units

Step 2: Click the "Update" button, then you will be able to go to the "Next" step.

Update Add a Record Delete List

Note: Choose between a study of cargo activities external or internal to the port.

Movements Internal to Port

Movements via Inland Transportation

Main Next

Record: 1

Figure 5.1.2

**Cargo Input**

File Help

Step 1: Input your cargo flow type, and its number of units. Check the box if the units are additive.

Cargo Type: Dry Bulk Cargo (Tons)

Units to Date: 2500

Additive Units

Step 2: Click the "Update" button, then you will be able to go to the "Next" step.

Total Units: 3,500

Update Add a Record Delete List

Note: Choose between a study of cargo activities external or internal to the port.

Movements Internal to Port

Movements via Inland Transportation

Main Next

Record: 2

Figure 5.1.3

**5.1.6 List:** To list the cargo in the cargo database, click on the “List” button. The cargo in this list has been entered by the user and is incorporated into the impact analysis.

**5.1.7 Delete:** To delete a cargo from the cargo database and from impact analysis, select the record (cargo type) to be deleted from the cargo list and click on the delete button. This removes the cargo record from the database.

## **5.2 Impact of Cargo Flows**

Once the cargo type information is entered and updated, the user is ready to begin an impact analysis. The Kit separates cargo flows into movements internal to the port and movements via inland transportation. The appropriate cargo flows transportation scenario is selected by checking an option box, and then clicking the “Next” button to access the cargo flow’s impact analysis subroutines.

### **5.2.1 Cargo Flow Movements Internal to Port**

A screen to analyze cargo movement internal to a port is shown in Figure 5.2.1.1. For transporting cargo internal to port, users enter the percentage breakdown by transportation mode. That is the percentage of each cargo type moved by rail, truck, or barge. When the Kit allocates the cargo units to the different transportation modes, it uses these percentages. For each mode, the revenue earned per unit of cargo moved or the cost of moving a unit of cargo must be entered in the appropriate box in the “Dollar per Unit by mode” column. The Kit uses the percent by transportation mode, the dollars per unit by mode, and the number of units moved to estimate the direct impact of the cargo flows by mode.

**File**

Step 1: Enter the percentage of the cargo handled by Rail, Truck, and Barge.

Cargo Type: Jumbo Hopper Railcars

Units: 15

Step 2: Enter each mode's Dollar per Unit, which is the cost of shipping and handling one unit.

Mode	Percent of the cargo by mode:	Dollar per Unit by mode:	Results for this record:	Grand Total of all records:
Rail	0 %	\$ 0	\$0.00	
Truck	0 %	\$ 0	\$0.00	
Barge	0 %	\$ 0	\$0.00	

Step 3: Repeat Steps 1 and 2 for each record. Then continue on to "Impacts."

Record: 1

**Figure 5.2.1.1**

**5.2.1.1 Update:** Once the percentages by cargo mode and dollars per unit by mode are entered, click on the “Update” button. The Kit will then compute value of the direct impacts by each mode as:

$$\text{Direct impact by mode} = (\text{Dollar per unit by mode}) \times (\text{Units}) \times (\text{Percent of cargo by Mode})$$

The results of these computations are then displayed in the two sets of output boxes as demonstrated in Figure 5.2.1.2. For each record and by mode, the direct impacts are shown in the “Results for this record” box. The grand totals for all the cargo types are

**File**

Step 1: Enter the percentage of the cargo handled by Rail, Truck, and Barge.

Cargo Type: Jumbo Hopper Railcars

Units: 15

Step 2: Enter each mode's Dollar per Unit, which is the cost of shipping and handling one unit.

Mode	Percent of the cargo by mode:	Dollar per Unit by mode:	Results for this record:	Grand Total of all records:
Rail	100 %	\$ 100	\$1,500.00	
Truck	0 %	\$ 0	\$0.00	
Barge	0 %	\$ 0	\$0.00	

Step 3: Repeat Steps 1 and 2 for each record. Then continue on to "Impacts."

Record: 1

**Figure 5.2.1.2**

shown in the “Grand Total of all Record Information” box. Figure 5.2.1.2 gives an example where cargoes transported in jumbo hopper railcars have a direct impact of \$100 per unit, or for the 15 railcars a total of \$1,500. Since this is the only record, the grand total of all records is also \$1,500.

Figure 5.2.1.3 shows another example where two transportation modes are used to move 1,000 tons of aggregates. In this example, the barge mode and the truck mode each move 50% of the 1,000 tons with a dollar per unit cost of \$0.097 and \$0.535 per ton, respectively. The estimated direct impacts are shown in the “Results for this record” box and the “Grand Total of all records.” box.

File

Step 1: Enter the percentage of the cargo handled by Rail, Truck, and Barge.

Cargo Type:

Units:

Step 2: Enter each mode's Dollar per Unit, which is the cost of shipping and handling one unit.

Mode	Percent of the cargo by mode:	Dollar per Unit by mode:	Results for this record:	Grand Total of all records:
Rail	<input type="text" value="0"/> %	\$ <input type="text" value="0"/>	\$0.00	\$0.00
Truck	<input type="text" value="50"/> %	\$ <input type="text" value="0.535"/>	\$267.50	\$267.50
Barge	<input type="text" value="50"/> %	\$ <input type="text" value="0.097"/>	\$48.50	\$48.50

Step 3: Repeat Steps 1 and 2 for each record. Then continue on to "Impacts."

Record: 1

**Figure 5.2.1.3**

Clicking on the “Update” button also activates two option buttons labeled “Impacts” and “Impacts by Cargo.” The subroutines to estimate the indirect and induced impacts are activated by clicking on either button.

**5.2.1.2 Reporting Impacts:** The user has two options for viewing the results of the impact analysis activated by clicking on either the “Impacts” or “Impacts by Cargo.” The format of the reports includes a summary report of the grand totals and an itemized summary.

**5.2.1.2.1 Summary Report:** To access a summary report of the grand totals for internal cargo flows, click on the “Impacts” button to view an Impact screen similar to the one shown in Figure 5.2.1.3. This screen shows the direct, indirect, induced, and total impacts associated with the movement of the 15 jumbo hopper railcars within the port area on the study areas output, employment level, employee compensation, and indirect business taxes.

	Direct	Indirect	Induced	Total	Type I	Type II
Output	\$1,429	\$725	\$84	\$2,238	1.51	1.57
Employment	0.01	0.01	0.00	0.02	2.00	2.00
Employee Comp	\$134	\$73	\$11	\$218	1.54	1.63
Indirect Business Tax	\$18	\$10	\$1	\$29	1.56	1.61

Buttons: Back, Main

**Figure 5.2.1.3**

**5.2.1.2.2 Itemized Reports:** To access an itemized report, click the “Impacts by Cargo” button to view a screen similar to the one in Figure 5.2.1.4. This screen identifies two cargo types associated with internal port movement. At the bottom of the screen are four display options. Selecting one of these options will result in the corresponding display of the cargo flow impacts on the output, employment, personal income, or indirect business taxes. The default screen is the cargo flow’s impact on output. The screen also has an option to preview and print an itemized summary report.