COSITU

Software for the Calculation of Costs, Tariffs
and Rates for Telephone Services

Telecommunication Development Bureau

(Edition 2002)

VERSION 1.0

International Telecommunication Union

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1 Installing COSITU

1.1 Introduction

The COSITU program can be installed on any computer running one of the following operating systems:

a) Windows 98

b) Windows 98 SE

c) Windows ME

d) Windows NT

e) Windows 2000

f) Windows XP or any later version

Important Note – If you are running Windows 98 first edition, you should have Internet Explorer 5.0 or a later version installed to be able to install COSITU.

1.2 Installation Process

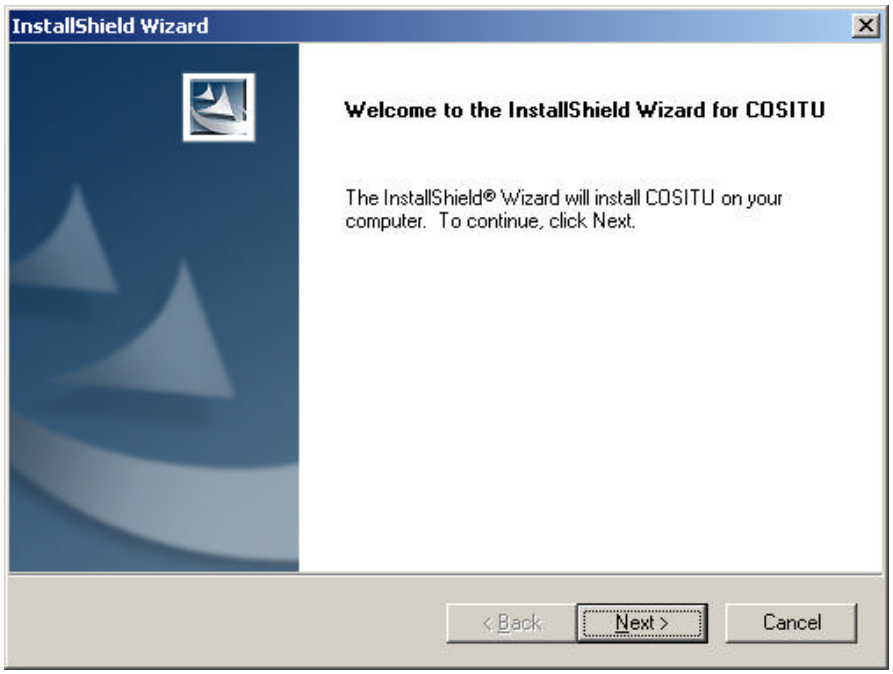
To install COSITU, proceed as follows:

1 Insert the COSITU CD into the CD drive of your computer

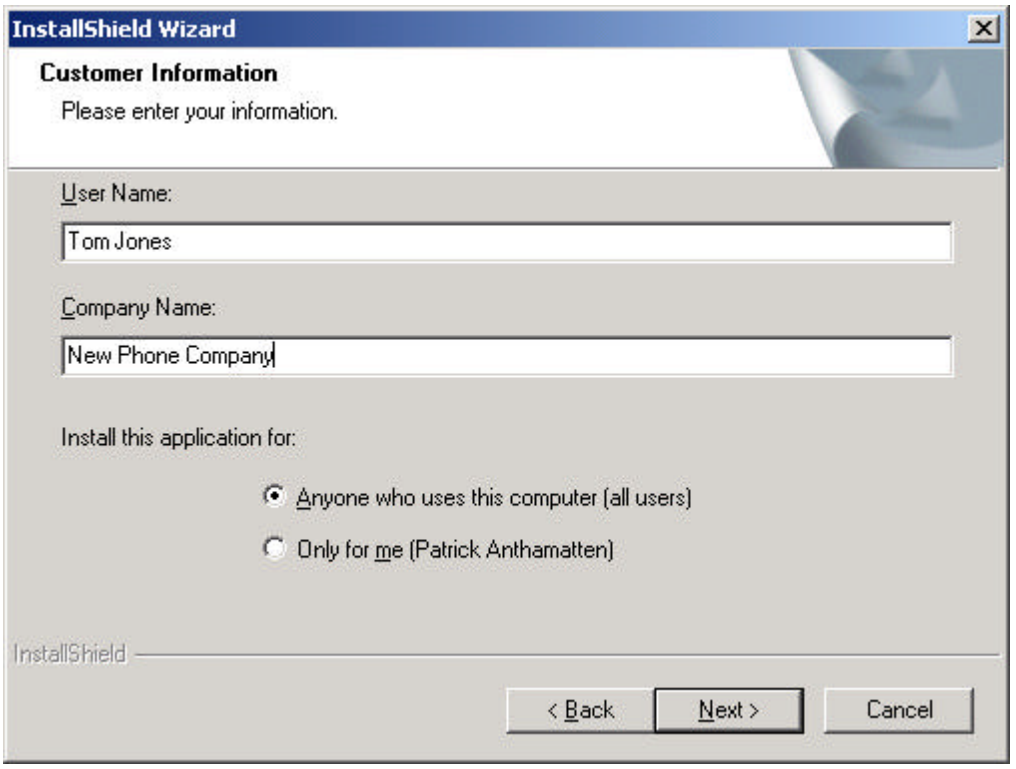
2 Open the COSITU *Install* directory

3 Doubleclick on the *Setup* icon

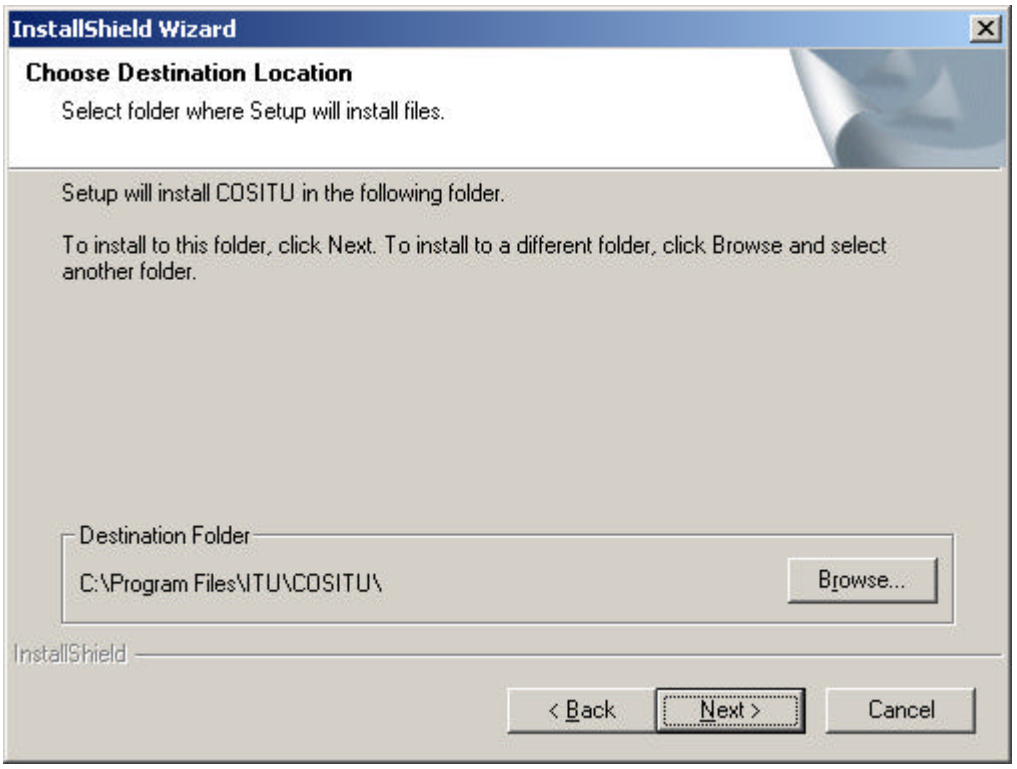
4 The Installation program runs and pauses at the following screen



5 Specify your Name and Company in the following window

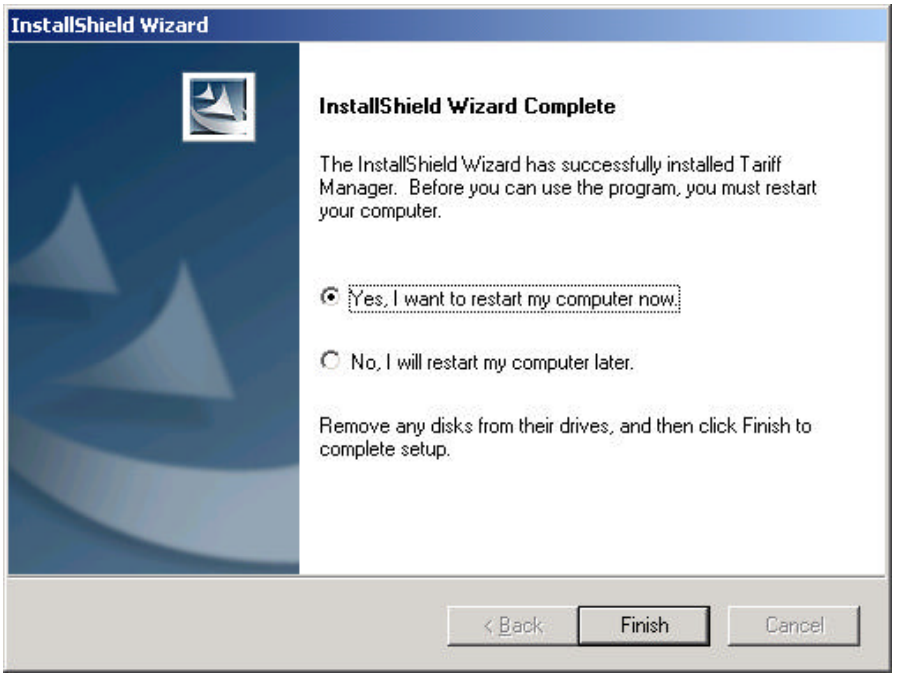


6 Choose the destination folder for the COSITU program



7 Proceed with installation by clicking the *Next* button

8 To complete installation, restart your computer



9 After you have restarted your computer, COSITU will be available among the other programs under the *Start* button.

1.3 Starting COSITU

When starting COSITU, the following Login screen appears:

Enter the user name *ITU* and password *itu* the first time you log in.

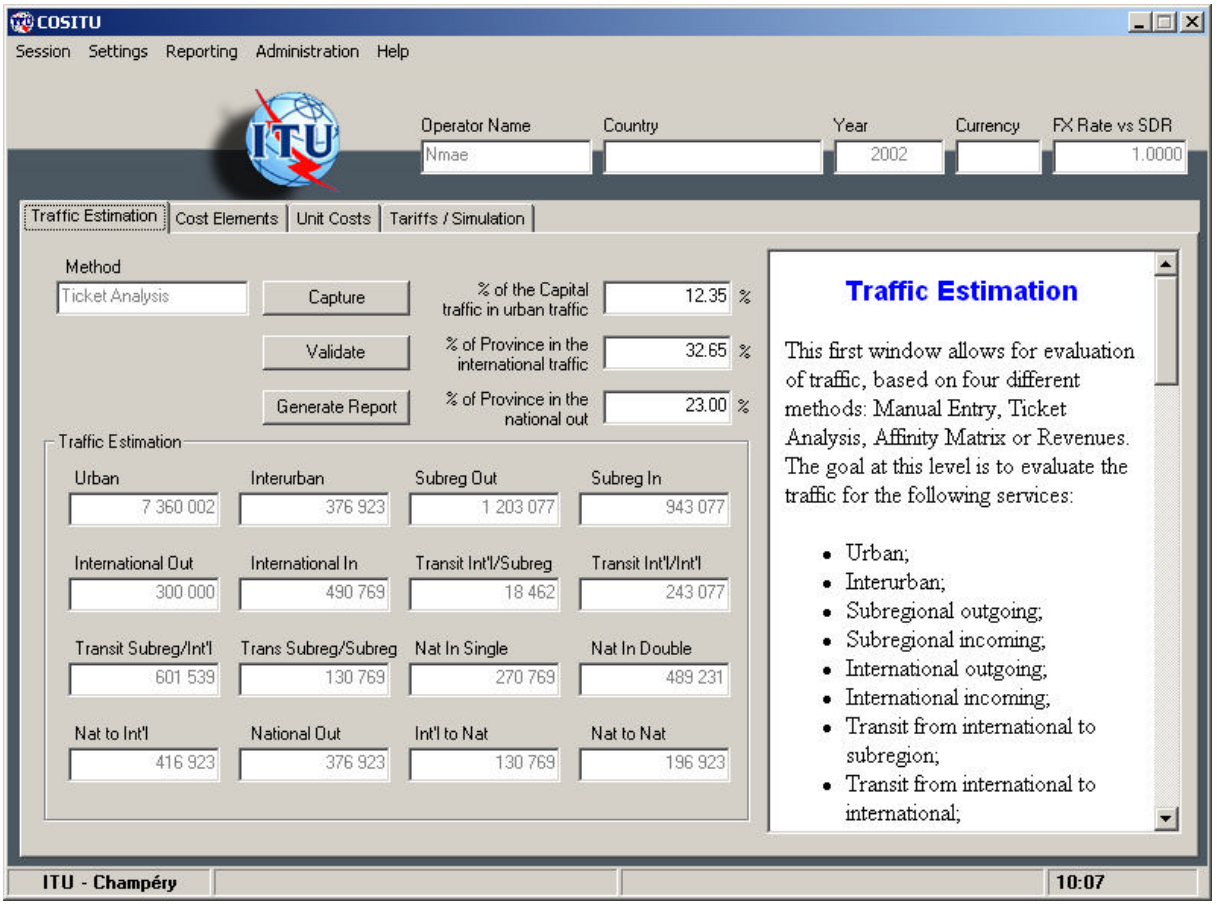
This user name has Administrator rights and allows you to define other COSITU users.

2 Using COSITU

2.1 Introduction

COSITU is a stand-alone[1] application using the Windows Graphical User Interface. Its goal is to compute cost-oriented tariffs for urban, interurban, international, subregional and interconnection communications at a country level, for a given year and a given operator.

All costs are expressed in local currency, but the exchange rate with the Special Drawing Right (SDR) must be known in order to be able to benchmark the computed data with other operators in other countries.



COSITU – Main window

The lower part of the window contains some general information such as:

- Current session name (see chapter 2.2)
- Current date and time

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[1] It is a stand-alone application in the sense that it is able to run independently. However, a connection to the central server is provided in order to benchmark the data.

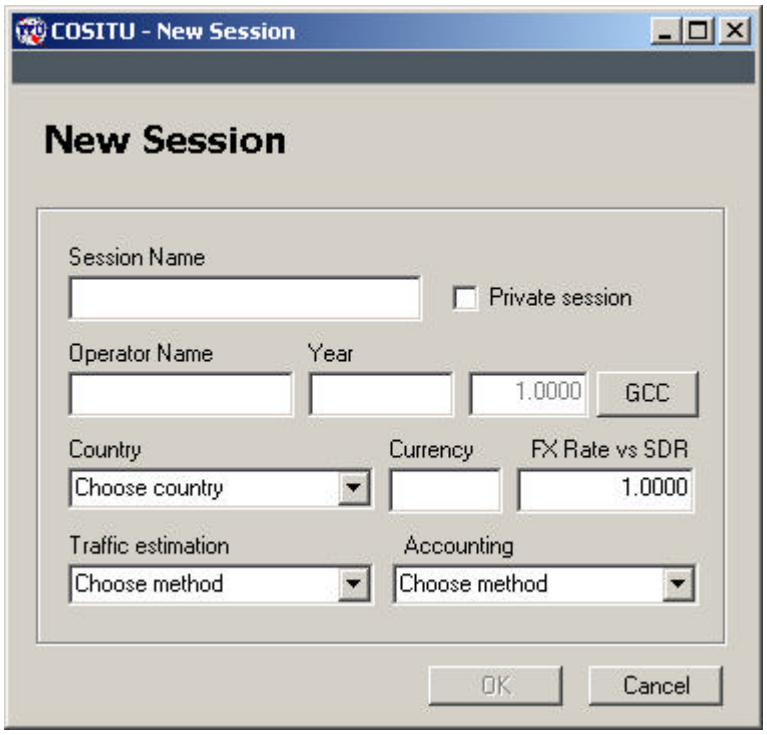
2.2 Session Menu

2.2.1 Introduction

This application is session-based. This means that when the application is started, it automatically opens the last session opened by the logged-in user.

2.2.2 New

This option allows the creation of a new session. When a new session is created, the following information must be entered:



Session Name:

This is the name by which this session will be referenced.

Private Session Indicator:

This indicator allows the user to specify whether the session can be managed by all system users (box unchecked) or only by its creator (box checked).

Operator Name:

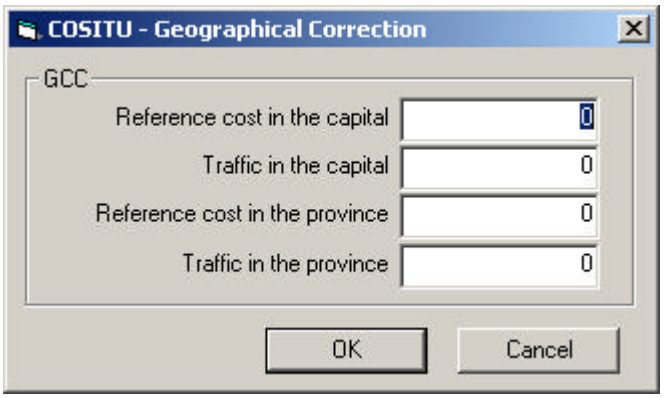
This is the name of the operator using COSITU.

Year:

This is the year for which cost-oriented tariffs will be calculated.

Geographical Correction Coefficient (GCC):

The GCC can be calculated with the following tool:



GCC is calculated as:

Tc*Cp/Tp*Cc where

Tc: Traffic in the capital

Tp: Traffic in the province

Cc: Reference cost in the capital

Cp: Reference cost in the province

If the GCC is smaller than 1, the system automatically rounds it up to 1. If it is greater than 3, the system informs the user that the value is not likely to be correct. However, the user can keep the calculated value if he/she considers it to be correct.

Country:

This is the country where the operator is active and for which tariffs are calculated in this session.

Currency:

Local currency of the country. All amounts are entered in local currency except settlement rates relative to international traffic.

FX Rate vs SDR:

Exchange rate of the local currency against the SDR. This rate is used when data are being exchanged with the ITU server as well as for the calculation of weighted average tariffs for international services.

Traffic Estimation Method:

The user can choose between four different methods to determine traffic data:

- Manual entry (these values do not necessarily come from an estimation method)
- Ticket analysis
- Affinity matrix
- Revenues

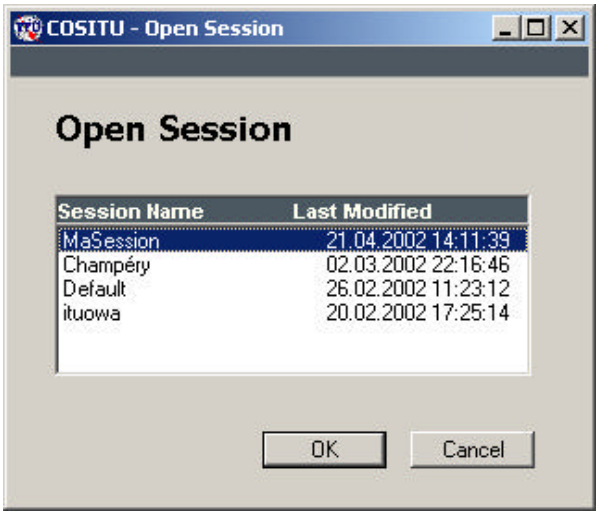
If the manual entry method is selected, the user must enter the traffic data manually. The three other methods allow specific traffic information to be deduced from other information known by the operator. The estimation logic of these three methods is detailed in chapter 3.

Accounting:

The user specifies, here, whether the cost data are coming from his/her General or Analytical Accounting. Choosing one source or the other will guide the user through different steps requiring the entry of specific data.

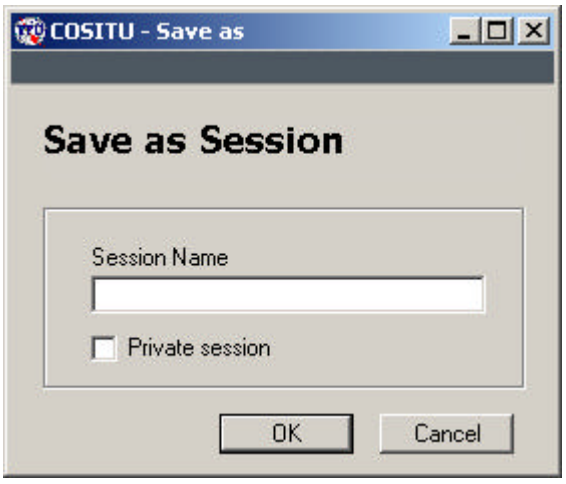
2.2.3 Open Session

This option allows a user to select a session to be opened from the list of sessions that are available.



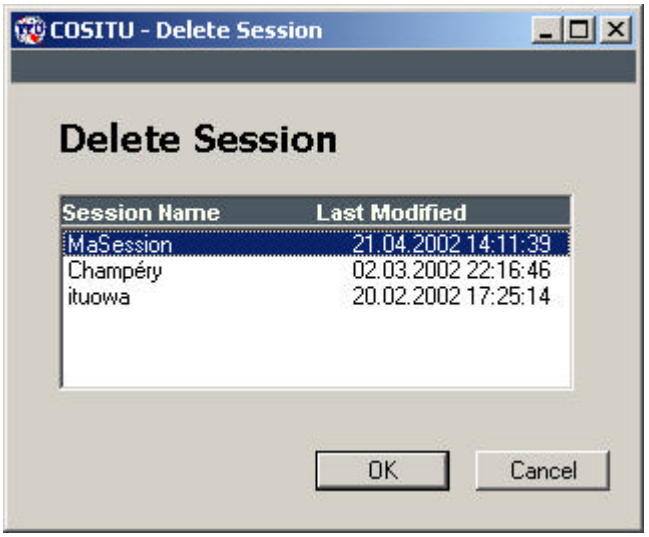
2.2.4 Save as Session

This option allows all the data of the current session to be saved as a new session. The system will ask for the new session name and the user can then specify whether the new session is private (checked box) or public (unchecked box). Private sessions can only be viewed or managed by their creator. Other sessions can be viewed and managed by all users of the system.



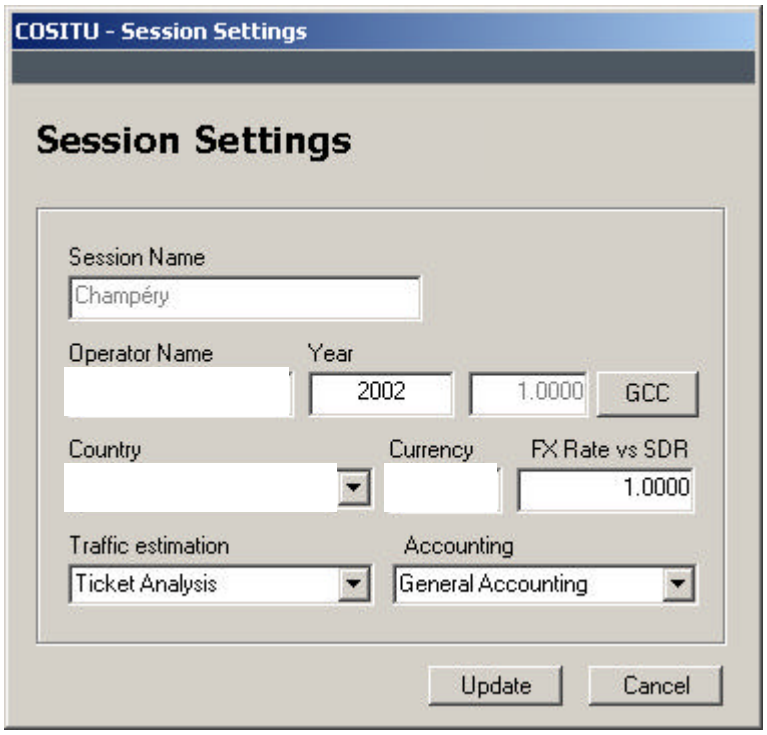
2.2.5 Delete

This option allows a session to be deleted from the list of sessions that are available to the user. The *Default* session cannot be deleted.



2.2.6 Settings

This option allows a user to modify the information related to a session. This information is the same as that required when creating a new session. All fields can be modified except the name of the session.



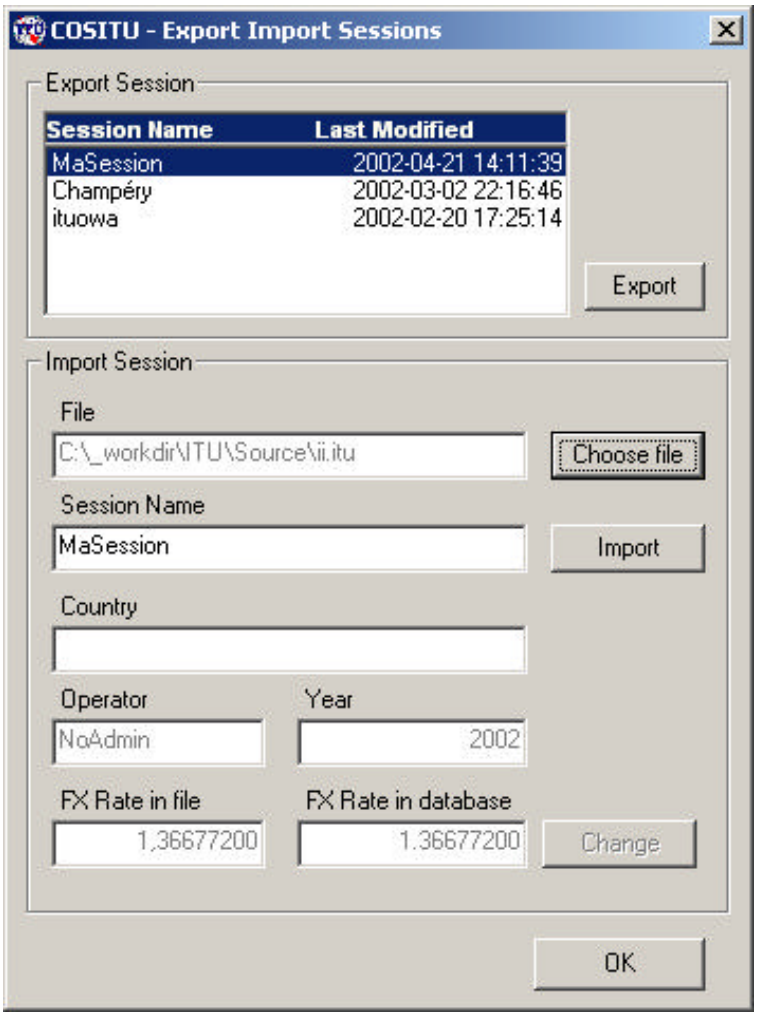
2.2.7 Export-Import

This option allows exporting and importing sessions.

To export a session, the user must choose the session and after pressing the *Export* button, specify the name of the file to which it should be stored.

To import a session, the user has to specify the file by pressing the *Choose file* button. If the name of the session from file already exists in the database, the user must set a different name for the imported session.

If the FX Rate in the database is different than the FX Rate of the imported file, the button *Change* is enabled and it is allowed to import the value from the file to the database.



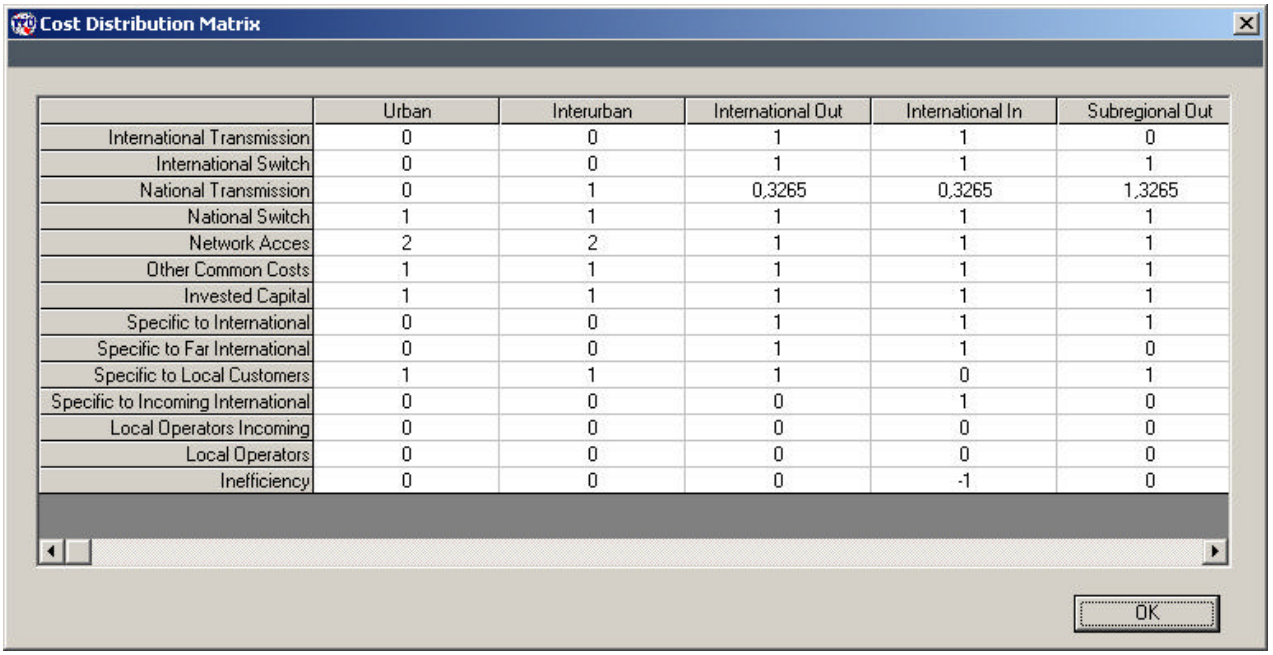
2.2.8 Exit

This option allows the user to quit the application.

2.3 Settings Menu

2.3.1 Cost Distribution Matrix

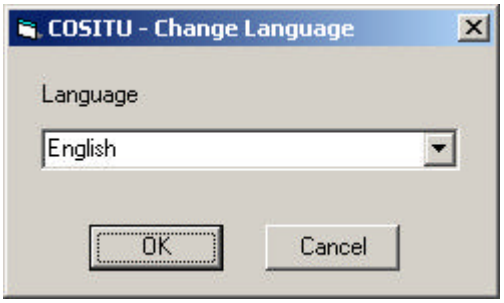
The Cost Distribution Matrix specifies the rules for allocating costs among the different services. This option displays the contents of the Cost Distribution Matrix.



	Urban	Interurban	International Out	International In	Subregional Out
International Transmission	0	0	1	1	0
International Switch	0	0	1	1	1
National Transmission	0	1	0,3265	0,3265	1,3265
National Switch	1	1	1	1	1
Network Acces	2	2	1	1	1
Other Common Costs	1	1	1	1	1
Invested Capital	1	1	1	1	1
Specific to International	0	0	1	1	1
Specific to Far International	0	0	1	1	0
Specific to Local Customers	1	1	1	0	1
Specific to Incoming International	0	0	0	1	0
Local Operators Incoming	0	0	0	0	0
Local Operators	0	0	0	0	0
Inefficiency	0	0	0	-1	0

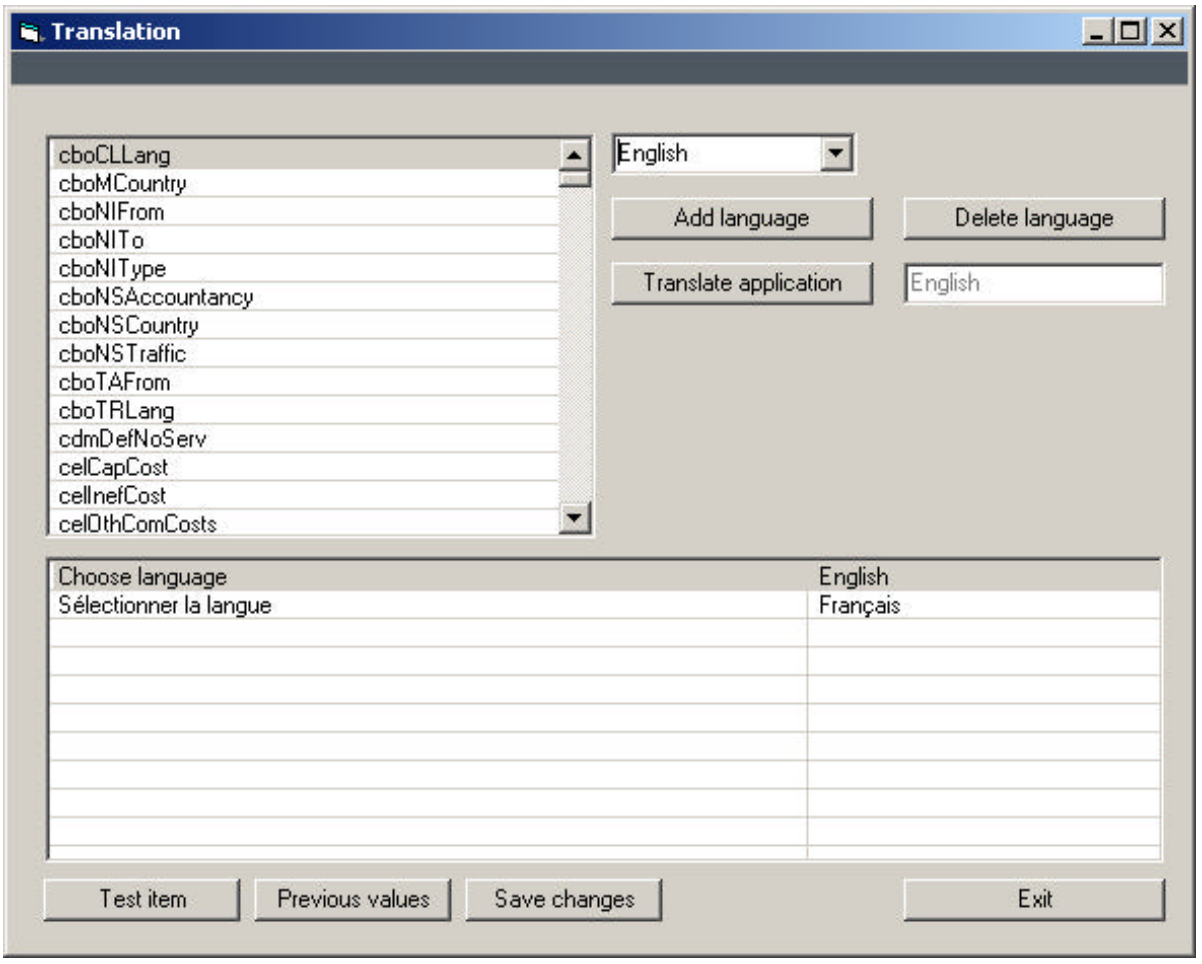
2.3.2 Change Language

This option allows users to change the language of the application. The user can choose from the languages available in the list. Once the language has been selected, the application is automatically translated.



2.3.3 Translation

The Translation option allows the management of translations for the application.



Add Language

The Add Language option allows users to add a new language in which the application can be translated. Translations can then be added to the application by the user.

Delete Language

The Delete Language option deletes the language itself and all its corresponding translations.

Translate Application

This option allows translation of the application to the language specified in the field at the top of the window; the read-only field indicates the current language.

Test Item

This option allows translations which have been entered to be tested before being saved. To use this option, select the translated item to be tested and activate the application in the area in which the item is used.

Previous Values

This option allows translation values entered to be replaced by stored values.

Save Changes

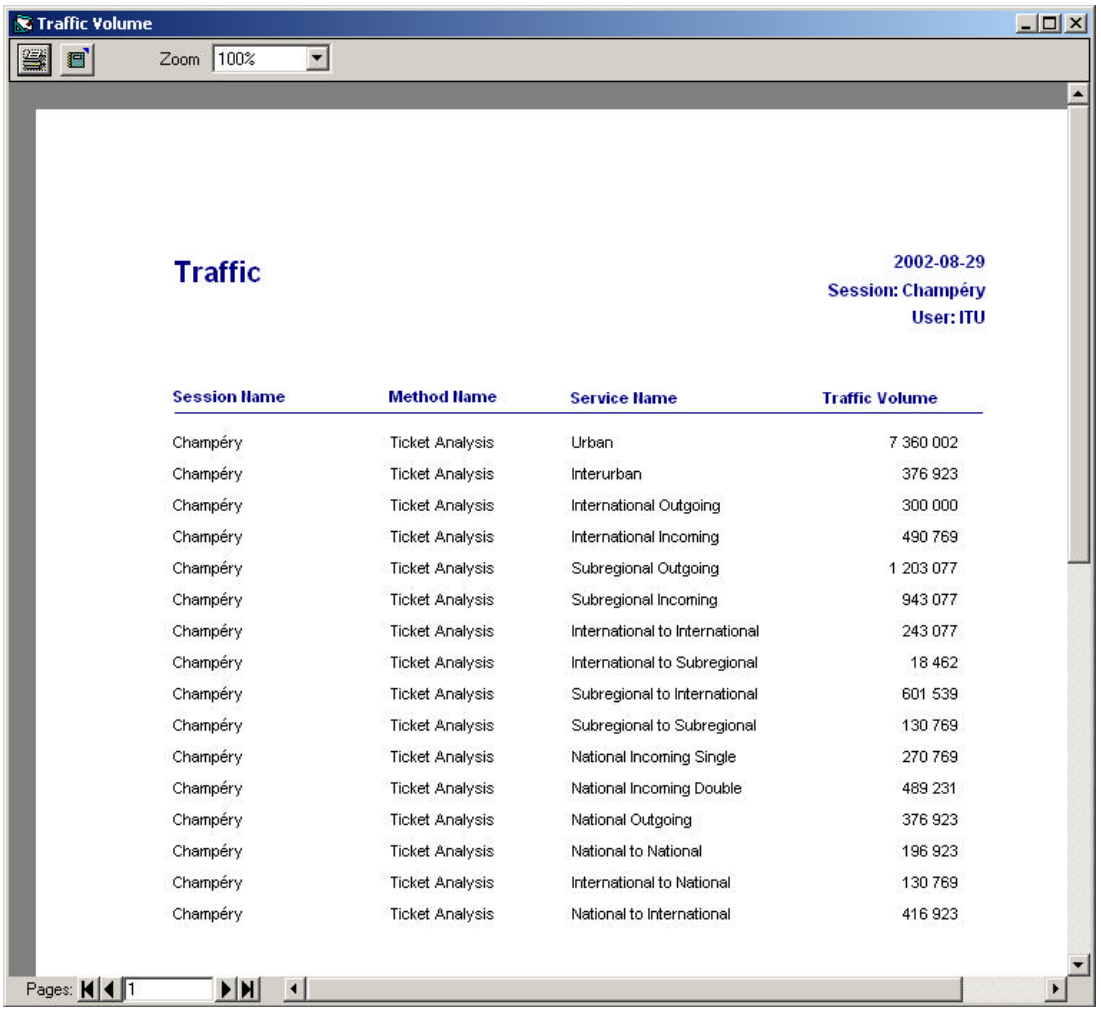
This option allows the newly entered translations to be stored in the database.

2.4 Reports Menu

The Reports Menu includes a set of reports that can be executed from the data stored in the database.

2.4.1 Results of the Traffic Estimation

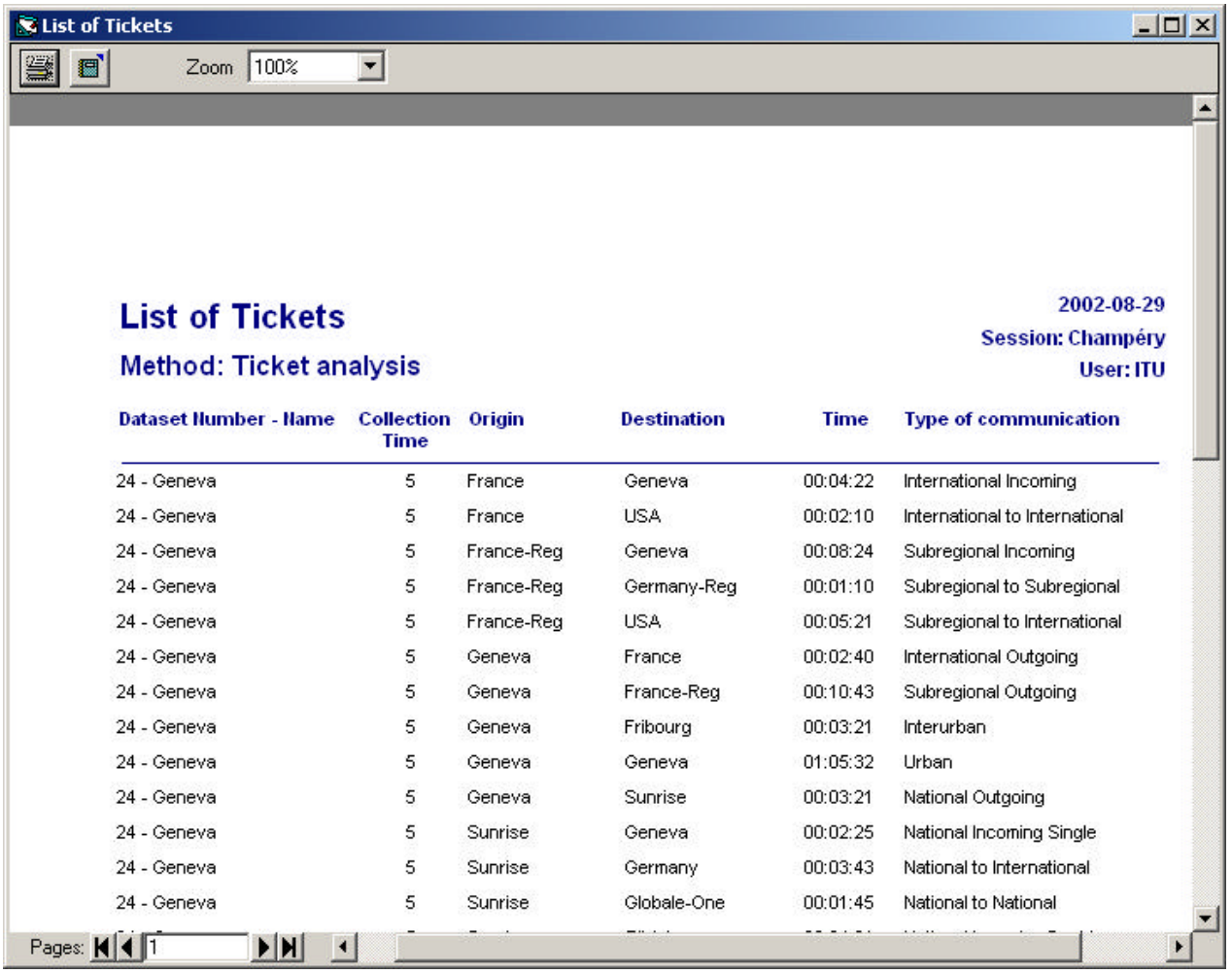
This report shows the traffic data that have been estimated using one of the estimation methods.



Session Name	Method Name	Service Name	Traffic Volume
Champéry	Ticket Analysis	Urban	7 360 002
Champéry	Ticket Analysis	Interurban	376 923
Champéry	Ticket Analysis	International Outgoing	300 000
Champéry	Ticket Analysis	International Incoming	490 769
Champéry	Ticket Analysis	Subregional Outgoing	1 203 077
Champéry	Ticket Analysis	Subregional Incoming	943 077
Champéry	Ticket Analysis	International to International	243 077
Champéry	Ticket Analysis	International to Subregional	18 462
Champéry	Ticket Analysis	Subregional to International	601 539
Champéry	Ticket Analysis	Subregional to Subregional	130 769
Champéry	Ticket Analysis	National Incoming Single	270 769
Champéry	Ticket Analysis	National Incoming Double	489 231
Champéry	Ticket Analysis	National Outgoing	376 923
Champéry	Ticket Analysis	National to National	196 923
Champéry	Ticket Analysis	International to National	130 769
Champéry	Ticket Analysis	National to International	416 923

2.4.2 List of Tickets

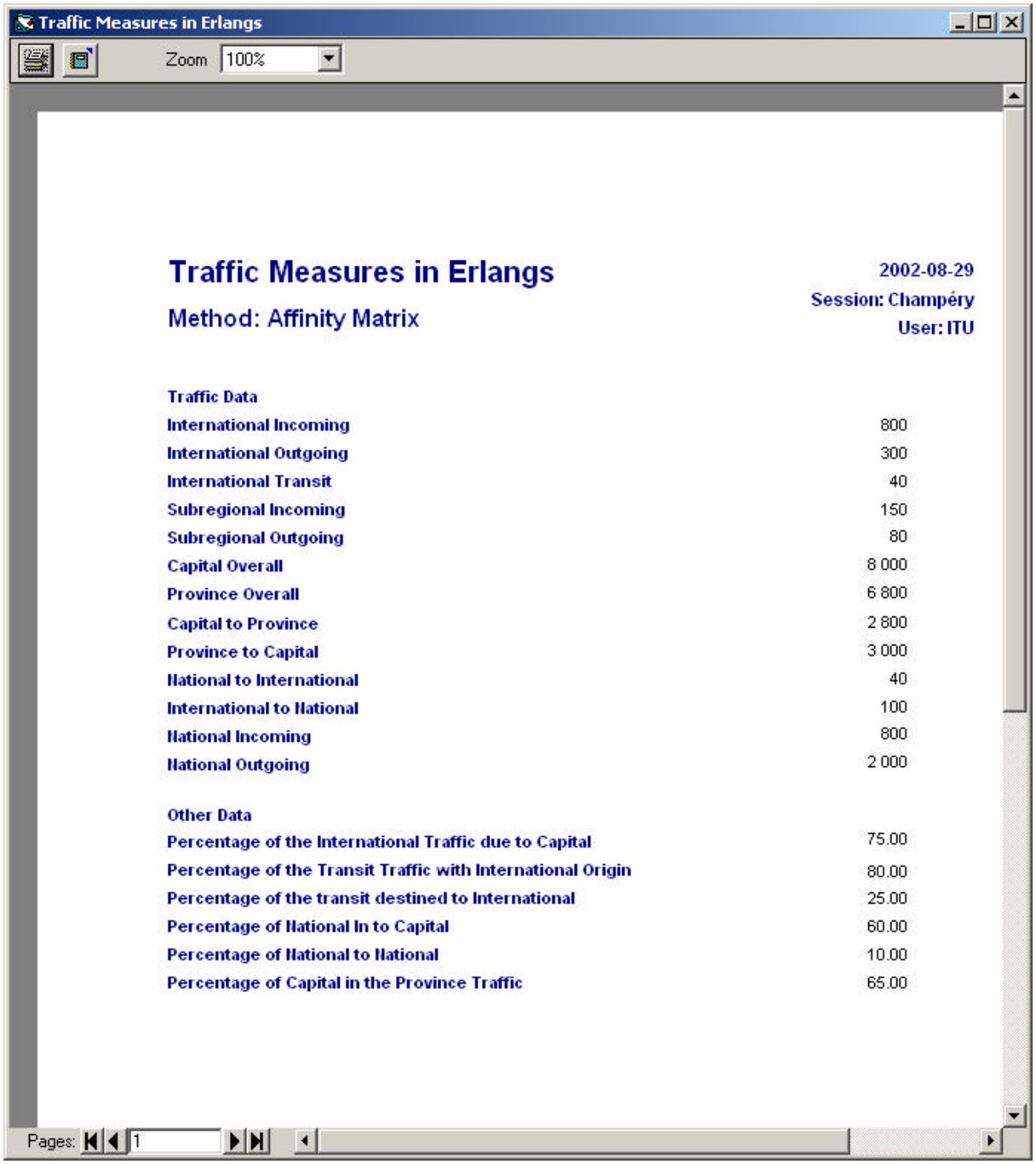
This report gives details on tickets imported from normalized files.



Dataset Number - Name	Collection Time	Origin	Destination	Time	Type of communication
24 - Geneva	5	France	Geneva	00:04:22	International Incoming
24 - Geneva	5	France	USA	00:02:10	International to International
24 - Geneva	5	France-Reg	Geneva	00:08:24	Subregional Incoming
24 - Geneva	5	France-Reg	Germany-Reg	00:01:10	Subregional to Subregional
24 - Geneva	5	France-Reg	USA	00:05:21	Subregional to International
24 - Geneva	5	Geneva	France	00:02:40	International Outgoing
24 - Geneva	5	Geneva	France-Reg	00:10:43	Subregional Outgoing
24 - Geneva	5	Geneva	Fribourg	00:03:21	Interurban
24 - Geneva	5	Geneva	Geneva	01:05:32	Urban
24 - Geneva	5	Geneva	Sunrise	00:03:21	National Outgoing
24 - Geneva	5	Sunrise	Geneva	00:02:25	National Incoming Single
24 - Geneva	5	Sunrise	Germany	00:03:43	National to International
24 - Geneva	5	Sunrise	Globale-One	00:01:45	National to National

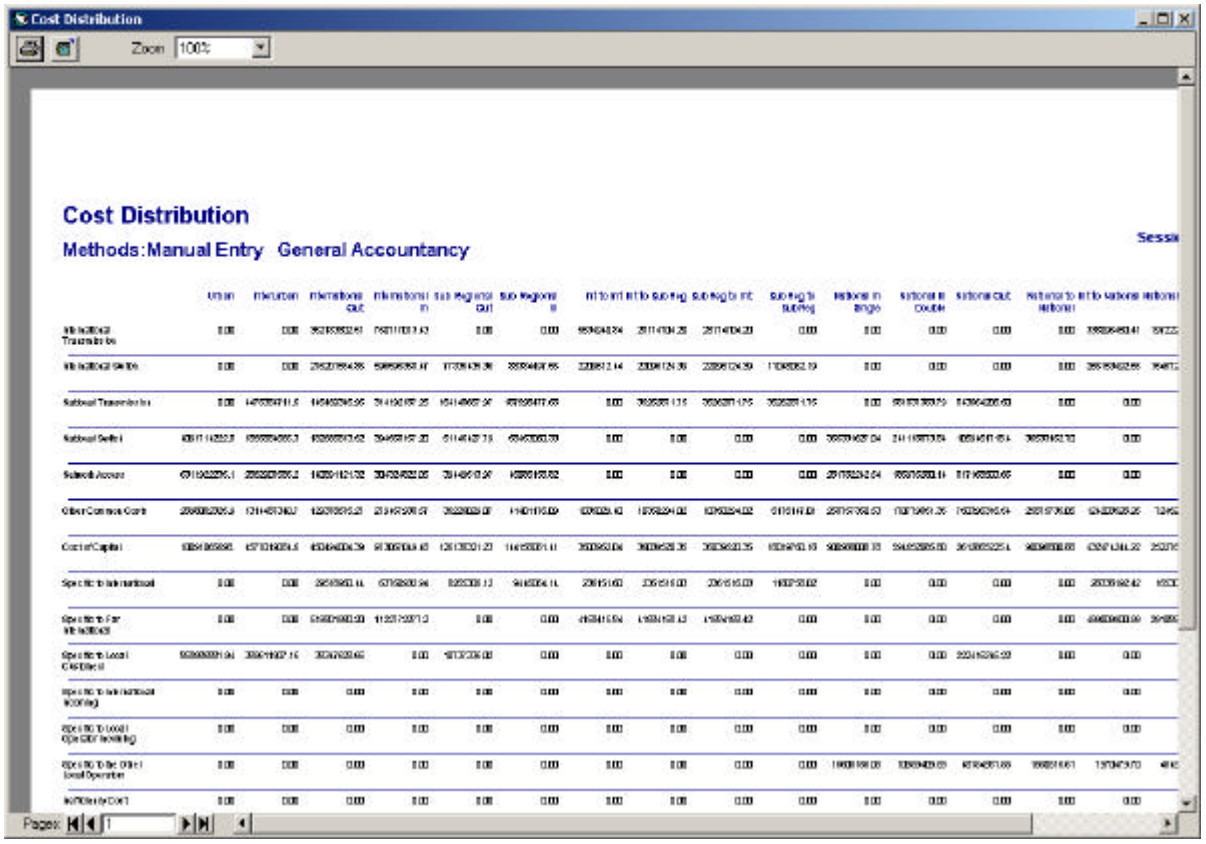
2.4.3 Traffic Measures in Erlangs

This report displays the data entered in Erlangs as well as the percentages used for the estimation of the traffic volume.



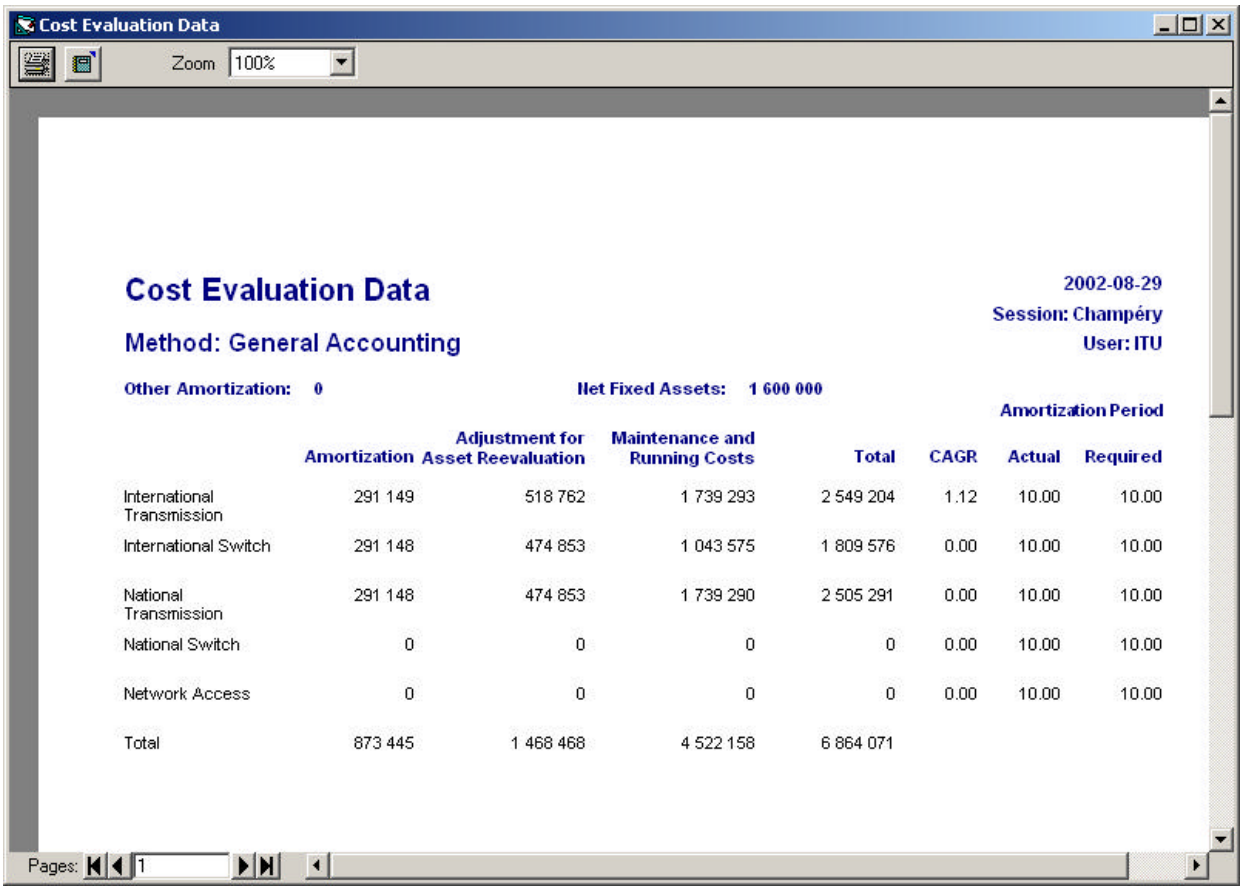
2.4.4 Cost Distribution Matrix

This report shows the distribution of the cost elements across the different services.



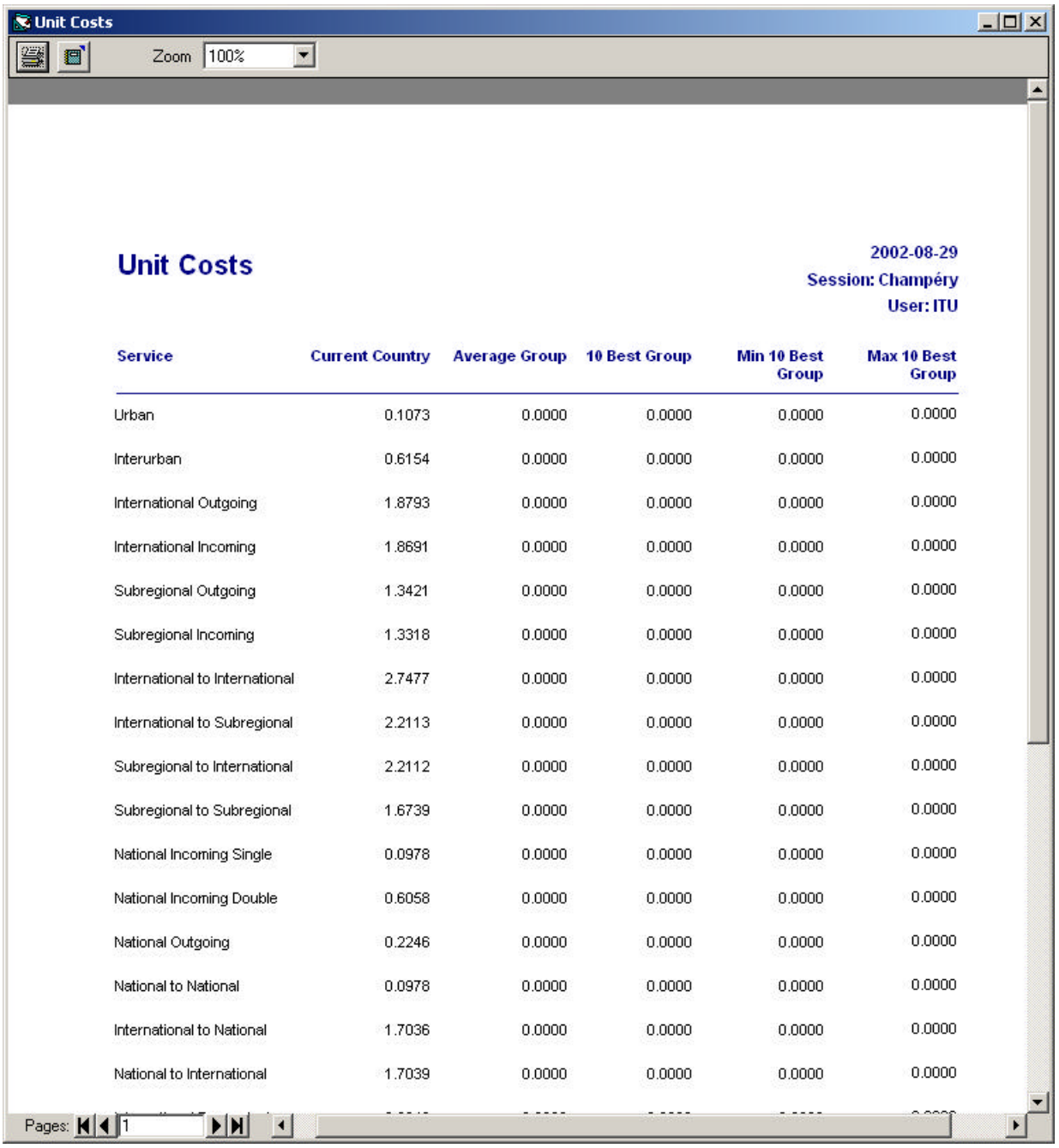
2.4.5 Cost Evaluation Data

This report shows the detailed result of the network costs calculation.



2.4.6 Unit Costs

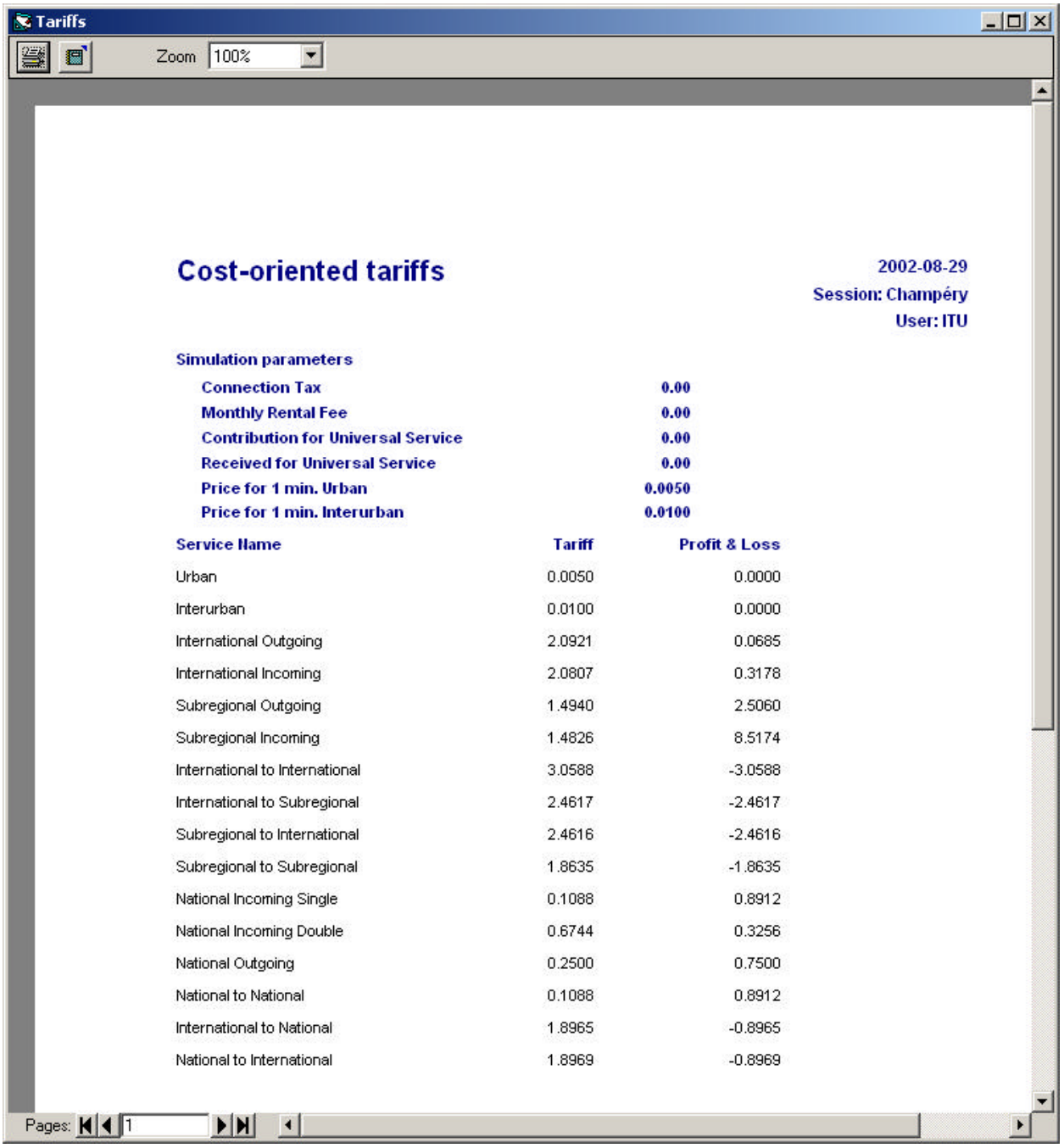
This reports displays the Unit Costs data as displayed under the *Unit Costs* tab.



Service	Current Country	Average Group	10 Best Group	Min 10 Best Group	Max 10 Best Group
Urban	0.1073	0.0000	0.0000	0.0000	0.0000
Interurban	0.6154	0.0000	0.0000	0.0000	0.0000
International Outgoing	1.8793	0.0000	0.0000	0.0000	0.0000
International Incoming	1.8691	0.0000	0.0000	0.0000	0.0000
Subregional Outgoing	1.3421	0.0000	0.0000	0.0000	0.0000
Subregional Incoming	1.3318	0.0000	0.0000	0.0000	0.0000
International to International	2.7477	0.0000	0.0000	0.0000	0.0000
International to Subregional	2.2113	0.0000	0.0000	0.0000	0.0000
Subregional to International	2.2112	0.0000	0.0000	0.0000	0.0000
Subregional to Subregional	1.6739	0.0000	0.0000	0.0000	0.0000
National Incoming Single	0.0978	0.0000	0.0000	0.0000	0.0000
National Incoming Double	0.6058	0.0000	0.0000	0.0000	0.0000
National Outgoing	0.2246	0.0000	0.0000	0.0000	0.0000
National to National	0.0978	0.0000	0.0000	0.0000	0.0000
International to National	1.7036	0.0000	0.0000	0.0000	0.0000
National to International	1.7039	0.0000	0.0000	0.0000	0.0000

2.4.7 Tariffs

This report displays computed tariffs, profit and loss and computation parameters.



2.5 Administration Menu

2.5.1 Create Login

The *Create Login* option allows new users to be added to the COSITU application.

When defining a new *User Login*, the following information must be entered:

Login:

This option specifies the *Login* to be used by the new user.

Password:

This option specifies the *Password* to be used by the new user. The password must be entered twice in order to be validated.

Administrator:

The *Administrator* option specifies whether the new user will be allowed to access the Administrative Tasks of the application. These Administrative Tasks are:

1 The Translation option in the Settings Menu

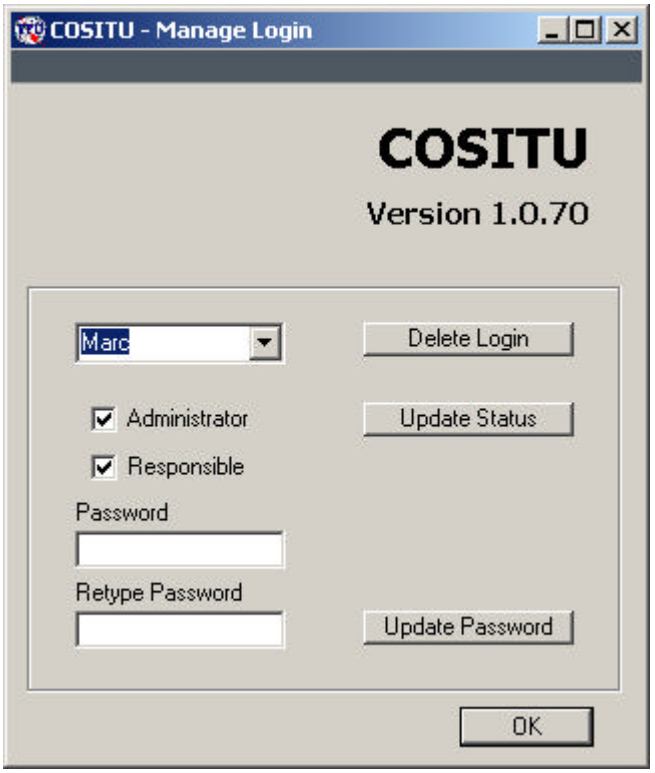
2 The Administration Menu

Responsible:

The *Responsible* option defines whether the specific user can create *Private* sessions. Private sessions are sessions that can only be managed and viewed by their creator.

2.5.2 Manage Login

The *Manage Login* option allows the management of User Logins.



Delete Login:

This option allows a User Login to be deleted.

Update Status:

This option allows the Administrator and Responsible status of a User Login to be modified (see 2.5.1 Create Login).

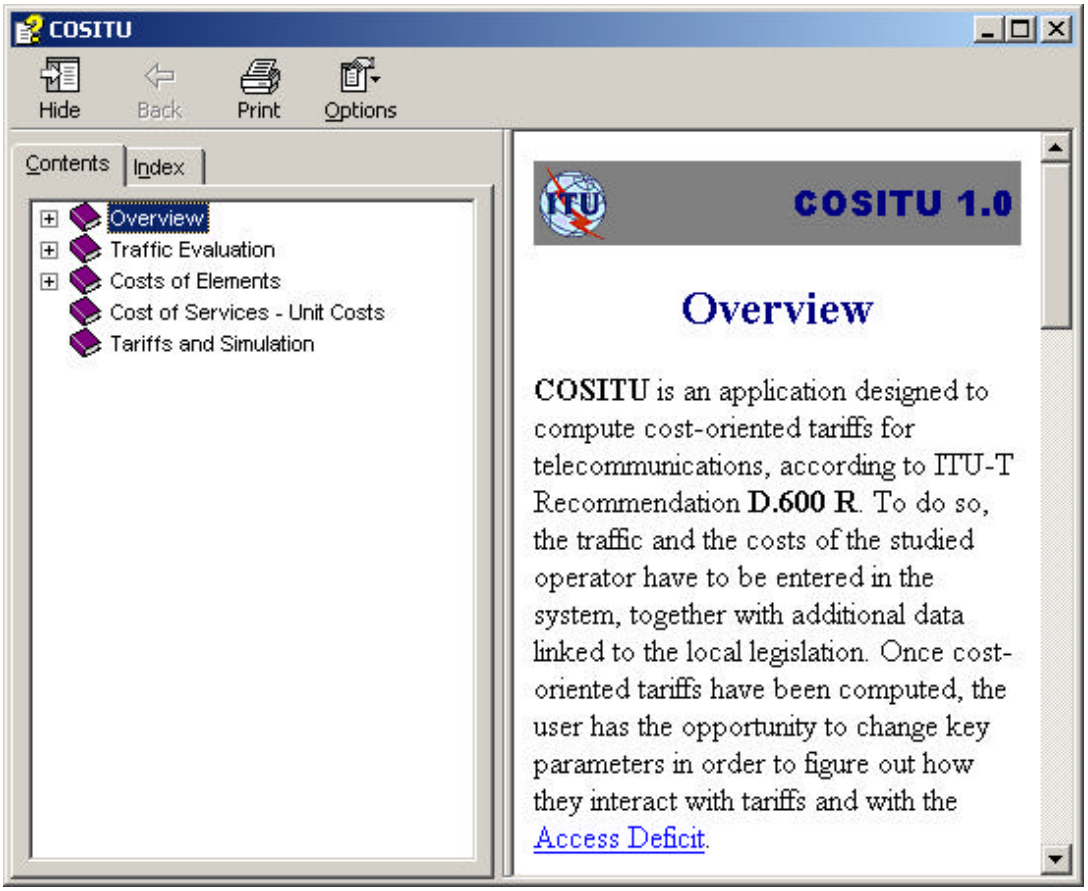
Update Password:

This option allows the modification of the User Login Password. The Password must be entered twice correctly to be accepted.

2.6 Help Menu

2.6.1 COSITU Help

This Menu option calls up the Help window. This window can also be called up by pressing F1 in any location of the application. Selecting this option from the Menu will open the standard Help window on its Overview page.



From this page it is possible to use Help in the following ways:

1 Select a page from the Contents window

2 Select a keyword from the Index or search for a keyword in the Index

3 Navigate within the Help by using the hyperlinks

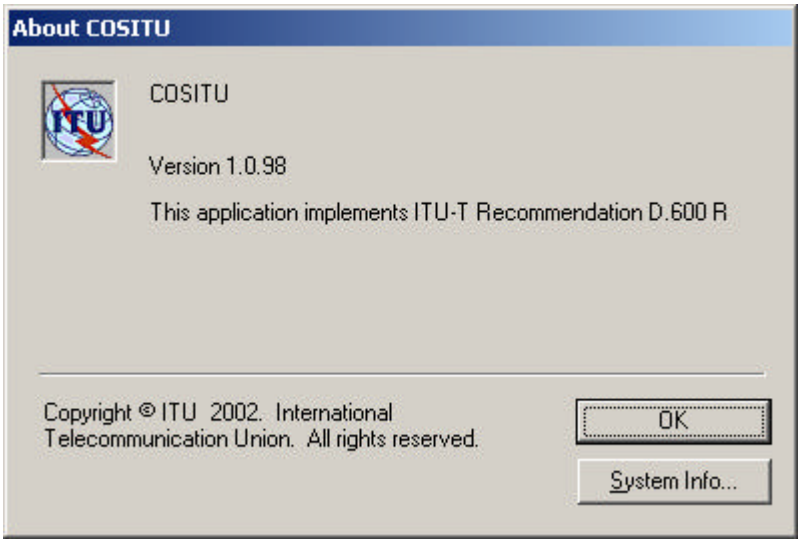
2.6.2 About COSITU

This window gives general information about the COSITU application such as:

– version number,

– description.

It is also possible to access System Information from this window by clicking System Info...



3 Traffic Estimation

The *Traffic Estimation* is the very first step in the determination of the Cost-Oriented Tariffs[2]. The goal here is to obtain as accurate an estimation as possible of the traffic data for all services.

If these traffic data are known, they can be entered directly into the system. However, knowing that very often this data is not entirely available, three methods for the estimation of the traffic data are proposed:

- *Ticket Analysis:* this method consists of collecting call tickets in the Telephone Exchanges during a specific period of time. Based on this data, the annual traffic in minutes for each service can be derived.
- *Affinity Matrix:* a traffic matrix in busy-hour Erlangs may be used to determine coefficients of affinity which are then considered in relation to outgoing national traffic or outgoing international traffic.
- *Revenues:* based on the international outgoing traffic and the national outgoing traffic which are usually known, and on the turnover for billed traffic, the turnover for domestic traffic can be determined, allowing the deduction of the urban and interurban traffic.

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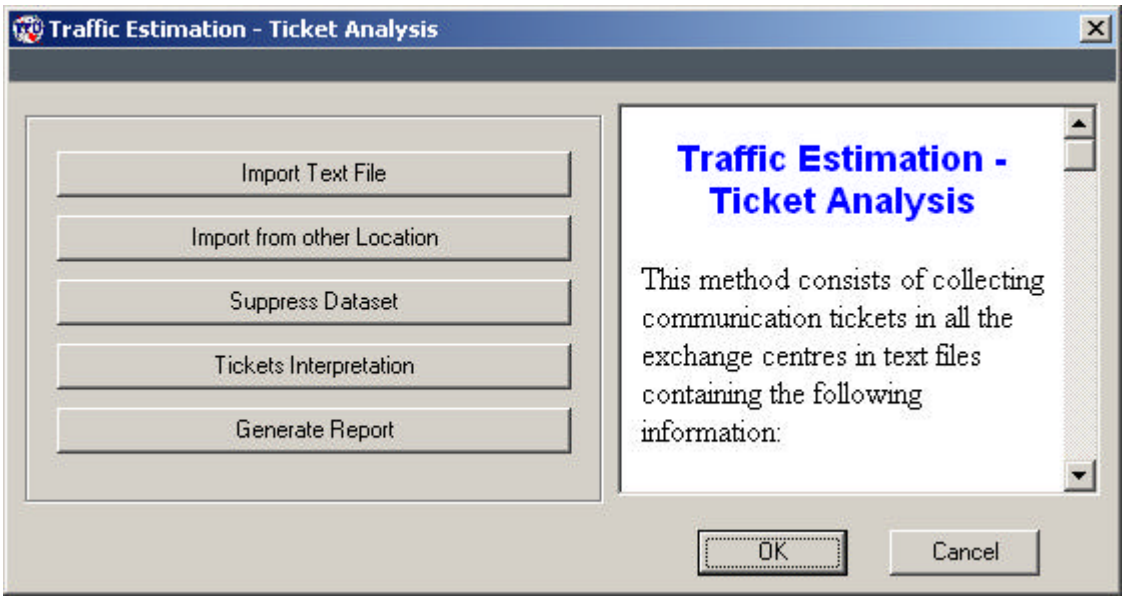
[2] The principles used are taken from ITU-T Recommendation D.600 R. The procedure is based on the Enhanced Fully Distributed Costing (EFDC) method. Taking as a basis the principles of activity-based costing, the procedure is applied in such a way that all the costs incurred for each service offered, and only those costs, are attributed to the service in question. The unit cost of the service is the total cost divided by the volume.

3.1 Ticket Analysis



Traffic observation can be performed by recording call tickets over a specific period of time (usually a week). The call tickets must show the location of the calling party, the location of the called party and the duration of the call. The point-to-point matrix determined from these data is used as the basis for extrapolation.

3.1.1 File Format

The call tickets are stored in text files having the following format:

```
Localisation,duration (in days)
Origin_1,Destination_1,minutes:seconds
Origin_2,Destination_2,minutes:seconds

....
Origin_n,Destination_n,minutes:seconds
```

It is the responsibility of the user to provide files having the required format. This format must be passed to the technical teams that will be in charge of extracting the data in the Telephone Exchanges. This kind of file can easily be generated from a database or from a spreadsheet.

3.1.2 File Import

The ticket files are **imported** into the system using the *Import Text File* button. If the file cannot be imported due to a format error, an error message appears telling the user where the mistake is and asking him/her to correct it manually. Before importing the file, the user is required to assign a name to this dataset. A number is automatically assigned to the dataset by the system.

3.1.3 Missing Data

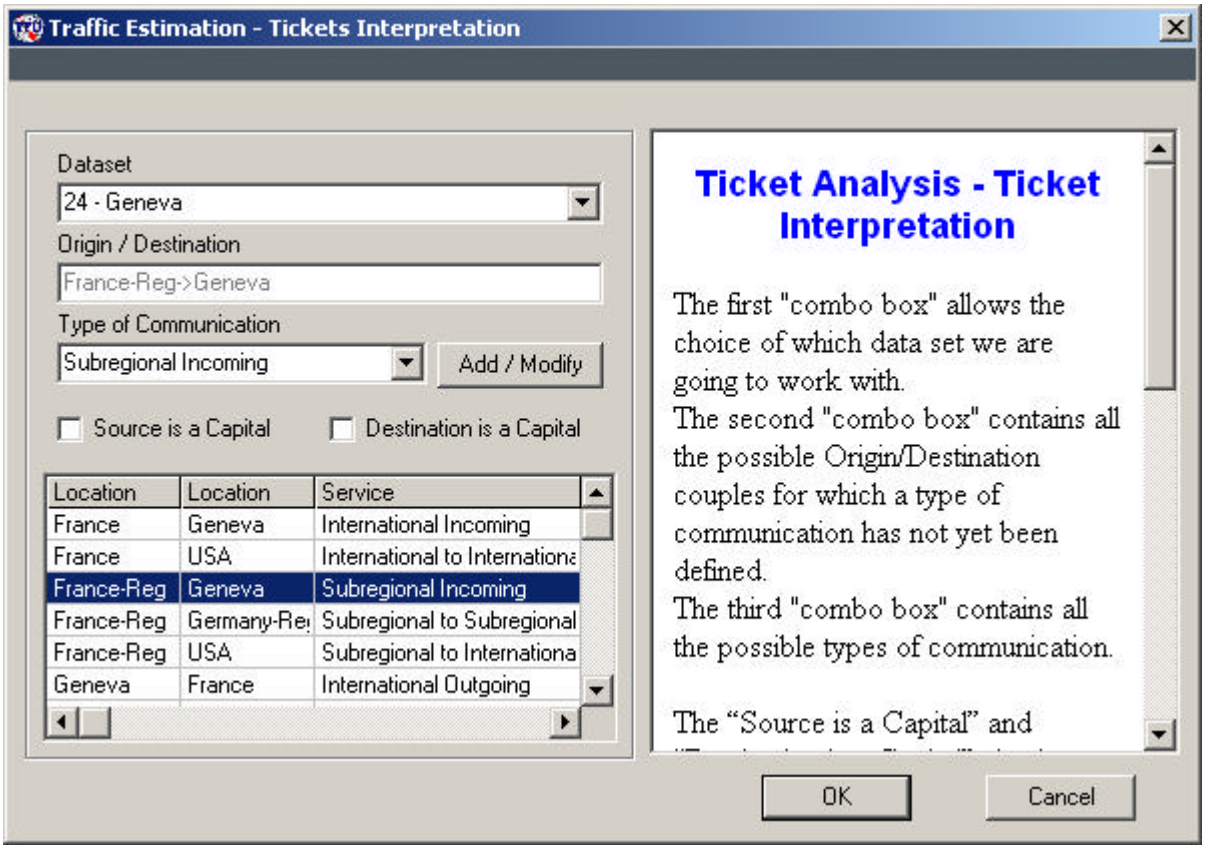
If, for any reason, data is missing for a given location, the user has the opportunity to copy data from another location that **he/she** considers similar. This operation can be performed with the button *Import from other Location*.

3.1.4 Dataset Suppression

With the button *Suppress Dataset*, the user has the possibility of deleting a previously entered dataset. It will not be taken into account in the traffic estimation. **A suppressed dataset cannot be recovered** (unless the corresponding text file is imported again).

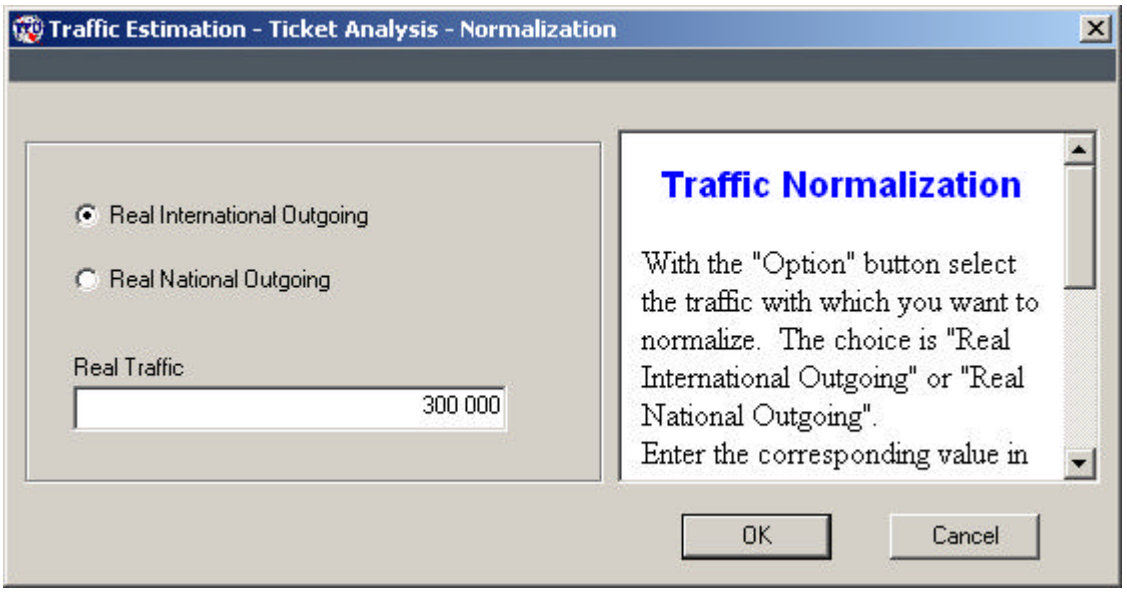
3.1.5 Ticket Interpretation

This button starts a sub-window allowing the assignation of a type of communication to all the occurrences of an Origin/Destination couple. This task has to be performed for each and every dataset. This sub-window is automatically started when a dataset has been imported.



3.1.6 Normalization

Once the data has been entered, and all the possible Origin/Destination couples have been identified, the traffic must be normalized, based on a known outgoing traffic volume in minutes such as the International Outgoing Traffic or the National Outgoing Traffic (recommended):



Based on the number entered, all traffic will be computed, assuming there is proportionality between the numbers estimated by the method and the real traffic volume entered.

3.1.7 Generate Report

The system allows the creation of a report containing all the call tickets entered for the current session, arranged by dataset.

3.2 Affinity Matrix

If it is not possible to observe the traffic by means of call tickets, a traffic matrix in busy-hour Erlangs may be used to determine coefficients of affinity which are then considered in relation to outgoing national traffic or outgoing international traffic.

The following data, coming from the busy-hour Erlangs measured in the Telephone Exchanges, must be entered:

Measured in the International Transit Centre:

- International Incoming
- International Outgoing
- International Transit
- Subregional Incoming

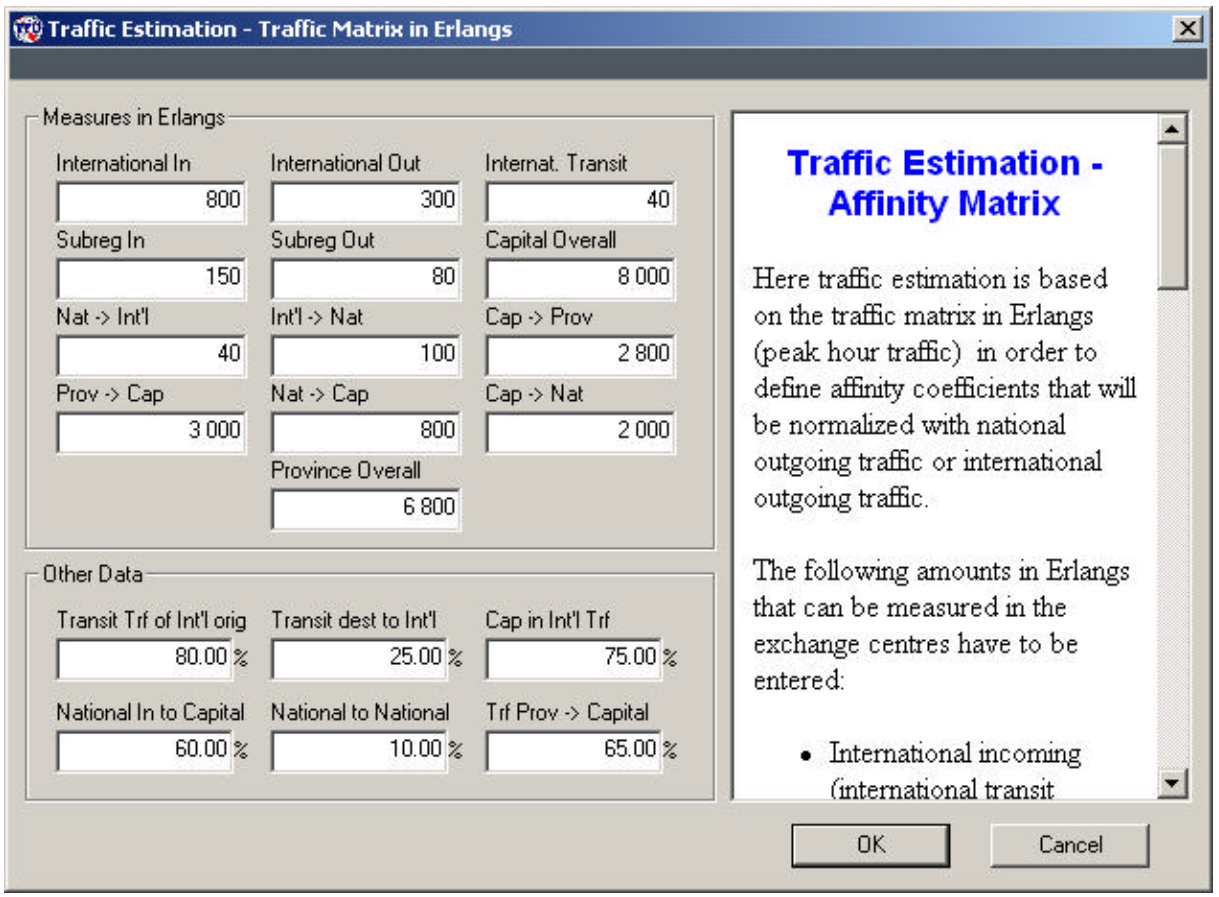
- Subregional Outgoing
- National to International
- International to National

Measured in the Capital exchanges:

- Capital Overall (total traffic of customers from the capital: Number of lines used x average traffic per line)
- Capital to Province (traffic between the capital and the Province switches)
- Province to Capital
- National to Capital (interconnection traffic between the capital switches and other local operators' networks)
- Capital to National

Measured in the Province exchanges:

- Province Overall (total traffic of customers from the province: Number of lines used × average traffic per line)



The additional percentages (in the second half of the window) and the volume of International Outgoing Traffic or National Outgoing Traffic in minutes, combined with the entered data will allow computing of the required traffic data.

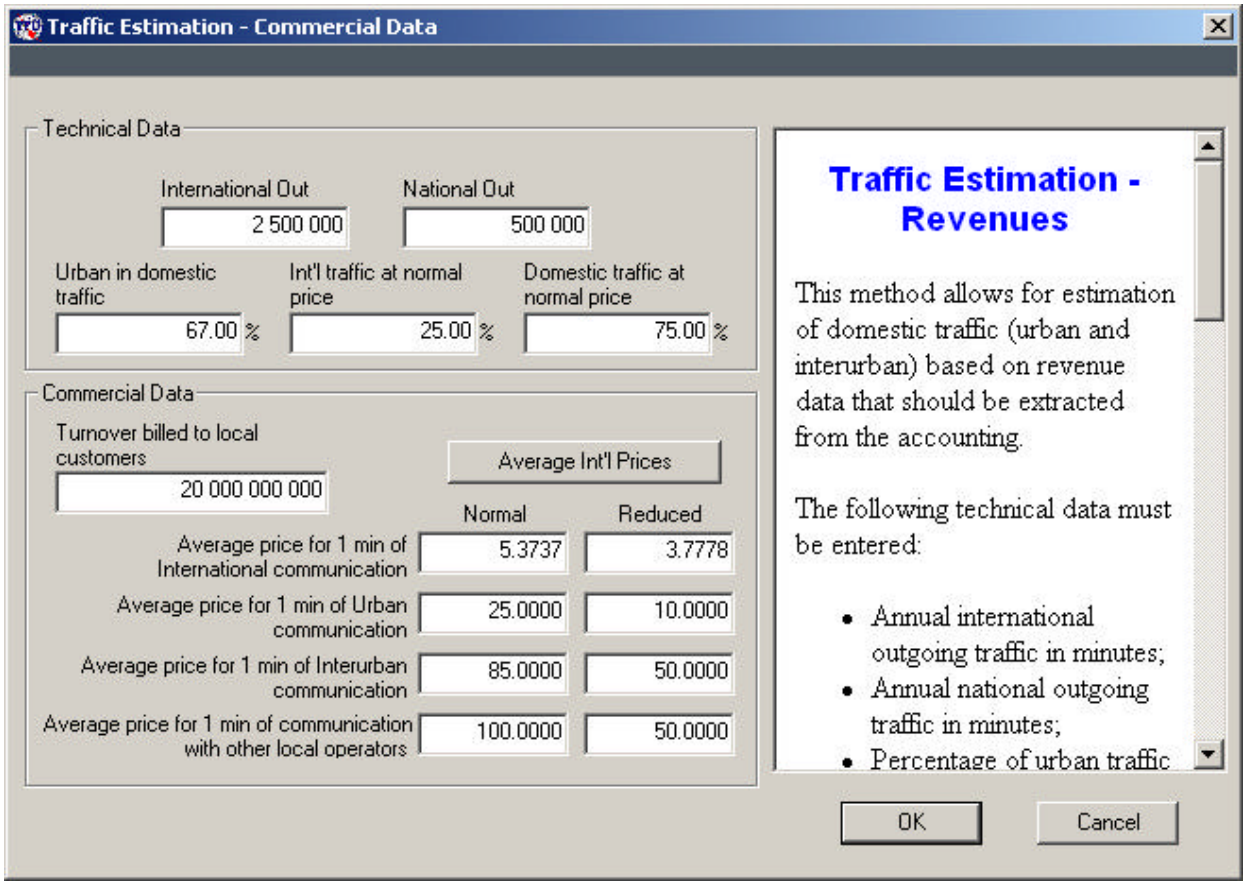
3.3 Revenues

If the international traffic and the interconnection traffic are known in minutes, it is also possible to take advantage of the fact that the turnover for billed traffic includes revenue from the following sources: domestic traffic, outgoing international traffic (including subregional outgoing traffic) and outgoing national traffic.

If the average price per minute and the volume of outgoing traffic are known, the turnover for domestic traffic can be determined.

The analysis of the matrix of national traffic and internal telephone exchange traffic allows the distribution of domestic traffic between local (urban) traffic and trunk (interurban) traffic, to be determined.

All the data are entered in the following window:



The average prices (normal and reduced tariffs) must be known for the international (including the subregional), the urban, the interurban and the interconnection traffic. The urban and interurban tariffs are usually known.

The expression of the urban tariff per minute in local currency may, however, require some intervention at the telephone exchange level with a view to determining, for a data observation period, the total amount and the duration of the corresponding urban communications.

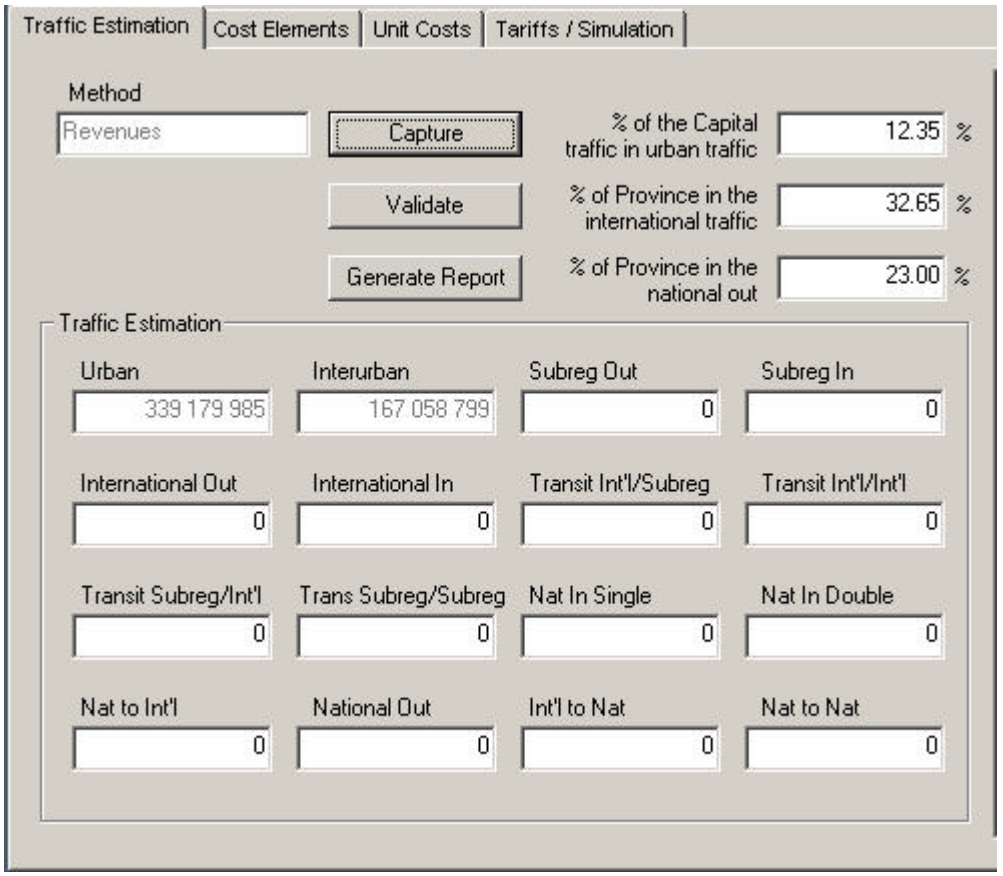
The international average prices may be a bit more difficult to determine, which is why a dedicated tool, activated by the *Average Int Prices* button, is available in the system. It requires, for each international and subregional relation, the entering of the annual traffic (incoming and outgoing), the settlement rate (incoming and outgoing) in SDR as well as the current normal and reduced prices in local currency for the outgoing traffic.

3.4 Validation

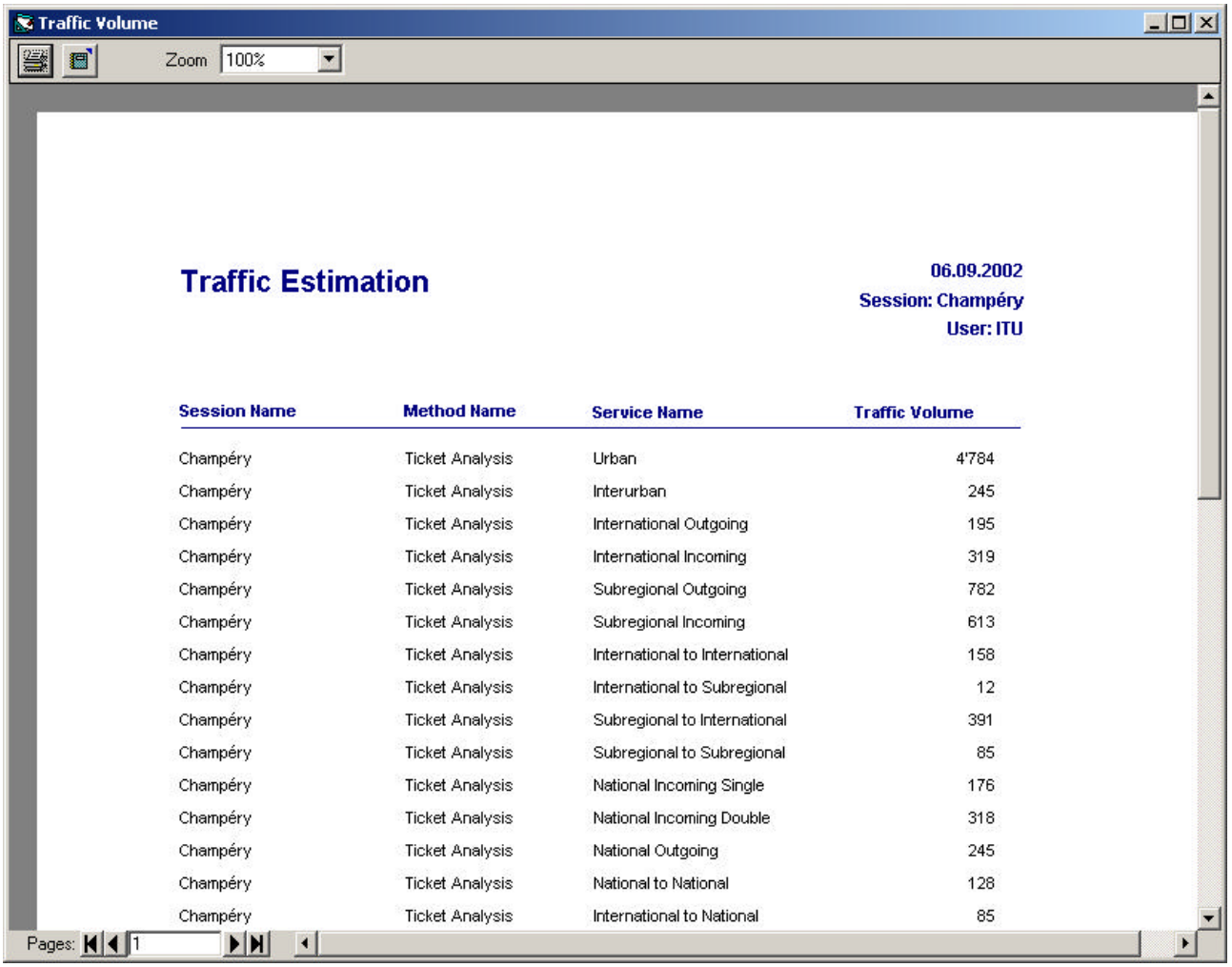
Once the traffic has been partially or fully estimated through one of the three methods mentioned above, the *Validate* button automatically sets the application to the *Manual Entry* mode. At this moment the results obtained from the estimation method are automatically copied. The user then has the possibility of manually entering missing data or modifying the existing data.

Additional data must now be entered. These will be used at a later stage by other processes:

- Percentage of the Capital in the Urban traffic;
- Percentage of the Province in the International traffic;
- Percentage of the Province in the National Outgoing traffic.



A report containing all the traffic data can be generated. It can be seen on-screen, printed or exported to a text file:

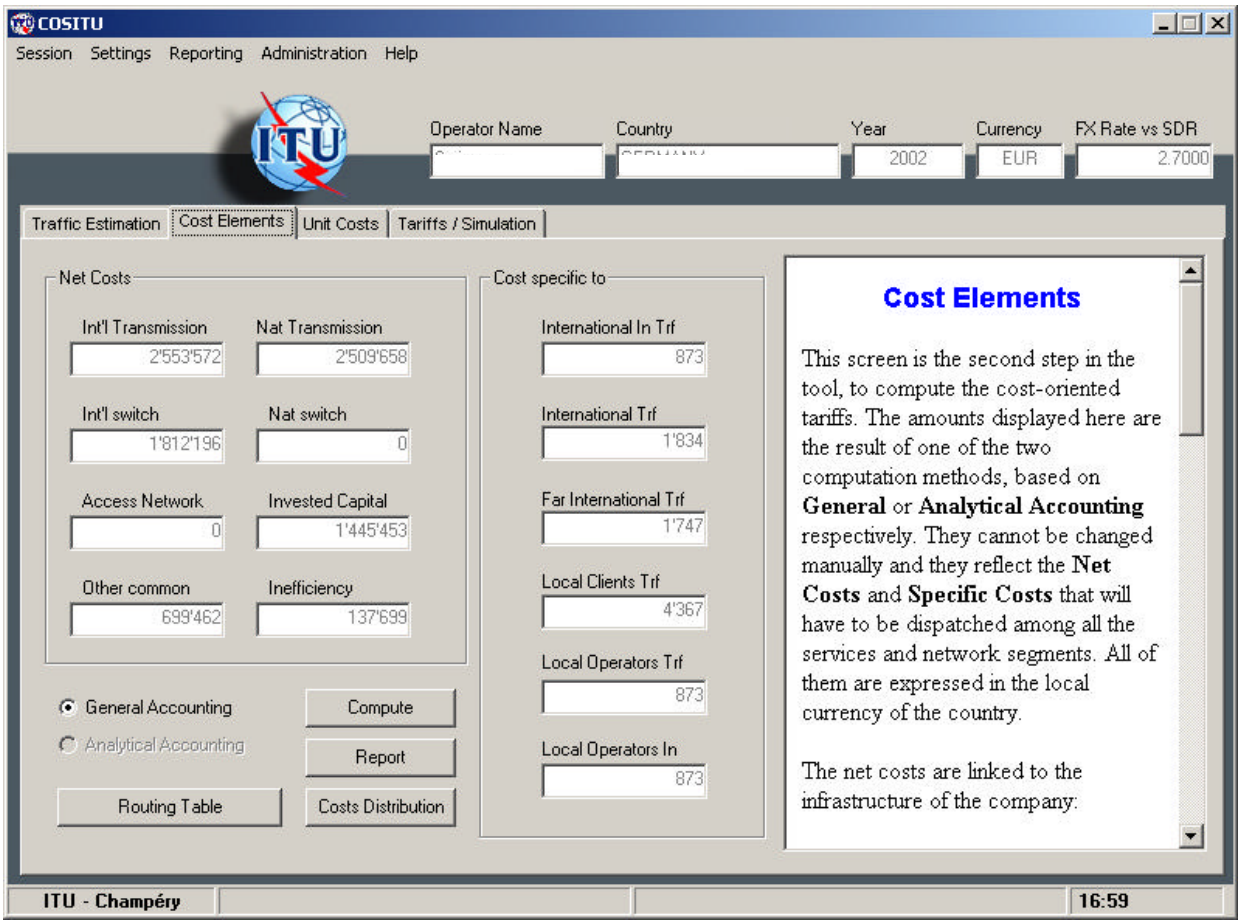


Session Name	Method Name	Service Name	Traffic Volume
Champéry	Ticket Analysis	Urban	4'784
Champéry	Ticket Analysis	Interurban	245
Champéry	Ticket Analysis	International Outgoing	195
Champéry	Ticket Analysis	International Incoming	319
Champéry	Ticket Analysis	Subregional Outgoing	782
Champéry	Ticket Analysis	Subregional Incoming	613
Champéry	Ticket Analysis	International to International	158
Champéry	Ticket Analysis	International to Subregional	12
Champéry	Ticket Analysis	Subregional to International	391
Champéry	Ticket Analysis	Subregional to Subregional	85
Champéry	Ticket Analysis	National Incoming Single	176
Champéry	Ticket Analysis	National Incoming Double	318
Champéry	Ticket Analysis	National Outgoing	245
Champéry	Ticket Analysis	National to National	128
Champéry	Ticket Analysis	International to National	85

4 Cost Evaluation

The second step of the application consists of evaluating all the costs related to the telephone services.

Depending on the accounting data available, two possible methods may be chosen: a cost evaluation based on analytical accounting or a cost evaluation based on general accounting. This choice has to be made when a session is created, but can be changed using the *Settings* tool in the *Session* menu.



4.1 Analytical Accounting

When analytical accounting is available, it should be possible to obtain detailed information regarding amortizations, operating costs and maintenance.

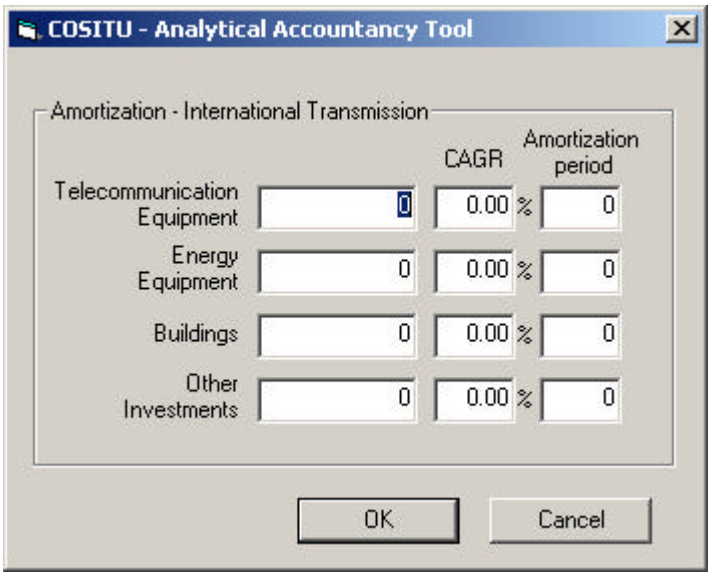
The following data should be provided: Annual amortization of equipment (telecommunications and energy), buildings and miscellaneous investments in the areas of switching (national and international), transmission (national and international), the access network and investments in structures.

The amortization period calculated for each network segment will be a weighted average of the amortization periods of the elements from which it is composed.

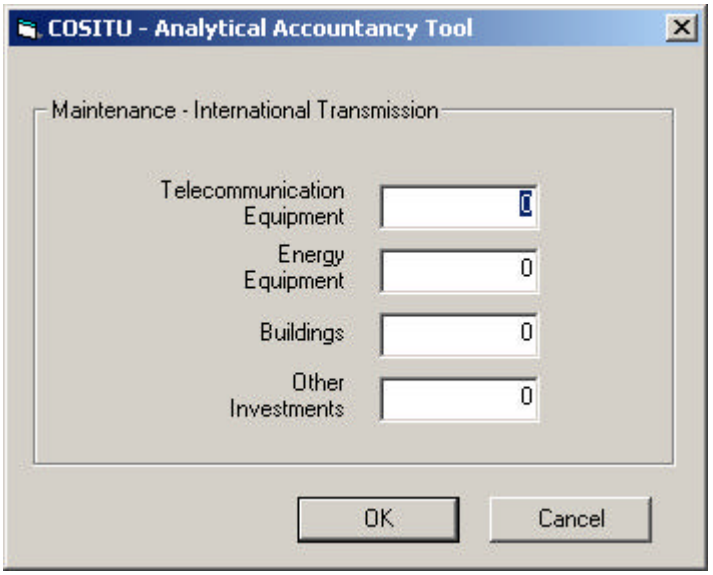
The data to be entered are the following:

- Amortization amounts for all segments

  Double clicking on any field will activate a detail sub-window that allows the amount to be entered (Amortization, Compound Annual Growth Rate (CAGR) and Amortization Period) for each category defined in the analytical accounting.



- Running and maintenance costs for each segment



- Compound Annual Growth Rate of the prices (CAGR) for each segment
- Amortization duration for each segment
- Total of net fixed assets

4.2 General Accounting

If cost information is available only from general accounting data, a good knowledge of the network's cost structure may allow the carrying out of an initial allocation of overall amortization and operating charges to the network's various segments.

The cost structure can be calculated on the basis of the net fixed assets of the various network segments. The segments considered are international transmission, international switching, national transmission, national switching and the access network. Other investments that cannot be classified in one of these segments are added.

It frequently happens that this information cannot be drawn directly from the subaccounts in the general accounting data. In this case, a more detailed analysis may be necessary (often requiring inspection in the field): for example, the separation of fixed assets for international and national switching, the allocation of fixed assets in technical buildings to the various segments, the allocation of fixed assets in electrical power equipment to the various segments, etc.

The cost structure is indicated by the relative value of net fixed assets for each segment of the network, in proportion to the total net fixed assets.

The general accounting data provide subaccounts of charges. The following subaccounts must be identified:

- *Purchases and variations in stock:* Purchases of material; purchases of raw materials and associated supplies; purchases of stocks of raw materials and associated supplies; purchases of packaging; other purchases; variations in stocks of material; variations in stocks of raw materials and associated supplies; variations in stocks of other supplies.

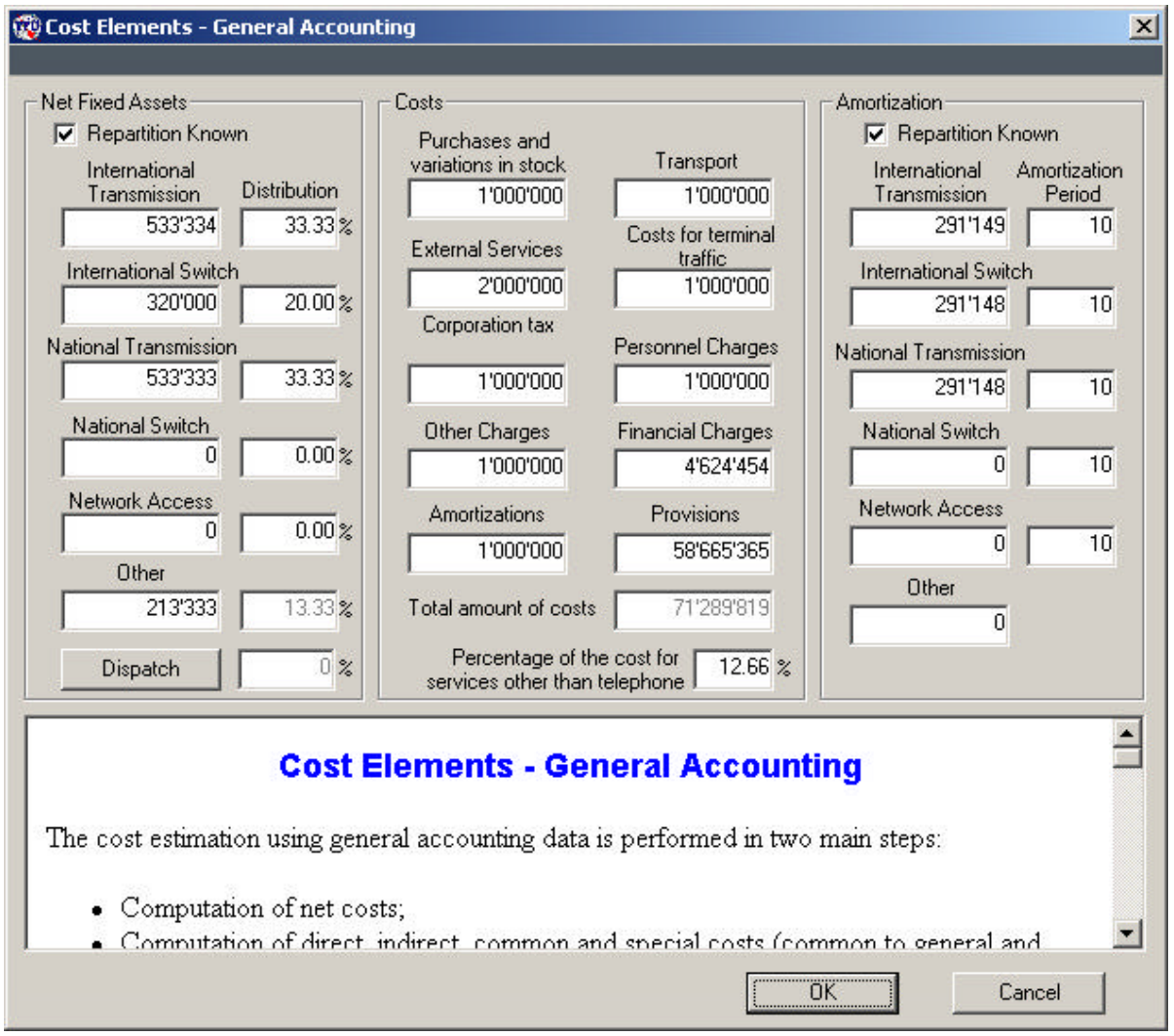
- *Transport:* Transport for purchases of non-fixed assets; transport for sales; transport for third parties; transport of staff; mail and other transport charges.

- *External services:* Subcontracting; rental, leasing and associated charges; payments on leases and similar agreements; maintenance, upkeep and repair; insurance premiums; studies; research and documentation; advertising; publications; public relations; telecommunication charges; bank charges; intermediaries' and consultants' honoraria; staff training charges; royalties in respect of patents, licences and computer software, and similar charges; sundry subscriptions and financial assistance; payments to outside personnel; other outside charges.

- *Expenses for terminal traffic:* Payments made to other operators (national or international) for settlement charges, excluding transit charges.

- *Taxes (other than income taxes):* Direct taxes; indirect taxes; registration fees; tax penalties and fines; other taxes and levies.

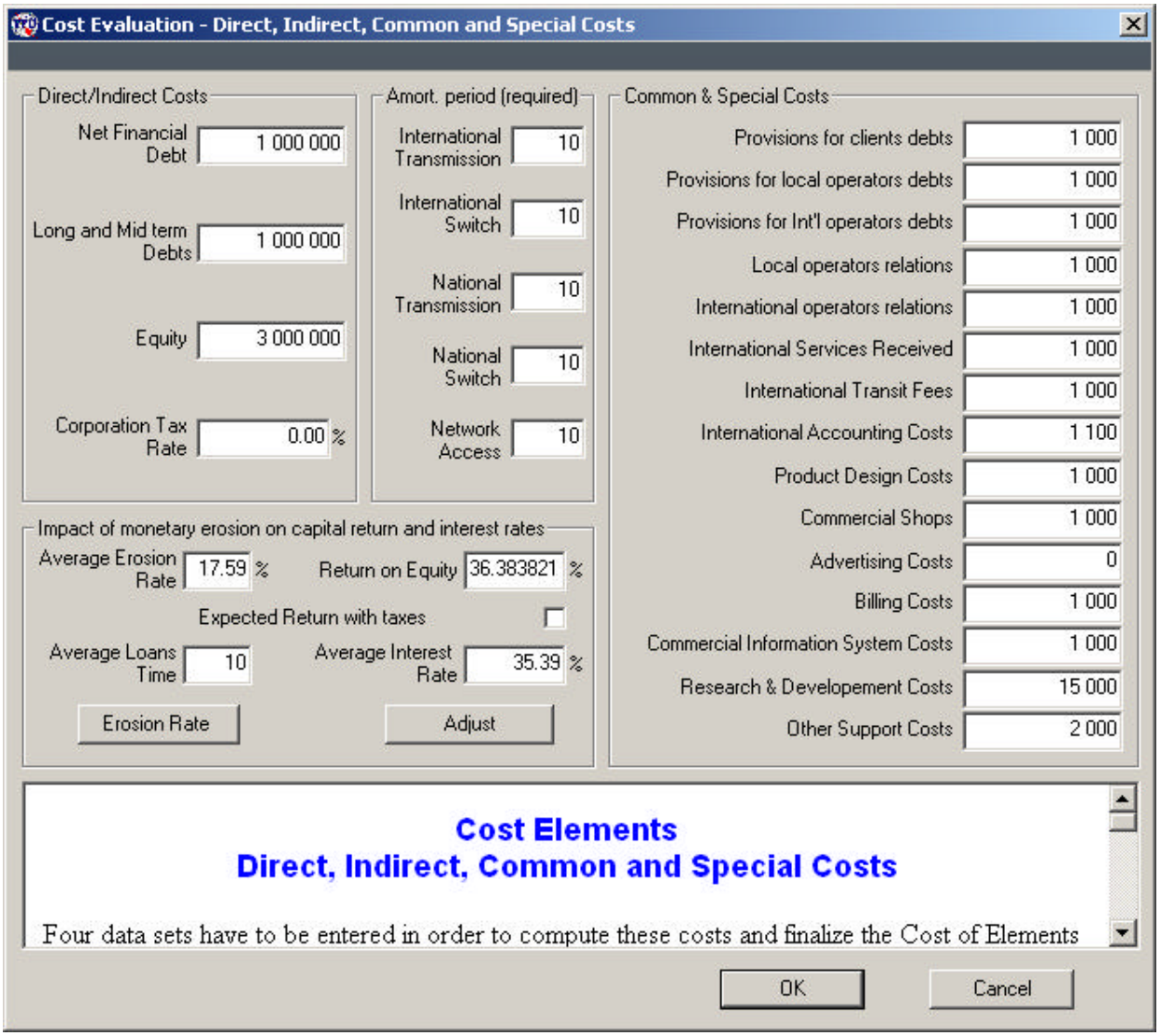
- *Other charges:* Losses on accounts receivable from customers and other debtors; share of earnings on joint ventures; cancelled share of earnings in respect of partial execution of agreements covering several fiscal years; accounting values of current transfers of fixed investments; sundry charges.
- *Personnel charges:* Direct remuneration paid to personnel; lump-sum indemnities paid to personnel; social charges; remuneration and social charges of individual operators; remuneration transferred to outside personnel; other social charges.
- *Financial and similar charges:* Interest paid on loans; interest on leases and similar agreements; discounts granted; other interest (advances received and creditor deposits, blocked current accounts, interest on commercial and sundry debts); discounted commercial paper; exchange losses; losses on transfers of securities; losses on financial risks; financial provisioning charges. (Given that financial charges are a component of the cost of capital, they must be clearly identified so as to prevent any double counting.)
- *Amortization:* Operating amortization; financial amortization (e.g. premium on redemption of securities).
- *Provisions:* Operating provisions, financial provisions.



The charges described above may not be generated solely by the telephone service. In this case, non-telephone charges must be individually identified and deducted. This is generally a straightforward procedure in low teledensity networks. However, if difficulties should arise in this regard, a cost deduction factor can be reckoned on the basis of the proportion of non-telephone revenues (this approximation assumes that prices are cost-oriented).

4.3 Other Costs

Once the direct costs have been estimated through the analytical or general accounting, the costs mentioned in the window below must be integrated in the model. These are the direct, indirect, common and special costs.



4.3.1 Direct and Indirect Costs

Net Financial Debt

Long-term bank and financial debts plus short-term funds (discount, …) minus financial investments minus available assets (cash, bank)

Long- and mid-term Debts

Long- and mid-term debts registered in the company's accounts.

Equity

Equity registered in the company's accounts.

Income Taxes

According to fiscal law, the State claims a part of the income as taxes. This value should only be entered if the user has specified that the cost of invested capital is taken after taxes.

4.3.2 Common and Special Costs

Provisions for National and International Debts

Amounts of provisions for uncertain National debts specific only to communications of local origin and amounts for provisions for uncertain International debts specific only to incoming communications of external origin.

Local Operator Relations

Costs of activities exclusively linked to the collection of accounts balance from other local operators. These are supported by the National Traffic.

International Operators Relations

Costs of activities exclusively linked to the promotion of the International traffic, the collection of accounts balance from international operators, etc. These are supported by the International Traffic.

International Services Received

Costs linked to services received from international third parties such as Intelsat, Rascom, International transit service providers, the maintenance of submarine cabling, etc.

International Transit Fees

Costs linked to international services received from international suppliers of transit services.

International Accounting Costs

Amount of costs linked to international accounting. These are separated in order to be able to allocate them to international communications only.

Product Design Costs

Costs generated by commercial studies of products that the operator offers or will offer to its customers. These costs are exclusively supported by the national customers.

Commercial Shops

Amount of costs linked to commercial agencies.

Advertising Costs

Amount of costs linked to advertising as far as these are accounted for in the category *Other Common Costs*.

Billing Costs

Amount of billing costs and customer relation costs specific only to communications of local origin.

Commercial Information System Costs

Amortization and operation costs linked to the commercial information system. These are exclusively supported by national customers.

Research and Development Costs

These functional support costs should be allocated to the infrastructure of the technical network. They are therefore distributed among all services that use the network. The distribution to the network segments is made according to their cost structure, unless a more precise allocation method is possible.

Other Support Costs

General support costs identified among common costs. These are allocated to all services according to the actual traffic in minutes, unless another, more precise allocation method, is available.

4.3.3 Adjusted *Average Interest Rate and Return on Capital*

Average Interest Rate

The average rate of interest can be determined by calculating the weighted average value on borrowings during the previous five years. For tariff purposes, it is preferable to use the evolution of the money rate on the international market in the telecommunication sector, and to take into account the risk factor for the given country.

Return on Capital

The after-tax return on capital can be calculated on the basis of net earnings, using the following relationship:

$$s = \frac{B}{E}$$

Where B is the net profit and E is the equity.

For tariff purposes, it is preferable to use the evolution of the rate of return on capital on the international market in the telecommunication sector, and to take into account the risk factor for the given country.

If, for any reason, the expected return includes the taxes, the check box *Expected Return with Taxes* must be checked, in order not to take taxes into account a second time in further computations.

Impact of Monetary Erosion

Entering the amount of monetary erosion and the average duration of the loans will allow the impact on the return on capital and the average interest rate to be computed (click the *Adjust* button).

These adjusted values will be used normally automatically in the rest of the computations.

4.3.4 Cost of Capital

The Net Financial Debt, the Equity, the Tax Rate and the Expected Return on Capital will be used for the computation of the Capital Cost. When the Expected Return on Capital has been adjusted (see chapter 4.3.3), this new value is automatically taken into account.

Important Note – The Long- and Mid-term Debt must always be entered in constant currency for the calculation of the Net Financial Debt. Otherwise the correction due to the monetary erosion would be applied twice.

4.3.5 Allocation of Common and Special Costs

All the costs specified in the *Common and Special Costs* part can be allocated very precisely to one or several services:

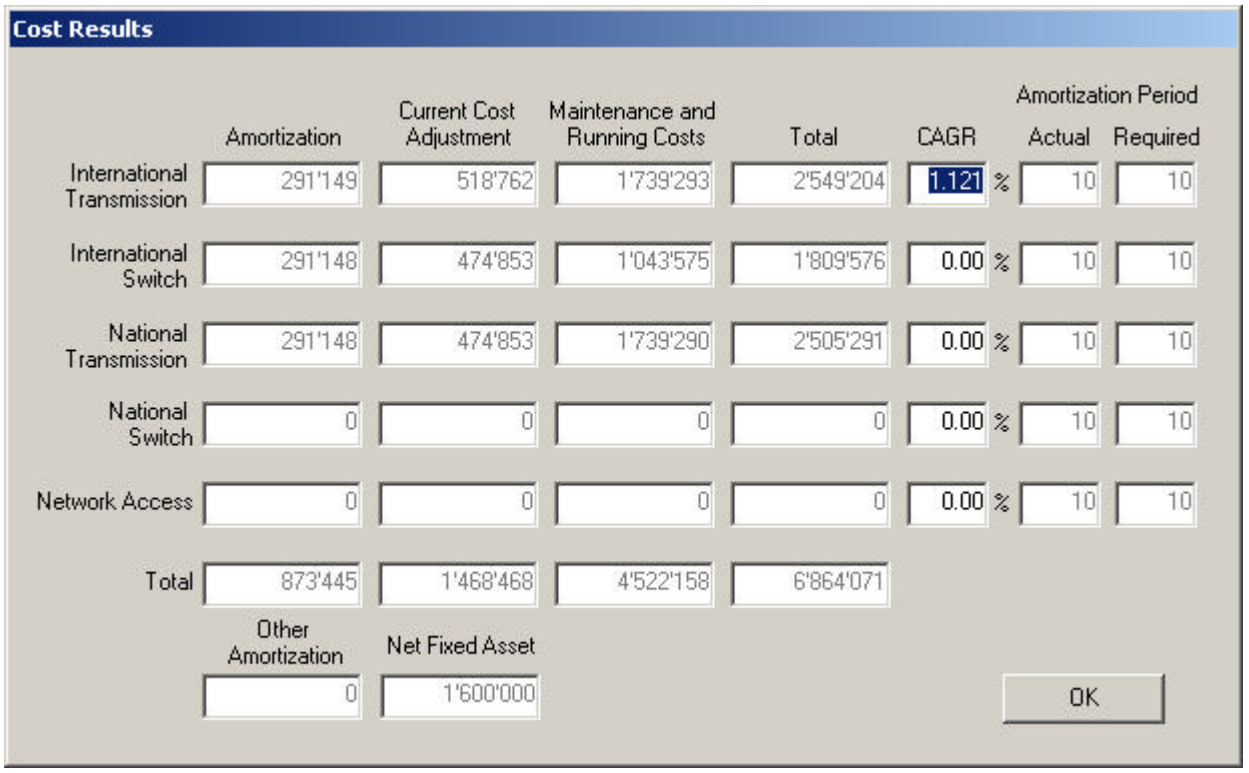
- The provision for client debts is specific to Telephone Services billed to Local Customers
- The provision for local operators debts are specific to the National Incoming Traffic
- The provision for international operators debts are specific to the International Incoming Traffic
- The management costs for local operator relations are specific to the National Traffic (Incoming, Outgoing, National to International and International to National)
- The management costs for international operator relations are specific to the International Traffic (Incoming, Outgoing, National to International and International to National)
- The costs for International Services received are specific to the Far International
- The fees paid for International Transit are specific to the Far International
- The International Accounting Costs are specific to the International Traffic (Incoming, Outgoing, National to International and International to National)
- The Product Design costs are specific to the Local Customers
- The Commercial Shops costs are specific to the Local Customers
- The Advertising costs are added to the Other Common Costs
- The Billing costs are specific to the Local Customers
- The Commercial Information System costs are specific to the Local Customers
- The Research and Development costs are allocated over all the services
- The Other Support Costs are added to the Common costs

4.3.6 Required Amortization Period vs Actual Amortization Period

The amortization period in accounts is governed by a policy that is rigorously monitored by government authorities. However, when the cost of services is being determined, the actual amortization period may need to be adjusted vis-à-vis the amortization period for accounting purposes. The effect of such an adjustment is twofold:

- The annual provision for amortization will have to be adjusted accordingly; and
- The figures for net fixed assets will also have to be corrected.

The result of such adjustment can be seen in the Cost Results window (Adjustment to current costs and net fixed assets):



This window is automatically displayed when all the cost data have been entered and the *Direct, Indirect, Common and Special Costs* window has been validated.

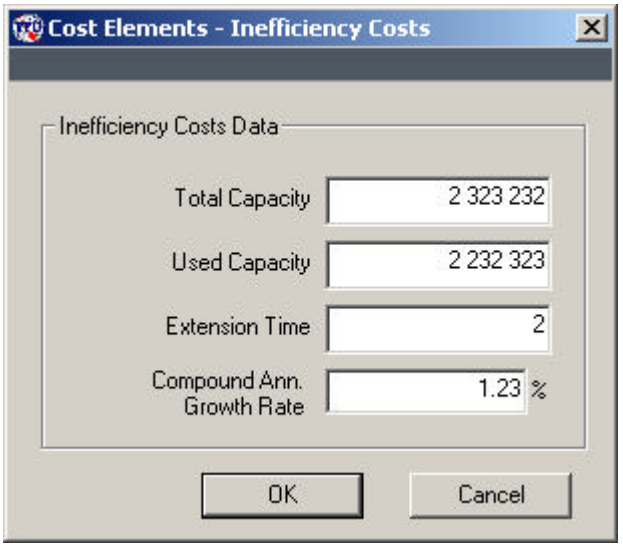
The Compound Annual Growth Rate (CAGR) that represents the growth (positive or negative) of prices for the equipment of the service concerned must be entered here. It will have a direct impact on the Adjustment to Current Costs.

4.3.7 Inefficiency Costs

The very last window allows the user to enter the data that is used to compute the inefficiency cost. It uses the Total and Used Capacity of the network, the Extension Time and the Compound Annual Growth Rate.

As regards mobile GSM networks, efficiency determination can be made in the same way by evaluating, at the level of base station controller (BSC), the potential traffic that results from the allocation of frequency channels of base stations compared with the flow of real traffic via the BSCs.

The Total Capacity is computed as the division of the potential traffic by the average traffic by user. The Used Capacity is computed as the actual traffic divided by the average traffic by user.

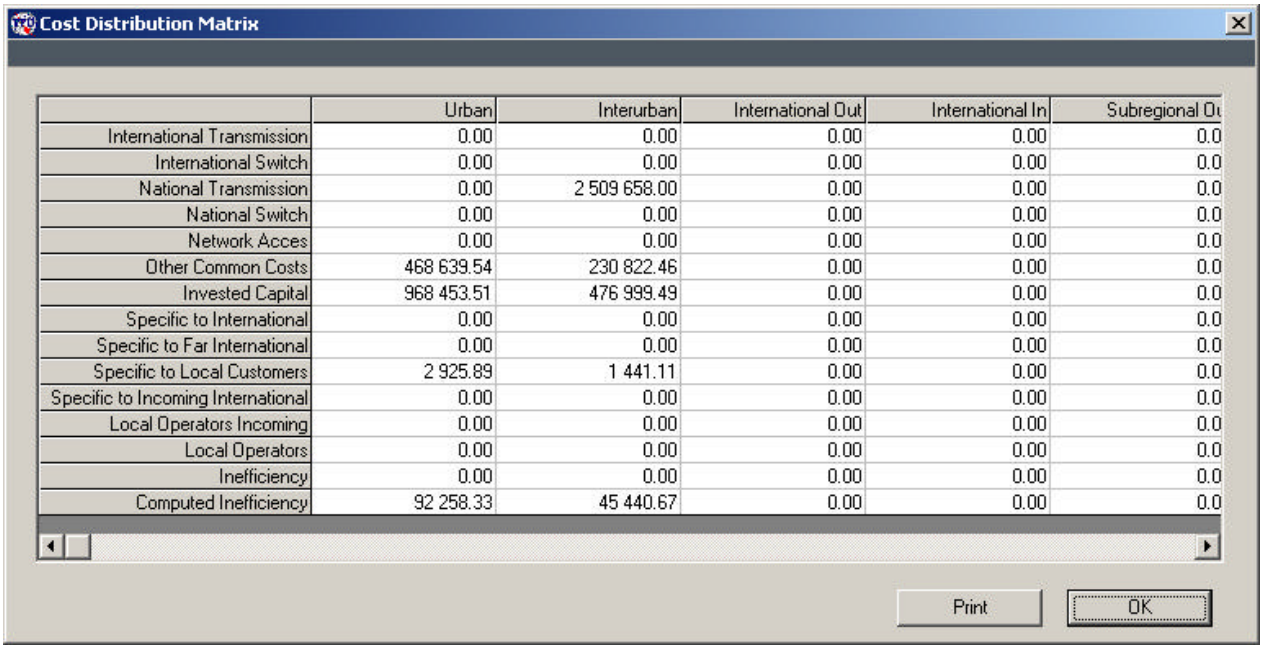


5 Cost of Services – Unit Costs

5.1 Cost of Services

The costs calculated at this stage differ from tariffs as they do not include any components specific to tax policy or to State policies with respect to universal service obligations. They cannot be directly compared to actual tariffs.

Nevertheless, these costs are the basis for all further calculations that will eventually lead to the determination of tariffs that are cost-oriented and tariffs that are cost-based. They are computed by the distribution of the costs computed in the *Cost of Elements* step over all the services. This distribution is based on a matrix that allows the right cost to be allocated to the right service, and is weighted by the traffic (equivalent traffic for the lines 1, 2, 3, 4, 5 and 7 in the matrix displayed below, and real traffic for all the other segments).



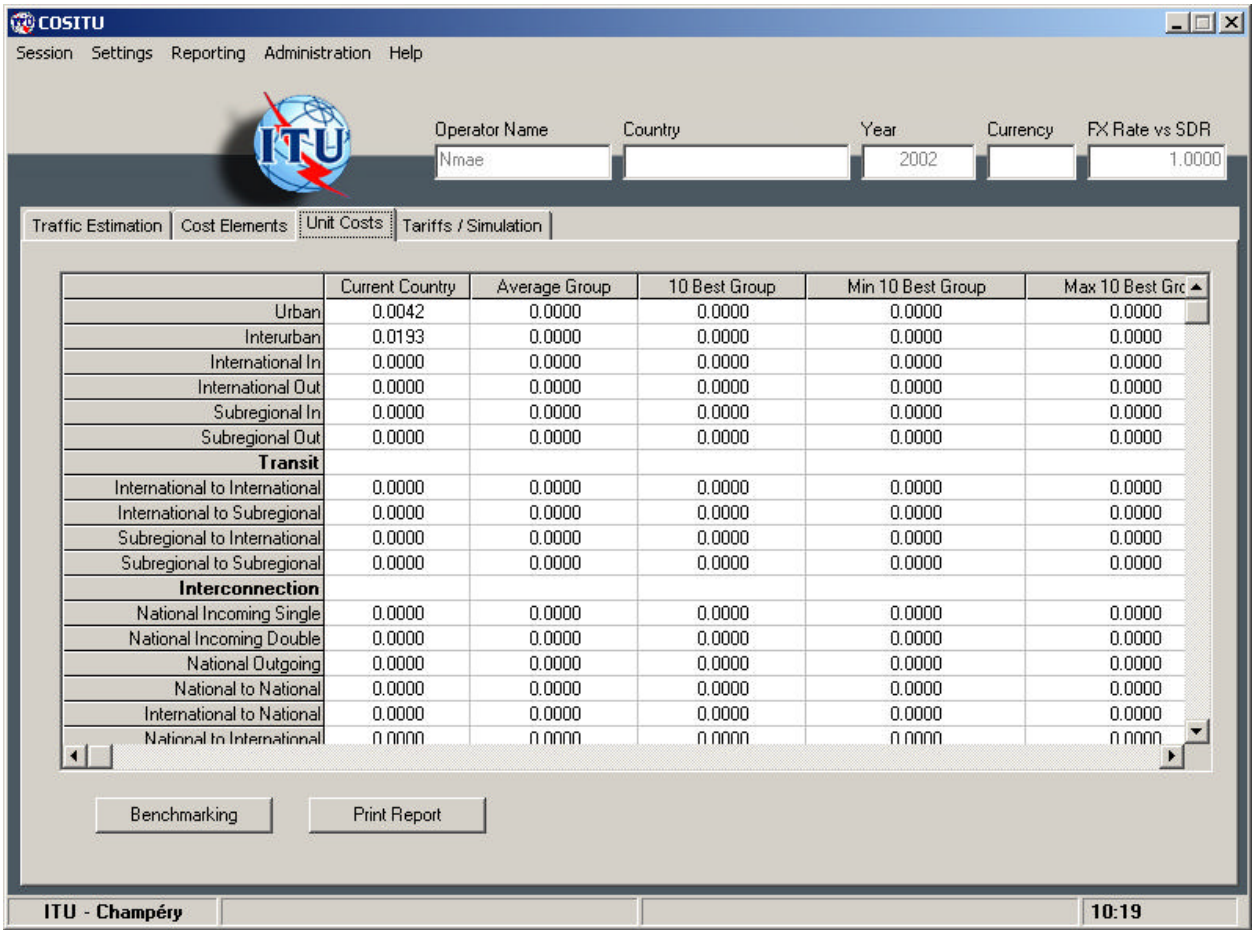
	Urban	Interurban	International Out	International In	Subregional Ou
International Transmission	0.00	0.00	0.00	0.00	0.0
International Switch	0.00	0.00	0.00	0.00	0.0
National Transmission	0.00	2 509 658.00	0.00	0.00	0.0
National Switch	0.00	0.00	0.00	0.00	0.0
Network Acces	0.00	0.00	0.00	0.00	0.0
Other Common Costs	468 639.54	230 822.46	0.00	0.00	0.0
Invested Capital	968 453.51	476 999.49	0.00	0.00	0.0
Specific to International	0.00	0.00	0.00	0.00	0.0
Specific to Far International	0.00	0.00	0.00	0.00	0.0
Specific to Local Customers	2 925.89	1 441.11	0.00	0.00	0.0
Specific to Incoming International	0.00	0.00	0.00	0.00	0.0
Local Operators Incoming	0.00	0.00	0.00	0.00	0.0
Local Operators	0.00	0.00	0.00	0.00	0.0
Inefficiency	0.00	0.00	0.00	0.00	0.0
Computed Inefficiency	92 258.33	45 440.67	0.00	0.00	0.0

5.2 Unit Costs

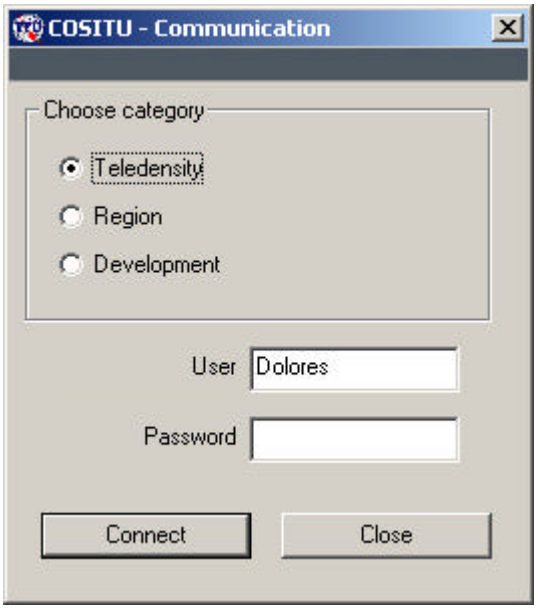
Telephone Service Costs: With costs being allocated to services as indicated above, the unit cost for each service is defined as being equal to the total cost of the service divided by its actual traffic.

Interconnection Service Costs: With costs being allocated to services as indicated above, the unit cost for each service is defined as being equal to the total cost of the service divided by its actual traffic.

Network Component Costs: The unit cost of each network segment is determined by dividing the consolidated value for the segment by the traffic.



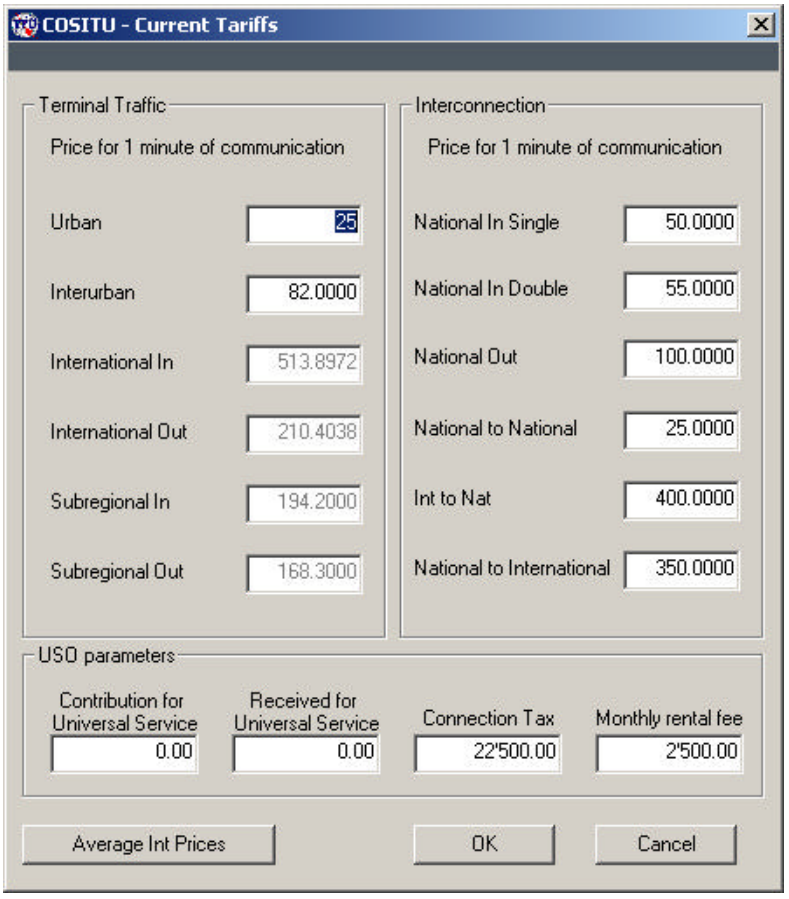
When computed, the data can be benchmarked with comparable data obtained in other countries. These countries must belong to the same group as the present country in terms of Teledensity, Region or Development level. To obtain these data, a connection with a server must be established, and a login and a password obtained.



For the selected group, the benchmark data will be the average unit cost per service, the average unit cost per service for the 10 best of the group, the minimum unit cost per service for the 10 best of the group and the maximum unit cost per service for the 10 best of the group.

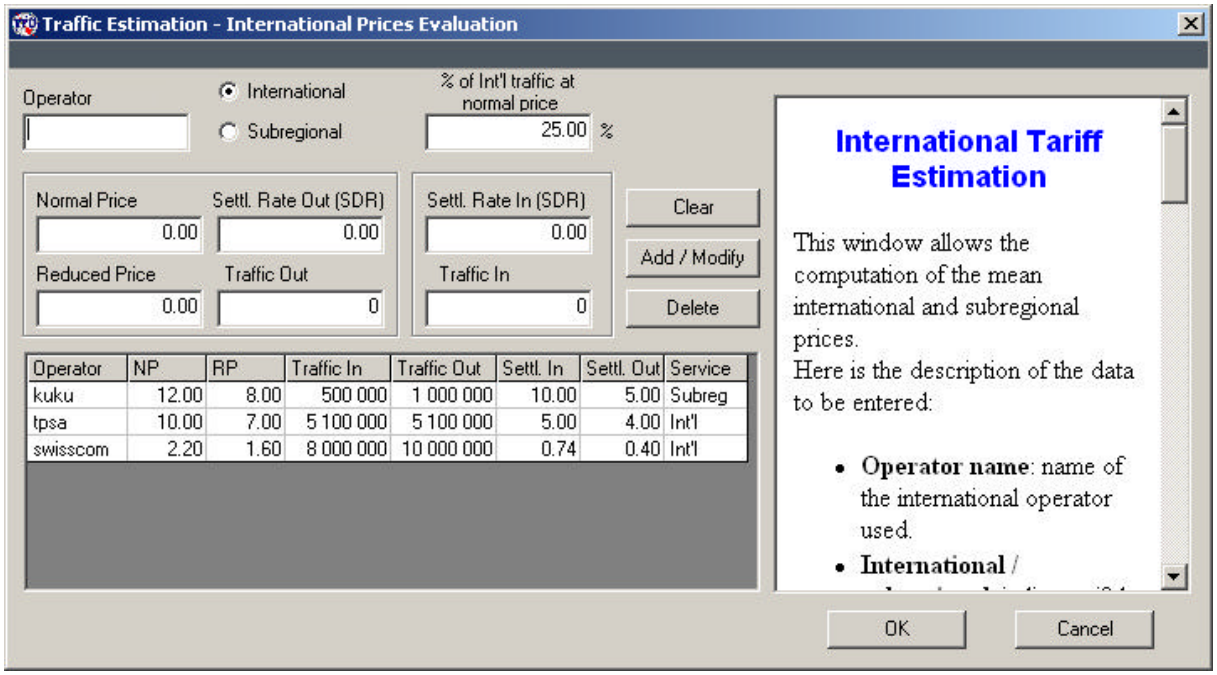
6 Current Prices

In order to compare the cost-oriented tariffs with reality, and to compute the access deficit and profit or loss for each service, the current prices for all traffic must be entered.



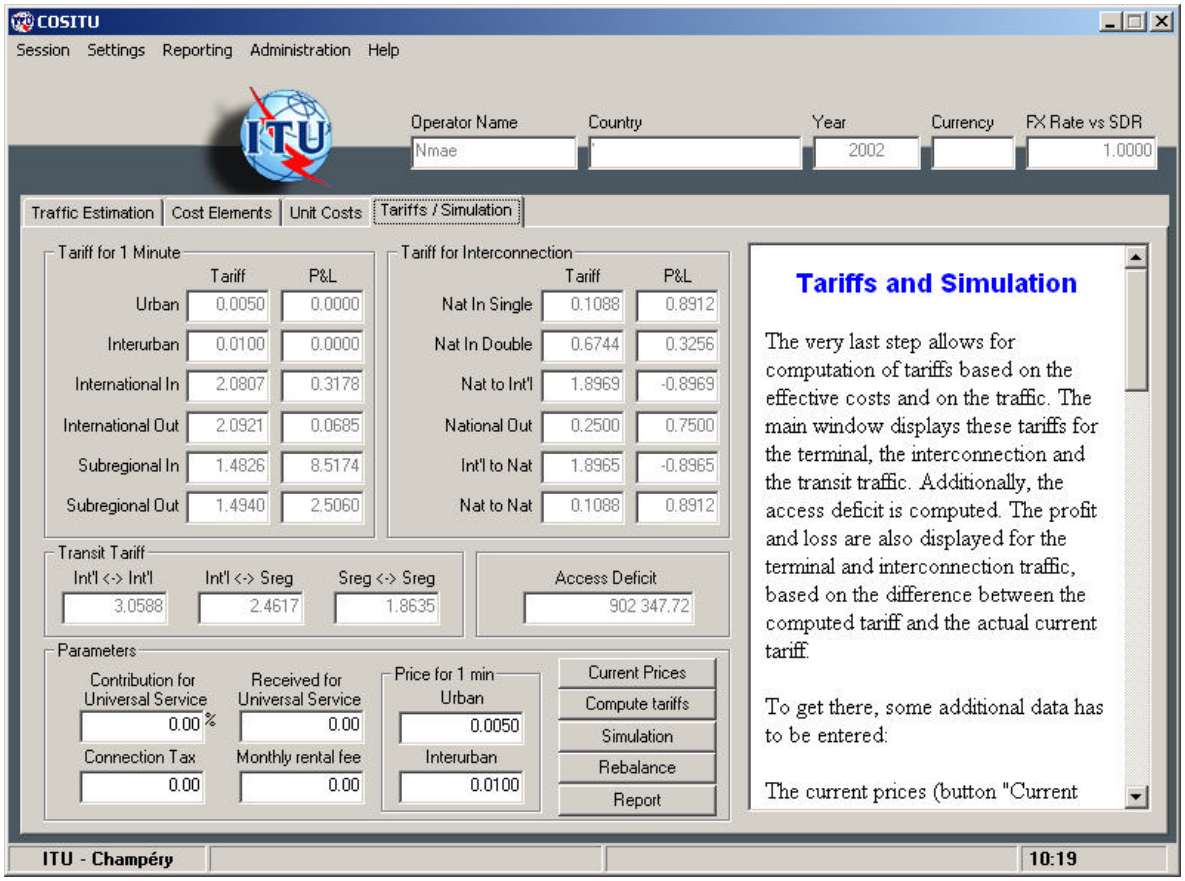
Average prices for the International Incoming, the International Outgoing, the Subregional Incoming and the Subregional Outgoing must be computed. A dedicated tool launched by the button labelled *Average Int Prices* allows this to be performed very easily.

Note – Settlement rates are expressed in SDR and not in local currency in this tool.



7 Tariffs and Simulation

The **cost-oriented tariffs** are computed here. The simulation function will allow the modification of some key parameters linked to political choices for universal service in order to figure out how they interact with the tariffs; the re-balancing tool will allow the modification of the domestic tariffs in order to make the access deficit null, thus obtaining **cost-based tariffs**.



Based on the Unit Costs, the tariffs are computed taking into account the Universal Services Obligations, the profit tax, the payment received (connection tax and monthly fees) and the access deficit.

Compute Tariffs

This button allows the calculation of the cost-oriented tariffs based on the data entered or computed:

- Unit Costs
- Taxes
- Payments (connection tax and monthly rental fee)
- Contribution to Universal Service
- Amount received to compensate the Universal Service obligation

Once the tariffs have been computed, the access deficit is deduced; it is allocated across other services if positive.

Simulation

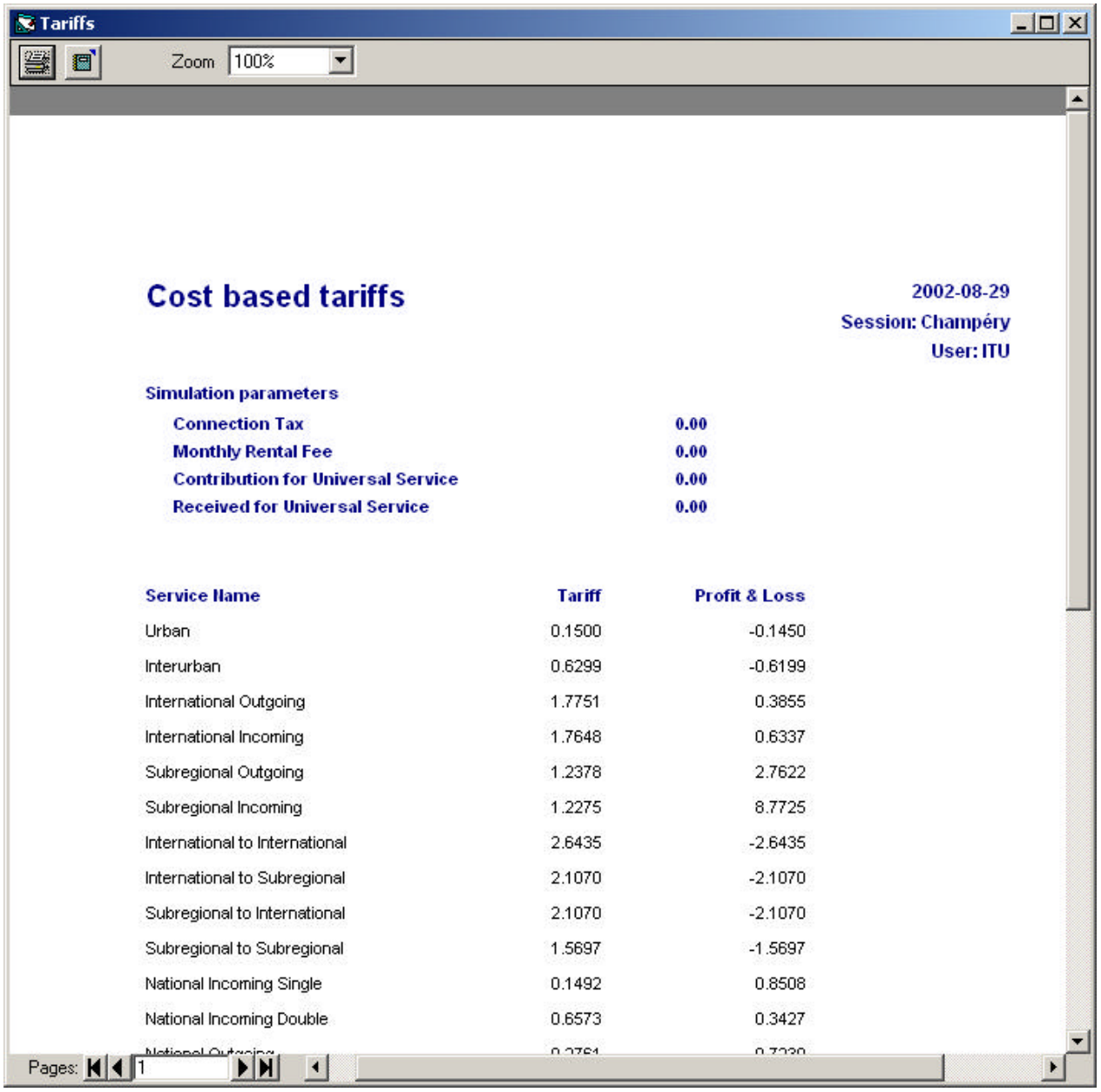
This function helps the user to figure out how a change in the domestic tariffs (and other parameters) would impact on the other tariffs and the access deficit. It does the same kind of computation as the one performed by the *Compute Tariffs* function but forces the domestic prices (urban and interurban) to the values provided by the user in the *Parameters* area.

Rebalance

This last function modifies the prices of urban and interurban traffic until the access deficit is exactly zero.

Report

This option runs the Tariff report. If access deficit is equal to 0, the report's name is *Cost-based tariffs*. Otherwise it is *Cost-oriented tariffs*.


Tariffs
Zoom 100%
Cost based tariffs
2002-08-29
Session: Champéry
User: ITU
Simulation parameters
Connection Tax 0.00
Monthly Rental Fee 0.00
Contribution for Universal Service 0.00
Received for Universal Service 0.00
Service Name | Tariff | Profit & Loss
Urban | 0.1500 | -0.1450
Interurban | 0.6299 | -0.6199
International Outgoing | 1.7751 | 0.3855
International Incoming | 1.7648 | 0.6337
Subregional Outgoing | 1.2378 | 2.7622
Subregional Incoming | 1.2275 | 8.7725
International to International | 2.6435 | -2.6435
International to Subregional | 2.1070 | -2.1070
Subregional to International | 2.1070 | -2.1070
Subregional to Subregional | 1.5697 | -1.5697
National Incoming Single | 0.1492 | 0.8508
National Incoming Double | 0.6573 | 0.3427
Pages: 1