

UNITED NATIONS
ECONOMIC
AND
SOCIAL COUNCIL



Distr.
GENERAL

E/CN.3/505
5 April 1978

ORIGINAL: ENGLISH

STATISTICAL COMMISSION

Twentieth session

20 Feb - 2 March
~~15-26 January~~ 1979

Item 3 of the provisional agenda. Industrial, energy, transport and international trade statistics: (c) Transport statistics

SHIPPING STATISTICS, WITHIN THE FRAMEWORK OF TRANSPORT STATISTICS

Report of the Secretary-General

SUMMARY

In compliance with the recommendation of the Statistical Commission at its sixteenth session in 1970, the United Nations Statistical Office has carried out pilot studies to develop statistics of maritime shipping on the basis of external trade statistics.

In the present document, the framework of transport statistics in general is described (paras. 6-13), past activities of the United Nations in developing shipping statistics are discussed (paras. 15-29), including the results of a pilot study in maritime transport, 1966-1968 (paras. 27-29). Possible ways to develop shipping statistics further are described (paras. 30-83), including short-term action (paras. 33-36) and long-term proposals aimed at the development of a uniform system to link commodity flows and shipping movements (paras. 37-83). Suggestions for action by the Commission are offered (para. 5).

CONTENTS

	<u>Paragraphs</u>	<u>Page</u>
INTRODUCTION	1 - 4	3
I. ACTION BY THE COMMISSION	5	4
II. SHIPPING STATISTICS, WITHIN THE FRAMEWORK OF TRANSPORT STATISTICS	6 - 83	5
A. Transport statistics	6 - 13	5
1. Classification of transport activities: modes of transport	6 - 7	5
2. Present situation in transport statistics. . .	8 - 13	5
B. Shipping statistics	14 - 83	7
1. Activities of the United Nations in developing shipping statistics	15 - 29	7
(a) Compilation of world aggregates for goods traffic	15	7
(b) <u>Ad hoc</u> studies on the utilization of the world fleet	16 - 17	8
(c) Analysis of external trade statistics by mode of transport	18 - 26	8
(d) Results of a pilot study in maritime transport, 1966-1968	27 - 29	10
2. Possible action in the immediate future . . .	30 - 83	11
(a) Short-term action: meeting the urgent need for information on commodity flow .	33 - 36	11
(b) Long-term action: development of a uniform system to link commodity flows and shipping movements	37 - 83	12

ANNEXES

- I. THE MATCHING OF COMMODITY AND SHIP FILES
- II. PACKAGING AND UNITIZATION
- III. CONFIDENTIALITY
- IV. ROUTE ANALYSIS
- V. SAMPLE TABULATIONS

INTRODUCTION

1. Following consideration of a document on external trade statistics analysed by mode of transport (E/CN.3/410) at the sixteenth session in October 1970, the Statistical Commission recommended that the Secretary-General continue to study this subject and "investigate the possibility of collecting international trade data, analysed by air, ocean and land transport." 1/

2. In late 1970 the Statistical Office launched a pilot project for the compilation of comprehensive statistics on goods transported by sea for the years 1966-1968 and, in compliance with the Commission's recommendation, it circulated in 1971 a letter to Governments inquiring about the availability of trade data by mode of transport. The Statistical Office also increased substantially its contribution to the project of the Economic and Social Commission for Asia and the Pacific (ESCAP) on the uniform system of collecting economic statistics of shipping. ESCAP published in January 1976 the report of the Task Force on the Economic Statistics of Shipping and the results of the United Nations pilot study were published in October 1976. 2/ Much of the material from the Task Force report has been used in the present document.

3. Reactions to the Pilot Study have been favourable and the ESCAP Task Force report showed that the uniform system could prove to be an efficient instrument for developing meaningful shipping statistics. Reflecting this, the Committee on Shipping of the United Nations Conference on Trade and Development (UNCTAD) adopted a resolution in April 1977, which was approved subsequently by the Trade and Development Board, calling upon the United Nations to give priority to and allocate funds for bringing up to date the results of the Pilot Study. 3/ Aware of the pressing need for these types of statistics in developing countries and of the potential viability of the uniform system described in the Task Force report, the Government of Norway has agreed to contribute \$US 680,000 for the period 1978-1981 for carrying out the initial stages of the project proposed by the Statistical Office.

4. At its seventh session, the Commission's Working Group on International Statistical Programmes and Co-ordination emphasized the importance of areas other than shipping statistics in the transport field and felt that the present

1/ Official Records of the Economic and Social Council, Fiftieth Session, Supplement No. 2 (E/4938), para. 99.

2/ Results of a Pilot Study in Maritime Transport for the Years 1966-1968, (United Nations publication, Sales No. E.76.XVII.9).

3/ See Official Records of the Trade and Development Board, Seventeenth Session, Supplement No. 3 (TD/B/648), annex I, resolution 31 (VIII).

report "should provide at least some indication of work that may be needed in these other areas" (E/CN.3/502, para. 10). It has not been possible to pursue this matter to any degree, but the Commission may wish to bear in mind two areas which may require attention in the near future, namely (a) the need to bring up to date the International Standard Definitions for Transport Statistics, published in 1950, ^{4/} and (b) the development of systems in the developing countries for the collection, by sampling techniques, of comprehensive national statistics on the carriage of passengers and freight by road.

I. ACTION BY THE COMMISSION

5. In the light of the developments described above, the Commission may wish to express its appreciation to the Government of Norway for its voluntary contribution to the Statistical Office for the proposed project on the development of shipping statistics and to request the Secretary-General:

(a) To call the attention of Member States to the importance of developing statistics of shipping and to the importance in this connexion of the uniform system;

(b) To request interested countries to examine the possibility of adopting the framework of this system;

(c) To endorse the proposals for bringing up to date the results of the Pilot Study and for promoting the uniform system among the developing countries, particularly in areas outside the ESCAP region; and

(d) To support the resolution of UNCTAD's Committee on Shipping.

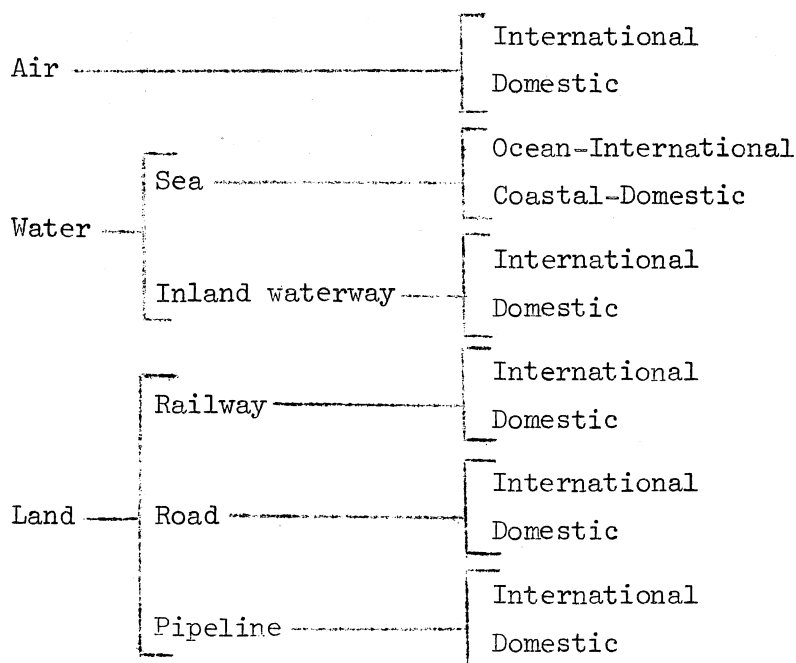
^{4/} Statistical Papers, series M, No. 8.

II. SHIPPING STATISTICS, WITHIN THE FRAMEWORK OF TRANSPORT STATISTICS

A. Transport statistics

1. Classification of transport activities: modes of transport

6. Transport activities may be classified by "modes", namely, air, water and land. Each mode of transport may be further subdivided as shown in the following diagram:



7. International transport activities with regard to land and inland waterways take place through contiguous territories, limited usually to activities within a few neighbouring countries. However, international air and ocean transport have no limitation with regard to any pair of countries between which transport of passengers and/or merchandise can take place. Therefore, they are the two most important forms of transport which make large-scale international travel and exchange of merchandise possible. Given their importance in the transport industry, the practical statistical classification used at the global level often relates to "international air", "ocean" and "other", where "other" encompasses all the other types of transport shown in paragraph 6. Sometimes the term "inland transport" is used to indicate "other". However, it should be mentioned that the Inland Transport Committee of the Economic Commission for Europe does not include "coastal shipping" or "domestic air transport" in its area of activity.

2. Present situation in transport statistics

8. The development of basic statistics for different modes of transport has been uneven. Among the different modes, railway transport is generally covered by comprehensive statistics which have been developed not only for the purpose of

/...

efficient operation but also for the analysis of the role it plays within the national economy. This is probably due to the fact that the railways have a long history and are usually operated by large enterprises mostly run by Governments or private corporations under Government control. Thus, a centralized statistical system could be instituted with relative ease. Traffic statistics of passenger-kilometres and freight ton-kilometres and statistics on the number of locomotives and rolling stock have been collected and published by the Statistical Office for the years from 1928 for individual countries. In the early 1950s, estimates of freight net ton-kilometres were made for countries which did not supply these data to the Statistical Office, thus making it possible to arrive at an estimate of world rail freight traffic for each year from 1929. Series of world and continental aggregates have been published annually since the early 1950s.

9. Road transport underwent a great expansion during the post-war years. In most countries, vehicle registration statistics are available and data on motor vehicles in use analysed by passenger and commercial vehicles have been collected and published by the Statistical Office since the late 1940s. However, since road transport has many facets, it has proved difficult to establish a comprehensive statistical system. The basic problem is that the units of operation may be very small - perhaps involving only one vehicle and one person. In such a situation, it is usually not practical to record operational statistics for all motor vehicles and estimation by sampling is preferred. This approach has been widely used during recent decades, particularly by many developed countries, with impressive results. No effort, however, has been made by the Statistical Office to collect road traffic statistics on a global basis since statistics for the developing world are still too weak to yield a meaningful global picture.

10. Air transport has witnessed enormous expansion since the end of the Second World War. Because it is a relatively new and rapidly expanding industry, a comprehensive statistical system has been developed both to meet its operational needs and to assess its performance. The standardization of international reporting, collection and publication of air transport statistics is the responsibility of the International Civil Aviation Organization (ICAO), a specialized agency of the United Nations. Four statistical series have been collected and published by the Statistical Office since the late 1940s covering the period from 1932. They cover kilometres flown, passenger-kilometres, cargo ton-kilometres and mail ton-kilometres.

11. Pipelines and inland waterways are important in only a few countries of the world. The statistics needed for their operation are relatively simple to collect, compared with those needed for other forms of transport. The existing statistical systems are usually adequate for most of the pipelines and also for some important waterways such as the Rhine and Danube Rivers in Europe and the Mississippi River in the United States of America. However, not much statistical information is available for many other well-known waterways of the world. Nevertheless, lack of such information does not have much economic impact at the international level, as transport on these waterways is mainly of a domestic nature. Between 40 and 50 series for traffic on inland waterways in some 24 to 26 countries were

published in the 1950s for the period from 1933, mainly relating to goods loaded and unloaded. The publication of these series ceased in the late 1950s on account of lack of general interest at the global level. The data published related mainly to waterways in Europe.

12. Although ocean transport provides the most important link in the international exchange of merchandise, the development of statistics in this field has been slow. One finds very few meaningful statistics in shipping for assessing the operation of national or international shipping fleets. In fact, it is difficult to assess with confidence the current effective demand for shipping services, since there are no comprehensive, up-to-date, reliable data on commodity flow analysed by types of ocean carriage. Nor is there any information on the deployment of various types of ships on the different sea lanes of the world or on the amount of freight revenues earned in carrying commodities on various routes. Lack of such essential statistics is probably a unique phenomenon at this date for an industry as huge as shipping.

13. The traditional type of statistics available since early this century relates to the movements of vessels in and out of harbours in terms of number of vessels and their sizes in net registered tonnage (NRT). These data, in the form of national aggregates of total NRT, have been assembled and published by the Statistical Office since its inception. Goods loaded and unloaded at the ports of individual countries have been collected and published since the early 1950s. Figures on gross registered tons of the world merchant fleet analysed by flag with subtotals for oil tankers and for dry bulk carriers, supplied by Lloyd's Register of Shipping (London), have also been published annually by the Statistical Office.

B. Shipping statistics

14. As may be seen from paragraph 12 above, shipping statistics represent a major gap in the development of transport statistics. The Statistical Office has therefore devoted considerable effort to narrowing the gap by undertaking the following work.

1. Activities of the United Nations in developing shipping statistics

(a) Compilation of world aggregates for goods traffic

15. When data on goods loaded and unloaded in the ports of the world were considered for general collection in the early 1950s, very few countries were compiling such statistics. However, rapid progress was made by many countries following the request for those data by the United Nations in its monthly questionnaire. Furthermore, the Statistical Office was able to utilize external trade statistics to estimate the total loadings and unloadings for those countries which did not compile them. Therefore, by the mid 1950s, it was possible to compile and publish world and regional aggregates on goods loaded and unloaded in international shipping in terms of dry goods and tanker cargo for the years 1929 and 1938 and for the period since 1950.

(b) Ad hoc studies on the utilization of the world fleet

16. A comparison of cargo carried by sea with the carrying capacity of the merchant fleet is not feasible on a national or regional basis because cargoes entering or leaving a country or region may move in vessels registered in another country. Such a comparison can be made only when a cross-reference with respect to the cargo and the vessel which carries the cargo becomes possible. On a world-wide basis, however, the utilization of the world merchant fleet can be studied by comparing estimates of the freight ton-miles actually moved by sea in international trade, with estimates of the total carrying capacity (in ton-miles) of vessels engaged in external trade, assuming that each vessel is in motion fully loaded all the time. The results for a number of selected years were published in the September 1954 and March 1956 issues of the Monthly Bulletin of Statistics. The results were expressed in terms of an index number called the "over-all utilization index", which was then expressed as the product of two subsidiary index numbers, one measuring the change (compared with 1937) in proportion of a year actually spent at sea by a ton of cargo capacity and the other measuring the change in the load actually carried while at sea by each ton of cargo capacity. This analysis was made separately for dry cargo and tanker cargo.

17. Although the ad hoc study on the utilization of the world fleet shed interesting light on the performance (in approximate volume terms) of the world fleet, the usefulness of the data for assessing operational efficiency of national or regional fleets was limited because the data were not disaggregated to a regional or country level and because of the lack of commodity detail. Furthermore, the study proved costly and was not continued.

(c) Analysis of external trade statistics by mode of transport

18. It is generally agreed that the first step in the development of shipping statistics should be the compilation of data on the flow of goods by sea. This can best be done by using external trade statistics, provided that these can be linked to trade by sea. It is therefore desirable to analyse external trade statistics at the national level by the mode of transport.

19. With the advance of computer technology and as detailed international trade statistics became available on computer tapes for a number of important trading nations, the Statistical Office undertook studies in the early 1960s to determine: (a) whether it was possible to extract from the regular trade statistics the value and weight of commodities entering into international trade which could be efficiently carried by air; and (b) whether it was feasible to compile statistics of goods carried on selected sea lanes in order to determine the pattern of ocean carriage for general cargo.

20. The study on the potential market for air transport concluded that until the external trade statistics were compiled by mode of transport, it would not be possible to use the regular trade statistics to meet the needs of the air transport industry. This was because quantity measurements for many commodities were not reported in the regular trade statistics and because there was no reliable way of estimating the proportion of a commodity that was carried by air.

21. Regarding the determination of the pattern of ocean carriage for general cargo, it was concluded that any attempt at estimation would be futile until a substantial number of important trading countries produced their external trade statistics by mode of transport with gross weight as the standard unit of measurement for quantity information.

22. At the second Joint Meeting of Statistical and Customs Experts, held at Brussels in June 1968, the Statistical Office presented a paper (ST/STAT/28) on the utilization of the information on customs documents for the purpose of analysing exports and imports by mode of transport. The experts agreed that there was a pressing need for such analysis, especially for air transport, and urged the Statistical Office to take the lead in promoting the collection and processing of such statistics.

23. A document entitled "External trade statistics analysed by mode of transport" (E/CN.3/410) was discussed by the Statistical Commission at the sixteenth session in October 1970. The document contained a suggestion that in the compilation of mode-of-transport statistics, it was desirable that:

(a) Modes be confined to air, ocean and inland transport - the latter covering rail, road, inland waterway, pipeline and coastal shipping;

(b) Quantity measurement be in terms of gross weight;

(c) The coastlines of countries such as the United States of America, Canada, France and the USSR be divided into two or more segments for reporting ocean transport statistics; and

(d) Efforts be made to include trade of goods in bond and trade in and out of free trade areas when important.

A further suggestion was that Governments consider recording modes of transport for external trade statistics at the SITC 3-digit group level with a few selected SITC 4-digit subgroups.

24. The Commission noted that many countries would have difficulties in supplying quantities in gross weights. Moreover, the cost of processing the larger volumes of data was likely to be high and consequently a study should be made of the likely cost in relation to the purposes which the material would serve. It felt that some flexibility should be introduced so that countries might undertake this work only for groups of commodities which were important in their trade. The Commission recommended that the Secretary-General continue this study and "investigate the possibility of collecting international trade data, analysed by air, ocean and land transport, for processing in the International Trade Statistics Centre of the United Nations". 5/

5/ Official Records of the Economic and Social Council, Fiftieth Session, Supplement No. 2 (E/4938), para. 99.

25. In compliance with the Commission's wish to investigate the possibility of the general collection of international trade statistics by mode of transport, the Statistical Office sent letters to Member States in June 1971 asking whether they would be in a position to furnish annual data on modes of transport at the 3-digit SITC group level. The response was encouraging. Forty-six countries, whose combined trade covered over 90 per cent (in volume terms) of the global movements of merchandise carried by ocean, agreed to furnish annual data if asked.

26. The results of the above study were reported to the Commission at the seventeenth session in November 1972. A conclusion of the study was that, in view of the promising results of this inquiry, it would be desirable to begin general collection of international trade statistics by mode of transport during 1974 for processing and publication by the Statistical Office. However, because of its limited resources the Statistical Office has not been able to follow this up.

(d) Results of a pilot study in maritime transport, 1966-1968

27. Since the inquiry made in the early 1960s on the pattern of ocean carriage of general cargo (see para. 19 above), there has been considerable development in the computerized collection and processing of international trade statistics. As a result, a large amount of detailed computerized international trade statistics became available and the use of computers for the compilation of a world network of goods flows and for certain types of research became possible. Furthermore, in the mid-1960s, the United States began to compile its trade data in gross shipping weight on a port-to-port basis. Because of the importance of the United States in world trade, the development of port-to-port data (which makes the geographical segmentation of United States trade possible) is essential for making the world matrixes of commodity flows more meaningful. In the light of these new developments and of the urgent need for information on the details of trade flows, the Statistical Office launched in 1970 a pilot project to make a comprehensive analysis of the pattern of maritime transport for the years 1966, 1967 and 1968. In October 1976, the Results of a Pilot Study in Maritime Transport for the Years 1966-1968 was released. The purpose of the study was to demonstrate that, by the use of the existing external trade data, certain types of meaningful economic statistics for shipping could be derived.

28. The study is based on statistical information on international trade made available regularly by Governments, except for the United States data which relate only to trade by sea on a port-to-port basis and which were supplied by the United States Government through a special arrangement. Coastlines of the world are divided into 29 regions. The data base used for the study consisted of exports of countries and of coastal sections in the case of four countries (the United States, Canada, France, and the USSR) whose coastlines are divided into two or more segments. Exports are broken down by SITC groups (3-digit codes), each of which is further analysed by country (or coastal section) of destination in terms of its tonnage and the corresponding average length of haul. The haul is the average distance which a ton of cargo of the SITC group in question is carried from its origin to its destination.

29. The 3-digit SITC groups are summarized according to the general characteristics of their ocean carriage into 35 categories which are again aggregated into 5 main types of cargo (bulk-dry, bulk-liquid, refrigerated foods, general cargo which may possibly be containerized and other dry cargo). Thus, the study contains 40 square matrixes of 29 regions - one matrix for each of the 35 basic categories and for the 5 summarized types of cargo. The study contained a detailed description of the method of compilation, limitations of the study and an evaluation of the accuracy of the results.

2. Possible action in the immediate future

30. Most types of transport statistics are based on operating statistics compiled by the operators of the vehicles (e.g., airlines, railway companies, bus or taxi companies etc.). In the case of ocean transport, however, most countries do not collect operating statistics from the companies whose ships are registered in their countries. This is because of a lack of legislative authority to collect such relatively detailed operational statistics, the bulk of which could very well relate to the carriage of goods in trade, which never touch any port of the country in question. Thus, in order to develop economic statistics of shipping, alternative sources must be found.

31. Goods which enter into international trade are recorded in the customs documents of most countries when leaving the country of export and again when entering the country of import. These documents almost invariably carry information on mode of transport by which the goods in question are being exported or imported. In addition, information on the name of the ship, or the type of vehicle carrying the goods, the dates of arrival or departure and the names of the owners and/or operators is usually given on customs documents. This information, together with that shown on the ships' manifests, bills of lading or port authority documents, could be used to derive numerous sets of economic statistics for ocean shipping. It appears therefore that, in the absence of direct reporting by the individual shipping companies to their own Governments, the use of the customs documents, together with those of port authorities, could very well be a satisfactory substitute.

32. To develop economic statistics of shipping through the use of external trade data, the Statistical Office could take short-term and long-term action, as follows.

(a) Short-term action: meeting the urgent need for information on commodity flow

33. UNCTAD has strongly urged the prompt updating of the Pilot Study with certain changes to meet its special requirements. At the eighth session of the Committee on Shipping, held in April 1977, a resolution was adopted calling upon the United Nations to give priority to and allocate funds for the production of seaborne trade statistics. These statistics were to be based on the Results of a Pilot Study in Maritime Transport and take into account certain modifications to meet the needs of users. The work was to be carried out in close co-operation with the UNCTAD secretariat to secure speedy implementation and publication of up-to-date information.

34. ICAO has also shown keen interest in the Pilot Study and has urged the Statistical Office to collect international trade data by mode of transport (sea, air, road and railway) so that the pattern of international commodity movements by air may be compiled.

35. Other international organizations which have indicated keen interest in the Pilot Study and have urged its updating are the General Agreement on Tariffs and Trade (GATT), the World Bank and the Organisation for Economic Co-operation and Development (OECD).

36. In view of these indications of the urgent need for statistics on commodity transport by sea, the Statistical Office plans to update the Pilot Study and to initiate general collection and publication of external trade data by mode of transport as soon as resources are available.

(b) Long-term action: development of a uniform system to link commodity flows and shipping movements

(i) General

37. The compilation of up-to-date statistics in the form of a comprehensive network of commodity flows by sea will contribute to a better understanding of the demand for shipping services. The use of such statistics for other purposes is, however, limited and a fully developed system of economic statistics of shipping should provide answers to the following kinds of questions:

(a) What is the efficiency and frequency of services rendered by liners and tramps in carrying a country's imports and exports?

(b) Who are the operators of the vessels and what are their market shares?

(c) What are the freight charges levied by the carriers for their services?

38. In order to answer the above questions, it is necessary to secure the following information:

(a) A complete tally of movement of ships into and out of the individual ports of a country;

(b) Identification of each cargo shipment in terms of SITC or CCCN 6/ headings with a cross-reference to the ship carrying the cargo;

(c) Characteristics of ships, their owners and/or operators and the types of services (liner or tramp) that they provide;

(d) Freight charges for each shipment.

39. Most of the information listed above is available in most market economy countries from the following sources:

6/ Customs Co-operation Council Nomenclature, previously referred to as BTN (Brussels Tariff Nomenclature).

(a) Customs documents, which provide the information needed to compile regular external trade statistics (i.e., quantity and value of commodities, country of origin for imports, country of destination for exports); and in which information about the name of the ship, port of lading or port of discharge, date of arrival or departure is also available;

(b) Port authorities' records, which contain certain information about ships' movements which the authorities need for their own operational purposes. This information covers the name of the ship, dates of arrival or departure, types of vessels (tanker, dry-bulk carrier, general cargo vessel and the like), dead-weight tonnage, draught, types of service (liner or tramp), operators' names, flag etc.;

(c) The ship's manifest, which is provided by the ship's operator for the customs and port authorities. It lists all the cargo shipments carried by the vessel. Sometimes details are also given about freight charges for each shipment, but they are often suppressed before the manifests are submitted to the customs and port authorities;

(d) Publications such as Lloyd's Register of Shipping and reports of the Maritime Administration of the United States Government which provide detailed information on individual ships' characteristics, their owners, flags etc.

40. Given the availability of these various source documents, the next question is how to put them together to produce the statistics required for answering the questions raised in paragraph 37. This can be done by merging the data available in the various documents through the common elements, i.e., names of the ships and dates of arrival (in the case of imports) or departure (in the case of exports).

41. To accomplish this merging operation, a uniform procedure should be developed so that the resulting data base will be statistically uniform on the global level. Under this system, not only will the resulting statistics be comparable internationally, but also the data bases of individual countries will be compatible with one another so that regional statistics can be obtained by merging data at any chosen level of detail.

(ii) Historical background to the uniform system

42. The secretariat of the Economic and Social Commission for Asia and the Pacific (ESCAP), in co-operation with the United Nations Statistical Office, has developed a scheme, known as the L.2 scheme, for the systematic collection of economic statistics of shipping. This scheme is based on tying the ships' movement statistics collected by the port authorities with the trade statistics.

43. Since the recommendation for implementation of the scheme by the Conference of Asian Statisticians in 1970, several countries in the region have tried it with varying degrees of success. Towards the middle of the 1970s, however, it was realized that progress in the implementation of the L.2 scheme was rather slow and the need became apparent for better guidance on implementing the techniques. Thus, with the active support of the Statistical Office, ESCAP launched in late 1975 a special project with financial support from the United Nations Development Programme (UNDP).

44. The project started with the meeting in October-December 1975 of a task force of four experts who were charged with the responsibility of examining the L.2 scheme with regard to its suitability for the ESCAP region, determining the causes of its slow implementation and recommending any necessary changes to the system.

45. The findings of the task force were that:

(a) The general approach towards the systematic collection of economic statistics on shipping which was adopted in the original proposal was correct and no fundamental changes were needed. However, some modifications were needed with regard to computer-processing techniques;

(b) The reasons for the slow progress in the implementation of the L.2 scheme appeared to be that (i) there had been a lack of specific recommendations in the form of concrete steps that had to be taken in each country in order to achieve the desired regional uniformity in the statistical system; (ii) the role that improved shipping statistics could play in a national economy had not been fully appreciated by the senior government officials who were in a position to influence, in a positive way, the close co-operation between different departments that such a system demanded (adequate co-operation between customs and port authorities and harbour administration was vital); and (iii) in its original form, the proposal had the appearance of an inflexible system since only one administrative system for collecting the statistics was described and there was no discussion on local variations.

46. In the light of these findings it was considered urgent to introduce a system for collecting data on shipping which would be uniform throughout the region with regard to the specifications of data collected and their report-formats, but which would permit each country to implement methods of data capture suited to its organizational and documentary system.

(iii) Framework of the uniform system

47. It was recommended that countries interested in developing the economic statistics of shipping should establish three basic data files on a standard format as follows:

a. The three basic files

i. Commodity file. This file contains 11 data elements, the majority of which are normally recorded on customs documents for imports and exports. The purpose of the file is essentially to provide information on commodity movement from one port to another with necessary provisions to link these flows with the other two files. The elements are:

1. Ship's name or other identifier, see annex I;
2. Date of arrival/departure;

3. Port of reference;
4. Port of loading/discharge;
5. Country of origin/destination;
6. Direction of flow of commodities (inward/outward);
7. Commodity code (SITC or CCCN);
8. Quantity in gross weight;
9. Value;
10. Freight charges (if available);
11. Packaging (as a long-term aim, see annex II).

The treatment of those data elements which do not currently appear on a particular country's customs documents is discussed in paragraphs 51 and 52.

- ii. Ship's movement file. This file contains nine data elements, usually available in ship's movement documents required by port authorities or harbour administrations. The record provides basic information on the amount of cargo, in aggregated terms, carried on board, discharged from, and loaded into, a particular ship providing a particular type of service. The nine elements are:

1. Ship's name (or other identifier, see annex I);
2. Date of arrival/departure;
3. Port of reference;
4. Cargo on board on arrival (gross tons);
5. Cargo discharged (gross tons);
6. Cargo loaded (gross tons);
7. Service type:
 - (a) Liner
 - (i) Conference (name)
 - (ii) Non-conference
 - (b) Tramp;

8. Previous port of call (see annex IV);
9. Next port of call (see annex IV).

iii. Ship description file. This is a semi-permanent file, containing nine data elements which define the relevant characteristics of a ship. Such information is often available on ship's movement documents or may easily be obtained through simple research. The nine elements are:

1. Ship's name (or other identifier, (see annex I));
2. Deadweight tonnage of ship (DWT);
3. Cubic capacity of ship (grain/bale);
4. Owner's name (usually a company);
5. Operator's name;
6. Ship type:
 - (a) Conventional general cargo;
 - (b) Combo;
 - (c) Cellular container;
 - (d) Tanker;
 - (e) Parcel tanker;
 - (f) Dry bulk;
 - (g) Lash, Seabee, with/without container;
 - (h) Side-door pallet;
 - (i) Roll-on/Roll-off;
 - (j) Others;
7. Length;
8. Draught;
9. Flag.

b. Use of the three basic files

48. These three basic files represent the data sets from which a very wide variety of statistical analyses of shipping can be made with the help of appropriate computer programmes. The analysis can be confined to a single ship, a single owner, a single shipping line, 7/ a single liner conference, a single flag etc. with reference to the amount and type of cargo carried, where from and to, how much is charged, frequency of voyages, how efficiently cargo space is utilized etc. Or the analysis can be oriented to a single port or all ports of a country, a group of countries or region with reference to a complete tally of commodity movements in and out of the ports in question at detailed or aggregated levels analysed by port, by region of loading and discharge or by route. The question of discerning route data is discussed in annex IV.

49. Analysis by type of ship determines which types are most efficient and economical for carriage of a country's imports and exports or a particular part of them. The pattern of ocean carriage of imports or exports from a specific origin or to a specific destination can be traced by comparing the data with reference to the ports of loading for imports and the ports of discharge for exports. In short, the answers to the questions raised in paragraph 37 can be found with the help of computer programmes within the three data sets described above.

c. Principles of setting up the three basic files

50. In principle, the establishment of the three basic data files involves only straightforward coding and keying-in of the data elements for storage and processing in a random-access computer memory. However, since the basic documents of each country on which the data elements appear are different in format, the methods appropriate for capturing the required data elements will have to be different from country to country. It should be emphasized that by "uniform system" is meant the establishment on standard format of the three uniform basic data files from which suitable computer programmes produce standard statistical analyses. It does not imply a uniform method of capturing the data and assembling them in the standard files.

51. Not all the required data elements will be available or sufficiently refined in any particular country's existing source documents. It is not recommended that modifications of the present reporting forms and other documents should be sought at the expense of the establishment of the three basic files. Rather, the unrefined data should be used with appropriate notes and space allocated in the standard format for data at present not available.

52. The absence of data on certain items should not delay the introduction of the system since sufficient information will be available on various subjects of importance to the shipping industry to shed useful light on its varied aspects.

7/ Attention must be paid to questions of confidentiality; this is discussed in annex III.

d. Establishment of two supplementary files

53. The uniform system would have a provision by which a continuous programme of improvement could be ensured as the importance of economic statistics on shipping becomes more widely recognized and more resources are allocated to their compilation. This provision would take the form of two separate supplementary files which could be built up over a period of years.

54. The first and more important of these supplementary files would be aimed at producing the tables of the various conversion factors needed for comparable cargo measures. While some countries have gross tonnages entered in customs documents or have plans to enter such data in the near future, most of the others have only quantity figures in net terms or in units of each commodity (e.g., pairs of shoes). It is recommended that these countries should create a supplementary file of quantity information, which would contain the following nine data elements:

- (a) Ship's name (or other identifier, see annex I);
- (b) Data on arrival/departure;
- (c) Port of reference;
- (d) Direction of flow of commodities (inward/outward);
- (e) Commodity code (CCCN or SITC);
- (f) Quantity in gross weight;
- (g) Quantity in cubic measurement;
- (h) Stowage factor;
- (i) Quantity in net weight.

55. The first five elements are needed for identification of the flow recorded in the basic commodity file, while the next four elements are included for the purpose of refining the quantity data already in the basic file. These elements may also be used to estimate gross tonnage of similar commodities in other countries.

56. In most cases, the supplementary file described in paragraph 54 can be established through a careful analysis of the information contained in the ships' manifests. If the available resources are not equal to the task of establishing this file, then the coverage of the file could be reduced to cover only important commodities for which information on the weight/volume relationship, storage characteristics etc. is most urgently needed. Furthermore, sampling techniques could be introduced to derive such information for certain broad commodity categories such as textiles.

57. The second supplementary file is for the estimation of freight charges, which will be missing for the time being for most countries. So far as resources allow, this file should contain the following seven elements:

- (a) Ship's name (or other identifier, see annex I);
- (b) Date of arrival/departure;
- (c) Port of reference;
- (d) Direction of flow of commodities (inward/outward);
- (e) Commodity code (CCCN or SITC);
- (f) Quantity in gross weight;
- (g) Freight charges.

58. All the elements except (g) are for purposes of identifying the flow in the basic commodity file. Depending on the sources of the data used to estimate freight charges, not all the elements listed above may be necessary, particularly when sampling methods are used. If ships' manifests are used, the estimates of charges will refer to individual consignments; when sampling methods are used the estimates of freight charges could be based on a frame referring to aggregated SITC or CCCN groups or to the total quantities of particular commodities carried during a selected period of time by a number of ships of a similar type and/or service. In the latter case, the data elements (a), (b) and (f) become irrelevant and the unit of measurement for the estimated freight charges will have to be in unit currency per gross ton of cargo.

59. A supplementary file containing only partial information can still be useful. Consequently, the progress in building this file will be quite flexible, depending upon the resources made available and the need for the additional data.

e. Immediate steps

60. For most developing countries, the immediate objective should be the establishment of the three basic files which will contain information on basic data elements already available on source documents now, without any attempt, at this stage, to refine or to increase the scope of the data inputs. It means, therefore, straight recording of the required data from the relevant documents for the ship's movement file and for the semi-permanent ship description file. As to the commodity file, most of the required elements are already being recorded in the regular compilation of trade statistics. The additional recording normally amounts to ship's name, date of arrival/departure and port of loading/discharge.

61. The United Nations Standard Country or Area Code for Statistical Use 8/ (3-digit code) should be used to record country names and three more digits may be added to the code for the names of ports of the world. Several operational port codes already exist.

8/ United Nations publication, Sales No. E.75.XVII.8.

62. The recording of the data elements in their respective files cannot be considered as complete until the commodity file has been successfully matched with the ship's movement file. In normal circumstances the ship's name and the dates of arrival/departure should be sufficient for matching the data sets, but it may prove more efficient to establish unique ship reference numbers (see annex I). Whatever device may be used eventually for matching purposes, the ship's name and the dates of arrival/departure should be preserved in the ship's movement file as they are needed for voyage analysis. Details on this and further discussion on the matching problem are contained in annex I.

63. In some countries the use of customs documents and trade statistics for shipping purposes has never been seriously considered mainly because of organizational difficulties and they have preferred to use a manifest-based system. In this system, SITC or CCCN codes (usually 2- or 3-digit level) are assigned to the brief commodity descriptions on the manifest. Commodity files built up in this way are "ship-based" and thus differ in form from the basic file of the unified system, but full compatibility with the unified system can be achieved at each level of detail of the SITC or CCCN chosen for the coding of commodities described on the manifests. This approach involves substantially more clerical work but is feasible in countries where clerical assistance is abundant.

f. Standard tabulations

64. The types of statistical analyses that may be derived from the three basic files are almost limitless. It is nevertheless desirable to devise some standard tabulations that will represent the common denominator of national needs as well as the regional requirements of an economic or geographical area in general. Some suggestions on these tabulations are given in annex V.

(iv) Progress made in the ESCAP region in implementing the uniform system

a. 1976 workshop

65. The ESCAP Task Force on the Economic Statistics of Shipping, which established the framework of the uniform system (see para. 47), recommended that, in implementing the system, two regional workshops be convened and that two regional advisers be recruited to assist member countries to implement the scheme. ESCAP convened the first workshop of statisticians responsible for the implementation of the system in the participating countries under the title "Workshop on Shippers' Co-operation", with financial assistance from the Norwegian Agency for International Development. Its objective was to finalize the formats of the three basic files of the uniform system and to recommend a set of standard statistical tabulations. An adviser was recruited for the period from September 1976 to December 1977.

66. The Workshop was convened in July 1976 at Bangkok. The participants represented 11 member and associate member countries of ESCAP (Bangladesh, Hong Kong, India, Indonesia, Iran, Malaysia, Pakistan, the Philippines, Singapore, Sri Lanka and Thailand). The United Nations Statistical Office was also represented.

67. The Workshop agreed on the principle of establishing a data base as suggested by the Task Force, even though it was not likely that all the data could be obtained in all countries. It recommended that plans be made to obtain all the data elements, but advised that implementation of the scheme should not be delayed until all the necessary data had become available.

68. In discussing the aims of the uniform system, the Workshop agreed that "the first objective was to set up satisfactory country systems. The second objective was to combine country statistics in subregional, regional or interregional groupings to facilitate the study of shipping systems serving trade routes which cross national boundaries. Although at present there were no provisions in ESCAP or the Headquarters of the United Nations for combining and reprocessing such country statistics, it was the unanimous view that such provision should be made and to that end the principle of uniformity was firmly established." 2/

69. The Workshop agreed on the contents of each of the three basic files, noting that certain data elements were optional while others were compulsory.

70. The Workshop discussed the draft standard tabulations submitted by Hong Kong, Malaysia, the Philippines and Singapore, as well as the tabulations suggested by the Task Force. It agreed that although they were satisfactory from a statistical point of view, the ESCAP secretariat should arrange to consult a wider audience of users before any firm recommendations for presentation were made.

b. Implementation in individual countries

71. The Philippines has established a data base for a number of recent years, which contains most of the elements needed for the uniform system and also keeps a separate file listing freight charges for every commodity heading during the preceding 12 months. To date, however, no analyses based on these data have been published.

72. In June 1976, Malaysia, in a report entitled Shipping Statistics, Peninsular Malaysia 1973, published the results of a pilot study initiated in 1972. The study limited its collection of data to the ports of Kelang and Penang through a specially designed "ship reporting form" filed by shipping agents. Information on commodities shown in the customs documents was successfully linked with data on ships' movements given on the ship reporting forms through the common elements in both sets of documents, i.e., the names of the ships and their dates of arrival or departure.

2/ "Report of the Workshop on Shippers' Co-operation: Economic Statistics of Shipping, Bangkok, 5-9 July 1976", paras. 15-17 (mimeo).

73. The report gives various cross-tabulations with regard to commodities, size group of ships, conference and non-conference status and countries of origin and destination. While analyses for several important commodities are made in terms of both quantity and value, the over-all analyses of imports and exports are in value terms only. This is because the quantity information for many commodities in Malaysian customs documents is often missing or is in units that are difficult to convert into weights. In spite of these weaknesses, the report shows that the framework of the uniform system can be successfully implemented even if the customs documents used for the regular external trade statistics are not particularly well suited for developing shipping statistics. With the system satisfactorily established, continuous improvements in the quality of statistics as well as in coverage can be expected in the future.

74. Singapore has done a lot of preparatory work for the implementation of the uniform system. To satisfy the requirements of the system, it has apparently decided that outward/inward declarations are to be amended to include information on freight charges and gross weight. In Singapore, the carrier's agent or operator who is responsible for filing such forms is able to furnish these data. 10/

75. Thailand plans to develop a system in which the commodities listed on ships' manifests will be coded in terms of CCCN. The information on movements of ships will be obtained by the customs through two new forms: "inward vessel report" and "declaration for ships outward", to be completed by the ship's captain. 11/

76. In Indonesia the basic documents used for the regular external trade statistics appear to be well suited to developing economic statistics of shipping since they contain many data elements required for the uniform system. However, implementation has been slow owing to difficulties in the collection of statistics from port authorities. It was considered desirable for some selected personnel of the port authorities to receive prior training. 12/

77. To avoid the problem inherent in combining statistics from different sources, i.e., customs, ports etc., India examined the effectiveness of using the shipping/steamer agents as a single source for reporting all the data required by the uniform system and found that such an approach was feasible. However, owing to the large number of agents involved, the administrative problems of using this source need to be further explored.

10/ Information furnished by the participants to the Workshop held in July 1976.

11/ The manifests approach to acquire the data specified in the uniform system to be adopted by Thailand was thoroughly discussed during the Workshop in 1976.

12/ See "Development of maritime policy and institutions: economic statistics of shipping (L.2 scheme)" (E/ESCAP/STC.1/14).

78. There are a few members and associate members of the ESCAP region other than those mentioned above which are either making preparations for the implementation of the uniform system or doing exploratory work for eventual implementation.

(v) Conclusions

79. From the brief description given above concerning the progress made by the member countries of ESCAP and from contacts with government officials in other countries, it can be concluded that the uniform system for collecting economic statistics of shipping is an efficient instrument for developing meaningful shipping statistics. The system can be used to establish a data base from which a variety of statistics can be derived for analyses of the operational aspect of the shipping industry. Based on the experience gained in implementing the uniform system in the ESCAP region, it has become clear that promotion of the system by international organizations will be very important, particularly in developing countries where the advice of technical experts from international organizations, visits to the field, seminars and workshops are essential for successful implementation of the uniform system.

80. The implementation of the system in the ESCAP region has in general progressed satisfactorily in spite of severe resource constraints. Indeed, progress has been so encouraging that it is appropriate to suggest that such work be extended to other developing regions as well.

81. On the question of participation by developed countries, it should be mentioned that the basic idea of the uniform system was originated in the United States. Early in the 1960s, the United States began to work on the idea and, by the latter half of the 1960s, the detailed commodity flow data on a port-to-port basis, by value and shipping weight and by type of vessel service became available for the years beginning with 1965. Shortly afterwards other computer-produced data became available on the movement of vessels and their characteristics, including the identity and nationality of the operator. This latter information, however, may be subject to confidentiality restrictions depending on the levels of detail involved.

82. The United States source documents for the data described above are, for imports (a) the customs import entry form prepared by importers/brokers containing detailed commodity information and (b) Customs Form 1400 prepared by customs staff containing information on the movement of vessels entering United States ports; and for exports (a) the Shipper's Export Declaration (SED) containing detailed commodity information; (b) the SED transmittal form FTD-13 containing specific information about the vessel carrying the cargo reported on the SEDs (including vessel manifest numbers) and (c) Customs Form 1401 containing more complete information on the movement of vessels leaving United States ports. For linking the commodity file with the ship's movement file, the United States port of unloading, the vessel code and the date of importation are used for imports; and the United States port of exportation and the vessel manifest number are used for exports.

83. As may be seen from this brief description, the mechanics of the United States system are identical in principle to those of the uniform system but there are some differences in the matter of practical application.

Annex I

THE MATCHING OF COMMODITY AND SHIP FILES

1. In the uniform system, the commodity file, the ship's movement file and the semi-permanent ship description file require a common data element to enable the files to be matched so that the computer-based analyses and tabulations can be carried out. This linking element must be the identity of the ship voyage on which the carriage of the goods took place. Since statistics will in all cases be based on movements at the seaports, voyages are uniquely identified by the sequence of ship arrivals.
2. The methods of providing the linking voyage data fall into two categories: (a) use of a unique ship reference number (USR); and (b) use of two data elements in combination.
3. Countries which have already successfully introduced a linking method, such as that based on the ship's name and date of arrival, should continue to match on this basis. However, in the long term, the USR principle which is more in line with international trade documentation systems and will match proposals for a unique consignment reference number, may be considered a simpler and more appropriate method.
4. The principle of any unique reference number is that it should be (a) applied at a source which has authority to allocate the number; and (b) applied early enough in the documentary process for other participants to be informed of and to use the correct number throughout their systems.
5. The USR will be used by the port authority in preparing the ship files and by the customs or other bodies in preparing the commodity files. It should be allocated either at the time of berthing or of processing the customs declaration, whichever is earlier.
6. There are two main alternative sources of the USR: the port authority (normally in the form of a ship rotation number); or the port-based customs office (normally in the form of a customs manifest rotation number). Either of these sources is satisfactory, provided that the USR allocated is reported to the other body and to the ship's agent.

Annex II

PACKAGING AND UNITIZATION

1. There have been rapid changes in the technology of cargo handling during recent decades. The physical form in which the goods are carried has an important effect on the cost structure of maritime transport. Consignments which are packaged, unitized and carried in the most economical way for given quantities, frequency of service and route length can reach the consignee at much lower freight costs than other consignments which are handled by less appropriate methods. It is important therefore that sufficient data on packaging and unitization be made available for monitoring the efficiency of cargo handling as well as for policy decisions about the type of ships needed, the adequacy of port equipment, storage facilities, infrastructure of seaports etc.

2. There are several levels of packaging and unitization. For example, food-stuffs may first be canned, then a number of cans assembled in cartons, then a number of cartons assembled in wooden pallets, then a number of pallets loaded into a standard 20-foot freight container. Thus, the preparation of a comprehensive and logical scheme for classifying packaging/unitization is a difficult task. Such work is in progress in UNCTAD. In the meantime, many port authorities have set up their own packaging classifications, most of which typically break down goods into the following categories: loose (bulk etc.); cases, cartons, crates etc.; bags; drums, reels etc.; pre-slung and bundles; pallets; containers.

Annex III

CONFIDENTIALITY

1. Bodies with commercial interests, such as shippers' councils, trade associations and shipping lines, will be among the users of shipping statistics and so care must be taken to reassure all concerned that commercial confidentiality will not be broken. This is particularly important for countries with a trade policy that balances the interests of international shipping with those of national shippers.
2. It is not proposed that the system record the name of consignor and consignee; so the shippers' interests are already protected. Although the system does carry the name of the vessel and of its owners/operators, analyses of the performance of individual operators would not generally be published. In general, publication will be limited to aggregated analyses by route, conference or trade. The existence in the system of detailed data prior to aggregation does not compromise confidentiality since, under all alternatives, the system is to be operated by an official government agency.
3. It will be the responsibility of individual Governments to decide the extent to which any detailed performance analyses should be made and to whom the results may be communicated.

Annex IV

ROUTE ANALYSIS

1. With the three basic files discussed in the present report, route analysis of a single ship or any group of ships is possible. This is so because the fundamental statistical unit of the uniform system - the individual consignment - is recorded on a port-to-port basis. In the case of a ship belonging, say, to the South-East Asia-Europe Conference, the basic file records for each individual port in South-East Asia may be aggregated to and discharged at each port of the South-East Asian end of the voyage, broken down by each port of loading and discharge at the European end.

2. Such aggregations can also produce the ship's full itinerary in the South-East Asian ports and in the European ports that actually send or receive goods to or from South-East Asia. However, two reservations must be pointed out:

(a) From the short-term point of view, as the three basic files are not likely to be available for all the ports in South-East Asia, the itinerary of ports of call for any particular ship is not likely to be complete;

(b) Should the ship have called, perhaps to carry goods between way-ports outside South-East Asia, at a port which did not load or discharge cargo destined for or originating from South-East Asia, this fact and its effect on the efficiency and economics of the voyage will not be known.

3. Because it will be some years before the data produced by the uniform system will be generally available for any given region, information on "previous port of call" and "next port of call" (see para. 47, elements 8 and 9 of the ships' movement file) is needed for an approximate route analysis. On this subject it should be mentioned that the General Declaration of the Inter-Governmental Maritime Consultative Organization (IMCO) Convention includes an item (No. 12) entitled "Brief particulars of voyage (previous and subsequent ports of call; underline where remaining cargo will be discharged)". If the IMCO proposition were to be included in full in the uniform system, the workload would be substantially increased without much enhancement of statistical significance. It would probably be more appropriate to make separate inquiries should the need for certain full route analysis arise prior to the general availability of the results of the uniform system.

Annex V

SAMPLE TABULATIONS

(See para. 64 of the report)

1. For general reference purposes, it is practical to present commodity flows at such a level of aggregation that commodities are grouped to reflect characteristics of ocean carriage. In addition, the ports of the world should be assembled into a manageable number of groupings for effective presentation of statistics by direction. In the Results of a Pilot Study in Maritime Transport, discussed in paragraphs 27-29, commodities traded internationally are classified into 35 categories and the world ports are grouped into 29 regions. Table 1 below shows flows of one of the 35 commodity groups ("machinery") for seven of the 29 regions, which have been chosen as examples.
2. The average length of haul (ALH) is the distance over which an average ton of cargo is carried. Thus it is derived from the data on ton-miles which is obtained by multiplying the tonnage of each shipment by the distance between the port of lading and the port of discharge for the shipment in question. The information on distances between ports of the world can be obtained from many sources.
3. When the uniform system has developed to a stage at which the complex voyage itinerary is known (see annex IV), the calculation of ALH can be refined by totalling all distances to give a figure which, when multiplied by tonnage, gives the operational ton-miles. Until that stage, it may be necessary for the ALH to be based on direct distances between ports; this figure, when multiplied by the respective tonnages of shipments, gives the revenue ton-miles.
4. Tables 1-4 below show sample tabulations:

Table 1A. a/ Commodity flows by region Port b/
 Inward flow of machinery d/ Quarter c/

A = Liner; B = Tramp

Region	Gross weight	Measure- ment tons	ALH <u>e/</u>	Value (f.o.b.)	Freight charges	Freight charges as per cent of f.o.b. value
World						
North America, Atlantic						
.						
Caribbean and Central America						
South America, Pacific						
.						
Baltic Eastern Europe						
.						
West Coast Africa						
.						
South-East Asia						
.						
Oceania						
.						

a/ Table 1B would be for "Outward flow of machinery" in the same format.
b/ This could refer to a group of ports, a country, a group of countries or any geographical region.
c/ This could refer to month or year.
d/ This could apply to any other commodity category.
e/ Average length of haul: the distance over which an average ton of cargo is carried.

Table 2. Ship performance by service type

Port a/

Year

	Liner		Tramp bulk carrier	Tanker	Unspecified	Total
	Conference	Non- Conference				
Number of ships						
Dwt						
As per cent of over-all dwt						100
Inward movements:						
Gross weight of cargo unloaded ALH						
Cargo unloaded as per cent of dwt						100
Freight charges As per cent of total freight charges						100
Outward movements:						
Gross weight of cargo loaded ALH						
Cargo loaded As per cent of dwt						100
Freight charges As per cent of total freight charges						100
Total freight charges As per cent of over-all total						100

a/ This could refer to a group of ports, a country, a group of countries or any geographical region.

Table 3. Liner ships: their cargo carriage and demand on berth space

Port a/ . . .

Size of ship by carrying capacity (dwt)	Number of ships (1)	Average mean draught (m) (2)	Average ship's length <u>b/</u> (m) (3)	Turn- round in days <u>c/</u> (4)	Berth- day require- ments <u>d/</u> (5)	Average dwt capacity (6)	Cargo on board at arrival (7)	Cargo unloaded (8)	Cargo loaded (9)	Cargo on board at departure <u>e/</u> (10)
January-March										
1 000-2 000										
2 000-5 000										
5 000-										
etc.										
April-June (repeat)										

a/ This could refer to a group of ports, a country, a group of countries or any geographical region.

b/ To tonnage allowed for area in question.

c/ If the date of arrival on customs document does not refer to the date a ship arrived at anchorage waiting for berth instructions, adjustment will be needed.

d/ (5) = (1) x (4) and can be used in berth occupancy analysis. This measurement is based on the assumption that every ship needs wharf for discharge and the available lighter service is not considered.

e/ (10) = (7) - (8) + (9).

...

Table 4. a/ Route analysis

Name of conference: South-East Asia-Europe Conference (example only)

Year

Port	Number of ships participating	Number of voyages made <u>c/</u>	Dwt <u>c/</u>	Cargo on board at arrival as per cent of dwt <u>d/</u>	Cargo loaded or unloaded	Cargo loaded or unloaded as per cent of dwt <u>d/</u>	Service performed in millions of ton-miles	Freight charges
EUROPE, east-bound								
Hamburg	5			-			-	-
Rotterdam	8			-			-	-
Le Havre	-			-			-	-
Marseilles	10			-			-	-
Genoa	15			-			-	-
Naples	2			-			-	-
Athens	-			-			-	-
	20 <u>b/</u>			-	Total		-	Total
SOUTH-EAST ASIA, east-bound								
Penang	5							
Singapore	17							
Bangkok	10							
Hong Kong	11							
Manila	2							
Jakarta	13							
	20 <u>b/</u>				Total		A	Total
EUROPE, west-bound								
Hamburg	8			-				
Rotterdam	10			-				
Le Havre	5			-				
Marseilles	12			-				
Genoa	1			-				
Naples	-			-				
Athens	5			-				
	20 <u>b/</u>				Total		B	Total
SOUTH-EAST ASIA, west-bound								
Penang	5						-	
Singapore	15						-	
Bangkok	9						-	
Hong Kong	13						-	
Manila	2						-	
Jakarta	10						-	
	20 <u>b/</u>				Total		-	Total

Memorandum item: Ton-mile capacity utilization as a percentage, e/ west-bound: $\frac{B}{\text{Capacity ton-miles}} \times 100.$

(Foot-notes on following page)

(Foot-notes to table 4)

a/ This table illustrates the types of meaningful statistical information that can be derived from the three basic files. All the figures entered are fictitious.

b/ Total number of ships participating. The numbers in the column refer to the distribution/frequency of calls made by the ships participating. In practice, these numbers may not necessarily be identical.

c/ Data in these columns should relate to the ships entered in the column "Number of ships participating".

d/ Averages weighted by dwt of individual ships involved.

e/ It should be noted that A and B are in revenue ton-miles while the capacity ton-miles (number of voyages x dwt of individual ships x distances between successive ports visited) relates to operational ton-miles.
