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TRANSPORT STATISTICS: PART 2<sup>1/</sup>

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1/ Part 1 was submitted to the commissions in 1949 as document E/CN.2/53-E/CN.3/5

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## TRANSPORT STATISTICS

### A. Outline of the Steps already taken by the Council and Commissions

1. The Transport and Communications Commission at its second session considered the problem of the establishment of internationally comparable statistics in the transport field, which had been referred to it at the request of the International Labour Organisation. The question was also considered by the Statistical Commission at its third session. Having considered parallel recommendations from the two commissions the Council adopted a resolution instructing the Secretary-General, in consultation with the specialized agencies and regional commissions concerned and assisted by such independent experts as he might consider desirable, to make a study of the following problems:

- (a) The establishment of economic and technical statistical requirements in the transport field (giving priority to the statistical requirements of an economic nature);
- (b) The achievement of comparability in the information to be collected;
- (c) Standardization of forms for the collection of this information.

The study was to be transmitted to the two commissions for their consideration<sup>1/</sup>

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<sup>1/</sup> The texts of the resolutions are given in the documents listed below:

Resolution of the Transport and Communications Commission: E/789

Resolution of the Statistical Commission: E/795

Resolution of the Economic and Social Council: E/1053.

All three resolutions are reproduced in document E/CN.2/53-E/CN.3/54.

## 2. THE STUDY OF THE BASIC TRANSPORT STATISTICAL SERIES

### A. The Establishment of Economic and Technical Statistical Requirements

2. The first part of the study requested by the Council was submitted as document E/CN.2/53-E/CN.3/54 to the Transport and Communications Commission at its third session and the Statistical Commission at its fourth session. It dealt with the establishment of economic and technical requirements in the transport field and ended by suggesting that a study of the achievement of comparability in the basic series listed below be undertaken. The commissions endorsed the suggestion<sup>1/</sup>. The series in question are:

1/ The texts of the resolutions of the Commissions follow:

#### "THE TRANSPORT AND COMMUNICATIONS COMMISSION

TAKES NOTE with appreciation of the preliminary report prepared by the Secretariat for the Transport and Communications Commission and the Statistical Commission on transport statistics;

HAVING IN MIND the resolution adopted by the Economic and Social Council at its seventh session concerning collaboration with the specialized agencies and regional economic commissions with respect to the matter,

REQUESTS the Secretariat to continue the study on the lines indicated in the preliminary report, taking into consideration the views expressed during the Commission's discussion of this report; and

EXPRESSES the wish that the Secretariat, at the appropriate moment, consult the governments concerning the present or future availability of the statistical series, the collection of which is recommended in the report".

#### "THE STATISTICAL COMMISSION

##### TAKES NOTE OF

(a) the preliminary report on transport statistics prepared by the Secretary-General, and

(b) the resolution on Transport Statistics adopted by the Transport and Communications Commission at its third session and

REQUESTS the Secretary-General to continue the study on the lines indicated in the preliminary report of the Secretariat, taking into account the observations made by the Statistical Commission.

These texts and summaries of the discussions leading up to the resolutions are contained in documents E/1311 and E/1312 respectively. Fuller accounts of the discussions appear in documents E/CN.2/SR.29 with Corr.1 and Corr.2 and E/CN.3/SR.44. Comments made by the member for the United States of the Transport and Communications Commission appear in document E/CN.2/64.

/For Civil

For Civil Aviation

Kilometres flown  
Passenger-kilometres performed  
Cargo tons loaded or unloaded  
Cargo net ton-kilometres  
Number of aircraft  
Operating revenues and expenses

For Ocean Shipping

Tons loaded and unloaded at ports  
Gross registered tonnage of  
fleets and number of vessels  
Entrances and clearances of  
vessels with cargo in foreign  
trade

For Inland Navigation

Tons loaded and unloaded  
Net ton-kilometres performed  
Vessel fleets and capacities

For Railways

Net ton-kilometres performed  
Freight tons carried  
Passenger-kilometres performed  
Tons loaded and unloaded  
Vehicle stocks and capacities  
Operating revenues and expenses

For Road Transport

Net ton-kilometres performed  
Passenger-kilometres performed  
Vehicle stocks and capacities

B. The Achievement of Comparability

3. The study of the achievement of comparability in transport statistics is now submitted to the commissions. Its purpose is to suggest definitions for most of the series listed above. The definitions are submitted in the hope that the Commissions will consider them as standard definitions by means of which the comparability of national series can be assessed. It is intended that definitions approved by the Commissions shall:

- (a) Be used by the United Nations Statistical Office in its compilations, deviations from the definitions in national statistics being, as far as possible, indicated by means of explanatory text, footnotes, etc.;
- (b) Be drawn to the attention of others collecting international transport statistics so that they may avail themselves of the definitions;
- (c) Be drawn to the attention of governments so that they may:
  - (i) determine the present availability of national statistical series covering the subject matter of the series here described;
  - (ii) determine the extent to which the available series conform to the definitions here set forth;
  - (iii) examine the possibility of producing for purposes of international comparability figures in substantial agreement with the definitions here set forth.

4. Definitions of all the series listed in paragraph 2, except those on the transport of goods and persons by road and those on operating revenue and expense, are suggested in Annex 1 to this paper, and those series for which no definitions are offered are discussed in less detail. The definitions have been framed with the following objects in view.

(a) The definitions should diverge as little as possible from those currently employed in national transport statistics.

(b) The figures defined should be of economic and technical importance. This aspect of the problem was discussed in document E/CN.2/53-E/CN.3/54.

(c) The commissions have stressed the importance of defining figures comparable not only between countries but also between forms of transport. The definitions below are, therefore, so framed as to permit as far as is possible the formation of totals including several forms of transport and several countries. The definitions are, for instance, set up so that the total railway freight movement of a continent can be obtained, without significant omissions or duplications, by addition of the figures for the individual countries making up the continent; and so that the total inland freight movement of a country (or of a region made up of several countries) can be shown.<sup>1/</sup>

(d) Figures measuring the movement of goods and persons by each form of transport are therefore discussed first. The definitions of vehicle statistics are then framed to include those vehicles which carry the traffic which is the subject of the figures first defined, and it is suggested that figures for operating revenue and expense include those operations to which the movement of goods and persons gives rise.

(e) The definitions put forward in Annex 1 aim to give, for each form of transport, figures for the total of goods transported in the commerce of a country and for all passengers except the service personnel of the carrier and, in some cases, official and military personnel. No suggestions are made in Annex 1 about the analysis of these total figures into domestic and international traffic or by commodities. The subject is, however, discussed in Section 3 of this paper.

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<sup>1/</sup> The Statistical Office has compiled figures showing the total railway goods traffic of continents for each of the years 1928-1938 and 1946-1948. They appear in "The Transport and Communications Review" Vol. 2 No. 4, and in the "Monthly Bulletin of Statistics" for December, 1949.

/5. The series

5. The series for which no definitions are suggested in Annex 1 are treated as follows. In the case of the measurement of road traffic the Working Party of Experts on Statistical Information of the Inland Transport Committee of the Economic Commission for Europe set in motion a study of the methods recommended by European governments for the measurement of road traffic. To avoid duplication of the work of the Secretariat of the Economic Commission for Europe no world-wide study of the subject has yet been undertaken. The position will be reviewed before the next meeting of the commissions. The paragraphs on road traffic of Annex 1 are therefore confined to a few general suggestions. On the question of operating revenue and expense some specific suggestions of a general nature are made.

6. In preparing Annex 1 to this paper, the Statistical Office took into account the comments on the first paper made by the commissions, including written comments prepared by members for the Netherlands and for the United States. As required by the commissions, a draft of the annex has been submitted to the Secretariats of the International Labour Organisation, the International Civil Aviation Organisation, the Economic Commissions for Europe, for Asia and the Far East and for Latin America and the following divisions of the Secretariat at United Nations headquarters: the Transport and Communications Division and the Division of Economic Stability and Development. Their suggestions have, as far as possible, been incorporated in Annex 1.

7. The following draft resolution is here suggested for the consideration of the commissions.

THE (TRANSPORT AND COMMUNICATIONS) (STATISTICAL) COMMISSION

RECOMMENDS that, where general policy permits, the statistical series listed below be compiled, by each country in which there is traffic of the sort described, on a monthly or annual basis as indicated below and that, after amendment as directed by the Commission, the definitions set forth in Annex 1 to this document be used for the series as far as possible.

/LIST OF

## LIST OF STATISTICAL SERIES

(It is recommended that those series marked by an asterisk be published on a monthly basis and the remainder on an annual basis.)

### For Railways

freight net ton-kilometres performed\*  
passenger-kilometres performed\*  
goods loaded\*  
goods unloaded\*  
goods carried\*  
number of locomotives  
number of vehicles in the passenger stock  
number of goods wagons  
passenger capacity  
goods capacity  
total starting draw-bar pull

### For Inland Waterways

freight net ton-kilometres performed\*  
goods loaded\*  
goods unloaded\*  
number of dumb barges  
number of self-propelled cargo vessels  
number of tugs  
goods capacity  
total horsepower

### For Road Transport

number of private cars  
number of buses  
number of lorries  
passenger capacity  
goods capacity

### For Seaborne Shipping

goods unloaded in coastwise traffic\*  
net registered tonnage of vessels entered with cargo in coastwise traffic\*  
net registered tonnage of vessels cleared with cargo in coastwise traffic\*  
goods loaded in international seaborne traffic\*  
goods unloaded in international seaborne traffic\*  
net registered tonnage of vessels entered with cargo in external trade\*  
net registered tonnage of vessels cleared with cargo in external trade\*  
number and gross registered tonnage of  
    (a) passenger vessels  
    (b) tankers  
    (c) dry cargo vessels

passenger capacity of passenger vessels

### For Civil Aviation

cargo ton-kilometres performed\*  
mail ton-kilometres performed\*  
passenger-kilometres performed\*  
cargo loaded\*  
cargo unloaded\*  
kilometres flown\*  
number of small passenger aircraft  
number of large passenger aircraft  
number of cargo aircraft



REQUESTS that the Secretary-General circulate the amended definitions mentioned above and a copy of this resolution to the Member Governments of the United Nations, so that they may examine the possibility of producing, for purposes of international comparability, series in substantial agreement with the definitions here set forth.

REQUESTS that the Secretary-General circulate the definitions and a copy of this resolution to bodies which publish international transport statistics inviting them to make use of the definitions in the interest of achieving comparability.

#### THE COMMISSION

HAVING IN MIND that governmental and non-governmental bodies are studying the definition of figures for operating revenue and expense of railways and civil aviation enterprises

REQUESTS the Secretary-General to bring this resolution and the relevant suggestions made in Annex 1 to this document to the attention of the bodies concerned.

#### C. Standardization of Forms for Collection of Data

8. The collection of data for the compilation of transport statistics forms part of the operating tasks of the transport undertakings and the method of collection is usually determined by the system of recording and accounting which each undertaking employs. This, in turn, may to some extent be determined by national laws. Statistical material has in many cases been regarded as a by-product of the system of recording and accounting and there is a clear need to draw attention to the basic importance of statistical data not only for the needs of the transport undertakings but also for national and international economic purposes. The method of primary collection must, however, be adapted to the recording and accounting systems in current use and the complexity of these systems in such that it is not possible to provide standard collection forms which will be universally adaptable for the primary collection of data. The methods of collection in use in each country may, however, be the subject of future study for the purpose of determining the kinds of collection systems that might be recommended for use in countries which require assistance in this field.

/9. In the case

9. In the case of the secondary type of collection of data which takes place at the international level it will be possible to describe to countries the data which are required for international comparison and which are necessary whenever transport problems of an international nature are considered. The definitions discussed in this paper may serve as a basis for such descriptions. Each country will be able to determine how its national system of collection may be adapted to provide the required data.

### 3. INTERNATIONAL TRAFFIC

10. The definitions discussed above have been so worded as to give figures for the total commercial traffic of a country. For economic studies, knowledge of the composition of total figures is often required, particularly their analysis into domestic and international traffic and the analysis of the latter into its components: import, export and transit traffic. For international traffic it is desirable that the figures for the transport of goods and the international trade figures bear a simple relation to one another.

11. Such a simple relation can only exist if (a) the concepts import, export and transit are, as far as possible, defined in the same way by the agencies collecting the two types of statistics; and (b) there is a rational relation between the commodity classifications the agencies use. Because the purposes served by commodity classification for trade and for transport are so different, it is probably not possible to have identical classifications for trade and traffic statistics. But a simple relation could be established if both the trade classification and the transport classification could be grouped in a common broad classification.

12. For the common broad classification, trade and transport statistics would then be comparable. This would have the advantage that gaps in transport statistics could in some cases be filled by the use of trade statistics which are, for most countries, the more complete of the two.

13. The Secretariat proposes that the study of transport statistics be continued by an investigation of international traffic statistics along the lines just described.

#### 4. TRANSPORT STATISTICS PUBLISHED BY THE STATISTICAL OFFICE

14. The Statistical Office at present publishes extended time series under the headings listed below. Annex 2 shows in detail for each Member Country the availability of the statistical series discussed above as far as it is known to the Statistical Office. The Statistical Office publishes figures in the series listed below. Annex 2 indicates for which Member Countries series are regularly published by the Statistical Office. Figures are also published for several non-member countries and territories.

##### Titles of Series Published by the Statistical Office

Monthly and annual figures	Annual figures only
<u>Railways</u>	
passenger-kilometres	rolling stock (number)
freight net ton-kilometres	
goods carried	
<u>Road Transport</u>	
	Vehicles registered (number)
<u>Inland Waterway Transport</u>	
goods loaded	
goods unloaded	
<u>International Sea-borne Shipping</u>	
goods loaded	gross registered tonnage
goods unloaded	of fleets (Lloyd's Figures)
net registered tonnage entered	
net registered tonnage cleared	
<u>Civil Aviation (figures collected by ICAO)</u>	
passenger-kilometres	kilometres flown
cargo and mail ton-kilometres	ton-kilometres-analysed to show cargo and mail separately

## ANNEX 1

### THE ACHIEVEMENT OF COMPARABILITY

#### INTRODUCTION

1. The following chapters propose definitions for the transport statistical series which are the subject of the recommendations suggested in the document to which this one is an annex. Also included are brief discussions of the measurement of the quantities of goods and persons carried by road motor vehicles and of the measurement of the operating revenue and expense of railways and civil aviation enterprises.

#### CHAPTER I. TRAFFIC STATISTICS

##### Section A. General Definitions

2. This chapter aims to give precise definitions of each of the traffic series about which recommendations are suggested in the covering document. Because of the large number of variables entering into each definition, the definitions must be built up step by step. In this section those steps will be taken which apply to more than one form of transport. Subsequent sections will discuss the definitions as they apply to each form of transport and will make such new definitions and minor amendments to the general definitions as may be necessary for the form of transport in question.

3. The advantages of treating first definitions common to more than one form of transport are:

(a) to promote comparability between the statistics for the several forms of transport,

(b) to avoid the necessity of frequent repetition.

4. The forms of transport. For the purposes of this paper there are 6 forms of transport: railways, road transport, inland waterway transport, coastwise shipping, international sea-borne shipping, civil aviation.

5. Vehicle. The term vehicle will be used below, irrespective of the form of transport, for the moving object actually effecting the transport of goods and persons. "Vehicle" therefore includes wagons, locomotives, ships, tugs, planes, etc.

6. Traffic. In what follows the term traffic will refer to the movement of goods and persons and not in general to the movement of vehicles. It will of course exclude accidental movement and movement uncontrolled by man.

/7. Types of

7. Types of carrier to be included in statistics. Traffic statistics, should where possible, include the traffic of both:

(a) public carriers (common carriers and carriers which operate under contract or for hire);

(b) private carriers (persons, firms or companies which perform carriage without being public carriers).

8. Traffic statistics should, where possible, include traffic moved by mechanical means and by wind or current. In the case of inland waterways, the traffic of barges drawn by animals should be included. Other traffic whose movement is by animal power and all traffic moved by human power should be excluded from the statistics because figures for such traffic are not generally available.

9. Definition of the type of traffic to be included. Traffic statistics should, where possible, refer only to commercial traffic. Commercial traffic is defined to be all traffic except: service, administrative and state traffic, which are defined immediately below; commercial traffic should also exclude the movement of fuel and stores by the vehicle in which they are consumed. Traffic statistics should, where possible, include all commercial traffic except that described as "special" in paragraph 11 below.

(a) Service traffic is the movement by a carrier of persons or goods, other than the fuel and stores of the vehicles in which they are consumed, which the carrier itself utilizes to meet its technical needs, whether or not this movement produces revenue for bookkeeping purposes.

(b) Administrative traffic is the carriage of goods or persons by a government vehicle or a vehicle engaged in the upkeep of the means of transport themselves provided the carriage is for the purposes of the service to which the vehicle belongs.

(c) State traffic is traffic carried without revenue for the armed forces or other governmental agency.

For certain forms of transport, service, administrative and state traffic overlap, but this has no effect on the definition of commercial traffic.

10. Definition of the distance through which traffic moves. In traffic statistics involving it, the following definition of distance should, where possible, be used. In the case of revenue traffic, the distance should be that on which the tariff is based. Otherwise, it should be the length of the route normally followed between the points of origin and destination.

/11. Definition

11. Definition of traffic of special character. The following types of traffic should, because of their special character, be omitted from traffic statistics:

Urban traffic, i.e., traffic within an urban unit; traffic between a city and a suburb is not considered urban.

Harbour traffic (including that of lighters).

River ferry traffic.

Movement in marshalling yards, depots and sidings.

Movement within plantation, forest and mining properties and industrial plants.

The carriage of catch in the original hunting or fishing vessel.

Vehicles when delivered as goods without being loaded on other vehicles.

12. Definition of the range of national traffic statistics

(a) Each country should collect statistics for goods loaded or unloaded within its boundaries (see paragraph 13) irrespective of the ultimate origin or destination of the goods loaded or unloaded and of the nationality of the carrier;

(b) Except in the case of civil aviation<sup>1/</sup> each country should collect statistics for the goods carried, and ton-kilometres or passenger-kilometres performed within its boundaries irrespective of the origin or destination of the goods or persons carried and of the nationality of the carrier;

(c) In the case of civil aviation, because some flights are over the sea which does not belong to any national territory, each country should collect statistics of the goods carried, ton-kilometres or passenger-kilometres performed or kilometres flown by aircraft registered in that country or territory no matter where the movement takes place and irrespective of the origin or destination of the goods or passengers carried.

13. Boundary

(a) In the frontier zone between two countries, customs barriers, railway division points, etc. do not always coincide with the actual frontier, so it may sometimes, particularly when the tariff changes from that of one country to that of the other at such a secondary point, be convenient to treat the traffic statistics as if the frontier were at the secondary point rather than at the actual frontier.

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<sup>1/</sup> If, for international sea-borne shipping, figures such as passenger-kilometres or ton-kilometres were available, sea-borne shipping would have to be treated according to sub-paragraph (c) rather than sub-paragraph (b).

(b) Where national territory is geographically divided, as, for instance, Algeria is from the rest of France, the statistics may be presented for the regions considered as one or as two units as is more convenient. The statistics of Dominions, Colonies and Dependencies should, on the other hand, where possible be presented separately from those of the mother country.

14. Units of Measurement

(a) For international purposes the metric system of weights and measures should be used, but each country or territory will, of course, collect and publish figures in the units to which it is accustomed.

(b) Weights of goods should, where possible, be gross, that is, should be the weight of the goods plus such of their packing as is not part of the vehicle carrying them. Where the weight used for computing the tariff differs from the actual weight, the actual weight should, where possible, be used. The weight of "containers" should be excluded from the figures.

(c) For the conversion of heads of livestock into weight units each country must determine its own factors.

(d) In some countries certain goods are measured in "shipping tons" of various descriptions which depend on the volume of the goods or the area they occupy. If a series so measured enters into the statistics defined in this paper, the country should establish for the series a "specific gravity" to be used in international statistics for converting the elements of the series to units of weight.

(e) The actual travel to which season and multi-trip tickets give rise is often computed from an average number of journeys per ticket. This average must be determined in each country to make possible the nearest approach to the true number of journeys.

15. Stages of the transport operation

(a) Goods loaded. A quantity of goods is said to be loaded if it is placed in a vehicle for shipment. Transloading from one vehicle to another belonging to the same form of transport is to be excluded. Loadings from entrepôt are, however, to be included. (The receipt across a frontier of a loaded vehicle is not considered a loading.)

(b) Goods unloaded. A quantity of goods is said to be unloaded if it is removed from a vehicle after shipment. Transloading from one vehicle to

/another



another belonging to the same form of transport and unloading due to damage to the vehicle are to be excluded. Unloadings to entrepôt are to be included. (The despatch across a frontier of a loaded vehicle is not considered an unloading.)

(c) Goods entering loaded. A quantity of goods is said to enter a country A loaded if, after having been loaded into a vehicle in another country B, it enters country A in that vehicle. The vehicle may also be said to have entered country A loaded.

(d) Goods carried. A quantity of goods is said to have been carried in a country A by a form of transport F when it has:

- (i) either been loaded by F in A or entered A loaded; and
- (ii) been moved by F in A; and
- (iii) either been unloaded by F in A or carried by F out of A.

Where possible the statistics to which this process gives rise should be collected at the end of the process.

(e) Freight net ton-kilometres (abbreviated to ton-kilometres in what follows). A ton-kilometre is said to be performed when a ton of goods has been carried (see above) one kilometre. In calculating the ton-kilometres performed in a given country in a given period, the goods which ended their journey during the period are to be considered, and for each shipment of such goods, the length of the whole journey in the country is, where possible, to be used, whether or not the journey was carried out during the period in question.

(f) Passenger-kilometres. A passenger-kilometre is said to be performed when a passenger is moved one kilometre. The treatment of journeys involving two time-periods should, where possible, be the same as that recommended for ton-kilometres.

16. Loaded vehicles carried on other vehicles. It is common for loaded railway rolling stock to be carried by water in car ferries. The resulting traffic should be treated as follows.

(a) If the car ferry moves a relatively small distance, such as across a river or through a harbour, it shall be considered that there has been no break in the railway journey.

(b) If the car ferry makes a journey which would normally (see 11) give rise to water-borne traffic, the goods or persons carried in the rolling stock

/should be

should be considered to have been:

- (i) unloaded by the railway and loaded by the ferry at the point where the rolling stock is run onto the ferry;
- (ii) carried by the ferry;
- (iii) unloaded by the ferry and loaded by the railway at the point where the rolling stock is run off the ferry.

It should be noticed that no account is taken of the movement by ferry of the rolling stock itself. Similarly no account should be taken of the movement of empty rolling stock by a ferry service of the type under discussion.

(c) Wherever there is carriage, by one form of transport, of a loaded vehicle proper to another, the resulting traffic should be treated according to the principles illustrated above in the case of the railway car ferry.

(d) Wherever there is carriage, by a form of transport, of a loaded vehicle proper to itself, it should be considered that there was no break in the journey of the original vehicle.

#### 17. Definition of statistical series for traffic

(a) A figure will be said to represent the goods loaded or unloaded, as the case may be, in a country A by a form of transport F in a time-period P if it represents the weight of all the goods, in commercial traffic, having the properties set forth in the definitions of this chapter, which were loaded or unloaded in country A by the form of transport F in the period P.

(b) Except as indicated at (c) below, a figure will be said to represent the goods carried or the ton-kilometres or passenger-kilometres performed in a country A by a form of transport F in a time-period P if it is the sum of the goods carried or the ton-kilometres or passenger-kilometres performed in country A via the form of transport F in time-period P by all the commercial goods or passenger traffic having the properties set forth in the definitions of this chapter.

(c) In the case of civil aviation, statistics for tons carried or ton-kilometres or passenger-kilometres performed or kilometres flown should be collected for traffic in aircraft registered in country A rather than for traffic in country A. The necessary definitions result from those at (b) above by replacing the second of the underlined phrases by the first.

(d) The definitions just given are discussed for each form of transport in the sections of this chapter listed below.

- |                              |                                     |
|------------------------------|-------------------------------------|
| B. Railways                  | E. Coastwise shipping               |
| C. Road transport            | F. International sea-borne shipping |
| D. Inland waterway transport | G. Civil aviation                   |

18. Water-borne traffic

(a) Because inland waterways may lead continuously into coastal waters which in turn merge into the sea, specific definitions for statistical purposes of inland waterways traffic, coastwise traffic and international sea-borne traffic are required. By coastwise traffic will be meant traffic between the ports of a single country; goods or persons will be said to have moved by inland waterway if no part of their journey in the vessel in question was by sea. These distinctions are made precise in sub-paragraphs f, g and h of this paragraph.

(b) Sea. In general a sea is a navigable body of salt water having a salt water connexion with the great oceans of the world. The Great Lakes of North America and the St. Lawrence River will, because of the size of the system they compose and its international character, here be classed as seas. Salt water ship canals, the Panama Canal and the Welland Canal of the Great Lakes System, will also be classed as part of the sea. Rivers above their mouths, will not be classed as part of the sea.

(c) Inland waterways. Navigable waterways not classed as part of the sea are called inland waterways.

(d) Ports. A point at which goods or passengers are loaded from land to a vessel or from a vessel to land or transhipped from a vessel moving in one form of transport to a vessel moving in another will be called a port.

(e) Sea voyage. A person or a consignment of goods will be said to have made a sea voyage if part at least of the journey of each ship in which the goods or person travelled was by sea. Transshipment in bond from one sea-going vessel to another will or will not be said to have terminated one voyage and begun another depending on whether or not the transshipment was interrupted by consignment to entrepôt. Transshipment between a sea-going vessel and a vessel carrying the goods or person on inland waterways will be said to have terminated one voyage and begun another.

(f) International sea-borne traffic. A person or a consignment of goods will be said to have moved in international sea-borne traffic if after having been loaded in a port of a country A it made a sea voyage to a port of another country B and was there unloaded.

/(g) Coastwise

(g) Coastwise traffic. A person or a consignment of goods will be said to have moved in the coastwise traffic of country A if after having been loaded in a port of country A it made a sea voyage to another port of country A and was there unloaded. (Persons taking part in a cruise, that is embarking at a port of A, visiting ports of other countries and returning to A but always moving in the same ship should be excluded both from international and coastwise shipping statistics as here defined.)

(h) Inland waterways traffic statistics should include the persons or consignments of goods moved on the inland waterways except those making a sea voyage (see (e) above).

(i) Tonnage measurement of ships. In this chapter and the next the net registered tonnage and gross registered tonnage of sea-going ships will be referred to. There is no internationally accepted definition of these terms, but a Convention for a Uniform System of Tonnage Measurement of Ships, agreed at Oslo on 10 June 1947 by the Plenipotentiaries of the Governments of Belgium, Denmark, Finland, France, Iceland, the Netherlands, Norway and Sweden, provided that

"the Contracting Governments undertake to observe the regulations entitled 'International Regulations for the Tonnage Measurement of Ships' issued through the League of Nations and dated June 30th 1939".

(These regulations are League of Nations Document C.108.M 63 and 63a. 1939 VIII. Article 10 of the Convention remarks that the principles they lay down are generally known as the English system). The Convention has not yet received a sufficient number of ratifications to come into force. Since then, however, the Transport and Communications Commission has requested the Economic and Social Council to approach Governments with the object of establishing whether a uniform system might be internationally adopted and the Council has agreed.

19. Analysis of traffic. It is not intended at this time to make recommendations concerning the analysis into their major components of the traffic figures defined in this chapter. This matter is, however, discussed briefly in the document to which this is an annex.

20. Arithmetic Properties of the Figures Representing Traffic

(a) This paragraph refers to the definitions made in paragraphs 15 - 18.

/(b) The

(b) The following table marks by an x those traffic figures which can, if the definitions proposed are adhered to, be added without risk of double counting to form for a given time-period: (a) regional totals, that is totals for two or more countries; (b) totals over two or more forms of transport.

	a. Regional totals	b. Totals over the forms of transport
goods loaded	x	
goods unloaded	x	
goods carried		
ton-kilometres performed	x	x
passenger-kilometres performed	x	x
goods imported <u>1/</u>		x
goods exported <u>1/</u>		x
goods in transit <u>1/</u>		

The figures in a time series for any one of the concepts tabulated above may be added without risk of double counting to give a total for the time-period which is the sum of the periods represented in the series.

(c) There are several useful arithmetic relations among the numbers in question.

Let:

- p denote the total weight of a category X of goods loaded within a country A in a time-period P by a form of transport F;
- p' denote the total weight of goods of category X entering A loaded in period P by F;
- q denote the total weight of goods of category X unloaded within A in period P by F;
- c denote the total weight of goods of category X carried within A in period P by F;
- i denote the total weight of goods of category X imported into A by F in period P;
- e denote the total weight of goods of category X exported from A by F in period P;
- t denote the total weight of goods of category X which, in period P, ended a journey in transit through A by means of F (goods imported by a form of transport F, transhipped to another form of transport G and then exported by G should be counted in i(F) and e(G) but not in t(F) or t(G);
- k denote the ton-kilometres performed in A by goods of category X carried ~~in~~ in period P by F;

1/ For a precise definition of the figure see sub-paragraph (c) of this paragraph.

h denote the average distance through which a ton of goods of category X was carried in A during period P by F.

Then the following simple formulas hold:

$$q + e + t = c$$

$$p + p' = c + E$$

$$p + i = q + e - N$$

where E is the weight of the goods being transported at the end of period P less the weight of the goods being transported at the beginning of period P plus the weight of goods lost during period P, and N is computed similarly except that goods in transit are omitted from the reckoning. If the rate of loss is small and P is at all a long period, E and N are small in comparison with the other quantities and may be neglected. Further formulas are:

$$p + i + t = c - N$$

$$p + q + i + e + 2t = 2c - N$$

$$k = h c.$$

(d) The additive properties and formulas described above hold exactly only when the definitions are followed exactly. Especially in the case of water-borne traffic this implies that the point of loading and point of unloading of each consignment of goods are known by the authorities both of the country in which the goods are loaded and of the country in which they are unloaded. Because the destination of goods, particularly of those moving by sea, is sometimes changed en route, it will occasionally be impossible for the point of destination to be known in the country of origin. To the extent to which there is ambiguity of this sort, the statements and formulas given above are approximate.

(e) This point can be illustrated by the following simple paradox. Suppose a river crosses the frontier between country A and country B at a point R and that the mouth of the river is in B. Let P be a river port of A and Q be a coastal port of B at some distance from the mouth of the river. A consignment of goods is carried in a single vessel from P to Q.

(f) Though according to the definitions the shipment is moving in international sea-borne traffic, it might well be that:

- (i) the records of country A would show it is an export by inland waterway;

/((ii) the

- (ii) the records of country B would show it as a shipment in coastwise traffic (if B conducts customs examination at R); or
  - (iii) the records of country B would show it as a shipment in international sea-borne traffic (if B conducts customs examination at Q).
- (g) In case alternatives (i) and (ii) obtain, the shipment would appear in a regional total including A and B as loaded but never unloaded in inland waterways traffic and unloaded but never loaded in coastwise traffic. A similar anomaly results in case it is alternatives (i) and (iii) that obtain.

Section B. Railways

21. In the case of railway traffic, the general definitions of Section A require the following explanations.
22. The types of carrier (see 7)
- (a) Public carriers are of two sorts: (i) the railways themselves which may be publicly or privately owned, and (ii) companies such as the Société des Transports Express Frigorifiques (STEF) and the Compagnie Internationale des Wagons Lits in Europe and the Union Tank Line (UTLX) and Pullman Car Company in America that own vehicles which run on the railroads. The traffic of both sorts of public carriers should be included in the statistics.
- (b) Private carriers are also of two sorts: (i) companies which own specialized cars to carry their own goods; the traffic they carry over the lines of the public carriers should be included in the figures;
- (ii) industrial and similar railways whose traffic is excluded from the statistics (see 11).
23. In the case of railways, almost all administrative traffic is also service traffic.
24. The Commercial goods traffic (see 9), as it applies to railways is called "public traffic" by the International Union of Railways from the introduction to whose annual publication, International Railway Statistics, the following quotation is taken.
- "Tons and ton-kilometres cannot in every case be divided between charged and free-hauled traffic, because by certain Railway Administrations internal service traffic is debited with charges for the purpose of their internal accounts. Traffic has therefore been divided into public traffic and service traffic. Traffic described as public traffic covers in general only traffic for which the Railway Administration receives carriage charges, and consignments of livestock. Service traffic is understood as that which is necessary for carrying on the business of the railway, such as the conveyance of coal from pit, port or depot to the place where it is to be used by the railway, the conveyance of permanent way materials from the place of production or depot to the place where they are to be used, etc."
- Where a railway cannot separate "internal service traffic debited with charges for the purpose of internal accounts" from "charged traffic", "charged traffic"

/should be shown



should be shown in national statistics rather than commercial traffic. This fact should then be indicated and an estimate should, where possible, be made of the amount of the difference between the commercial and charged traffic of the railway.

25. Except where it is urban in character, the traffic of narrow gauge and light railways (including inter-urban tramways) should be included in traffic figures if the distances they cover and the quantity of goods or passengers they carry are appreciable. Where figures for their traffic are not available, it must be omitted and a statement should be made of the approximate magnitude of the traffic thus excluded. Rack and pinion, cable and funicular railway traffic should be excluded from traffic figures because the distances such railways cover is short (see IA10).

26. It was recommended that the data on which goods carried and ton-kilometre figures are based be collected when the goods are delivered to consignee (see 15). The difference caused by recording the transaction when the goods are accepted for transport, as is often done by railways, is not large enough to affect comparability. In computing goods carried it is chiefly important that goods be not counted twice on being transferred from one part of the railway system to another in the same country. The method of computing ton-kilometres varies among railways. Many use way-bills or train documents to compute exact figures. Others use approximate methods. The methods used by the members of the International Union of Railways are described in the introduction and notes to International Railway Statistics. It is not here recommended that a change in established methods of collecting figures for tons carried and ton-kilometres be made.

27. Comparability will not seriously be affected whether certain traffics, small in amount, are included in the figures or not. Such traffics are: passengers' luggage, mail, express traffic, freight carried on passenger trains, service traffic carried by regular goods trains.

28. The text of Section A of this chapter and of this section gives rise to definitions of the following statistical series for railway traffic:

- freight net ton-kilometres performed
- passenger-kilometres performed
- goods loaded
- goods unloaded
- goods carried

/which are the subject

which are the subject of a recommendation suggested in the document to which this paper is an annex. No recommendation is made concerning statistics on the number of passenger journeys because this figure is in many countries disproportionately influenced by the journeys of commuters.

Section C. Road Transport

29. It was recommended that, for road traffic, ten-kilometre and passenger-kilometre figures be studied. In their discussion of the matter, the Transport and Communications Commission and the Statistical Commission emphasized the importance of approximate methods of measuring road traffic.

30. Because of the great difficulties in the way, particularly as regards private carriers, it is not at present reasonable to expect figures for commercial traffic by road to be available in many countries. The work of those countries in which figures are available is all the more praiseworthy in view of the general situation.

31. It is perhaps worth while to suggest that the figures listed below will, if systematically collected for some well-defined part of road traffic, chosen to be as representative of commercial traffic as possible, give an indication of the role of road transport in the country collecting them. If reliable data on road traffic are available for a given month or year by means, for instance, of a sample survey, the figures listed will help in making approximations for earlier and later periods.

goods vehicle-kilometres	passenger vehicle-kilometres
fuel consumption by goods vehicles	fuel consumption by passenger vehicles
number of goods vehicles	number of passenger vehicles

Urban traffic should be excluded from vehicle-kilometres.

32. The Secretariat of the Economic Commission for Europe has, at the request of the Working Party on Transport Statistics of the Inland Transport Committee, undertaken a study of the methods recommended by European governments for the measurement of road traffic. To avoid duplicating this work no study of the problem on a world-wide basis has yet been undertaken.

Section D. Inland Waterways Traffic

33. In the case of inland waterways traffic the general definitions given in Section A require the explanations which follow.

34. Public carriers (7) fall into three classes:

- (a) carriers operating vessels in regularly scheduled services;
- (b) carriers operating vessels which carry goods under contract;
- (c) carriers operating tramp vessels

35. The traffic produced by rafting and the floating of logs should be included in the figures (see 8) for inland waterway traffic.

36. Service traffic includes the ballast of vessels (see 9).

37. Commercial traffic by its definition includes traffic moved in scheduled, contract, tramp and private carriers (see 9).

38. Where part of an inland waterway is the boundary between two countries, the ton-kilometres performed by a vessel moving on that part should, in the absence of an international agreement on the subject, be recorded by the country lying to starboard.

39. Inland waterways of international importance. Where an inland waterway, such as the Rhine, is so situated that its traffic is of great international importance, the part of the inland waterways traffic, proper to the waterway in question, of each riparian country should be listed separately from the total traffic of all waterways of the country.

40. The text of Section A of this chapter and of this section gives rise to definitions of the following statistical series for inland waterway traffic:

freight net ton-kilometres performed  
goods loaded  
goods unloaded

which are the subject of a recommendation suggested in the document to which this paper is an annex.

Section E. Coastwise Shipping

41. It is impossible to examine the total traffic of countries having an extended sea-coast without taking coastwise traffic into account, so it appears to be necessary to complete the study for railways, road transport and inland waterways by an investigation of coastwise traffic. The most convenient way to obtain data on sea-borne traffic is by means of port statistics.

42. Definitions of entrance and clearance of vessels

(a) A vessel will be said to have entered a port with cargo in coastwise trade if it touches at the port to unload goods (including mail) carried in commercial coastwise traffic.

(b) A vessel will be said to have cleared a port with cargo in coastwise trade if it leaves the port after having loaded goods (including mail) carried in commercial coastwise traffic.

(c) A vessel entering without unloading or clearing without having loaded commercial goods (including mail) will be said to have entered or cleared in ballast.

(d) Every entrance or clearance with cargo in coastwise trade should be counted no matter how many ports are touched during a voyage; and, if a ship making an international voyage stops to unload or load goods (including mail) in commercial coastwise traffic, the resulting entrance or clearance should be included in the figures.

(e) Where entrances and clearances with cargo cannot be separated from those in ballast the sums for vessels with cargo and in ballast should be shown and the fact that this is being done should be indicated.

43. Service traffic (see 9) includes the ballast of vessels.

44. For coastwise traffic there is no essential difference between the quantity of goods loaded, the quantity of goods unloaded and the quantity of goods carried in a given period (see 15 and 20).

45. The text of Section A of this chapter and of this section gives rise to definitions of the following statistical series for coastwise traffic:

goods unloaded  
net registered tonnage of vessels entered with  
cargo in coastwise trade  
net registered tonnage of vessels cleared with  
cargo in coastwise trade

which are the subject of a recommendation suggested in the document to which this paper is an annex.

/Section F. International

Section F. International Sea-Borne Traffic

46. The general definitions given in Section A of this chapter require, in the case of international sea-borne traffic, the additions and explanations which follow.

47. Definitions of entrance and clearance of vessels

(a) A vessel will be said to have entered a port with cargo in external trade if it touches at the port to unload goods (including mail) carried in international sea-borne traffic.

(b) A vessel will be said to have cleared a port of a country with cargo in external trade if it leaves the port after having loaded goods (including mail) carried in international sea-borne traffic.

(c) A vessel entering without unloading or clearing without loading commercial goods (including mail) will be said to have entered or cleared in ballast.

(d) When a vessel in foreign trade enters or clears several ports of a country A in succession with cargo without entering or clearing a port of another country B with cargo, only the first entrance and the last clearance at its ports shall be counted by country A.

(e) Where entrances and clearances with cargo cannot be separated from those in ballast the sums for vessels with cargo and in ballast should be shown and the fact that this is being done should be indicated.

48. Service traffic includes the ballast of vessels (see 9).

49. The text of Section A of this chapter and of this section gives rise to definitions of the following statistical series for international sea-borne traffic:

goods loaded  
goods unloaded  
net registered tonnage of vessels entered  
with cargo in external trade  
net registered tonnage of vessels cleared with  
cargo in external trade

which are the subject of a recommendation suggested in the document to which this paper is an annex.

Section G. Civil Aviation

50. The general definitions given in Section A of this chapter require, in the case of civil aviation traffic, the explanations and amendments which follow. Where possible definitions are quoted from "Statistical Summary, Air Transport" No. 2, ICAO, March 1949, referred to below as ICAO,SS. Attention is also called to Annex III to part 1 of this study which was prepared by the International Civil Aviation Organization (ICAO) and in which a programme is outlined for the collection of civil aviation statistics.

51. Definition of kilometres flown. The kilometres flown in a given type of service in a given period is the total distance (55) moved by aircraft operated in that service in the period. The figures should exclude "dead-head" flights constituting non-revenue movement for technical and operational purposes which are not considered commercial traffic.

52. The services of public carriers fall into three classes:

- (a) scheduled services (revenue) which comprise "the operation of:
  - (i) regularly scheduled trips;
  - (ii) any supplementary services occasioned by overflow traffic on regularly scheduled trips;
  - (iii) preparatory flights on new services that have the character of scheduled services;" (ICAO,SS)
- (b) non-scheduled operations, excluding contract operations<sup>1/</sup>;
- (c) contract operations<sup>1/</sup>.

53. It is recommended that as a first step the traffic produced by scheduled services be collected, that non-scheduled services excluding contract services be added as a second step and that contract operations and the operations of carriers which transport their own goods be added as a third step.

54. Definition of the type of traffic to be covered (see 9). ICAO collects statistics for "revenue" traffic whose definition is quoted below from ICAO,SS. It is understood that the definition is intended to exclude that part of the service traffic of the carrier which produces revenue for bookkeeping purposes. Therefore what ICAO calls revenue traffic is in the case of public carriers the same as what is called commercial traffic in paragraph 9.

"Revenue applied to passengers shall mean all passengers for whose transportation remuneration is received (whether at full or reduced rates);

<sup>1/</sup> See Annex III of E/CN.2/53 - E/CN.3/54, p. 24.

<sup>1/</sup> applied

"applied to excess baggage, mail and freight, it shall mean the shipments for which remuneration is received;

"applied to ... kilometres flown, passenger-kilometres and ton-kilometres, it shall mean those for which remuneration is received. Completed stages that are part of a regular commercial schedule are counted as revenue flights for purposes of ... kilometres flown, even if no revenue load or passengers are carried.

"Cargo means all goods carried for remuneration (other than mail) whether on excess baggage tariffs, freight tariffs, express tariffs, or special contract".

55. Distance (amendment to 10). The following quotation from ICAO,SS defines what is meant by "distance" in civil aviation.

"In the calculation of the number of route kilometres, kilometres flown, etc. the number of kilometres on each stage between two scheduled stops shall be taken to be the airport-to-airport distance as determined by the governmental authority having supervision of the airline. In the absence of such official determination, the number of kilometres shall be taken to be the airport-to-airport distance as determined by the airline".

56. The text of Section A of this chapter and of this section gives rise to definitions of the following statistical series for civil aviation:

- cargo ton-kilometres performed
- mail ton-kilometres performed
- passenger-kilometres performed
- cargo loaded
- cargo unloaded
- kilometres flown

which are the subject of a recommendation suggested in the document to which this paper is an annex.



## CHAPTER II. VEHICLE STATISTICS

### Section A. General Definitions

57. Among the series listed in the document to which this is an annex are several on the number and capacity of vehicles. It is the purpose of this chapter to suggest definitions for each of them.
58. The object of collecting such statistics is to obtain a measure of the carrying capacity of a transport system. This capacity depends jointly on the capacity of vehicles and that of fixed installations such as depots, repair facilities, permanent way, etc. The capacity of fixed installations, however, is difficult to measure directly. It is easier to investigate it by asking whether or not it is acting as a brake on the utilization of vehicle stocks. There are various indexes designed to help in answering this question: for instance average turn-around time of vehicles and the number of loaded vehicle kilometres per serviceable vehicle. In paragraph 69 a method is suggested for computing from freight documents the average speed of a ton of goods from consignor to consignee. This would provide a sensitive index of the congestion of facilities.
59. The problem of defining series for vehicle stocks and capacities will now be discussed. As in Chapter I, definitions applicable to more than one form of transport will be suggested first, followed by a discussion for each form of transport.
60. Registration. A vehicle will be said to be registered in a country if it is recorded in the appropriate official register of that country.
61. Ownership. A transport undertaking or a vehicle will be said to be owned in a country if it is the property of a body which is part of the government of that country, or of a company or association incorporated in that country, or of a company or association whose principal office is in that country, or of an individual or a group of individuals whose business is principally in that country. These criteria should be tried in order, and the first criterion for which there is a country such that the criterion applies should govern.
62. Control. A vehicle will be said to be under the control of a country A if it is regularly at the disposal of a transport undertaking owned in country A. Vehicles on short term operational loan or lease to the transport system of another country B are none the less said to be under the control of A.
63. Stored vehicles. Stored vehicles should be omitted from vehicle statistics. A vehicle will be said to be stored if it is removed from operations to be broken

up or to be sold. A vehicle under or awaiting repair, i.e. one that is out of service because it is either actually being repaired or is awaiting its turn for repair under a specific repair programme, is not said to be stored.

64. Carrying capacity. The carrying capacity of a stock of vehicles is the sum of the capacities, as defined below, of the individual vehicles making up the stock.

(a) Passenger vehicles. The carrying capacity of a passenger-carrying vehicle shall be the number of seats or berths with which it is equipped when in the service for which it was primarily designed. If special spaces, other than aisles or corridors, are provided for standing passengers, their capacity should be included.

(b) Goods vehicles. The capacity of a goods vehicle is its rated capacity. Where this is in units other than tons weight, conversion to tons weight should where possible be made by means of the specific gravity of the cargo for which the vehicle was designed or which it may be assumed usually to carry.

(c) Mixed vehicles. In assessing the total capacity of a group of vehicles, the passenger and goods capacity of a mixed vehicle should each contribute to the appropriate total.

65. Power. The power of a stock of vehicles is the sum, over all the vehicles making up the stock, of the power of each vehicle. In international statistics it should where possible be expressed in metric horsepower, that is in units of 75 kilogramme meters per second.

66. Time of vehicle count. The number of vehicles making up a stock and the capacity or power of the stock should, in each country, be measured at the same time of year. Where seasonal fluctuation exceeds 5 per cent its bearing on the figures should be noted to make possible the comparison of figures between countries making the count at different seasons.

67. Analysis of stock by types. In some cases it will be recommended that vehicle statistics be broken down by types of vehicle. Analysis by type can be carried to considerable length but only the main types will be considered here.

68. Analysis of stock by capacity or power. The total range of the capacity or power of the individual vehicles of a stock can be broken down into intervals and the number of vehicles whose capacity or power falls into each interval can be

/shown.

shown. This procedure makes it possible both to estimate the total capacity or power and to see how the total is distributed.

69. The average speed of a ton of goods from consignor to consignee

(a) The quantities described below can usually be obtained from the freight document accompanying the  $i$ th consignment of goods.

Let  $w_i$  = the weight of the consignment in tons,

$d_i$  = the revenue distance through which the consignment was carried,

$t_i$  = the time elapsed between the receipt of the consignment by the carrier and its delivery to the consignee.

Then

$H = \frac{\sum_i (w_i d_i)}{\sum_i w_i}$  is the average length of haul of a ton, and

$S = \frac{\sum_i \left( \frac{w_i d_i}{t_i} \right)}{\sum_i w_i}$  is an average speed of a ton.

(b) The trip of a consignment of goods may be in three stages:

- (i) the period during which the consignment waits in the station of dispatch to be put in a vehicle.
- (ii) the journey to the station of destination,
- (iii) the period of waiting for delivery.

The times taken by stages (i) and (ii) do not depend on the time taken by stage (iii). Therefore a decrease in  $H$  would bring about a decrease of  $S$  even if all other factors were constant. A decrease of  $S$  without a corresponding decrease in  $H$  would, however, indicate congestion of facilities.

## Section B: Railways

70. In this section definitions of figures for the number, capacity and power of railway rolling stock will be suggested. Use will be made of the general definitions given in Section A of this chapter.

71. The vehicles to be included. Those vehicles should be included in the rolling stock statistics of each country which are under the control (see 7) of the railway administrations whose traffic should, according to the definitions of Chapter I, be included in the traffic statistics of that country.

72. Where the coverage of the national traffic statistics is incomplete from the point of view of Chapter I, the vehicle statistics should none the less be as complete as possible and a note should, where feasible, be given showing the fraction of the vehicle stock which is under the control of the administrations for which traffic statistics are available. Then vehicle statistics can be used to obtain a rough estimate of total traffic.

73. Vehicles owned by others than railway administrations. Vehicles owned by others than railway administrations but operated by those administrations are to be included in the stock under the control of the administrations.

74. Number of vehicles. The number of the vehicles included in rolling stock statistics should be shown, irrespective of gauge, under the headings: locomotives, passenger-stock, goods wagons. The definitions of these categories are based upon the definitions quoted below from the introduction to "International Railway Statistics" published annually by the International Union of Railways.

### (a) International Railway Union definitions.

(i) Locomotives. "The term 'locomotive' covers all vehicles furnished either with engines or motor and motive power or with motors only (e.g. electric locomotives) destined exclusively for transporting themselves and hauling other vehicles".

(ii) Railcars. "Railcars are locomotives fitted for the conveyance of passengers or goods".

(iii) Passenger carriages. "Passenger carriages embrace all vehicles used for the conveyance of passengers including railcars constructed for the conveyance of passengers. Passenger carriages or passenger railcars with compartments for baggage, merchandise or mail are also included, as well as special carriages owned by the railway (sleeping cars, saloons or parlour cars, buffet cars, /hospital cars,

hospital cars, etc.)". "In the case of articulated stock, the number of units to be included is not the number of bodies but the number of sets composed of two or more permanently articulated bodies".

(iv) Baggage vans. "All vehicles (not appearing above) and used for the conveyance of baggage, whether used on passenger trains or as service passenger vehicles on goods trains, are included as baggage vans. Postal vans owned by the railway are also included if they have no passenger compartment".

(v) Wagons. Wagons include those for fast and those for ordinary service but exclude railway service wagons. All types are to be included such as: "covered wagons, bolster wagons, open wagons without sides, low-sided open wagons, open wagons with fixed sides fitted with doors not opening to the full height of the sides, high-sided wagons other than those preceding, well wagons, cattle trucks with two or more compartments or floors, tank wagons and wagons fitted with mechanism for the conveyance of special goods".

(b) Definitions for general international use. The following definitions, based on those of the Railway Union, are here recommended for general international use:

(i) Locomotives: as defined by the Railway Union but excluding railcars.

(ii) Passenger stock: passenger carriages plus baggage vans as defined by the Railway Union. This category includes railcars (see (a) (iii) above).

(iii) Wagons: as defined by the Railway Union.

75. Capacity. The total passenger and goods carrying capacity of the vehicles included in vehicle statistics should be shown, except that the capacity of vehicles designed to carry baggage or mail should be excluded. On some railways the goods carrying capacity of a wagon is in direct relation to the number of its axles.

76. Power. The sum of the starting draw-bar pull in metric tons of all the locomotives and railcars included in vehicle statistics should be shown. Where this figure is not directly available for a vehicle, it is suggested that the figure be approximated as  $\frac{1}{4}$  of the total weight on the driving wheels of the vehicle.

/77. The

77. The text of Section A of this chapter and of this section gives rise to definitions of the following statistical series for railway rolling stock:

- number of locomotives
- number of vehicles in the passenger stock
- number of goods wagons
- passenger capacity
- goods capacity
- total starting draw-bar pull

which are the subject of a recommendation suggested in the document to which this paper is an annex.

Section C. Road Transport

78. In this section definitions of figures for the number and capacity of road motor vehicles will be given.

79. The vehicles to be included. To determine which vehicles should be included in vehicle statistics, it is necessary to discuss separately the countries having: (a) annual registration of motor vehicles; (b) registration valid for more than a year including permanent registration.

(a) In case registration is annual it is the vehicles that are registered which should be included in vehicle statistics.

(b) In case registration is at longer intervals than a year:

- (i) the registration or census figures should be shown for years in which a general registration or census of motor vehicles took place;
- (ii) for other years officially estimated figures for the motor vehicles in use should be shown.

80. Where road traffic figures are available, an estimate should be made of the relation of total vehicle stocks recorded to the number of vehicles whose traffic is covered by the traffic statistics.

81. The types of vehicles.

(a) Vehicles to be excluded from statistics: two and three-wheeled bicycles and motorcycles, military vehicles, ambulances, hearses, the service vehicles of governmental agencies, trams, trolley-buses, trailers designed to be drawn by bicycles, motorcycles or private cars.

(b) Private cars: road motor vehicles designed for the conveyance of passengers and seating less than eight persons; taxis included.

(c) Buses: road motor vehicles designed for the conveyance of passengers and seating more than seven persons.

(d) Lorries (trucks): road motor vehicles not designed for the conveyance of passengers and having their own motive power, including tractor and semi-trailer combinations.

(e) Trailers: road vehicles without motive power but designed to be drawn by a bus, lorry or road tractor. Where stocks include more trailers for tractor and semi-trailer combinations than tractors, the excess semi-trailers should be counted as trailers.

82. Number of vehicles. In vehicle statistics the number of motor vehicles should be shown under the heads: private cars, buses, lorries.

83. Capacity of vehicles. The total goods carrying capacity of lorries and trailers and the total passenger-carrying capacity of buses and trailers should be shown in vehicles statistics.

84. The text of Section A of this chapter and of this section gives rise to definitions of the following statistical series for road motor vehicles:

- number of private cars
- number of buses
- number of lorries
- passenger capacity
- goods capacity

which are the subject of a recommendation suggested in the document to which this paper is an annex.



#### Section D. Inland Waterways

85. In this section definitions of figures for the number and capacity of inland waterway vessels will be suggested.

86. The vessels to be included. Vessels should be included in the statistics of a country which are both:

- (a) registered in the country, and
- (b) primarily engaged in carrying inland waterway traffic whether inside or outside the country of registration.

Harbour vessels and rafts should be excluded from the statistics.

87. The types of vessels.

- (a) Dumb barges: goods carrying vessels without installed power designed to be moved by an agency outside the vessel or by sail.
- (b) Self-propelled cargo vessels: goods carrying vessels with installed power, including self-propelled barges.
- (c) Tugs: powered vessels adapted to the moving of barges or rafts but not to the carriage of goods.

88. The number of vessels. The number of vessels should in vessel statistics be shown under the headings: dumb barges, self-propelled cargo vessels, tugs.

89. Capacity and power of vessels. In vessel statistics the total carrying capacity of dumb barges and self-propelled cargo vessels and the total horsepower of self-propelled cargo vessels and tugs should be shown.

90. The text of Section A of this chapter and of this section gives rise to definitions of the following statistical series for inland waterway vessels:

- number of dumb barges
- number of self-propelled cargo vessels
- number of tugs
- goods capacity
- total horsepower

which are the subject of a recommendation suggested in the document to which this paper is an annex.

### Section E. Sea-Going Vessels

91. Because the same vessel may be used both in coastwise and international sea-borne trade, no distinction in the figures for the number and capacity of sea-going vessels will be made between those trades.
92. Methods employed for establishing national statistics for fleets of sea-going merchant vessels vary widely. Most figures are in units of gross registered tons but some are in net registered or dead weight tons. The lower limit of the tonnage of the vessels included in the statistics varies from 5 to 500 tons. For general economic purposes figures showing powered vessels of 100 gross tons or over and analysed according to the use for which the vessel is designed appear to be sufficient. The figure of 100 gross registered tons is chosen because it is the one used in the main summary tables published annually by Lloyd's Register of Shipping, a source often used for international comparisons.
93. The vessels to be included. The statistics of a country should include those vessels which are:

- (a) registered in the country, and
- (b) primarily engaged in carrying sea-borne traffic, and
- (c) moved by mechanical power installed in the vessel (including sailing vessels with auxiliary power) and
- (d) of 100 gross registered tons or over.

Both vessels not designed primarily to carry passengers or cargo and harbour vessels should be excluded from the statistics.

94. The types of vessels.

- (a) Passenger vessels: vessels designed to carry more than 12 passengers<sup>1/</sup>, whether or not they can also carry cargo;
  - (b) Tankers: vessels, other than passenger vessels, designed primarily to carry liquid cargo in bulk;
  - (c) Dry Cargo Vessels: vessels other than passenger vessels and tankers.
95. The number of vessels. The number of vessels should, in vessel statistics, be shown under the headings: passenger vessels, tankers, dry cargo vessels.

<sup>1/</sup> This definition is taken from: International Conference on Safety of Life at Sea, 1948: "Final Act etc." Chapter I, Regulation 2. London, His Majesty's Stationery Office.

96. Capacity of vessels. Vessel statistics should show the passenger carrying capacity of passenger vessels and the total gross registered tonnage of each of the three types of vessels defined in paragraph 94.

97. The text of Section A of this chapter and of this section gives rise to definitions of the following statistical series for sea-going vessels:

Number and gross registered tonnage of:

- (a) passenger vessels
- (b) tankers
- (c) dry cargo vessels

Passenger capacity of passenger vessels which are the subject of a recommendation suggested in the document to which this is an annex.

Section F. Civil Aviation

98. In this section definitions of figures for the number of aircraft used in civil aviation will be suggested.

99. Types of aircraft. The figure should include only power driven aircraft of all types, for instance: aeroplanes, including land planes, sea-planes and amphibians; airships; gyroplanes; and helicopters.

100. Classification of aircraft by ownership.

(a) State aircraft should be excluded from the statistics: they are aircraft used in military, customs and police services.

(b) Aircraft operated by private carriers should be included in the statistics.

(c) Aircraft operated by public carriers, both:

(i) Aircraft operated by carriers which conduct scheduled services, and

(ii) aircraft operated by carriers which do not conduct scheduled services

should be included in the statistics.

101. Classification of aircraft by use

(a) Non-transport aviation. The aviation activities not carried out principally for the carriage of passengers, mail or goods are to be excluded from the statistics. This category includes aircraft used for the training of pilots and aircrew, for experimental or exhibition purposes or for spraying, advertising, photography, etc.

(b) Passenger aircraft. Aircraft designed to carry one or more passengers whether or not cargo and mail can be made part of their payload are to be included in the statistics. A person piloting a plane of a private carrier in order to transport himself from place to place is here considered to be a passenger. Passenger aircraft should be divided into two classes:

(i) Small passenger aircraft: aircraft of 1,000 kilogrammes gross weight or less;

(ii) Large passenger aircraft: aircraft of more than 1,000 kilogrammes gross weight.

(c) Cargo aircraft. Aircraft designed to carry mail or goods but not passengers are to be included in the statistics.

102. The number of aircraft. The number of aircraft registered in a country should be shown in the aircraft statistics of the country classified under the headings: small passenger aircraft, large passenger aircraft, cargo aircraft. Where traffic statistics are available, a statement should be made of the relation of total aircraft stocks recorded to the number of aircraft whose traffic enters into the traffic statistics, using, where possible, the definitions of paragraph 100.

103. The text of Section A of this chapter and of this section gives rise to definitions for the following statistical series for aircraft:

number of small passenger aircraft  
number of large passenger aircraft  
number of cargo aircraft

which are the subject of a recommendation suggested in the document to which this paper is an annex.

### CHAPTER III. OPERATING REVENUE AND EXPENSE

104. Among those listed in the document to which this is an annex are series designed to show the operating revenue and expense of railways and civil aviation undertakings. Such figures are under intensive study by specialized organizations: for railways by the Inland Transport Committee of the Economic Commission for Europe, the International Union of Railways and the Pan American Railway Congress Association; for civil aviation by the International Civil Aviation Organisation and the International Air Transport Association.<sup>1/</sup> This chapter will therefore do nothing more on the subject than make some general suggestions as to how the figures on operating revenue and expense could be defined so as to fit the traffic and vehicle figures for which definitions were suggested in the previous chapters. If the Commissions approve, the suggestions will be drawn to the attention of the specialized organizations.

105. The coverage of figures for operating revenue and expense.

It is suggested that for each form of transport in each country those operations which produce traffic that should, according to the definitions of Chapter I, be included in the traffic statistics should also give rise to the statistics for operating revenue and expense.

106. Whether or not transport undertakings are nationalized, it is common for undertakings primarily engaged in one form of transport to control facilities providing subsidiary services through another form of transport. For instance: railways may control bus, lorry, barge or shipping services; civil aviation enterprises may control bus or lorry services. It is recognized that in such

- 
- 1/ References: 1. Document E/ECE/TRANS/SC.2/22;  
2. International Union of Railways: "International Railway Statistics", published annually;  
3. Pan American Railway Congress Association: "V Congreso Panamericano de Ferrocarriles" volume 4, section D;  
4. International Civil Aviation Organization: "Statistical Reporting Forms";  
5. International Air Transport Association: "Manual of Accounting Procedures".

cases it may be difficult to classify receipts and expenditures by form of transport as suggested in the previous paragraph. In the interest of a division between the forms of transport consistent with that made in the case of traffic, the rule of the previous paragraph should, where possible, be interpreted as follows.

Suppose an organization, O, primarily engaged in providing transport of one form, F, also provides services by another form of transport, G. Operations by O which, according to the definitions of Chapter I, contribute statistically to the traffic figures for G should be excluded in computing the operating revenue and expense for F.

In view of the provisions of paragraph 11, this interpretation provides that only long-distance operations of O by G need be excluded from the figures for the operating revenue and expense for F.

107. The distinction between operating expense and revenue and other expense and revenue. It is suggested that those items of revenue and expense which, in the main, vary directly with the amount of traffic should be classed as operating revenue and expense.

108. Items which occur both as revenue and expense. A much used index of the relation between the expenses and revenues of a transport undertaking is the operating ratio: i.e. the quotient of the operating expense by the operating revenue. The effect of including in operating revenue an item which must then also be included in operating expense is to bring the operating ratio nearer to the number one in value, that is to decrease its sensitiveness. It is therefore suggested that, where possible, such items be excluded both from operating revenue and expense.

109. It is recommended in the document to which this is an annex that the Secretariat bring the contents of this chapter to the attention of the organizations engaged in the study of operating accounts of railways and civil aviation undertakings.

## ANNEX 2

### THE AVAILABILITY OF TRANSPORT STATISTICS

1. The tables which follow show the availability to the Statistical Office of official figures in most of the series discussed in this study for each Member Country of the United Nations except the following countries from which figures have not been received: Afghanistan, the Byelorussian SSR, Haiti, Honduras, Iceland, Liberia, Saudi Arabia, the Ukrainian SSR, the Union of Soviet Socialist Republics and Yemen. Series on civil aviation and merchant fleets have been omitted because the International Civil Aviation Organisation is the primary collecting agency for data about the former and the Statistical Office has, up to the present, used Lloyd's figures for the latter. Where official data in a series are only available to the Statistical Office for a few countries, the series has been omitted from the tabulation.

2. The Statistical Office publishes, for all countries which supply current data, official figures in all the series tabulated except those on coastwise shipping and the operating revenues and expenses of railways. Publication by the Statistical Office is indicated in the tables by an asterisk. In its tabulations the Statistical Office combines railcars, passenger coaches and baggage vans into a single series and does the same for lorries and buses.

3. The symbols appearing in the table have the meanings indicated below.

A annual series available	j includes coastwise shipping
M monthly series available	k significant ports omitted
* published by Stat. Office	l figures for lorries and buses combined
b definition of the series differs widely from definition of Annex 1	n inter-provincial traffic only
c exact definition not available	o carload lots only
d principal lines only	p one company only
e service traffic included	q quarterly figures only
f livestock excluded	r tons carried
g goods in transit omitted	s Syria and Lebanon
h vessels in ballast included	t excluding Ofotbanen
i more than one entrance or clearance per voyage	u including taxis
	v Stat. Office publishes tons carried



# THE AVAILABILITY OF TRANSPORT STATISTICS

Argentina Australia Belgium Bolivia Brazil Burma Canada Chile China Colombia Costa Rica Cuba

For Railways												
1. freight net ton-kms	A*e	M*	M*do	A*	M*def	Ae	M*	M*b	M*e	M*f	Mc	M*d
2. passenger-kms	A*	A	M*d	A*	M*d	A	M*	M*	M*	M*	Mc	M*d
3. goods carried	Ae	M*	M*do	A	M*def	Ae	M*	M*b	Me	Mf	Mc	Md
4. No. of locomotives	A*	A*	A*d	A	A*	A*	A*	A*	MA*	A*	Ac	Ac
5. No. of railcars	A*	A*	A*d	A	A*	A*	A*	A*	MA*	A*	Ac	Ac
6. No. of passenger carriages	A*	A*	A*d	A	A*	A*	A*	A*	MA*	A*	Ac	Ac
7. No. of baggage vans	A*	A*	A*d	A	A*	A*	A*	A*	MA*	A*	Ac	Ac
8. No. of goods wagons	A*	A*	A*d	A	A*	A	M	A	A	A	Ac	Md
9. operating revenues	A	A	Md	A	A	A	M	A	A	A		
10. operating expenses	A	A	Md	A	A	A	M	A	A	A		
For Inland Waterways												
11. freight net ton-kms		M	M			M*p				M		
12. goods loaded		M*	M*			Mp				MA*		
13. goods unloaded		M	M									
For Coastwise Shipping												
14. goods unloaded		An			A			M		A	M	
15. entrances with cargo (NRT)		An			A		Ah	Ah	Ah	A		
16. clearances with cargo (NRT)		An			A			Ah	Ah	A		
For International Sea-borne Shipping												
17. goods loaded		M*	M*		M		M*k	M*g		M*		
18. goods unloaded		M*	M*		M		M*k	M*g		M*		
19. entrances with cargo (NRT)	A*h	M*	M*		Ahi	M*i	Mk	Mh	A*h	M*h	A*hi	A*i
20. clearances with cargo (NRT)		M*	M*		A*hi	M*i	M*k	M*h	AH	Mh	Ahi	A*i
For Road Transport												
21. No. of private cars		A*	A*		A*		A*	A*	A	A*	A*	A*
22. No. of buses		A*1	A*1		A*1		A*	A*	A	A*	A*	A*
23. No. of lorries		A*1	A*1		A*1		A*	A*	A	A*	A*	A*

For explanation of the symbols see the first page of this Annex.

/Czechoslovakia

THE AVAILABILITY OF TRANSPORT STATISTICS (CONT'D)

	Czechoslovakia	Dominican Republic	Ecuador	El Salvador	Egypt	France	Greece	India	Iran
<u>For Railways</u>									
1. freight net ton-kms	M*de	A*	M*de	M*de	M*de	M*de	M*de	M*de	M
2. passenger-kms	M*d	A*	M*d	M*d	M*d	M*d	M*d	M*d	M
3. goods carried	M*de	A*	M*de	M*de	M*de	M*de	M*de	M*de	M
4. No. of locomotives	A*	A*	A*	A*	A*	A*	A*	A*	M
5. No. of railcars	A*	A*	A*	A*	A*	A*	A*	A*	M
6. No. of passenger carriages	A*	A*	A*	A*	A*	A*	A*	A*	M
7. No. of baggage vans	A*	A*	A*	A*	A*	A*	A*	A*	M
8. No. of goods wagons	A*	A*	A*	A*	A*	A*	A*	A*	M
9. operating revenues	A	A	A	A	A	A	A	A	Md
10. operating expenses	A	A	A	A	A	A	A	A	A
<u>For Inland Waterways</u>									
11. freight net ton-kms	A								
12. goods loaded	M*								
13. goods unloaded	M*								
<u>For Coastwise Shipping</u>									
14. goods unloaded									
15. entrances with cargo (NRT)									
16. clearances with cargo (NRT)									
<u>For International Sea-borne Shipping</u>									
17. goods loaded	M*	M	M	M	M	M	M	M	A
18. goods unloaded	M*	M	M	M	M	M	M	M	A
19. entrances with cargo (NRT)	M*hi	M	M	M	M	M	M	M	Ah
20. clearances with cargo (NRT)	A*	M*hi	M	M	M	M	M	M	A*h
<u>For Road Transport</u>									
21. No. of private cars	A*	A*	A*	A*	A*	A*	A*	A*	A*
22. No. of buses	A*	A*	A*	A*	A*	A*	A*	A*	A*
23. No. of lorries	A*	A*	A*	A*	A*	A*	A*	A*	A*

For explanation of the symbols see the first page of this Annex.

/Iraq

# THE AVAILABILITY OF TRANSPORT STATISTICS (CONT'D)

	Iraq	Israel	Lebanon	Luxem- bourg	Mexico	Nether- lands	New Zealand	Nicar- agua	Norway	Pakis- tan	Panama	Para- guay	Peru
<b>For Railways</b>													
1. freight net ton-kms	A*	M* e	M* ds	M* f	M* de	M* fo	M*	A*	M* df	M	A	A	A*e
2. passenger-kms	A*		M* ds	M*	M* d	M*		A*	M* d	M	A	A	A*
3. goods carried	A	Me	Ms	Mf	Mde		M	A	M* dt	M	A	A	Ae
4. No. of locomotives	A*		A*s	A*	A*	A*	A*	A*	A*	A	A*d	A	A*
5. No. of railways	A*		A*s	A*		A*			A*		A*d	A	A*
6. No. of passenger carriages	A*		A*s	A*	A*	A*							
7. No. of baggage vans	A*		A*s	A*	A*	A*	A*	A*	A*	A	A*d	A	A*
8. No. of goods wagons	A*		A*s	A*	A*	A*	A*	A*	A*	A	A*d	A	A*
9. operating revenues	A		Mds	M	Md	A	A	A	M		A	A	A
10. operating expenses	A		As	M	Md	A	A		A		A	A	A
<b>For Inland Waterways</b>													
11. freight net ton-kms						M							
12. goods loaded						M*							
13. goods unloaded						M*							
<b>For Coastwise Shipping</b>													
14. goods unloaded					M		M						
15. entrances with cargo (NRT)					A		M						
16. clearances with cargo (NRT)					A		M						
<b>For International Sea-borne Shipping</b>													
17. goods loaded			M*k		M*	M*	M*						
18. goods unloaded			M*k		M*	M*	M*						
19. entrances with cargo (NRT)	A*	M* h	M* lk		M*	M*	M*	Ac	M*	M*			Mhj
20. clearances with cargo (NRT)	A*		Mhk		M*	M*	M*	Ac	M*	M*			M* hj
<b>For Road Transport</b>													
21. No. of private cars	A*		A*	A	A*	A*	A*		A*		A*		A*
22. No. of buses	A* 1		A*	A	A*	A*	A*		A*		A* lu		A*
23. No. of lorries	A* 1		A*	A	A*	A*	A*		A*		A* 1		A*

1951/52  
1952/53  
1953/54  
1954/55

For explanation of the symbols see the first page of this Annex.

/Philippines

THE AVAILABILITY OF TRANSPORT STATISTICS (CONT'D)

	Philip- pines	Poland	Sweden	Syria	land	key	Thai- Tur-	Union of South Africa	United Kingdom	United States	Uruguay	Venezuela	Yugo- slavia
<u>For Railways</u>													
1. freight net ton-kms	M	M*de	M*d	M*ds	A*	M*df	M*f	M**	M*d	A**	A**		
2. passenger-kms	M	M*d	A*	M*ds	A*	M*d		A*	M*d	A*	A*		
3. Goods carried	M	M*de	A	Ms	M	M*df	M*f	M**	M*d	M**	M**		
4. No. of locomotives	A*	A*	A*	A*S	A*	A*	A*	A*	A*	A*	A*		
5. No. of railcars		A*	A*	A*S	A*	A*	A*	A*	A*	Ad	A*		
6. No. of passenger carriages	A*	A*	A*	A*S	A*	A*	A*	A*	A*	A*	A*		
7. No. of baggage vans		A*	A*	A*S	A*	A*	A*	A*	A*	Ad	A*		
8. No. of goods wagons	A*	A*	A*	A*S	A*	A*	A*	A*	A*	A*	A*		
9. operating revenues		Ad	A	Mds	A	A	A	A	Md	A	A		
10. operating expenses		Ad	A	As	A	A	A	A	Md	A	A		
<u>For Inland Waterways</u>													
11. freight net-kms		A						Mk					
12. goods loaded		A*b						Mk	A*d	Ar			
13. goods unloaded													
<u>For Coastwise Shipping</u>													
14. goods unloaded			A						A				
15. entrances with cargo (NRT)	Mk		A			Ab	A	A		A			
16. clearances with cargo (NRT)	Mk		A					A		A			
<u>For International Sea-borne Shipping</u>													
17. goods loaded		M*	A			Ab			M*		A		
18. goods unloaded		M*	A						M*		A		
19. entrances with cargo (NRT)	M*	M*h	M*		M*	A*b		M*	M*	A*hi	A*	Ah	
20. clearances with cargo (NRT)	M	Mh	M*		M*			M*	M*	Ahi	A*	A*h	
<u>For Road Transport</u>													
21. No. of private cars	A*	A*	A*	A	A*	A*	A*	A*	A*				
22. No. of buses	A*1	A*1	A*	A	A*1u	A*	A*1	A*1	A*				
23. No. of lorries	A*1	A*1	A*	A	A*1	A*	A*	A*1	A*				

For explanation of the symbols see the first page of this Annex.