



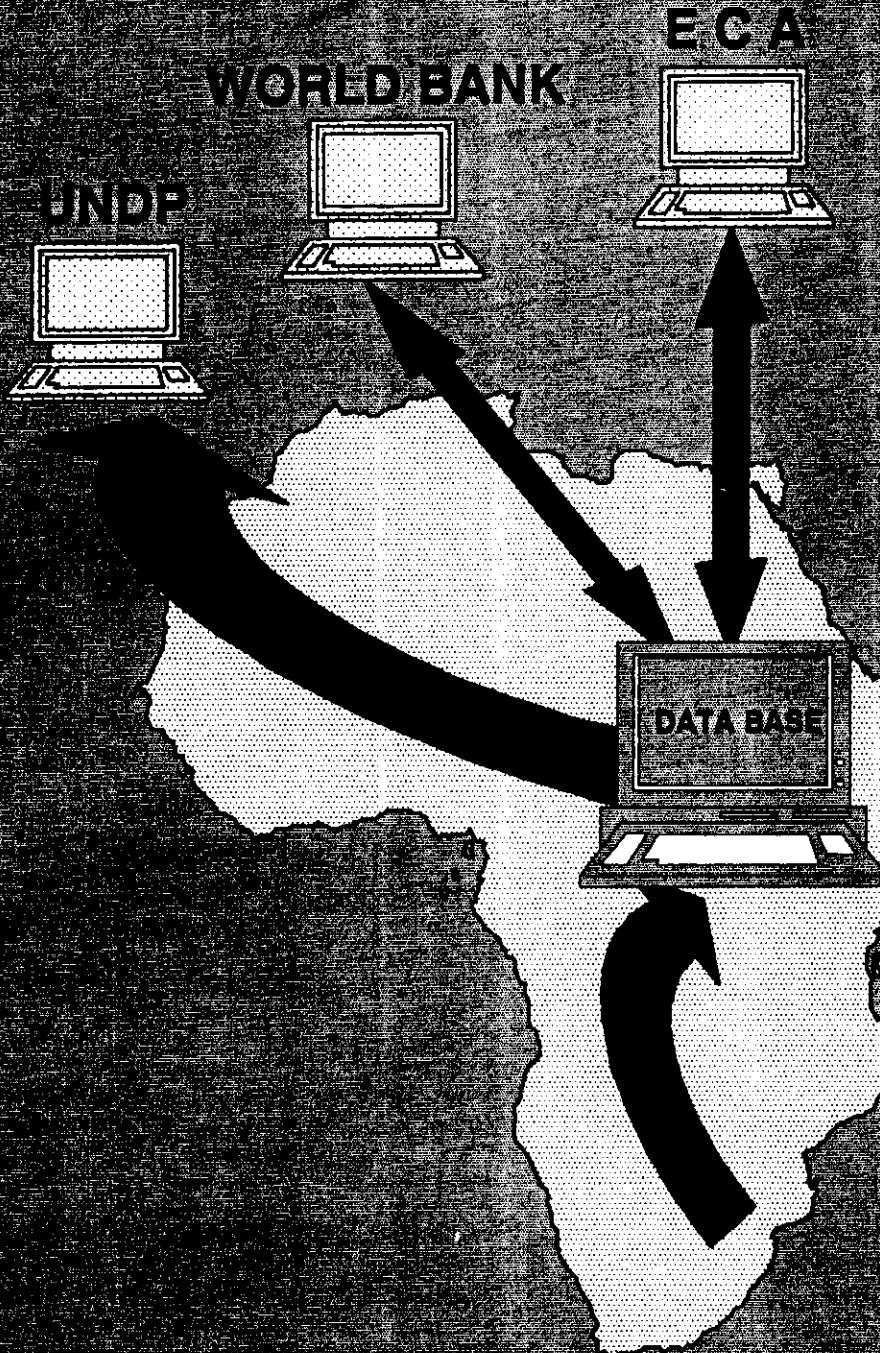
UNITED NATIONS
ECONOMIC COMMISSION
FOR AFRICA

REGIONAL TRANSPORT DATABASE PROJECT - RAF/89/046

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WORLD BANK
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REPORT ON EXISTING PROCESSES AND STRUCTURE, AT ECA
FOR THE COLLECTION, PROCESSING AND DISSEMINATION
OF TRANSPORT DATA.

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REPORT ON EXISTING PROCESSES AND STRUCTURE, AT ECA FOR THE COLLECTION, PROCESSING AND DISSEMINATION OF TRANSPORT DATA

1. EXECUTIVE SUMMARY

A. PURPOSE OF THE STUDY

1.1 In June 1993 a launching seminar was held in Addis Ababa that has dealt with the different aspects of transport data base development project for sub-Saharan Africa as part of the effort to implement one of the key objectives of the Second United Nations Transport and Communications Decade in Africa (UNTACDA II) which has stressed the establishment of regional transport information system.

1.2 Thus, the purpose of this study is to review one of the major aspects dealing with the preliminary stage of the implementation process of the transport database project at ECA. This study focuses on the following key areas, which are necessary for the establishment of transport data base.

- Review of the identified indicators and input data needs.
- Present data collection and dissemination methods in ECA.
- Current DP capabilities and ongoing information system projects at ECA.
- linkages between existing systems with national, subregional, regional and international data bases.

Summary of observations, findings, conclusions and recommendations are presented in this section of the report.

B. OBSERVATIONS AND FINDINGS

(a) Analysis of selected transport indicators and identification of input data needs.

1.3 Most of the indicators of each transport mode are in a higher level of aggregation which is mainly required by policy makers at national level and regional and international users of global data. The identified indicators are also in conformity with the measuring elements of UNTACDA II except in the case of the port and railway sub-sectors, where the transport safety element has not been taken into account. The data needed in the process of compiling the key indicators have been identified which range from the highly detailed data item through increasing aggregation levels to the final stage of derivation

of the indicators.

(b) Existing Data Collection Processing and Dissemination Methods

1.4 The present data collection and dissemination procedures of TCTD, SD and PADIS are reviewed in detail. The existing systems at ECA are also given major emphasis with an assessment of current capabilities to collect, process and disseminate transport data and the present data sources both within and outside ECA.

1.5 Data collection in ECA is undertaken mainly through official publications, regular reports, missions to member states, by sending computer print outs to member states for updating, etc. We were able to observe clearly that the current transport data needs of TCTD have not been satisfied by the existing Regional Statistical database (ECA-RSDB) as the most valuable data are not available in the system.

(c) Current Data Processing Capabilities within ECA

1.6 At present the major computer power of ECA depends on an HP3000 machine of over 15 years of age. Major systems which include Administrative Computing (Payroll preparation, finance and budget, the maintenance of ECA's manning table, mailing address, etc.), multi-sectoral statistical data bases and non-statistical data bases are handled on this machine.

1.7 The massive influx of micro-computers (presently 488 pieces) into the ECA system in late 80's and early 90's is in the process of changing the overall computing environment. Currently 195 PCs or over 40 per cent of the micros are assigned to Administrative and Conference Services Division (ACSD). About 23 Micro Computers are also assigned to TCTD.

1.8 The majority of these micro-computers i.e. over 80 per cent are two basic modules from NCR. About 367 pc's are 386SX machines with 40 MB and 31 are 386 with 100 MB hard disc. The IBM micro's account for 15 per cent of the total. Over 95 per cent of the total i.e. 465 printers are either HP Desk jet (68 per cent) and HP Laser Jets (27 per cent). Backed by four servers, the micro's are currently being linked through Local Area Network (LAN).

1.9 Regarding the software, the HP3000 machine is equipped with IMAGE 3000 - a proprietary data base system, MINISIS - a bibliographical data base system developed by International Development Research Centre of Canada (IDRC), Cobol, Fortran, RPG II and SPL compilers, TDP - for word processing; Tape handling software; INSIGHT for Application developing and ISEA for econometric analysis. The micro's are loaded with MS-Dos, Word Perfect 5.1, Quattro Pro 2.0 and Paradox 3.5.

1.10 Apart from the administrative computing, SD and PADIS maintain two data bases on HP3000. The multi-sectoral statistical data base of regional statistics maintained by SD contains well over 160,000 time-series data items. The module on Transport, tourism and Communication has 21 data items on railways, roads, motor vehicles, seaborne shipping and air traffic.

1.11 PADIS maintains four major non-statistical data bases on HP3000. These include PADdev (a bibliography reference data base), PADcom (reference on ECA documents and participating centres), PADexp (referral database on African experts) and PADins (a referral data base on African development institutions.)

1.12 The overall Technical Support, systems development, programming, maintenance of LAN, Communications, training, etc. are undertaken by 6 analysts/programmers in ISS. Presently the experts are mostly occupied with training of ECA staff, developing and supporting LAN and undertaking various assignments of the ACSD.

(d) On-going Information Systems Projects at ECA

1.13 The Integrated Management Information Systems project (IMIS) which is currently undertaken in UN Headquarters, is aimed at networking organization-wide UN Administration. This system will run on UNIX based computer. Additional facilities of the system include Wide Area Net-work (WAN) within ECA, telecommunication connection to UN Headquarters and access to world-wide UN network. Though IMIS is designed for Administrative Computing the networking that will be established through the process could be of great significance for the implementation of Transport database programme.

1.14 The second and most important project undertaken in ECA is by PADIS. The project aims at promoting the development information management systems throughout Africa. Currently PADIS is undertaking a number of programmes and projects which can support the Transport database project. These include:

- (a) the on-going PADIS networking programme which consists of over 34 national, 43 institutional and 4 sub-regional participating centres;
- (b) the Capacity Building for Electronic Communication project (CABECA), which is currently undertaken by PADIS has the main objective of providing technical assistance to bring about sustainable electronic networking in Africa whereby members of the network will exchange data and information electronically world-wide at a fraction of the cost of fax or telex;
- (c) other projects undertaken by PADIS include,

- the promotion of standardization and compatibility of information systems in Africa;
- promotion of the use of MINIS Resource in Africa;
- the study on the effectiveness of National Information Instruments implemented in the sub-Saharan Africa.

1.15 If exploited properly the PADIS programmes and projects can be used as one of the starting points for transport data transmission between member countries, subregions, regional and international organizations.

1.16 The third major on-going project that will have great impact on the transport data base is United Nations Telecommunications network. This project is aimed at providing more efficient and low cost telecommunication service between UN Headquarters and all specialized agencies within the UN System. Among the different activities undertaken by this project is the plan to install the necessary facility in New York, Geneva, Vienna, Paris, Rome, Santiago, Addis Ababa, Nairobi and Bangkok, which is aimed at improving the inter-agency data communication and a message handling system (E-mail) between UN Headquarters and specialized agencies. Thus, this telecommunications programme will drastically improve ECA's capacity to collect/disseminate data and information from/to UN Specialized Agencies and the Headquarters.

1.17 The fourth project that affects the Transport Data Base Project is the on-going programme undertaken by UN headquarters on Economic and social informations system (UNESIS). The major objective of UNESIS is to establish connectivity and interfaces between data base resources within the UN System.

(e) Linkages Between Existing Systems with National, Sub regional, Regional and Intrnational Data Bases

1.18 Unfortunately, except for the effort undertaken by PADIS and limited access to UN Headquarters and Geneva by statistics division, the information systems linkage has not yet developed on the expected scale.

1.19 At present HP3000 is connected to the IBM main frame at UN Headquarters for two hours a day and has allowed limited number of users to have direct access to headquarters data. The second linkage is that of PADIS network which has electronic connectivity with 34 African States and this number is increasing every week.

C. CONCLUSIONS and RECOMMENATIONS

1.20 We were able to observe that the future organizational direction of computer service in ECA is dictated by five major developments. These are:

- the on-going IMIS and UNESIS projects and their impact on the future use of the HP3000 machine;
- the telecommunications improvement project undertaken by UN Headquarters and its impact on the capability and cost reduction for data transmission;
- the office automation programme and the intensive user awareness and capability building training programmes in ECA;
- the on-going programme of local area networking; and
- the various projects and programmes undertaken in PADIS.

1.21 Based on the developments outlined above and after having undertaken the necessary analysis the following options have been forwarded for further analysis and consideration.

(a) Hardware organization

A fully distributed hardware structure where micro-computers of suitable size and architecture are assigned to each expert and support service personnel, and printers are shared among group of users. TCTD will have its own database server and shall also be linked to the rest of ECA-LAN.

(b) Organization of systems development and maintenance

Three options which include: the establishment of a full fledged data processing unit; ISS providing the necessary service; mixture of the two options were thoroughly analysed in terms of advantages and disadvantages.

Subject to further analysis during part II of the study, we consider the last option with the following features to be the optimal solution.

- The standardization of hardware, systems software, data base management system, internal and external connections including the administration of WAN, communications network and the overall activities related to linkage within and outside ECA shall be under the responsibility of ISS.

- TCTD shall build within itself a capability to undertake sector specific systems development and maintenance, transport data base administration, administration of TCTDs LAN and the provision of all the necessary technical support to users within the division.

(c) Organization of Transport data base development and administration.

Two options which include:

- the Statistics Division undertaking the maintenance and administration of Transport database and PADIS maintaining the non-statistical data base; and
- building the capability within TCTD for development and maintenance of the transport data base were analysed.

Option two with the following features shall be analysed further during Part II of the study.

- TCTD shall build the necessary capacity for development, administration and maintenance of the Transport data base
- Statistics division shall have access to the data to fulfil its mandate.

1.22 Regarding data collection methods and the analysis of selected indicators the following were recommended.

- Upgrading of data collection methods is required in ECA, member nations, sub-regions and regions in order to assure the availability of adequate transport statistics.
- The inclusion of transport safety data and indicators is recommended for railway and ports sub-sectors in order to fulfil the requirements of UNTACDA II.
- Basic indicators like GNP or GNP per capita are to be considered together with the population and area data, which would give the transport data base an international significance by enabling national, sub-regional and regional comparisons. They can also be used for the computation of some UNTACDA II evaluation indicators. Data on GNP and GNP per capita are readily available in the socio-economic module of ECA-RSDP.

2. INTRODUCTION

A. BRIEF BACKGROUND OF THE REGIONAL TRANSPORT DATA BASE PROJECT

1. The United Nations General Assembly in its meeting on December, 1988 proclaimed the Second United Nations Transport and Communications Decade Programme in Africa (UNTACDA II) for the period 1991-2000. The basic aim of the programme is to focus both African and international attention towards the development of integrated and efficient transport network so as to achieve success in production and socio-economic growth in Africa.
2. One of the key objectives of UNTACDA II programme is the establishment of transport information system so as to effectively monitor the impact of UNTACDA II programme implementation on the socio-economic development of African States.
3. Consequently, a transport data base project (RAF/89/046) with a financial assistance from United Nations Development Programme (UNDP) was launched by Economic Commission for Africa (ECA), which is responsible for the implementation and monitoring of UNTACDA II and, the World Bank, as part of the sub-Saharan African Transport Policy Project (SSATP). The role of ECA in the implementation of UNCTACD II including organizational structure, key responsibilities and detailed activities to be undertaken by Transport, Communications and Tourism Division are presented in detail in Annex 2.
4. A Steering Committee consisting of ECA, United Nations Development Programme (UNDP) and the World Bank, which was set-up to monitor the project, in its first meeting decided to undertake the project in two phases.
5. The first phase of the project, which is managed by the World Bank, would identify, a set of core data necessary for monitoring and operating the transport sector, reasons why transport data are not properly collected at the national and subregional levels, make recommendations on the set of data to be collected, the best ways to collect and disseminate the data, and on the policy reforms necessary to improve national database systems. Additionally, the necessary ground work for the establishment of regional transport data base in ECA shall be worked out during this phase. The final outcome of the phase one study is expected to produce statistical manuals for each mode of transport. The second phase would focus on the implementation of transport data base systems at national, subregional and regional levels.
6. The first phase of the project was started by launching a comprehensive study on the existing transport data base systems at national level with the objectives of identifying key problems and preparing a plan of action. The study was undertaken in 1991 by two consultants, Dr. John Heads and Dr. K.W. Studnicki-Gizbert.

7. The recommendations forwarded by the consultants were reviewed by the Project's Steering Committee during its second meeting which took place in Abidjan in February 1992. The committee agreed to continue phase I of the project for a transitional period of 18 months in order to undertake the following activities:

- (a) design transport data collection systems in pilot countries, in subregional organizations and at ECA, including agreements on the data to be collected, the process of country reporting, subregional reporting and data editing and analysis;
- (b) harmonize norms and design transport data manuals for key transport modes and investigate ways to develop methodology i.e. to fill major data gaps; and
- (c) prepare project document for phase II.

B. PRESENT STATUS OF THE PROJECT^{1/}

8. The progress made so far in implementing the first phase of the project and the key achievements in the various transport sectors are outlined in the following lines.

Road and Road Transport

9. Based on the documentation provided by Burkina Faso, Burundi, Senegal, Uganda, the World Bank and International Road Federation, a draft statistical manual comprising both road and road transport data has been prepared. The draft includes the key performance indicators and recommends the best ways to compute them. The draft is expected to be reviewed by the members of the network, the road transport working group of UNCTACDA II and discussed at a special meeting of the members of the working group before being finalized.

Railways

10. The key performance indicators selected during the launching seminar have been approved by the representatives of the African Railways during the last General Assembly of the Union of African Railways (UAR), held in Arusha (Tanzania) in October 1993. It is proposed to recruit a consultant that will prepare a statistical manual for railways and prepare the first statistical data book for the African Railways.

^{1/}Based on project status report dated January 1994 prepared by the team leader of the project

Ports and Shipping

11. The key performance indicators for ports have been discussed and approved during the launching workshop. In this respect it is expected that the list shall undergo amendment and updating by Senegal and Mozambique. On the other hand a comprehensive project on maritime access to Western and Central African countries is being undertaken by MINCONMAR and the World Bank. The project will finance "Transport Laboratories" which will monitor the efficiency of maritime access in the sub-region. Thus based on the outcome of activities outlined above a statistical manual on ports and shipping shall be produced.

Air Transport

12. It was agreed during the launching seminar that the representative of ICAO would prepare and submit air transport indicators to members of the network including the Project Unit. Accordingly, the Project Unit has recently received from ICAO list of performance indicators that are considered as universally accepted performance measures for Air Transport subsector. It seems that a lot of work remains to be done in the area of identifying the data required for working out the indicators.

Urban Transport

13. So far a proposal on urban transport has been received only from Burkina Fasso. Based on these data and on going experience in other pilot countries (Burundi, Senegal) the Project Unit shall propose list of performance indicators.

C. PURPOSE OF THIS STUDY

14. The present study deals with the following key aspects, which are necessary for the establishment of transport data base at ECA.

- (a) Review of the existing process and structures related to transport data collection within ECA;
- (b) Systems analysis to determine the computer resources (manpower, hardware, software, etc.) needed for the development, administration and maintenance of the proposed transport data base.
- (c) Study the existing information systems including computing capacity at ECA in order to ensure harmonization of data exchange, linkages/integration etc. of the transport data base with the existing ECA systems.

- (d) In light of the above, and with full collaboration of Transport, Communication and Tourism Division (TCTD), Information System Section (ISS), Pan-African Development Information System (PADIS) and Statistical Division (SD) prepare specifications for additional computing resources including software design specifications required for the transport data base.
- (e) Prepare recommendations for the appropriate infrastructure necessary for the development, administration and maintenance of the proposed data base, as well as operational arrangements for its linkage with ECA's multi-sectoral statistical data base and other interested units within ECA.

15. For operational convenience the overall study was split into two parts. The first part deals mainly with:

- detail analysis of existing data collection and dissemination of information systems and methods in ECA;
- current capabilities of the existing systems which include items such as hardware, software, data base management system, manpower, expenses, on-going information system projects and linkages between existing systems to national, subregional, regional and international transport data bases;
- analysis of indicators selected by the project launching seminar;
- identification of data needs regarding the selected indicators to evaluate UNTACDA II progress;
- identification of transport data users within ECA, and at subregional and regional levels;
- collection of information regarding how existing data collection system works within ECA;
- preparation of realistic organizational options required to implement regional transport data base.

16. The second part of the assignment, according to the option to be chosen by ECA, shall focus on:

- transport data flow and supporting specifications;

- suitable organization of data collection and transmission (organization at national level and transmission to ECA);
 - determination of computing resources (manpower, hardware, software) needed for the development, administration and maintenance of the chosen transport data base;
 - linkage between existing systems and the chosen transport data base;
 - role and needs of regional transport data base in the phase II of the project, regarding the necessary efforts to improve, harmonize and disseminate transport data produced by member countries, subregional and Inter-Governmental Organizations (IGO);
 - final recommendations for an appropriate infrastructure for the development, administration and maintenance of the selected data base.
17. As the result, ECA issued two terms of reference for the first part of the study. These terms of references are shown in Annex 1.

D. APPROACH AND METHODOLOGY

18. The study has been carried out by a two person team consisting of W.M Gebre Mariam - System Analysis Specialist and Mohammed Jemal - Transport Statistician. The method used in this study was:

- to undertake an extensive desk study of relevant documents and information available in ECA.
- to conduct interviews with key personnel in various Divisions of ECA.

19. The work started with series of discussions with key personnel associated with multi-sectoral transport functions in TCTD, multi-sectoral statistical functions in SD, ECA's information system development function in ISS and ECA's development information system function in PADIS. The discussion focussed mainly on the existing data collection processing and dissemination methods in ECA and associated problems. In this respect the consultants are truly grateful to those individuals listed in Annex 3 for the time they have made available to us, often without notice, and for their cooperation and insights during our interview. In particular the consultants want to acknowledge the invaluable help provided by Mr. Paul T.A. Were, EAO Multi modal Transport, Mr. Sekou Maiga, Transport Data Base Project team leader, Mr. A.M. Farazi, Chief, Statistical Database, Mr. K.T. Mavuba, Computer Operation Officer - ISS and Mrs. Nancy J. Hafkin, Officer-in-Charge of PADIS.

20. We have also undertaken extensive desk study of documents in ECA which have relevance to our assignment. The documents which were used as the main source of data and information are listed in Annex 3.

E. THE REPORT

21. The report has the following eight parts:

- Executive summary in chapter one
- Introduction in chapter two
- The analysis of the identified transport indicators and identification of input data needs in chapter three
- The existing data collection, processing and dissemination systems and methods in chapter four
- Current information systems resources and facilities within ECA in chapter five
- Linkages between existing systems with national, subregional, regional and international data bases in chapter seven
- Conclusions and recommendations which outlines among other things, the various options available for the overall structuring of transport data base in chapter 8.

3. ANALYSIS OF THE SELECTED TRANSPORT INDICATORS AND IDENTIFICATION OF INPUT DATA NEEDS

22. This Chapter deals mainly with the analysis of the key transport indicators selected during the project launching seminar and the identification of the corresponding input data needs. The major transport data users within ECA, Sub-regional and Regional levels are also identified. Finally, the performance indicators required for the evaluation of UNTACDA II progress are analyzed in relation to the selected indicators.

A. EVALUATION OF TRANSPORT INDICATORS SELECTED BY THE PROJECT LAUNCHING SEMINAR

A.1 GENERAL

23. The need for transport indicators arises from the ever-increasing demand for data in a more aggregated level in order to plan and monitor the development of transport system of the various regions and sub-regions. Different users of transport data require various degrees of aggregation depending on their areas of operation and activities.

24. Four user groups have already been identified by the previous studies that were conducted in relation to the development of transport statistics in sub-Saharan Africa, namely: operational management group, sector or sub-sector management group, national and international authorities. Each group has its own interest on the aggregation levels of transport statistics which varies from the detailed operational data to the more comprehensive global indicators.

25. Transport indicators of various aggregation levels could enable the measuring of the efficiency and productivity of the different transport modes which could not be possible through data that are available in a crude form. Based on these facts and the goals and targets set forth by UNTACDA II, key statistical indicators have been developed, for the transport sector of sub-Saharan Africa.

26. Following the successive studies made on the development of a regional transport data base for sub-Saharan Africa, key statistical indicators have been selected for the various modes of transport during the project launching seminar held on June 1993. According to the final report of this seminar the performance indicators for road, road transport, railway and ports sub-sectors were selected while that of the other transport sub-sectors have not been finalized during that time.

27. Though performance indicators for air transport subsector have not been identified at the project launching seminar, it was agreed that the representative of ICAO, at the meeting, would consult his organization and prepare the indicators and the corresponding

data definitions required for computational purposes. These set of indicators were then expected to be transmitted to the members of the network, which include the pilot countries, subregional organizations, specialized agencies, the World Bank and ECA.

28. Accordingly, the following performance indicators have been sent by ICAO, which can be considered as universally accepted measurements of air transport subsector. However, the necessary data definitions for the performance indicators have not been compiled yet.

Airline Performance Indicators

- ✓ Passenger Load Factor
- ✓ Weight Load Factor
- ✓ Aircraft Utilization (hours flown per aircraft)
- ✓ Tonne-Kilometres Performed (TKP) per employee
- ✓ TKP per Flight Crew Member
- ✓ Block Hours per Crew Member
- ✓ Number of Passengers Carried per Crew Member
- ✓ Yields in US cents per TKP
- ✓ Operating Cost in US Cents per Tonne-Kilometre Available
- ✓ Expenditure per Passenger
- ✓ Income per Passenger
- ✓ Average Stage Length

Airport Performance Indicators

- ✓ Income per Passenger
- ✓ Expenditure per Passenger
- ✓ Trading Profit (operating revenue less operating expenditure) per Passenger

- ✓ Aeronautical Income per Passenger
- ✓ Non-Aeronautical Income per Passenger
- ✓ Passengers per Employee
- ✓ Income per Employee
- ✓ Value-added per Employee
- ✓ Capital Expenditure per Passenger
- ✓ Net Assets per Employee

29. Further refinement is required in the preparation of air transport indicators in the latter stages of the project, as they were not at all considered at the previous meeting. These indicators can, therefore, be incorporated in the transport data base along the same line with railways and ports subsectors, following the data/indicator flow pattern agreed upon during the pilot stages.

30. As the evaluation of the selected indicators item by item is beyond the scope of the study, just a review is made mainly stressing the goals and targets of UNTACDA II and the various groups of transport data users. In other words, the evaluation of the selected indicators is made based on the coverage of the indicators from the point of view of the different transport data user groups and the goals and targets of UNTACDA II.

31. The degrees of aggregation considered in this analysis are identified as lower, medium and higher levels which represent the operational management group, sector or sub-sector management group and national/international authorities, respectively. As shown in Tables 3.1, 3.2 and 3.3 each indicator is classified in any one of the three user groups where it is assumed to be more appropriate.

A.2 ROAD AND ROAD TRANSPORT SUB-SECTORS

32. The selected indicators for this mode entirely fulfil the measuring elements of UNTACDA II which were mentioned earlier. Regarding the level of aggregation with respect to the various transport data user groups, most of the indicators have fallen within the range of medium and higher levels that satisfy the interests of sectoral and sub-sectoral management groups and national and international authorities, respectively. Detailed classification of the indicators by the various aggregation levels is shown in Table 3.1.

Table 3.1 Identified key indicators in various levels of aggregation.

Sub-Sector	Key indicators	Level of aggregation
<u>1. Road Sub-sector</u>	Proportion of good, fair, poor for the classified network (%)	2
	Length of road network and length classified network (km)	2
	Spatial road density (km/km ²)	1
	Per capita length (km per cap)	1
	Ratio road budget/total national investment budget (%)	1
	Road expenditure per capita (\$ per capita)	1
	Road expenditure/length of classified network (\$ per km)	1
	Construction cost (amount per km)	3
	Rehabilitation cost (amount per km)	3
	Periodic maintenance cost (amount per km)	3
	Routine maintenance cost (amount per km)	3
	Construction cost/total budget (%)	2
	Rehabilitation cost/total budget (%)	2
	Periodic maintenance cost/total budget (%)	2
	Routine maintenance cost/total budget (%)	2
	Personnel expenditure/total budget (%)	1
	Construction and maintenance expenditure/total budget (%)	1
	Actual/required for the four categories and total expenditure (%)	1
	Total amount of contracting cost (US\$)	1

Table 3.1 (continued)

Sub-Sector	Key indicators	Level of aggregation
<u>Road</u> <u>Subsector</u>	Total amount of sub-contracting cost (US\$)	2
	Contracting/force account + contracting (%)	1
	Donors contribution/total for construction maintenance and rehabilitation (%)	1
	Road general sufficiency (%)	1
	Road user sufficiency (%)	1
	Fuel taxes /fuel prices (US\$/l)	1
	Total number of employees	3
	Number of professional and technicians	3
	Number of workers	3
	Number of worker per length of road maintained (number/km)	1
	Professionals and technicians/total employees (%)	3
	Number of equipment by category	1
	Availability per category (%)	1
	Equipment rented by highway authority from highway authority (cost and percentage)	2
	Average age of equipment items (years or months)	

Table 3.1 (continued)

Sub-Sector	Key indicators	Level of aggregation
2. Road transport sub-sector	International freight traffic (tons and ton km)	1
	National freight traffic (tons and tkm)	1
	Proportion of owner operators of the total fleet (%)	1
	Proportion of companies of the total fleet (%)	1
	Proportion of own account of the total fleet (%)	1
	Proportion of parastatals of the total fleet (%)	1
	Vehicle loading capacity by classes of vehicles (number and ton).	2
	Vehicle in use by classes of vehicle (number and ton).	2
	Fleet age by type (years).	1
	Load factor (%)	1
	Percentage of spare parts in operating costs by classes of vehicle (%)	1
	Current road transport prices or tariff for major routes, in particular for international road (monetary unit per ton km)	1
	Transport delay for major international roads (hrs or days)	2
	Road transport user charges (monetary unit)	1
	Budget allocation for road transport sub-sector (percentage of total budget)	1
	Freedom in access to the profession (Y/N)	1
	Agreement and facilitation procedure of transit with neighbour countries (Y/N)	1
	Number of road transport controls on main road	
	Freedom on tariff fixation (Y/N)	
3. Road Safety	Existence of national road safety coordinator committee (Y/N)	1
	Effective national accident data collection system operating (Y/N)	1
	Effective accident reduction programs being implemented (Y/N)	1
	Existence of technical control centers (Y/N)	1
	Number of deaths per 10,000 vehicles on road	1
	Number of deaths per 100,000 inhabitants	
	Number of driving school	
	Existence of training center for drivers of truck (Y/N)	

1 = Higher 2 = Medium 3 = Lower

A.3 RAILWAY SUB-SECTOR

33. Most of the indicators in this sub-sector are at the higher aggregation level that are designed mainly to serve the purposes of national and international authorities. Some also satisfy the interests of medium level user groups, namely, the sectoral and sub-sectoral management groups that need indicators in a less aggregation level than the former.
34. The selected indicators for this sub-sector have as well taken into account the various measuring elements of UNTACDA II, except the one element that deals with road safety. The classification of the selected indicators in terms of the various levels of aggregation is shown in Table 3.2.

Table 3.2
Identified key indicators in various levels of aggregation

Subsector	Key indicators	Level of aggregation
Railway	Traffic units per km of railway route (TU/km)	1
	Average gross trailing load of freight trains (tons)	1
	Passenger train occupancy ratio (%).	1
	-----	-----
	Passenger revenue as total of revenue (%)	1
	Freight revenue per ton km (US\$)	1
	Passenger revenue per seat km (US\$)	1
	Revenue per passenger km (US\$)	1
	Working ration (%)	1
	Operating ratio (%)	1
	Operating income (%)	1
	Net income (US\$)	1
	Return on Asset (%)	1
	-----	-----
	Locomotive availability (%)	1
	Locomotive reliability-km between failure (KM)	1
	Locomotive utilization factor (km/day)	1
	Annual kilometrage per available locomotive (km)	2
	Locomotive total output utilization factor (tkm/loc x hrs)	1
	Locomotive productivity (TU/loc x hrs)	1
	Wagon availability (%)	1
	Wagon turnaround-number of days between two successive loadings (days)	2
	Annual kilometrage per available wagons (km)	2
	Average wagon load (tons)	2
	Empty back haul factor (%)	1
	Wagon productivity indicator (tkm/total capacity of the fleet)	1
	Coach availability (%)	1
	Annual kilometrage per available coach (km)	2
	-----	-----
	Traffic units per staff number	1
	-----	-----

1 = Higher

2 = Medium

3 = Lower

A.4 PORTS SUB-SECTOR

35. In the case of ports sub-sector the measuring elements of UNTACDA II considered are the same as the other sub-sectors except that the equipment and labour productivity measuring elements were not treated separately. The selection of the indicators is made in conformity with the different measuring elements of UNTACDA II. However, transport safety is not taken into account which is one of the major elements of measurement.

36. As in the case of the other transport modes the indicators selected for this sub-sector are at macro level, mainly those that measure productivity and cost efficiency. The detailed classification of the selected indicators is shown in Table 3.3 by different levels of aggregation.

Table 3.3 Identified key indicators in various levels of aggregation

Subsector	Key indicators for Ports sub-sector	Level of aggregation
Ports	Number of vessels by type	1
	Total outbound traffic (tons)	3
	Of which transit (tons)	3
	Trans-shipment traffic (tons)	3
	Transit traffic (tons)	3
	Container traffic - Domestic + Transit + Transhipped (TEUs).	3
	<hr/>	
	Working ratio (%)	1
	Operating ratio (%)	1
	Net income (US\$)	1
	Return on Asset (%)	1
	<hr/>	
	Gross berth occupancy by type of berth (%)	1
	Average waiting time in berth before and after berthing (hrs).	3
	Average time at berth (Hours or days)	3
	Average tons loaded/unloaded per ship in berth per day (Tons/ship/day)	3
	Handling performance per working hour (tons/gang/hour)	1
	Tonnage handled per linear meter of quay (tons/meter)	1
	Average daily handling performance by berth for containers (TEUs per ship in berth)	1
	Degree containerization (%)	1
	Average dwelt times for containers (days).	

1 = Higher

2 = Medium

3 = Lower

B. PERFORMANCE INDICATORS REQUIRED FOR THE EVALUATION OF UNTACDA II

37. In the evaluation made towards the end of UNTACDA I, the lack of measurable transport indicators and basic information have been considered as some of the major problems that had hampered the implementation of the programme. For a programme of this kind, which is set with multiple objectives directed towards the development of various transport modes, the establishment of measurable performance indicators would have been of a paramount importance satisfying basic elements required for monitoring the implementation of different policies, plans and programmes at regional and subregional levels.

38. In view of the above facts, ECA with the assistance of the project unit has defined certain performance indicators that are relevant for the evaluation of UNTACDA II, based on the goals and targets established during the preparatory phase of the programme. These indicators could enable to assess the contribution of the decade programme in the development process of transport and communications through continuous evaluation of the achievements and performances during the three phases.

39. As it plays the leading role in the implementation process of UNTACDA II, through policy making, planning and monitoring of the programme, most of these performance indicators basically reflect the requirements of ECA. The indicators are thus highly aggregated, which are mainly required for planning and macro-economic analyses. The performance indicators at regional and sub-regional levels developed by ECA, for the evaluation of UNTACDA II are presented in detail in Annex 5.

40. In this section of the report the performance indicators for the evaluation of UNTACDA II progress are analyzed in relation to the key transport indicators that are selected during the project launching seminar. The indicators developed for the evaluation of UNTACDA II are partly selected, especially those whose basic data needs are available at country level. Some can also be easily computed from the basic data identified for the selected key transport indicators. The performance indicators required for the evaluation of UNTACDA II, that are outside the range of key transport indicators at country level (selected during launching seminar) are shown in tables 3.4 and 3.5.

41. Among these indicators for UNTACDA II evaluation, some can be computed using the basic data identified for the national level indicators only by changing units of measurement. For instance, the value for the following indicators can be determined just by changing the general information on the total surface area of a country from square kilometer (km₂) to hectare (ha).

- Number of vehicles per 1000 ha.
- Number of death per 100,000 ha.
- Length classified road network per 1000 ha.

42. Basic indicator like GNP is also required to determine the values of transport indicators such as:

- number of vehicles per millions \$GNP;
- length classified road network per millions \$GNP;
- length of railway per million \$GNP.

Therefore, if this basic indicator is identified for each country as one of the general information, these valuable indicators of high regional and sub-regional significance can easily be developed. The possible sources of this general information can be the publications of some international institutions, such as The World Bank. The GNP per capita of each African country is for example, among the basic indicators that are readily available in the "World Development Report" which is published annually for The World Bank (Oxford University Press). Similar data is also available in the socio-economic module of the ECA-RSDB.

43. There are also some indicators that can be computed from the basic data already identified for the country level. These include:

- number of vehicles per paved roads km;
- ratio: fuel taxes/fuel price;
- total railways transport/total all transport modes;
- total tons loaded in African ports;
- total tons unloaded in African ports;
- total containers handled by African ports.

44. The performance indicators, for the evaluation of UNTACDA II, other than these can neither be developed from the identified basic data for country level indicators nor are readily available from other data sources of ECA. Therefore, special emphasis should be given during subsequent activities of the project to incorporate these valuable indicators required by ECA, sub-regions and regions so that the information needed to evaluate the progress of UNTACDA II can be entirely covered.

Table 3.4 ROAD AND ROAD TRANSPORT PERFORMANCE INDICATORS FOR THE EVALUATION OF UNTACDA II THAT ARE NOT SELECTED DURING THE PROJECT LAUNCHING SEMINAR.

It No	Goals and targets of UNTACDA II	Indicators	Unit	Comments
	I. ROAD TRANSPORT SUBSECTOR			
1.	Improvement of international traffic facilitation through, inter-alia ratification and implementation of effective international transport commercial interests.	- Number of subregion which established subregional service agreements based on facilitation and competitiveness - Number of countries in each subregion which ratified and implement this service agreements	NO	Needs survey
2.	Development in the majority of countries of efficient axle-load control.No	- Number of countries whose efficient mechanism for axle-load control	NO	
	Indicators for planning and economic analyses not foreseen by program of UNTACDA II			
3.	Importance of road industry	- Vehicle registration in year - Number of vehicles per 1000 ha - Number of vehicles per paved roads km	NO No/ha NO/km	- Need Survey - Input Data Available from Basic Data that are already identified for national level indicators (Annex 5) - Input Data Available from Basic Data that are already identified for national level indicators (Annex 5)
4	General information about road transport and economic development level and policy.	- Number of vehicles per millions \$ GNP	NO/M U	Needs basic indicator (Million \$ GNP)
5	Road transport safety	- Number of deaths per 100,000 ha	NO/HA	Input Data Available from Basic Data that are already identified for national level indicators (Annex 5)
	II. ROAD SUBSECTOR			
1	Rehabilitation of 200,000 km of rural roads	- Length of rehabilitated rural roads and total length of rural roads, unit costs	KM	Needs harmonization of definition of rural roads and sometimes inventory

It No	Goals and targets of UNTACDA II	Indicators	Unit	Comments
2	Rehabilitation of i 85 percent of paved roads ii 40 percent of unpaved roads iii 25 percent of rural roads	- Length of these types of roads maintained and rehabilitated - % of good, fair and poor for rural roads - Ratio: fuel taxes/fuel price - Number of private enterprises qualified for road rehabilitation and maintenance	% % % NO	Can be computed using basic data identified for selected indicators at national level (Annex 5)
3.	Reduction of road accidents by 25 percent	- Deaths per 100,000 ha	NO/HA	Can be computed using basic data identified for selected indicators at national level (Annex 5)
4	Indicators for Macro-Economic analyses and planning not foreseen by programme of UNTACDA II General information of Importance of road network	- Length of classified road network per 1000 ha	KM/HA	Can be computed using basic data identified for selected indicators at national level (Annex 5)
5	General information about road network and economic development level and policy	- Length of classified road network per million \$ GNP	KM/\$	Needs Basic Indicator (Million \$ GNP)

Table 3.5
RAILWAY AND PORTS PERFORMANCE INDICATORS FOR THE EVALUATION OF UNTACDA II
THAT ARE NOT SELECTED DURING THE PROJECT LAUNCHING SEMINAR.

It No	Goals and targets of UNTACDA II	Indicators	Unit	Comments
	III. RAILWAY SUBSECTOR			
1	Average cost per unit/km should be reduced by 30%	Cost per traffic unit km	Mu/km	Needs harmonization of definitions
2	During the decade, at least 25 percent of the existing track should be either partially or totally renovated (about 8,000 km)	✓ Ratio :Length of renovated track/ total length of truck ✓ Total length completely renovated	% km	Needs good definition of renovated track
3	By the end of the decade, every railway corporation should seed to establish formal rehabilitations with governments through contact plan or memorandum of understanding clearly spelling out the role of the railway and the state. Each railway plan of action should be spelt out in the corporate plan.	✓ At each phase of the decade number of railway with contract plan of memorandum	NO	
4	Training courses of railway managers should be established in four African subregions	✓ African subregions where these courses are established	NO	
5	Railway safety should be increased by at least 10 percent	✓ Number of accidents resulting in death or injury ✓ Deaths and injuries per locomotives	NO	
6	Development of African manufacturing capability should be accelerated	✓ Assessment of manufacturing capability		Needs survey
7	Indicators for macro-economic analyses and planning not foreseen by programme of UNTACDA II Importance of railway transport	✓ Length of railway per 1000 ha ✓ Total railways transport/total transport all modes	Km/ha %	Can be calculated using basic data identified for selected indicators at national level (Annex 5) Can be calculated using basic data identified for selected indicators at national level (Annex 5)
8	General information about railway transport and economic development level and policy	✓ Length railway per million \$ GNP ✓ Ratio: railway budget/total transport sector budget	km/\$ %	Needs Basic Data (Million \$ GNP) Basic Data on Budget of all Transport Sectors is needed
	IV. PORTS SUBSECTOR			
1	To reduce cargo losses due to damage and pilferage	✓ Information on financial losses due to damage and pilferage	% or MU	
2	To reduce port costs per ton of cargo handling (for ship)	✓ Total cost (port charges + ship's time + stevedoring + tallying short handling/total tonnage handled	MU	Need Survey

It No	Goals and targets of UNTACDA II	Indicators	Unit	Comments
3	To improve the maintenance of port equipment so that the down time of equipment is reduced	✓ Utilization of cargo handling equipment: availability of major types of equipment/planned availability of this equipment	%	Need survey
4	Indicators for planning and macro-economic analyses not foreseen by programme of UNTACDA II.	✓ Number and capacity of seaports - Total tons loaded in African ports - Total tons unloaded in African ports - Total containers handled by African ports	No/ton TON TON TEU	Can be calculated using basic data identified for selected indicators at national level (Annex 5)

C. DATA NEEDS OF THE SELECTED TRANSPORT INDICATORS

45. As mentioned in the previous sections most of the indicators selected for the various modes are global level indicators whose derivation requires basic data inputs. The validity of the aggregated data therefore depends on the accuracy of the basic data which requires a properly designed data collection methodology.

46. The recommended approach to compile the indicators is from "bottom up" that ranges from the highly detailed operational management level through increasing levels of aggregation required by policy makers and other user groups to the final stage of the derivation of the key indicator. There is a variation in the data needs of the different indicators depending on the level of aggregation required. The data needed for some indicators is very detailed primary data that can only be obtained through surveys. For instance the data needed for the load factor indicator used to measure fleet utilization in the road transport sub-sector requires an Origin-destination Survey to be conducted at national level in order to collect the necessary input data.

47. Therefore, it would be possible to estimate the average loads along major roads of a country by considering both the inward and outward movements of goods from major cities, usually Capitals or Ports. Once the proportion of the empty trucks and the average load for trucks carrying goods or loaded trucks is identified through the survey the load factor can be estimated by applying the weighted average method. The data needed for the final derivation of the selected indicators are presented in Annex 6.

D. TRANSPORT DATA USERS WITHIN ECA, SUBREGIONAL AND REGIONAL LEVELS.

48. The various modal experts of TCTD require transport data of different aggregation level depending on their activities and subjects of interest. Transport data of different nature are also required in the implementation process of UNTACDA II programme.

49. Among the other divisions in ECA the following are expected to be major users of transport data.

- Socio-economic Research and Planning
- Joint ECA/FAO Food and Agriculture
- Industry and Human Settlement
- Trade and Development Finance
- Natural Resources
- Population

50. The sub-regional, regional and international transport data users are presented in Annex 7.

4. EXISTING DATA COLLECTION, PROCESSING AND DISSEMINATION SYSTEMS AND METHODS IN ECA

A. GENERAL

51. The activities of ECA include the provision of assistance to member African States in formulating policies and implementing strategies. In this regard, data and information play a major role in the planning and monitoring process of the various activities. These data and information can only be reliable if the collection, processing and dissemination procedures are systematically designed. This chapter reviews present methods of data collection, existing problems in data collection, existing methods of information dissemination, current capabilities to collect, process and disseminate transport data, and current transport data sources.

B. PRESENT DATA SOURCES AND METHODS OF COLLECTION

B.1 STATISTICS DIVISION (SD)

52. Currently there is a data base developed within the Statistics Division of ECA which is known as the Regional Statistical Database (ECA-RSDB). It is a multi-sectoral statistical database system that serves as a repository for the various statistical data in Africa mainly focusing on: National Accounts, Industry, Price, Public finance, Agriculture, Transport and Communications, Tourism, Balance of payment and Debt.

53. Most of the data in this division are collected from secondary sources and the collection of primary data through surveys and special projects is uncommon. The existing data collection procedures that are practiced in Statistics Division include:

- national publications and regular reports by Member States through National Statistical Office's (NSO);
- sending the available data in the form of computer printouts to Member States and receiving updated information through the same means;
- data collection by some staff members of the various technical divisions of ECA while on missions to member States;
- direct contacts and from the regular reports of UN organizations who have a well organized data collection system in African countries, e.g. FAO, UNIDO, UNESCO etc;
- on line access to UN headquarters data for two hours a day;

- global data collected through the technical divisions from international organizations specialized in specific sectors (e.g. TCTD collects data from the World Bank, UNCTAD, IMO, ICAO, UAR, etc), technical publications, annual Reports, by attending special meetings and taking part in technical committees with these international agencies;
- from publications, regular reports, and through special contacts with the various sub-regional organizations in Africa.

B.2 PAN AFRICAN DEVELOPMENT INFORMATION SYSTEM (PADIS)

54. The data/information collection process of PADIS is coordinated through the PADIS network that consists of national, sub-regional and institutional participation centers. At present there are about 38 national and sub-regional participating centers in the PADIS network. In addition to their various activities, the sub-regional participating centers serve as national and sub-regional information clearing houses and as links for the transfer of information between national participating centers and the central coordinating office.

55. The existing 43 institutional participating centers are made up of sub-regional institutions which are responsible for the coordination of data collection in their special subjects of focus. The prevailing data collection method of PADIS through the PADIS network is in the form of manual input sheets, diskettes, codes and electronically compressed files, e-mail and non-abstracted big volumes of documents are also sometimes received and the indexing and abstracting is done by PADIS itself.

B.3 TRANSPORT, COMMUNICATIONS AND TOURISM DIVISION (TCTD)

56. The data collection activities of TCTD are usually undertaken by the various sections, units and modal experts in an ad hoc basis. Some of the sources and methods of data collection include :

- national publications of member states on the different aspects of the various modes of transport;
- staff missions to member states, though the purpose of the mission can be for another assignment;
- regular reports from regional and international organizations such as the World Bank, IMO, ICAO, AFRR, AFCAC, UAR, etc;

- publications and regular reports of the various sub-regional organizations in Africa such as PTA, ECOWAS, ECCAS, SADCC, UMA, etc.

57. The data collection activities of TCTD are more dependent on external sources than SD. Although the Regional Statistical Data Base (ECA-RSDB) incorporates the various transport modes, it does not seem to satisfy the needs of transport data users in TCTD for different reasons including the following.

- (a) The content of the Statistical Year Book is mostly dominated by estimated values, which undoubtedly affect the reliability of the data.
- (b) Due to delays in the process of updating the available data, official publications like the statistical year book are not issued promptly. At present the latest issue of the Statistical Yearbook is that of 1990/91.
- (c) The ECA-RSDB has no full coverage over the data needs of TCTD, i.e. the transport data structure under the existing data base system does not include the most important data items needed by the experts. As shown in Table 4.1, only 16 transport data items are available in the present statistical database for road, road transport, railway and ports sub-sectors. On the other hand the total number of data items identified for the performance indicators of these sub-sectors was about 215. Therefore, the existing database comprises only 7 per cent of the total transport data required. Data on financial performance and transport indicators, usually needed in the planning and monitoring process of these transport modes have not been covered by the statistical database. It is clearly evident that there is a serious gap between the availability and the need of transport data in ECA.

Table 4.1
STRUCTURE OF TRANSPORT DATA AVAILABLE WITHIN THE
EXISTING DATABASE SYSTEM (ECA- RSDB)

Mode of Transport	Data item
Railway	Length of Railway (km) Rolling stock <ul style="list-style-type: none"> - Locomotives (NO.) - Carriages (NO.) - Wagons (No.) Traffic <ul style="list-style-type: none"> - Passenger (pkm -in 10 million) - Net ton (tkm - in 10 million)
Road Transport	Total Length of roads (km) Paved roads (km) Principal roads (km) Secondary roads (km) Other roads (km) Motor vehicles in use (No.) <ul style="list-style-type: none"> - Passenger cars (No.) - Commercial vehicles (No.) - Registration of new motor vehicles (No.)
Sea borne shipping	Goods loaded Goods unloaded Freight tons (tons) <ul style="list-style-type: none"> - loaded - unloaded
Air Traffic	Passengers (No.) <ul style="list-style-type: none"> - Arrival - Departure - Transit.

C. EXISTING PROBLEMS IN DATA COLLECTION

58. As in the case of most under developed countries, data collection has been a serious problem in most of the African countries. This in turn has affected the data collection activities of ECA. Some of the major reasons that are causing data collection problems include:

- communication problems in the process of data transmission due to technological setbacks;
- unwillingness of some countries to collaborate in the supply of information required;
- the consideration of some types of information or data as confidential by most of the member nations;
- the weight given to data/information being very low in most of the countries;
- data transmitting agencies of member states are not well staffed with skilled manpower.

59. Due to the above problems encountered in the data collection process, among the total data presented in the Statistical Year Books of the five consecutive years (1988-1992) considered in our analysis about 65 per cent are estimated figures while 25 per cent are remarked as not available (NA). Only 8 per cent of the total data represent official figures obtained from member nations. Table 4.2 shows the summary of findings while the detailed information is shown in Annex 4.

**Table 4.2 SUMMARY OF AFRICAN TRANSPORT AND COMMUNICATION DATA
RECORDED IN STATISTICS DIVISION DURING 1988 - 1992**

Means of Transport	Total Data recorded	Official National figure	Estimate	Insignificant	Not Available
Railway	1050	104	765	25	156
Road Transport	2040	34	1739	37	230
Seaborne	370	199	159	12	-
Transport	1275	52	886	-	337
Air Traffic	1530	129	546	-	855
Communication					
Total	6265	518			
Percentage	100	8.2	4095 65.4	74 1.2	1578 25.2

Source: Statistics Division
Tabulation: By Consultants.

D. EXISTING METHODS OF INFORMATION DISSEMINATION

60. Information of various nature are disseminated to users both within and outside ECA. The different outputs of the data processing activities of ECA including updated time series data and the provision of other user services from existing database systems are frequently released to various users in the form of:

- technical publications;
- regular reports of the different technical divisions;
- statistical year books;
- printouts from databases;
- selective dissemination of information;
- question/Answer services;

- hard copy and microfiche document delivery;
- magnetic media;
- e-Mail.

E. CURRENT CAPABILITIES TO COLLECT, PROCESS AND DISSEMINATE TRANSPORT DATA

61. As discussed in section C above, most of the African countries are incapable of collecting reliable data due to technological backwardness, lack of resources unawareness to the significance of information, and lack of skilled manpower. ECA has some resource constraints to send missions to member countries for data collection. Although it is not widely used within the different divisions of ECA, at present, there is an on-going project under PADIS which is known as "Capacity Building in Electronic Communications in Africa (CABECA)". The purpose of this project is mainly providing computer based networking between African countries and ECA.

62. Presently there are about 8 statistical assistants that are involved in the different data processing activities of SD, and 4 assistants assigned in PADIS. These are assumed to be sufficient for the existing data processing work loads.

63. As the existing HP3000 Mini- computer is fully utilized, it is unlikely that the system can accommodate additional new application. On the other hand the available Micro computers can accommodate applications that do not require large disk space.

64. The software that are presently loaded in the HP3000 Mini computer are fully utilized while the software already loaded in the Micro computers are only partially utilized with the exception of the word processing program. This is mainly due to the recent introduction of most of the micro's and the corresponding need for staff training and practice.

65. As mentioned in section D above, the existing systems of data dissemination at ECA include technical publications, regular reports and statistical year books. However, ECA is not currently in a position to produce this documents satisfactorily. This is manifested through the frequent delays in the publishing processes. Consequently, quite a lot of the printing and publishing activities of ECA are presently undertaken by private printers.

66. The existing number of personnel involved in the translation activities is also insufficient. This has contributed to the low performance in the dissemination of data through documents published in the languages required by the various data users.

5. CURRENT INFORMATION SYSTEMS RESOURCES AND FACILITIES WITHIN ECA

67. During fact finding interviews, the present information systems facilities in operation in ECA were examined with particular emphasis on the establishment of regional transport data base.

A. PRESENT COMPUTER HARDWARE FACILITIES

68. Currently ECA has 2 computer systems under use. These include:

- the Hewlett Packard HP3000 Mini-Computer purchased in early 80's with finance from UNDP financed Pan-African development System project;
- four hundred eighty-eight (488) Micro-Computers purchased in late 80's by ECA for office automation.

69. The Hewlett Packard HP3000 which is managed by Information System Section has the following configuration.

Disc Space	4x404 MB fixed disc drives
Line Printer	2x1000 Lpm line printer 1x 600 lpm line printer
Tape drive	1x6250 bpi 1x1600 bpi
Networking	The HP 3000 is connected to IBM mainframe at HQ through the Alternate Voice and Data Line (AVD)

70. Until the massive introduction of micro computers during the last 3 years, the HP 3000 has been virtually a single source of computer power in ECA. The major users and the number of sectors occupied by each user are shown in table 5.1

TABLE 5.1
HP 3000 Computer Resources Usage

Users	Sectors* Occupied	Relative %
ADMINISTRATION	1,595,110	28.6
AFRICA	404,794	7.3
ALGERIA	170,840	3.1
IDRIS	161,160	2.9
LABOUR	305,557	5.5
MAIL	129,663	2.3
MINISIS	57,913	1.0
PADIS	73,250	1.3
PADIS DOC	231,650	4.2
STATIS	1,064,829	19.1
SURVEY	77,252	1.4
SYST	311,470	5.6
TCDRO	519,231	9.3
UNIDO	80,313	1.5
OTHERS	390,546	6.9
TOTAL	5,573,578	100
* 1 Sector = 256 bytes (a byte is equivalent to an alphanumeric character).		

Source: ISS computer resource usage printout dated 12/1/94.

71. As indicated in table 5.1 the major user of the system is ACSD and the major uses include payroll preparation, finance and budget, the maintenance of ECA's manning table, mailing address, etc. The programming and maintenance of administrative services is undertaken by ISS. The second major user is SD which maintains multi-sectoral database basically geared towards the production of African statistical year book. The third major

user is PADIS which maintains quite a number of non-statistical data bases. Other users include Socio-Economic Research and Planning Division, Industry and Human Settlement Division, Population Division, etc. Some of these users have developed their own programmes in order to fulfil their work assignments.

72. Two Wang VS systems used to be maintained in ECA. One of the Wang machines was installed in TCTD. It was originally meant to be used for UNTACDA I programme. However, apart from some word processing, the machine has never been put into use for the intended purpose. The second Wang VS Machine was located in Personnel Section and was used for handling P5-actions until June 1993. The Wang VS machines are slightly outdated compared to today's standard as far as user applications are concerned. These machines do not support up-to-date software. The hardware and software for these range of machines is expensive compared to comparable machines of the same brand and the maintenance cost of the machines is extremely high.

73. Presently, about 488 micro-computers of varied capacity are deployed in ECA. Total number of micro-computers and printers in each of the divisions, types of micro-computers, monitors and types of printers are presented in Annex 8.

74. The majority of these PC's (about 82 per cent) are the NCR micro's of two basic models.

NCR 386 SX - equipped with

- 80386 20 MHZ processor
- 40 MB hard disc
- 3 1/2 inch, 1.44 MB Diskette Drive
- VGA color monitor

NCR 386 equipped with

- 80386 20 MHZ processor
- 100 MB hard disc
- 3 1/2 inch, 1.44 MB diskette drive
- 5 1/4 inch, 1.2 mm diskette drive
- VGA color minuter

About 15 per cent of the micro's are IBM machines of varied models.

75. During the survey we were able to witness that all experts and supporting staff in TCTD are provided with Micro-computers and the necessary printers. During part II of

the study detailed assessment of these equipment VS the requirement of the implementation of Transport data base in ECA shall be undertaken.

B. PRESENT COMPUTER SOFTWARE FACILITIES

76. The HP3000 machine runs under MPE Operating System. Major software and compilers running on this machine and the Micro's are the following:

- (a) IMAGE 3000 - An HP-proprietary data base system with additional features for table generation and queries developed in-house using COBOL programmes. This software is basically used for the maintenance of the time-series statistical database.
- (b) MINISIS - This is a bibliographical data base system developed by the Canadian International Development and Research Center (IDRC). The software was written entirely in SPL - an HP-unique programming language and thus not transportable to other systems. This software is basically used by PADIS for the maintenance of bibliographical data bases.
- (c) Compilers. The major compilers resident in the HP3000 are COBOL, FORTRAN, RPGII and SPL. COBOL is used extensively by programmers and analysts for the development and maintenance of administrative computing and generation of various reports and tables of the Statistical Division. FORTRAN is mainly used by Socio-Economic Research and Planning Division for the manipulation of socio-economic data.
- (d) Other software on the HP include:
 - ✓ TDP for text documents processing;
 - ✓ TAPE software of handling tape backups;
 - ✓ INSIGHT for application developing;
 - ✓ ISEA an econometric software.
- (e) Software loaded on the Micro-Computers. The Micro's are loaded with MS-DOS, Wordperfect 5.1, Quattro Pro 2.0 and Paradox 3.5.

C. PRESENT DATA BASE RESOURCES

77. From our discussion with ISS, SD and TCTD personnel we were able to identify four major systems residing in HP3000 main frame computer and, one system residing in a micro-computer in TCTD. These include:

- ✓ the Regional Statistical Data Base (ECA- RSDB);
- ✓ the non-statistical data base;
- ✓ the administrative services data base; and
- ✓ UNTACDA II Projects Information System.

78. The Statistical Division of ECA maintains Regional Statistical Data Base (ECA-RSDBS) on agriculture, transport, communication and tourism, population and employment, industry, international trade, national accounts and prices index. The database contains about 160,000 time series data item for the years from 1970 up to 1993.

79. The transport, communication and tourism sector of the database contains 21 items (6 items in railway sub-sector, 5 items in road sub-sector, 3 items in motor vehicles sub-sector, 2 items in seaborne traffic and 5 items in air traffic). The types of data items are shown in table 4.1.

80. PADIS information system maintains the following non-statistical databases of bibliographical and referral in nature.

Bibliographic databases

PADdev:- bibliographic reference database, presently comprised of nearly 20,000 records from ECA documents and documents input from national participating centers in economic, technological and social aspects of development in Africa;

PADcom:- more than 400,000 references from a variety of international and bilateral data bases that supplement PADdev in fields such as agriculture, industry, labour, social affairs and natural resources. Among the databases in PADcom are POPIN- AFRICA, DIS, CABORDOC, AGRIS, DEVSIS-Canada, IDA, ILCADO, IDRIS, LILACS and POPLINE.

Referral databases

PADexp:- database of 8,000 African experts in all development fields.

PADins:- database of institutions in Africa engaged in research, and/or consultancy services in development that are potential partners in the promotion of Technical Cooperation between developing countries.

PADpro:- database of development research projects in Africa.

PADdab:- database of African data bases.

81. Administrative activities which include payroll, finance, budgetary controls, ECA's personnel system and the mailing addresses are maintaining on the HP3000. These systems are developed and currently managed by ISS.

82. Updating of both the statistical and the non-statistical data bases is undertaken on line continuously as and when data is received from member countries and other sources. Eight statistical assistant in SD and four experts in PADIS undertake the updating function.

83. An attempt has been made in TCTD to design and implement UNTACDA II projects Information System (UPIS) aimed at establishing a data base for monitoring UNTACDA II activities including programme project monitoring and the measurement of impact of the decade programme. The data base has the following major modules.

- (a) UNTACDA II Programme Projects Database (UPPD):- The UPPD module is basically designed to serve as a data bank and source of information on the preparation of the decade programme with special emphasis on the projects submitted and those approved for execution during the first phase of the decade.
- (b) UNTACDA II Programme Projects Execution Database (UPED):- UPED module is designed to store data on execution of projects approved for the decade programme.
- (c) UNTACDA II Programme Base Year Database (UPBD):- UPBD is designed to store data on transport and communications indicators which shall be used as a reference to monitor the impact of the decade programme.

- (d) UNTACDA II Programme Administration Database (UPAD):- UPAD was designed for use by the secretariat for monitoring the activities of the various participants in the decade programme.

84. UPIS system resides on a 386 PC with 40 MB disc storage. It was developed in-house on Dbase IV software by a system expert from ISS. Two of the four modules UPPD & UPED of the data bases have been designed and ready for use. The third and fourth modules (UPDB & UPAD), planned to handle the monitoring function of the programme and the overall activities and administrative functions of the Decade programme respectively, are not yet designed.

85. Unfortunately both the usage of the already developed modules (UPPD and UPED) and the development work on the two modules (UPBD and UPAD) has ceased functioning during the writing of this report. This was due to the fact that the expert assigned to handle the data base project was withdrawn due to lack of financial resources.

D. NETWORKING FACILITIES

86. Presently the HP is connected to IBM main frame at HQ through Alternate Voice and Data (AVD) line. Thus, selected users within ECA have access to this facility for two hours connection window.

87. Within ECA, LAN is being set up for the major users in Administration, Statistics and Socio-economic Research and Development Divisions. so far 100 users are linked to the network. The network is served by four SERVERS located in ISS and one in SD. ECA's networking is a continuous programme planned to link most of the substantive divisions within ECA.

E. HUMAN RESOURCES AND TRAINING

88. Including Information Systems section chief there are seven professionals in ECA who provide systems development and programming service. These professionals provide services ranging from users training up to development of full fledged systems and detailed programming. The service is provided on request basis. Presently and for sometime in the future the experts are fully engaged in networking and provision of training to users.

89. There is an on-going training programme for users undertaken by Information Services Section. To date over 400 ECA staff members have taken training. Details of subjects covered and number of staff members trained in various subjects is presented in Table 5.2.

TABLE 5.2
Number of ECA staff members participated in computer training

<u>Subject</u>	<u>Number of Staff Trained</u>
. Introduction to PC, DOS and WordPerfect	410
. Advanced WordPerfect	49
. Tables	81
. Macros & Merge	44
. Introduction to Quattro Pro	292
. Advanced Quattro Pro	11
. Introduction to Paradox	115
. Advanced Paradox	59
. Novel of LAN Systems	10
. Ventura Desk-Top Publishing	13
. Virusaft Programme	<u>21</u>
Total	<u>1,105</u>

Source: ISS

90. As indicated in table 5.2 most of the experts (users) and supporting staff (secretaries, technical and statistical assistants and administrative personnel) have acquired the basic computer skill. As the user training programme is an on-going scheme it is expected that ECA staff will have a dependable level of computer knowledge within a short period of time.

91. On the other hand almost all experts and supporting service personnel in TCTD have acquired the basic skill in Word processing (Word perfect), about four have acquired training in Quattro Pro, Windows and Paradox. Detailed training requirement for TCTD personnel, required for the implementation of Transport Data Base, shall be worked out during Part II of the study.

F. RESOURCE UTILIZATION

92. Our survey indicates that the HP3000 is fully utilized. On the other hand due to old age, outdated configuration (not supporting modern software) and the emergence of powerful micro-computers, no substantial development work is envisaged on the HP

machine. Therefore, it is very likely that in the near future computing trend in ECA will be on LAN based micro's.

93. The Wang VS computers are already out of use either due to old age, lack of technical support, high cost of maintenance support and outdated technology. The Wang computers are expected to be disposed of in the near future.

94. The micro-computers, except in some divisions, are basically used as a word processing tools. However, other uses of these machines are expected to emerge soon.

95. The six professionals in ISS are fully engaged in provision of programming service, local area networking and technical support to users. It is expected that introduction of more and more LAN's, WAN's and micro-computers will entail the need for substantial amount of technical support from the professionals. Therefore, additional manpower might be sought in the near future in order to strengthen ISS.

6. ON-GOING INFORMATION SYSTEMS AND RELATED PROJECTS IN ECA

96. We were able to identify some advanced level information system projects in communications, low cost data and information flow mechanisms and an integrated management information system which will benefit ECA in general and TCTD in particular. Some of the major projects are presented in this chapter.

A. INTEGRATED MANAGEMENT INFORMATION SYSTEMS (IMIS)

97. IMIS is an on-going project undertaken by UN headquarters aimed at networking UN administration world wide. Major features of the project include:

- ✓ the use of UNIX-based mini-computer;
- ✓ local area network (LAN) within administrative units;
- ✓ wide area networking (WAN) facilities to all ECA division;
- ✓ the main LAN at ECA to be connected by telecommunication to the main computer at UN Headquarters and from there ECA will have access to world wide UN network.

98. Although IMIS is a closed circuit project aimed at connecting only UN world-wide network, TCTD could benefit immensely from its implementation as existing transport related data bases within the UN system can be consulted on line. This will not only eliminate the existing system of time consuming data transfer mechanism through use of magnetic tapes, diskettes or printed output but will also enrich the data base resource of TCTD through world wide connection.

B. PAN-AFRICAN DEVELOPMENT INFORMATION SYSTEM (PADIS)

99. Established in 1980 under the aegis of ECA, PADIS is an on-going project whose main task is the promotion of development information management throughout Africa. In particular PADIS undertakes, the following activities.

- (a) Delivery of advisory service to ECA Member States on aspects of development of information and documentation systems.

- (b) Training staff of national, subregional and institutional participating centers as well as information policy matters and other system users through workshops, seminars and short courses in information system methodologies, computerized documentation techniques, information systems policy and management, and statistical data base management and utilization.
- (c) Creation and maintenance of bibliographic, referral and statistical data bases.
- (d) Provision of user services, including printed outputs from data bases, newsletters, selective dissemination of information, current awareness profiles and retrospective searches, question/answer services, hard copy and microfiche documents delivery, data bases on magnetic media and consolidating and repacking of information.

100. In the area of Information Systems PADIS has so far established five in-house data bases based on information produced in or originating from Africa. These data bases are described in detail in paragraph 5.14.

101. Similarly, in the area of networking PADIS has created connections with 34 national, 43 institutional and four subregional participating centers. These centers receive from PADIS advisory service, training and access to PADIS data base. They also input data into the system for exchange with other countries in the region.

102. PADIS is currently executing a project entitled "Capacity Building for Electronic Communication in Africa (CABECA)" which is aimed at providing technical assistance to bring about sustainable computer-based networking in Africa. Apart from training and technical support the basic aim of CABECA is to offer inexpensive and easy access to local and international information services on systems run by local operators which will be sustained by revenue received from users. Under this scheme members to the network will exchange data and information electronically worldwide at a fraction of the cost of fax or telex. To date the following national participating centers of PADIS have been connected or will be connected within the next two month with public access nodes facilitated by CABECA.

- (a) Centre National d'Information et de Documentation
Economique, Ministère du Commerce, Algiers, Algeria.
- (b) National Institute of Research
University of Botswana
Gaborone, Botswana

- (c) Service central de la documentation
et des archives
Ouagadougou, Burkina Faso
- (d) Science and Technology Commission
Addis Ababa, Ethiopia
- (e) Centre de documentation technique
Lome, Togo
- (f) Centre d'information et de documentation
economique et sociale
Niamey, Niger
- (g) Department of Planning and External Relation
Victoria, Seychelles
- (h) Ministry of Economic Planning and
Industrial Development
Bangul, Gambia
- (i) Documentation Unit
Ministry of Economic Planning and Development
Port Louis, Mauritius
- (j) Swaziland National Library Service
Mbabane, Swaziland
- (k) Lusaka Library, University of Zambia
Lusaka, Zambia
- (l) Ministère du plan et de l'aménagement du territoire
Yaoundé, Cameroun

These national nodes are further connected to regular users in each country. For example so far about 135 end users are connected to PADISnet and receive regular service through the network.

103. Another project undertaken by PADIS is promotion of standardization and compatibility of information systems in Africa. Started in January 1994 with financial support from Carnegie Corporation, the project is aimed at finding solutions to problems

in information handling in the African region and develop and promote guidelines promoting the adoption of the developed solutions as standards for information exchange.

104. MINISIS Resource Center (MRC), another project undertaken by PADIS and, which started operation in August 1992 by financial support from IDRC, is aimed at promoting the use and application of MINISIS software among African countries. MRC is expected to assist new and existing users of MINISIS by installing the software, provision of initial and advanced user training in MINISIS, support African users encountering usage problems, and issue a newsletter specific to MINISIS use in the region.

105. The final major project undertaken by PADIS is a study of the effectiveness of national informatics instruments implemented in Sub-Saharan Africa. Started in September, 1993 by financial assistance from IDRC, this project is aimed at carrying out exploratory research into the success of informative policy instruments including computer to computer communication which have been successfully implemented in Sub-Saharan Africa and those projects which were not successful and identify reasons for success and failures in implementations.

C. UNITED NATIONS TELECOMMUNICATION NETWORK

106. There is an on-going project in UN headquarters which is aimed at developing the provision of more efficient and effective telecommunication services between UN headquarters and its specialized agencies. After the switch from analog transmission facilities to digital service and the overall switch from commercial carriers to privately leased lines the cost for telex, voice, facsimile and data transmission has reduced tremendously in the UN system. These costs savings were also made available to UN specialized agencies including ECA.

107. Under the programme of institutional building and social and economic development activities of the United Nations charter, the use of satellite capacity to provide telecommunications services to the specialized agencies (ECA included), which was agreed between UN and INTELSAT, have opened a way for a low-cost telecommunication facilities. Thus, at present UN is able to provide voice, telex, data and facsimile communication facilities between New York, Geneva, Vienna, Bangkok and Santiago on a twenty-four hour basis.

108. Currently UN has 12 earth stations connected to INTELSAT and a proposal to implement additional stations in Nairobi, Addis Ababa, Santiago, Amman, Bangkok and Vienna is being finalized. Once the project is implemented it will provide ample voice, data and image communications between UN headquarters and the specialized agencies.

109. In order to improve inter-agency data communications and a message handling system (E-mail) between UN headquarters and specialized agencies , it is planned to install the necessary facility in New York, Geneva, Vienna, Paris, Rome, Santiago, Addis ababa, Nairobi and Bangkok.

110. In conclusion this on-going telecommunications programme is expected to improve tremendously ECA's capacity to collect/disseminate data and information from/to UN specialized agencies and the headquarters.

D. UNITED NATIONS ECONOMIC AND SOCIAL INFORMATION SYSTEM (UNESIS).

111. The Department for Economic and Social Information Policy Analysis (DESIPA) at the UN headquarters has recently initiated a project whose main objective is to harmonize and standardize the data holdings maintained in the various Departments of the Headquarters and the Regional Commissions. Initially the project aims to create connectivity between the existing related data modules within the UN system and thus establish a secretariat-wide "United Nations Economic and Social Information System (UNESIS)". Under the envisaged scheme ECA's multi-sectoral statistical data base (ECA-RSDB) and other related data bases will eventually form an integral part of UNESIS. The implementation of this project will have a tremendous impact on the overall economic and social information systems with the UN system and all member states. By creating connectivity to data base resources within the UN system, the project shall create a tremendous positive impact on the implementation of the envisaged transport data base.

7. LINKAGES BETWEEN EXISTING SYSTEMS WITH NATIONAL, SUBREGIONAL, REGIONAL AND INTERNATIONAL DATA BASES

112. For an institution like ECA information systems linkage between national, subregional and regional and international data bases places a crucial role in fulfilling its mandate. Various experts, researchers, planners and policy developers attached to ECA face severe difficulty in getting appropriate data and information in order to fulfil their assignments in time and within reasonable cost.

113. Unfortunately, except for the limited effort outlined below, the information linkage in ECA has not yet developed. There are two units in ECA who have managed to communicate with data bases of external organizations.

114. Currently HP3000 is connected to UN headquarters and ICC in Geneva for two hours a day. This has allowed a limited number of users to have access to headquarters data. The second and most important linkage in ECA is the continuous effort undertaken by PADIS. PADIS linkages have been fully covered in paragraph 6.6 & 6.7 above.

115. At present there is an on-going effort at ECA to link with World Bank data base. To this effect a task force has been set up entrusted with the responsibility of determining the data needs at ECA and to what extent the World Bank data could help fill data gaps and for ECA to be more up-to-date in its data collection effort.

116. At the time of writing this report a team of three experts is awaiting decision to visit World Bank headquarters. The aim of the visit is to study all aspects of the social and economic data capability at the bank, IMF and UN headquarters with particular reference to data needs of ECA.

117. The United Nations Economic and Social Information System (UNESIS) and an Integrated Management Information System (IMIS) projects undertaken by UN Head Quarters are to-date the major programs expected to create connectivity between ECA, UN Head Quarters and other UN agencies. These projects have been fully covered in paragraphs 6.2 and 6.16 above.

118. Therefore, the envisaged regional transport data base, can undoubtedly benefit from the projects outlined above. To this end, in depth study of data base resources within the UN system and specialized agencies in order to identify areas of concentration during the implementation of the regional transport data base should be undertaken immediately.

8. CONCLUSIONS AND RECOMMENDATIONS

119. In this section alternative methods of organizing the transport data base, coverage of transport indicators and data collection consideration are presented in detail. Recommendations for the required infrastructure for the development, administration and maintenance of the selected data base including operational arrangements for its linkage with ECA multi-sectoral statistical data base, with other interested units within ECA and with subregional, regional and international transport data bases together with resource requirement in terms of technical and financial assistance, hardware and software needed to implement the project shall be dealt with in part II of this study.

120. The issues to be discussed at this stage include:

- ✓ organization of hardware;
- ✓ organization of systems development, maintenance and administration;
- ✓ organization of transport data base development, maintenance and administration;
- ✓ data collection and selected indicators.

A. PRESENT SITUATIONS AND FUTURE DIRECTION OF COMPUTER SERVICES IN ECA

121. Through our fact finding process we were able to identify six major developments presently emerging in ECA which drastically affect data processing situation.

- (a) The first and foremost is the on-going IMIS project that will be introduced for the UN administration world-wide (for details refer chapter 6). The use of HP3000 for administrative computing shall not continue as soon as IMIS is implemented.
- (b) The second project is on the improvement of communication network within the UN system. This will have an effect of both reducing cost for data transmission and shall create capability within the UN system for a direct access.
- (c) The third most important development is the office automation programme in ECA. This has not only availed micro computers to almost all experts

within ECA, the users through continuous training programmes have been well exposed to the powers of a computer. This will have a great impact on the future computing organization (user demand).

- (d) The fourth is the on-going programme of networking. We assume that the Statistical Division will migrate its statistical data base to micro-computer based LAN. Since a server is already installed in the division and quite a number of micro's are in place what is left is the actual shift from HP to micro's.
- (e) The fifth programme is undertaken in PADIS. With the arrival of MINISIS Version H data base management software, the non-statistical data base system shall be shifted from HP to micro-computers.
- (f) The last project which will have an impact on Regional Transport Data base project is UNESIS which is aimed at creating connectivity between the existing related data bases within the UN system (for the detail refer paragraph 6.16)

122. Thus, the logical conclusion to be derived from the situation outlined in the above paragraph is that the use of HP3000 shall have to be phased out within a short period of time.

123. After the phasing out of HP3000 the logical step to follow in ECA shall be as follows.

(a) Hardware

124. Completely distributed hardware structure where micro computers shall be placed on the desk of every expert and supporting service personnel, and printers will be shared among group of users within the division. These micro computers shall be linked to the data base servers within each division through Local Area Network. ECA wide resources such as E-mail, IMIS, common server, and data base servers and other gateways, global telecommunications, gateways to the UN information systems LAN shall be under the responsibility of ISS. On the other hand divisional resources where required (such as TCTD data base server, divisional LAN) will be managed by LAN or system administrator which may be a staff of the concerned division. The bridging of the divisional LAN to the rest of ECA LAN shall be the responsibility of ISS.

(b) Systems development and maintenance

125. This involves the overall development of information system including:

- ✓ standardization of forms, flow of data, processing, output, etc.;
- ✓ standardization of hardware and system software and all types of peripherals and equipment;
- ✓ standardization of systems analysis design and programming;
- ✓ standardization of data base structures and an overall operating environment;
- ✓ administration of LAN's and WAN;
- ✓ administration of international connections;
- ✓ development of linkages between data bases of varied origins, structures and systems;

126. Presently the functions of system development are undertaken primarily by Information Systems Section.

(c) Development, Maintenance and administration of data bases

127. This includes administration and maintenance of the already existing data bases and the development of new ones. Major function include:

- ✓ new entries and deletion of records;
- ✓ data collection, editing, updating, estimation, maintenance of data dictionaries and reference files;
- ✓ data base administration including general administration, control and security of the data;
- ✓ data distribution and dissemination including statistical bulletin and other quarterly and annual statistical publications and direct access to data .

128. Presently these functions are undertaken by Statistical Division and PADIS.

**B. ORGANIZATIONAL CONSIDERATION OF COMPUTER SERVICES FOR
TRANSPORT, COMMUNICATION AND TOURISM DIVISION (TCTD)**

B.1 HARDWARE ORGANIZATION

129. We assume that TCTD's hardware organization will follow the pattern outlined in paragraph 8.5/a above. Thus, TCTD will have its own LAN served with an appropriate data base server and the division will be linked to ECA-wide LAN's.

**B.2 ORGANIZATION OF SYSTEM DEVELOPMENT, MAINTENANCE AND
ADMINISTRATION**

130. TCTD has a number of options for consideration.

Option one:- Establish a full fledged data processing unit within TCTD which will undertake all the functions outlined in paragraph 8.5/b above.

Major advantage of this option are:

- ✓ direct control over resources (both human and material) can be exercised by the division and thus results in more interest and motivation, provides local independence and sense of responsibility;
- ✓ the division can set priorities without any reference to outside body;
- ✓ the option allows flexible implementation of systems so that the data processing functions can be extended to different activities within the division;
- ✓ the implementation programme can be speeded up due to the fact that other programmes within ECA do not create any impact on TCTD's activities.

The disadvantages of this option should be viewed from ECA-wide context and not from TCTD's view point. The major disadvantages are:

- ✓ duplication of effort;
- ✓ a greater number of technical personnel with the possibility of wastage of resources;

- ✓ lack of standards end up in an environment which becomes difficult to coordinate;
- ✓ in the long run there is a risk of having a system (hardware, software, communications) not compatible among different ECA divisions leave alone other external organizations.

Option two:- ISS undertakes all the tasks outlined in paragraph 8.5/b and TCTD will have no role in the systems development and maintenance activities.

Some of the major advantages of this option are:

- ✓ compatibility of hardware, software and communication links among different sites and installation is achieved;
- ✓ resource usage could be optimized;
- ✓ ECA-wide flexibility of operation to meet unforeseen requirements can be achieved easily;
- ✓ unwarranted decision making by divisions which might not be in the interest of ECA is minimized;
- ✓ duplication of effort is avoided.

Major disadvantages of this option are:

- ✓ resentment of users departments to relinquish authority to a unit outside their control;
- ✓ difficulty in obtaining equitable service;
- ✓ the development and implementation of systems in a centralized facility might take much longer time due to changing priorities.

Option three: Mixture of options one and two. In this option ISS undertake the standardization of hardware, system software, internal and external connections including the administration of WAN's and communication networks and the overall activities related to linkages within and outside ECA, including regions, subregions, member countries and international organizations. On the other hand TCTD shall

build within itself a capability to undertake sector specific systems development, system maintenance, transport data base administration, administration of LAN and provision of all the necessary technical support for user within the division.

131. In today's computing world satisfaction of users' needs is given top priority. If users are not provided with the necessary technical support within a reasonable period of time their work programme will be affected thus creating inefficiency. Therefore, complete centralization of systems development and maintenance should not be sought from the organizational point of view. In this regard appropriate recommendation on organization of system development, maintenance and administration shall be included in Part II of the study.

B.3 ORGANIZATION OF TRANSPORT DATA BASE DEVELOPMENT, MAINTENANCE AND ADMINISTRATION

132. There are two options to be considered. The first option is to maintain the present system whereby Statistics Division undertakes the maintenance and administration of the statistical transport data base and PADIS maintain the non-statistical data base. Under the present scheme TCTD will have the role of user with no authority over dependability, completeness and timeliness of data. The second option is to shift the overall function of transport data base maintenance and administration to TCTD. Under this scheme the Statistics Division and PADIS will continue to be data repositories and TCTD will play the major role of the sectoral data base development.

133. The organizational decision on this issue requires the understanding of Statistics Division's data repository mandate and TCTD's data requirement. At this juncture we would like to reiterate the issues cited in the present transport data collections and associated data gap. One can observe a considerable gap between:

- ✓ present data and TCTD's requirement;
- ✓ SD's data collection objectives and TCTD's objectives;
- ✓ frequency, timeliness, dependability of data vs user needs.

It is therefore apparent that the organizational decision for the development administration and maintenance shall take into account the situations outlined above. Appropriate recommendation on organization of Regional Transport Data Base development, maintenance and Administration shall be provided in part II of the study.

C. DATA COLLECTION AND ANALYSIS OF SELECTED INDICATORS

134. Upgrading of data collection methodologies in ECA, member nations, regions and subregions would be necessary in order to assure the availability of adequate transport statistics. This can be achieved through the improvement of the data collection activities in the national, subregional and regional levels and acquiring and maintaining a modern data collection system by ECA. Some of the key measures that are to be taken to improve the present data collection include:

- ✓ encourage and support the conduct of special surveys at national and regional level that can enable the collection of primary data;
- ✓ experience and information transfer among African countries through specialized workshops and seminars;
- ✓ give the necessary technical and advisory support required in the implementation process of the above activities;
- ✓ undertake in depth study on data base resources within the UN system and specialized agencies so as to identify data that can be incorporated into the Regional Transport Data Base.

135. Transport safety is one of the elements that is required in the monitoring process of UNTACDA II targets. However, transport safety data and indicators identified during the project launching seminar are for the road subsector only. The inclusion of transport safety data and indicator is therefore recommended for railway and ports subsectors in order to fulfil the requirements of UNTACDA II.

136. It is also useful to include basic indicator like GNP together with the population and surface area figures that have been selected in the project launching seminar. This indicator will enable the determination of the share of the transport sector in a country and some indicators required for the evaluation of UNTACDA II.

**TERMS OF REFERENCE
FOR SYSTEMS ANALYSIS SPECIALIST**

In collaboration with the Transport Statistician, the Consultant will undertake the following:

- Briefing at TCTD and preparation of a draft report on existing process which will include inter alia:
- Details analysis of the existing data collection and dissemination of information systems and methods in ECA.
- Current capabilities of the existing systems which include items such as:
 - (i) inventory of hardware, generalized software (system software, data base management system, etc...), application systems and personnel assigned to MIS;
 - (ii) analysis of expense, hardware utilization, software utilization, personnel utilization etc..
 - (iii) status on new information system projects in process; and
 - (iv) linkage between existing system with national, subregional, regional and international transport data bases.

TERMS OF REFERENCE FOR TRANSPORT STATISTICIAN

In collaboration with the System Analysis Specialist, the Consultant will undertake the following:

Briefing at TCTD and preparation of a draft report on existing processes and structures related to transport data base which will include inter alia:

- Analysis of indicators selected by the project launching seminar;
- Identification of data needs regarding the selected indicators to evaluate UNTACDA II progress;
- Identification of transport data users within ECA and at subregional and regional levels;
- Collection of information regarding how existing data collection systems work within ECA (TCTD, subregional and regional data bases) in order to assess its strength and weaknesses (Data gap, frequency availability etc....) To this end, the following will be reviewed:
 - Current capabilities to collect, process and disseminate transport data;
 - Current transport data sources (internal and external); and
 - Current transport data capture modes, types of information and end-users.

ECA'S ROLE IN THE IMPLEMENTATION OF UNTACDA II

A. ECA'S KEY RESPONSIBILITIES UNDER UNTACDA II

2.1 The United Nations General Assembly in its meeting on December, 1988 proclaimed the Second United Nations Transport and Communications Decade in Africa (UNTACDA II) for the period 1991-2000. The basic aim of the programme is to focus both African and international attention towards the development of integrated and efficient transport network so as to achieve success in production and socio-economic growth in Africa.

2.2 Central to the implementation of UNTACDA II programme is the establishment of transport information system so as to effectively monitor the impact of UNTACDA II programme implementation on the socio-economic development of African States. This was clearly reflected in UNTACDA II document. Objective 5 of the document states that

"Establishment of information systems on transport and communications as a basis for analysis and better planning and management of investments".

2.3 The issue of transport statistics was also reflected in the Sub-Saharan Africa Transport Programme (SSATP). The International Advisory Committee of SSATP, during its meeting in Oslo in 1988 adopted, as part of SSATP, a transport data project which led to this study. As stated in the objectives of SSATP's transport data project, the study is expected to develop policies and guidelines to establish user-oriented, transport sector related information system in Sub-Saharan Africa. The preliminary phase of this project is expected to focus on the best data collection methods at national and regional levels, and the establishment of a computerized data base for multi-modal transport statistics at ECA.

2.4 The role of ECA in UNTACDA II programme implementation emanates from the decision by the Conference of African Ministers of Transport, Communications and Planning, a policy-making body for the planning, implementation and monitoring of UNTACDA II programme. The Conference nominated ECA to be the Lead Agency responsible, in cooperation with other agencies, for the preparation of the programme and the harmonization, coordination and monitoring of UNTACDA II activities.

2.5 As a lead agency ECA, in cooperation with other agencies, is responsible for:

- (a) conceptualization and promotion of concerted plans for the orderly development of an integrated Pan-African transport and communication network;
- (b) drawing up of regional plans by integrating subregional ones where they exist and, where they do not, formulating them in cooperation with governments and relevant member of Inter-agency Coordinating Committee (IACC);
- (c) coordination of the overall Decade activities in order to achieve rational, the most cost effective and synchronized development of the networks;
- (d) making proposals for concrete actions for the standardization of systems where necessary;
- (e) rendering technical assistance to the IGO's needing such assistance.

2.6 In the organizational set-up of UNTACDA II's implementation programme, ECA belongs to the following subsectoral working groups and committees.

(a) Sub-sectoral working groups

- . Roads and roads transport (member)
- . Railways (member)
- . Air transport (chairman)
- . Maritime, inland water and multi-modal transport (member)
- . Urban transport (member)
- . Telephone and broadcasting (member)
- . Postal services (member)
- . Manufacturing (Chairman)

ECA together with the other members of the sectoral working group is responsible for: undertaking a baseline assessment of subsectoral transport and communication systems; identifying key issues and constraints relative to UNTACDA II objectives; and recommending sectoral policies, strategies and programmes in response to the existing situation aimed at improving sector performance and build-up related capabilities.

(b) Resources Mobilization Committee (member)

Together with other committee members ECA is responsible for promoting effectively the programme within and outside Africa by elaborating efficient methods of resource mobilization, examining and insuring programme and

projects financial viability, and disseminating information on the decade projects among various financial institutions.

(c) Inter-Agency Coordinating Committee (member)

This is a coordinating committee consisting of all relevant United Nations agencies and African intergovernmental organizations involved in transport and communication in Africa. The committee's main tasks include:

- Provision of recommendation to the Conference of African Ministers on the coherence of the programme;
- monitoring and carrying out periodic evaluation of the programme.

B. ORGANIZATIONAL STRUCTURE OF ECA IN VIEW OF UNTACDA II IMPLEMENTATION

2.7 Although not within the scope of this assignment, it might be relevant to see how ECA is organized in light of the responsibility it shoulders for the implementation of UNTACDA II programme.

2.8 The ECA is organized into ten divisions who report directly to the Executive Secretary, each headed by a Division Chief. These Divisions are:

- Socio-economic Research and Planning;
- Joint ECA/FAO Food and Agriculture;
- Industry and Human Settlement;
- Trade and development Finance;
- Natural Resources;
- Transport, Communications & Tourism;
- Public Administration, Human Resources and Social Development;
- Statistics;
- Population;
- Administration and Conference Services.

In addition to the above, two offices report to the Executive Secretary. These are:

- Economic Cooperation Office which is responsible to MULPOC offices in Niamey, Lusaka, Tangiers, Yaounde and Gisenyi;

Office of the Executive Secretary which embraces office of the Deputy Executive Secretary, Policy and Programming Coordination Office and Technical Assistance Coordination and Operations Office.

2.9 Transport, Communications and Tourism Division, which is the focal point in ECA for the implementation of UNTACDA II programme, is organized into three sections, each section headed by a section chief. The sections are as follows:

(a) Transport Policy Coordination

- . Multimodal
- . Aviation
- . Transport Economist
- . Roads

(b) Communications Section

- . Postal Services
- . Telecommunications

(c) Transport Operations Section

- . Ports
- . Inland Waters
- . Railway

(d) Tourism

- . Tourism

2.10 The organizational structure outlined above is expected to change slightly during the coming months. However, these changes do not affect the responsibilities and the associated activities assigned to TCTD and sections under it.

C. DETAILED ACTIVITIES TO BE UNDERTAKEN BY TRANSPORT, COMMUNICATIONS AND TOURISM DIVISION IN RELATION TO UNTACDA II IMPLEMENTATION

2.11 Given the fact that ECA is a lead agency and transport function as a focal point for the implementation of UNTACDA II programme, a number of activities and programmes have been formulated for the coming years. Thus TCTD's focus will be on assisting African countries in formulating policies and implementing strategies, including the application of appropriate science and technology for the development of efficient transport and communication systems in Africa, with particular emphasis on the implementation of UNTACDA II programme.

2.12 Some of the major activities planned to be executed during 1994-1995 fiscal years only, which require massive data and information are presented below:

2.13 International cooperation: This involves the preparation of reports to meetings of subregional and regional bodies on the Decade programme.

2.14 Parliamentary services: Major activities include:

a) parliamentary documentation which involves the preparation of;

thirteen (13) progress reports on the coordination and harmonization of the Decade programme,

five (5) reports to the Conference of African Ministers of Transport and Communications special and ordinary meetings,

progress reports on the implementation of Yamoussoukro declaration on the new African air transport policy,

progress reports on the Second Transport Decade, database and the Trans-African Highway Bureau,

evaluation report on the Second Transport Decade,

report on the special meeting of the Conference of African Ministers of Transport and Communications,

progress report on the implementation of the Second Transport Decade,

- . annual reports on the Second Transport Decade to the General Assembly;
- b) substantive services involving the preparation and hosting of the Conference of African Ministers of Transport and Communications;
- c) ad hoc expert group meetings involving:
 - . technology transfer in transport and communication aimed at promotion of the African Economic Community;
 - . urban transport development in Africa;
 - . air transport policy and integration in Africa.

2.15 Publications. TCTD produces a number of publications of recurrent and non-recurrent nature. Some of the major ones include:

- . four recurrent publications (newsletters) on the Second Transport Decade;
- . list of approved projects of the Second Decade;
- . twenty six publications on transport and communications traffic facilitation in Africa (policies, problems, issues);
- . financing policies and practices in transport and communication sectors in Africa (including taxation, user fees, joint ventures and private sector financing);
- . institutional reforms and organizational restructuring in transport and communications in Africa;
- . urban transport development in Africa;
- . improvement of maintenance management systems in fields of road, rail and inland waterways transport;
- . cooperation in rail transport in Africa.

2.16 Information materials and services TCTD is expected to produce four press releases on the Second Transport Decade in international journals, as well as create forum on African transport and communications.

2.17 Operational activities: TCTD shall be involved in the provision of advisory services which entail the despatch of missions to African countries and intergovernmental organizations in the various fields of transport and communications in Africa, including multisectoral projects and on the establishment of the African Economic Community. Additionally, four subregional workshops on the Second Transport Decade shall be undertaken within the specified time.

2.18 Coordination, harmonization and liaison. TCTD shall also be involved in the coordination and collaboration with United Nations organizations (UNIDO, UNCTAD, UNDP, IMO, ILO, IBRD, ITU, ICAO) in relation to activities of the Second Transport Decade programme.

2.19 The activities outlined above are, among other things, the driving force which require the need for more accurate and timely transport information.

2.20 An improved flow of transport information that permits more informed and therefore, better understanding among member States, IGO's, subregional and regional organization and the international community at large is required to assess regional requirement and problems and design appropriate development policy and strategy.

2.21 The very essence of this exercise is based on the aim of establishing transport data base in ECA capable of serving the needs outlined above and future requirements.

APPROACH TO THE STUDY

A. MEMBERS OF THE CONSULTANCY TEAM

3.1 The members of the team which undertook the initial fact finding and wrote this report are:

W.M. Gebre Mariam - System Analysis Specialist
Mohammed Jemal - Transport Statistician

B. GENERAL APPROACH

3.2 The fact-finding activities consisted of series of interviews with key personnel associated with multi-sectoral transport functions in TCTD, multi-sectoral statistical functions in SD, ECA's information system development function in ISS and ECA's development information system function in PADIS. Apart from the interview, the consultants undertook review of various reports and documents in TCTD, PADIS, SD, ISS and ECA library.

C. INTERVIEWS

3.3 During our initial fact finding activities we had discussions with many individuals in TCTD, SD, ISS and PADIS. In particular the following individuals were of great assistance.

(a) Transport Communication & Tourism Division (ECA)

1. Mr. Paul T.A. Were
Economic Affairs Officer, Multi-Modal Transport
2. Mr. Daniel Ngangmuta
Transport Economist
3. Mr. E. Dhliwayo
Economic Affairs Officer; Roads
4. Mr. P. Chechekhin
Economic Affairs Officer; Ports

5. Mr. H. Koumare
Economic Affairs Officer; Aviation
6. Mr. Antoine Tchibozo
Economic Affairs Officer; Railways

(b) Statistical Division (ECA)

1. Mr. Arif Farazi, Chief
Statistical Data base
2. Mr. A.K. Amelewonu, Chief,
Economic Statistics Section
3. Mr. Pandit
Senior statistical assistant
Transport, Communication and Agriculture
4. Ms. A.P. Ngwako, associate statistician
Price and Tourism
5. Mr. Teklehaimanot Derso, Senior Statistician, Industry
6. Mr. Melkamu Hagos, Senior Statistician,
Education and Health
7. Mr. Mesfin Tesfaselassie, Senior Statistician,
Demography and Population
8. Mr. Yacob Zewoldi, Senior Statistician, Environment

(c) Information Systems Section

1. Mr. K.T. Mavuba
Computer Operations Officer (ISS)

(d) Pan-African Development Information Systems

1. Mrs. Nancy J. Hafkin
Officer-in-Charge
2. Mr. Lishan Adam
Manager, Capacity Building for Electronic Communication for Africa
Project (CABECA)

D. LIST OF DOCUMENTS AND REPORTS REVIEWED

3.4 The Consultants were provided with the following reports and documents which provided important input for the understanding of the real situation regarding the assignment.

- (a) A transport database for Sub-Saharan Africa
by: K.W. Studnicki-Gizbert and John Heads
- (b) African Transport Database Improvements
- working paper
by: John Heads and Konrad W. Studnicki-Gizbert
- (c) Final Report of the Launching Seminar of the Regional Transport Database Project for Sub-Sahara Africa
- (d) Report on Some Aspects of the Implementation of a Transport Database in Sub-Saharan Africa
by: Mr. Herbert E. Girkes, PADIS/ECA
- (e) UNTACDA II - Towards Africa's Economic Integration
A short profile of UNTACDA II including objectives, strategies, programmes and programme for decentralized implementation.
- (f) Justification for the revision of the Transport Database project entitled "Development of a Transport Database in Sub-Saharan Africa"
- (g) Use of the United Nations Telecommunications Network - Note by the United Nations.
- (h) Various papers and reports submitted to the launching seminar of the regional transport database project for Sub-Saharan Africa.
- (i) PADIS Newsletter - various issues
- (j) Manual on the ICAO Statistics Programme issued
by: International Civil Aviation Authority

- (k) Manual and uniform system of port statistics and performance indicators prepared
by: United Nations Conference on Trade Development (UNCTAD)
- (l) Report to the Union of African Railways on the preparation of programmes for procuring and modernizing rolling stock in Africa
by: Economic Commission for Africa
- (m) Various project paper of PADIS
- (n) Various printouts from Databases in Statistical Division and PADIS
- (o) Conceptual framework for statistical data bases
By: Arif M. Farazi, Statistics Division, UNECA
- (f) Guidelines and standard relating to acquisition, use and support of office automation equipment and software in the United Nations.
- (q) Economic and Social Information Systems in support of sustainable development and Regional Integration in Africa

Proceedings of the Eight Session of the Joint Conference of African Planners, Statisticians and Demographers. (Addis Ababa 21-26 March 1994)

AFRICAN TRANSPORT AND COMMUNICATIONS DATA RECORDED IN STATISTICS DIVISION

Total data recorded during 1988-1992

	<u>COUNTRY</u>	<u>RAILWAY</u>	<u>ROAD</u>	<u>SEA</u>	<u>AIR</u>	<u>COMM.</u>	<u>TOTAL</u>
1.	Algeria	30	40	10	25	30	135
2.	Egypt	30	40	10	25	30	135
3.	Libyan Arab Jemahariya	*	40	10	25	30	105
4.	Morocco	30	40	10	25	30	135
5.	Sudan	30	40	10	25	30	135
6.	Tunisia	30	40	10	25	30	135
7.	Benin	30	40	10	25	30	135
8.	Burkina Faso	30	40	*	25	30	125
9.	Cape Verde	*	40	10	25	30	105
10.	Cote D'Ivoire	30	40	10	25	30	135
11.	Gambia	*	40	10	25	30	105
12.	Ghana	30	40	10	25	30	135
13.	Guinea	30	40	10	25	30	135
14.	Guinea Bissau	*	40	10	25	30	105
15.	Liberia	30	40	10	25	30	135
16.	Mali	30	40	*	25	30	125
17.	Mauritania	30	40	10	25	30	135
18.	Niger	*	40	*	25	30	95
19.	Nigeria	30	40	10	25	30	135
20.	Senegal	30	40	10	25	30	135
21.	Sierra Leone	*	40	10	25	30	105
22.	Togo	30	40	10	25	30	135
23.	Angola	30	40	10	25	30	135
24.	Botswana	30	40	*	25	30	125
25.	Comoros	*	40	10	25	30	105
26.	Djibouti	30	40	10	25	30	135
27.	Ethiopia	30	40	10	25	30	135
28.	Kenya	30	40	10	25	30	135
29.	Lesotho	30	40	*	25	30	125
30.	Madagascar	30	40	10	25	30	135
31.	Malawi	30	40	*	25	30	125
32.	Mauritius	*	40	10	25	30	105
33.	Mozambique	30	40	10	25	30	135
34.	Namibia	30	40	10	25	30	135
35.	Seychelles	*	40	25	30	105	
36.	Somalia	*	40	10	25	30	105

	<u>COUNTRY</u>	<u>RAILWAY</u>	<u>ROAD</u>	<u>SEA</u>	<u>AIR</u>	<u>COMM.</u>	<u>TA</u>
37.	Swaziland	30	40	*	25	30	125
38.	United Rep. of Tanzania	30	40	10	25	30	135
39.	Uganda	30	40	*	25	30	125
40.	Zambia	30	40	*	25	30	125
41.	Zimbabwe	30	40	*	25	30	125
42.	Burundi	*	40	25	30	95	
43.	Cameroon	30	40	10	25	30	135
44.	Central African Republic	*	40	25	30	95	
45.	Chad	*	40	*	25	30	95
46.	Congo	30	40	10	25	30	135
47.	Equatorial Guinea	*	40	10	25	30	105
48.	Gabon	30	40	10	25	30	135
49.	Rwanda	*	40	*	25	30	95
50.	Sao Tome & Principe	*	40	10	25	30	105
51.	Zaire	<u>30</u>	<u>40</u>	<u>10</u>	<u>25</u>	<u>30</u>	<u>135</u>
	TOTAL	1050	2040	370	1275	1530	6265

* The transport mode does not exist in the country.

AFRICAN TRANSPORT AND COMMUNICATIONS DATA RECORDED IN STATISTICS DIVISION

Official National Figures (1988-92)

	<u>COUNTRY</u>	<u>RAILWAY</u>	<u>ROAD</u>	<u>SEA</u>	<u>AIR</u>	<u>COMM.</u>	<u>TOTAL</u>
1.	Algeria	-	-	6	-	-	6
2.	Egypt	3	-	6	2	-	11
3.	Libyan Arab Jemahariya	*	-	6	-	-	6
4.	Morocco	-	-	6	-	-	6
5.	Sudan	-	-	6	25	-	31
6.	Tunisia	-	-	6	-	-	6
7.	Benin	-	-	6	-	-	6
8.	Burkina Faso	26	1	*	-	-	27
9.	Cape Verde	*	-	4	5	-	9
10.	Cote D'Ivoire	1	-	6	-	-	7
11.	Gambia	*	20	6	-	-	26
12.	Ghana	1	-	6	-	-	7
13.	Guinea	1	-	6	-	-	7
14.	Guinea Bissau	-	-	6	-	-	6
15.	Liberia	26	-	6	-	-	32
16.	Mali	1	-	*	-	-	1
17.	Mauritania	1	-	6	-	-	7
18.	Niger	*	-	*	-	-	-
19.	Nigeria	1	-	6	-	-	7
20.	Senegal	1	-	7	-	-	8
21.	Sierra Leone	*	-	6	5	-	11
22.	Togo	1	-	5	-	5	11
23.	Angola	-	-	4	-	-	4
24.	Botswana	7	-	*	-	5	12
25.	Comoros	*	-	3	-	-	3
26.	Djibouti	1	-	6	-	5	12
27.	Ethiopia	6	-	6	-	5	17
28.	Kenya	6	-	6	-	5	17
29.	Lesotho	1	-	*	-	5	6
30.	Madagascar	1	8	6	-	5	20
31.	Malawi	6	-	*	-	5	11
32.	Mauritius	*	-	6	-	5	11
33.	Mozambique	1	-	6	4	5	16
34.	Namibia	5	5	-	-	-	10
35.	Seychelles	*	-	4	-	5	9
36.	Somalia	*	-	3	-	4	7

DOC/DATABASE/PHASE I/TRANSCOM/733

Annex 4

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	<u>COUNTRY</u>	<u>RAILWAY</u>	<u>ROAD</u>	<u>SEA</u>	<u>AIR</u>	<u>COMM.</u>	<u>TOTAL</u>
37.	Swaziland	1	-	*	-	5	6
38.	United Rep. of Tanzania	1	-	6	-	5	12
39.	Uganda	1	-	*	-	-	6
40.	Zambia	-	-	*	-	-	5
41.	Zimbabwe	-	-	*	-	11	11
42.	Burundi	*	-	-	-	5	5
43.	Cameroon	1	-	3	-	5	9
44.	Central African Republic	*	-	*	-	-	5
45.	Chad	-	-	*	-	-	5
46.	Congo	1	-	6	-	5	12
47.	Equatorial Guinea	*	-	6	-	5	11
48.	Gabon	1	-	6	-	5	12
49.	Rwanda	*	-	-	-	5	5
50.	Sao Tome & Principe	*	-	4	-	5	9
51.	Zaire	1	-	6	-	5	12
	TOTAL	104	34	199	52	12	518

* The transport mode does not exist in the country.

AFRICAN TRANSPORT AND COMMUNICATIONS DATA RECORDED IN STATISTICS DIVISION

Estimated Figures (1988-92)

	COUNTRY	RAILWAY	ROAD	SEA	AIR	COMM.	TOTAL
1.	Algeria	30	40	4	20	15	109
2.	Egypt	27	35	4	18	15	99
3.	Libyan Arab Jamahiriya	*	15	4	10	15	44
4.	Morocco	30	40	4	25	15	114
5.	Sudan	30	35	4	-	15	84
6.	Tunisia	30	40	4	25	15	114
7.	Benin	30	35	4	25	15	109
8.	Burkina Faso	4	39	*	25	15	83
9.	Cape Verde	*	25	6	5	10	46
10.	Cote D'Ivoire	29	40	4	25	15	113
11.	Gambia	*	20	4	25	10	59
12.	Ghana	19	40	4	15	15	93
13.	Guinea	19	35	4	-	15	73
14.	Guinea Bissau	*	-	35	4	-	49
15.	Liberia	4	35	4	25	15	83
16.	Mali	29	40	*	25	10	104
17.	Mauritania	14	40	4	25	10	93
18.	Niger	*	35	*	25	15	75
19.	Nigeria	14	35	4	-	15	68
20.	Senegal	29	40	3	25	15	112
21.	Sierra Leone	*	40	4	20	15	79
22.	Togo	29	35	5	23	10	102
23.	Angola	25	35	6	-	15	81
24.	Botswana	13	40	*	15	5	73
25.	Comoro	*	20	7	-	10	37
26.	Djibouti	4	40	4	25	10	83
27.	Ethiopia	24	35	4	25	10	98
28.	Kenya	24	40	4	25	10	103
29.	Lesotho	4	40	*	20	5	69
30.	Madagascar	29	32	4	25	10	100
31.	Malawi	24	40	*	25	10	99
32.	Mauritius	*	9	40	4	20	70
33.	Mozambique	29	20	4	6	10	69
34.	Namibia	3	-	-	-	-	3
35.	Seychelles	*	30	6	25	5	66
36.	Somalia	*	38	5	-	6	49

	COUNTRY	RAILWAY	ROAD	SEA	AIR	COMM.	TOTAL
37.	Swaziland	15	35	*	20	10	80
38.	United Rep. of Tanzania	29	40	4	25	10	108
39.	Uganda	29	40	*	15	10	94
40.	Zambia	30	40	*	25	10	105
41.	Zimbabwe	25	35	*	14	15	89
42.	Burundi	*	40	*	20	5	65
43.	Cameroon	29	40	7	25	5	106
44.	Central African Republic	*	35	25	10	70	
45.	Chad	*	20	*	25	5	50
46.	Congo	29	40	4	25	10	108
47.	Equatorial Guinea	*	20	4	20	10	54
48.	Gabon	4	35	4	25	10	78
49.	Rwanda	*	40	*	25	5	70
50.	Sao Tome & Principe	*	20	6	-	5	51
51.	Zaire	29	35	4	-	10	78
	TOTAL	765	1739	159	886	546	4095

* The transport mode does not exist in the country.

AFRICAN TRANSPORT AND COMMUNICATIONS DATA RECORDED IN STATISTICS DIVISION

Not Available (1988-92)

	<u>COUNTRY</u>	<u>RAILWAY</u>	<u>ROAD</u>	<u>SEA</u>	<u>AIR</u>	<u>COMM.</u>	<u>TOTAL</u>
1.	Algeria	-	-	-	5	15	20
2.	Egypt	-	-	-	5	15	20
3.	Libyan Arab Jemahiriya	*	25	-	15	15	55
4.	Morocco	-	-	-	-	15	15
5.	Sudan	-	5	-	-	15	20
6.	Tunisia	-	-	-	-	15	15
7.	Benin	-	5	-	-	15	20
8.	Burkina Faso	-	-	*	-	15	15
9.	Cape Verde	*	15	*	15	20	50
10.	Cote D'Ivoire	-	-	-	-	15	15
11.	Gambia	*	-	-	-	20	20
12.	Ghana	10	-	-	10	15	35
13.	Guinea	5	5	-	25	15	50
14.	Guinea Bissau	*	-	-	-	25	25
15.	Liberia	-	5	-	-	15	20
16.	Mali	-	-	*	-	20	20
17.	Mauritania	15	-	-	-	20	35
18.	Niger	*	-	*	-	15	75
19.	Nigeria	15	5	-	25	15	60
20.	Senegal	-	-	-	-	15	15
21.	Sierra Leone	*	-	-	-	15	15
22.	Togo	-	-	-	2	15	17
23.	Angola	5	5	-	25	15	50
24.	Botswana	10	-	-	10	20	40
25.	Comoro	*	20	-	25	20	65
26.	Djibouti	20	-	-	-	15	35
27.	Ethiopia	-	-	-	-	15	15
28.	Kenya	-	-	-	-	15	15
29.	Lesotho	20	-	*	5	20	45
30.	Madagascar	-	-	-	-	15	15
31.	Malawi	-	-	*	-	15	15
32.	Mauritius	*	-	-	5	15	20
33.	Mozambique	-	20	-	15	15	50
34.	Namibia	17	35	-	25	30	107
35.	Seychelles	*	10	-	-	20	30
36.	Somalia	*	-	-	25	20	45

	<u>COUNTRY</u>	<u>RAILWAY</u>	<u>ROAD</u>	<u>SEA</u>	<u>AIR</u>	<u>COMM.</u>	<u>TOTAL</u>
37.	Swaziland	14	-	*	5	15	34
38.	United Rep. of Tanzania	-	-	*	-	15	15
39.	Uganda	-	-	*	10	15	25
40.	Zambia	-	-	*	-	15	15
41.	Zimbabwe	5	5	*	-	15	25
42.	Burundi	*	-	*	5	20	25
43.	Cameroon	-	-	-	-	20	20
44.	Central African Republic	*	5	*	-	15	20
45.	Chad	*	20	*	-	20	40
46.	Congo	-	-	-	-	15	15
47.	Equatorial Guinea	*	15	-	5	15	35
48.	Gabon	20	5	-	-	15	40
49.	Rwanda	*	-	-	-	20	20
50.	Sao Tome & Principe	*	20	-	25	20	65
51.	Zaire	-	5	-	25	15	45
	TOTAL	156	230	-	337	855	1578

* The transport mode does not exist in the country.

AFRICAN TRANSPORT AND COMMUNICATIONS DATA RECORDED IN STATISTICS DIVISION

In significant data (1988-92)

	<u>COUNTRY</u>	<u>RAILWAY</u>	<u>ROAD</u>	<u>SEA</u>	<u>AIR</u>	<u>COMM.</u>	<u>TOTAL</u>
2.	Egypt	-	5	-	-	-	5
13.	Guinea	5	-	-	-	-	5
14.	Guinea Bissau	-	5	-	-	-	5
18.	Niger	-	5	-	-	-	5
22.	Togo	-	5	-	-	-	5
26.	Djibouti	5	-	-	-	-	5
27.	Ethiopia	-	5	-	-	-	5
29.	Lesotho	5	-	-	-	-	5
34.	Namibia	5	-	10	-	-	15
36.	Somalia	-	2	2	-	-	4
37.	Swaziland	-	5	-	-	-	5
47.	Equatorial Guinea	-	5	-	-	-	5
48.	Gabon	5	-	-	-	5	5
	TOTAL	25	37	12	-	-	74

* The transport mode does not exist in the country.

PERFORMANCE INDICATORS FOR THE EVALUATION OF UNTACDA II

RAOD TRANSPORT SECTOR PERFORMANCE INDICATORS FOR UNCTADA II

A	GOALS AND TARGETS	INDICATORS	UNIT	AVAILABILITY	COMMENTS
1	Improvement of international traffic facilitation through, inter alia, ratification and implementation of effective international transport service agreements based on commercial interests	<ul style="list-style-type: none"> - Number of subregions which established subregional service agreements based on facilitation and competitiveness - Number of countries in each subregions which ratified and implement these service agreements 	NO NO	A A	But needs survey
2	Development in the majority of countries of efficient axle-load control	- Number of countries with efficient mechanism for axle-load control	NO	A	
3	Increasing traffic facilitation	- Delay for main transit corridors	Hour, days	A	Needs some survey
4	Reduction of road transport costs by 10 percent	<ul style="list-style-type: none"> - Vehicle operating costs by classes of vehicle - Current tariff for main transit corridors 	MU/KM MU/KM	NA NA	Needs survey Needs survey

ROAD TRANSPORT SECTOR (CON'T)

B	Indicators for Planning and macro-economic analysis not foreseen by programme of UNCTADA II	Indicators	Unit	Availability	Comments
1	- Importance of road industry sector	- Vehicle registration in year - Number vehicles per 1000 ha - Number vehicles per paved roads km Total freight traffic - international - national	NO NO/HA NO/KM Tons Tons and TKM	A A A NAA NAA	Needs gut survey
2	- General information about road transport and economic development level and policy	- Number of vehicles per millions \$ GNP - Share of road industry transport in total budget Road transport user charges - Fuel tax per litre for gasoline and diesel Freedom on tariff fixation	NO/MU Percent MU Percent Percent	A A NA A A	
3	- General information about				
	(a) STRUCTURE OF THE PROFESSION (a) ¹ Public Service - Owner Operators - Companies (a) ² Own Account (a) ³ Companies	Fleet number and Capacity Fleet number and capacity Fleet number and capacity	No and Tons " " "	NA NA NA NA	Needs Survey " " "

ROAD TRANSPORT SECTOR (con't)

	GOALS AND TARGETS	INDICATORS		AVAILABILITY	COMMENTS
	b) <u>OPERATION CHARACTERISTICS</u>	Vehicle fleet on road (by classes of vehicle) vehicle age (by type)	no year	na	Needs survey
		Vehicle loading capacity (by classes of vehicle)	[Percent]	na	"
	c) <u>FLEET UTILIZATION</u>	- Load factor average km per year per class of vehicle	km	na	"
	d) <u>ROAD TRANSPORT SAFETY</u>	Number of death per 10.000 vehicles Nnumber of death per 100.000 ha		na	"
1	Construction of 15,000 km classified main roads	Length of constructed classified main roads and total length of classified roads	KM	A	Needs harmonization
2	Rehabilitation of 200,000 km of rural roads	Length of rehabilitated rural roads and roral length of rural roads	KM	NAA	Needs harmonization of definition of rural roads and sometimes inventory
3	Rehabilitation of: (i) 85 percent of paved roads (ii) 40 percent of unpaved roads (iii) 25 per cent of rural roads	Lenth of these type of roads maintained and rehabilitated and total length of these type of roads Percent of good, fair, poor for each type of roads	Percent	A NAA	Often existing, not always reliable, may need specific surveys

RAOD SECTOR PERFORMANCE INDICATORS FOR UNCTADA II

A	GOALS AND TARGETS	INDICATORS	UNIT	AVAILABILITY	COMMENTS
4	Implementation of efficient maintenance systems covering at least the rehabilitated network, with emphasis on promoting small and medium-scale indigenous road maintenance enterprises	Budget allocation (amount, per km) and ratio for: - construction/rehabilitation - rehabilitation/periodic maintenance (pm) - pm/routine maintenance (rm) - rm/total budget		Percent	Needs analysis and needs survey
		Road user charges sufficiency; ratio; fuel taxes/fuel price	Percent	A	
		Ratio rehabilitation and maintenance budget total financing requested for maintenance and rehabilitation	Percent		
		Unit cost for the 4 categories of work:	MU/KM	a	
		Ratio: contracting amount/force acct. contracting	Percent	A	
		Number of private enterprises qualified for road rehabilitation and maintenance	MP	A	
		Number of professional and technicians	No		
		- number of total worker			
		- ratio total staff km of roads maintained	Percent		
		- ratio: professional and technicians/total staff	Percent		

ROAD SECTOR (con't)

	GOALS AND TARGETS (UNTACDA)	INDICATORS	UNIT	AVAILABILITY	COMMENTS
5	Reduction of road accidents by 25 percent	- Deaths per 10,000 vehicles - Deaths per 100,000 HA	No No	NAA NAA	Needs analysis of police reports
(B)	Indicators for macro-economic analysis and planning not foreseen by programme of UNTACDA II				
	-General information of importance of road network	-Length classified road network per 100 km ² area -Length classified road network per 1000 ha	KM/KM KM/HA	A A	
	-General information about road network and economic development level and policy	-Lenght classified road network per million \$ GNP -Percent roads budget in total national budget	KM/MU Percent	A	Needs Analysis of Financial Report of parastatal enterprises

RAILWAYS TRANSPORT INDICATORS FOR UNTACDA II

GOALS AND TARGETS	INDICATORS	UNIT	AVAILABILITY	COMMENTS
(a) Through improvement of railway services it is expected that rail traffic will increase by 3 per cent for freight and 2 per cent for passengers	- Freight traffic [ton x km, and ton] - Passenger traffic [passenger x km, and in passenger]	Ton and tkm P and PKM	A A	
(b) Availability of locomotives should be at least 70 percent of the projected total fleet at the end of the decade the numbers of breakdowns per 100,000 km should be reduced by 50 per cent and average sum per locomotive should be increased by 30 percent.	- Locomotive availability - Numbers of breakdowns per 100,000 km - Locomotive productivity (traffic units per loco x hour) or - Locomotive total output utilization factor (gross ton x km per loco x hour)	Percent no TU/H/LO CO TKM/H/L OCO	A NAA A A	But needs harmonization of definitions
c) wagon and passenger car productivity should be increased by 30 per cent	- wagon productivity indicator (ratio tk/total capacity of the fleet) or - net coach productivity (ratio: passenger x km/total capacity of the fleet in seats)	tk/t pk/s	a a	coach availability
d) Average cost per unit/km should be reduced by 30%	Cost per traffic unit km	MU/TU	A	Needs harmonization of definitions. $tu = \frac{tk + pk}{2}$

RAILWAYS SECTOR (con't)

GOALS AND TARGETS	INDICATORS	UNIT	AVAILABILITY	COMMENTS
(e) Human resources productivity expressed in unit/km per staff should be raised by at least 40 per cent	Number of traffic units per total staff	no	A	
(f) During the decade, at least 25 percent of the existing track should be either partially or totally renovated (about 8,000 km)	Ratio: length of renovated track/total length of track - Total length completely renovated	Percent km	A	Beeds good definition of renovated track
(g) By the end of decade, every railway corporation should seek to establish formal relationships with governments through contract plan or memorandum of understanding clearly spelling out the role of the railway and the state. each railway plan of action should be spelt out in the corporate plan.	At each phase of decade: number of railway with contract plan of memorandum	no	A	
(h) Training courses of railway managers should be established in four african subregions	African subregions where these courses are established	A		
(i) Greater attention should be given to environment impact of railways				Still to be defined
(j) Railway safety should be increased by at least 10 per cent	- Number of accidents resulting in death or injury - deaths and injuries per locomotives	A A		

RAILWAYS SECTOR (con't)

GOALS AND TARGETS	INDICATORS	UNIT	AVAILABILITY	COMMENTS
(k) Development of african manufacturing capability should be accelerated	- Assessment of manufacturing capability			Needs survey
<u>Indicators for macro-economic analysis and planning not foreseen by programme of untacda II</u>				
- Importance of railway transport	- Length of railway per 1 000 ha, and per 100 km ²		A	Needs good survey
	- Percentage of intercity freight traffic (all modes moved by rail)		A	
	- Total railways Transport/total Transport all modes		A	
-General information about railway transport and economic development level and policy	- Length railway per million \$ GNP	Km/\$	A	
	- Ratio railway budget/total transport sector budget	Percent	A	
	- Percent passenger revenue as total revenue	Percent	A	
- Revenue and financial indicators	- Freight revenue per TKM	MU/TK	A	
	- Revenue per seat x km	MU/SK	A	
	- Revenue per pk	MU/TK	A	
	- Working ratio	Percent	A	
	- Operating ratio	Percent		
	- Net income	[Percent t]		

PORT AND MARITIME TRANSPORT (SHIPPING)
INDICATORS FOR UNTACDA II

GOALS AND TARGETS	INDICATORS		AVAILABILITY	COMMENTS
i Establishing of African maritime information center	phae of project			
ii Shipping				
(a) To achieve equitable participation in sea-borne liner trade under conditions of united nations code of conduct for liner conferences	- Percent liner maritime traffic by conference national fleets in total national liner maritime traffic of conferences (in tons and value)	Percent	naa	needs analysis
(b) To increase significantly the participation of national fleets in non liner trade under conditions of untacda resolution 120 (v)	- Percent non liner traffic by national fleets in total non liner-national maritime traffic	Percent	naa	"
(c) To increase the competitiveness of national fleets through modernization and adaptation of tonnage to trading requirements and through adaptation of management techniques leading to reduced units costs of transport	- Nunumber, type and age of each ship of the fleets - Tonnage of competitive vessels of african owner/total tonnage of competitive vessels (containers ship ro-ro) in maritime transport of each country	No Year	a	needs analysis of financial results of maritime enterprise
(d) To increase significantly the level of ownership and control by African countries of competitive tonnage adapted to the equipments of african trade				

PORTS INDICATORS FOR UNTACDA II

	GOALS AND TARGETS	INDICATORS	UNIT	AVAILABILITY	COMMENTS
III	<p>Ports</p> <p>To increase the productivity of african seaports</p> <p>To reduce the time both cargo and ships spend in ports</p> <p>To reduce cargo losses due to damage and pilferage:</p> <p>To reduce port costs per ton of cargo handling (for ship)</p> <p>To improve the maintenance of port equipment so that the down time of equipment is reduced:</p>	<p>(a) Gross berth occupancy (general cargo, containers, vrac-solid, vrac-liquid).</p> <p>(b) Handling performance per working hour.</p> <p>(c) Handling performance for containers.</p> <p>(a) Average time at berth (general cargo, containers, dry</p> <p>(b) Cargo's time in port: total time the cargo spends in the port from the moment it enters to the moment it leaves the port/total volume of cargo handled by the port.</p> <p>(a) Information on financial losses due to damage and pilferage</p> <p>(a) Total cost (port charges+ship's time+stevedoring+tallying+shore handling)/total tonnage handled</p> <p>(a) Utilization of cargo handling equipment: de facto availability of major types of equipment/planned availability of this equipment</p>		<p>naa</p> <p>naa</p> <p>naa</p> <p>naa</p> <p>naa</p> <p>naa</p> <p>naa</p>	<p>needs harmonization</p> <p>needs survey</p> <p>needs survey</p> <p>needs survey</p>
IV	Indicators for planning and macro-economic analysis not foreseen by programme of untacda ii	<p>- Number and capacity of seaports</p> <p>- Total tons loaded in African ports</p> <p>- Total tons unloaded in African ports</p> <p>- Total containers handled by African ports</p>		<p>A</p> <p>A</p> <p>A</p> <p>NAA</p>	

DATA NEEDS OF SELECTED TRANSPORT PERFORMANCE INDICATORS

1. ROAD SUB-SECTOR

General Information

- Total population of the country
- Total surface area of the country (KM²).

Road Inventory

- Length of road network by condition (km)
 - . good
 - . fair
 - . poor
- Length of road network by surface type (km)
 - . paved
 - . unpaved
- Length of road network by classification (km)
 - . Highway-main or national roads
 - . secondary or regional roads
 - . others

Road budget and expenditure

- Total road budget (US\$)
- Total national investment budget (US\$)
- Total road expenditure (US\$)
- Road budget allocation by type of activity (amount/km)
 - . Construction
 - . Rehabilitation
 - . Periodic maintenance
 - . Routine maintenance
- Expenditure for personnel (US\$).
- Actual road expenditure by type of activity (US\$)
 - . Construction
 - . Rehabilitation

- . Periodic maintenance
 - . Routine maintenance
- Budget required by type of Activity (US\$)
 - . Construction
 - . Rehabilitation
 - . Periodic maintenance
 - . Routine maintenance
- Total amount of road investment on force account (US\$)
- Total amount of road investment on contracting (US\$).
- Total amount of road investment in sub-contracting (US\$)
- Donors contribution to the road sector (US\$).

Funding Mechanism

- Amount of funding from road general sufficiency (US\$).
- Amount of funding from road user charges sufficiency (US\$).
- Road user taxes.
 - . Taxes on acquisition
 - . Import and other related dues
 - . Ownership of vehicles annual taxes
 - . Driving license fees
 - . Taxes on use
 - . Tolls
 - . Other special taxes.
- Road fund (Y/N)
- Average contractor payment delay (month).

Motor Fuels

- Fuel price per litre (US\$)
 - . petrol
 - . Diesel
- Fuel tax per litre (US\$)
 - . petrol
 - . Diesel
- Annual fuel consumption in metric tons

- . petrol
- . Diesel

Highway Authority Personnel

- Number of employees
 - . Professional
 - . Technicians
 - . Workers

Management (Y/N)

- Procurement efficient
- Road data base
- Cost accounting
- Supervision/monitoring
- Maintenance Management Systems

Equipment

- Total quantity of equipment required by the Highway Authority by type or category.
- Total quantity of equipment available by type or category.
- Total cost of equipment rented by the Highway Authority (US\$).
- Total equipment and related costs of the Highway Authority (US\$).
- Average age of equipment by type (month or year).

II ROAD TRANSPORT SUB-SECTOR

Total freight traffic

- Total dry cargo traffic (ton, Tkm)
 - . International
 - . National

- Total liquid cargo traffic (ton, tkm)
 - . International
 - . National

Structure of profession

- Total vehicle fleet size of public service Enterprises
 - . Owner operators
 - . Companies
- Total vehicle fleet size of own account enterprises
- Total vehicle fleet size of parastatals.

Vehicle fleet

- Total number of vehicles by vehicle class (Number)
 - . class 1 (private cars)
 - . class 2 (Taxis)
 - . class 3 (Mini Buses)
 - . class 4 (Buses)
 - . class 5 (Small trucks)
 - . class 6 (Medium trucks)
 - . class 7 (Heavy trucks)
 - . class 8 (Trailers and semi trailers)
 - . class 9 (others)
- Total vehicle load capacity by vehicle class (No or ton)
 - . class 1 (private cars)
 - . class 2 (Taxis)
 - . class 3 (Mini Buses)
 - . class 4 (Buses)
 - . class 5 (Small trucks)
 - . class 6 (Medium trucks)
 - . class 7 (Heavy trucks)
 - . class 8 (Trailers and semi trailers)
 - . class 9 (others)

- Average fleet age by vehicle class (yrs)
 - . class 1 (private cars)
 - . class 2 (Taxis)
 - . class 3 (Mini Buses)
 - . class 4 (Buses)
 - . class 5 (Small trucks)
 - . class 6 (Medium trucks)
 - . class 7 (Heavy trucks)
 - . class 8 (Trailers and semi trailers)
 - . class 9 (others)

Fleet utilization

- **Load factor^{2/}**
- Empty trucks as proportion of all trucks using major routes^{3/} towards the capital of the country or inwards (%).
- Average load for trucks carrying goods towards the capital of the country or inwards (tons).
- Empty trucks as proportion of all trucks using major routes from the capital of the country or outward (%).
- Average load for truck carrying goods from the capital of the country or outwards (tons).
- Total load capacity of the truck.

Vehicle operating costs and road transport tariff

- Total vehicle operating cost per km (by vehicle class).
 - . class 1 (passenger cars)
 - . class 2 (buses)

2/ The information sources are origin and destination conveyed.

3/ Roads mainly radiating from the capital of a given country.

- . class 3 (trucks)
 - . class 4 (pickups)
 - . class 5 (trailers)
 - . class 6 (motorcycles)
- Total spare parts cost per km (by vehicle class).
 - . class 1 (passenger cars)
 - . class 2 (buses)
 - . class 3 (trucks)
 - . class 4 (pickups)
 - . class 5 (trailers)
 - . class 6 (motorcycles)
- Current freight transport prices (tariff) for major routes^{4/} (monetary unit per tkm).
- Current passenger transport prices (tariff) for major routes (monitory unit per tkm).
- Road transport delay for main international roads (hrs/days).

Financing

- Road transport user charges (monitory unit).
- Budget allocated for road transport sub-sector (US\$).

Rules or Regulations

- Freedom in access to the profession (Y/N).
- Agreement and facilitation procedures of transit with neighboring countries (Y/N).
- Number of road transport controls on main road.
- Freedom on tariff fixation (Y/N).

^{4/}Inparticu~~for~~international roads.

3. ROAD SAFETY

Prevention (Y/N)

- Existence of national road safety coordinator Committee
- Effective national accident data collection system operating.
- Effective accident reduction programs being implemented.
- Existence of technical control centre.

Fatalities and Training

- Total number of deaths per annum.
- Number of driving school
- Existence of training center for truck drivers (Y/N).

4. RAILWAY SUB-SECTOR

General Information

- Total length of railway route (km)
- Total freight ton kilometer (Tkm)
- Total passenger kilometer (Pkm)
- Total seat kilometer (skm).

Locomotive utilization and availability

- Locomotive availability (percentage)
- Locomotive reliability, kilometer between failure (km).
- Annual kilometrage per available locomotives (km)
 - . Number of available locomotives
 - . Total annual kilometrage of available locomotives (km).
- Locomotive total output utilization factor (tkm/locomotive x hrs).
 - . Total output of locomotives (gross ton x km = Tkm)
 - . Utilization of locomotives (locomotives x hrs = lhrs).

- Locomotive productivity ($Tu / \text{locomotives} \times \text{hrs}$).
 - . Total locomotive ton kilometer (tkm)
 - . Total locomotive passenger kilometer (pkm)
- Total locomotive hours ($\text{loco} \times \text{hrs}$).

Wagon utilization and availability

- Wagon available (percentage).
- Duration of wagon turnaround, number of days between two successive loadings (days).
- Annual kilometrage per available wagon (km).
 - . Total number of available wagons
 - . Total annual kilometrage of available wagons (km).
- Average wagon load for loaded wagons (tons).
- Empty back haul factor (percentage).
- Wagon productivity indicator.
 - . Average annual wagon ton kilometer (km)
 - . Total capacity of wagon fleet (tons).

Coach utilization and availability

- Passenger coach availability (percentage).
- Annual kilometrage per available coach.
 - . total number of available passenger coaches
 - . total annual kilometrage of available passenger coaches (km).
- Average gross trailing load of freight trains (tons).
- Average net load of freight trains (tons).
- Passenger train occupancy ratio per type of service (percentage).
 - . sleeping cars and couchettes

- . first class
- . second class
- . third class
- . baggage vans.

Staff productivity

- Traffic units per staff. (number)
- Total number of employees of the railway organization.

Financial Performance

- Passenger revenue as total of revenue (percentage)
 - . Total revenue from passengers (US\$).
 - . Total revenue of the railway organization (passenger + freight US\$).
- Freight revenue per ton kilometer (US\$).
 - . Total freight revenue (US\$)
- Passenger revenue per seat kilometer (US\$).
- Revenue per passenger kilometer (US\$).
- Operating income (US\$)
- Operating expense (US\$)
- Depreciation (US\$)
- Return on assets (%)

5. PORTS SUB-SECTOR

Traffic

- Number of vessels by type

- . General cargo
 - . Containers carriers
 - . Dry-bulk
 - . Liquid-bulk
- Total outbound traffic by type of cargo (tons)
 - . General cargo
 - . Containers carriers
 - . Dry-bulk
 - . Liquid-bulk
- Out of which transit (tons)
 - . General cargo
 - . Containers carriers
 - . Dry-bulk
 - . Liquid-bulk
- Total inbound traffic by type of cargo (tons)
 - . General cargo
 - . Containers carriers
 - . Dry-bulk
 - . Liquid-bulk
- Out of which transit (tons)
 - . General cargo
 - . Containers carriers
 - . Dry-bulk
 - . Liquid-bulk
- Transshipment traffic (tons)
- Transit traffic (tons)
- Container traffic (TEU'S)
 - . Domestic
 - . Transit
 - . Transhipped

Port Operation performances

- Gross berth occupancy by type of berth (%)
 - . General cargo
 - . Containers carriers
 - . Dry-bulk
 - . Liquid-bulk
- Average waiting time in port before berthing (hrs)
 - . General cargo
 - . Containers carriers
 - . Dry-bulk
 - . Liquid-bulk
- Average waiting time in port after berthing (hrs).
 - . General cargo
 - . Containers carriers
 - . Dry-bulk
 - . Liquid-bulk
- Average time at berth by type of good (hours or days)
 - . General cargo
 - . Containers carriers
 - . Dry-bulk
 - . Liquid-bulk
- Average tons loaded per ship in berth per day (tons/ship/day).
- Average tons unloaded per ship in berth per day (tons/ship/day).
- Handling performance by type of goods per working hour (Tons/gang/hour).
- Tonnage handled by type of quays per linear meter of quay (Tons/meter).
- Average daily handling performance by type of berth for containers (TEU's per ship in berth).

- Degree of containerization (percentage).
- Handling performance for containers (TEU/crane/hour).
- Average dwelt time for containers (days).

Financial Performance

- Operating income (US\$)
- Operating expenses (US\$)
- Depreciation^{5/} (US\$)
- Return on Assets (percentage).

^{5/} The method of calculation for depreciation has to be mentioned

TRANSPORT DATA USERS IN SUB-REGIONAL, REGIONAL AND INTERNATIONAL LEVELS

ORGANIZATIONS

- | | | |
|-----|---|-----------|
| 1. | PREFERENTIAL TRADE AREA SECRETARIAT | PTA |
| 2. | MANO RIVER UNION | MRU |
| 3. | ORGANIZATION OF AFRICAN UNITY | OAU |
| 4. | COMMISSION OF THE EUROPEAN COMMUNITIES | EEC |
| 5. | PREFERENTIAL TRADE AREA BANK | PTA BANK |
| 6. | UNITED NATIONS DEVELOPMENT PROGRAMME | UNDP |
| 7. | PAN-AFRICAN POSTAL UNION | PAPU |
| 8. | AFRICAN CIVIL AVIATION COMMISSION | AFCAC |
| 9. | ARAB MARITIME TRANSPORT ACADEMY | AMTA |
| 10. | PAN AFRICAN TELECOMMUNICATIONS UNION | PATU |
| 11. | PORT MANAGEMENT ASSOCIATION FOR WEST AND CENTRAL AFRICA | PMAWCA |
| 12. | ECONOMIC COMMUNITY OF WEST AFRICAN STATES | ECOWAS |
| 13. | AFRICAN AIRLINES ASSOCIATION | AFRAA |
| 14. | AFRICAN DEVELOPMENT BANK | ADB |
| 15. | MINISTERIAL CONFERENCE FOR WEST AND CENTRAL AFRICAN STATES IN THE FIELD OF MARITIME TRANSPORT | MINCONMAR |
| 16. | UNION OF AFRICAN RAILWAYS | UAR |
| 17. | SOUTHERN AFRICAN TRANSPORT AND COMMUNICATIONS COMMISSION | SATCC |

18.	ARAB BANK FOR ECONOMIC DEVELOPMENT IN AFRICA	BADEA
19.	INTERNATIONAL CIVIL AVIATION ORGANIZATION	ICAO
20.	INTERNATIONAL MARITIME ORGANIZATION	IMO
21.	UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION	UNESCO
22.	FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS	FAO
23.	INTERNATIONAL TELECOMMUNICATIONS UNION	ITU
24.	UNITED NATION CONFERENCE ON TRADE AND DEVELOPMENT	UNCTAD
25.	INTERNATIONAL LABOUR OFFICE	ILO
26.	VIENNA INSTITUTE FOR DEVELOPMENT AND COOPERATION	VIDC
27.	AFRICAN, CARIBBEAN AND THE PACIFIC SECRETARIAT	ACP
28.	UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION	UNIDO
29.	WORLD FOOD PROGRAMME	WFP
30.	AGENCY FOR INTERNATIONAL DEVELOPMENT	AID
31.	SWEDISH INTERNATIONAL DEVELOPMENT AUTHORITY	SIDA
32.	ORGANIZATION OF PETROLEUM EXPORTING COUNTRIES	OPEC
33.	UNITED NATIONS SUDANO-SAHELIAN OFFICE	UNSO
34.	DEPARTMENT OF TECHNICAL COOPERATION FOR DEVELOPMENT	DTCD

- | | | |
|-----|---|-------------|
| 35. | REGIONAL COMMISSION LIAISON UNIT UNITED NATIONS HQ | |
| 36. | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | IBRD |
| 37. | THE CANADIAN INTERNATIONAL DEVELOPMENT AGENCY | CIDA |
| 38. | ABU DHABI FUND FOR ARAB ECONOMIC DEVELOPMENT | |
| 39. | ISLAMIC DEVELOPMENT BANK | IDB |
| 40. | EXPORT-IMPORT BANK OF THE UNITED STATES | EIBUS |
| 41. | SAUDI FUND FOR DEVELOPMENT | SFD |
| 42. | ARAB FUND FOR ECONOMIC AND SOCIAL DEVELOPMENT | AFESD |
| 43. | EUROPEAN INVESTMENT BANK | EIB |
| 44. | KREDITANSTALT FUR WIEDERAUFBAU | KFW |
| 45. | INTERGOVERNMENTAL AUTHORITY ON DROUGHT AND DEVELOPMENT | IGADD |
| 46. | TRANSIT CO-ORDINATION AUTHORITY FOR THE NORTHERN CORRIDOR | TTCA |
| 47. | INTERNATIONAL AIR TRANSPORT ASSOCIATION | IATA |
| 48. | INTERNATIONAL ROAD FEDERATION | IRF |
| 49. | ECONOMIC COMMUNITY OF WEST AFRICAN STATES FUND | ECOWAS FUND |
| 50. | KAGERA BASIN ORGANIZATION | KBO |
| 51. | NATIONAL CIVIL AVIATION TRAINING | |

	ORGANIZATION OF EGYPT	NCATO
52.	INTERGOVERNMENTAL STANDING COMMITTEE ON SHIPPING	ISCOS
53.	EASTERN AND SOUTHERN AFRICA MANAGEMENT INSTITUTE	ESAMI
54.	ASSOCIATION POUR LA SEAIRTE DE LA NAVIGATION AERIENNE EN AFRIQUE	ASECNA
55.	ORGANISATION POUR LA MISE EN VALEUR DU FLEURE SENEGAL	OMVS
56.	UNION DOVANIERE DES ETATS ETE L'AFRIQUE CENTRALE	UDEAC
57.	ORGANISATION COMMUNE AFRICAINE	OCAM
58.	COMMISSION DU BASIN DU LACK TCHAD	COBALT
59.	INDIAN OCEAN COMMISSION	IOC
60.	CENTRE D'ETUDES OU TRANSPORT POUR LA MEDITERRANEE ACCIDENTALE	CETMO
61.	COMMUNAUTE ECONOMIQUE DES ETATS DE L'AFRIQUE DU CENTRE	CEEAC
62.	UNION AFRICAINE DES POSTES ET TELECOMMUNICATIONS	UAPT
63.	UNION DES RADIODIFFUSIONS ET TELECOMMUNICATIONS	URTNA
64.	UNIVERSAL POSTAL UNION	UPU
65.	COMMUNATE ECONOMIQUE DES PAYS DES GRANDS LACS	CEPGL
66.	COMMUNAUTE ECONOMIQUE DE L'AFRIQUE DE L'OUEST	CEAO
67.	BANQUE DE DEVELOPPEMENT DES ETATS DE	

L'AFRIQUE CENTRALE

BDEAS

68. COMITE PERMANENT INTER-ETATS DE
LUTTE CONTRE LA SECHERESSE
DANS LE SAHEL

CILSS

**TYPES OF PC's AND ACCESSORIES, AND THEIR ALLOCATION TO VARIOUS
DIVISIONS IN ECA
NUMBER OF MICRO-COMPUTERS IN EACH DIVISION
WITHIN ECA**

Division	Number of PC's	No. of Printer
1. Administration & Conference Services Division	195	186
2. African Training & Research Center for Women	9	9
3. Carinate Office of the Executive Secretary	52	49
4. Industry & Human Settlement Division	29	27
5. Joint ECA/FAO Regional Advisory Group	26	26
6. Multi-disciplinary Advisory Group	10	8
7. Natural Resources Division	24	24
8. Public Adm., Human Resources and Social Dev.	24	24
9. Population Division	12	12
10. Socio-economic Research and Planning Division	24	23
11. Statistics Division	26	25
12. T.Assistance Coordination and Operation Office	16	12
13. Transport, Communications & Tourism Division	23	22
14. Trade Development and Finance Division	<u>18</u>	<u>18</u>
Total:	<u>488</u>	<u>465</u>

Source: ISS

	<u>Quantity</u>
NCR 925	31
NCR 386 SX	368
IBM 486	5
IBM M-507	25
IBM Mod.I 8558	1
IBM M-30286	13
IBM M-50	15
IBM M-70 (386)	5
IBM M-80 (386)	1
IBM M-60	3
IBM M-55 SX	5
Vectra	4
Wang	1
NCR SYS 3200	1
Laptop	1
Others	<u>9</u>
Total	<u>488</u>

Source: ISS

TYPES OF MONITORSMonitors

NCR VGA Color monitor	403
IBM M-8503	39
Zenith	15
IBM P/S 2	2
IBM M-8512	15
IBM M-8512	6
Easy Data	1
NEC	1
Vectra	4
Wang	1
Viking	1
IBM Monitor	10
Laser Master Monitor	1
LM GS 1280	1
Viewsonic 6FS	<u>1</u>

Total: 501

Source: ISS

TYPES OF PRINTERS

HP Desk Jet 500	315
HP Laser Jet IIP	58
HP LJ series II	16
HP Laser Jet III	37
Laser Master	3
HP Desk Jet plus	10
Epson LQ-1050	4
Epson LQ-850	10
NEC	9
IBM	2
Others	<u>1</u>

Total: 465

Source: ISS