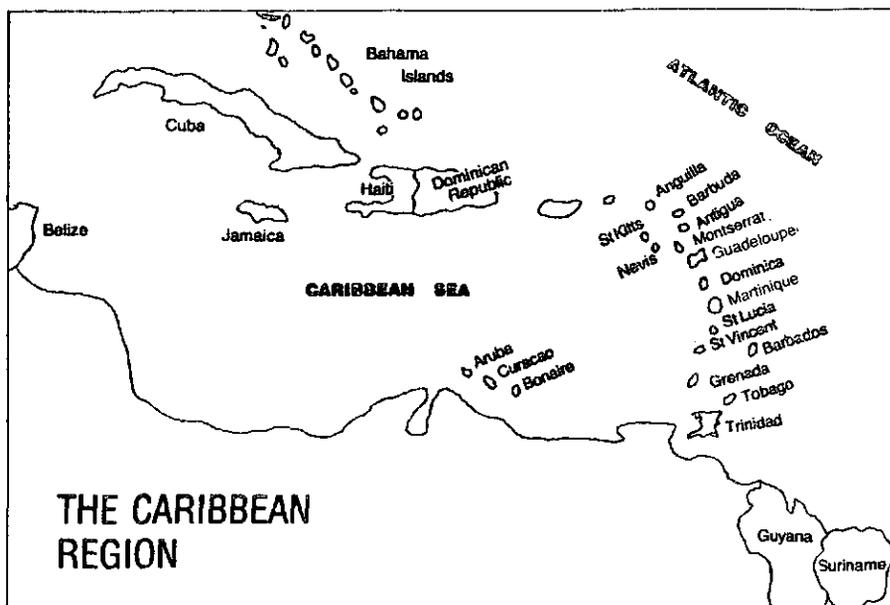


CARIBBEAN
DEVELOPMENT
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COMMITTEE



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 CARIBBEAN DEVELOPMENT AND CO-OPERATION COMMITTEE



REPORT ON
 AN AGENDA FOR TRANSPORTATION PLANNING
 IN THE CARIBBEAN
 (For the Working Group in Transportation Planning
 Caribbean Development and Co-operation Committee)

Prepared by
 Winston Dookeran



UNITED NATIONS

ECONOMIC COMMISSION FOR LATIN AMERICA Office for the Caribbean

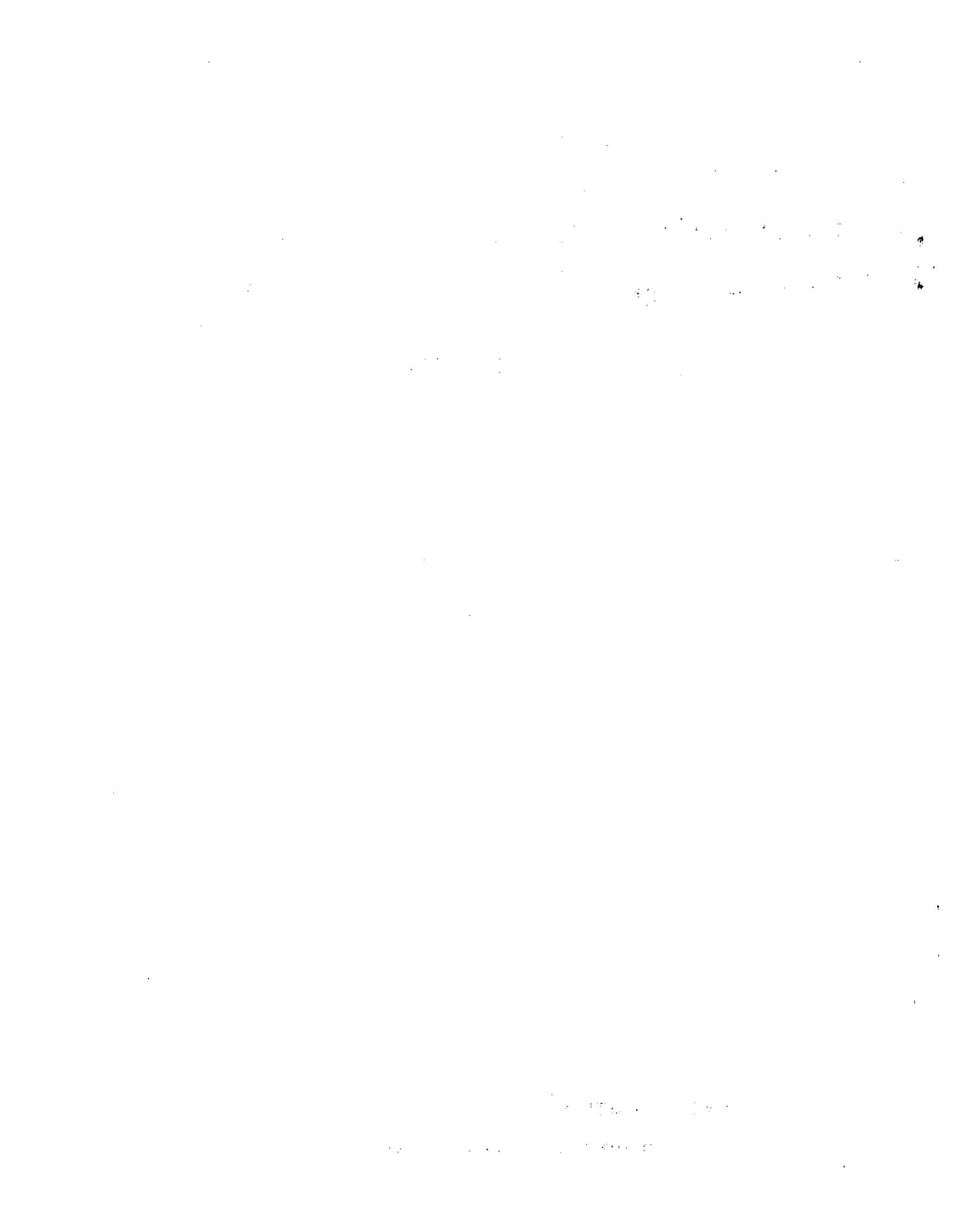


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An Agenda for Transportation Planning in the
Caribbean

Foreword^{*}

This report is divided into three parts. In Part A, there is a general discussion on conceptual and methodological issues in transportation planning in developing countries. A brief review of the recommendations of previous reports and current transport activities in the Caribbean is given. Some of the peculiar characteristics of the Caribbean transport economy are discussed. Part B outlines a detailed work programme in transportation planning that may be undertaken. The programme is developed on the premise of a multimodal, integrative approach to transportation planning. While the programme is not tailored to any particular context, a broad set of specific proposals which may be undertaken is identified. There is no attempt to order these proposals into any list of priorities, as such a listing will depend on the existing situation in each country. Part C provides an overview, and brings together the ideas leading towards the development of an integrated and ongoing research programme. Some suggestions for developing institutional links are made. In this part, certain recommendations are also made. These recommendations are aimed at initiating a work programme in transportation for the CDCC countries. The work programme hopes to encourage an integrative, multimodal approach to transport planning on a regional basis and identifies some institutional links that may be forged. The report remains, however, only an agenda for Transportation Planning in the Caribbean.

^{*}/ The author wishes to acknowledge the invaluable assistance of Mr. Peter Wickenden in the preparation of this report.



An Agenda for Transportation Planning in the Caribbean

Part A

Discussion

Conceptually, transport planning consists of two distinct yet inter-dependent aspects. On the one hand, we are concerned about the adaptation of transport facilities to the demand for transport and the distribution of economic activities from which the demand is derived. On the other hand, we are concerned about the interaction between the transport sector and the wider economy. Both aspects involve different conceptual issues and planning approaches. In addition, planners are nowadays inclined to view transport planning as an interdisciplinary activity requiring knowledge of "neighbouring" fields and incorporating social and environmental objectives. At the same time, and this is particularly true for the developing world, there is need to make transport decisions in the context of the macro economic role of transportation in the development process.

Transport planning in the Caribbean region is relatively recent and transport programmes have generally been formulated within a partial analytical framework. Transport decisions have historically been geared to the interest of the export-oriented sectors of the economy and to considerations of public administration and security. These were high priority issues during the colonial era. Consequently, the development of inter-island transport and the fusion of internal transport networks with the productive potential of the economy did not attract public policy focus. Emerging from the priorities of historical times is a pattern of transport development, that apart from being difficult to reverse, tends to focus on the market and production aspects of the regional economy and its relationship to its external equivalent.

The transport sector is the physical component and an essential part of the distribution system. This distribution system generates a peculiar production structure and at the same time services the consumption pattern in the economy. In the Caribbean, the distribution system rather than being the outgrowth of the production structure and consumption pattern, generates the forces upon which production structure is formed and the consumption pattern is built. In this context, the working of the distribution system is at the heart of any strategy for economic change. The role is even more pronounced

in small, open, dependent economies; a characteristic of the countries of the Caribbean region.

The openness of the Caribbean economies and the international nature of the transport industry almost makes transport technology an exogenous factor in the planning process. In a dynamic sense, high technology levels may consume larger quantities of resources and in the absence of scale operations yield a proportionally lower output. The policy implications are clear. There must either be a lower level of technology or an increase in the scale of operations, otherwise, the balance between resources used and macro benefits may not be achieved.

This conceptual view of the transport-development effect in small, open dependent economies implies that the current orientation in transport^{*} investment and policy decisions is somewhat myopic, though, this does not necessarily imply that past transport decisions are incorrect. In the Caribbean region, transport investment has been viewed largely in an infrastructural sense as social overhead capital, ignoring the view that transportation is a technological phenomenon. At the same time, very little cognizance has been given to the spatial and linkage effect of transport and the incorporation of these factors into the decision-making process for transport investment.

Institutions for decision-making are generally conditioned in their focus by the prevailing thought at a particular point in time and space. As such, there is need to reappraise the transport planning methodology in the region without being bounded either by the prevailing circumstances in the environment, or by the special interests of established transport institutions. In this area, institutions are being developed at both the regional and national levels with a view to increasing the quality of transport decision-making and effecting transport operational plans. There is a multitude of executing agencies including international agencies and a plethora of research

^{*}/ Wickenden argues that in the Caribbean region "there appears to have been over-investment in infrastructure ... and due to the lack of regional planning there has been no attempt made to vary equipment or services to overcome deficiencies and thus obviate the need for further infrastructural development". This social overhead capital view of transport is further reinforced by the allocation of Ministerial responsibility for transport to Ministries of 'Works' which in the Caribbean are primarily concerned with physical implementation and construction.

and fact-finding projects, largely uncoordinated and not necessarily leading to a "consensus" evolution of objectives. It is against this kind of background, at the theoretical, institutional and policy levels that this report hopes to open up a discussion on an agenda for transportation planning in the Caribbean region and make specific recommendations to initiate a work programme in this sector.

Transport Planning in Developing Countries

Methodology

There are major differences between transport planning in the developing world and planning for transportation in the more advanced economies of North America and Western Europe. In the first place, the objectives of transportation planning differ. In North America and to a lesser extent in Europe, the maximization of consumer choice is an agreed to and desirable objective for transportation planning. In the developing world where the economies are less endowed with factors of production, more emphasis is placed on the supply side of transport and on the operational yardstick of economic efficiency and social benefits.

Secondly, the methodologies employed in transport planning techniques in the advanced economies necessitate a comprehensive data base using a wide range of computational aids. There is a growing debate on the transferability of this methodology to developing countries, where not only is there a scarcity of data, and unavailability of computational aids but also a dynamic setting in which structural changes are constantly taking place. These changes make any data bank inventory quickly inappropriate. This problem is highlighted in the case where methodologies rely upon a high level of disaggregation as in forecasting methods for transportation demand.

Thirdly, professional planners tend to have a more significant influence on decision-making in developing countries than they do in developed countries where the influence of professional planners "seems to have waned considerably over the last twenty years in the face of enlightened opposition from non-professional but higher influential pressure groups".* The

*/ See Soberman, Richard M.; "Transportation Planning in Developing Countries". Mimeo, Toronto/York University.

validity of the difference depends on the socio-political situation in each country, and it would be hazardous to generalize on this point.

These differences lead to different foci in transport analysis. For example, modal split analysis in the developed world is concerned with "choice" markets. The usual procedure is to estimate total trip generation, distribute these trips spatially and then apportion the demand that will be satisfied by public transportation or by private automobile. A large part of the modal split analysis in North America is concerned with the "choice" parameters that will generate a socially optimal decision between auto users and public transit users. As Soberman points out, "this is hardly the case in developing countries where the problem is often one of coping with large volumes of public transit users and where modal split is a determination that can be based solely on the availability of a private automobile".

Transport Planning Process

Transportation planning involves the ability to identify the relevant consequences of different decisions regarding investment, operating policy and pricing policy within the transport sector. The true test of effective transportation planning is whether it has any impact on decision-making. A planned implementation programme is an important aspect of transportation planning. Such a programme must include the following elements:

- Preliminary Design;
- Cash flow Analysis;
- Detailed Design;
- Preparation of Specifications and Contract Documents;
- Enunciation of Training Programmes;
- Establishment of an Organization for Operation and Maintenance;
- A Programme of Initial Testing and Acceptance;
- Establishment of a Mechanism for Continuous Review.

There is considerable literature dealing with the transportation planning process, which can be simplified into five stages:

- Stage 1: Identification of Problems and Issues
- Stage 2: Formulation of Alternative Solutions
- Stage 3: Testing and Evaluation of Alternatives
- Stage 4: Selection of best Option
- Stage 5: Implementation.

Particularly for urban transportation, there has been tremendous advancement in the development of sophisticated forecasting models. Logit analysis* is now operationalized and extensively applied. Multinomial Probit analysis* is a further refinement in techniques and is likely to be widely utilized in transportation demand forecasting. It may be some time before these techniques can be applied effectively in a developing country situation. Rule of thumb approaches may still be more valid not only because of the absence of a perfect data base but also because of the continuous structural changes that are taking place in the developing world.

Economic Issues in Caribbean Transport

Broadly speaking it may be useful to divide the Caribbean Transport System into Maritime Transport, Air Transport and Land Transport. Land Transport may be further divided into Urban Transport, Rural Transport and Freight Transport. Although there are specific problems associated with each sub-sector, there is an overall problem of developing an integrated and unified transport system with an efficient mechanism for co-ordination and complementarity in decision-making. It has been argued that the partial analytical approach taken in transportation decision-making in the Caribbean region, has led to an incongruence between the transportation plan (formal or informal) and the general economic plan. In general, there has been a variance between micro economic efficiency and social efficiency in the planning methodology. It is necessary to work towards an integrated transport plan where intra and inter-modal inconsistencies are eliminated and where allocative and distributional effects are socially efficient.

The Regional Question

A report of the World-Bank, examining Caribbean regional transport argued that "an optimal regional transport system is a logical extension of the regional integration process". In order to construct such a system the Report called for "co-ordinated planning of investment in physical facilities and equipment" with a view to preventing both duplication, and

*/ Logit analysis deals with consumer choice behaviour and uses generalized models for the prediction of transport demand, given the parameters of the study area. Multinomial probit analysis introduces probability distribution into the logit models, thus providing greater precision in forecasting results. While logit models are widely used in transport demand forecasting, the author is not aware of any practical application of a multinomial probit model in the area.

over-investment, and minimizing operating transport cost. The study envisages the need to develop an integrated system of trunk and feeder services both for shipping and for air transport. In general, the study argues the case for planning in a regional context as opposed to the narrower national context. It is argued that this approach will ensure that the transport system of the region will be viewed as a unified whole. Such an orientation may lead to a rationalization of port and airport development so as to minimize the number of terminals and substitute an operational trunk and feeder route system.

The following comments from the report highlighted the need for a regional approach:

- "The planning of port facilities within a regional framework is not being done and this could lead to overinvestment".
- "It is likely that major transshipment ports will be needed in the region as shipping technology changes, but probably not more than two".
- "To maximize regional benefits, a system of major airports and small airports connected by adequate feeder services is desirable".
- "The mission believes that there is a prima facie case for a regional shipping line. The regionally owned West Indies Shipping Corporation ... is a good base from which to develop" such a line.
- "It seems incongruous that the Commonwealth Caribbean "owns" four airlines - BWIA, Air Jamaica, International Caribbean Airway (ICA) and Guyana Airways ... An optimal air transport system in the region argues for examining the feasibility of some form of amalgamation".

Recommendations of Recent Reports

The report of the group of experts on the strategy for the Caribbean integration movement during the decade of the '80's noted the improved performance of the West Indies Shipping Corporation over the last few years and argued for an increased role for WISCO particularly in the movement of agricultural produce in the Eastern Caribbean. With respect to air trans-

portation, the Committee cited the development of an efficient intra-regional service and more effective co-ordination between the various airlines that serve the extra-regional market, as being the two major issues to be resolved. In this regard the Committee was specific and recommended the following:

- Existing national companies should establish a Caribbean airline holding company or a Caribbean airline leasing company. A holding company would have responsibility for planning the overall route structure, determining fleet size and type of equipment, operating the capital budget, deciding on overseas offices, staff counters and reservation facilities, and operating ad hoc or Charter services. A leasing company would purchase aircraft and ground equipment and lease these to the national carriers.
- Other Governments should join the air freighting company established bilaterally by the Governments of Barbados and Trinidad and Tobago.
- CARICOM States should adopt a co-ordinated approach to the issue of de-regulation by the United States.
- Regionally owned airlines, should guarantee a minimum level of service to Member States which do not have national airlines.
- Member States without national airlines should consult with Governments of Member States which have such airlines in advance of concluding air service agreements with Third Countries.

Another World Bank report reviewing Caribbean regional transport provide an overview of transport developments in the Caribbean region, identified major transport needs and looked tentatively at development assistance requirements. Some of the pertinent insights and findings were as follows:

- "Most Caribbean countries ... look extra regionally rather than intra regionally in terms of their major markets and transport linkages since their economies are competitive rather than complementary. This is true from the standpoint of both freight and passenger movements".
- "Funds and Technical Assistance for transport infrastructure development are available from a variety of sources, both bilateral and multilateral ... Co-ordination among the various donors and lenders ... is through informal communication".
- "Only partial statements of the total transport demand can be made because of the serious lack of standardized statistics".
- "The region is well supplied with liner services to its major trading partners in Europe and America, but distribution within the region is not efficient, particularly for traffic to and from the smaller countries and territories, where tonnages are low".
- "In the principal public ports, a considerable amount of investment has taken place over the past decade and funds are committed to numerous projects. In the small countries, terminal deficiencies exist".
- "With respect to extra-regional maritime transport ... there is no evidence of major capacity constraints in liner services or terminals".
- "With regard to intra-regional maritime transport ... the future role of government-owned regional shipping lines should be defined and then services should be made more effective within the context of general policies for all intra-regional services".

- "Proposals in the area of maintenance and navigational safety should receive priority attention . . . Major investments in terminals should await the outcome of a comprehensive review of regional maritime services".
- "With the completion of current projects, principal airports in the region can, for the most part, accommodate the traffic of extra-regional carriers".
- "With respect to extra-regional air transport, long-distance scheduled services are in adequate supply at competitive rates, locally based carriers may require advanced jet aircraft to expand their share of the market, small islands need better tourist access through improvements in transfer connection",
- "With regard to intra-regional air transport . . . route structure and service schedules are in need of coordination, but the establishment of a single regional airline is not seen likely or desirable in the near future".
- "It is recommended that consideration be given to the establishment of a Caribbean Air Transport Board and to a comprehensive analysis of intra-regional air services".

Current Transport Activities in the Caribbean

The bulk of passenger traffic in the region is carried by air while most freight is moved by sea. Air freight is increasing in importance especially in Trinidad and Tobago but is still relatively insignificant. Most of the countries in the region have maintained economic and cultural links with former colonial powers and, hence, transport links are also maintained. National transport planning is not conducted systematically and investment decisions are generally taken on an ad hoc basis.

The Caribbean Airport Maintenance and Operations Study carried out by ICAO commented that airports in the region were under-utilized, little focus was placed on financial management of airport operations and that there was inadequate budgetary provision for preventative maintenance and

renovation work. In addition, user charges were low, there were problems in collecting landing fees as well, and there was no attempt to secure revenue from non-aeronautical sources.

Transportation is becoming a major bottleneck to the integration and development process in the region. It may even retard economic growth. The World Bank Country Economic Report, The Commonwealth Caribbean - The Integration Experience described in broad outline the existing transport system (see pages 96-116). Attempts to upgrade, expand and modernize the transport system are continuing, although, in a largely uncoordinated way. Many international organizations are involved including UNDP, CDB, CARICOM, IDB, ECLA/CDCC, EEC, EDF, UNCTAD, ICAO, IBRD, and IMCO. In addition, there are many national bodies in each country. In 1975, a Standing Committee of Ministers responsible for Transportation was established by CARICOM with a view to integrating transport development and co-ordinating at the highest level of transport decision-making.

CDCC Work Programme

There are a number of transport-related studies that have been initiated by the CDCC since its formation in 1975. Below is a synopsis of the studies actually carried out as proposed.

Despite the efforts which have been made to develop genuine Caribbean shipping fleets and to improve port facilities, the Caribbean region is still largely dependent on foreign shipping services. Both the intra and extra-Caribbean trades need to be improved in order to reduce transport costs, enhance the quality of shipping services, foster the development of regional co-operation and protect shippers' interests.

A large amount of technical co-operation has been provided to the region, and maritime transport has been given significant attention by the CDCC Secretariat. Due to the importance of the maritime sector and the relationship between it and other sectors, it was felt that the efforts being made by agencies involved in maritime matters should be consolidated. With this aim in view, and following discussions between the CDCC Secretariat, IMCO and UNCTAD, a joint plan of action was prepared for submission to the third session of the CDCC in Belize in 1978 (see E/CEPAL/CDCC/35). The joint plan of action was accepted and given a high priority. Funding was provided for this programme by UNDP through the CGCED, and it is known as Regional Co-operation in the Development of Shipping, Including Support for Small Vessels and Schooners.

It is a comprehensive project in the maritime sector, executed by UNCTAD/IMCO and located in St. Lucia. The Project has a duration of three years with funding of US\$846,000 from UNDP through the CGCED.

The project will constitute a maritime centre which will provide a focal point for analysis, decision-making and upgrading of shipping in the Caribbean. The initial thrust of the work programme will cover the upgrading of the small vessel fleet in the Eastern Caribbean, the development of the maritime sector, the provision of information systems and maritime safety.

Initially, this project will concentrate on the small vessel fleet in the Eastern Caribbean. In 1978 a study by CARICOM showed that the fleet consisted of more than 150 vessels which carried 60% of the intra-CARICOM trade. This amounted to about 230,000 tons, with an annual freight revenue of about EC\$6 million.

The effectiveness of the fleet could be significantly improved by a tighter control of cargo loading patterns and sailings, with faster port turnaround. Currently there is some overtonnage which prevents a fully effective commercial operation.

General standards of safety are unsatisfactory. Officers and ratings are not always qualified and owners appear to have little regard for maritime safety. Ships are often seriously overloaded and some have been known to sail with decks awash. The majority of the ships and their equipment are neither maintained in a serviceable condition nor regularly inspected. This results in a high loss rate of both vessels and crew as well as cargo.

As a result, hull and cargo insurance is unobtainable for a substantial part of the fleet, and even for well-maintained vessels rates are as high as 14% of the ship's value, compared to a more normal 4%.

The project aims to provide a set of guidelines on the appropriate function, size and technical standards of the small-vessel fleet, alternative routes and tariff structures, and its role as part of the shipping network for the area. The project will include the definition of a group insurance scheme, financing for repairs and improvements, regulations governing safety, maintenance and quality of service, training of officials to enforce the standards adopted, recommendations for ship repair facilities, recommendations for appropriate navigational aids and the possible establishment of a vessel owners' association.

The project team will consist of four experts, three United Nations volunteers and a number of consultants together with regional and national counterparts.

In promoting the co-ordination of maritime activities in the Caribbean for the purpose of enhancing the efficiency of such operations and improving the level of service, advisory assistance on managerial and operational aspects will be provided, on request, to governmental and inter-governmental shipping enterprises.

During the course of the project, the requirements for further activities will be defined. Priorities for longer-term undertakings may include greater emphasis on the protection of shippers' interests, the development of merchant marines (both liner and bulk trades), and the strengthening of national maritime administrations to cover not only safety but also the whole range of governmental maritime responsibilities.

Shipping Traffic Data Survey

It has long been recognized that the lack of adequate information on the volume of freight moving through the ports of the Caribbean severely hampers planning for both port facilities and shipping services.

In 1977 an attempt was made to redress this situation when as part of an investment study for the West Indies Shipping Corporation, carried out by the Caribbean Development Bank with funding provided by the Canadian International Development Agency, the CEPAL Office for the Caribbean and CARICOM worked together to produce shipping statistics on WISCO routes. This work was published as the Inter-Island Shipping Survey (CEPAL/CARIB 77/1).

When the Caribbean Group was formed, UNDP agreed to provide funds to update the previous exercise and the data collection and processing was again undertaken by CEPAL/CDCC.

In an exercise such as this, difficulties can be anticipated and this work proved to be no exception. However, most of the difficulties were of an administrative nature and the survey method (extracting data from ships' clearance documents) proved to be basically sound. Some manifests were found to be incomplete, details requested for the commodity description were probably overevaluate with 275 classifications, and it was not possible to obtain the desired level of detail for the types of containers used in the area.

It had been hoped to complete a full year's census, but this was only achieved in Suriname, Trinidad and Tobago, Barbados, Grenada, St. Vincent, St. Lucia, Dominica, Antigua, St. Kitts-Nevis-Anguilla, Montserrat and Belize. About 80% of the data was obtained in Jamaica and 50% in Guyana and Haiti. For the Bahamas, Nassau was covered 100% and summaries were obtained for Freeport and the other Bahamian ports.

The results of this work have now been published as Shipping Statistics of CDCC Countries (CEPAL/CARIB 80/9). This report gives details of the methodology used and the problems encountered and also provides sample tabulations from the data collected.

It is proposed that this work shall now be continued by the earlier mentioned UNCTAD/IMCO Development of Shipping Project. A maritime statistics expert together with two United Nations Volunteers will continue the initial efforts to produce an annual statistical publication on Caribbean shipping. The team will also assist participating governments in developing national capability in this field. At the end of the project, recommendations will be made concerning the desirability of establishing a method for producing this type of statistics on a permanent basis, including methods of financing the work programme.

Port Authority legislation, functions and management structure for the CARICOM LDC's

A pre-feasibility study has recently been completed by a joint UNCTAD/IMCO team funded by CDB. The mission found three common problems;

- (i) A shortage of the technical skills needed to operate and repair new facilities efficiently, especially in relation to modern shipping technologies,
- (ii) General limitations in the administrative structures that have been established, which needlessly restrict management's freedom of action and prejudice the efficient use and development of existing facilities,
- (iii) A general lack of management skills, for instance, with respect to delegation of authority, staff development and labour relations.

These common problems have resulted in higher than necessary operating costs, including significant cargo losses through damage and theft. These

costs are borne by consumers and producers and not directly by the port or the government. At times, such costs may even be so high as to nullify the benefits anticipated by changing from lighterage to alongside-quay operations.

There is a need for advice on technical and management aspects of port operations. There is also a longer term need for training whereby officials can acquire those skills which it has not been possible for them to assimilate through experience. Since the administrative structures are a direct government responsibility, the advice and training might be most usefully extended beyond port management to Boards of Directors and government officials.

While the number of experts required, time frame and total funds needed for the proposed project remain to be worked out, a draft project document has been produced. Preliminary estimates in this draft suggest that funding for the project will be approximately US\$600,000.

Caribbean container distribution and loading centre port study

It was proposed to carry out a detailed analysis of existing and planned developments in container handling facilities and services. The European Economic Community indicated that it was prepared to consider funding for such an examination if CARICOM indicated that it was a priority item.

This matter was duly considered, but as there was no container development planned by CARICOM States at that time, CARICOM did not designate container handling as a priority area. It is interesting to point out that at the present time both Aruba and Curacao (neither of them CARICOM members) have requested financing from the Netherlands to construct container handling facilities in the Netherlands Antilles.

Maritime Training

Governments in the English-speaking Caribbean are concerned about the absence of facilities within the region for training seagoing personnel particularly in subregional trade, and the CARICOM Secretariat has given the highest priority to the establishment of maritime training facilities.

Subsequently, under a bilateral agreement with Norway, Jamaica established a maritime training facility and would like to co-operate with other governments in the region to solve their maritime training needs.

IMCO preparatory assistance, financed by UNDP, is being provided in order to update information on maritime training needs and give technical advice on ways and means of meeting those needs under a regional approach.

In particular, the following data will be provided:

- (1) Detailed cost (capital and recurrent) of establishing and maintaining a school for ratings and another for officers at potential locations,
- (2) Estimates of the minimum and maximum number of students which would permit the staff and facilities of the two institutions to be efficiently utilized with cost estimates for each level of operations for each institution,
- (3) Estimates of the total number of students to be sponsored by each participating member government for the next ten years and for the following five years,
- (4) Syllabuses of courses to be undertaken at each institution, based on current international standards,
- (5) Figures on the cost of training the same categories of seamen and officers outside the region,

The main outputs will consist of a realistic and integrated approach to maritime training which will be presented for approval to the next meeting of the CARICOM Standing Committee of Ministers of Transport, due to be held later in 1981. It is hoped that this re-examination might also provide an assessment of the number and types of vessels owned by Caribbean interests upon which Caribbean nationals might be employed; of the potential for growth of such a fleet; and the annual turnover of personnel on these vessels.

A seminar had been planned on Search and Rescue, but this was cancelled in 1978 due to insufficient response from CDCC member countries. A number of events have recently occurred, however, which have reinforced the need for such a seminar to determine a Caribbean position in this area:

- (a) Two supertankers collided near Tobago, fortunately with little damage to the environment,
- (b) The USCG informed the region that they could no longer be relied upon to respond to all requests for assistance in SAR,

- (c) A number of countries are considering the formation of joint coastguard services.

As a result of the renewed interest in the subject, a seminar was held in Barbados in December 1981. Training for search and rescue personnel was arranged at the USCG Academy in New York State.

With respect to facilitation, UNCTAD/FALPRO has carried out a review of the problems of the CDCC area. Three missions have been undertaken to evaluate the commercial practices of different member States. The reports of the UNCTAD/FALPRO expert include an assessment of the current situation and remedial measures needed to correct the deficiencies which have been found to exist. On the basis of these missions, UNCTAD/FALPRO has prepared a specific document which, inter alia, outlines a sub-regional facilitation work programme.

Civil Aviation

At the second session of the CDCC, held in the Dominican Republic, a joint ICAO/CDCC proposal for the study of air transport was approved (see E/CEPAL/CDCC/19/Add.1). The work undertaken involved the collection of basic data and the convening of two meetings of CDCC Experts in Civil Aviation to consider alternative strategies for the region. A number of recommendations were presented to the fourth session of the CDCC in Suriname and accepted (see Annex 1). To date three studies have been initiated concerning aviation problems under the auspices of the Caribbean Group and will be considered by the Ministers of Transport of the CDCC countries.

Caribbean airport maintenance and operations study

The objective of the study was to determine what was needed in terms of improvement in maintenance and operations and equipment in order to bring 35 Caribbean airports up to the standards needed for safe and efficient handling of the current and expected traffic levels.

From a maintenance viewpoint, two aspects stand out clearly. First, airport pavements in nearly all cases need some attention. Inspections are not undertaken on a regular basis and consequently there is a steady deterioration. Second, buildings and facilities are not inspected regularly, with the result that buildings deteriorate, especially when they are occupied by personnel who are only assigned from other governmental units for airport duty. An evaluation of the funding required to correct this situation is presented in Annex 2.7

Similarly, a serious situation has been identified concerning fire and rescue services. The fire and rescue services at Caribbean airports are generally below recognized safety standards. All appropriate national airport authorities appear to be aware of this problem. Some authorities have been continuously trying to take remedial action, but others are faced with severe financial restraints and cannot undertake needed work programmes. In nearly all cases fire and rescue equipment has been supplied by aid programmes.

The general situation can be summarized as follows:

- (a) Lack of knowledge and understanding of fire-fighting and rescue requirements;
- (b) Inadequate equipment;
- (c) Almost total lack of spares and lack of stores;
- (d) Inadequate maintenance of equipment;
- (e) Inadequate emergency organization;
- (f) Lack of training;
- (g) Almost total lack of funding to maintain efficiency.

In view of the serious safety implications contained in this report, the CGCED, the donors and the individual countries concerned are giving urgent consideration to this situation. [It is hoped that the Caribbean Group meeting in June 1981 will be in a position to indicate measures being taken.]

LIAT fleet requirements and routing structure

EDF is funding a seven-month consultancy through CDB to define the aircraft replacement programme and service improvements that will permit the company to attain viability. The operating costs and revenue that would be produced with both existing and alternate route structures will be examined. This study is to be circulated by the CDB when finalized.

Establishment of a Caribbean air transport council

This proposal, originating from the Transport Review, has been considered by the CARICOM Standing Committee of Ministers of Transport although no decision was taken. It is also due to be considered as one of a number of alternatives by the meeting of CDCC Ministers of Transport.

Part B

Issues and Proposed Approach to Research*

The purpose of this section is to provide some initial thoughts on the issues likely to be of concern in a variety of areas, the range of analytic methods that may be appropriate in addressing these issues, and the general approach to be used. The areas discussed are:

- Highway and highway transport
- Urban transport planning
- Public transport services
- Freight/commodity flows
- Rural transport
- Ports and maritime
- Air and civil aviation
- Plan and programme development/institutional
- Financial, legal, regulatory
- Training and advisory services

Highways and Secondary Road System

There are a wide variety of highway-related issues which include:

- Tradeoffs between improvements to the primary and secondary systems - The national system of primary and secondary roads both play important roles in the overall transportation systems of each Caribbean country. However, given the different functions that these systems serve, a key issue to be addressed is the relative emphasis to be devoted to improving and maintaining these systems as well as construction of other roads.
- Selection and staging of new highway construction - In both urban and rural areas, the appropriate mix and staging of construction projects must be determined. In many cases, lower design standards, less than ultimate improvements, and various staging strategies may be the most effective means to utilize scarce resources.

*/ The author wishes to acknowledge the useful discussions with Professor Marvin Manheim which helped in the preparation of this part of the Report.

- Road maintenance versus capital improvements - Many national governments currently lack sufficient funds to maintain existing roads properly. Careful consideration must be given to the tradeoffs involved in maintaining existing facilities at various levels of surface and structural quality, versus, capacity expansions to existing facilities and the development of new facilities. Appropriate maintenance levels are likely to vary depending on the level and mix of traffic using the facility and the function of a particular facility in the overall road network.
- Access to airports and ports - Access to airports and ports from the area they serve is often a critical constraint to increasing either the passenger or freight throughput capabilities of these facilities. The role of existing roads in providing access to these facilities must be carefully reviewed and access road improvements must be weighed against improvements to the remainder of the road network,
- Urban area traffic management - Depending on the level, pattern and peaking characteristics of urban highway travel, a variety of traffic operational improvements may provide level-of-service improvements which reduce the need for capital expenditures in these areas.
- Highway safety improvement programme - Methods of improving highway safety should be explored as well as maintenance and capacity improvements. A safety programme could include major capital improvements to geometrics and lateral clearances, operational improvements including road signs and traffic signals, driver education and enforcement elements.

All of these issues must be addressed in assessing the current condition of the highway system and in evaluating the various options for improving and maintaining that system over time. Historical evidence indicates that the strength of a nation's economy is strongly related to the condition of its surface transportation system, and to its main road network in particular. As a result, the tradeoffs implied by various construction, reconstruction, and maintenance policies are critical to the development of an overall transport plan. Furthermore, as the main road system matures, maintenance expenditures become increasingly important.

In addition to the technical issues discussed above, there are a number of complex policy issues that should be of concern for national transport-planning. Such as whether there is a prevalence of monopoly structures

(usually state-owned or regulated) in the transport sector, leading to an absence of competitive pressures for efficiency, improvements in level of service, development of long-range policies, and utilization of objective techniques to justify proposed investments. Investments in the transport sector may be biased towards large-scale, high-technology construction methods, overtaking local capabilities and incurring the expansion of foreign exchange expenditures. Moreover, transport investment and policy planning are seldom undertaken within a clear, well-structured development framework, leading to misallocation of resources (e.g., overcapacity or congestion) conflicting objectives (e.g., between competing modes), and distortions in tax and subsidy structures. And finally, the full implementation of available transport capacity may be hampered by deficiencies in forward and backward linkages; e.g., lack of spare parts for vehicles, improper use of equipment, or inability to operate properly and maintain the current transportation infrastructure.

As a result, both national transport institutions and international lending agencies have stressed the importance of not only the evaluation and funding of new transport infrastructures, but also the analysis of the institutional, regulatory, and socio-economic issues that make these investment outlays necessary, or which will constrain their potential effectiveness. This involves the extent to which transportation regulations have affected system performance and cost, thereby, influencing past and present investment strategies.

Urban Transport Planning

Urban transport involves the provisions of new urban roads, improved transit facilities, regulation (e.g., area-licensing schemes, auto-free zones etc.), introduction of paratransit technology and the introduction of mass transit systems. Emphasis on urban transport is important in the region because of the rapid urbanization in the area and the concern for well planned land uses in urban areas. In most urban areas, there is an adequate capacity of transportation services leading to overloading of the system, and a deterioration of the quality of service.

In this regard, there is an emerging literature on the "transferability" of the modelling techniques used in the more advanced countries. Lack of data, uncertainty of the future and the linkage effects pose real problems in the transfer of these sophisticated techniques. Seven options

are available for decision-making in an imperfect data situation. These include the notion of sketch planning in the context of scenario-based planning.*

Notwithstanding these developments, Stopher** concludes that "the current operating technology of urban transport planning cannot be transferred to developing countries". Research must focus not only in the practical "problem-solving approach" but also at the methodology to devise an operating technology for urban transportation planning in developing countries.

Transportation Services

Public passenger transport in the major cities of the region must be analyzed in a comprehensive manner. The analysis must begin with a detailed inventory of each of the current systems, segregating the modes by category. The vehicle fleets for each will be inventoried by a variety of supply-oriented characteristics including:

- garaging sites
- route locations and service areas
- age and mileage
- seating capacity
- vehicle type and condition

In addition, the current ridership must be characterized according to its market characteristics: age, trip purpose, income, occupation, etc. Developing this type of information about the current ridership will be helpful in the analysis of service, especially with respect to alternatives designed to improve the system.

Specifically, the analysis of public transport alternatives must consider the ability of public transport to offer increased mobility to major market segments and to assess changes which may improve the accessibility of market segments to important destinations. For example, the access of tourists to hotels, shopping areas, and entertainment areas can be enhanced with the properly designed mix of public transportation services.

*/ Scenario-based planning is the identification of alternative future paths given different initial conditions and behavioural trends over some time horizon. Each set of initial conditions and a behavioural trend function represent a specific scenario.

**/ Stopher, Peter R., "Urban Transport Planning in Developing Countries: Can the Technology be transferred" Northwestern University U.S.A.

Other market groups which must be considered include the elderly and handicapped, who often require access to special types of service; the economically disadvantaged; and those persons without private cars. Special consideration must be given to the travel patterns and transit requirements of commuters and other workers, especially between residential communities and the adjacent areas of employment opportunities.

The desire to meet cost-effective goals is important and can be achieved through the appropriate use of alternative modes if these are available* methods, or procedures. For example, cost effectiveness can often be enhanced on high-volume intercity routes by the introduction of articulated buses which can carry twice the passenger load of a standard coach or some form of mass transit system. In contrast, in areas with low-density of travel demand, it may be more cost effective to offer a paratransit mode such as:

- mini-bus feeding a linehaul service
- shared-ride taxi service
- jitney service
- park-and-ride facilities
- special "subscription" services

The innovative use of private carriers (such as shared-ride taxis) to interface with the public carriers by providing transport service can also offer possible solutions to unique situations.

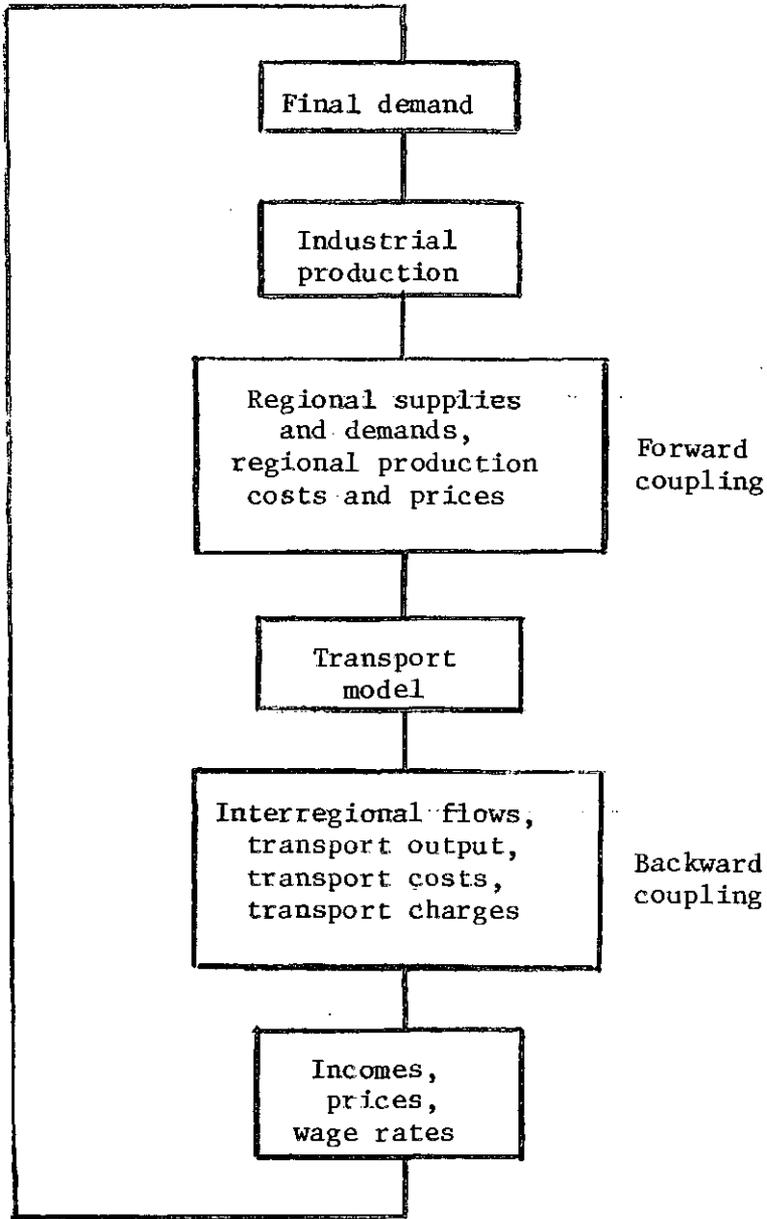
The Transport of Freight/Commodity Flows

In general, the movement of goods (as opposed to passengers) is more readily addressed by normal economic methods because the monetary costs are directly relevant and there is less subjective judgement as to the proper value of the various components. Given a stable market price at the delivered point, goods which can be delivered quickly, safely, and cheaply before they perish, and can be economically warehoused will return more profit to the suppliers than those goods moving over inferior transport routes. By solving this problem, the monetary costs of each of these elements (time in travel, loss and damage, transport rates, warehouse costs, perishability) are directly revealed, and the economic return of improved transport can be easily compared to the investments required to provide those improvements.

*/ See Soberman, Richard M.; "Transportation Planning in Developing Countries". Mimeo, Toronto/York University.

The economic model (individually tailored for each area of study) must be comprehensive. Typically, it is based on input/output model with sufficiently detailed variables to reflect the impact of price changes on major freight movements. Further, it is desirable to adjust input/output variables to reflect these price changes. If there is insufficient information to construct such a detailed Macro-economic model, there is no need to couple the model to the transport system model. The following chart taken from the Harvard Brookings Model gives the functioned components of the Macro-economic Model.

Functional Components of the Macroeconomic Model



The Transport Factor in Rural Development

It has been argued that rural development requires the "urbanisation" of the rural population. In this context, urbanisation means the bringing of urban-type opportunities and services within reach of all the people and the provision of infrastructure to raise the standard of living of rural communities. In this regard, transport facilities and services form an important part.

The provision of rural transportation, feeder roads, inter city roads, agricultural roads may have a more direct effect on development by expanding the production and exchange frontier of the economy. As a rule, the comprehensive planning approach must encompass this spatial dimension of the problem in the development of a unified transport system.

Port and Maritime Issues

The design of port facilities is a critical element in the planning of a nationwide system of maritime transport. In the Caribbean, port operations are particularly important, since the import and export of goods are vital to the region's economy. There is a critical need for a coherent regional and national port improvement program at the present time.

The approach proposed for the analysis of ports is based on technical, institutional, and regulatory experience in port planning. The analysis of ports and maritime transport will incorporate the following basic objectives:

- determine the desirable level of total investment in the years 1982 through 1985 and 1985 through 2000
- determine the investment by type of facility
- determine the general location of new investment
- determine the type of port charges that will induce an efficient use of the port system and will meet the criteria of financial viability
- determine the staging of new investment over the period considered

Container Terminal Planning

Containerization of cargo has been the most significant recent development in the shipping industry, and this trend has not escaped the Caribbean. Provision of container handling facilities is an essential requisite for the development of modern ports. The container potential for a port could be established by conducting market studies on the use of containers among users. In addition to examining the specifics of container handling systems and market analysis, staging of investments, financial, technical and manpower requirements are interrelated aspects for container terminal planning. Flexibility and adaptability are key considerations in the planning process. The plan must provide the flexibility to provide for future growth and adaptability to new systems and equipment.

Improvement of Goods Movement

The development of a cost-effective strategy for freight requires the analysis of both demand and supply characteristics. In cases where major investments are under consideration, demand forecasts should be analysed in relation to supply conditions throughout the nation's port network. The optimal solution to existing or projected supply constraints at a single port may be to divert excess traffic elsewhere through the creation or expansion of port facilities at another location. Thus, the demand analysis is composed of two components: (1) forecasting of total system-wide port demand by commodity type; and (2) allocation of demand throughout the port network. The second component of the analysis is actually an iterative process, since any changes induced in the supply network (e.g., through investment in particular facilities) may result in a reallocation of demand. The result of this analysis is a strategy which optimizes conditions not only at a single facility, but throughout the maritime transport system. Experience has shown this approach to be essential to the development of a coherent national transport program.

As suggested previously, the overall performance of the port system is dependent on the capacity and condition of the inland infrastructure. Congestion on ground access facilities can ultimately have impacts on the operation of maritime transport which are as serious as queuing at the ports themselves. Therefore, it is essential that

infrastructural conditions be explicitly taken into account in the port analysis.

Airports and Civil Aviation

The aviation system in the region must be capable of providing a number of critical services. In order to do this and to plan for the anticipated growth in the region's economy, there is need for a complete inventory of airports, including airside and landside capacity, the frequency and timing of services and connections to other airports. In addition, consideration must be given to the proliferation of airlines, organisation and management of airports and a regional policy towards air transport. To allow for efficient planning, estimates of future traffic must be undertaken.

Air travel demand forecasting will be instrumental in determining the air system requirements. Modelling work in this regard has tended to be extrapolative. Underwood * using available information developed an air transport model for Trinidad and Tobago using techniques that "appear appropriate both in a rapidly changing economic environment and to other nations in the Caribbean". Other more data intensive studies apply a system of disaggregate models for demand forecasting.

The planning of airport/airline facilities involves a broad spectrum of issues: air traffic control, runway lengths, terminal capacity and taxiway assignment practices. Evaluation of each issue in isolation generally leads to unsatisfactory results. Further, the system as a whole must be considered for successful airport and airline facilities design.

Planning of airport facilities must be accompanied by complementary planning for Air Traffic Control Facilities. It is to be noted that Air Traffic Control Planning may more effectively be undertaken after a thorough meteorological study of the given terminal area has been completed. Environmental issues, like noise exposure over residential areas, will assume larger importance during the decade of the 1980s.

* J.R. Underwood, "An air transport model for Trinidad and Tobago" Civil Engineering Department, U.W.I.

PLAN AND PROGRAM DEVELOPMENT IN TRANSPORTATION

Technical, Management and Implementation Requirements

The issues identified and the specific policy and investment options evaluated in each modal area must eventually be integrated into an overall transport policy and plan. In turn, the recommended policies and plans must be translated into a series of specific programs encompassing policy, operating, and maintenance elements, as well as, capital investment projects for implementing the plan. A number of requirements must be met in developing a transport program. These requirements are (1) the technical requirements which must be met to provide the information to produce good project and program decisions, (2) the management requirements which must be met to make the output of the plan and program development effort responsive to agreed goals, and (3) the implementation requirements which must be met to assure that the specific recommendations contained in the program are accepted by all agencies with a role in the implementation process. The specific requirements are:

Technical Requirements

- Consistent project evaluation criteria - Unless similar technical criteria and assumption are used for all projects, any decisions made at the national or regional level must necessarily be quite arbitrary and often indefensible.
- Systematic inclusion of many criteria - To be useful as a real guide to project selection decisions, a plan and programming methodology must recognize and systematically incorporate a range of factors including non-quantifiable impacts, equity, professional judgements, and political preferences.
- Sensitivity analysis - The sensitivity of any project selection criteria to the basic assumptions underlying those criteria must be tested.
- Alternative project designs - To be effective, a programming methodology must address the question of what is the appropriate design scale of each project, as well as, what set of projects should be funded.

- Budget constraint and project timing - Explicit consideration should be given to relating project design and selection decisions to the budget constraint (or constraints) and implementation timing.
- Project interdependencies - In addition to the budget constraint, many factors and impacts can create the need to examine all projects or specific subsets of projects simultaneously. In particular, tradeoffs between modes must be explicitly addressed.

Management Requirements

- Multi-year program time period - Because previous decisions can greatly constrain the choice of projects "ready to go" in any given year, the implementation program should cover at least five years and preferably longer.
- One-year program monitor and review cycle - In order to be an effective management aid, a programming methodology must be geared to periodic revision coordinated with the budgeting cycles of the agencies with implementation responsibility.
- Program documentation - The methodology should produce as an output a periodic program status report describing the contents of the current program, the rationale for project selection decisions, and key future decision points.
- Flexible computer software environment - Because of the many factors which influence program decisions and which create the need for a continual process of review and adjustment in the face of changing conditions, any computer programs used or developed should be compatible with the operating environment.

Implementation Requirements

- Involvement of all agencies with planning and implementation responsibilities - Agencies at all levels of government can provide important inputs to planning and programming decisions. For staff of these agencies to accept a new methodology and a new program, they must be involved in its design, implementation, and operation.
- Unders tandable and realistic - The objectives of a plan and program development methodology and the

- procedures to accomplish those goals must be carefully communicated to all agencies involved in the programming process.
- Incremental strategy - Any new plan and program development approach should be implemented in a step-by-step fashion to perform useful functions at each step while moving towards a long-term goal. At each step, an opportunity should be available for revising the approach for later steps, as experience is gained.
- Mechanism for adaptation - Because every organization's capabilities and needs vary and change over time, an explicit mechanism to review and adjust the initial program should be created early in the implementation phase. An explicit cycle of plan and program update activities is required to assure the ultimate success of this effort.

As reflected by the requirements listed above, a key product of this effort will be a new process and approach for developing and implementing transport plans and programs. Institutionalizing this new process will be just as important, in the long run, as developing a sound initial plan and program of investments and policy actions. Realistically, the implementation of any plan and program must be viewed as a dynamic process and the capability to review, monitor and update initial plans and programs is critical to assuring the ultimate success of this study. The basic sequence of activities will be to:

- develop a range of policy and investment options within each modal area based on the assessment of existing conditions and key issues identified;
- identify the most important inter-modal tradeoffs and issues;
- review current and projected financial conditions and develop a range of fund projections for the transport sector and a range of initial allocations to modal areas;
- develop some overall multi-modal plan and program options based on the modal studies and the range of financial policy options considered;
- evaluate the effectiveness of these various options

including a detailed review of potential legal, regulatory and institutional barriers to implementation;

- develop a recommended plan and program including a detailed assignment of responsibility for implementing various program elements and a proposed implementation strategy for any potential legal, or institutional barriers.

Two key elements of this proposed approach should be emphasized. First, both within and between modes, many complex tradeoffs are possible. The only effective way to explore these tradeoffs is by explicitly developing and analyzing a range of policy and project alternatives, both within each mode and in developing multi-modal plans and programs. The second key element is that to be successful, the actual design of the overall plan and program development methodology must be the result of a joint effort by all concerned parties.

Financial, Legal and Institutional Factors

After completing an inventory and analysis of each of the modes, it will be necessary to review the financial aspects of their operations. User charges must be thoroughly researched in order to determine the direct cost of public transport modes (i.e., fares, tolls, etc.), as well as, the indirect costs such as taxes. Measuring the actual government revenues, however, cannot be accomplished without utilizing a demand analysis. Thus, one set of tariffs, tolls and taxes will result in some demand and a given revenue, while higher user costs will result in a reduced demand but greater revenues per user. Careful evaluation of user charges is critical since they serve as a source of government revenue, as a means of influencing travellers' behavior through the pricing mechanism, and as a method of influencing the distribution of wealth.

In addition to this financial analysis, it will be necessary to examine the legal and organizational issues. In the cases of highway and public transit, research work will examine the unique aspects of these modes. This review should yield an understanding of how the

regulating agencies are currently operating, plus a knowledge of their flexibility for change. This analysis must include the legal barriers to change and the organizational obstacles which inhibit such changes. In the cases of civil aviation and ocean shipping, the Caribbean legal and organizational frameworks are superimposed on an international structure which governs these networks.

Training and Advisory Services

The development of continuing planning capabilities within government agencies must be a major goal of the national transport study. Staff training and advisory services are vital to the achievement of that objective. There is need to develop a diversified approach to staff training incorporating the following:

- formal sessions and training seminars
- on-going participation by trainees in performance of the study
- participation in intensive training programs
- courses in Universities abroad, and at the University of the West Indies

There is need to operationalise this approach and develop an on-going program of training for implementation by the various agencies involved. Training programs may emphasise courses in the technique of transportation analysis, land use development, intermodal takeoff in transportation network analysis, and the economics of transport operations.

"Agenda for Transportation" Overview

Part C

The Situation and the Challenge

During the 1970's, the transport systems of most Caribbean countries have been severely tested. The demand for the transportation of passengers, freight and information increased substantially and reflected a general rise in economic activity, employment, per capita incomes and urban development. Plans for increasing the supply capability of the transport system fell short of demand requirements. For instance, in

Trinidad and Tobago the excess demand for transportation services manifested itself in serious and costly congestion on the road and in ports and airports. At the same time, transport costs which ranged from 15 to 20 per cent of disposable income, exceeded those in most other developing nations.

The challenge for the 1980's will be to develop services which are capable of addressing the wide-ranging transport needs of the region's economies. The success of transport planning efforts will depend on the development of a transport policy framework which clearly establish program objectives and priorities. The functioning of the diverse components of the region's transport system, at both the regional and national level, is closely interrelated and the development of cost effective transport programs require a coordinated planning approach. Piecemeal treatment of isolated transport problems tend, over an extended period of time, to result in inefficiency and poor performance throughout the entire transport system. This need for a unified approach is especially critical at a time when substantial transport investments are already being undertaken (or are about to be undertaken), to ensure that major transport expenditures are consistent with longer term transport requirements.

The development of permanent internal organisational capabilities in planning, administration, and operation of transport services is also vital to the achievement of transport objectives. A comprehensive planning study can serve a valuable purpose in establishing a consistent long term policy and program focus. Realistically, however, a single plan cannot anticipate in detail the full range of changes in transport which will occur over the long term. The capability to approach specific transport needs and problems on an incremental basis, and to identify immediately implementable solutions, given that they are consistent with longer-run objectives, is therefore essential. The institutional capability to implement required programs and operate existing services efficiently will also, ultimately, determine the success of planning efforts.

Towards a Research Program

A research program must emphasize both specialized mode-specific analysis and the integration of individual analysis areas into a unified, comprehensive planning framework. A comprehensive analysis of each national transportation system is an essential first step in the development of a coherent transport program and set of policy guidelines. Also considered crucial is the development of effective program implementation and administrative capabilities. The training of personnel in the techniques of transport planning is another key focal point.

Planning is an on-going process, and the effectiveness of planning efforts on a long term basis depends on the development of internal technical capabilities. The principal products to be provided by the research effort are as follows:

- Recommended transport improvements which are immediately implementable
- A detailed program of transport improvement and investment projects for a specified five year period
- A coherent policy framework for short and long term transport planning
- Recommendations on the financing of investments and the pricing of transport services
- Recommendations for improvements in the organisation, administration and operations of agencies responsible for transport

The research effort may be broken down into the following:

- Review and Forecasting of Transport Needs: The purpose is to establish the level and pattern of current and future transport demand. Existing transport data will be disaggregated with respect to mode, spatial location and other market characteristics. In developing fixed demand forecasts, the effect of supply conditions on total volume and modal distribution of demand must be considered.
- Analysis of Existing Transport Systems: A complete inventory of existing transport supply

conditions will be developed and analyzed to determine the following:
capacity of systems in relation to current projected demand; condition of facilities; technological capabilities; level of service; and efficiency of operations. The results of the analysis will consist of an assessment of the adequacy of existing facilities and operations, and the identification of current and potential system supply constraints.

- Analysis of Transport Funding and Policy Implementation: The principal areas to be addressed in the analysis of transport financing include the following:
cost-effectiveness of alternative transport investments, as determined through the comparison of anticipated benefits and costs; distribution of costs for current operations and proposed improvements; mechanism for financing transport investments and continuing operations, including an evaluation of the role of user charges as a means for recovering costs and influencing travel behaviour. The analysis of policy implementation capabilities will include an assessment of the organizational, administrative, and regulatory factors which affect the implementation of transport plans, policies and programs.
- Development of Regional and National Transportation Policy and the Formulation of Transportation Plan: The policy implications of proposed transport developments, projects, and improvements must be examined and translated into policy guidelines which will be applied in the development of transport investment programs and the implementation of related organizational, legislative, and administrative changes.
- Development of a Training Program: A program must be developed for the training of staff for various transportation agencies, operations and other institutions. Guidelines on the use of advisory services in establishing a permanent internal planning capability must also be formulated.

Co-ordination in the Research Effort

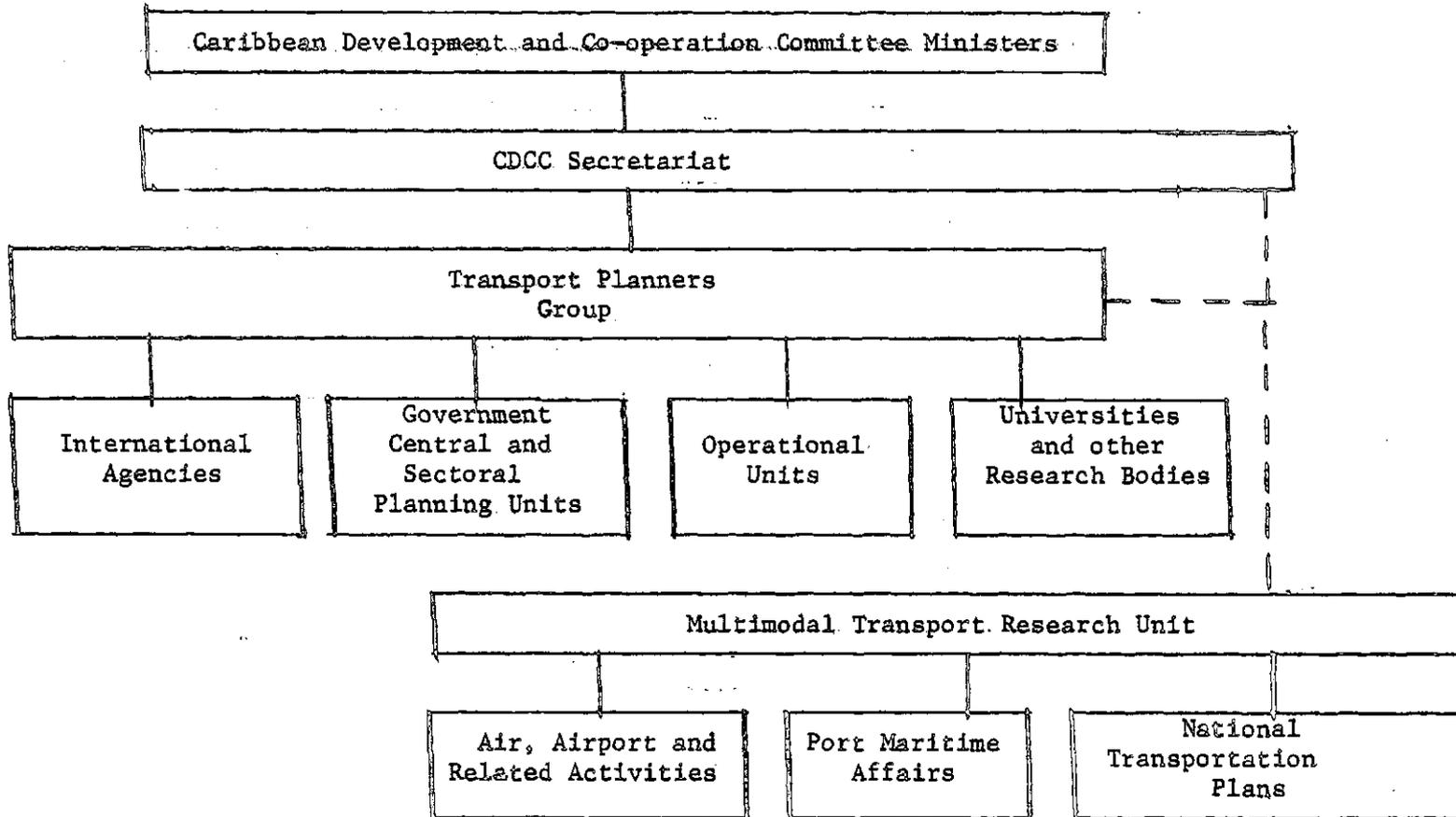
A transport decision is usually formulated at the highest

political level. The researcher's input in the decisions has in many cases been only marginal when transport decisions are taken for, frequently, in this sector no explicit decisions are taken at all. These factors may have deterred the researcher from indulging in this field. Transport decisions are not easily reverseable and usually involve large outlay of capital and high opportunity costs. It is therefore important that attempts be made to work towards a systematic analysis of transportation decision making.

In order to do this, there is need for appropriate mechanisms to coordinate the research effort and to broaden the domain within which micro decisions may be made. The synchronization of the regional transport system with the international and national transport systems in the Caribbean region is a key focal point and dictates the kind of orientation that must prevail in the research and decision making environment. The Caribbean is in dire need of an integrated and unified system of transport. But the planning process must incorporate techniques for community interaction.

There are numerous agencies - international, regional and national that are involved and engaged in transportation analysis, projects and decision making. Many of these agencies are specialist in their interest and competence. There is a clear need for a permanent forum to coordinate the activities and priorities in the transport sector in the region. While such a "body" must be endowed with resources that would allow it to perform in a technically competent manner, it must at the same time be sufficiently positioned to influence in a very direct way transport decision making.

It is recommended that a Transport Planners Group be established under the authority of the Caribbean Development and Co-operation Committee (CDCC) Ministers. This Group should comprise of individuals drawn from a broad spectrum of modes, institutions and activities. The Transport Planners Group ideally should be served by a permanent body called The Multimodal Transport Research Unit whose function would be to conduct on a continuous basis research activity as outlined earlier in this report. In addition, the Multimodal Transport Research Unit (MTRU) would encourage the preparation and implementation of National Transport Plans and the interpretation of these plans into an overall regional framework. The following flow chart describes the institutional structure that is being proposed.



The Multimodal Transport Research Unit (MTRU) should be set up in close association with the various Universities in the Region. The University of the West Indies already offers courses in the Economics of Transport and in Transport Planning. There is need for more effort and resources to be placed at the disposal of the transport sector and for applied research to be conducted on an on-going basis. At the same time, there is need to mount regular training programmes for practitioners engaged in Transport Planning.

It is therefore proposed that a Transport Planning Course be organised for those professionals who are or may be engaged in transportation planning. The course will aim at introducing the multimodal approach to transport planning and so assist in changing the methodological orientation to transport planning in the region. In addition, the course may cover the basic techniques and in transportation analysis; transport modelling (distribution, generation, modal split, etc.), cost benefit analysis, forecasting techniques in an imperfect data base environment and system's performance measurement techniques.

The work programme outline in Part B identifies a wide spectrum of analysis areas which may easily be converted into specific projects. It is being proposed that each national entity be encouraged to incorporate as a specific function Multimodal Transport Research and that all efforts be made to encourage the formulation of transportation plans. Hence, a major role of the Transport Planners Group will be to encourage and assist National Governments in setting up the mechanisms for the development and implementation of transport plans. The following specific program of work may be initiated (as outlined in detail in Part B of this report):

- Review and Forecasting of Transport Needs.
- Analysis of Existing Transport Systems.
- Analysis of Transport Funding and Policy Implementation.
- Development of National Transport Policy and the Formulation of a Transportation Plan.

- Development of a Training Programme.

Summary and Recommendations

The Working Group in Transportation Planning of the Caribbean Development and Co-operation Committee (CDCC) is asked to note the following:

- Transportation planning in the Caribbean Region is a relatively new concern of policy makers and researchers. Transportation planning is taking place without a clear specification of the macro economic role of the transportation sector in the development process.
- Transportation decision making in the Region has been on an ad hoc incremental basis resulting in an uncoordinated set of activities at both the research and implementation levels. Activities reflect more the priority of external institutions than the requirements of the regional and national economies.
- The demand for transportation facilities and services in the future is likely to grow at an increasing rate imposing pressure on the existing transport system, so much so, that transportation may well impede the integration and development efforts in the region.
- The development of an integrated and unified transport system for the region requires a reorientation in the environment towards a multimodal, interdisciplinary and integrative approach to transportation planning and decision making.
- The existing Transport Institutions in the region do not encourage the matching of research and implementation priorities to a regional transportation policy. There are no Institutions vested with the responsibility to develop a comprehensive research program for the region's transport economy or to encourage the development of national transportation plans.

The following Recommendations are being made:

1. That a Transport Planners Group (TPG) be established under the

authority of the CDCC Ministers. The terms of Reference of the Transport Planners Group will be as follows:

- (a) To act as a focal point for transport research activities in the Region.
- (b) To agree on a work program in Transportation for the CDCC Secretariat and for the MTRU.
- (c) To encourage the development of National Transportation Plans in the CDCC countries.
- (d) To set priorities in Research for The Multimodal Transport Research Unit and to encourage the development of a transportation system that will deepen the integration process in the Region.

2. That a Multimodal Transport Research Unit be established as a permanent Research institution in association with the Regional Universities. The MTRU will overview an integrative research effort in air/airport, port/maritime and national transportation plans and encourage continuous research in transport.

3. That the composition of the Transport Planning Group be wide-based at the modal, activity and interdisciplinary level. Participants may be chosen from all Regional Institutions which may have an interest in transportation whether it be at the research, financing, or operating level. These may include International Agencies, Governments' Central and Sectoral Planning Units, Universities, other Research Institutions and Transport Operators.

4. That the research program as outlined in Part B of this Report form the basis for the development of a detailed work program for the Multimodal Transport Research Unit. The MTRU may initially be established within the framework of an existing Regional Institution to minimize delay in implementation.

5. That a Transport Planners Course be organised for professionals

engaged in Transport Planning with a view to encouraging a multimodal approach to planning and to upgrade personnel with techniques for transportation analysis.

6. That all CDCC countries be encouraged to incorporate (where it does not exist) Multimodal Transport Research functions in the most appropriate planning agencies in their respective countries. The recognition of this function may encourage basic research in transportation analysis.

7. That CDCC countries be encouraged for formulate, develop and implement national transportation plans, utilizing an integrative, multimodal approach to transport planning. In the process, specific projects must be identified for implementation. The Transport Planning Group and the Multimodal Transport Research Unit may assist in this area by conducting Seminars/Courses and identifying areas for applied research e.g.: area licensing schemes, staging of new investment, inter-modal trade-offs, etc.

8. That a comprehensive study on Proposed, Projected and Anticipated Transport Investment of as many CDCC countries as possible be undertaken with a view to assessing the existing state of affairs and the prospects for a coordinated investment program in the region. Since transport investment is not easily reversible and has "locked-in" features, such a study must be periodically updated. For policy purposes this study must be carried out at a reasonable level of disaggregation.

9. That each CDCC country be encouraged to prepare a list of transport projects which it may wish to initiate, whether at the research, implementation or policy level. These projects must be derived from an assessment of the current transport problems and after an evaluation of the adequacy or inadequacy of any proposed solutions. Part B of this report provides a framework which may be useful for identification of specific transport projects for this purpose.

10. The following action and timetable is being proposed:

Month

1	2	3	4	5	6	7	8	9	10	11	12
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1. Establishment of Transport Planners Group.

Month

1	2	3	4	5	6	7	8	9	10	11	12
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2. To agree on an on-going work program in transportation. 
3. To encourage the formulation of National Transportation Plans. 
4. To establish a Multimodal Transport research Unit. 
5. To develop and run a Transport Planners Course 
6. To encourage a multi-modal transport research function in appropriate agencies of individual countries. 
7. To assist in the establishment of mechanisms for the development of Transportation Planning. 
8. To conduct an Investment Study as per recommendation (8). 
9. To prepare Transport Projects as per recommendation (9). 

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