GOVERNMENT OF PAKISTAN
PLANNING COMMISSION
NATIONAL TRANSPORT RESEARCH CENTRE

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PC - II

NATIONAL TRANSPORT RESEARCH CENTRE

PHASE - III

(Approved)

NTRC - 108

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CHIEF

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Approved by CDWP on 10th August, 1988

PART A

PROJECT DESCRIPTION

1. NAME OF THE PROJECT : National Transport Research Centre (Phase-III)

2. AUTHORITIES RESPONSIBLE :

(a) Sponsoring	Planning Commission
(b) Execution	National Transport Research Centre
(c) Operation	National Transport Research Centre

3. TIME REQUIRED : 5 Years

4. BACKGROUND

The need for setting up of National Transport Research Centre had been felt for a long-time and numerous recommendations had been made by various experts and advisory groups to this effect, from time to time. Among others the Transport Coordination Study (TRACO) - 1970 recommended the setting up of a Central Transport Planning Cell with the following charter:-

(a) Carrying out studies and research in the economic forecasting and priority rating areas;

(b) With this background, preparing a rolling long-term coordinated investment, operating, tax, subsidy and price plan embracing all modes of transport; and

(c) Coordinating the research and planning work of the planning agencies of the separate provinces and the transport sector.

The above responsibilities involve comprehensive transport planning studies on continuing basis involving regular estimation of demand, inventories, modal split, pricing and investment, etc. The achievement of the goals would require a multi-disciplinary team of researchers encompassing all modes of transport including specialists from each principal made and adequate representatives of the theoretical and applied economics, civil and mechanical engineering, social and economic geography, system analysis, statistics, electronic data processing, etc.

On the basis of above recommendations, a proposal for setting up the National Transport Research Centre was initiated by the Planning Commission in June 1971. The Centre was to be set-up with assistance from the UNDP in the form of experts and equipment. The Centre was included in the Country-programme of UNDP for Pakistan from 1971 till 1975 but due to financial stringencies in the UNDP during the period, the technical assistance could not materialize.

Since the Centre was urgently required for carrying preparation of Fifth Five Year Plan, the Planning Commission, in June 1973, decided to set-up the nucleus of the Centre with the own resources and develop it in phases. The overall cost of Phase-I of the Centre was estimated at Rs. 1.929 million with F.E.C. of Rs. 0.975 million. The Centre, however, actually became operational in June 1974. The Centre was to achieve the following objectives:-

(a) Carrying out studies and research in economic forecasting and priority rating areas.

(b) Preparing long-term coordinated investment, operating tax, subsidy and price plans embracing all modes of transport.

(c) Coordinating the research and planning work of planning agencies of the individual provinces and transport modes.

(d) Continuing and updating of research and studies done by TRACO and other consultants in the past.

(e) Formulation and review of "national transport policies" leading to the preparation of integrated plan for the development of a well-coordinated transport system.

(f) Providing consultancy services to provincial and modal planning agencies to evolve sound planning policies.

(g) Providing training and education in transport planning and project appraisal to ensure availability of trained staff for agencies concerned with planning, development, operation and maintenance of transport services and infrastructure.

The Centre operated as a Development Project upto June 1978. During 1977-78, Ministry of Finance carried out a detailed review of the scheme and made the following recommendations:-

"(a) Beginning financial year 1978-79, the expenditure in respect of staff, etc. of the Centre should be transferred to non-development budget.

(b) Only the expenditure on research studies should be reflected in the development budget".

Accordingly, the PC-II of the Centre was revised and approved by CDWP in May 1978 at an estimated cost of Rs. 3.694 million with no Foreign Exchange Component.

During 1980-81, PC-II for Phase-II of the Centre was prepared. However, it was decided that commencement of the Phase-II of the Centre should be deferred to coincide with Sixth Five Year Plan. Accordingly, a revised scheme for Phase-I covering the period 1974-83 was prepared. The revised scheme was approved by the CDWP in January 1981 at an estimated cost of Rs. 10.304 million with a F.E.C. of Rs. 4.5 million. The charter of the Centre was also amended as follows:-

(a) To enlarge the scope of research being undertaken in the Centre and to cover those modes of transport which hitherto have not been covered in the Centre.

(b) To provide additional facilities in terms of manpower, equipment and materials to enable the Centre to develop a reliable and effective in-house expertise for research in various modes of transport to relieve the dependence of the country on foreign experts.

(c) To establish close liaison with other such institutions in the developed as well as developing countries.

(d) To coordinate the research efforts taking place in the country to avoid un-necessary and wasteful duplication of research efforts.

(e) To act as clearing house for all the research being undertaken in the country and project it among various international agencies.

(f) To help other institutions develop indigenous expertise and accelerate the pace of research and development in the field of transport.

(g) To persuade various international agencies to either sponsor research in areas where NTRC had built sufficient expertise to undertake research independently or collaborate in areas of mutual interest.

(h) To arrange maximum dissemination of research being undertaken by the Centre among various individuals and organizations both at the local and international level.

(i) To disseminate the work being done by various international organizations among various individuals and agencies involved in the field of transport.

(j) To implement/execute experimental pilot projects on the basis of research carried out in the Centre to give the research efforts undertaken in the Centre the "problem oriented outlook".

(k) To organize national and international seminars to discuss the problems facing the country in the field of transport and make suitable recommendations to the Government.

(l) To arrange and organize training-courses in various modes of transportation planning, design, operation and maintenance.

During Sixth Five Year Plan, a Road Research Division was added with the following objectives:-

(a) To provide research facilities in terms of manpower, equipment and materials to enable the Institute to develop a reliable and effective in-house expertise for research in roads.

(b) To fill-in the gap in R&D activities of various road research agencies i.e. Provincial Road Research Laboratories to ensure adequate R&D Support for their investment programme.

(c) To coordinate the research efforts taking place in the field of roads in the country to avoid un-necessary and wasteful duplication of research resources and efforts.

(d) To establish liaison with other institutions in the developed as well as developing countries in the field of Research & Development in Roads.

(e) To act as clearing house for all the research being undertaken in the country in the field of Road and project it among various international agencies.

(f) To help other institutions develop indigenous expertise and accelerate the pace of Research and Development in the field of Road Transport.

(g) To obtain sponsorship of international agencies for research in the areas of Road Transport where the Institute has built sufficient expertise to undertake research independently or to collaborate in areas of mutual interest.

(h) To disseminate results of research undertaken by the Institute and other national and international bodies in the field of Road Transport among various individuals and organizations both at the local and international level.

(i) To implement/execute experimental pilot projects on the basis of research carried out by Institute to establish viability of the research efforts and also to give it "problem oriented outlook".

(k) To organize national and international seminars to discuss the problems facing the country in the field of Road Transport and make suitable recommendations to the Government.

(l) To arrange and organize training courses in road transport planning, appraisal, design, execution, monitoring, operation and maintenance.

The Road Research Division is being set-up with the assistance of O.D.A. and is expected to become operational by the end of 1988.

5. JUSTIFICATION:

Realizing the crucial importance of transport, most developing countries invest as much as 25 to 30 percent of their total public expenditure in transport. In Pakistan, during last six plan periods, approximately one-fifth of all public sector outlay was allocated to the transport sector. The tentative allocation for transport in the public sector during Seventh Plan Period is estimated at Rs. 49.792 billion. Much larger investments are still needed to meet the growing needs of mobility.

There is, therefore, dire need for great care to be exercised to make only the right kind of investments in developing essential transport facilities. In fact, there are immense possibilities of committing costly mistakes by making wrong investments in the field of transport i.e. investing where no investment should have been made, or vice-versa, and providing inappropriate/inadequate facilities not commensurate with requirements.

Modern transport is a very complex field in which numerous technological alternatives have become available for achieving the desired objectives. Each alternative (singly or in combination) has to be studies carefully to arrive at the optimum solution. The solution, has, of course, to be found in keeping with the nature of traffic, its composition, density, size of consignments, distances as obtaining at present and as projected in future. Since the estimates of future needs are bound to alter with the passage of time, it is essential that assessment should be made on a continuing basis, using the latest available statistics and methods. As such, long-term transport planning is not something that can be taken-up for a short while through sporadic arrangements. It has to be a continuous process of research and investigations, surveys and future forecast.

This type of planning is a typical federal responsibility, nevertheless, it can only be carried out properly in cooperation with the provincial and other modal agencies. This is essential to enable the federal Government to make sound and economically justified decisions.

The exercise of developed countries shows that they were also faced with problems of similar character in the earlier stages of their development. In recasting to them, errors were made which resulted in economic waste on a large scale. As a result of the experience thus gained, planning techniques were evolved which could help avoid such errors in future. It is imperative that advantage should be taken from the experience of the other. The administrative expenditure required in this context may possibly be large in absolute terms, but would be small in relations to the savings and benefits resulting from a balanced system of transport facilities.

During the past 20 years, a number of comprehensive transportation studies and surveys have been carried out in the country at a cost of millions of rupees, with a substantial component of foreign exchange. The U.S. Corps of Engineers Study - 1962, Transportation Coordination (TRACO) - 1970, National Transport Plan Study by JICA - 1983 and current updating of the Study by JICA are only a few examples. Besides, a multitude of Master Plan Studies pertaining to various individual sectors and still larger number of project feasibility studies have been carried out by foreign experts. This arrangement has three very distinct disadvantages:

(a) Firstly, all plans and studies are based on planning assumptions pertaining to the country of origin of the experts. How far they are applicable to Pakistan is only a matter of faith. Their relevance to Pakistan would continue to be questioned unless they are determined specifically for Pakistani conditions by carrying out research in the country.

(b) Secondly, the transport situation is always dynamic. It changes with time and economic development. It is, therefore, utmost important that the research in planning process should be conducted on a continuous basis.

(c) Thirdly, the arrangement leaves no residual expertise in the country. As a consequence every-time, costly foreign experts are required to be employed for carrying out project feasibility studies, sectoral master plan and comprehensive transportation plans.

This can only be overcome by strengthening the indigenous R&D resources of the country. But, there are serious gaps in the present research efforts which does not allow proper utilization of the existing facilities. There is also a need for establishing new institutions as well as enlarging the scope of the existing ones. There is need for streamlining the procedure to ensure that the results achieved by research institutions are in-line with the national planning needs and priorities.

Unfortunately, in the past, research has not been taken very seriously. Only token allocations were made for the R&D. As a result, not much was expected from these institutions. As against 5% of A.D.P. considered as essential minimum allocation for R&D in the Transport Sector, the actual funding has been of the level of 0.194% of A.D.P. which is too meagre to have any impact.

The proposed scheme is aimed at full utilization of the existing indigenous expertise in the field of transportation and reduce the dependence of the country on foreign expertise. The proposal would also help make most economical use of the scarce resources for developing an efficient system of transport by providing reliable planning inputs.

6. STAFFING POSITION OF NTRC

TRACO Experts had recommended the following staff schedule for the Centre :-

(a) The Cell should be headed by a highly qualified and dynamic transport economist with, in the beginning, only a small staff. After a few years the Cell may be expected to increase in size and consist of between 40 to 50 members containing administrative staff, specialists from each principal transport mode and adequate representatives of the following disciplines:-

(i) Theoretical and applied economics

(ii) Civil and Mechanical Engineering

(iii) Social and economic geography

(iv) System analyses

(v) Statistics

(vi) Electronic data processing

(b) It is important that the staff should be of the highest academic calibre as well as possessing managerial qualities which would enable them to accept responsibilities and take initiatives.

(c) The suggested Central Transport Planning Cell should be an addition to the existing planning institutions in West Pakistan. The provincial Transport Planning Cell should take care of the specific provincial transport coordination problems and should be developed according to the needs of each province. Similarly, railway, highway, air and pipeline transport planning institutions should be further strengthened and developed.

(d) The Central Transport Planning Cell should develop a special educational programme and run yearly courses for transport planners. The programme should be a continuation of the University education to produce planning specialists to cover the Central Cell's own needs and also to supply other transport planning institutions in West Pakistan with highly qualified personnel.

Over the years, Ministry of Finance has been sanctioning additional posts. However, the present professional strength of the Centre is only 20. As a result, even after more than 14 years of its inception the staff strength is still far less than what was envisaged to be achieved in few years.

The staff of the Centre is recruited strictly on the basis of Quota System. This poses great difficulties. As a result, a number of posts could not be filled during last three years, primarily because of the fact that the quota belonged to Sind Rural, Baluchistan, N.A. or FATA. Even at present time, 8 out of a total of 20 professional posts remain vacant.

All the studies being undertaken in the Centre are emperical in nature which involve collection, compilation, analyses and storage of massive amount of data. The Centre is also seriously handicaped in so far it does not have adequate lower staff to help with the data collection, compilation and analyses. At present, this need is being met by providing additional manpower at the level of BPS-16 and below on short-term basis. This is, however, not a very satisfactory arrangement for the following two reasons:-

(a) Individuals with appropriate qualifications do not come forth due to temporary nature of the assignment.

(b) The services of those who get trained while working on one study cannot be utilized for longer periods as they leave as soon as permanent job is available.

As regards representation of various disciplines, it may be mentioned that Chief of the Centre is a Transportation Planner and in addition has specialization in Highway Safety. The field of specialization of the incumbent Deputy Chiefs is as follows: -

(1) Transport Economics

(2) Statistics

(3) Road Transport

(4) Transportation Engineering

(5) Electrical Engineering

As a result, the Centre has not so far been able to initiate research in all modes of transport. The sanctioned staff of the Operational Research Division during the period 1974-87 may be seen at Annex-'I'. The current position may be seen at Annex-II.

As regard the Road Research Division, out of a total of 82 staff provided in the PC-I only 15 posts have been sanctioned by Ministry of Finance so far. Out of these only 2 Research Officers and 3 Support Staff are actually in position, as per Annex-III.

7. REVIEW AND COORDINATION:

The work being done in the Centre is reviewed, monitored and coordinated at four different levels as detailed below:-

(a) Inter Ministerial Committee: The Committee lays down the policy guidelines and is chaired by the Minister for Planning and Development with Deputy Chairman, Planning Commission and Secretaries, Ministries of Planning & Development, Communications, Railways, Science and Technology, Civil Aviation and Additional Secretary Finance as members. Chief NTRC is the Member/Secretary of the Committee. The members of the Research Advisory Committee of the Centre are ex-officio members of the Committee. The Composition of the Committee may be seen at Annex-IV.

(b) Research Coordination Committee: The Committee is charged with co-ordinating with various concerned federal and provincial transport agencies. The Committee is headed by the Secretary, Ministry of Communications and consist of the representatives of all transport related agencies at the federal and provincial level. The Composition of the Committee may be seen at Annex-V.

In addition, Centre keeps all concerned informed of the research carried out by supplying copies of the studies free of cost. Also, close liaison is maintained on regular basis with all the agencies.

(c) Research Advisory Committee: With a view to ensure that all research studies carried out by the Centre are technically sound, a Research Advisory Committee consisting of eminent transportation experts examines each proposal carefully. The membership of the Committee is by name. The Composition of the Committee may be seen at Annex-VI.

(d) Cost Appraisal Committee: The Committee with representative from Ministry of Finance (F.A. Wing) is responsible for scrutinizing and approving the cost estimates of individual studies and programmes. The Composition of the Committee may be seen at Annex-VII.

8. EXPENDITURE:

From 1974 to 1978, the entire expenditure of the Centre was charged to the Development Budget. However, w.e.f. 1-7-1978, the expenditure on Regular Staff, etc was transferred to the Revenue Budget and only the expenditure on Studies was allowed to continue to be charged to the Development Budget.

As against the approved cost of Phase-I (1974-83), amounting to Rs. 10.304 million with a F.E.C. of Rs. 4.50 million, the total Development Expenditure by 30-06-1983 was Rs. 5.301 million with no F.E.C. Out of this, Rs. 1.593 million was incurred on staff salaries, etc. during the period 1974-78 and Rs. 3.708 on Studies.

During Phase II (1983-88), as against Rs. 19.900 million with F.E.C. of Rs. 2.500 million, the actual Development Expenditure is estimated to be Rs. 22.920 million with a F.E.C. of Rs. 3.341 million.

As regards the Road Research Division, against the approved cost of Rs. 29.800 million with a FEC of Rs. 8.600 million, the actual expenditure by 30.6.1988 is estimated at Rs. 6.887 million with no FEC.

As against the total allocation amounting to Rs. 42.828 million during the period 1974-88, the actual expenditure amounts to Rs. 28.221 million, giving an average annual utilization of 66%. The actual utilization, however, varied from 12% to 124% as per details below:-

DEVELOPMENT EXPENDITURE			
Y e a r	Allocation (Rs.Mill.)	Expenditure (Rs. Mill.)	Utilization (%)
Phase-I			
1974-75	0.860	0.569	66
1975-76	0.426	0.337	79
1976-77	0.500	0.439	88
1977-78	0.720	0.619	86
1978-79	1.123	0.560	50
1979-80	1.360	0.682	50
1980-81	1.570	0.560	36
1981-82	3.588	1.447	12
1982-83	1.290	1.088	84
Sub-Total :	11.437	5.301	46
Phase-II			
1983-84	2.133	1.349	59
1984-85	2.553	3.169	124
1985-86	8.389	7.315	99
1986-87	11.674	5.474	51
1987-88	6.642	5.613	85
Sub-Total :	31.391	22.920	72
T o t a l :	42.828	28.221	66

The detailed break-down of Development Expenditure may be seen at Annex-VIII.

9. SELECTION OF STUDIES TOPICS:

The actual execution of the research studies is undertaken keeping in view the following four factors:-

(a) Work Plan of Research Studies

(b) Requirements of the Planning Commission

(c) In-house expertise in the Centre

(d) Availability of funds.

The following procedures are followed for carrying out research studies in the Centre:-

(i) A research proposal, giving objective, scope, manpower requirement, cost estimates and approximate time of completion is prepared in the Centre.

(ii) The proposal is then placed before the Research Advisory Committee (RAC) of the Centre comprising of most eminent professionals in the field of transport.

(iii) The study proposal, after it has been examined and endorsed by the R.A.C., is submitted to the Secretary Planning for his administrative approval.

(iv) After the administrative approval, the study is submitted to the Cost Appraisal Committee for approval of the cost estimates.

(v) The study is undertaken by the Centre as and when funds become available.

10. WORK DONE TODATE:

Inspite of all these difficulties as of December, 1987, the Centre has completed, 85 studies. In addition, 27 studies are in-hand.

The studies carried out by the Centre can be broadly categorized as follows:-

(A) Studies undertaken by Foreign Consultants

(B) Studies undertaken by Local Consultants

)C) Studies carried out by NTRC Staff.

The list of the studies may be seen at Annex-IX. Brief description is as follows:-

1. Studies carried out by Foreign Consultants:

Todate, 10 studies have been entrusted to the Foreign Consultants in the Centre. Out of these, all studies have since been completed and none are in-hand. Prior to 1980-81, the foreign consultants were given independent assignments, while at present, all such studies are carried out in-collection with the Centre's staff.

2. Studies undertaken by Local Consultants:

A total of 5 studies have been undertaken so far in the Centre. Four studies have since been completed and no study is in the pipeline for any local consultant.

3. Studies undertaken by NTRC Staff:

The studies carried out by the Centre are of three kind namely: Disk Studies;A.D.P. Studies and Consultancy Studies as described below:-

(i) Desk Studies:

These studies are undertaken by the individual officers of the Centre. A total of 31 studies have so far been undertaken by the Centre todate, which have already been completed. Most of these studies have been done during the initial five years. The motivation for such studies stems from the following factors:-

(i) Most of these studies are specifically assigned to the Centre by the Planning Commission in connection with preparation of Five Year Plan, Annual Plan or other important matters relating to transport sector planning policies.

(ii) Primary studies undertaken by the staff sometime run into procedural difficulties or go through a stage such as collection, and compilation, etc. of data in which the coordinator of the studies can contribute very little. These studies are persued to make gainful use of the time thus available.

(iii) While doing the primary studies, data is collected which could also be used for other relevant issues as well. Additional studies are thus generated without any extra cost.

(iv) It is the chartered duty of the Centre to collect and disseminate the latest development in the field of transport and prepare state-of-the-art reports for the benefit of those who do not have direct access to technical journals.

This type of research work has been deliberately encouraged for the following reasons:-

i) These studies are done by the regular staff in their spare time, therefore, they do not cost any additional funds.

ii) This keeps the researcher abreast of technical development in the professional as it requires considerable library work and going through the relevant literature, etc.

iii) This also gives exposure to the junior staff to learn research techniques so that in due course they could undertake research independently.

(2) A.D.P. Studies:-

These studies are charged to the Development Budget of the Centre. Todate, the Centre has been sanctioned a total of 82 studies. Out of these, 55 studies have been completed and 27 studies are in-hand.

(3) Consultancy Studies:

The Centre has provided consultancy services to a number of other national and international agencies as per summary below:-

S.No.	Agency	No. of Studies
1.	National Highway Board	7
2.	ESCAP	2
3.	I.B.R.D.	2
4.	Asian Development Bank	1
5.	Ministry of Railways	1
6.	Capital Development Authority	1
7.	Rawalpindi Municipal Corp.	1
8.	SAARC	1
	Total :	16

Details may be seen at Annex-x.

In addition, a number of consultancy assignments are currently under negotiations with various national and international agencies.

11. IMPACT OF WORK DONE:

The impact of research carried out by the Centre can be felt at the three levels namely; the Planning Commission; national and international level.

1. Planning Commission

At the Planning Commission's level, the main beneficiary of research carried out in the Centre has been the Transport and Communications Section. The studies have been directly used by T & C Section for the preparation of the Five Year Plans; appraisal of projects and National Transport Study being carried out by JICA for which major part of the data is being provided by the Centre, in the form of more than a dozen studies. It may be pointed out that JICA was very reluctant to undertake the study in the begining. It was only after their fact finding mission visited Pakistan and learned about the work already done/underway in the Centre that they agreed to undertake the study.

The research carried out in the Centre has also helped improved the quality of project appraisal in the Transport and Communications Section. In the past, the assumptions and data on which appraisal of the transport projects was based were either derived from foreign sources or were mere rules of thumb. However, as a result of the research carried out by the Centre, sound basis have now become available for proper appraisal of the projects.

2. National Level

At the national level, a number of agencies have benefited from the work done by the Centre by providing them copies of the studies free of charge. As a result, the Centre has been able to build a large group of the users of its research. Some of the studies have generated great demand and have gone through 3rd and 4th printing.

This would not have been possible without the relevence of research work done by the Centre to the problems faced by these agencies and the benefit they derive from it. The following are the specific examples of the impact of NTRC research at national level:-

(i) Data Bank:

Accurate statistical data is a pre-requisite for sound planning. The transport statistics were either not readily available or were inconsistent, unreliable and inadequate. In the past, a number of efforts were made to collect and compile accurate data regarding transport but without any success. As a result, the planning continued to be based on not so reliable data. The Centre as one of its highest priorities undertook the task of collecting the required data. A number of teams of Investigators were formed to extract statistics from the records of various transport agencies. As a result, NTRC was able to collect for the first time, accurate and reliable statistics for the period 1947-83. The data thus collected has been published in two volumes of 400 pages each. The effort has been greatly appreciated and the publications are extensively being used by all concerned. The publications are accepted as standard and the problem of lack of accurate statistics has been overcome. The statistics are continuously updated and placed on computer for ready retrieval.

(ii) Highway Safety:

As a result of a number of studies carried out by the Centre in various aspects of highway safety namely: role of road, vehicle, road users, enforcement, laws, education, etc., the perception of the problem of highway safety has radically changed. On the basis of research in the Centre, it was proved that the past diagnosis of the problem, whereby the primary blame was laid on inadequacy of roads, mechanical fitness of vehicle, etc. was not correct and the remedial measures therefore tried had no effect. It was established that the basic problem of highway safety in the country was primarily due to three factors namely: ignorance of traffic safety rules on the part of road users; lack of effective enforcement; and out-moded legislation. The findings have resulted in radical change in the perception of the problem.

To overcome the deficiency of knowledge of traffic safety rules a comprehensive Programme of Traffic Safety Education was designed in the Centre and carried out through television, radio, newspapers, posters, etc. A new Highway Code was also produced. The impact of these efforts have been that since 1978 the level of the knowledge of the traffic safety rules on the part of road users has risen from almost zero to more than 40%, which though is still very low as compared to international standard of 95%.

To improve the enforcement, a Comprehensive Plan for Re-organization of Traffic Police was produced and gotton approved by the Federal Cabinet in December 1978. Unfortunately, the decisions taken by the Government, for a number of reasons, have not yet been fully implemented by the Provincial Governments. Therefore, the enforcement still remains the weakest link. However, it has now been decided to set up a Pilot Highway Patrol between Attock and Jhelum along N-5 with the assistance of World Bank to demonstrate the modern techniques of Highway Patrolling. Also, Traffic Police Training Schools are being established at Karachi and Lahore.

As far the laws, a Comprehensive Road Safety Act was prepared which after going through various stages of consultation with concerned provincial and federal agencies, was considered by Federal Cabinet in June, 1981. The Act was referred to Cabinet Sub-Committee head by Governor of Sind. The Sub-Committee has finalized its recommendations and the draft of the legislation is likely to be considered by the Federal Cabinet in the near future.

Also, a new scheme of Road Signs was prepared and gotton approved by the Government which has paved the way for adoption of international signs in the country. The new signs were first erected/installed as a model on Islamabad Highway between Zero Point and Airport and are now being replicated all over the country.

(iii) Consultancy:

The Centre receives a large number of requests for technical assistance from various quarters. The Centre is also called upon to undertake studies on behalf of other Government Agencies. The notable example in this regard is a number of studies being carried out by the Centre for the National Highway Board.

In addition, a number of international agencies have offered consultancy assignments to the Centre in which the Centre has built considerable expertise. The notable example in this connection are World Bank, Asian Development Bank, ESCAP-Bankok, SARRC, etc. A number of studies are under negotiation with various agencies. The list of the Consultancy Studies carried out in the Centre todate may be seen at Annex-X.

3. International Level:

At the international level, the work done by the Centre has been appreciated by a number of international agencies. As a result, the Centre has received offer of collaborative research from a number of institutions. In this regard, T.R.R.L - U.K. is an example with whom two separate collaborative research programmes have already been implemented. Similar offers have been received from Australian Road Research Bureau, Drug Abuse Centre of W.H.O., Swedish Road Research Institute and a number of other institutions.

From the preceding, it is obvious that in a short period of time NTRC has made a mark both at the national as well as international level. This has been achieved inspite of great difficulties encountered during earlier years. Had the Centre received greater support, it would have been able to make even bigger impact.

12. PRIORITY AREAS FOR TRANSPORT RESEARCH:

There are three possible areas of research in the field of transport namely : (i) Industrial Research; (ii) Structural Research; and (iii) Operational Research:

(i) Industrial Research: None of the sub-sectors except railways is sufficiently developed to justify undertaking of indigenous manufacture of equipment and hence industrial research. Since the railways are not doing very much by way of research in this field, there is thus urgent need to fill this gap.Nevertheless, efforts need to be made to lay foundation for research in other important areas such as Road Transport and Ship-building where indigenous manufacturing capability exists.

(ii) Structural Research: The size of transport infrastructure makes it imperative that structural research in all the sub-sectors should be undertaken to make optimum use of investment. A number of well-equiped laboratories exist in some highway departments, Pakistan Railways and the Universities. However, all these laboratories are primarily engaged in Material Testing and no Structural Research of any significance is undertaken anywhere in the country. There is, therefore, pressing need for undertaking structural research in all the sub-sectors particularly rail, road, ports, civil aviation, etc.

(iii) Operational Research: This type of research is required for all sub-sectors of transport, both at the level of individual modes as well as at the national level. The individual modes need such research to obtain maximum return from their existing assets by removing any bottlenecks and weak points. At the national level, the research is required to ensure coordinated development of

all modes of transport in the country. Unfortunately none of the individual agencies responsible for various sub-sectors carry out such research. At the national level i.e. Planning Commission, this task is partly being performed by the National Transport Research Centre (NTRC). The thrust of research in the Centre has been rimarily directed in the area of planning, economics and safety of road transport. No research could be undertaken in Railways, Ports, Shipping and Civil Aviation due to lack of in-house expertise in these fields. Therefore, the research requirements of Planning Commission in these sub-sectors remain unfulfilled.

(iv) Adaptive Vs Basic Research:

The research in these areas could be either of Basic Type of Adaptive type. Keeping in view the fact that extensive research has already been done in these areas in the developed countries, it would not be necessary to resort to Basic Research. Instead, efforts should be concentrated on adopting the results of such research to suit the conditions prevailing in the country. The priorities of research in the field of transport should, therefore, be to carry out Adaptive Research in the following areas:-

(a) Industrial Research - Railways & Ship-Building

(b) Structural Research - Roads, Railways, Ports & Civil Aviation.

(c) Operational Research - All Modes.

3. ORGANIZATIONAL SET UP

The TRACO Experts had recommended that the Centre should be organized on the line of the 'Institute of Transport Economy in Oslo, Norway'. No efforts were, however, made to study the organizational and administrative set-up of Oslo Institute before the Centre was established.

Literature later obtained about the Oslo Institute revealed that the Institute was founded in 1958 by the Royal Norwegian Council for Scientific and Industrial Research (NTNF) and is affiliated to the Council together with 13 other national institutes.

The main objectives of the Institute are to carry out research and to promote the application and use of results through consultative assistance to public authorities, transport industry, and others by means of information, education, and training. The Institute has also a responsibility for international cooperation within the transport sector. The Institute has a total staff of 110 employees of which 75 are professionals. The annual budget is approximately US $ 5 million (1981).

The Institute is governed by a Board of Directors. The day to day matters are looked after by a Managing Director, supported by six Assistant Directors. The research staff is organized in six departments. In addition, there is Administration Department and an Information Services Group. The organization chart of the Institute may be seen at Annex-XI.

Most activities are based on a multi-disciplinary approach and the staff consists of a wide variety of professions. Traditionally, Economists and Engineers form the major groups but the staff also includes other professions as indicated below:-

- Engineers
- Economists
- Political Scientists
- Geographers
- Statisticians
- Sociologists
- Psychologists
- Architects/Planners

The Institute carries out research and development projects and gives consultative assistance to public authorities, the transport industry and to others within the road, rail, sea and air transport sectors. The main field of activity are:-

- Transport policy and sector development
- Institutional aspects
- Planning and decision making processes
- Economic analysis and demand forecasting
- Cost analysis

- Transport statistics
- Planning & Operation of transport systems
- Public transport studies
- Port and terminals studies
- Road and traffic planning
- Traffic management and operation
- Coastal Shipping Studies
- Road maintenance
- Road safety
- Socio-economic analyses
- Environmental analysis
- Work environment studies
- Business logistics studies.

In comparison the Centre at present has only two divisions namely : Operational Research Division and Road Research Division. The Operational Research Division is in fact th original National Transport Research Centre which has been renamed as such. The total sanctioned strength of the Centre todate is only 77. The Organizational Chart of the Centre may be seen at Annex-XII.

14. THE PROPOSAL:

The following programme is proposed during Seventh Five Year Plan:-

1. Research Studies:

The Research Coordination Committee of the Centre has recommended the following research programme during the 7th Plan:-

(a)	Road	...	15
(b)	Road Transport	...	19
(c)	Railways	...	2
(d)	Civil Aviation	...	4
(e)	Ports	...	4
(f)	Shipping	...	4
(g)	Inter Modal	...	6
	Total :	...	54

A lump-sum amount of Rs. 14.450 million is provided for this purpose to cater for the financial requirements of the studies entrusted to the Centre for both the Operational Research Division and the Road Research Division. The actual utilization of the amount would be subject to formulation of detailed individual proposal and approval of the competent authority. Details of the research programme may be seen at Annex-XIII.

2. Highway Safety Studies:

Considering the importance of Highway Safety, a specific provision of Rs. 1.00 million is being made to carry out research studies in this vital field. The tentative break down may kindly be seen at Annexure-XIV.

3. Demonstration Projects:

Experimentation is the essence of research. Demonstration Projects are the most economical and quickest method of spreading the benefit of research to a wide area. There is considerable scope and need for experimentation and demonstration projects in road pavement geometrics, pavement thickness and urban traffic management such as exclusive bus lanes,parking meter, etc. However, apart from a few low cost roads, highway safety counter-measures, urban transport, the Centre so far has not carried out large scale demonstration projects during Sixth Plan.

The low cost roads, two in number were constructed with pit-run and crushed gravel as well as brick bats. The road safety measures included provision of junction boxes at busy inter-sections in Islamabad. The urban-transport projects consisted of an introduction of de-regulated quality urban transport service in the private sector in Rawalpindi/Islamabad and undertaking the development of an Urban Bus Train for cheap transport for the poor urban commuters. All the projects except for Bus-Train which is still in the developmental stage, yielded very good results.

Another Demonstration Project, using geotextile fabrics in water logged/swampy areas where sub-grade is weak and there is likelihood of sub-grade failure is in the offing. If successful, it would overcome the problem of road construction in water-logged areas.

During the 7th Plan period, it is envisaged to undertake Demonstration Projects in the following areas:-

(1) Traffic Engineering

(2) Enforcement

(3) Education

(4) Road Users Behaviour

(5) Low Cost Roads

(6) Roads in Water Logged Areas

(7) Soil Stabilization for Road Embankments

(8) Land Sliding

(9) Local Construction Materials

(10) Quality Control.

A lumpsum provision of Rs. 5 million is made for the purpose during the 7th Plan.

4. Computerization:

The computerization of the Centre began with two micro computers provided by O.D.A. under their Technical Assistance to the Centre primarily for recording, storage, analyses and retrieval of accident data. With the installation of N.C.R. Mainframe Computer are the Planning Commission, the Centre was provided two terminals i.e. one at Jawaid Azfar Memorial Computer Centre and 2nd one at the Centre itself through a dedicated line. This enabled the Centre to start computerizing its huge amount of transport statistics and traffic data. On transfer of NCR Mainframe Computer to the Registration Authority, the Centre was provided with a NCR mini-computer of IMB-RAM and 46 MB of hard-disk memory to ensure the continuity of the efforts made in this regard.

The main objectives of the computerization in the Centre are:-

(a) to establish a transport data bank;

(b) analyses of studies data; and

(c) General Management Information System.

Inspite of the fact that since the installation of the mini-computer, the Centre has been without the services of a qualified Programmer and the post of Programmer is still lying vacant due to administrative problems, the following has been achieved:-

(a) Transport Statistics from 1947 to 1983 computerized;

(b) Accounts of the Centre maintained on daily basis.

(c) 13,000 driving licences stored.

(d) Library references being computerized.

(e) Statistical analysis of studies carried out.

At present, eight terminals are hooked-on to the mini-computer which are used extensively by various officials. As a result, the computer response time has become too slow and there is urgent need to upgrade it to at least 3 MB-RAM and 191-MB hard-disk. The total development outlays required during 7th Plan are estimated at Rs. 1.900 million as per details at Annex XV.

5. Data Bank:

The importance of statistical data cannot be over-emphasised in planning and policy formulation. The shortage of statistical data in developing countries is often the basic cause of poor planning. A large amount of data is required by researchers, planners, policy-makers and the administrators for carrying-out in-depth analysis which is absolutely essential for arriving at accurate conclusions. The need for data increase exponentially as the economy grows and develops complex inter dependencies.

One of the primary function of NTRC, was the establishment of Data Bank in which all statistics relating to the field of transportation had to be stored.

Till 1978, NTRC was not in a position to discharge this important function. The proposal for setting up a Data Bank was approved in Research Advisory Committee's Meeting held in July, 1978. The Finance Division approved this proposal in December, 1978 with an estimated cost of Rs. 323,000/-. An expenditure of Rs. 371,000/- was incurred upto 30th June, 1983. During the 6th Five Year Plan an amount of 1.000 million was ear-marked for the Data Bank. The actual expenditure of 31.12.1987 amount to Rs. 1,228,514/-. The total expenditure during Seventh Plan is estimated to be Rs. 2,267,000/- to collect the data special teams of investigators were organized to extract the requisite information directly from the records of various concerned agencies such as Pakistan Railways, PIAC, Civil Aviation Authority, National Shipping Corporation, Karachi Port Trust, Provincial Excise and Taxation Departments, Provincial Highways Departments, Provincial Police Departments, District Councils, Municipal Corporations/Committees, Cantonment Boards and Provincial Urban Transport Authorities and PACO, etc. The First Statistical Bulletin containing a variety of information covering all modes of transport for the period 1947-79 was issued in November, 1980. This was followed by another one in November, 1981 containing additional statistics which were not covered in the earlier issue.

Publication of these two bulletins overcome the problem of lack of accurate and consistent statistics to a very large extent. Although the present publication in two volumes is basically another edition of the earlier bulletins, It also updates the information upto the year 1983 and reconciles certain anamolies which had come to notice in the earlier two issues. Summary of the data being collected and compiled may be seen at Annex-XVI.

During Seventh Plan, National Transport Research Centre intends to update the data on regular basis and issue periodic bulletins so that the various planning agencies are provided with the latest available data. The statistical data contained in these publications have also been computerized which would not only ensure easy updating but would be used for detailed analysis of transport trends in the country. The total expenditure on this account is estimated at Rs. 2.267 million as per details at Annex-XVII.

6. Dissemination of Research:

National Transport Research Centre as an organization devoted to carrying out research on all modes of transport. Todate, the Centre have completed 100 studies, more than dozen studies are in-hand and a number of studies are in pipeline. To keep the various professional and technical personnel abreat of the technological developments taking place in the field of transport the Centre has compiled a mailing list of over 600 of all the technical and professional personnel working in various transport related agencies. Each NTRC publication is printed in 300-500 copies and distributed among all those concerned with the subject locally as well as abroad. The arrangements have proved very beneficial to the researchers and planners. Some of the studies of the Centre have gone through 3-4 times printing to meet the demand.

During the Sixth Plan, an amount of Rs. 500,000/- was allocated for dissemination of research. Out of this, about Rs. 420,000/- have been expended on Printing/Reprinting of Research Studies, their dissemination and salaries of staff. The remaining balance is expected to be utilized by the end of 30th June, 1988.

To continue the programme during the 7th Plan, an allocation of Rs. 1.000 million has been proposed which would enable the Centre to print/reprint the studies carried out by the Centre itself as well as those received from outside agencies for circulation amongst the various individuals and organizations concerned with transport. The details may be seen at Annex-XVIII.

7. Training Courses:

National Transport Research Centre has been providing professional training in Transportation Projects planning every year. Todate, the Centre has organized nine such courses. The first four courses were held in collaboration with E.D.I. of the World Bank from 1976-79. The courses were, however, discontinued in 1980. In 1983, after a lapse of 4 years this programme was re-activated. By that time E.D.I. - World Bank was no longer able to extend any material help and as a result, rest of the five courses were organized entirely with own resources. The eighth course was elevated to Regional Level and now future training courses are open to the SAARC and OIC countries of the region. These courses had a very positive effect on the quality of projects prepared by the various provincial and federal agencies.

During the 6th Plan period an allocation of Rs. 500,000 was made for training programme of the Centre. Out of this, Rs. 380,000 have been expended as of 30-06-1987. The remaining balance would be expended by the end of June 1988.

To continue the training programme during 7th Plan, an allocation of Rs. 1.000 has been proposed as per details at Annex-XIX.

8. Seminars/Symposium:

In view of the tempo and quantum of research undertaken during last 10 years and the future programme, it is felt that holding of a few national/international Seminars/Symposium to discuss the transport problems in general and securing the views of other experts with regard to its research programme, and providing opportunities to the research staff to attend International Conferences to keep them abreat of the latest technological development would be most desirable.

The total development outlays required during 7th Plan for this programme are estimated at Rs. 0.750 million as per details given at Annex-XX.

9. Traffic Count Programme:

An amount of Rs. 2.5 million was specifically provided for Traffic Counts during the period 1983-88. Phase-I of the programme was launched in July 1985 with the help of automatic traffic counting machines provided by O.D.A. under their Technical Assistance for NTRC and 10 permanent stations were set-up on National Highways.

In the 2nd Inter Ministerial Committee meeting held on 16th December 1985 under the Chairmanship of Minister for Planning and Development, it was decided to extend the coverage of the programme, by setting up 10 more permanent stations. In addition, it was decided to provide permanent huts for the staff. The cost of Phase-II was estimated at Rs. 3.51 million.

10 stations under Phase-I were set-up in July-October 1985, while the additional 10 stations under Phase-II were set-up during July - December 1986. The location of the stations may be seen at Annex-XXI. At each station, hourly data was collected by automatic counters. In addition, classified directional counts i.e break-up of traffic by type of vehicle and direction of flow was noted for two hours (one hour during day light and one hour during night time) on rotating basis. Total staff employed at each station included one Supervisor (BPS-16),

Four Enumerators (BPS-II) and one Cook/Chowkidar, daily, weekly and monthly survey forms have been filled-in. Editing of the record of these stations is nearing completion. Further analysis and compilation through computerization is underway.

The programme entered Phase-III. On the completion of 13 months data at each of the station, the scope of the programme was reduced to only daily reading of the counters at specified hour and classified directional counts of two hours every day. The total expenditure on Phase-I, II & III by 30-06-1988 is expected to be Rs. 7,092,839 as per summary below:-

Phase No.	Amount (Rs)
I	2,407,770
II	3,420,269
III	1,264,800
TOTAL :	7,092,839

During the 7th Plan, the following programme is proposed :-

(a) Continue current traffic counts on the existing 20 stations - Phase IV

(b) Establish 10 additional stations to cover other major roads - Phase V

(c) Continue traffic counts with reduced scope beyond first year - Phase VI.

The cost of Traffic Count Programme during 7th Plan amounts to Rs. 20.633 million as per summary below :-

Phase	Amount
IV	11,233,000
V	4,380,000
VI	5,020,000
TOTAL :	20,633,000

Details may be seen at Annex-XXII.

10. FOREIGN ASSISTANCE:
The entire expenditure in respect of the Research Programme of the Centre shall be in local currency and no Foreign Exchange will be required. However, a nominal amount of Rs. 1.000 million is provided for the purchase of specialized equipment which may be required for some experiments and other un-foreseen expenses.

11. SUMMARY:
Total programme during 7th Plan is estimated to cost Rs. 50.000 million with F.E.C. of Rs. 1.000 million as per details below:-

(Rs.Million)

Sl.No.	I t e m s	Allocation
1.	Research Studies	14.450
2.	Highway Safety Studies	1.000
3.	Demonstration Projects	5.000
4.	Computerization	1.900
5.	Data Bank	2.267
6.	Dissemination of Research	1.000
7.	Training Courses	1.000
8.	Seminar/Symposium	0.750
9.	Traffic Count Programme	20.633
10.	Foreign Exchange	1.000
11.	Miscellaneous	1.000
	TOTAL :	50.000

P H A S I N G :

The phasing of the expenditure would be as follows: Details may be seen at Annex-XXIII

Year	Local	F.E.C.	Total
1988-89	6.480	0.200	6.680
1989-90	10.575	0.200	10.775
1990-91	10.575	0.200	10.775
1991-92	10.705	0.200	10.905
1992-93	10.665	0.200	10.865
Total :	49.000	1.000	50.000

15. REQUIREMENT OF MATERIAL, ETC.

a) Plant and Machinery - Workshop Equipment

- Laboratory Equipment

- Data Storage, Analysis and Retrieval

b) Structural: - - N I L -

c) P o w e r: - - N I L -

16. RECURRING expenditure:

The annual recurring expenditure of the Centre is charged to the Revenue Budget and only nominal increase from current year's level (1987-88) is expected on account of slight increase in the staff in-line with the proposed research programme. Details of current year's recurring expenditure may be seen at Annex-XXIV.

ANNEX-I

SANCTIONED POSTS OF NTRC *

Sl. No.	Post	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.	Chief	-	-	1	1	1	1	1	1	1	1	1	1	1	1
2.	Deputy Chief	3	3	3	3	3	2	2	3	3	3	4	6	6	7
3.	Assistant Chief	1	1	1	1	1	1	1	1	1	2	3	3	3	5
4.	Planning/ Research Officer	-	2	2	2	2	1	1	1	1	2	3	3	5	5
5.	Section Officer	-	-	-	-	-	-	-	-	-	-	-	1	1	1
6.	Librarian	-	-	-	-	-	-	-	-	-	-	-	1	1	1
7.	Computer Programmer	-	-	-	-	-	-	-	-	-	-	-	1	1	1
8.	Superintendent	-	1	1	1	1	1	1	1	1	1	1	1	1	1
9.	Stenographer (BPS-16)	-	1	1	1	1	1	1	1	1	1	1	1	1	1
10.	Stenographer (BPS-15)	2	2	2	2	2	2	2	2	2	2	2	4	4	7

ANNEX-I

(Contd.)

Sl. No.	Post	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
11.	Stenotypist	1	3	3	2	2	2	2	2	2	4	5	5	5	5
12.	Draftsman	-	1	1	1	1	1	1	1	1	1	1	1	1	1
13.	Assistant	2	3	1	1	1	1	1	1	1	1	2	2	2	3
14.	U.D.C.	-	1	1	1	1	1	1	1	1	1	2	2	2	2
15.	L.D.C.	-	1	1	1	1	1	1	1	1	2	2	2	2	2
16.	D.M.O.	-	1	1	-	-	-	-	1	1	-	-	1	1	1
17.	Despatch Rider	-	-	-	-	-	-	-	-	-	1	1	1	1	1
18.	Driver	-	1	1	1	1	1	1	1	1	3	3	3	3	3
19.	Naib Qasid	3	7	7	7	7	7	7	7	7	10	12	12	12	14
	TOTAL :	12	28	27	25	25	23	23	25	26	36	44	51	53	62

* Operational Research Division

ANNEX-II

OPERATIONAL RESEARCH DIVISION - STAFF POSITION

(01.04.1988)

(No.)

Sl. No.	Post	BPS	Sanctioned Posts	In Position	Vacant
1.	Chief	20	1	1	-
2.	Deputy Chief	19	7	5	2
3.	Assistant Chief	18	5	3	2
4.	Research Officer	17	5	3	2
5.	Librarian	17	1	-	1
6.	Computer Programmer	17	1	-	1
7.	Section Officer	17	1	1	-
8.	Superintendent	16	1	1	-
9.	Stenographer	16	2	2	-
10.	Stenographer	15	6	4	2
11.	Stenotypist	12	5	5	-
12.	Assistant	11	3	3	-
13.	Draughtsman	11	1	1	-
14.	UDC	7	2	2	-
15.	LDC	5	2	1	1
16.	Driver	4	3	3	-
17.	D.R.	4	1	1	-
18.	D.M.O.	4	1	1	-
19.	Naib Qasid	1	14	14	-
	Total :-		62	51	11

ANNEX-III

ROAD RESEARCH DIVISION - STAFF POSITION

(01.04.1988)

(No.)

Sl. No.	Post	BPS	Sanctioned Posts	In Position	Vacant
1.	Deputy Chief	19	2	-	2
2.	Assistant Chief	18	2	-	2
3.	Research Officer	17	4	2	2
4.	Stenographer	15	1	-	1
5.	Stenotypist	12	2	-	2
6.	UDC	7	1	1	-
7.	LDC	5	1	-	1
8.	Naib Qasid	1	2	2	-
	Total :-		15	5	10

ANNEX-IV

COMPOSITION OF INTER-MINISTERIAL COMMITTEE OF N.T.R.C.

1) Minister for Planning and Development	Chairman
2) Deputy Chairman, Planning Commission	Member
3) Secretary, Planning Commission	Member
4) Secretary, Ministry of Communications	Member
5) Secretary, Ministry of Railways	Member
6) Secretary, Aviation Division	Member
7) Secretary, Ministry of Science & Technology	Member
8) Member (Admn.), Planning Commission	Member
9) Mr. Aftab Alam, Chairman, K.P.T.	Member
10) Dr. Z.M. Khilji, Professor of Civil Engg. University of Engg. & Technology, Lahore	Member
11) Mr. Ghiasuddin, General Manager Railways, Lahore	Member
12) Dr. Nasim M. Sadiq, O.S.D., Federal Bureau of Statistics	Member
13) Additional Secretary (E), Ministry of Finance	Member
14) Mr. Tajammal Hussain Qureshi, Secretary, C&W Dept. Lahore	Member
15) Chief, NTRC	Member/ Secretary

ANNEX-V

COMPOSITION OF RESEARCH COORDINATION COMMITTEE

(1) Secretary, Ministry of Communications Government of Pakistan Islamabad	Chairman
(2) Director General, Ports & Shipping Wing, Ministry of Communications Karachi	Member
(3) Member (Traffic) Ministry of Railways Islamabad	Member
(4) Chief (T&C) Planning Commission Islamabad	Member
(5) Director General National Highway Board, Islamabad	Member
(6) Joint Secretary (Transport) Ministry of Communications Islamabad	Member
(7) Joint Secretary, Aviation Division Rawalpindi	Member
(8) Secretary C&W Department, Government of Punjab Lahore	Member
(9) Secretary C&W Department, Government of NWFP Peshawar	Member

Annex-V (Contd.)

(10) Secretary — Member
C&W Department
Government of Sind
Karachi

(11) Secretary — Member
C&W Department,
Government of Baluchistan
Quetta

(12) Secretary — Member
C&W Department
Government of A.J.K.,
Muzaffarabad

(13) Secretary — Member
Transport Department
Government of Punjab
Lahore

(14) Secretary — Member
Transport Department
Government of NWFP
Peshawar

(15) Secretary — Member
Transport Department,
Government of Sind
Karachi

(16) Secretary — Member
Transport Department
Government of Baluchistan
Quetta

(17) Chief of T&C Section — Member
Planning & Development Board
Government of Punjab
Lahore

(18) Chief of T&C Section — Member
Planning & Development Department
Government of Sind
Karachi

Annex-V (Contd.)

(19) Chief of T&C Section Planning & Development Department Government of NWFP Peshawar	Member
(20) Chief of T&C Section Planning and Development Department Government of Baluchistan Quetta	Member
(21) Chief, NTRC	Member
(22) Rep. of P.I.A.C.	Member
(23) Rep. of Civil Aviation	Member
(24) Rep. of Port Qasim Authority	Member
(25) Rep. of Karachi Port Trust	Member
(26) Rep. of Railway Board, Lahore	Member
(27) Deputy Chief, NTRC	Secretary

ANNEX-VI

COMPOSITION OF RESEARCH ADVISORY COMMITTEE OF NTRC

(1)	Mr. Aftab Alam, Chairman, Karachi Port Trust Karachi	Chairman
(2)	Engineer Ghiasuddin, General Manager Pakistan Railways Lahore	Member
(3)	Mr. Tajammal Hussain Qureshi, Secretary, Communication & Works Deptt., Government of Punjab Lahore	Member
(4)	Dr. Nasim M. Sadiq, O.S.D. Federal Bureau of Statistics Islamabad	Member
(5)	Dr. Z. M. Khilji, Professor of Civil Engineering, University of Engg. & Technology Lahore	Member
(6)	Chief, N.T.R.C.	Member
(7)	Deputy Chief, NTRC	Secretary

ANNEX - VII

COMPOSITION OF COST APPRAISAL COMMITTEE OF NTRC

(1)	Engineer Ghiasuddin, General Manager Pakistan Railways Lahore	Chairman
(2)	Malik Muhammad Saeed Khan, Chief (T&C) Planning Commission Islamabad	Member
(3)	Mr. Masood H. Kizilbash, Chief, E.R. Section Planning Commission Islamabad	Member
(4)	Mr. Inamullah Khan, D.F.A. (Planning) Ministry of Finance Islamabad	Member
(5)	Chief, N.T.R.C.	Member
(6)	Deputy Chief, NTRC	Secretary

Annexure-VIII

SUMMARY OF DEVELOPMENT EXPENDITURE

(1974 - 1988)

(Rs.Million)

Year	Allocation			Expenditure		
	Local	F.E.C.	Total	Local	F.E.C.	Total
Operational Research Division						
A. Phase-I						
1974-75	0.860	-	0.860	0.569	-	0.569
1975-76	0.426	-	0.426	0.337	-	0.337
1976-77	0.500	-	0.500	0.439	-	0.439
1977-78	0.720	-	0.720	0.619	-	0.619
1978-79	1.123	-	1.123	0.560	-	0.560
1979-80	1.360	-	1.360	0.682	-	0.682
1980-81	1.570	-	1.570	0.560	-	0.560
1981-82	1.088	-	3.388	0.447	-	0.447
1982-83	1.290	2.500	1.290	1.088	-	1.088
Sub-Total(A)	8.937	2.500	11.437	5.301	-	5.301
B. Phase-II						
1983-84	1.892	0.241	2.133	1.108	0.241	1.349
1984-85	1.553	1.000	2.553	1.369	1.800	3.169
1985-86	6.389	2.000	8.389	6.315	1.000	7.315
1986-87	10.099	1.575	11.674	5.174	0.300	5.474
1987-88	6.642	-	6.642	5.613*	-	5.613*
Sub-Total(B)	26.575	4.816	31.391	19.579	3.341	22.920
G.Total:	35.512	7.316	42.828	24.880	3.341	28.221

Annexure-VIII (Contd.)

Road Research Division

1985-86	0.500	-	0.500	0.500	-	0.500
1987-88	6.500+	3.00	9.500	6.387*	-	6.387
Total:	7.000	3.00	10.000	6.887	-	6.887
G.Total:	42.512	10.316	52.828	31.767	3.341	35.108

* Revised Estimates
+ Including 5.00 million which is expected to be re-appropriated.

ANNEX-IX

RESEARCH STUDIES

COMPLETED

1.	Economics of Electrification - Khanewal - Samasatta Section of Pakistan Railways	February, 1975
2.	Inland Water Route-Port Qasim-Sukkur	May, 1975
3.	Highway Improvement Priority Criteria	January, 1976
4.	Pilot Origin & Destination Survey	January, 1976
5.	Inland Traffic Forecast 1980-81	February, 1976
6.	Port Cargo Traffic Forecast for Pakistan (1974-75 to 1989-90)	February, 1976
7.	Effects of Highway Design Elements on the Capacity of two-lane Roads	August, 1976
8.	Farm-to-Market Roads Survey	November, 1976
9.	Pakistan Maritime Transport Study	January, 1977
10.	Lawari Ropeway Study	February, 1977
11.	A Note on Petrol Versus Diesel Transport	August, 1977
12.	Re-organization of Administrative Control of Transport	October, 1977
13.	Change of Passenger Class Structure of Pakistan Railways-Effect on Revenues	November, 1977
14.	Containerization in Pakistan	November, 1977
15.	Economics of Pipeline Versus Rail	December, 1977
16.	Pakistan Highway Code	December, 1977
17.	Re-Organization of Traffic Police	January, 1978

ANNEX-IX

(Contd.)

18.	Traffic Survey of Islamabad Highway	June, 1978
19.	Effect of Increase in Bus Fares on Common Man's Budget	July, 1978
20.	Highway Operating Speeds of Government & Private Bus Drivers	August, 1978
21.	Transport Requirements Shortage of Buses	October, 1978
22.	Modern Transportation	December, 1978
23.	Survey of Bus Services for Islamabad Secretariat	December, 1978
24.	Accident Study for Punjab	December, 1978
25.	Feasibility Study for the Operation of a Passenger/ro-ro-ferry service to the Gulf by P.N.S.C.	March, 1979
26.	Transport Data Collection, Storage & Retrieval System	March, 1979
27.	Highway Transportation Studies and Surveys	April, 1979
28.	National Port Policy	May, 1979
29.	A Survey of Intercity Bus Operations	May, 1979
30.	Canal roads for Public Use (Feasibility Study)	July, 1979
31.	Choice of Mode for Journey to Work (For Government Employees)	August, 1979
32.	Traffic Enforcement Plan for Rawalpindi	November, 1979
33.	Fourth Course on Transportation Projects Planning	November, 1979
34.	Psychological Attitudes Towards Highway Safety	January, 1980

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(Contd.)

35.	Bus Make Study	March, 1980
36.	Computerized Reservation of PIAC	June, 1980
37.	Role of Transportation in Development	July, 1980
38.	Real Problem of Highway Safety in Pakistan	July, 1980
39.	Investment Programme and Development Projects of PIAC	July, 1980
40.	Review of Port Traffic Forecasts	August, 1980
41.	Effectiveness of Traffic Police Training	September, 1980
42.	Road Safety Ordinance, 1978	October, 1980
43.	Transport Bulletin	November, 1980
44.	Highway Speed Survey	November, 1980
45.	Energy Use in Transport	February, 1981
46.	Utilization of Technical Manpower in PWDs	February, 1981
47.	Effect of Enforcement on Road User's Behaviour	March, 1981
48.	Manual of Uniform Traffic Control Devices	July, 1981
49.	Fuel Consumption Study	July, 1981
50.	Inland Water Transport in Pakistan	September, 1981
51.	Transport Research & Development in Pakistan	October, 1981
52.	Transport Bulletin (Supplementary No. 1)	November, 1981
53.	Bus Driver Training Pilot Study	December, 1981

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(Contd.)

54.	Traffic Factors for Pakistan	March, 1982
55.	Multi Axle Vehicle Survey	October, 1982
56.	Axle Load Survey	October, 1982
57.	Road Accidents in Pakistan	January, 1983
58.	Economic Implication of Vehicle Overloading	April, 1983
59.	Road Development Plan Azad Jammu & Kashmir (1983-88)	April, 1983
60.	National Transport Plan Study	May, 1983
61.	Road Traffic Origin-Destination Survey (1979-80)	June, 1983
62.	Transport Alternatives for Sixth Plan	August, 1983
63.	Review of Vehicle Operating Equipment Inventory in Pakistan	November, 1983
64.	Survey of Skidding Resistance Values on Main Roads in Pakistan	December, 1983
65.	A Review of Design Standards for Tertiary Rural Roads	November, 1984
66.	Intermodal Choice Motivation	December, 1984
67.	Vehicle Operating Cost Study	January, 1985
68.	The Volume and Composition of Traffic on Tertiary Rural Roads	January, 1985
69.	A Study of Design Standard for surface width and Design Speed on Tertiary Rural Roads	February, 1985
70.	Transport Statistics, 1984	April, 1985
71.	Motor Vehicle Utilization Survey	June, 1985

ANNEX-IX

(Contd.)

72.	Road Accidents Counter Measures in Pakistan	June, 1985
73	Transport Demand for Major Commodities	June, 1985
74.	O.D Survey for Rail	June, 1985
75.	Public Service Vehicle Survey	June, 1985
76.	Survival Rate of Motor Vehicle	December, 1985
77.	Origin Destination Survey for the Link Road between Super Highway and PQA	March, 1986
78.	The Effect of Road work Sign on Driver Behaviour	October, 1986
79.	The Effect of Road Markings on Driver Behaviour	December, 1986
80.	Survey of Road Construction Machinery	January, 1987
81.	Economics of Taxi Operation	March, 1987
82.	Improvement in Taxi Service Rwp.- I'bad (Vol.I & II)	February, 1987
83.	Procedures Manual for Evaluation of Farm-to-Market Roads	June, 1987
84.	Battery Powered Electric Vehicle	October, 1987
85.	Pilot Urban Bus Project (Preliminary Evaluation)	December, 1987

ON - GOING

86.	Improvement in Taxi Service
87.	Traffic Count Programme Phase-I
88.	Traffic Count Programme Phase-II

ANNEX-IX (Contd.)

89. Unit Cost of Road Construction & Bridges

90. Urban Bus Pilot Study

91. Inland Water Transport - Review

92. Urban Bus Train

93. Quality Control of Road Construction & Bridges

94. Un-Remunerative Rail Lines

95. Prime Minister's Manifesto - Rural Roads

96. Role of Tractor Trollies in Transportation

97. Demonstration Projects

98. Intersection Improvement at Peshawar

99. PCU Equivalency Factors

100. Economics of Mini-Bus Operations

101. Truck Industry Survey

102. Economics of Truck Sizes

103. Effect of Road Roughness on Freight Tariffs

104. Role of Improved Communication on Truck sizes

105. Re-Training Bus Drivers and Accident Reduction

106. Drivers Awareness of Road Work Signs & their Reaction to them

107. Low Cost Remedial Measures on the National Highways in Pakistan

108. The Effect of Police Radar Traps on Drivers Speeds

109. Accident Under Reporting Study

110. Police Patrol Study

111. Effectiveness of Bus Drivers Training Course

112. Effects of Police Presence on Driver's Behaviour

ANNEX-X

CONSULTANCY

The Centre has provided consultancy services to a number of other national and international agencies as briefly described below :

(1) Axle Load Survey, sponsored by World Bank for Highway Board, Ministry of Communications, Government of Pakistan - 1981-82.

(2) Economic Implications of Road Maintenance - ESCAP, Bangkok - 1981-82.

(3) Installation of Traffic Signs on Islamabad Highway for National Highways Board of Ministry of Communications, Government of Pakistan, 1981-82.

(4) Economic Implication of Vehicle Overloading, sponsored by World Bank for National Highways Board of Ministry of Communications, Government of Pakistan - 1982-83.

(5) Decade of Transport Development - ESCAP, Bangkok - (January 1984).

(6) Foodgrain Transport Economics and Logistics Study, sponsored by World Bank for Ministry of Food and Agriculture, Government of Pakistan - 1984-85.

(7) Murree Road Traffic Management Study - Municipal Corporation, Rawalpindi, Pakistan - 1985-86.

(8) Accident Black Spots - National Highways Board, Ministry of Communications, Government of Pakistan - 1980-85.

(9) Intersection Improvement Study - Peshawar Development Authority.

(10) Road User Charges Study, sponsored by World Bank for National Highways Board, Ministry of Communications.

(11) Transport Flows and Intermodal Distribution in Pakistan - SAARC 1985.

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(12) Track Rehabilitation Programme of Pakistan Railways during Sixth Plan - Railways Board, 1986.

(13) Farm-to-Market Road, Phase II, sponsored by Asian Development Bank, 1986.

(14) Installation of Traffic Signs on N-5, N>H.B. - 1986.

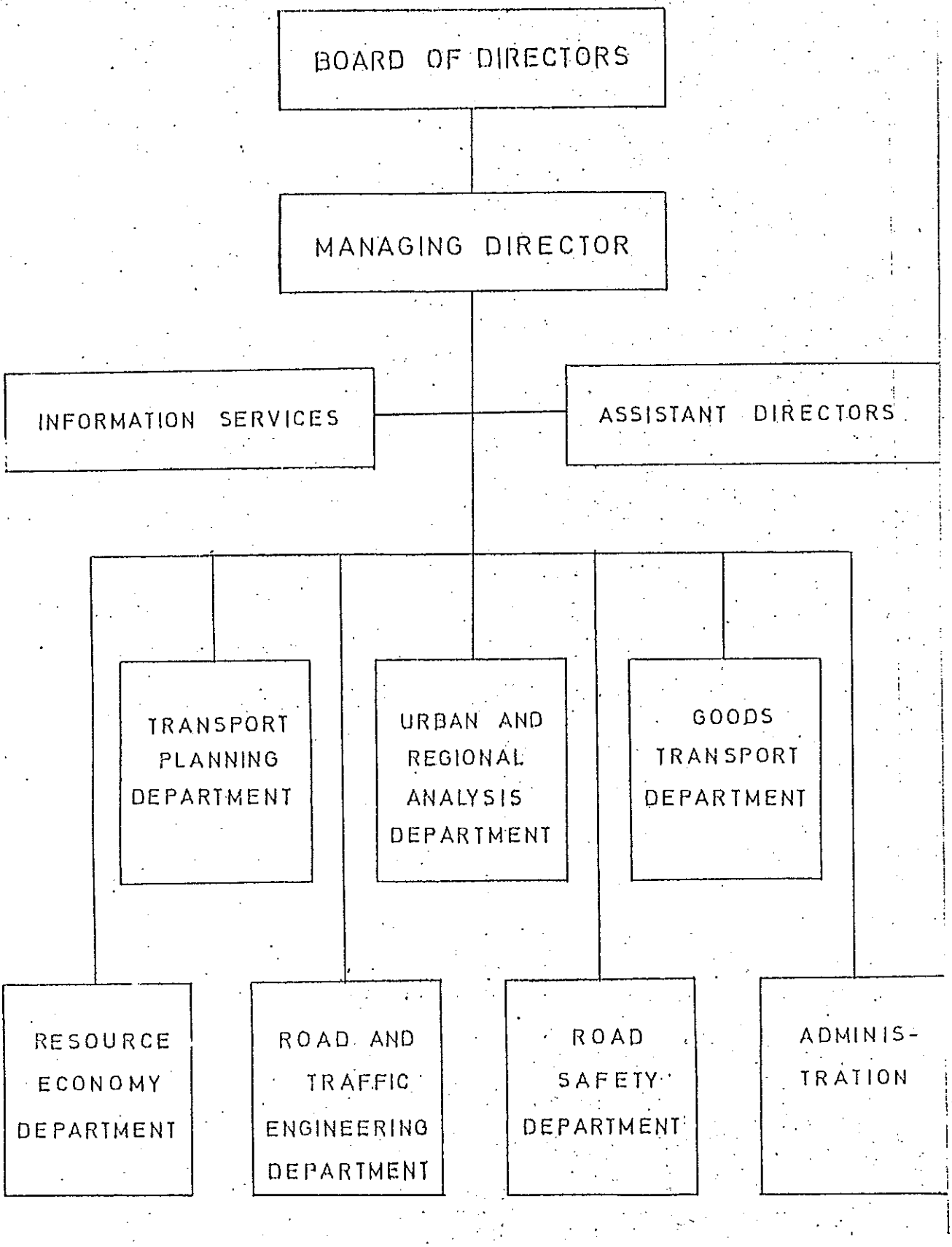
(15) Periodic Traffic Count - N.H.B. - 1986.

(16) Indus Highway Feasibility Study - N.H.B. - 1987.

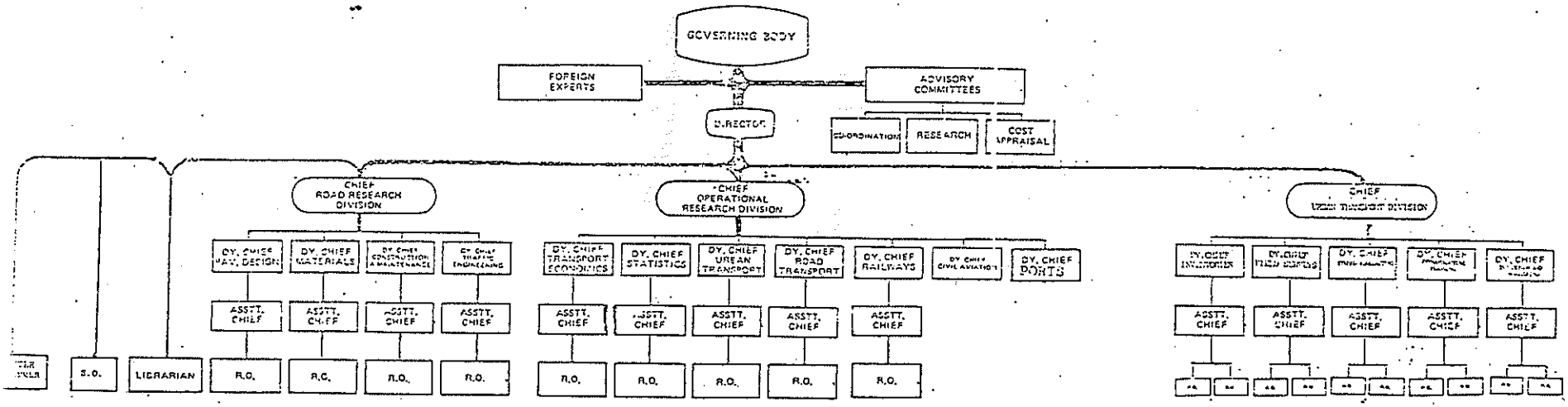
ANNEX-XI

ORGANIZATIONAL CHART

(INSTITUTE OF TRANSPORT ECONOMY - OSLO)



ORGANISATION CHART



ANNEX-XII

Annexure-XIII

Report of the Sub-Committee
appointed under the Chairmanship of

Mr. Abdus Salam
Secretary, Communications & Works Department
Government of the Punjab

To Review Research Programme of the
NATIONAL TRANSPORT RESEARCH CENTRE

(As approved by the Research Coordination Committee)

27-08-1987

C O N T E N T S

1. Introduction

The Research Coordination Committee of the National Transport Research Centre, at its second meeting held at Islamabad on 18th September, 1984 under the Chairmanship of Secretary, Ministry of Communications, while considering the research programme of the National Transport Research Centre for the Sixth Five Year Plan, decided that:

"a small Committee should go through the list of studies proposed for the sixth plan period and determine priorities; identify those which can be undertaken by the Centre and refer the rest to administrative agencies for getting them done either on their own or employment of consultants"

At the 3rd meeting of Research Coordination Committee held on 21-01-1986, a Sub-Committee was constituted under the Chairmanship of Mr. Abdus Salam, Secretary, Communications and Works, Punjab, to determine priorities of studies and also to identify the agency to be made responsible for execution. The composition of the Committee is given at Annexure-A.

II. Meetings of the Sub-Committee

The sub-Committee held in all five meetings at Islamabad on 19th March, 20th April, 11th May, 1st June and 7th September, 1986, with the representatives of federal Ministries of Communications, Railways, Local Government and Rural Development, Planning Commission, Provincial Planning and Development Departments, Government of Azad Jammu and Kashmir, Sind Road Transport Corporation, etc. The list of participants is given at Annexure-B.

III. Deliberation of the Committee

The Sub-Committee reviewed in detail studies proposed by the National Transport Research Centre and other concerned agencies and determined agency responsibility and priorities.

The research programme of various transport agencies was formulated during the first three meetings of the Sub-Committee and then circulated to concerned agencies for their reviews. In the light of comments received from various agencies, the programme was finalized in the last two meetings.

*

IV. Recommended Research Programme

The Committee has identified 96 studies of which 49 studies are in the field of Roads and Road Transport, 21 studies pertain to Railways, 11 concern air transport, 9 relate to ports and Shipping and the remaining 6 are intermodal studies. The National Transport Research Centre will carry out 54 studies, C&W Punjab 10, PACO 5, Pakistan Railways 19, PIA 7 and KPT 1 study as follows:

Distribution of Studies by Agency and Mode

Sl. No.	Agency	Road & R.T.	Railways	Air	Ports & Shipping	Inter-modal	Total
1.	NTRC	34	2	4	8	6	54
2.	Pakistan Railways	-	19	-	-	-	19
3.	C&W Punjab	10	-	-	-	-	10
4.	PACO	5	-	-	-	-	5
5.	PIA	-	-	7	-	-	7
6.	KPT	-	-	-	1	-	1
	Total:	49	21	11	9	6	96

The list of studies with brief description of each is given in the following pages. The list is not conclusive. Agencies concerned may undertake other studies depending upon their requirements and resources. It is however expected that the agencies desirous of undertaking additional studies shall prepare detailed proposals for each study including scope of work, coverage, estimated costs, etc. and provide copies of the proposal and the final report to the Centre for information and record to avoid any duplication of efforts.

%As apprved by the Research Coordination Committee.

V. BRIEF DESCRIPTION OF STUDIES (as approved by the RCC)

A. ROADS AND ROAD TRANSPORT

In the area of Roads and Road Transport, a total of 50 studies have been identified for execution by various agencies as per detail below.

1. Highway and Bridge Inventories

The existence of uptodate inventories is a pre-requisite for transport planning. Such inventories for highways and bridges either do not exist or are incomplete and out of date. To prepare inventories on uniform basis NTRC should prepare a standard format and circulate the same to the Provinces for their views and thereafter make arrangements for collection, storage, retrieval and updating of requisite information, on regular basis, in consultation/collaboration with the Provinces - Agency Responsible - NTRC

2. Traffic Counts

Traffic counts are at present made regularly by the Punjab Highway Department only. In other Provinces the activity is sporadic without any consistancy of coverage and frequency. In order to compile traffic count data on national basis, National Transport Research Centre should standardise vehicle classifications, forms and procedures and organize collection, compilation, storage and dessimination of data on regular basis in collaboration with the National Highways Board, Provincial Highway Departments, District Councils and local bodies.
Agency Responsible - NTRC

3. Inland Traffic Origin-Destination Survey for Passenger and Goods

Country wide origin-destination surveys are a pre-requisite for comprehensive transport planning. The first partial road traffic origin-destination survey was undertaken by the TRACO during 1969-70. The first comprehensive survey was conducted by National Transport Research Centre in 1979-80. The next comprehensive O-D Survey should be carried out by the NTRC during 1989-90 so that results are available well in time before the commencement of work on the next plan. The survey should cover rail and air also.

Agency Responsible - NTRC

4. Operating Characteristics of Public Service Vehicles

Information concerning ownership, financing costs, revenues, utilization, etc. of public service vehicles such as trucks, buses, wagons, taxis, rickshaws, etc. which is required for planning and regulation of transport services, is not collected by any agency. NTRC should collect such information by means of sample surveys. This information should supplement traffic data to arrive at national traffic statistics.

Agency Responsible - NTRC

5. Highway Construction and Improvement Cost

Standard costs of construction and maintenance of roads of different specifications are often needed for general planning purposes. To meet the requirements standard costs of construction and improvement of roads should be prepared by the National Transport Research Centre for various parts of the country and different types of roads. This should be based on quantities of physical inputs which when multiplied with prices in different parts of the country should give standard costs which can be used for planning purposes. The information should be regularly updated by periodic cost and price surveys.

Agency Responsible - NTRC

6. Vehicle Operating Cost Studies

There are gaps in data required for estimating vehicle operating costs. For example, authentic information on rates and utilization of vehicles under different conditions, depreciation, maintenance parts and labour, wearing out of tyres etc is not available. Particularly information on variation of above factors with type of road is lacking. To fill-up such gaps, National Transport Research Centre should carry out vehicle operating cost studies covering among other things, the following:

- o Fuel Consumption
- o Tyre wear and tear
- o Utilization
- o Load Factors
- o Maintenance Parts
- o Maintenance Labour
- o Depreciation

Agency Responsible - NTRC

7. Road User Charges Study

The study carried out by the National Transport Research Centre for the World Bank as a requirement of 4th highway project and transport sector loan, should be updated by the Centre periodically, preferably every five years or whenever changes are made in the rates of taxes.

Agency Responsible - NTRC

8. Final Performance of Toll Rods

Tolls are at present being collected on major bridges and selected roads like Karachi Hyderabad Super Highway.In addition, local bodies also collect tolls on local roads. The financial performance of such toll facilities should be reviewed and rationalized.

Agency Responsible - NTRC

9. Manuals of Road and Bridges Maintenance

For uniformity in maintenance practices and procedures, the Manual should be prepared by NTRC during 7th Plan. Provincial Highway Departments, National Highways Board and Ministry of Local Government and Rural Development (FRDEC) should be associated.

Agency Responsible - NTRC

10. Criteria for Determining Urban Bus Services Requirements

There is no satisfactory way of determining the number of buses required for urban areas for planning purposes. The study should evaluate different criteria and recommend the most suitable one.

Agency Responsible - NTRC

11. Accident Compensation Assessment

The study should examine existing rules, procedures, difficulties and time involved in the assessment and payment of compensation in road accidents and suggest necessary legal, administration and other measures to ensure objective assessment and prompt payment of compensation.

Agency Responsible - NTRC

12. Regional Variations in road Surfacing Specifications

Due to variations in climate and soil conditions, there is need to adjust specifications to regional variations. The study should identify homogenous regions and give specifications for each. However, the study may be carried out by the Centre when the Road Research Division starts functioning.

Agency Responsible - NTRC

13. Alternate Materials for decking suspension bridges

The Committee recommended that this study may be carried out by the NTRC during the 7th Plan and as soon as the Road Research Division has become operational.

Agency Responsible - NTRC

14. Manual for Bridge Inspection

There is need for documentation and standardization of procedures and practices for upkeep and maintenance of bridges. NTRC in consultation with the C&W Department, Government of Punjab and National Highways Board should prepare a Manual of Bridge Inspection and circulate the same among concerned agencies to make use of them.

Agency Responsible - NTRC

15. Traffic Factors for Pakistan

In order to meet data requirements for evolving Traffic Factors for Pakistan, the National Transport Research Centre set up 10 permanent Traffic Count Stations on National Highways in Phase-I. To extend the coverage to other major roads, 10 more permanent Traffic Count Stations were set up under Phase-II. After first year of operation, the stations would be used for monitoring the traffic growth rates on these highways. This type of data may also be collected for small roads within the four Provinces. NTRC should extend the coverage of their programme to achieve the objective.

Agency Responsible - NTRC

16. Practical Capacities of various widths of Roads

Determination of optimum capacity of roads of different widths is a pre-requisite for drawing up any meaningful programme for the improvement of roads in the country. NTRC should therefore carry out the study to determine optimum capacity of roads of various widths.

Agency Responsible - NTRC

17. Passeger Car Equivalency Factors for various types of vehicles

The standard practice in traffic engineering is to represent different vehicles in terms of a standard passenger car units. As driving behaviour and vehicle mix are different in Pakistan as compared to developed countries for which the standard PCU values have been developed, it is necessary to derive PCU values for the different types of vehicles for our roads and traffic conditions.

Agency Responsible - NTRC

18. Axle Load Survey

A survey of axle loads of goods vehicles was carried out by NTRC in 1981-82 to provide realistic data for pavement design. The Committee appreciated the work done by the Centre and recommended that the scope of work may be extended to provide data for bridge design loading also and to suggest damaging factor for various types of loading conditions.

Agency Responsible - NTRC

24. Impact of Farm-to-Market Roads in the National Economy

During last decade, substantial investments have been made in the Farm-to-Market Roads on the assumption that it increases the agricultural yield and brings a number of benefits to the rural population. However, no proper evaluation has been carried out to determine the impact. National Transport Research Centre should carry out a proper study of the impact of Farm-to-Market Roads on the National Economy.

Agency Responsible - NTRC

25. Road Traffic Monitoring

Travel speeds form basis of estimation of vehicle operating costs and road user savings which are needed for appraisal of highway project and cost benefit analysis. NTRC had carried out a study of vehicle operating speeds on different types of roads in the country during 1979-80. The study should be updated and the Centre should also monitor speeds on different types of roads in the country.

Agency Responsible - NTRC

26. Demonstration Projects

Demonstration projects which are the most economical and quickest method of spreading the benefit of research to a wide area, should be undertaken in the field of pavement geometry, pavement structure and urban traffic management such as exclusive bus lane, parking meter, etc. The Committee recommended that the National Transport Research Centre should undertake such projects in collaboration with Provincial Communications and Works Departments and the various urban Development Authorities in larger cities.

Agency Responsible - NTRC

27. Land Slide

In Murree area in Punjab and in other hilly areas in Pakistan, land slides cause considerable damage and inconvenience. Their occurrance is taken as Act of God and remedial measures consist for removing the debris.

A lot of work has been done in this field, notably in India in containing land slides in matter of their occurrance and limiting the extent of their damage with profitable results. Valuable literature is available on the subject. A study need to be carried out utilizing the work already done, in the context of our conditions, to formulate such proposals as can be used by the field staff suiting our conditions.

Agency Responsible - NTRC

By Passes to Major Towns

There is a great interest in the public and Government to provide by Passes in respect of major towns. They cost a lot of money but their life is limited to about 20-25 years, as the area gets built up rather soon. There is therefore need to properly evaluate the performance of bye-passes.

Agency Responsible - NTRC

29. Financing Problem of Road Transport

Institutionalized credit is not available to road transport undertaking for several reasons. Consequently large scale enterprises have not come up. The financial requirements of present day transporters far exceed personal savings. There is therefore need for institutional credit for transport operations at viable scale. The study would accordingly investigate the existing means of financing of road transport, analyse its drawbacks and shortcomings, factors affecting credit worthiness and suggest measure for properly institutionalized financing at reasonable interest rate.

Agency Responsible - NTRC

30. Transport Demand for Major Commodities

The bulk of freight transport demand is generated by a small number of bulk commodities. An understanding of supply and demand of such commodities is essential for demand forecasting and planning and development of transport service. A study on the subject was carried out by the National Transport Research Centre using 1981-82 data. As the, situation changes over time, the study should be updated and reviewed at regular intervals.

Agency Responsible - NTRC

31. Role of Private Sector in Transport

The road transport sector is dominated by private sector which is responsive to market forces and rewards of efficiency. The study would explore the possibilities of extending the role of private sector to areas heretofore dominated by public sector e.g. roads, railways, shipping and ports.

Agency Responsible - NTRC

32. Energy Conservation in Transport

A study of energy use in transport systems was carried out by the National Transport Research Centre. As a follow up of this study, a further study should be carried out to recommend measures of energy conservation in transport systems.

Agency Responsible - NTRC

33. Urban Transport Studies

The urban transport problems have not so far received the attention they deserve. There is no department at federal and provincial level to look into urban transport planning. The situation in main cities has become worst over the years. The National Transport Research Centre should take immediate measures for urban transport planning studies in the main cities. To begin with the Centre would carry Urban Transport Planning Study for the twin cities of Rawalpindi/Islamabad.

Agency Responsible - NTRC

34. Multi-axle Trucks

The proportion of multi axle vehicles has increased in traffic composition on main roads. However, information about their operations, utilization performance costs, revenues etc. is not known. The study would cover all aspects of multi axle vehicles. Relevant information would be obtained through special field survey as well as from concerned departments.

Agency Responsible - NTRC

35. Design Criteria for River Training Works

River training works are an important part of major bridge projects. At present there is no uniform practice in the country for the design of river training works for bridges over major rivers. Scour factor adopted for the calculation of scour at the nose and along the body of river training works vary with the designer. Like-wise, thickness of pitching on the water side slope of guide bank and spurs vary considerably. Width and thickness of covering on the top of guide banks also differs from case to case. As the river training works consume a large proportion cost of bridge projects, it is important that some efforts should be made to frame design rules by a competent body so that there is no wasteful expenditure in over design and under

designing can also be avoided. There is another aspect which needs mention. The various design rules or recommendations refer to rivers and nullahs in plain areas and there is no guidance in respect of bridge structures located on streams in the submountaneous regions. Design rules need to be devised for this purpose as well.

The study would evaluate the behaviour of existing river training works over the years, review literature on the subject and recommend suitable design rules.

Agency Responsible- C&W Punjab

36. Survey of Existing Major Bridges for Appropriate Length of Water way

There are a number of major bridges and medium span bridges in the country both in the plain areas and submountaneous regions. Some have generous water way while others have tight water way. There is no guidance available for determining the appropriate length of water ways. The Lacey's width is only a general approximation. For more important bridges, model studies are carried out.They are very time consuming, require extensive surveys and are not always favoured for medium span bridges. Based on extensive studies, a relationship can be developed to provide ready guidance to the designers which can offer practical solution.

Agency Responsible - C&W Punjab

37. Design Rules for Causeway

In various areas of Punjab, there are flashy streams which carry occasional heavy discharge during or soon after rains and remain dormant for the rest of the year. Construction of high level bridges on such streams is very expensive and not justified in case of roads which carry small volume of traffic and do not serve important towns. For such cases, causeway have been provided on a number of Farm to Market Roads. At present, there are no design rules for the

upstream and down stream cut off walls based on scientific studies and the design is based on empirical formula. The performance of such causeways is often dicy. A number of failures have occured which have invited unsavoury criticism from public. A study thus needs to be carried out for this purpose to provide guidance to the practising engineers. The amount spent on this study would be insignificantly small compared to the expenditure being incurred on the construction of such structures in the Farm to Market Road Programme.

Agency Responsible - C&W Punjab

39. Experimental Stretches of Roads

The road pavement is an expensive item in the context of our road construction. In 10' wide road, it costs about 44 per cent of the total cost of road. The rules for pavement design prepared under British or American conditions are not strictly applicable to Pakistani conditions. It is proposed to construct some experimental stretches with specifications and thicknesses based on existing rules and with slight variations and to watch their behaviour and formulate design rules for our pavements under our conditions.

Agency Responsible - C&W Punjab

40. Behaviour of the Existing Road Pavement Under Traffic

The Punjab Communications and Works Department has been using standard specifications in different areas of the Province, irrespective of the traffic volume, soil conditions and water table. A study on the performance of such road pavement would help to assess the design parameters for future design of pavements. This study would supplement the study for formulation of design rules for pavement design to suit our conditions as in the previous case.

Agency Responsible - C&W Punjab

41. Structural Equivalence of Road Crust

It is necessary to know structural equivalence of various road crusts including thin asphalt concrete carpets of various thicknesses. This is important to refine the pavement, design to get the most suitable and economical pavement. Benkelman Beam deflection is possibly one of the method. The Road Research and Material Testing Institute Punjab could carry out these studies and formulate rules for the design.

Agency Responsible - C&W Punjab

42. Performance of Surfacing

The thin asphalt carpets are suitable for lightly trafficked roads in the residential areas. It is also necessary to evaluate their performance in case of major highways where they can provide better wearing surface under medium to heavy Traffic, as against tripple surface treatment.

Two coat surface dressing can be suitable for Farm to Market roads. These should be laid and their performance evaluated. They should offer significant economy.

Agency Responsible - C&W Punjab

43. Lime Stablized Sub Base

There are number of locations in the Punjab where highly plastic soils are available and thus such road stretches are suitable for lime stablized sub-base. They are good for light traffic and in places where stone is expensive, they can make inexpensive substitute.

This alternative form of sub-base has not been utilized in Punjab where lime is plantiful and this type of construction has great promise.

Agency Responsible - C&W Punjab

44. Provision of Public Utilities and Services along Rural Roads

Public utilities and services along rural roads within the country are negligible. The Committee recommended that Communication & Works Department of the Government of the Punjab should study the reasons for this deficiency and recommend measures to overcome the same.

Agency Responsible - C&W Punjab

45. Motorized Transport Industry in Pakistan

Automobile Industry is in nascent stage in Pakistan. However, a significant number of parts are being manufactured in the public and private sectors. The study would review the state of the art, determine the potential, identify bottlenecks and suggest remedial measures for local manufacture and progressive deletion of imported parts.

Agency Responsible - PACO

46. Scope for creation of new automative manufacturing facilities

The study would review potential and scope for creation of new automative manufacture facilities and make policy recommendations to remove bottlenecks and overcome difficulties.

Agency Responsible - PACO

47. Potential of ancillary industries for development of local components of automotive industry

There is considerable scope for the manufacture of automotive components by the engineering units in the public and private sectors. As such there is need for identifying the components and potential engineering units having capability of manufacturing such parts and to recommend measures for utilization of domestic manufacturing capabilities to the maximum possible extent.

Agency Responsible - PACO

48. Manpower Training need in Transport Industry

There are at present no arrangements for training of manpower for transport manufacturing industry. The study would assess requirements of trained manpower for the transport industry, training facilities available in the country and requirements for higher training abroad and to draw up a proper programme for the next plan.

Agency Responsible - PACO

49. Market Surveys for Road Transport Demand Estimation

Road transport is entirely in the private hands and dominated by individual operators who rarely keep record beyond their immediate operational requirements. The operations are also spread all over the country. Thus nothing is known about overall magnitude and nature of demand. Such information is needed for overall planning and coordination. Accordingly specific market surveys will be carried out to estimate overall demand for transport.

Agency Responsible - PACO

B. RAILWAYS

50. Travel and Transportation Time Studies

Information on travel and transportation time is essential for determining operating costs of vehicles, economic costs of transportation of passenger and goods and intermodal distribution of traffic and feasibility studies. The study would collect data on actual travel and transportation times by means of special surveys for main traffic categories, analyse the data, locate avoidable delays and suggest remedial measures.

Agency Responsible - NTRC

51. Criteria for Closing un-economic Railway Lines

A study for closing of unremunerative rail lines was initiated by the National Transport Research Centre taking up Mandra Bhaun line in Rawalpindi Division as a demonstration project. The work has been with-held at the instance of the Railway Board pending decision for action on a wider scale. The study should be taken up again as soon as possible.

Agency Responsible - NTRC

52. Rail Car Trailers

The study will experiment the running of Rail Car trailors on regular train service between Lahore and Rawalpindi fitted with compressed air brakes having a load of 400 tons by HAU-20/ALU-20 D.E. Locos on Lalamusa Rawalpindi Section at 70 km/h speed.

Agency Responsible - Pakistan Railways

53. Goods Train Speed Trails

Trail will be carried out for increasing speed of goods trains from 65 km/h to 90 km/h with load of 2250 tons, on loop lines on Karachi - Peshawar Section, and (72 wagons = 2400 tons) for braking distance of 1200 meters.

Agency Responsible - Pakistan Railways

54. Utilization of obsolete stock

Railway assets have very long life and can become obsolete before their physical deterioration. Alternate utilization of such stock can provide additional revenues. With this objective, Pakistan Railways would mount tanks on wagons for oil companies. This will yield approximately Rs. 40 million additional revenue without any significant investment.

Agency Responsible - Pakistan Railways.

55. Study for Introduction of Ticket Issuing Machines to meet peak demand to eleminate delays and to avoid fake and use tickets

The passenger tickets used by Pakistan Railways are of very old design and can be misused. Developments in the field of electronics have made it possible to use electronically coded tickets by simple ticket issuing and collecting machines which would also compile origin-destination data. The study would accordingly evaluate new designs, methods of issue and collection rail tickets with a view to eleminating the chances of their misuse as also to provide better statistics.

Agency Responsible - Pakistan Railways

56. Scope of Local Manufacture of track components

The demand for rail components for rehabilitation and renewal as well as for replacement due to wearing out is of regular nature. The Pakistan Railways would carry out studies for the manufacture of such components in their manufacturing units or in the private sector

Agency Responsible - Pakistan Railways.

57. Relation between speed of goods trains and passenger trains on curves for fixing cant deficiency

Passenger trains are light and fast while goods trains are heavy and slow. They need different types of track geometry. However, a compromise has to be found for improvement of train speeds.

Agency Responsible - Pakistan Railways

58. Installation of suitable type of Signalling System for a particular speed and Standardization of Signalling System

Experiments are being carried out by Pakistan Railways for increasing the speed of passenger and goods trains, complementary studies on mechanical signalling arrangements for making them fit for 120 kilometers an hour speed are to be carried out by the Pakistan Railways. Studies will also be carried out for Standardization of Signalling System on Pakistan Railways.

Agency Responsible - Pakistan Railways

59. (i) Study of axle box repacking techniques, (ii) replacement of Conventional axle boxes with roller bearing on 4 wheeled and other wagons; and (iii) design changes for running 4 wheeled wagons at highest speed of 80 km per hour

The existing rolling stock was designed and built when the rolling speeds were very low. Now that there is urgency in increasing speeds to increase line capacity and better utilization of rolling stock, it is necessary to determine design parameters for construction of new rolling stock. Studies would accordingly be carried out to determine speed and construction parameters for next generation of rolling stock.

Agency Responsible - Pakistan Railways

75. Origin-Destination Surveys

Information on ultimate origin-destination of passengers is essential for scheduling of services between different city pairs. Such surveys would be periodically carried out by PIA in respect of domestic traffic.

Agency Responsible _ PIA

76. Air Traffic Analysis

The study would carry out detailed analysis of air traffic, both domestic and international, and discern trends for making forecasts and planning facilities accordingly.

Agency Responsible - PIA

77. Economics of Various Routes

Overall analysis of operations conceals losses and profits made on different routes. Accordingly, analysis of costs and earnings on different routes is essential for planning of operations. Accordingly, the study would carry out economic and financial analysis of existing as well as proposed new routes.

Agency Responsible - PIA

78. Performance of Aircrafts and Engines

Different types and size of aircraft have different operating characteristics. The study would accordingly carry out analysis of performance of different types of aircrafts and aircrafts engines for their suitability on different routes operated by PIA.

Agency Responsible - PIA

79. Fleet Planning

The study will review and update fleet plan for PIA.

Agency Responsible - PIA

80. Traffic Forecasts

For planning and scheduling of services, forecasts will be made with details upto city pair level for the following types of traffic:

a) Passenger
b) Cargo
c) Excess
d) Mail

Agency Responsible - PIA

81. Inflight Passenger Services

Evaluation of inflight passenger services will be carried out to determine their level and extent.

Agency Responsible - PIA

D. PORTS

82. Inventories of Ports Facilities and Infrastructure

As a first step in port planning, coordination and review of operational performance, an inventory of port infrastructure, facilities and services will be updated for formulation of policies concerning replacement renewal and performance evaluation.

Agency Responsible - NTRC

83. Survey of Port Capacities

The capacity of port for handling various types of cargo with different equipment will be determined to match with projected traffic volume for each category of traffic.

Agency Responsible - NTRC

84. Port Traffic Forecasts

For planning and development of port facilities and cargo handling equipment, traffic forecasts will be updated for different types of traffic, e.g. bulk, general, containerised, liquid etc.

Agency Responsible - NTRC

85. Integration of Port and Inland Transport Facilities

The study would review port and inland transport facilities, identify bottlenecks and advise measures for their coordination and integration to remove congestion at the port, quick delivery of cargo and better use of transport facilities.

86. Port Congestion, Ship Arrival Rates and Cargo Accumulation

The study would analyse ship arrival data and simulate models of arrival rate, service time, cargo discharge rate, etc. for future planning and coordination purposes. The flow of cargo, its accumulation and port congestion would also be analysed to suggest policies and measures to remove bottlenecks.

Agency Responsible - NTRC

87. Improvement of Cargo Handling Techniques

The study would review in detail cargo handling techniques identifying their short comings and bottlenecks and suggest remedial measures for the improvement.

Agency Responsible - KPT

E. SHIPPING

88. Operational Performance of Pakistan's Shipping Fleet

The review and evaluate operational performance of Pakistan merchant fleet in detail analysing time spent in ports, at sea, cargo loading unloading rates etc. for comparison between ships and with targets. Deficiencies bottlenecks shortcomings would be identified remedial measure suggested.

Agency Responsible - NTRC

89. Operating Costs of Major Components

The study would analyse operating costs by type of ship, voyage, type of service, etc. for comparison with targets and norms. Weak areas would be identified and remedial measures suggested.

Agency Responsible - NTRC

90. Financial Performance of National Shipping Industry

The study would analyse revenues and expenses of the National Shipping fleet according to ship, voyage, type of services, type of commodity; make comparison between ships, with industry norms and targets; identify weak and strong points and suggest remedial measures for improvement.

Agency Responsible - NTRC

F. INTERMODEL STUDIES

91. Relative Costs and Charges by Rail and Road for Major Commodities

Costs of transport of major commodities by rail and road for various distances and consignment sizes would be estimated for intermodel traffic allocation, etc.

Agency Responsible - NTRC

92. Relative Costs and Fares for Rail and Air Services for High Class Passengers

Passenger Fares by Air and AC Rail class would be compared for competitive city pairs and traffic between such pairs by the two modes would be estimated to formulate modal choice models for forecasting and formulation of policies.

Agency Responsible - NTRC

93. Impact of Road Transport Improvements on Rail Traffic

The study will examine effects of improvement of roads on rail traffic. The Committee however decided that this study may be carried out by the NTRC during 7th Plan period.

Agency Responsible - NTRC

94. Impact of Oil Pipeline on the Railways

Opening up of pipeline from Karachi to Mahmud Kot in 1982 has diverted oil traffic from rail. Effects of such diversion on rolling stock, locomotive power, line capacity, costs and earnings of railways would be analysed in detail to determine costs and benefits realised as against planned.

Agency Responsible - NTRC

95. Optimum Length of Haul for Rail and Road Traffic

Cost of transport by road varies proportionately with distance. In the case of Railways substantial part of costs are fixed so that average cost decreases with distance. As a result, cost of transport by road in general is less by road over short distances but the cost of rail transport becomes lower than road as the distance increases.

ANNEXURE-A (Contd.)

8.	Mr. Muhammad Yousaf, Secretary, C&W Department, Muzaffarabad.	Member
9.	Chief of T&C Section, Planning & Development Department, Government of Sind, Karachi.	Member
10.	Chief of T&C Section, Planning & Development Department, Government of Baluchistan, Quetta.	Member
11.	Chief of T&C Section Planning & Development Department, Government of NWFP, Peshawar.	Member
12.	Chief of T&C Section, Planning & Development Board, Government of Punjab, Lahore.	Member
13.	Chief NTRC,	Member/Secretary

ANNEXURE-B

LIST OF PARTICIPANTS IN THE MEETING OF THE COMMITTEE

X = Meeting attended

Sl. No.	Name and Address of Office	Meeting Attended				
		1st	2nd	3rd	4th	5th
1	2	3	4	5	6	7
1.	Mr. Abdus Salam, Secretary, C&W Department, Govt. of the Punjab, Lahore.	X	X	X	X	X
2.	Mr. M. Sadiq Swati, Chief NTRC, Planning Commission Islamabad	X	X	X	X	X
3.	Mr. S. H. Reza, Joint Secretary (T), Min. of Communications, Islamabad.	X				X
4.	Malik Muhammad Saeed Khan Chief (T&C Section), Planning Commission, Islamabad.	X				
5.	Col. Raza Hussain Shah, Project Director (FRDEC), M/o Local Govt. & Rural Dev., Islamabad.	X	X		X	X
6.	Mr. Habib Ullah Kazi, Joint Director (Commercial), Ministry of Railways, Islamabad.	X				

ANNEX-B(Contd.)

Sl. No.	Name and Address of Office	Meeting Attended				
		1st	2nd	3rd	4th	5th
1	2	3	4	5	6	7
7.	Mr. Abdul Jalil Moghal, Chief (T&C), Planning & Development Deptt: Government of NWFP, Peshawar.	x				
8.	Mr. Mian M. Hanif, Chief (R&B), Planning & Development Deptt: Government of Punjab, Lahore.	x	x			x
9.	Mr. M. Ijaz Khan, Director Planning, National Highways Board, Islamabad.	x	x			x
10.	Mr. Muhammad Ilyas Sulehri, Chief Engineer, Central Design Office, Muzaffarabad.	x	x	x	x	x
11.	Mr. P. S. Rajani, Chief (T&C), Planning & Development Deptt: Government of Sind, Karachi.		x			
12.	Mr. Muhammad Aslam, Joint Director (Commercial), Ministry of Railways, Islamabad.		x	x	x	

ANNEX-B(Contd.)

Sl. No.	Name and Address of Office	Meeting Attended				
		1st	2nd	3rd	4th	5th
1	2	3	4	5	6	7
13.	Mr. S. M. Pasha, Director, National Highways Board, Islamabad.			x		
14.	Mr. Arbab A. Sattar, Director Planning, Ministry of Railways, Islamabad.				x	
15.	Mr. A. M. H. Kango, Chairman, Sind Road Transport Corp., Hyderabad.				x	
16.	Mr. Abdul Majeed Mohmand, Secretary, C&W Department, Government of NWFP, Peshawar.					x
17.	Mr. S. R. A. Rizvi, Joint Director (Planning), Ministry of Railways, Islamabad.					x

ANNEXURE-B (Contd.)

Sl. No.	Name and Address of Office	Meeting Attended				
		1st	2nd	3rd	4th	5th
1	2	3	4	5	6	7
18.	Mr. S. Mansoor Hasan, Director (Design), C&W Department, Government of Sind, Karachi.					x
19.	Syed Abdul Bari, Deputy Chief, T&C, Planning Commission, Islamabad.					x
20.	Mr. Muhammad Rafiq, Superintending Engineer, Planning & Development Cell, C&W Department, Government of Baluchistan, Quetta.					x

ANNEXURE-XIV

HIGHWAY SAFETY STUDIES

COST ESTIMATES

A)	Pay of Staff:		(Rs.)
	1. Research Investigator (BPS-16) @ Rs.3,299/- per month for 60 man-months.		192,000
	2. Enumerators (BPS-11) @ Rs. 2,000/- per month for 120 man-months.		240,000
	Sub-Total (A)	:	432,000
B)	Field Surveys	:	275,000
C)	Data Analysis	:	40,000
D)	Stationery	:	25,000
E)	Printing	:	75,000
F)	Honorarium	:	25,000
	Sub-Total (B-F)	:	440,000
	Sub-Total (A-F)	:	872,000
G)	Contingencies @ 15%	:	131,000
	GRAND TOTAL	:	1,003,000
	SAY	:	1,000,000

ANNEX - XV

C O M P U T E R I Z A T I O N

Cost Estimates

		(Rs.)
A)	**Pay of Staff:**	
	i) Data Controlling Supervisor (BPS-16) 60 Man-months at Rs. 3,200/- P.M.	192,000
	ii) Key Punch Operators (BPS-12) 180 Man-months at Rs.2,500/- P.M.	450,000
	iii) Naib Qasid (BPS-1) 60 Man-months at Rs. 1,200/- P.M.	72,000
	Sub-Total (A) :	714,000
B)	**Training:**	
	10 persons for two times/years for 5 years @ Rs. 1,000/- per training	100,000
C)	**Hardware:**	
	Upgrading and net working	500,000
D)	**Software:**	100,000
E)	**Maintenance Charges**	100,000
F)	**Stationery**	100,000
G)	**Travel**	50,000

	Sub-Total (B - G) :	950,000
	Total :	1,664,000
H)	Contingencies at 15%	249,000
	GRAND TOTAL :	1,913,000
	OR SAY :	1,900,000

Annex-XVI

SUMMARY OF DATA

Roads and Road Transport

1. Total Kms. of roads by category under Federal/Provincial Governments.
2. Inventory of road making machinery and its characteristics thereof.
3. No. of vehicles by Type registered/On road.
4. No. of urban and inter-city route permits by type of vehicles.
5. No. of vehicle by Type by Tax paying/non Tax-paying.
6. Monitoring and cost evaluation prices of :
   - (i) Tyres.
   - (ii) Batteries.
   - (iii) Body Building and Other inputs.
7. Import/sale of vehicles by Type.
8. Taxes and duties realized by type of vehicles.
9. Road Transport Corporation.
   - (i) No. of vehicles in fleet by make/model.
   - (ii) No. of vehicles on road by make/model.
   - (iii) Kms. Operated-urban/inter-city.
   - (iv) Passengers carried and Passenger Kms. travelled.
   - (v) No. of serviceable vehicles.
   - (vi) No. of vehicles scrapped.
   - (vii) No. of vehicles added to the fleet.

Annex-XVI

Summary of Data (Contd.).

(viii) Operating costs per seat Kms.

(ix) Fuels Tyres/Tubes, maintenance cost etc.

(x) Wages and Salaries.

(xi) Financial and Operation Statistics.

Railways:

1. Total rolling stock by category in fleet.
2. Total rolling stock by category on line.
3. Number of passengers carried and passenger Kms. travelled.
4. Freight carried in tons and tons Kms.
5. Average turn-around time.
6. Average Kms. per wagon per day.
7. Average load carried per wagon.
8. Average trip length i.e. average distance travelled by passenger per journey.
9. Peak month traffic - both passenger and freight.
10. Vehicle Kms. per vehicle on the line per day.
11. Locomotive- Kms. per day for locomotive by category and type.
12. Average number of passengers/freight coaches per train.
13. Average number of passengers per passenger coach.
14. Average tonnage hauled per freight train.

Annex-XVI

Summary of Data (Contd.).

15. Average speed per train.

16. Number of employees by category.

17. Gross revenue.

18. Operating and maintenance expenditure on rolling stock:-

i) Fuel consumed.

ii) Maintenance cost.

19. Wages and salaries of staff.

20. Total expenditure.

21. Developmental expenditure and physical achievements of:-

i) Rehabilitation & improvement of track.

ii) Construction of new lines.

iii) Repair and reconditioning of lines.

iv) Manufacture/Acquisition of new rolling stock.

v) Re-engining and repair of rolling stock.

vi) Construction of terminals, building and other facilities.

vii) Capital at charge.

Ports:

1. Cargo handled by type.

2. Number of ships entering/leaving the ports.

3. Average waiting time of ships.

4. Average number of ships in queue, with maximum and minimum length of queue.

Annex-XVI

Summary of Data (Contd.).

5. Average turn around time of ships.

6. Number of employees by category.

7. Gross revenue earned and expenditure.

8. In-coming and outgoing passengers handled.

Shipping:

1. Total number of ships in the fleet by type and DWT.

2. Total capacity and % avg. utilized by Category.

3. Tons of freight by type carried.

4. Imports and exports by type of cargo carried by all international carriers to and from Pakistan.

   - By foreign ships.

   - By Pakistan flag carriers.

5. Operating costs of national ships:

   i) Fuel costs.

   ii) Repairs and sundries.

   iii) Port expenses.

6. Number of employees by category of Pakistan shipping companies.

7. Total wages paid.

8. gross revenue earned.

Civil Aviation:

1. Number of Civil Aircrafts by type in the country.

2. International and domestic passengers carried and number of passenger Kms.

Annex-XVI

Summary of Data (Contd.).

3. International and domestic freight carried and number of ton Kms.

4. Imports and exports of freight by all airlines.

5. Movement of International Passengers by PIA vs others to and from Pakistan.

6. Operating costs of PIA.

(i) Fuel.

(ii) Chartering.

(iii) Repairs and Sundries.

(iv) Landing fees, etc.

7. Number of employees of PIA by category.

8. Total wages paid.

9. Gross revenue.

10. Number of airports (International, Jet, Non Jet, Landing strips).

11. Landing fee charged.

12. Revenue from Landing fee etc.

13. No. of Civil Air Craft over-flying Pakistan without landing..

Investments on Roads and Road Transport:

(i) Non development.

(ii) Annual Development Programme and

(iii) Other Sources.

ANNEX-XVII

DATA BANK STUDY

COST ESTIMATES

			(Rs.)
A)	Pay of Staff:		
	1)	Research Investigator (BPS-16) 300 Man-months at Rs. 3,200/- P.M.	960,000
	2)	Enumerators (BPS-11) 180 Man-months at Rs. 2,400/- P.M.	432,000
	Sub - Total :		1,392,000
B)	T.A./D.A.		300,000
C)	Stationery		15,000
D)	Printing		240,000
E)	Honorarium		25,000
	Sub - Total :		580,000
	Total :		1,972,000
F)	Contingencies @ 15%		295,800
	GRAND TOTAL :		2,267,800
		OR SAY :	2,267,000

ANNEXURE -XVIII

DISSEMINATION OF RESEARCH

Details of Cost Estimates

		(Rs.)
1.	Pay of Staff	
	Research Investigator (BPS-16) @ Rs. 3,200 per month for 60 man-months.	192,000
2.	Stenographer (BPS-15) @ Rs. 2,800 per month for 60 man-months.	160,000
3.	Enumerator (BPS-11) @ Rs. 2,400/- per month for 60 man-months.	144,000
	Sub - Total :	494,000
4.	Stationery	300,000
5.	Printing & Binding	80,000
6.	Honorarium	25,000
7.	Conveyance Charges	15,000
	Sub - Total :	914,000
8.	Contingencies @ 15%	137,100
	GRAND TOTAL (1-8)	1,041,100
		OR SAY 1,000,000/=

ANNEXURE-XIX

TRAINING COURSE

Details of cost Estimates

		(Rs.)
1.	Research Investigator (BPS-16) @ Rs. 3,200 per month for 60 man-months.	192,000/=
2.	Inaugural closing Cermonies.	25,000/=
3.	Lecture Fee/T.A, D.A for guest Speakers.	200,000/=
4.	Transport	100,000/=
5.	Telephone	15,000/=
6.	Refreshment	50,000/=
7.	Stationery	45,000/=
8.	Subsidies	30,000/=
9.	Honorarium	30,000/=
10.	Field visits	80,000/=
11.	Postage/Telegraphs	15,000/=
12.	Printing of Course material etc.	100,000/=
	Sub - Total :	882,000/=
13.	Contingencies @ 15%	132,300/=
	Total :	1,014,300/=
	Or Say	1,000,000/=

ANNEXURE - XX

SEMINARS/SYMPOSIUM

Details of Cost Estimates

		(Rs.)
1.	Inaugural Ceremony	25,000/=
2.	Boarding & Lodging	200,000/=
3.	Transport	50,000/=
4.	Telephone	25,000/=
5.	Stationery	50,000/=
6.	Refreshment	50,000/=
7.	Field Visits	50,000/=
8.	Foreign Visit	200,000/=
	Sub - Total :	650,000/=
9.	Contingencies @ 15%	97,500/=
	TOTAL :	747,500/=
	OR SAY	750,500/=

ANNEXURE-XXI

LOCATION OF PERMANENT TRAFFIC COUNT STATIONS

S.NO.	STATION	LOCATION
1.	T.C.P - 01	Attock Bridge
2.	T.C.P - 02	Jhari Kass
3.	T.C.P - 03	Jhelum Bridge
4.	T.C.P - 04	Pattoki
5.	T.C.P - 05	Sutlij Bridge
6.	T.C.P - 06	Sadiqabad
7.	T.C.P - 07	Khair pur
8.	T.C.P - 08	Super Highway
9.	T.C.P - 09	Gaddani
10.	T.C.P - 10	Quetta
11.	T.C.P - 11	Kohala
12.	T.C.P - 12	Mattani
13.	T.C.P - 13	Sakhakot
14.	T.C.P - 14	Fatehpur
15.	T.C.P - 15	Kamoke
16.	T.C.P - 16	Sakhi Sarwar
17.	T.C.P - 17	Shikarpur
18.	T.C.P - 18	Thatta
19.	T.C.P - 19	Basham
20.	T.C.P - 20	Pezu

ANNEXURE-XXII

DETAILS OF COST ESTIMATES OF T.C.P.

Cost Estimates:- The cost estimates of the three Phases have been worked out separately as per details below:-

(A) Phase-IV:- The details of capital outlays required for Phase-IV are as follows:-

(i) Staff Salaries:- During Phase-IV each station would be manned by only two Enumerators with a total man-months of 2,400. The total amount of station staff salaries is estimated at Rs. 2,400 x 2,400 = Rs. 5,760,000/-.

In addition, an amount of Rs. 1,338,000/- would be required for office staff as listed below:-

Sl. No.	Designation	Nos	Salary	Man-Months	Amount (Rs.)
1	2	3	4	5	6
1.	Res. Investigator	3	3,200	180	576,000
2.	Enumerators	4	2,400	240	576,000
3.	Stenotypist	1	1,900	60	114,000
4.	Naib Qasid	1	1,200	60	72,000
	Total :				1,338,000

Provision has also been made for relief staff to ensure continuity of at-least two persons at each station during the period when one of them would be on leave. For this purpose, 5 additional Enumerators would be hired. The total amount on this account is estimated at Rs. 720,000/-.

ANNEX-XXII

(Contd.)

The total amount required during 7th Plan on account of staff salaries is estimated at Rs. 7,818,000/- as per details below:-

(a)	Field Staff	5,760,000
(b)	Office Staff	1,338,000
(c)	Relief Staff	720,000
	Total :	7,818,000

(ii) Field Visits:

In order to ensure that the counting is carried out properly, surprise visits and checking is essential. The stations are scattered all over the country and far from the Headquarter. In addition, items of stationery, spare-parts, etc are sent to the stations from Headquarter, which entail cost of transportation, daily allowance and hotel charges. A lump-sum amount of Rs. 350,000/- is proposed for this purpose.

In addition, relieving staff would be required to visit all the stations as per schedule provided to them. One reliever would remain out of Headquarter for about 280 days per year. An amount of Rs. 450,000 (lump-sum) is estimated for meeting TA/DA expenditure on this account. The total estimated cost of field visit would thus amount to Rs.800,000/-.

(iii) Survey and Camping Equipments:

Most of the survey and camping equipment have already been procured under Phase-I and II, however, some of items such as tents and umbrellas, etc have been worn out and need replacement. Also, reflecting cylinders, sign boards, etc. being used for the channelization of traffic, are sometime broken as a result of collision with vehicles. A lump-sum amount of Rs. 250,000/- is provided for this purpose.

ANNEX-XXII

(Contd.)

(iv) Repair and Maintenance:

Automatic Traffic Counters with special power system are being used at permanent traffic count stations. These machines are sometime out of order. Some other items at the stations are to be repaired. An amount of Rs. 250,000/- would be required.

(v) Stationery and Printing:

Stationery and printing is essential for the survey forms and reports. An amount of Rs. 500,000 is being proposed.

(vi) Postage and Telephone:

Since all the stations are scattered all over the country, station staff is required to regularly send collected data by mail on weekly basis and also contact Head Office in case of any emergency. To cover the expenditure a lump-sum amount of Rs.150,000 is provided.

(vii) Contingencies:

This head covers those expenses which cannot be covered by head mentioned above. It also covers un-expected and casual expenditures. An amount of Rs. 1,465,200/- which is 15% of the total expenditure is proposed.

(viii) Summary:

The total cost of Phase-IV is estimated at Rs. 11,233,000/-. The summary is given below:-

ANNEX-XXII

(Contd.)

(PHASE IV)

SUMMARY OF COST ESTIMATES

Sl. No.	I t e m s	Amount (Rs.)
1	2	3
1.	Salaries	7,818,000
2.	Field Visits	800,000
3.	Survey and Camping Equipment	250,000
4.	Repair and Maintenance	250,000
5.	Stationery and Printing	500,000
6.	Mailing Charges	150,000
	Sub-Total :	9,768,000
	Contingencies at 15%	1,465,200
	GRAND TOTAL :	11,233,200
	OR SAY :	11,233,000

ANNEX-XXII

(Contd.)

(B) Phase-V:

It is proposed to set-up the following 10 addition Permanent Stations (Fig.1) to complete the coverage:

Sl. No.	Additional Proposed Stations	L o c a t i o n
1.	NTRC-21	D.I. Khan - Zhob
2.	NTRC-22	Nushki - Taftan
3.	NTRC-23	Quetta - Kalat
4.	NTRC-24	Larkana - Dadu
5.	NTRC-25	Daud Khan - Kala Bagh
6.	NTRC-26	Khushab - Shah Pur
7.	NTRC-27	Sargodha - Faisalabad
8.	NTRC-28	Jand - Khushall Garh
9.	NTRC-29	Jhang Sadr - Atharan Hazari
10.	NTRC-30	D.G. Khan - Rajanpur

The capital outlays required for Phase-V are estimated at Rs. 4.38 million as per details below:-

ANNEX-XXII

(Contd.)

(i) Staff Requirements:

The Phase-V programme would need about 65 persons to perform the office and field duties. The staff composition and functions are explained below:

(a) Field Organization:

In order to ensure round-the-clock counting, each party shall consist of six members i.e. one Supervisor, 4 Enumerators and one Cook/Chowkidar. Data would be collected in six shifts of 4 hours each.

Requirement of field staff

Sl. No.	Category	Scale	Nos.
1.	Supervisor	BPS-16	10
2.	Enumerator	BPS-11	40
3.	Cook/Chowkidar	BPS-01	10
	Total :		60

Functions:

The functions of each category of staff are given below:-

(i) Supervisors:

There will be one Supervisor at each station/point in each shift. He will look after the working of Enumerators. His main responsibilities will be :-

a) To supply the forms to Enumerators

b) To collect the completed forms to ensure change of time at hourly interval

ANNEX-XXII

(Contd.)

b) To collect the completed forms to ensure change of time at hourly interval

c) To help the Enumerator in peak hours

d) Preliminary checking of filled-in-forms

e) Preparation of summary tables of number of vehicles counted

f) Tabulation of data on daily, weekly and monthly basis

g) To look after and to operate the automatic counters

(ii) Enumerators:
There will be four Enumerators at each station but only one in each shift. He will be responsible for counting the vehicles and watching the equipment.

(iii) Cook/Chowkidar:
As stated above, there will be 6 persons at each station. It is necessary to establish a camp to provide them shelter and to keep expensive equipment. There should be a person who can cook meal and take care of stores and supplies. He will do minor day to day work. One Cook/Chowkidar for each station will be sufficient.

ANNEX-XXII

(Contd.)

(b) Office Staff:

For such a heavy and long duration programme, there should be some staff other than field staff. This office staff would be responsible for controlling all stations, editing/coding of forms, transmission of forms for punching and reconcilation of tabulation of data on daily, weekly and monthly basis, presentation, compilation and analysis of data to derive results and may do work for preparation of final report. Office staff would be retained for 15 months. The requirement for office staff is as under:-

Requirement of Office Staff

Sl. No.	Category	Scale	Nos.
1.	Statistical Investigator	BPS-16	3
2.	Stenotypist	BPS-12	1
3.	Naib Qasid	BPS-01	1
	Total :		5

Functions:

The main duties, work and functions of office staff are as under:-

a) Record, Control and Documentation of forms

b) Presentation, Compilation, Processing and Analysis of collected data

c) Tabulation and consolidation of statistics

ANNEX-XXII

(Contd.)

d) Editing and coding of forms for computerization

e) Transmission of filled in forms for punching and surprise visits to the stations/points

f) Co-ordination with field staff

g) Other minor, regular and office desk work

2. Requirement of Equipment:- Conforming to the type of work, the field staff and office staff would require 3 types of equipment, namely:-

(a) Survey Material

(b) Camping Material

(c) Office Equipment

(a) Survey Material:- It has already been explained that traffic data would be collected at 10 stations for a period of at least 12 months. Various types of material are required for the purpose. The following items would be needed:-

ANNEX-XXII

(Contd.)

Sl. No.	Items	Demand for One Station	Demand for 10 Stations
1.	Counters with kit	3 Nos	30 Nos
2.	Cone and Cylinders	2 Sets	20 Sets
3.	Batteries	6 Nos	60 Nos
4.	Battery Boxes	3 Nos	30 Nos
5.	Charger	1 No	10 Nos
6.	Petromexes	2 Nos	20 Nos
7.	Torches	3 Nos	30 Nos
8.	Large Umbrella	2 Nos	20 Nos
9.	Furniture:		
	(a) Folding tables	2 Nos	20 Nos
	(b) Folding chairs	4 Nos	40 Nos
10.	Steel Boxes (for data storage, spare parts, equipment)	3 Nos	30 Nos
11.	Watch (Time Piece)	1 No	10 Nos
12.	Miscellaneous, minor and consumable items	- As required -	

ANNEX-XXII

(Contd.)

(b) Camping Equipment — A camp will have to be established at each point to provide shelter and accommodation. They will stay outside city limits throughout the programme and would require the following items:-

Sl. No.	Items	For one Station	For 10 Stations
1.	Tents	2	20
2.	Steel Folding Beds	6	60
3.	Hamam	2	20
4.	Water Cooler	1	10
5.	Stoves	2	20
6.	Medical Boxes	1	10
7.	Buckets,Utencils,Crockery	-As required-	
8.	Timber, Kerosine Oil and other consumable items	-As required-	
9.	Miscellaneous minor items	-As required-	

ANNEX-XXII

(Contd.)

(C) Office Equipment: The following office equipment shall also be required:-

Sl. No.	I t e m s	Number
i)	Staff Table	4
ii)	Staff Chairs	4
iii)	File Racks	5
iv)	Steel Almirah	3
v)	Typewriter	1
vi)	Calculator	3
vii)	Minor Misc. items	- As required -

Cost Estimates: The above items are estimated to cost Rs. 4.25 million as per details below:-

(a) Field Organization: Field staff would be deputed on contract basis, however, field allowance would be allowed. The estimates for one and ten stations are as follows:-

ANNEX-XXII

(Contd.)

Estimate of field staff for 10 stations for 12 months

(Rs.)

Sl. No.	Category	Man-Month	Salary per month			TOTAL (3x6)
			Basic	Field Allow.	Total	
1	2	3	4	5	6	7
1.	Supervisor, BPS-16	120	3,200	500	3,700	444,000
2.	Enumerator, BPS-11	480	2,400	400	2,800	1,344,000
3.	Cook/ Chowkidar, BPS-1	120	1,200	300	1,500	180,000
	Total :					1,968,000

(b) Office Staff:

Needs, requirements and functions of office staff have been explained above. Cost estimate is as follows:-

ANNEX-XXII

(Contd.)

Sl. No.	Category	Nos.	Salary per Month	Cost for one Month	Cost for 12 Months
1	2	3	4	5	6
1.	Statistical Investigator BPS-16	3	3,200	9,600	115,200
2.	Stenotypist BPS-12	1	1,900	1,900	22,800
3.	Naib Qasid BPS-1	1,	1,200	1,200	14,400
	Total :				152,400
	GRAND TOTAL (a + b)				2,120,400

(C) Equipment:

Total cost of equipment is estimated at Rs.900,000/- as per summary given below:-

(i) Camping Equipment	100,000
(ii) Survey "	657,000
(iii) Office "	31,000
Sub - Total :	788,000
Contingencies @ 15%	118,000

Details may be seen below :

ANNEX-XXII

(Contd.)

Requirement of Equipment

i) Camping Equipment

Sl. No.	I t e m s	Demand for one Station	Demand for 10 Stations	Rate (Rs.)	Total Amount Required (Rs.)
1	2	3	4	5	6
1.	Tents	2	20	2,000	40,000
2.	Steel Folding Beds	6	60	300	18,000
3.	Hamam	2	20	150	3,000
4.	Water Cooler	1	10	300	3,000
5.	Stoves	2	20	200	4,000
6.	Medical Boxes	1	10	200	2,000
7.	Buckets, Utencils, Crockery & Other small kitchen items	E s t i m a t e d (1,000 for one station)			10,000
8.	Miscellaneous items	E s t i m a t e d (2,000 for one station)			20,000
	Total :				100,000

ANNEX-XXII

(Contd.)

(ii) Survey Equipment

Sl. No.	I t e m s	Demand for one Station	Demand for 10 Stations	Rate (Rs.)	Total Amount Required (Rs.)
1	2	3	4	5	6
1.	Counters with kit	3	30	12,000	360,000
2.	Road Signs Boards	4	40	300	12,000
3.	Station Sign "	2	20	2,000	40,000
4.	Road Cycliner	80	800	200	160,000
5.	Batteries	6	60	300	18,000
6.	Battery Box	3	30	100	3,000
7.	Charger	1	10	300	3,000
8.	Petromexes	2	20	700	14,000
9.	Torches	2	20	50	1,000
10.	Large Umbrellas	2	20	1,000	20,000
11.	Furniture:				
	(a) Folding Tables	2	20	300	6,000
	(b) Folding Chairs	4	40	100	4,000
12.	Steel Boxes (for data storage, spare-parts, equipment)	3	30	200	6,000
13.	Watches (Time Piece)	1	10	600	6,000
14.	Calculators	2	20	200	4,000
	Total :				657,000

ANNEX-XXII

(Contd.)

(iii) Office Equipment

Sl. No.	I t e m s	Demand	Demand Rate (Rs.)	Total Amount Required (Rs.)
1	2	3	4	5
1.	Staff Tables	4 Nos	500	2,000
2.	Staff Chairs	5 "	200	1,000
3.	Special Racks	5 "	800	4,000
4.	Steel Almirah	3 "	1,000	3,000
5.	Electronic Typewriter	1 "	20,000	20,000
6.	Calculators	4 "	250	1,000
	Total :			31,000

3. STATIONERY AND PRINTING: It has been estimated that 1,000 reams of duplicating and offset papers would be required for hourly, daily and monthly survey/counting forms, as well as for the publication of final report at the close of the programme. In addition to this cost of printing of this quantity @ paisa 5 per piece of paper or Rs. 20 per ream is 1,000 x 20 = approximately. Anyway, cost estimates for stationery and printing is as under:-

ANNEX-XXII

(Contd.)

Sl. No.	I t e m s	Qty. required	Rate (Rs.)	Amount (Rs.)
i)	Duplicating Paper	900 reams	50	45,000
ii)	Offeset paper (170 gm)	100 "	60	6,000
iii)	Note sheet pads	100 Nos.	10	1,000
iv)	File Covers	1,000 "	1	1,000
v)	File Boards	1,000 "	3	3,000
vi)	Lead Pencils	100 dozen	10	1,000
vii)	Printing Paper	1,000 reams	20	20,000
viii)	Miscellaneous	Lump-sum	-	2,000
	Total :			79,000

4. FIELD VISITS:

A group of 3 officers is supported to go in the field to select the exact location of the points before regular programme is started. Moreover, all 10 stations at various cities will be controlled by the Headquarter through surprise visits.

The cost estimates are based on the following assumptions:-

(a) Three officers would go to select the exact location for 15 days.

(b) One officer would visit the station thrice a month.

(c) Total duration of field work is 12 months.

On the basis of these conclusions, a lump-sum amount of Rs. 100,000/- has been provided.

ANNEX-XXII

(Contd.)

5. Transport:
The equipment and personal effects of the survey team would need to be transported to survey sites. Based on the experience of Phase-I, II and III, a lump-sum amount of Rs. 300,000 is proposed for this purpose.

6. Repair and Maintenance:
Automatic Traffic Counter would be used for the survey. These machines require frequent repair and maintenance. Also, provision need to be made for repair and maintenance of other equipment like furniture, tent, etc. An amount of Rs. 25,000/- has been provided under this head.

7. Mailing Charges:
Since all the stations are scattered all over the country. Station staff is required to regularly send collected data by mail on weekly basis and also contact Head Office in case of any emergency. To cover the expenditure a lump-sum amount of Rs. 25,000/- is provided.

8. Installation of Counters:
Automatic Traffic Counters withloop-detector are difficult to instal as it needs cutting of pavement crust and embedding the loops. At least 2 counters would be installed at each station. It is estimated that Rs. 2,000/- would be required for each station. The cost of installation at the 10 stations is estimated at Rs. 20,000/-.

9. Permanent Huts:
Since these stations would be working on permanent basis, permanent huts would be required to be constructed at all the 10 additional Stations. An estimated cost of Rs. 35,000/- for each hut would be required. A total amount of Rs. 350,000/- for 10 huts would, therefore, be required.

10. Contingencies:
This head includes the items and expenditure that cannot be covered by any above head. An amount of Rs. 4,380,000/- is estimated for this purpose, which is 15% of the total expenditure.

ANNEX-XXII

(Contd.)

11. Summary : The summary of the cost estimates is given below :

Phase-V

		(Rs.)
1.	Staff Requirement	2,120,400
2.	Requirement of equipment	788,000
3.	Stationery & Printing	79,000
4.	Field Visits	100,000
5.	Transport	300,000
6.	Repair and Maintenance	25,000
7.	Mailing Charges	25,000
8.	Installation of Counters	20,000
9.	Permanent Huts	350,000
	Total :	3,807,400
10.	Contingencies at 15%	571,510
	GRAND TOTAL :	4,378,510
	OR SAY	4,380,000

(C) Phase-VI: On the completion of one year traffic count at the additional 10 stations, the scope of the programme will be reduced to only daily counts and staff strength accordingly curtailed to two. The total expenditure on this account for four years during 7th Plan period is as follows:

ANNEX-XXII

(Contd.)

i) Staff Salaries:

Each station would be manned by only two Enumerators with a total man-months of 960. The total amount of station staff salaries is estimated at Rs. 2,400 x 960 = Rs. 2,304,000.

In addition, an amount of Rs. 840,000/- would be required for office staff as listed below:

Sl. No.	Designation	Nos.	Salary	Man Months	Amount (Rs.)
1.	E. I.	3	3,200	144	460,800
2.	Enumerators	2	2,400	96	230,400
3.	Stenotypist	1	1,900	48	91,200
4.	Naib Qasid	1	1,200	48	57,600
	Total				840,000

Provision has also been made for relief staff to ensure continuity of atleast two persons at each station during the period when one of them would be on leave. For this purpose, 3 additional Enumerators would be hired. The total amount on this account is estimated at Rs. 345,600/-.

The total estimated expenditure on account of salaries thus amounts to Rs. 3,489,600 as per summary below.

a.	Field Staff ...	Rs.	2,304,000
b.	Office staff ...	Rs.	840,000
c.	Relief staff ...	Rs.	345,600
		Rs.	3,489,600

ANNEX-XXII

(Contd.)

ii) Field Visits:

In order to ensure that the counting is carried out properly, surprise visits and checking is essential. The stations are scattered all over the country and far from the Headquarter. In addition, items of stationery, spare-parts etc., are sent to the stations from Headquarter, which entail cost of transportation, daily allowance and hotel charges. A lump-sum amount of Rs. 200,000 is proposed for this purpose.

In addition, relieving staff would be required to visit all the stations as per schedule provided to them. One reliever would remain out of Headquarter for about 280 days per year. An amount of Rs. 216,000 (lump-sum) is estimated for meeting TA/DA expenditure. On this account the total estimated cost of field visit would thus amount to Rs. 416,000.

iii) Requirement of Equipment:

Most of the survey and camping equipment would be procured under Phase-V, however some of items such as tents and umberallas etc. have been worn out and need replacement. Also reflecting cylinders, sign boards, etc. being used for the channelization of traffic, are some time broken as a result of collision with vehicles. A lump-sum amount of Rs. 100,000 is provided for this purpose.

iv) Repair and Maintenance:

Automatic Traffic Counters with special power system are being used at permanent traffic count stations. These machines are sometime out of order. Some other items at the stations are to be repaired. An amount of Rs. 100,000 would be required.

ANNEX-XXII

(Contd.)

v) Stationery and Printing:

Stationery and printing is essential for the survey forms and reports. An amount of Rs. 200,000/- is being proposed.

vi) Mailing Charges:

Since all the stations are scattered all over the country. Station staff is required to regular send collected data by mail on weekly basis and also contact Head Office in case of any emergency. To cover the expenditure a lump-sum amount of Rs. 60,000 is provided.

vii) Contingencies:

This head covers those expenses which cannot be covered by heads mentioned above. It also covers un-expected and usual expenditure. An amount of Rs. 654,840 which is 15% of the total expenditure is proposed.

Summary

The total capital outlays required for Phase-VI are estimated at Rs. 5.02 million as per summary given below.

ANNEX-XXII

(Contd.)

		Amount (Rs.)
1.	Staff Salaries	3,489,600
2.	Field Visits	416,000
3.	Requirement of Equipments	100,000
4.	Repair and Maintenance	100,000
5.	Stationery and Printing	200,000
6.	Mailing charges	60,000
	Sub-Total :	4,365,600
7.	Contingencies at 15%	654,840
	Total :	5,020,440
	Or Say :	5,020,000

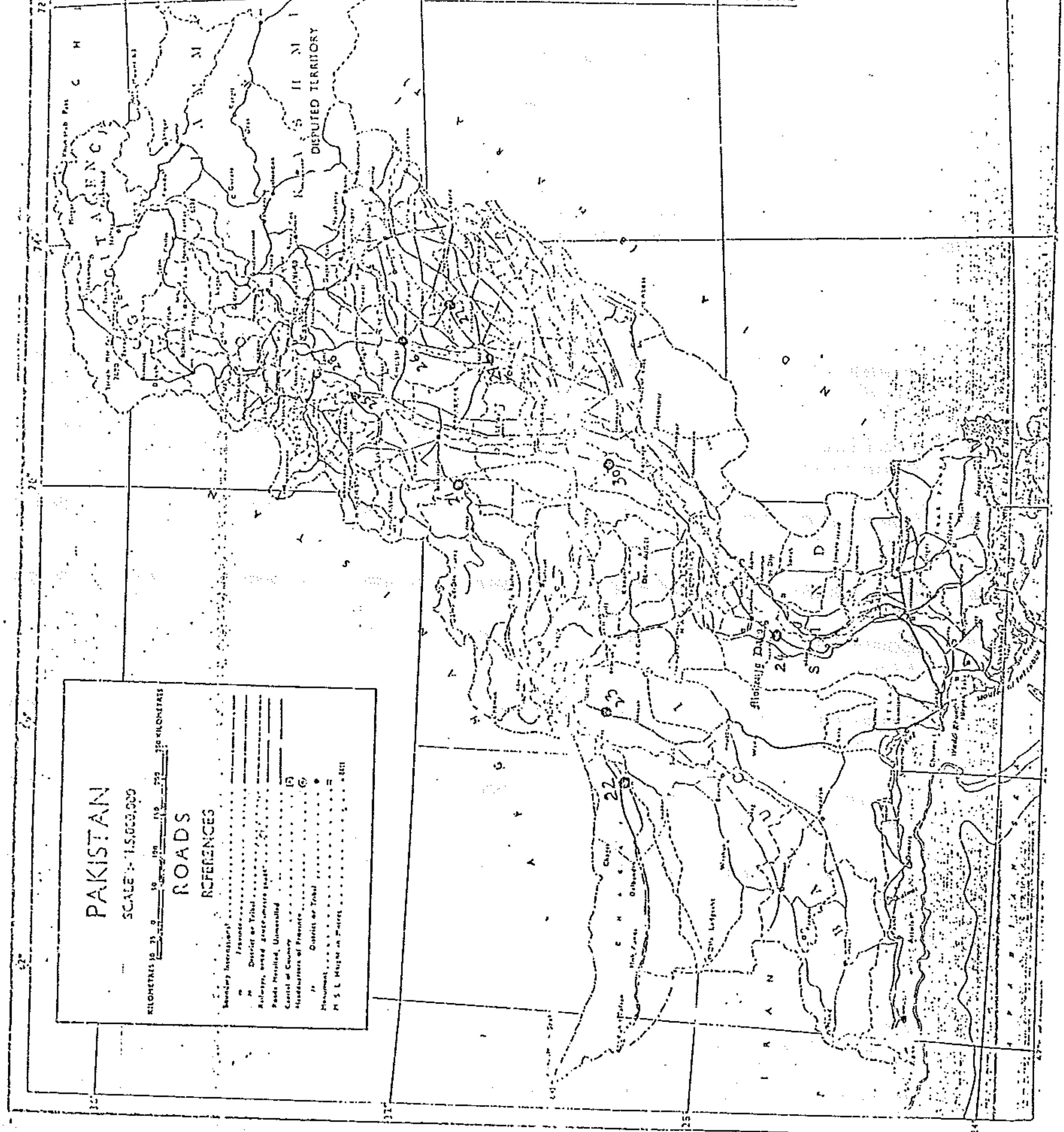
12. TOTAL COSTS: The Total Cost of Phase IV, V and VI is estimated at Rs. 20,633,000/- as per details below:-

Phase	Amount(Rs.)
IV	11,233,000
V	4,380,000
VI	5,020,000
TOTAL :	20,633,000

ANNEX-XXII
(Contd.)

FIGURE 1

LOCATION OF ADDITIONAL PERMANENT TRAFFIC COUNT STATIONS



ANNEX-XXIII

PHASING OF EXPENDITURE

1988-1993

(Million)

S.No	Item	1988-89	1089-90	1990-91	1991-92	1992-93	Total
1	2	3	4	5	6	7	8
1.	Research Studies	0.900	4.800	4.800	4.800	4.800	20.100
2.	Traffic Count Programme	2.000	3.200	3.200	3.330	3.323	15.133
3.	Demonstration Projects	1.000	1.000	1.000	1.000	1.000	5.000
4.	Data Bank	0.500	0.450	0.450	0.450	0.417	2.267
5.	Computeriza-tion	1.200	0.175	0.175	0.175	0.175	1.900
6.	Dissemination of Research	0.200	0.200	0.200	0.200	0.200	1.000
7.	Training Courses	0.200	0.200	0.200	0.200	0.200	1.000
8.	Highway Safety Studies	0.200	0.200	0.200	0.200	0.200	1.000
9.	Foreign Exchange	0.200	0.200	0.200	0.200	0.200	1.000
10.	Seminar/ Symposium	0.080	0.150	0.150	0.150	0.150	0.680
11.	Miscellaneous	0.200	0.200	0.200	0.200	0.200	1.000
	Total :	6.680	10.775	10.775	10.905	10.865	50.000

ANNEXURE-XXIV

ESTIMATES OF RECURRING EXPENDITURE

Rupees in Million

S.No.	I t e m	1987-88
1.	Basic Salary Officers	1.207
2.	Basic Salary Staff	0.570
3.	Regular Allowances	0.685
4.	Other Allowances	0.173
5.	Purchase of Durable Goods	0.072
6.	Maintenance of Durable Goods	0.050
7.	Transportation	0.083
8.	Commodities & Services	0.529
9.	Communication	0.220
10.	Utilities	0.130
11.	Entertainment	0.006
	Total :	3.725

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