GOVERNMENT OF PAKISTAN
PLANNING AND DEVELOPMENT DIVISION
NATIONAL TRANSPORT RESEARCH CENTRE
8-AGHA KHAN ROAD, F-6/4

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N.T.R.C.

Phase - I (Revised)

M. SADIQ SWATI
CHIEF
&
ABDUL MAJEED
DEPUTY CHIEF

November, 1980

FORM PC.II

1. SERIAL NUMBER OF SCHEME:

2. NAME BY WHICH SCHEME WILL BE KNOWN: National Transport Research Centre Phase-I (Revised)

3. ADMINISTRATIVE AUTHORITIES:

(a) Sponsoring Provincial/ Central Government: Planning and Development Division

(b) Central Ministry Concerned: Ministry of Planning and Development

4. COST AND PERIOD:

	Total Cost	F.E.C.
(a) Total Estimated Cost: (Million Rupees)	13.600	4.500
(b) Estimated Period of Execution:	9 Years (1974-83)	

5. GENERAL DESCRIPTION OF THE SCHEME:

The proposal is aimed at continuing the Phase-I of the National Transport Research Centre upto 1982-83 with a view to achieving the following objectives:-

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

(ii) To provide additional facilities in terms of manpower, equipment and material 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.

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

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

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

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

(vii) To approach various international agencies to either sponsor research in the areas where NTRC has built sufficient expertise to undertake research independently or collaborate in areas of mutual interest.

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

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

(x) To implement/execute experimental pilot projects on the basis of research carried out in the Centre to establish the viability of the research efforts undertaken in the Centre, and also give it "problem oriented outlook".

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

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

6. MANNER OF IMPLEMENTATION:

(a) Agency for execution/ operation: Planning and Development Division

(b) How proposed to be financed:

Local
~~Lost~~ Cost - Govt. of Pakistan
Foreign Exchange - U.N.D.P.,etc.

7. BACKGROUND AND JUSTIFICATION:

The need for setting up of National Transport Research Centre had been felt for a long time and numerous recommendations have been made to this effect in the past. Among others, the Transport Co-ordination Study (TRACO) had recommended the setting up of a Central Transport Planning Cell. The summary of their recommendations to this effect is as follows:

(a) The Cell should be headed by a highly qualified and dynamic transport economic 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:-

Theoretical and applied economics, civil and mechanical engineering and economic geography, system analysis, statistics, electronic data processing.

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 responsibilties and take initiatives.

(b) One important factor is that this group should not be allowed to fall into a rigid Government scale of renumeration. Appointment and salary should be agreed initially with each one of be granted individually in accordance with merit, notably performance in their job and in relation to their future potential.

(c) The suggested Central Transport Planning Cell should be an addition to the existing planning institutions in West Pakistan. The provincial Transport Planning

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.

Fourth Five Year Plan:

The need for such a Centre was also strongly stressed in the Fourth Five Year Plan in the following words:

"Transport and Communications system have been changing rapidly in the past decade. Continuous research is essential if we are not to end up using methods which are crude and have become obsolete. To prevent this happening, the Transport Planning Cells in the provinces are being strengthened for proper coordination with the provincial and outside agencies and for the sake of national perspective, a "National Transport Research Centre" will be set up to undertake the much needed technical and economic research at the national level".

Existing Research Facilities:

The existing research facilities in the country are far from adequate and leave much to be desired. This is largely due to the lack of adequate know how and facilities which in turn suffered from very low priority give to research and experimentation in the past. Even now the incentives for research in the country are practically non-existent. Due to lack of proper incentives, tremendous amount of brain drain occurred during fifties and sixties and is continuing even at present. As a result, the research activity in the field of transportation has remained stagnant as would be seen from the following:

Transport Research Panel Findings: A panel under the Chairmanship of Federal Secretary, Mr. T.H. Hashmi constituted by Roedad Committee on Research during 1974-75 made the following observations and recommendations regarding the state of affairs in the field of Transportation Research:

(i) The Research Institutions in the field of Transportation are neither properly maintained nor adequately staffed.

(ii) The number of Research Institutions in the country are very few. There is a positive need for creating more facilties.

(iii) There is no coordination among existing research organizations. But the problem is more or less lack of information about the research capabilities and research activities about other institutions. There is urgent need for creating a central agency to work as clearing house of information regarding research activity in the various organizations.

(iv) There are obvious gaps in the present research efforts which does not allow proper utilization of the existing facilities. There is also need for establishing new institutions as well as enlarging the scope of the existing ones.

(v) There is need for streamlining the procedure to ensure that the Government is kept fully informed of the research activity in various institutions.

(vi) There is lack of accountability to ensure that the results achieved by research institutions are commensurate with the amount spent on them. This may, however, be viewed in the light of the fact that only token amount was spent in R & D in the past in the field of Transportation. Research has not been taken very seriously and as a result not much was expected from these institutions to justify their existence.

(vii) The problems tackled by the existing institutions in the past were mostly local in nature and did not have wide spread impact.

Roedad Committee:

The Roedad Committee on Research and Development constituted in 1975, after thorough deliberations made the

following observations regarding R & D in the field of transport:-

(a) There are obvious gaps in the present research effort which does not allow proper utilization of the existing facilities.

(b) There is also need for establishing new institutions as well as enlarging the scope of the existing one.

(c) There is need for streamlining the procedure to ensure that the Goverrnment is kept fully informed of the research activity in various institutions.

(d) There is lack of accountability on the part of R & D institutions and it is imperative to ensure that the results achieved by research institutions are commensurate with the amount spent on them.

Details of Existing Facilities:

The detail of the existing research capabilities for various types of research in the field of transport is as follow:-

i) Industrial Research:- In the field of industrial research very little has been done and at the present not much may be warranted because of the state of our manufacturing industry. However, a start has been made by the Pakistan Railways where an engine is being converted to natural gas operations for traction. If successful, it would pave the way for changing the Pakistan Railways fleet of locomotivee to gas operation and thereby save on the import of diesel fuel. In the field of road transport only assembly is undertaken and no large scale manufacturing is being done.

ii) Structural Research:- A Buildings and Roads Research Laboratory was established at Lahore in 1951. The Laboratory was entrusted with the work of both Buildings

and Roads for the entire province and continued to work as such upto 1961, when it was bifurcated into two separate organizations for Buildings and Roads. Since then, the Road Research Institute is exclusively meant for work on roads. It has upto now devoted itself to routine work, which includes site investigation, soils and materials testing, etc. Very little work on other important problems such as soil mechanics,pavement design, low-cost roads and construction techniques has been done up-till now. Recently, however, work has been initiated on the design of flexible pavements in water logged areas; cuase of failure of various roads and design of flexible pavement with regard to local soil conditions. In addition, limited studies have also been undertaken to assess requirements of machinery for road building. A bulletin is also published which includes results of the progress of technical problems conducted by the laboratory.

In order to lay the foundation of the road system on a sound basis, to protect the huge investment involved in the construction of roads and to provide proper research facility which would from the basis of most economical and efficient road construction in the country, the Ministry of Communications proposed a Five Year Development Programme for the period 1970-75 for expansion of existing road research facilities and provision of regional materials testing and field control laboratories.

The implementation of this programme would have gone a long way in the development of road research facilities in the country, but unfortunately due to some reasons, the programme was shelved after the first year grant of more than Rs. 35 million made to the provinces. It can safely be said that no adequate road research facilities are available in the country

and scarcely any headway is being made in this field.

iii) Operational Research:- As regards operational research, very little has been done in the country todate. Some studies were carried out by TCI, TRACO and SOFRERAIL and Transport Planning Cell, created in West Pakistan Highway Department during mid sixties did considerable work prior to dissolution of one unit. The Cell has since been almost disbanded and only skeleton staff remains.

Railway also set up a Research and Development Cell in 1964 with the following charter:-

(a) To establish a Railway Technical Library, summarise articles of interest and publish these for general information of Railway men, including documentation of important foreign journals.

(b) To maintain liaison with other national and international Research Organizations.

(c) To undertake studies for assistance in solving specific problems of immediate practical necessity.

The organization has, however, remained stagnant and it has barely been able to perform its functions. Only sporadic and isolated efforts have been organized from the Cell in speed and load factors. The allocation for the Cell has been very meagre.

Similarly in 1968, a Harbour Hydraulic Investigation Model was established at Karachi Port. The objectives of the model among others were:-

- Investigation through fixed bed tidal model.
- Prototype investigations for coastal sedmentation studies.

These studies were required for long term development of Karachi Port. The R & D Unit is manned by approximate 22 scientists, technicians and supporting staff and has an annual budget of Rs. 0.6 - 0.8 million. The unit has very limited scope of work and does not undertake any operational research in the area of port development.

As regard involvement of academic institutions of of higher learnings, there are four full-fledged engineering colleges/universities which have adequate facilities by way of manpower as well as equipment which could take part in the Research and Development effort. However, these facilities have remained virtually untapped on account of lack of sponsorship for research work as well as lack of incentives for the staff to engage in research.

Apart from these no R & D facilities worth mentioning exists in the field of Transport and Shipping beyond collecting and compiling statistical data.

8. REPURCUSSION OF THE SCHEME:

Modern transportation 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 studied carefully to arrive at the optimum solution.

This type of planning is a typical Central responsibility, nevertheless it can only be carried out properly in cooperation

with the provincial and other model planners. This is essential to enable the Central Government to make sound and economically justified decisions.

The proposed scheme shall ensure full utilization of the existing indigenous expertise in the field of transport 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.

9. ANALYSIS OF WORK INVOLVED:

Transport is a major part of the socio-economic infrastructure of the country. There is no other sector of the economy which has such broad and so many inter-relations and links. By integrating separate sectors of the economy and linking economic regions, it creates the potential for broad spatial and productive division of labour. Socio-economic development of a nation can be measured in terms of its mobility. Therefore, the scale, capacity and technological level of the transport network as well as their performance (traffic), are significant indicators of economic advancement of the country.

The growth of production, increase in per capita income and broadening of foreign trade relations alongwith specialization and concentration of production and consumption centres lead to a steady increase in the overall transportation demand. In order to meet the transport requirements of the

economy efficiently the transport as a whole, and all of its parts need to be constantly improved. To evolve an efficient transportation system which would adequately cater for the increased developmental activity in the country, the allocation for transport has been increased manifold since 1970-71, inspite of great restraints on resources.

The increased emphasis on the transport sector and the limited resources warrant 'optimal investment and policy formulation criteria' for transport investment resources. However, in order to achieve the maximum economy and the optimal investment criteria, it is essential to improve the techniques of planning and implementation of projects and utilize the available local facilities and materials to the fullest extent for which development of adequate research facilities in the country is a pre-requisite.

Unfortunately, the research effort in the past has been far short of the desired level, between 1.0% to 1.5% of the transport sector allocation (0.1% average for Pakistan in the past). It is clear that in order to achieve the desired result, the investments in research shall have to be substantially increased. It is estimated that lack of proper research facilities in the country results in a loss of upto 50% of the investment in major transportation projects due to improper project planning and implementation techniques.

Type of Research:- In the field of transportation the research may be defined as not only getting the facts, experimentation, equipment development although these may be indispensable; but

also conception of new relationship between the variables entering into the problems. Research as a whole may be broadly categorized into two basic formats:-

(a) Basic Research
(b) Adaptive Research

Basic research is the original work aimed at developing new relationship between the variables, invention of new theories, development of hardwares as well as softwares. The adaptive research is carried out on the ways and means by which the technological know how obtained in advanced countries could be applied to conditions prevalent in lesser developed countries. Most of the research being carried out in developing countries at present is adaptive research. Only when sufficiently sophisticated institutions are developed, basic research can be undertaken.

In the field of transportation, research can be divided into three broad categories viz:-

i) Industrial research
ii) Structural research
iii) Operational research
    a) Empirical approach
    b) Systems approach

i) Industrial Research: Industrial research can be defined as the research which is carried out for production and improvement of the basic transportation model. It involves research on the type of materials and their structural strength used for the production of transportation vehicles;

fuels; types of motive units and other structural components etc. This type of research would only be needed when our transport industry becomes capable of producing automobiles, railway rolling stock, air-crafts and other transport vehicles.

ii) Structural Research:-Structural research relates to the load carrying capability of the structures on which the vehicles ply. The main areas where such research could be carried out are :-

(a) Roads:
- Construction materials,i.e. Soil, Aggregates, binders, re-inforcement.
- Design of pavements for various soil, water and climatological condition.
- Construction methods.
- Drainage structures.

(b) Ports:
- Shoreline characteristics.
- Wave action
- Marine geology.
- Silting and Dredging.
- Construction materials.
- construction methods

(c) Airports:
- Construction materials
- Construction methods.
- Design of pavements
- Drainage etc., etc.

(d) Railways:
- Construction material
- Construction methods
- Track design.

(e) Bridges:
- Foundations
- Super structures.
- Training works.

(iii) Operational Research:- The operational research, though relatively a newer form of research is most important in that both the industrial and the structural standards are dependent upon the outcome of the operational research for new facilities, and conversely, in case of a facility already available, the optimal use of the facility is dependent upon operational research. There are two approaches to operational research.

(a) The Empirical Approach:-The empirical approach represents the traditional approach. It has provided most of the present knowledge in the field of transportation engineering. The empirical approach primarily draws upon observations, measurements and statistical behaviour of the transportation phenomenon. The empirical approach has, however, failed to answer many questions about the behaviour of traffic; optimal scheduling; optimal facilities based on arrival of ships and aeroplanes at ports and airports and the stochastic occurrence of events in transportation.

(b) The Systems Approach:- The latest approach adopted for operational research is called the systems approach. The system is defined as a set of objects and with relationship between the objects and between their attributee. In the case of transport elements, the vehicle, the driver, the road, the railway track may be defined as objects, and driver's vision; reaction time, vehicle speed, accelerating and decelerating capability, head way, street width and traffic controls as the attributes.

A system therefore is a collection of diverse human and machine elements integrated to achieve a common desired objective by manipulation and control of materials, information, energy, and human. The system approach involves formulation of mathematical models, analysis of the sensitivity and the stability of the system with respect to their elements; analysis of the compatibility of the various components and sub-systems.

The system's approach is especially suitable for tackling transport problems which are inherently very complex. Even an apparently single problem situations can seldom be corrected by changes in any one factor or by un-coordinated changes in several factors.

Inherent in the research process are theory formulation, experimentation and evaluation. Theory formulation, includes establishing the criteria for system optimization and formulating a mathematical model experiment can be of either controlled or an un-controlled nature. Controlled experiments may be either undertaken in the laboratory or in the field. Examples of the former are simulation, both analog and digital, examples of the latter are test tracks and to a certain extent tunnel and freeway control projects. The controlled field experiments are useful in evaluating theories,but actual validation must be based on real world situation i.e. the un-controlled field test.

Realizing the crucial importance of transport, most developing countries have been investing as much as 25 to 30 percent or more of total public expenditure in transport and communications. In Pakistan, during the four Plan periods, approximately one-fifth of all public sector outlay was allocated to the transport sector.

The Fifth Plan proposes an investment of Rs. 28,000 million in the sector during 1977-78/1982-83. Much larger investments are still needed to meet the growing needs of mobility.

Setting Up of the Centre:

On the basis of TRACO 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 which was set up as a Development Scheme was to achieve the following objectives:-

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

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

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

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

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

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

(vii) 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.

Cost of the scheme was estimated at Rs. 2.45 million with foreign exchange component of Rs. 0.5 million. The Centre was to be manned by the technical staff of the T&C Section in addition to their own duties. This was,however, not supported by the Ministry of Finance.

Accordingly, the scheme was reeast in December,1971 to provide for full time staff for the Centre. The revised cost of the scheme was estimated at Rs. 2.523 million with a FEC of Rs. 1.39 million. However, due to paucity of the funds and on the recommendation of Ministry of Finance, it was decided to confine the duration of the project to one year and provide only nucleus staff of three Deputy Chiefs(Grade-19) and one Planning Officer (Grade-17) alongwith the supporting staff. The revised cost of the scheme was estimated at Rs. 1.929 million with a FEC of Rs. 0.975 million.

The revised scheme was administratively approved by the Planning Division in June, 1973. However, due to financial constraints, the scheme could not be implemented immediately. The Centre actually become operative in May, 1974 when the first Deputy Chief was inducted. The staffing details of the Centre over the years may be seen at Annexure-I.

The nucleus staff was to do the preliminary spade work and act as counterpart staff for U.N. Advisers who were to help organize the Centre into a fullfledged organization in the course of time. The foremost task that the nucleus staff undertook was:-

(i) Preparation of forecasts for Fifth Five Year Plan; and

(ii) Work Plan for the Centre.

However, due to financial difficulties of UNDP during the period, their assistance did not beoome available and the Centre continued to be funded from the development budget on year to year basis.

However, during 1977-78, the Ministry of Finance carried out a detailed review of the scheme and decided that:-

(a) Of the 29 posts agreed to for NTRC at various times, 25 (i.e. with the exception of 2 posts of Assistants, one post of Stenotypist and one post of D.M.O.) may be allowed to continue upto 31-5-1978 as well as in the financial year 1978-79.

(b) Planning Division should submit the relevent development scheme to the competent authority (CDWP/ECNEC) for ex-post-facto approval.

(c) From financial year 1978-79 onwards, the expenditure on NTRC should find a place in the revenue budget. The expenditure on studies should, of course, continue to be debitable to the development budget.

Accordingly, a PC.II form was prepared at an estimated cost of Rs. 4.560 million with no foreign exchange. The scheme was ex-post-factively approved by the CDWP at its meeting held on 31st May, 1978 at a cost of Rs. 3.694 million, which included expenditure on regular staff and studies from 1974-75 to 1977-78 and Budget Estimates for studies for 1978-79 as follows:

	Staff	Studies	Total
1974-75	481,300	87,477	569,277
1975-76	310,500	26,291	336,791
1976-77	337,085	92,517	429,602
1977-78	419,974	300,000	719,974
1978-79	-	1,638,632	1,638,632
	1,548,359	2,144,917	3,694,276

As against this, the total expenditure actually incurred by 30-6-1980 amounts to Rs. 3.106 million, which is well within the amount sanctioned for Phase - I. The details of year-wise expenditure on studies and staff charged to development budget may be seen in the table below:-

Expenditure on NTRC

Year	Staff	Studies	Total
1974-75	481,800	87,477	569,277
1975-76	310,500	26,291	336,791
1976-77	347,085	92,517	439,602
1977-78	454,000	165,000	619,000
1978-79	-	560,000	560,000
1979-80	-	682,000	682,000
	1,593,385	1,613,285	3,206,670

Fifth Plan Provision:

The need for greater emphasis on R & D in the field of transport has been stressed in the Fifth Five Year Plan. The relevent abstracts are as follows:-

Transport:- In this field R & D activity remained virtually stagnant for lack of directions, funds, equipment and qualified trained workers. Some R & D work is in progress at the Road Research Station, Railway Research and Development Cell, National Transport Research Centre and Material Testing Laboratories.

During the Fifth Plan, R & D work will be carried out for improvement in road building technologies alongwith the maximum use of local materials for better planning, design, construction and maintenance techniques adopted to local weather and traffic conditions. Research will be undertaken at the National Transport Research Centre for which Rs. 15 million have been provided.

Work Done Todate:

The Centre has so far completed 51 studies. In addition, 8 studies are in-hand. The details of the studies completed/in-hand may be seen at Annexure-II. The studies undertaken by the Centre can be broadly categorized as follows:-

A. Studies undertaken by Foreign Consultants.

B. Studies undertaken by Local Consultants.

C. Desk Studies carried out by NTRC staff.

D. Research Studies carried out by NTRC staff.

Brief description of these categories is as follows:-

A. Studies Carried Out by Foreign Consultants:

To-date eight studies have been carried out by the Foreign Consultants in the Centre. All these studies have been entrusted to the Centre by the Planning Commission.

All these studies have since completed.

B. Studies Undertaken by Local Consultants:

A total of two such studies have been undertaken so far in the Centre. These studies were also entrusted to the Centre by Planning Commission. All these studies have since been completed.

C. Desk Studies Undertaken by NTRC Staff:

These studies are undertaken by the individual officers of the Centre. A total of 42 such studies have so far been undertaken by the Centre todate. Bulk of these studies have been done during the past three 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 and other important matters relating to transport sector planning.

(ii) Primary studies undertaken by NTRC staff some time run into procedural difficulties or go through a stage in which the coordinator of the studies can contribute very little (such as collection and compilation, etc. of data). These studies are pursued 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 relevent issues as well. Additional Studies are thus generated without any extra cost.

(iv) It is chartered duty of NTRC to collect and disseminate the latest development in the field of transport 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:

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

(ii) This keep the researcher abreat of technical development in the profession a 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.

D. Studies Charged to ADP:

So far 13 studies have been financed out of the development budget of the Centre. Out of these 7 have been completed and the remaining are at various stages of completion. These in fact can be termed as the real research work being done by the Centre.

Highway Safety:- The work done in the area of highway safety todate includes:-

(i) A three minute duration T.V. Programme explaining the 'rules of the road" was prepared and telecast during the month of December, 1977.

(ii) Preparation of material for broadcasting from Radio Pakistan for the period 1.11.1977 to 30-6-1978.

(iii) Preparation of 45 documentaries of one minute duration explaining the safe driving practices for telecasting from T.V. and showing in the Cinema houses.

(iv) Preparation of sixty display ads for publication in the newspapers.

(v) Launching an extensive campaign of traffic safety education through the mass media with effect from 1-1-1978 with the following salient features:-

(a) Traffic Safety Week.
(b) Special Supplement in Newspapers

(c) Seminar/Symposia in Pakistan National Centres.

(d) Regular transmission of two spots of one minute each from T.V.

(e) Releasing traffic documentaries for showing in all cinema houses all over the country within a period of six months.

(vi) Preparation and Printing of Pakistan Highway Code. Three lakh copies of English and Five lakh copies of Urdu were printed.

(vii) Preparation of revised draft of Motor Vehicle Ordinance to provide a comprehensive legal framework for dealing with traffic problems.

(viii) Report regarding Re-organization of Traffic Police to make it into a fully professional traffic police force.

(ix) Carry out research in various aspects of Highway Safety to have a better insight into the problem. Todate the following research studies have been either completed or in progress:-

(i) Psychological Attitudes Towards Highway Safety.
(ii) Effectiveness of Traffic police Training.
(iii) Effect of Enforcement on Road User's Behaviour.
(iv) Driver Behaviour at Signalized Intersection.
(v) Accident Study for the Punjab.
(vi) Real Problem of Highway Safety in Pakistan.
(vii) Study of Accident Black Spots on National Highways.
(viii) Low Cost Traffic Safety Solutions.
(ix) Manual of Uniform Traffic Control Devices.
(x) Evaluation of Speed Breakers.

Study Procedures:

Prior to 1977-78, no set procedures existed for processing of the research studies. During 1977-78, the following procedures were evolved for carrying out research studies in the Centre:-

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

(ii) The proposal is then placed before Research Advisory Committee (RAC) comprising the following five individuals in their personal capacity:-

1. Mr. T.H. Hashmir, formerly Secretary, Water & Power.	...	Chairman
2. Mr. Sadaqat Hasan Mir, presently Senior Chief (T&C) Planning Division.	..	Member
3. Mr. Aftab Alam, presently General Manager (P&D), Karachi Port Trust.	...	"
4. Dr. Z.H. Khilji, presently Prof. of Civil Engg: University of Engineering and Technology, Lahore.	...	"
5. Dr. Nasim M. Sadiq, presently Dy. Director General, C.S.O., Karachi.	...	"

The Chief (NTRC) acts as Member/Secretary of the Committee. The study proposal, after it has been examined and endorsed by the RAC, is submitted to the Secretary (Planning) for his administrative approval. After that it is sent to Finance Division for approval of the cost estimates. The study is undertaken by the Centre as and when funds become available. Also the actual undertaking of the studies is governed by a number of factors such as availability of necessary technical manpower/funds and priorities of research prevailing at the time.

Staff Position of NTRC:

It would not be out of place to mention here that the TRACO Consultants had recommended that the Cell may be expected to increase in size and consist of between 40 to 50 members containing administrative staff, specialists from each principal mode and adequate representatives of the theoretical and applied economics, civil and mechanical engineering, social and economic geography, system analysis, statistics, electronic data processing.

However, the present strength of professional staff of the Centre consists of 5 person only, including one Chief, two Deputy Chiefs, one Assistant Chief and one Research Officer. As regards representation of various disciplines, it may be mentioned that one of the Deputy Chiefs is a Transport Economist and the other a Civil Engineer. Assistant Chief and Research Officer are both Electrical Engineers.

Keeping in view the fact that the Centre of this type is primarily engaged in empirical research, it is essential to have an efficient field and office staff to gather, compile, and analyse the massive amount of the data usually required. The Centre is handicaped in so far it does not have adequate lower staff to help with the data collection, compilation and analysis. At present, this need is being met by providing additional manpower at the level of Grade-16 and below on short term basis against the individual studies to be undertaken by NTRC. This is, however, not a very

desirable practice for the following two reasons:-

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

(ii) The services of those who get trained while working on one study cannot be utilized for next study as they leave whenever a permanent job is available.

The British expert whose services were acquired to advise on the organizational structure of the Centre also noted the staffing deficiency, imbalance and proposed an organizational chart for the Centre which may be seen at Annexure-III.

As a consequence, the scope of research being undertaken in the Centre has been very limited. The Centre has the following options to undertake and accomplish the objective of covering all the modes of transport:-

(a) Expand the staff of the Centre to cover all modes.

(b) Farm out studies to local Consultants to do the job.

(c) Hire foreign consultants.

(d) Use other indigenous resources to achieve the objective.

Expansion of staff to the required extent is not possible under the present restrained economic conditions. Use of Consultants is not desirable for the following reasons:-

(i) Quality of work done by the Consultants cannot be guaranteed as their approach is basically commercially oriented.

(ii) The cost of utilizing consultants is very high.

(iii) It does not leave any residual expertise in the Centre.

Strategy:

Under the circumstances, the alternative (d) seems to be the most desirable and the following strategy would be adopted:

(i) Highest priority shall be given to those studies which can be undertaken by the staff of the Centre, keeping in view the area of their expertise and work load. The capabilities of the staff of the Centre shall be stretched to the fullest.

(ii) Those studies which are most essential but outside the competence of the Centre shall be dealt with as follows:-

(a) Services of research minded local experts working in various agencies within or outside the Govts. shall be acquired on deputation for a fixed period of two years to undertake research studies where in-house expertise is not available within the Centre.

(b) Research resources of the universities shall be fully utilized in meeting the research requirements.

(c) The existing relevant Research and Development institutions in the country shall be persuaded to collaborate with the Centre in undertaking research studies of mutual interest jointly by providing them suitable incentives.

Research Programme:- The research programme of the Centre can be divided in three categories namely studies already completed, studies in progress and future studies as detailed below:-

(a) Completed Studies:- As of 30-6-1980, the Centre has completed 41 studies. Out of these studies 3 were charged to the development budget of the Centre, while 38 were the desk studies. The total expenditure incurred on this account by 30-6-1980 amount to Rs. 3.106 million. The detail of year-wise expenditure

incurred may be seen at Page - 19. . The list of the studies including the desk studies completed may be seen at Annexure-II.

(b) On-going Studies:- As of 30-6-1980, a total of 18 studies were in progress. Out of these, 10 were charged to the development budget of the centre, while the remaining studies were desk studies. The estimated revised cost of these studies stand at Rs. 2,198,750/- of which an amount of Rs.1,250,839 has been spent upto 30-6-1980 leaving a balance of Rs. 947,811/- as throw-forward to the remaining period of Phase-I. The summary of the estimated cost (original as well as revised) of the studies chargeable to ADP, expenditure incurred by 30-6-1980 and the amount of the funds needed to complete these studies may be seen at Annexure-IV.

A brief description of various on-going studies charged to the development budget of the centre is as follows:-

i) Origin-Destination Survey:- The study was approved at a cost of Rs. 900,000. However, the cost of the survey is expected to increase from Rs. 900,000/- to Rs. 1,124,000/- due to increased expenditure on field operation. Originally, it was envisaged that survey will cover 78 points all over the country in three rounds in one year i.e. a total of 234 points. However, the actual experience showed that not more than 150 points could be covered in one year. Accordingly, it was decided to cover 106 points twice i.e. a total of 212 points and would take approximately 16 months. Besides, cost of POL and pay and allowances of staff have also increased in the meanwhile.

As of 30-6-1980, an amount of Rs. 703,937/- has been spent. The estimated expenditure during 1980-81 amount to Rs.320,000/-. The balance of Rs. 100,000/- would be provided in the budget estimates for 1981-82.

The detail of original cost Vs revised estimates may be seen at Annexure- V.

(ii) Data Bank:- The scheme was approved by FA Wing at a estimated cost of Rs. 323,000/-. The revised cost of the scheme stands at Rs. 371,000/-. The increase in cost is less than 15%. The increase in cost is primarily due to the fact that the data collection now underway shall be further improved and expanded to provide for maximum possible statistical data support for preparation of Sixth Five Year Plan. The data collected shall be fully computerized for ready retrieval. A yearly "Transport Bulletin" shall also be published to provide upto-date information to the interested individuals and agencies.

An amount of Rs. 166,200/- has been expended as of 30-6-1980. The revised estimates for 1980-81 include Rs. 77,000/- for the scheme. The remaining amount shall be spread over 1981-82 (Rs. 88,000/-) and 1982-83 (Rs. 40,000/-). The scheme would be completed by June, 1983. The detail of the cost estimates may be seen at Annexure-VI.

(iii) Dissemination of Knowledge:- Unfortunately, no systematic and reliable source exist in the country to keep the various professional and technical personnels abreat of the developments, taking place in the field of transport. In majority of the cases, the individuals are to rely on their personal efforts to obtain such information at their own cost. To bridge this gap, during 1978-79 the Centre had prepared a scheme for dissemination of technical knowledge at an estimated cost of Rs. 228,000/-. The scheme involved re-printing of 23 studies carried out by the Centre by that time. However, M.O.Finance sanctioned a lump-sum of Rs.150,000.

In the meantime the Centre has carried out 38 additional studies. Another two dozen studies are likely to be completed by 30-6-1983. Beside, in view of high demand, reprints of some of the studies previously printed would be prepared. The revised cost of the scheme is estimated at Rs.350,000 and is provided as a lump-sum provision. The amount include pay of two Stenographers for 24 months, purchase of two electric typewriters, pay of one D.M.O. for 24 months, stationery (Rs. 140,000/-), printing of title covers (Rs. 30,000/-), mailing charges (Rs. 15,000/-) and contingencies(Rs. 16,000).

The Centre has already compiled a mailing list of all the relevent agencies and technical and professional personnel working in various transport related agencies. The research studies of the Centre are regularly distributed among the relevent individuals and organizations.

(iv) Traffic Factors for Pakistan:- The study was originally estimated to cost Rs. 55,000/-, the revised cost is estimated at Rs. 88,250/-. The increase is due to enhanced data base of the study by making use of the data becoming available from O-D Survey. So far Rs. 44,000/- have been incurred. The balance of Rs. 44,250/- will be needed for computer processing of data, pay of one Investigator and stationery etc. to complete the study by September, 1981. Details are at Annex.VII.

(v) Fuel Consumption Study:- Against approved cost of Rs. 62,680/- an amount of Rs. 67,371/- have been incurred on import of instruments and preliminary experiments. The progress was hampered due to abolition of the post of Planning Officer who was the Co-ordinator of the study. The study shall be completed at a revised cost of Rs. 84,000/- by June, 1981. The detail of original cost Vs revised estimates may be seen at Annexure-VIII.The increase is primarily due to very high cost of acquisition of the instrument. As against Rs. 200,000/- provided for this purpose, the actual cost of the instrument was Rs. 29,000/-.

(vi) Travel Speed Survey:- The work has nearly been completed. The final report is being written. Against the original cost of Rs. 60,000/- the completion cost of the study will be Rs.68,900/-. The increase is less than 15% of the originally sanctioned amount. The increase in cost was due to enhanced cost of actual data collection and analysis. The study shall be completed by June,1981.

(vii) Effectiveness of Traffic Police Training:- The study shall be completed at original cost of Rs. 25,000/-. An amount of Rs. 6,250/- is provided during 1980-81 as final payment.

(viii) Energy Use in Transport Systems: The study shall be completed at original cost. The budget provision of Rs. 7,100/- during 1980-81 is for the payment of final instalment.

(ix) Utilization of Technical Manpower:- The study shall be completed by February, 1981 at an estimated cost of Rs. 45,000/-. The original sanctioned cost of the study was Rs. 40,000/- The increase in cost is therefore less than 15% and within permissible limits.

(x) L.P.G. Study:- The study was approved at a cost of Rs. 11,133/-. The revised cost of the study is estimated at Rs. 12,500/-. The escalation is within 15% of the original cost. The study shall be completed by June, 1981.

(c) New Studies:- Over next two and half years, the Centre intends to initiate 15 additional studies at an estimated cost of Rs. 4.1 million. Every effort shall be made to complete these studies by 30-6-1983. However, continuation of some of the studies beyond 30-6-1983 is unavoidable.The list of the new studies given below and the detail of their cost estimates may be seen at Annexures IX to XXII.

List of New Studies

S. No.	Name of Study	Estimated Cost
1.	Transport Demand for Major Commodities	300,000
2.	Highway Needs Study	100,000
3.	Transport Alternatives for Sixth Plan	100,000
4.	Air Traffic Forecast for Sixth Five Year Plan	50,000
5.	Port Traffic Forecast for Sixth Five Year Plan	50,000
6.	Inland Traffic Forecast for Sixth Five Year Plan	50,000
7.	Intermodal Choice Motivation	500,000
8.	Survival Rate of Motor Vehicles	200,000
9.	Economics of Truck Sizes	500,000
10.	Public Service Vehicle Survey	250,000
11.	Axle Load Survey	250,000
12.	O-D Survey for Rail Traffic	200,000
13.	Road Vehicle Operating Costs	300,000
14.	Road Safety Studies	500,000
15.	Lump-sum provision for new studies	700,000
		4,050,000

(Notes:- (i) Studies at S.Nos. 1 to 6 would be given priority.
(ii) Study at S.No. 9 would be taken up if resources permit after providing for the Sixth Plan -oriented studies).

(d) Foreign Technical Assistance:- So far, the services of a shipping expert from Netherlands has been acquired for a period of three years i.e. July, 1976 to July, 1979. He undertook the following studies:-

(i) Pakistan Maritime Transport Study.
(ii) Containerization in Pakistan.
(iii) National Port Policy.
(iv) Ro-Ro-Ferry Service to Gulf.

The services of another expert from U.K. Professor B.T. Bayliss were also acquired for a short period of two months under U.K. Technical Assistance Programme to advise the Planning Commission regarding the future organizational set up of the Centre.

Although the Centre has achieved considerable maturity in terms of handling transport research, the foreign technical assistance would, however, be needed in areas where in-house/indigenous expertise is not available. The foreign assistance would, however, be welcome in collaborative research and providing help with regard to securing in equipments, instruments for data collection, analysis, storage and retrieval and meeting the needs of the Centre in respect of Foreign Exchange.

A sum of Rs. 4.5 million is provided in foreign exchange to meet the requirements of the Centre with regard to instruments needed for carrying out research studies (weigh bridges for axle load studies, radars for Travel Speed Studies, etc.), installation of a mini-computer/ terminal at the Centre, production and re-production equipment, transport, audio-visual equipment, staff training and acquiring technical a literature besides other miscellaneous requirements. Efforts shall be made to take advantage of U.N. Programme such as "Transfer of Know-how through Expatriate Nationals" and recently established

$ 250 million "U.N. Interim Fund for Science and Technology for Development" (UNIFSTD) and technical assistance provided by other international agencies.

(e) Administrative Expenditure:- The existing office premises of the Centre is very small and cannot provide office space required for staff hired for carrying out the studies. Over next two years, the pace of research is expected to accellerate considerably. As a consequent, lot more additional staff would be engaged which would necessitate hiring of extra office space. An amount of Rs.600,000 is provided to meet the expenditure on account of additional office accommodation, telephone, office equipment, furniture,etc. The details of the administrative expenditure may be seen at Annexure-XXIII.

(f) Demonstration Projects:- Strenuous efforts shall be made to practically demonstrate the benefits of research being undertaking in the Centre as well as in the country in the field of transport through low cost remedial measures. This would make the research effort as "Problem oriented" and would increase the creditability of research findings.These projects would be undertaking either directly by the Centre or in collaboration with other international or national Research and Development institutions.An amount of Rs. 200,000/- has been provided for this purpose.

(g) Seminars:- So far, it has not been possible to organize seminars/symposiums by the Centre. However, in view of the tempo and quantum of research undertaken during last 2 years and the future programme, it is felt that holding of seminars to discuss the transport problems in general and the work being done by the

Centre would be very desirable. It would help the Centre in securing the views of other experts with regard to its research programme and give it a problem oriented outlook. Accordingly, a sum of Rs. 100,000/- is proposed to organize national and international seminars in the Centre.

The summary of the programme may be seen below:-

(a)	Expenditure incurred upto 30-6-1980.	... Rs. 3,206,670
(b)	Throw forward on account of on-going studies.	... Rs. 947,811
(c)	New studies	... Rs. 4,050,000
(d)	Foreign Technical Assistance	... Rs. 4,500,000
(e)	Administrative Expenditure	... Rs. 600,000
(f)	Demonstration Projects	... Rs. 200,000
(g)	Seminar	... Rs. 100,000
	GRAND TOTAL:	... Rs.13,604,481
	S A Y:	... Rs.13,600,000

Consultancy:- Phase-I of the project envisaged providing consultancy services to other agencies but due to shortage of staff and number of other reasons, it has not been possible to do the needul apart from limited involvement of Mr. M. Sadiq Swati, Chief (NTRC) as Adviser Highway Safety to the Ministry of Communications and other agencies in a substantial manner. Concerted efforts

shall be made to seek consultancy work on behalf of various national and international agencies for research in various aspects of transport.

Accountability:- To keep close watch on the performance of the Centre, a Review Committee was constituted in 1977. The Committee has the following composition:-

Additional Secretary	... Chairman
Senior Chief (T&C)	... Member
Joint Chief Economist-II	... Member
Chief, Economic Research	... Member
Chief, NTRC	... Member/Secretary

The Committee has been meeting regularly on quarterly basis. With the enhanced scope of research in the Centre, it is proposed to enlarge the Committee to include the Heads of Research and Development Cells in various transport organizations as members. This shall have two advantages:-

(i) It would ensure avoidance of any duplication of research efforts.

(ii) The other Research and Development Cells could also be asked to report their progress to the Committee.

The following composition of the Committee is proposed:-

Additional Secretary	- Chairman
Senior Chief (T&C)	- Member
Chief, E.R. Section	- Member
J.S. (T),M/o Communications	- Member
Rep. of Railways	- Member
Rep. of Ports	- Member
Rep. of Shipping	- Member
Rep. of Civil Aviation	- Member

Heads of Provl.Road Research Laboratory	- Member
Chief, N.T.R.C.	- Member/ Secretary

Phasing:-

The phasing shown below indicate actual expenditure incurred during 1974-78, the revised estimates for 1980-81 and likely budget allocation for 1981-83:

Year	Total Expenditure	F.E.C.
1974-75	569,500 Actuals	-
1975-76	236,500 "	-
1976-77	439,100 "	-
1977-78	619,000 "	-
1978-79	560,000 "	-
1979-80	682,000 "	-
1980-81	846,000 (R.E.)	-
1981-82	4,780,000 (B.E.)	2,500,000
1982-83	4,868,000 (B.E.)	2,000,000
Total :	13,600,000	4,500,000

11. REQUIREMENTS OF MATERIALS,ETC:

(a) Plant and Machinery:	Mathematical instruments, drawing equipment, computer terminal and other specialized equipment would be procured for the studies.
(b) Structural and Constructional Materials:	N i l.
(c) P o w e r :	N i l.

ANNEXURE-I

STAFF POSITION OF
NATIONAL TRANSPORT RESEARCH CENTRE

S.No	Post	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
1.	Chief	-	-	1	1	1	1	1
2.	Deputy Chief	3	3	3	3	3	2	2
3.	Assistant Chief	-	1	1	1	1	1	1
4.	Planning Officer	1	2	1	1	1	-	-
5.	Research Officer	-	-	1	1	1	1	1
6.	Superintendent	-	1	1	1	1	1	1
7.	Assistants	2	3	3	1	1	1	1
8.	Stenographer	2	3	3	3	3	3	3
9.	Stenotypist	1	3	3	2	2	2	2
10.	U.D.C	-	1	1	1	1	1	1
11.	Draftsman	-	1	1	1	1	1	1
12.	L.D.C	-	1	1	1	1	1	1
13.	D.M.O	-	1	1	-	-	-	-
14.	Driver	-	1	1	1	1	1	1
15.	Peon	3	7	7	7	7	7	7
	TOTAL	12	28	29	25	25	23	23

(ANNEXURE-II)

NATIONAL TRANSPORT RESEARCH CENTRE

LIST OF RESEARCH STUDIES

SL. NO.	T I T L E	AUTHOR/ CO-ORDINATOR	D A T E
1	2	3	4

I. COMPLETED STUDIES

1974-75

1.	Economics of Electrification- Comparative Cost of Diesel and Electric Traction on Khanewal-Samasatta section of Pakistan Railways.	Mr. Abdul Majeed, Deputy Chief.	February,1975
2.	Inland Water Transport.	NESPAK Ltd.	May, 1975

1975-76

3.	Highway Improvement Priority Criteria.	Mr.M.Sadiq Swati, Deputy Chief	January,1976
4.	Pilot Origin & Destination Survey.	Mr.Abdul Majeed, Deputy Chief.	January,1976
5.	Inland Traffic Forecast 1980-81.	Mr.Abdul Majeed, Deputy Chief.	January,1976.
6.	Cargo Port Traffic Forecast for Pakistan (1974-75 to 1989-90)	i)Dr. Ghulam Rasul, Joint Chief Economist. and ii)Mr.Abdul Majeed Deputy Chief.	February,1976
7.	Organization of NTRC — Interim Report.	Prof. B.T. Bayliss Consultant, NTRC.	April, 1976.

1976-77

8.	Effects of Highway Design Elements on the Capacity of two-lane Roads.	Malik Muhammad Saeed Khan, Deputy Chief.	August,1976.
9.	Farm-to-Market Roads Survey.	i)Transport Consultants & Surveyors. ii)Ascon & Bolan Ltd. iii)Sharp International Ltd. iv) Republic Engineering Ltd.	

SL. NO.	TITLE	AUTHOR/ CO-ORDINATOR	DATE
1	2	3	4
10.	Pakistan Maritime Transport Study.	Dr. R.D.Osmers, Adviser Shipping.	January, 1977.
11.	Lowari Ropeway Study	Mr.Burnhard Burgi, Swiss Consultant.	February,1977.
	1977-78.		
12.	A note on petrol versus Diesel Transport-An assessment of a policy Option.	Mr. Abdul Majeed, Deputy Chief.	August, 1977.
13.	Re-Organization of administrative control of transport.	Mr. M.Sadiq Swati, Chief.	October,1977.
14.	Change of Passenger Class structure of Pakistan Railways-effect on revenues.	Mr. Abdul Majeed, Deputy Chief.	November,1977.
15.	Containerization in Pakistan-Interim Report.	Dr.R.D. Osmers, Adviser Shipping.	November,1977.
16.	Economics of Pipeline Versus Rail.	Mr.Abdul Majeed, Deputy Chief.	December,1977
17.	Pakistan Highway Code.	Mr.M.Sadiq Swati, Chief.	December,1977.
18.	Re-Organization of Traffic Police.	Mr.M.Sadiq Swati, Chief.	January,1978
19.	Draft Motor Vehicle Ordinance, 1978.	Mr. M.Sadiq Swati, Chief.	January,1978.
20.	Traffic Survey of Islamabad Highway (Dual Carriageway)	Mr. Abdul Majeed, Deputy Chief.	June, 1978.
	1978-79		
21.	Organization of N.T.R.C. Final Report.	Prof.B.T. Baylis, Consultnat,N.T.R.C.	July, 1978.
22.	Effect of increase in Bus fares on common man's budget.	Mr.Abdul Majeed, Deputy Chief.	July, 1978.
23.	Highway Operating Speeds of Government & Private Bus Drivers.	Mr. Abdul Majeed Deputy Chief.	August,1978.
24.	Transport requirements-shortage of Buses.	Mr. Abdul Majeed, Deputy Chief.	October,1978.

SL. NO.	T I T L E	AUTHOR/ CO-ORDINATOR	D A T E
1	2	3	4
25.	Modern Transportation	i)Mr.M.Sadiq Swati, Chief. ii)Mr.M.Kazim Idris, Assistant Chief.	December,1978
26.	Survey of Bus services for Islamabad Secretariat.	Mr.Abdul Majeed, Deputy Chief.	December,1978.
27.	Accident Study for Punjab.	i)Mr.M.Sadiq Swati, Chief. & ii)Mr.M.Kazim Idris, Assistant Chief.	December,1978
28.	Containerization in Pakistan-Final Report.	Dr. R.D. Osmers, Adviser Shipping.	January,1979.
29.	Feasibility Study for the Operation of a passenger/ro-ro ferry service to the Gulf by P.N.S.C.	Dr. R.D. Osmers, Adviser Shipping.	March, 1979.
30.	Transport Data Collection, Storage & Retrieval System.	Mr.M.Asaf Khan, Deputy Chief.	March, 1979.
31.	Highway Transportation Studies & Surveys.	Mr.M.Aslam Farouk, Deputy Chief.	April, 1979.
32.	National Port Policy.	Dr. R.D. Osmers, Adviser Shipping.	May, 1979.
33.	Bus Passenger Loads and Mileage- A survey of inter-city bus operations.	Mr. Abdul Majeed, Deputy Chief.	May, 1979.
34.	Revised Draft of Motor Vehicle Ordinance,1979.	Mr. M.Sadiq Swati, Chief.	May, 1979.
1979-80			
35.	Canal Roads for public use(Feasibility Study)	i) Mr.M. Sadiq Swati, Chief. ii) Mr.M.Aslam Farouk, Deputy Chief.	July, 1979
36.	Choice of Mode for Journey to Work(For Government Employees).	Mr. Abdul Majeed, Deputy Chief.	August,1979.
37.	Traffic Enforcement Plan for Rawalpindi.	Mr.M.Sadiq Swati, Chief	December1979

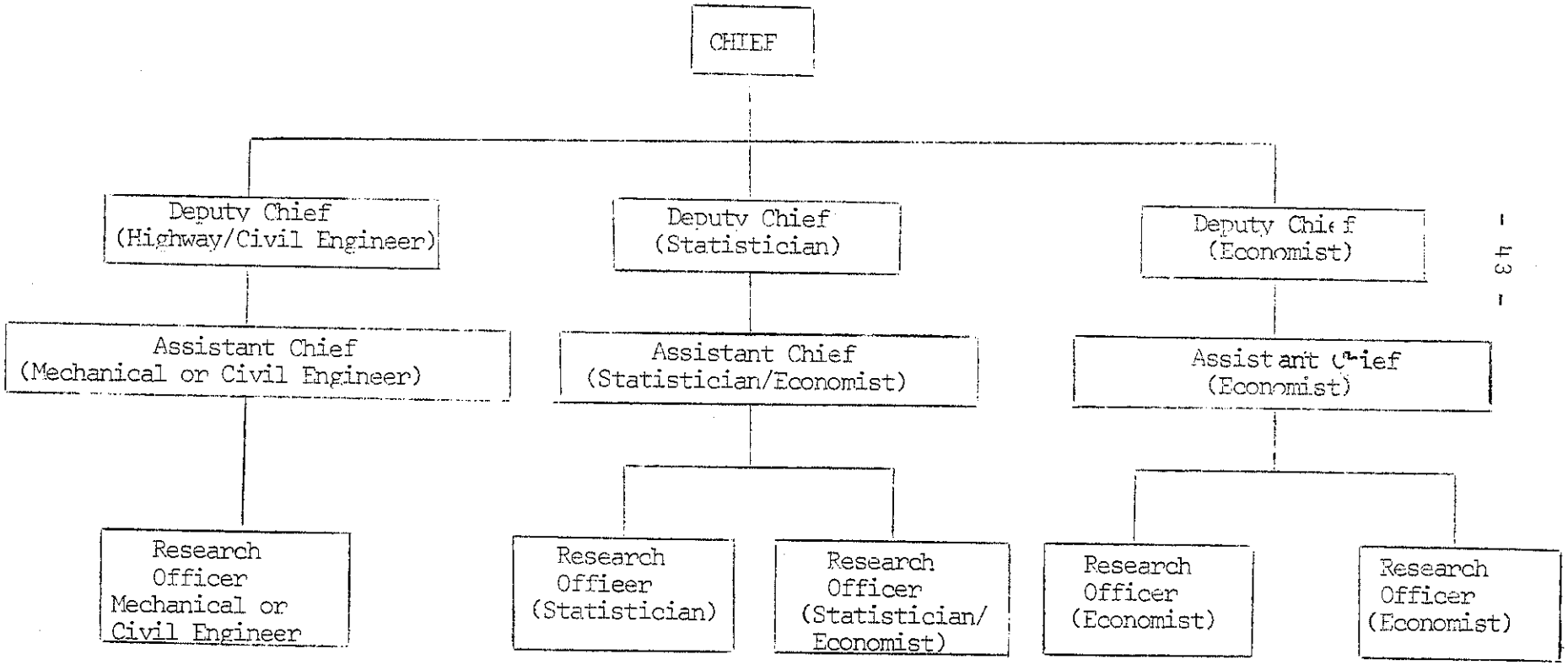
SL. No	TITLE	AUTHOR/ CO-ORDINATOR	DATE
1.	2.	3.	4.
38.	Psychological Attitudes towards Highway Safety.	i)Mr.M.Sadiq Swati, Chief. & ii)Prof. Mumtaz Daniel, Consultant.	January,1980
39.	Bus Make Study	Mr.M.Aslam Farouk, Deputy Chief.	March, 1980.
40.	Abstract of Research/ Desk Studies of National Transport Research Centre.	Mr. M. Kazim Idris, Assistant Chief.	March, 1980.
41.	Computerized Reservation of PIAC-A Re-appraisal of the project.	Mr. Abdul Majeed, Deputy Chief.	June, 1980
1980-81			
42.	Role of Transport in Development.	M. A. Farouk, Deputy Chief.	July, 1980
43.	Effectiveness of Traffic Police Training.	i) Mr. M. Sadiq Swati, Chief & ii) Mr. Syed Muhammad, Consultant.	August, 1980
44.	Review of Port Traffic Forecasts with particular reference to fertilizer imports.	Mr. Abdul Majeed, Deputy Chief.	Aug. 1980
45.	Energy Use in Transport System.	Dr. M. Abdullah, Chairman, Deptt: of Electrical Engg. Peshawar.	October,1980
46.	Road Safety Ordinance-1980.	Mr. M. Sadiq Swati, Chief.	October,1980.
47.	Real problem of Highway Safety in Pakistan.	Mr. M. Sadiq Swati, Chief.	November,1980.
48.	Transport Bulletin	Dr. M. Qasim Rind, Assistant Chief.	November,1980
49.	Manual of Uniform Traffic Control Devices.	i) Mr. M. Sadiq Swati, Chief & ii) National Highway Board.	November,1980.
50.	Travel Speed Study.	Mr. Abdul Majeed, Deputy Chief.	November, 1980

SL NO.	T I T L E	AUTHOR/ CO-ORDINATOR	D A T E
1.	2.	3.	4.
51.	Low Cost Roads.	Mr. M. A. Farouk, Deputy Chief.	November, 1980.

II. STUDIES IN PROGRESS

52.	Accident Black Spots on National Highways.	i)Mr.M.Sadiq Swati, Chief. & National Highway Board.	
53.	Liquified Petroleum Gas Study.	Mr. M.A. Farouk, Deputy Chief.	
54.	Fuel Consumption Study.	Mr. Abdul Majeed, Deputy Chief.	
55.	Traffic Factors for Pakistan.	i)Mr.M.A.Farouk, Deputy Chief ii)Mr.M.Kazim Idris, Assistant Chief.	
56.	Data Bank	Deputy Chief(Stat)	
57.	Highway Origin-Destination Survey.	Mr. Abdul Majeed, Deputy Chief.	
58.	Utilization of Technical Manpower in P.W.Ds.	i)Mr. M.A. Farouk, Deputy Chief.	
59.	Effect of Enforcement on Road User's Behaviour.	i)Mr. M.Sadiq Swati, Chief. & ii)Mr. Syed Muhammad, Consultant.	

NTRC SET-UP RECOMMENDED BY PROF.B.T. BAYLISS



(Annexure-IV)

THROW FORWARD OF ONGOING STUDIES

S.No.	Name of Study	Estimated Cost		Exp. upto 30.6.80.	Balance	REMARKS
		Original	Revised			
1.	2.	3.	4	5.	6.	
1.	Fuel Consumption Study	62,600	84,000	59,048	24,952	Detail of Original Vs Revised cost at Annex.VIII.
2.	Highway Travel Speed Study	60,000	68,900	67,371	1,529	Escalation less than 15%
3.	Utilization of Technical Manpower	40,000	45,000	30,000	15,000	Excalation less than 15%
4.	Energy Use in Transport System	30,000	30,000	22,900	7,100	To be completed at original cost.
5.	Effectiveness of Traffic Police Training	25,000	25,000	18,750	6,250	- do -
6.	Origin Destination Survey	900,000	1124,000	703,937	420,063	Detail of Original Vs Revised Cost at Annex.V.
7.	Printing of NTRC Studies	150,000	350,000	127,500	222,500	Lump Sum provision.
8.	Data Bank.	323,200	371,000	166,200	204,800	Excalation less than 15%
9.	Traffic Factors for Pakistan	55,000	88,250	44,000	44,250	Detail of Original vs revised cost at Annex.VII.
10.	Economics of LPG as Transport Fuel.	11,133	12,500	11,133	1,367	Escalation less than 15%
	T o t a l:	1,656,933	2198,750	1,250,839	947,811	

ANNEXURE-V

ORIGIN DESTINATION SURVEY

(Original Vs Revised Cost)

(Rs.)

S.No.	I t e m	Amount Proposed	Approved	Revised Estimates
1.	Office Staff - Data Control	244,300	120,000	190,000
2.	Field Work	526,100	450,000	380,000
3.	Forms & Stationery	38,000	30,000	60,000
4.	Data Processing - Computer Time, Stationery etc.	115,000	85,000	100,000
5.	Survey Equipment	21,130	21,000	60,000
6.	Purchase of Vehicle	215,000	194,000	177,696
7.	Maintenance of Vehicle			156,304
		11,59,530	900,000	1124,000

ANNEXURE-VI

DATA BANK

(Original Vs Revised Cost)

(Rs.)

Sl. No.	I t e m	Original Estimates	Revised Estimates
1.	Salary of Staff	55,500	157,000
2.	TA/DA	23,000	90,000
3.	Furniture	15,000	27,000
4.	Typewriters	15,000	18,000
5.	Printing	5,000	14,000
6.	Conveyance	4,000	10,000
7.	Computer Service	200,000	40,000
8.	Contingencies 5%	5,500	15,000
		323,000	371,000

ANNEXURE-VII

TRAFFIC FACTORS FOR PAKISTAN
(Original Vs Revised Cost)

(Rs.)

S.No.	Item	Original Estimate	Approved Cost	Revised Cost
1.	Data Collection and Compilation.	16,830	10,000	34,432
2.	TA/DA.	7,156	6,000	11,236
3.	Stationery.	1,000	1,000	9,692
4.	Computerizing.	35,000	26,000	19,500
5.	Reprinting Printing.	15,000	10,000	13,090
6.	Contingencies	3,714	2,000	300
	T o t a l:	78,700	55,000	88,250

FUEL CONSUMPTION STUDY

(Original Vs Revised Cost)

(Rs.)

	Proposed	Approved	Revised Cost
1. Pay and Allowances	20,644	12,000	25,000
2. Vehicle Running Costs	29,540	16,000	20,000
3. Instruments	2,000	27,000	29,000
4. Fire Extinguisher	2,000	1,000	2,000
5. Computer Time	2,000	2,000	2,000
6. Stationery	2,000	-	4,000
7. Contingencies	2,823	500	2,000
	61,007	58,500	84,000

ANNEX- IX.

INTER-MODAL CHOICE MOTIVATION SURVEY - PASSENGER AND GOODS TRAFFIC.

Details of Cost Estimate

			(RS)
1.	DATA COLLECTION COMPILATION & ANALYSIS		
	Economic Investigator(Grade-16) @ Rs. 1062.50 per month for field & Office work(144 man-months).		153,000
	Assistants(Grade-11) & Rs. 770/- per month for field and Office work(144 man-months)		110,880
		Sub Total	263,880
2.	T.A/D.A.		
	A. Study Coordinator		
	Inspection visits to Karachi, Multan D.I. Khan, Quetta, Lahore, Peshawar,etc.		20,000
	B. Staff Members		
	Railway/Bus Fare		10,000
	Daily Allowance		30,000
	Hotel Charges		60,000
	Taxi Charges		10,000
		Sub Total(2-B)	110,000
		Sub Total(2)	130,000
3.	COMPUTERIZATION		40,000
4.	STATIONERY		15,000
5.	REPORT PREPARATION		
	1 Stenographer(Grade-11) @ Rs. 770/- per month for (12 man-months)		9,240
6.	REPORT PRINTING & BINDING		
	500 copies		18,000
		Total (1-6)	476,120
	CONTINGENCIES @ 5 %		23,806
		Grand Total	499,926
		Say Rs.	500,000

ANNEX - X.

SURVIVAL RATE OF MOTOR VEHICLES IN PAKISTAN

Details of Cost Estimate

			(RS)
1.	PAY AND ALLOWANCES OF STAFF		
	Economic Investigators(Grade-16) @ Rs. 1062.50 per month (44 man-months)		46,750
	Stenographer (Grade-11) @ Rs. 770/- per month (12 man-months)		9,240
		Sub Total(1)	55,990
2.	T.A/D.A.		
	A. Study Coordinator		
	Inspection visits(L.S)		20,000
	B. Staff Members		
	T.A/D.A. and Hotel Charges for (24 man-months)		65,000
		Sub Total (2)	85,000
3.	COMPUTERIZATION		27,000
4.	STATIONERY		10,000
5.	REPORT PRINTING AND BINDING		
	500 copies		12,500
		Sub Total(1-5)	190,490
	CONTINGENCIES @ 5 %		9,525
		Grand Total:	200,015
		Say Rs.	200,000

ANNEXURE-XI.

ECONOMICS OF TRUCK SIZES

DETAILS OF COST ESTIMATES

		(Rs)
1.	MOBILIZATION	
	6 Man-months(Grade-16) @ Rs. 1062.50/- p.m.	6,375
2.	DATA COLLECTION(SECONDARY SOURCES).	
	12 man-months (Grade-16)	12,750
	T.A/D.A and Hotel Charges.	
	Sub Total (2)	37,750
3.	FIELD SURVEYS	
	A. Survey of Road & Bridge Structures	
	12 man-months(Grade-16 @ Rs. 1062.50 per month.	12,750
	T.A/D.A and Hotel Charges.	35,000
	Sub Total(3-A)	47,750
	B. Market Survey	
	12 man-months(Grade-16) @ Rs. 1062.50 p.m.	12,750
	24 man-months(Grade-16) @ Rs. 770/-p.m.	8,480
	T.A/D.A and Hotel Charges.	85,000
	Sub Total(3-B)	116,230
	Total (3)	163,980
4.	FIELD TESTS	
	Testing of trucks and vehicles through Road Research Laboratory, Lahore and Automobile Corporation(LS) including fees for professional services of Highway & Automobile Engineers.	75,000
5.	DATA PROCESSING AND ANALYSIS	
	Editing, Coding, Listing of Survey Schedules, 12 man-months(Grade-16) @ Rs. 1062.50 p.m. each.	12,750
	Computer Time for programme development and data processing including computer stationery.	75,000
	Analysis of data 3 man-months @ Rs. 2500/- per month.	7,500
	Sub Total (5)	95,250

(ANNEX.-XI CONTD.)

6. OFFICE STAFF

	(Rs)
1 Stenotypist for 12 months @ Rs. 680 p.m.	8,160
1 Clerk for 12 months @ Rs. 560 p.m.	6,720
1 Naib Qasid for 12 months @ Rs. 505 p.m.	6,060
	20,940

7. OFFICE MACHINES, STATIONERY AND EQUIPMENT AND OTHER EXPENSES.

(a) Office Machine(Typewriters and calculators) Stationery and Equipment (LS).	20,000
(b) Furniture for Office staff(LS)	10,000
(c) Telephone expenses (LS)	10,000
(d) P.O.L for office vehicle(LS)	10,000
(e) Other miscellaneous office expenses	10,000
(f) Printing, binding and other expenses	10,000
(g) Honoraria for office staff	10,000
	80,000
Total (1-7)	479,295
CONTINGENCIES @ 5 %	23,965
Grand Total	503,260
Say Rs.	500,000

ANNEXURE-XII

PUBLIC SERVICE VEHICLES SURVEY
(Cost Estimates)

1. Office Staff	
Economic Invest. (G-16) 8 man months @ Rs. 1075/- P.M.	Rs. 8,600
Stat. Asstt. (G-11) 24 man months @ Rs. 770/- P.M.	Rs. 18,400
	Rs. 27,000
2. Data Collection - Field Work	
Economic Invest. (G-16) 12 man months @ Rs. 1075/- P.M.	Rs. 12,900
Stat. Asstt. (G-11) 48 man months @ Rs. 770/- P.M.	Rs. 36,960
	Rs. 49,860
3. Travel Expenses.	
TA/DA @ Rs. 20.00 to Rs. 25.00 per day for 120 days x 12 persons.	Rs. 32,400
Hotel Expenses (3 times DA) @ Rs. 60.00 to Rs. 75.00 for 120 days x 12 persons.	Rs. 90,000
	Rs. 122,400
4. Data Processing Computer Time, Stationery, etc.	Rs. 30,000
5. Stationery and Printing	Rs. 10,000
6. Contingencies.	Rs. 10,740
T o t a l :	Rs. 250,000

ANNEX - XIII.

AXLE LOAD SURVEY

Details of Cost Estimates

		(RS)
1.	DATA COLLECTION AND COMPILATION:	
	Economic Investigators(Grade-16) @ Rs. 1062.50 p.m. for 36 man-months	38,250
	Assistant (Grade-11) @ Rs. 770/- p.m. (12 man-months)	9,240
	Helpers(Grade-5) @ Rs. 560/-p.m.(36 man-months)	40,320
	Sub Total (1)	87,810
2.	TRAVEL EXPENSES:	
	A. Field visits by the Study Coordinator:	10,000
	B. S t a f f:	
	(i) Daily Allowance:	
	@ Rs. 25/- per day for 200 man-days	5,000
	@ Rs. 20/- per day for 300 man-days	6,000
	@ Rs. 15/- per day for 200 man-days	3,000
	@ Rs. 12/- per day for 300 man-days	3,600
	(ii) Hotel Charges:	
	@ Rs. 75/- per day for 200 man-days	15,000
	@ Rs. 30/- per day for 300 man-days	9,000
	@ Rs. 45/- per day for 200 man-days	9,000
	@ Rs. 18/- per day for 300 man-days	5,400
	Sub Total(2)	17,000
3.	TRANSPORT	
	Office vehicle(Ford Wagon) for field work - P.O.L., repairs, etc.	15,000
4.	FIELD TESTS:	
	Equipment/instruments for testing axle loads,etc.	15,000
5.	COMPUTERIZATION:	20,000
6.	STATIONERY:	10,000
7.	REPORT PREPARATION:	
	Stenographer @ Rs. 770/- p.m. for 12 man-months	9,240

		(Rs.)
8.	REPORT PRINTING AND BINDING:	
	500 copies at Rs. 30/- per copy	15,000
	Total(1-8)	237,730
9.	CONTINGENCIES @ 5 %	11,886
	Grand Total:	249,616
	SAY RS.	250,000

*These estimates have been based on the assumption that office transport shall be available for carrying out the field survey.

ANNEX - XIV.

O-D SURVEY FOR RAIL TRAFFIC

Details of Cost Estimates

		(Rs.)
1.	DATA COLLECTION AND COMPILATION:	
	Economic Investigators @ Rs. 1,062.50 per month for 24 man-months.	25,500
	Assistants @ Rs. 770/- p.m. for 12 man-months	9,240
	Sub-Total(1)	34,740
2.	TRAVEL EXPENSES:	
	A. Study Coordinator.	5,000
	B. S t a f f	
	(i) Bus/Rail Fare	3,000
	(ii) Daily Allowance	
	@ Rs. 25/- per day for 300 man-days	7,500
	@ Rs. 20/- per day for 300 man-days	6,000
	(iii) Hotel Charges:	
	@ Rs. 75/- per day for 300 man-days	22,500
	@ Rs. 30/- per day for 300 man-days	9,000
	(iv) Taxi Charges:	5,000
	Sub Total(2)	53,500
3.	COMPUTERIZATION:	50,000
4.	STATIONERY:	20,000
5.	REPORT PREPARATION:	
	Stenographer @ Rs. 770/- p.m. for 12 man-months	9,240
6.	REPORT PRINTING AND BINDING:	
	500 copies at Rs. 50/- per copy	25,000
	Total(1-6)	191,990
7.	CONTINGENCIES @ 5%	9,699
	Grand Total:	201,679
	Say Rs.	200,000

ANNEXURE: XV.

TRANSPORT DEMAND FOR MAJOR COMMODITIES
DETAILS OF COST ESTIMATES

		(Rs)
1.	DATA COLLECTION AND COMPILATION:	
	Economic Investigator (Grade 16) @ Rs.1062.50 per month (96 man-months)	102,000
	Assistant (Grade-11) @ Rs.770/- per month (24 man-months)	18,480
	Sub-Total(1))	120,480
2.	TRAVEL EXPENSES:	
	A. Study Coordinator (L.S)	25,000
	B. Staff	
	i) Rail/Bus Fare	10,000
	ii) Daily Allowance	
	@ Rs.25/- per day for 240 man-days	6,000
	@ Rs.20/- per day for 300 man-days	6,000
	iii) Hotel Charges:	
	@ Rs. 75/- per day for 240 man-days	18,000
	@ Rs. 30/- per day for 300 man-days	9,000
	iv) Taxi Charges:	500
	Sub-Total (2)	74,500
3.	COMPUTERIZATION:	40,000
4.	REPORT PREPARATION	
	Stenographer @ Rs.770/- per month (24 man-months)	18,480
5.	STATIONERY	20,000
6.	REPORT PRINTING AND BINDING:	
	500 copies @ Rs.25/- per copy	12,500
	Total (1-8)	285,960
7.	CONTINGENCIES @ 5%	14,298
	GRAND TOTAL:	300,258
	OR SAY RS:	300,000

ANNEXURE:XVI.

ROAD VEHICLE OPERATING COSTS
DETAILS OF COST ESTIMATES

		(Rs)
1.	PAY AND ALLOWANCES OF STAFF:	
	Mechanical Engineer (Grade-17) @ Rs.1,730/- per month (48 man-months)	83,040
	Auto Diploma Holder (Grade-16) @ Rs.1062.50 per month (48 man-months)	51,000
	Stenographer (Grade 11) @ Rs. 770/- per month (24 man-months)	18,480
	Sub-Total(1)	152,520
2.	TRAVEL EXPENSES:	
	A. Study Coordinator:	15,000
	B. Staff:	
	i) Daily Allowance:	
	Mechanical Engineer:	
	@ Rs.30/- per day for 90 man-days	2,700
	@ Rs.25/- per day for 90 man-days	2,250
	Auto Diploma Holder:	
	@ Rs. 25/- per day for 90 man-days	2,250
	@ Rs. 20/- per day for 90 man-days	1,800
	ii) Rail/Bus Fare:	10,000
	iii) Taxi Charges:	500
	Sub-Total (2)	55,425
3.	FUEL MEASURING EQUIPMENT & OTHER INSTRUMENTS,ETC	40,000
4.	HIRING OF VEHICLES OF DIFFERENT MAKES AND MODELS	60,000
5.	COMPUTERIZATION	44,000
6.	STATICNERY	
7.	REPORT PRINTING AND BINDING: 500 copies @ Rs.20/- per copy	10,000
	Total(1-7)	331,945
8.	CONTINGENCIES @ 5%	19,097
	GRAND TOTAL:	401,042
	SAY RS:	400,000

ANNEXURE-XVII.

ROAD SAFETY STUDIES
DETAIL OF COST ESTIMATE

		(Rs)
1.	PAY AND ALLOWANCES OF STAFF:	
	Economic Investigator (Grade-16) @ Rs.1062.50 per month (96 man-months)	102,000
	Assistant (Grade-11) @ Rs.770/- per month (24 man-months)	18,480
	Stenographer (Grade-11) @ Rs.770/- per month (24 man-months)	18,480
	Helper (Grade-5) at Rs.560/- for 96 man-months.	53,760
	Sub-Total (1)	192,720
2.	TRAVEL EXPENSES:	
	A. Study Coordinator:	25,000
	B. Staff:	
	i) Rail/Bus Fare:	25,000
	ii) Daily Allowance:	
	@ Rs. 25/- per day for 360 man-days	9,000
	@ Rs. 20/- per day for 360 man-days	7,000
	iii) Hotel Charges:	
	@ Rs. 75/- per day for 360 man-days	27,000
	@ Rs. 30/- per day for 360 man-days	10,000
	iv) Taxi Charges, etc:	6,000
	Sub-Total (2)	109,800
3.	INSTRUMENTS/EQUIPMENT LIKE SPEED CHECKING DEVICES, ETC:	50,000
4.	COMPUTERIZATION:	60,000
5.	STATIONERY:	30,000
6.	PRINTING & BINDING OF REPORT: 6000 copies @ Rs. 35/- per copy	36,000
	TOTAL (1-6)	478,520
7.	CONTINGENCIES @ 5%	23,926
	GRAND TOTAL:	502,446
	SAY RS:	500,000

ANNEXURE-XVIII.

HIGHWAY NEEDS STUDY
DETAILS OF COST ESTIMATE

		(Rs)
1.	STAFF:	
	Economic Investigator (Grade-16) @ Rs. 1062.50 p.m (12 man-months)	12,750
	Assistant(Grade-11) @ Rs. 770/- per month (12 man-months)	9,240
	Sub-Total (1)	31,230
2.	TRAVEL EXPENSES:	
	A. Study Coordinator:	6,000
	B. Staff:	
	i) Daily Allowance	
	@ Rs.25/-per day for 40 man-days	1,000
	@ Rs.20/-per day for 50 man-days	1,000
	ii) Hotel Charges:	
	@ Rs.75/- per day for 40 man-days	3,000
	@ Rs.30/- per day for 50 man-days	1,500
	iii) Rail/Bus Fare:	2,000
	iv) Taxi Charges:	500
	Sub-Total (2)	15,000
3.	STATIONERY:	10,000
4.	COMPUTERIZATION:	15,000
5.	REPORT PRINTING AND BINDING: 1000 copies @ Rs.25/- per copy	25,000
	Total (1-5)	96,230
	CONTINGENCIES @ 5% :	4,812
	GRAND TOTAL:	101,042
	SAY RS:	100,000

ANNEX.- XIX.

TRANSPORT ALTERNATIVES FOR PAKISTAN FOR SIXTH FIVE YEAR PLAN

Details of Cost Estimates

		(Rs.)
1. S T A F F:		
Economic Investigator(Grade-16) @ Rs.1062.50 p.m. (12 man-months)		12,750
Assistant (Grade-11) @ Rs. 770/- per month (12 man-months)		9,240
	Sub-Total(1)	31,230
2. TRAVEL EXPENSES:		
A. Study Coordinator:		6,000
B. S t a f f:		
(i) Daily Allowance		
@ Rs.25/-per day for 40 man-days		1,000
@ Rs.20/-per day for 50 man-days		1,000
(ii) Hotel Charges:		
@ Rs. 75/- per day for 40 man-days		3,000
@ Rs. 30/- per day for 50 man-days		1,500
(iii) Rail/Bus Fare:		2,000
(iv) Taxi Charges:		500
	Sub-Total(2)	15,000
3. DETAILED SET OF COUNTRY MAP:		7,500
4. STATIONERY:		10,000
5. COMPUTERIZATION:		20,000
6. REPORT PRINTING AND BINDING: 1000 copies @ Rs. 25/- per copy		12,500
	Total(1—6)	96,230
7. CONTINGENCIES @ 5%:		4,812
	GRAND TOTAL:	101,042
	SAY Rs.	100,000

ANNEX. XX

A I R TRAFFIC FORECASTS FOR SIXTH FIVE YEAR PLAN

Details of Cost Estimates

		(Rs.)
1. STAFF:		
Economic Investigator @ Rs. 1062.50 per month (12 man-months)		12,750
Stenographer @ Rs. 770/- per month (12 man-months)		9,240
	Sub-Total(1)	21,990
2. TRAVEL EXPENSES:		
(i) Coordinator		5,000
(ii) Staff		5,000
	Sub-Total(2)	10,000
3. STATIONERY:		6,000
4. PRINTING OF REPORT:		10,000
500 copies @ Rs. 20/- per copy.		
	Sub-Total(1-4)	47,990
5. CONTINGENCIES @ 5%:		2,400
	GRAND TOTAL:	50,390
	SAY Rs.	50,000

ANNEX. XXI.

P O R T TRAFFIC FORECASTS FOR SIXTH FIVE YEAR PLAN

Details of Cost Estimates

		(Rs.)
1. STAFF:		
Economic Investigator @ Rs. 1062.50 per month (12 man-months)		12,750
Stenographer @ Rs. 770/- per month (12 man-months)		9,240
	Sub-Total(1)	21,990
2. TRAVEL EXPENSES:		
(i) Coordinator		5,000
(ii) Staff		5,000
	Sub-Total(2)	10,000
3. STATIONERY:		6,000
4. PRINTING OF REPORT:		10,000
500 copies @ Rs. 20/- per copy.		
	Total(1—4)	47,990
5. CONTINGENCIES @ 5%:		2,400
	GRAND TOTAL:	50,390
	SAY Rs.	50,000

ANNEX. XXII.

INLAND TRAFFIC FORECASTS FOR SIXTH FIVE YEAR PLAN

Details of Cost Estimates

	(Rs.)
1. STAFF:	
Economic Investigator @ Rs. 1062.50 per month (12 man-months)	12,750
Stenographer @ Rs. 770/- per month (12 man-months)	9,240
Sub Total(1)	21,990
2. TRAVEL EXPENSES:	
(i) Coordinator	5,000
(ii) Staff	5,000
Sub Total(2)	10,000
3. STATIONERY:	6,000
4. PRINTING OF REPORT:	10,000
500 copies @ Rs. 20/- per copy.	
Total(1—4):	47,990
5. CONTINGENCIES @ 5%:	2,400
GRAND TOTAL:	50,390
SAY Rs.	50,000

ANNEX.X.XIII.

Administrative Expenses for Local Experts

Rent of Office	5000 x 12 x 2	= 120,000
Telephone	2000 x 5 x12 x 2	= 240,000
Furniture (L.S.)		= 50,000
Equipment (L.S.)		= 150,000
Miscellaneous (L.S.)		= 40,000
	Total:	= 600,000