A NATIONAL TRANSPORT SYSTEM FOR NEPAL

Including an Investment Program
for the Third Plan 1965/66-1969/70

(In three volumes)

VOLUME I

PLANNING FRAMEWORK AND PRINCIPAL RECOMMENDATIONS

Report of a Mission
organized by the
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
at the request of
THE GOVERNMENT OF NEPAL

Washington, D.C.
June 1965

CURRENCY EQUIVALENTS

U.S. $1	=	NRs 7.619
NRs 1	=	U.S. $.13125

THE MISSION

John S. Gallagher, Jr.	Chief of Mission and Transportation Economist
Ponnambalam Wignaraja	General Economist
Georg-Magnus von der Goltz	Agricultural Economist
Jean Brechot	Railway Adviser
Jean-L. Frejacques	Highway Adviser
Muzzafer M. ErSelcuk	Aviation Adviser
Miss Maureen H. Page	Mission Secretary

TABLE OF CONTENTS

Volume I.
Planning Framework and Principal Recommendations

Volume II.
Supporting Technical Papers and Discussions

Volume III.
Statistical Appendix

MAPS

PREFACE

This economic survey of transport in Nepal was organized by the World Bank at the request of the Nepal Government. The terms of reference of the Mission are fundamentally to produce a Five-Year Transport Sector Plan for inclusion in, and integrated with, the Government of Nepal's Five-Year Economic Development Plan (called the "Third Plan"). The Chief of the Mission is responsible for the contents of this report.

In approaching this assignment the Mission found it necessary to adopt a procedure somewhat different from that which would normally be expected because there is little by way of an existing transport infrastructure upon which to build. The Mission's task was further complicated by the lack of a clear statement of the national goals for the other key sectors of the economy because Nepal is still in the early stages of planning. A serious shortage of basic and statistical information of all kinds hampers the presentation of a quantitative view of the present situation and of possible future trends.

In gathering data for this report, the Mission had the benefit of major help from the Nepal Government, the assistance of many of the foreign aid agencies working in Nepal, and the work of the previous World Bank Mission. As a result, more information was gathered than was previously thought to exist. Much of it, however, is still in the form of raw data which could not be thoroughly verified within the limitations of the time available. There are still important gaps. Of fundamental importance to the Mission is the lack of information on land use and traffic volumes. Insofar as possible the Mission has used its own personal observations to check the general accuracy of information used. In the many areas where statistical or factual data are scarce or missing altogether, personal and collective judgments of the Mission members have been used.

For the purpose of this report, all available background information and data were gathered, assembled and analyzed. From this a long-term Master Plan for Transport Development was drafted for the purpose of establishing specific objectives and a framework for future planning. A specific plan for the five-year period 1965/66-1969/70 was then abstracted from this Master Plan.

This report is presented in three volumes: I. Planning Framework and Principal Recommendations, II. Supporting Technical Papers and Discussions, and III. Statistical Appendix. The arrangement used was adopted by the Mission to permit systematizing the vast amounts of information collected, and its ready extraction by the Nepal Government in preparing the Third Plan. Although the chapters are numbered consecutively, each chapter represents a stage in the process of reaching a

final plan and each should be treated as a self-contained unit. In other words this report is a compilation of papers building towards a specific plan, as presented in Chapter 3, but not intended to be read as a single flowing document.

Volume I contains three chapters, as follows: 1. Past Performance and the Financial Framework; 2. A Master Plan for Transport Development in Nepal; and 3. The Transport Sector of the Third Plan (1965/66-1969/70).

The work papers which lie behind the conclusions presented in the Transport Plan are in Volume II. A great deal of data collected is presented in tabular form in the Statistical Appendix which appears as Volume III, and for the most part are not repeated in the text.

Chapter 1

PAST PERFORMANCE AND THE FINANCIAL FRAMEWORK

Introduction

1. In a country like Nepal, where there are few long-standing investments in modern transport, the introduction of modern transport facilities in substitution for the traditional means in use for past centuries represents a major technological change. The impact of this change is great and far-reaching. Not only will it reduce the cost of transport for existing production and trade, but it will also affect the growth of national income, the structure and volume of future agricultural and industrial production, and the volume and direction of future internal and external trade. It will also increase administrative efficiency in general. For the first time there has been an opportunity to consider national transportation in Nepal on a coordinated basis.

2. In looking at the existing transport facilities the most significant fact that emerged was that there is no other independent country in the world with such a low density of road mileage or high number of persons per vehicle. Nepal has 10 million people, 5,000 registered motor vehicles and a permanent road mileage of only 284 miles. The following table provides some basis for comparison:

	Population per Vehicle	Mileage of Permanent Road per: Square Kilometer	100,000 Inhabitants
U.S.A.	2.4	1.00	2,021
France	4.7	3.04	1,508
Spain	46.0	0.37	258
Ceylon	69.0	0.38	119
Malaya	46.0	-	110
India	737.0	0.25	82
Nepal (1963)	2,000.0	0.006	3

These figures relate to varying years between 1955 and 1963.

3. The meager road transport facilities in Nepal are supplemented by some few miles of railway and some air transport.

4. Before looking at the transport sector in detail, the Mission undertook to examine the economy as a whole for the purpose of determining the current economic situation; to see whether the economy is growing and, if so, how and where; and to get some feel for the records of past performance. It was also interested in the administrative

capacity of the Government in directing this growth. The public development effort is appraised in this chapter, and the background and current trends in the economy, as evaluated by the Mission, are set out in Chapter 4. This examination indicated that the economy is growing and the performance capacity of the Government is improving. It also revealed that the lack of modern transport is a basic limiting factor in Nepal's economic development. Therefore it is the view of the Mission that transport should continue to receive a high priority in the Government's plans because it is an essential precondition to development in other sectors of the economy.

5. The Mission then proceeded to look at the transport sector with a view to determining how investment in transport could help to expand the economy and alleviate some of the major economic and administrative problems facing Nepal. However, it was recognized that the cumulative benefits of transport improvement on investments, output, employment, and trade, will not occur automatically. It therefore assumed that there will be continued political stability, a sustained and coordinated drive towards development, an increase in the cadre of competent administrators, entrepreneurs, and economic managers; an adequate supply of skilled labor; and a general strengthening of financial institutions and governmental organizations. Without these preconditions, the full benefits of the transport plan cannot be secured.

The Public Development Effort and the Administrative Organization

6. For a country of 10 million people, Nepal is reasonably well endowed with exploitable natural resources (for a detailed discussion see Chapter 4). The main growth potentials lie in the fields of agriculture, forestry, hydroelectric power, and tourism, each of which can provide a significant increment to the national product. With electric power available there will be scope for selective industrial development. Mineral potentials are as yet largely unexplored. The country also has a favorable geopolitical location. Thus, even though Nepal is a landlocked country with a difficult terrain, it has advantages which can be systematically exploited to further improve living standards. The prospects for the development of this potential are enhanced by the existence of a large measure of political stability and a sustained interest in stimulating economic development by its leaders.

7. The present governmental structure in Nepal is very new, having been an effective working body for little more than seven years. As such it is still hampered by the problems of newness and difficulties arising out of continuing elements of the older administrative system from which it emerged. This includes an inability to communicate with all parts of the country, a shortage of trained administrators and technical personnel. In spite of these problems, however, the present Government has achieved a satisfactory record of performance.

8. A start has been made on economic planning. With this Third Plan,the Government is moving from the first faltering steps in learning how to plan towards a proper planning exercise. However, the technical departments and organizations within the Government which must carry out these plans are weak and in need of being strengthened. Because of this, there are many shortcomings in the planning process itself; in project preparation and in the implementation processes which will need to be overcome with time. It is significant that there have been noticeable improvements in the public development effort during the past few years, and the economy is growing in spite of the many difficulties.

9. During the Three-Year Plan period (1962/63-1964/65) just ending there has been a sizeable and progressive increase in public sector investment. As noted elsewhere in this report, the public sector outlays increased nearly four times between the beginning of the first Five-Year Plan in 1956/57 and the end of the Three-Year Plan in 1964/65. The public sector outlay in the Three-Year Plan period doubled between the first and the last years. Nepal is also demonstrating greater ability to live up to plans; that is, there has been increasing actual expenditure as a percentage of planned expenditure. This reflects an increasing awareness by the Government of the country's development problems and that specific steps are being taken to improve the efficiency of the administrative machinery. This recent performance also indicates an improving capacity for negotiating and carrying through foreign-aided projects.

10. Although the Government accounts were first publicized in 1951 it was only in the last five years that formal budgetary procedures were established by the Ministry of Finance. A serious attempt is being made to maintain financial discipline and to strengthen the machinery for collection of taxes and controlling expenditure. Other governmental agencies which have important supplementary roles in development policy, such as the Ministry responsible for Panchayat development work, the Nepal Rastra Bank, and the Nepal Industrial Development Corporation, are being strengthened. New agencies, such as the Nepal Transport Corporation which is to manage the ropeway and railways, are being established to rationalize old functions and are being entrusted to competent persons. With the expansion of foreign education and training opportunities for Nepalese, educated and competent persons are beginning to emerge in increasing numbers, both in and outside the Government. (In 1963/64 a total of 354 Nepalese were sent abroad for training.) A large cadre of foreign technical personnel is assisting Nepal in its development effort, and will be required at higher levels for some time. There is some question, however, as to whether a slightly smaller number better utilized would be more effective.

11. One major problem which will continue to confront the Government is a shortage of skilled Nepalese technicians, primarily those in the middle grades. This will become more apparent with the extension of the

Panchayat program, land reform, transport expansion, and industrial development. Present government standards for establishing wages and promotion may have to be reviewed to give further recognition to technical skill. Some of the training efforts of donor countries assisting Nepal are being lost due to this lack of suitable remuneration. Likewise, Gurkha soldiers who have had extensive technical training and experience find there is no place for them in the local society or economy when they are released from service.

12. A result of this situation is that Nepal is actually exporting some middle-grade technicians to India even though Nepal itself has an acute shortage. Another is that technically trained Gurkha soldiers take up farming when leaving service, partly because they can earn more and live better in that way than by plying their trade. Thus even though there is a reservoir of trained manpower in the country, it is not being tapped effectively.

13. The existence of these problems is being recognized by the Government and some steps are being taken to make better use of available technically trained manpower. A manpower survey, which is currently under way, will help identify the country's needs and supply. Negotiations have already been initiated with the British Government for mobilizing retiring technicians among the Gurkhas. A national educational program and in-service training schemes are also being planned so as to provide some training to fill the gap. However, it will be some time before these new programs can bring results and the first graduates are available. During this necessary interval, the Government must make the fullest possible use of the resources of trained manpower presently available within the country.

14. There are three factors which have helped to supplement the Government's efforts in implementing its development program, resulting in a higher volume of investment than the governmental organization itself could have managed. First, foreign aid agencies have undertaken the implementation of development projects (e.g., roads and airports) and, in some cases, have followed through with maintenance of the works until the Government was ready to take over. In general, the relationship with the outside is characterized by a sense of independence and self-confidence, which is reinforced by the Nepal Government's estimate of the advantage it enjoys by virtue of its geographical position. Secondly, the Government's encouragement to private investment has borne modest results, particularly in the manufacturing sector, and has added to the industrial expansion of the economy. The institutional arrangements for encouraging the private sector and building up a local entrepreneur class are gradually taking shape. Finally, the Panchayat movement which is designed to provide a basis for regional administration and generate a national consciousness is also contributing to releasing the energies of the people and gearing them gradually to a greater

development effort. Significant investments, principally from voluntary contributions, have been organized for such activities as feeder road construction, and school building.

15. Despite this record of performance, it is clear that in order to achieve the increased level of investment envisaged in the Third Plan, important further improvements in public administration and policies supporting the development effort will be necessary. With a conscious effort such improvement is possible. Without a determined policy, efforts and aspirations can be dissipated. In pushing a development effort it is not only the planning organization that needs to be strengthened, but the whole administrative machinery. Throughout its inquiry into the transport sector, the Mission paid special attention to the relationship between administrative organization and transport development, and has made appropriate recommendations for strengthening key organizations.

Performance under the Three-Year Plan (1962/63-1964/65)

16. In the first Five-Year Plan period from 1956/57 to 1961/62, annual budgeted development expenditures were in the order of NRs 43 million. In addition there were a few projects outside the budget that were executed entirely by foreign aid agencies, but these did not involve large expenditures. For purposes of the Mission's assumptions on economic performance, the experiences in this period are considered not entirely relevant. This period was, for the most part, a pre-planning phase in the economic development of Nepal, though some new projects were initiated.

17. The early planning phase was carried over to the 1962/63-1964/65 Three-Year Plan period with one of the main objectives being to establish the preconditions for better planning and an expanded development effort. The Three-Year Plan aimed at an investment target in the public sector of NRs 600 million. Of this, 75 per cent was allocated to economic services such as transport, agriculture, industry, power, public works and Panchayat development projects, with 15 per cent for social services and 10 per cent for improvement in economic administration and data collection.

18. In each of the three years budgetary expenditures were as follows:

1st year 1962/63	NRs 94 million (actual)
2nd year 1963/64	NRs 141 million (actual)
3rd year 1964/65	NRs 180 million (estimate)

(These figures are a refinement of the preliminary information contained in Table B-5 of Vol. III.)

These figures show that throughout the three years there was a progressive increase in the utilization of budgeted development expenditures. In all

these figures there are some small elements which more appropriately belong in the current budget. Even subject to this qualification the figures show a significant increase in actual investment during the three-year period.

19. In addition to these budgeted expenditures, there were extra-budgetary investments on public sector development projects by donor countries (India, U.S.S.R., Mainland China and the United States) averaging about NRs 78 million per year. These projects covered, among others, the Trisuli project (India), the Kodari Road (Mainland China), the Birganj sugar factory and the Janakpur cigarette factory (U.S.S.R.) and the Kathmandu Ropeway (U.S.A.).

20. On the basis of the figures above it would appear that the actual investment in the three-year period was approximately NRs 649 million, and exceeded the Plan target. This was made possible by projects being completed on time and additional domestic resources being available. Total development expenditure (budgeted and extra-budgetary) in the public sector in the final year of the Plan 1964/65 is likely to be in the order of NRs 258 million (NRs 180 million + NRs 78 million). Even though the figure for the last year of the Plan is still an estimate, it was calculated on the basis of a reasonable expectation of achievement.

21. The statistical basis is lacking for a proper appraisal of Plan performance in physical terms. However, in looking at the individual sectors there is some evidence of growth in the economy. In the agricultural sector several improvements have been initiated though there is still a great deal to be done. In 1963/64 adverse weather conditions resulted in lower agricultural production but in 1964/65, favorable weather conditions resulted in higher output. Higher prices for agricultural commodities also appear to have provided some stimulus to increased production in this year. Modest increases in industrial production have been registered both in the public and private sectors over the three years. The expansion of transport, irrigation, power and education facilities is progressing. Greater benefits of past investment in all these fields will be secured in the Third Plan period for 1965/66-1969/70. What is of significance to this study is the fact that there are several identifiable areas in addition to the Kathmandu Valley where this investment is beginning to mature and to have cumulative effects, e.g. the Chatra-Kosi basin, the Birganj-Hitaura corridor, the Rapti Valley and to a smaller extent places like Pokhara, Bhairawa, Janakpur and Nepalganj. Details of economic activity in each area are discussed further in Chapters 4 and 5.

Third Plan Priorities, Targets and Financial Resources 1965/66-1969/70

22. As has been stated earlier Nepal is embarking on the Third Plan, having learned some lessons from its early planning experiences. A clear development strategy, which could serve as the basis for the Third Plan has yet to be formulated. Such a strategy would need to take into consideration an up-to-date appraisal of the present economic situation, a realistic estimate of future potentials, and the immediate problems facing the country. It would appear to the Mission that a more effective plan could be drawn up by focusing more sharply on specific regions and key sectors, rather than on the overall aspects.

23. As a starting point for this planning exercise, however, a very broad framework of proposed investment targets for a five-year period has been drawn up by the Government. There is some question as to whether, given the limitations to planning in Nepal,a more concentrated plan could not have been drawn up for a shorter period, as was done earlier when a three-year time span was taken. A shorter period plan would of course have to be supported by a much longer-term perspective plan.

24. Though this financial framework purports to cover the whole economy, both private and public, at the present stage in the planning exercise it can be no more than a public sector investment program where nearly two-thirds of the investment is to be provided by foreign assistance. The framework is in some respects based on past performance and a very tentative forecast of resources that would be available. When the other sectoral plans are drawn up and a clearer picture of available foreign assistance emerges, this framework will need to be modified accordingly.

A. Sectoral Priorities

25. In general the Government has given highest priority in the allocation of resources in the framework to the agricultural and transport sectors (see Table B-24). The task of preparing a detailed investment program for transport has been entrusted to this survey Mission. However, within the total Plan there is little evidence that a precise program for increased productivity in the agricultural sector is yet at hand. An agricultural sector plan is most important for Nepal to meet the increasing internal demand for food, to check inflation, to earn foreign exchange through an expansion of exports, and to support agriculturally based industries. If such a program had been available it would have made the drawing up of a transport plan itself easier. An agricultural program (including irrigation) needs to take into consideration recent technical developments, plus the effect of past investments which are just beginning to mature. Details of investment programs

for the other key sectors of the economy are also yet to be worked out. Little emphasis appears to have been given to planning for forestry and tourism where the opportunities for early economic return and the generation of foreign exchange are very high.

B. Investment Targets and Allocations of Resources

26. The plan framework envisages a total development expenditure of NRs 2,000 million, divided between public and private sectors as follows:

NRs 1,500 million - public sector.
NRs 500 million - private sector.

27. The target of private investment appears to have been somewhat arbitrarily determined. It appears high, on the basis of the very tentative information available concerning organized private investment in the recent past. Tentative estimates of private investment indicate that for the Three-Year Plan period as a whole, investment in commercially organized enterprises was approximately NRs 80 million. The investment in transport (principally vehicles and service stations) was about NRs 25 million. It was estimated that in housing and other local activities, excluding Panchayat works, actual investment was of the order of NRs 60 million. Panchayat investment in the three-year period could not have exceeded NRs 10 million. (The Panchayat investment would be of significance to transport development because in the past a substantial part of these resources have been devoted to local roads as mentioned earlier. There is no estimate of the precise investment, however.) This would give a total of approximately NRs 175 million over the three years or NRs 58 million per year. The new plan target assumes that this would move up to NRs 100 million per year during the five-year period. This target appears to be based on anticipation of a large inflow of private foreign capital plus a repatriation of Nepalese capital which has been invested abroad in years past.

28. The public sector expenditure target of NRs 1,500 million includes all foreign assistance except foreign advisory services and training programs abroad directly provided by aid agencies. This follows from a recent decision of the Government to include most of the items formerly considered as extra-budgetary (that is, direct expenditures by aid-giving countries) in the Government's development budget.

29. As has been stated already, in the first year 1962/63 of the Three-Year Plan, development expenditures in the public sector, both budgeted and extra-budgetary, were of the order of NRs 172 million. In the last year of the Plan 1964/65 they were estimated to be of the order of NRs 258 million. This represents an average annual increase of approximately 25 per cent in the rate of development expenditure during the Three-Year Plan period. The new targets now envisage an

average investment of NRs 300 million each year. This represents a 20 per cent increase over the level of expenditure in the last year of the previous Plan. It is assumed that the Plan will be phased so that the rate of investment will be increased gradually each year with the smallest total investment in the first year of the Five-Year Plan and the largest in the last year. Even with this phasing the achievement of this target will require a further strengthening of the administrative capacity of the Government. It is the Mission's view, however, that with a continuation of the improvements that have been taking place in the administration and a continuation of technical assistance from foreign aid agencies, this objective of a higher level of investment in the public sector is not unrealistic provided the financial resources are available.

C. Sources of Finance

30. The sources of finance envisaged for the planned investment of NRs 1,500 million in the public sector are as follows:

NRs 525 million - domestic resources.
NRs 975 million - foreign resources.

31. Domestic Resources. It is expected that the NRs 525 million to be raised domestically will be secured as follows:

NRs 475 million - revenue surplus.
NRs 50 million - local borrowing.

32. There is no precise information on the level of savings which can be used to determine even tentatively, the magnitude of domestic capital formation. Thus, the above targets can be discussed only in general terms.

33. As will be discussed in Chapter 4, the economy has additional taxable capacity. As a result of improved administration, further increases in receipts are expected based on the collection of existing income taxes and customs duties. As new power projects are completed and some of the industrial enterprises in the public sector come into production, proceeds from sales, excise duties and customs will increase. On the basis of these assumptions, the Government has estimated that during the next Five-Year Plan period revenue will increase at an average annual rate of 12 to 13 per cent while expenditures will be held at a rate increasing by 8 per cent per year, giving the NRs 475 million surplus of revenue to support the development budget. A tentative budgetary forecast has been prepared by the Ministry of Finance on this basis, and is set out in the tables which follow.

	Third Plan - in Million NRs					
	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70
Revenue	178.9	199.9	218.0	240.6	268.8	300.1
Expenditure	123.1	129.8	138.6	148.9	161.3	173.3
Surplus	55.8	70.1	79.4	91.7	107.5	126.8

Given the tentative estimate of NRs 3,680 million in gross national income for 1961 (see Chapter 4) and assuming an average 3 per cent rate of growth, the revenues shown above represent less than 5 per cent of the anticipated income in 1964/65 and even by 1969/70 will be less than 6 per cent. If the absolute level of income is higher than this tentative estimate, as suggested in Chapter 4, paragraph 7, the ratio is even lower.

34. The detailed revenue forecast is as follows:

	Third Plan - in Million NRs					
	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70
Customs	60.1	67.3	75.3	84.3	94.4	105.7
Excise	19.3	21.4	24.1	27.1	31.5	33.4
Land Revenue	49.0	49.0	49.0	50.0	51.0	52.0
Forest	12.0	12.6	13.2	13.8	14.5	15.2
Income Tax	4.8	7.2	10.8	16.2	24.3	36.4
Other Tax	2.4	2.5	2.6	2.8	3.0	3.2
Interests and Dividends	10.3	16.8	17.6	18.5	19.4	20.4
Miscellaneous	21.0	23.1	25.4	27.9	30.7	33.8
Total	178.9	199.9	218.0	240.6	268.8	300.1

35. From these figures it can be seen that major increases are expected from income taxes and customs. Improved administration and wider coverage would result in these higher receipts. There is also scope for reviewing the tax rates and moving them upwards.

36. The estimate for increased returns from higher sales of electric power and profits from government enterprises, as new industries come into being, are conservative. Land tax revenues could increase further

as the cadastral survey is completed, leaving a cushion in this item to cover any shortfall in other sectors.

37. On the expenditure side, the 8 per cent rise appears to be an underestimate and is being reviewed by the Government to insure that all current expenditures consequent to the Plan are included. It is conceivable that the expenditure estimate may be raised following this review. It is the Mission's view, however, that the estimate of surplus of NRs 475 million is not unrealistic and can be achieved in view of the additional taxable capacity in the economy and the cushions indicated above, provided appropriate fiscal measures are adopted.

38. The revenue surplus will be supplemented by an internal borrowing program which is expected to yield NRs 50 million over the five-year period. The only previous experience with the issue of internal bonds was at the end of January 1964 when the Government issued bonds to the value of NRs 13.1 million. The experience with the earlier issue was encouraging. With the unavailability of other suitable investment opportunities for institutional investors, as well as private individuals, there should be no difficulty in mobilizing this amount through a carefully phased internal borrowing program. With the growth of income, the evidence of increasing voluntary contributions to Panchayat works, the expansion in savings deposits in commercial banks, and a tendency to hoard wealth, it would be reasonable to assume that there is scope for increasing the resources for development, if suitably diverse instruments are used for mobilizing available savings. Thus, the Mission is of the view that, with the potential for increasing revenue, the use of new instruments for mobilizing internal savings, the continuation of financial discipline and the improvement in fiscal administration, the achievement of a target of NRs 525 million is well within the realm of possibility.

39. Foreign Resources. During the Three-Year Plan period 1962/63-1964/65 the greater part of foreign aid available to Nepal was in grant form. As was mentioned earlier, part of the foreign funds were expended through the development budget and part directly by the aid agencies. Foreign aid actually expended on various projects both within the budget and on extra-budgetary investments in the first two years of the Three-Year Plan were as follows:

FOREIGN AID ACTUALLY EXPENDED ON PROJECTS
1962/63 AND 1963/64
(Millions of NRs)

Countries and Organizations	1962/63	1963/64	Total
U.S.A.	68.0	95.6	163.6
India	46.2	50.7	96.9
U.K.	8.1	5.4	13.5
Mainland China	10.7	5.6	16.3
Russia	13.2	2.6	15.8
Ford Foundation	0.3	1.0	1.3
U.N.O.	3.0	0.7	3.7
Total	149.5	161.6	311.1

Source: Ministry of Economic Planning.

40. The foreign aid budgeted for the final year of the Three-Year Plan development budget was of the order of NRs 144 million. Of this amount approximately NRs 115 million will be utilized. This is still an estimate, but the expectation is that this level of investment will actually take place. In addition, in 1964/65 foreign aid amounting approximately to NRs 80 million for extra-budgetary operations executed by aid agencies was to be utilized. Thus, in the final year of the Three-Year Plan (1964/65), while the total foreign aid budgeted was of the order of NRs 224 million, the amount utilized will be approximately NRs 195 million. The level of foreign aid committed and expected to be utilized in this last year of the Plan is higher than the average in the recent past.

41. In the Third Plan period a total of NRs 975 million, or NRs 195 million annually, will be required from foreign sources to fulfill the public sector investment target. Of this amount the Government had estimated that NRs 867 million can be counted upon on the basis of existing agreements and understandings with all donor countries and institutions. This leaves a gap of NRs 108 million for the public sector plan.

42. In attempting a forecast of foreign aid, present indications are that: (1) both India and Mainland China will increase their assistance programs to a small extent; (2) the U.S. will reduce the level of its grant assistance but the level of loan assistance may increase, leaving the total at approximately the present level. However, a greater part than previously may be made available to the private sector; (3) the U.S.S.R. may not commit any new funds until those already negotiated are drawn down; (4) other aid agencies (principally the U.K., U.N., and Ford Foundation programs) will also be maintained at approximately the same level as in the recent past. There is, of course, the ever present uncertainty stemming from the fact that many sources of foreign aid do not make five-year commitments.

43. On these assumptions there may be a small overall shortfall in foreign resources. This may not be serious, as some under-expenditure is likely. In addition, Nepal's foreign assets have been increasing and can provide a small cushion. These resources can also be supplemented by a small amount of soft loans, though Nepal's capacity for servicing foreign loans, even on easy terms, is limited and should be used sparingly and only for projects of highest priority.

44. There are, however, some expenditures which at present appear to be underestimated in the Plan which, when adjusted, will exert a pressure on resources and widen the gap. Should some of these expenditures be met from foreign loan finances outside the aid programs there would be service charges and consequent pressure on the external payments position. The finance required for the extension of the land reform program, though it may not be a foreign exchange commitment, is not yet fully worked out. There are other projects, too, such as the Karnali power project, which, if they mature, will exert further pressure on financial resources and could also mean a diversion of resources from other projects.

45. With the probability of a shortfall in the financial resources, it is essential that there should be a careful screening of projects to insure that only essential and technically feasible projects are included in the Plan. In allocating finance, emphasis should be given to a reasonable number of quick-yielding projects in order that the benefits of the investment can be secured in the shortest possible period. In the final analysis it is not the size of the investment program that is of significance; it is its soundness and the resulting benefits that reflect the true absorptive capacity of the economy.

Chapter 2

A MASTER PLAN FOR TRANSPORT DEVELOPMENT IN NEPAL

Justification of the Master Plan

1. In preparing an investment program for transportation to be used as a part of the Government's Third Plan (1965/66-1969/70), the Mission recognized that transport developments in Nepal cannot be looked at within the framework of such a short period of time. Transport investment needs to have a long-term goal, some precise idea of the steps by which that goal can be reached, and a detailed plan for each of the time periods in which a particular stage is to be covered. In Nepal so much needs to be done that without such a framework it is difficult to develop a practical and workable five-year plan.

2. The Master Plan for Transport developed in this report is in effect a perspective plan giving a general idea of the goals to be reached in, say, a 30-year period of time. It was developed principally in terms of physical targets, and is primarily concerned with an assessment of the country's needs and of technological possibilities. It has a financial base in that it has been tailored to fit a conservative assessment of the financial resources likely to be available. The Five-Year Transport Plan as presented in the next chapter, which is abstracted from the Master Plan, goes into greater detail.

3. This Master Plan also seeks to establish a modicum of continuity from one Plan period to another in the very process of change which it seeks to promote. The central idea in the preparation of both a master plan and a five-year plan has been to evolve what may be called a "rolling plan." In other words, the starting points were a 30-year "perspective plan" and a five-year plan, but as the Plan proceeds from one planning year to the next the investment targets get carried over to the corresponding year in the following Plan period, and so on. In any event, the Five-Year Plan itself needs to be adjusted to changing circumstances, through annual plans. Obviously no plan can be very rigid in the light of possible changes in the economic situation and technological changes resulting in variations from the original forecasts upon which the Plan is based. The Master Plan itself is only a beginning. Starting from this base, transport programs can be evolved for each successive planning period.

The Existing Transport System

4. The starting point in this planning process was an inventory of the present transport system and some understanding as to how it works. The map on the following page shows all existing transport facilities in Nepal. It also shows principal issues and junctions with the transport system of India.

A. Highways and Trails

5. Historically, all transport in Nepal has been by porters, pack animals, and bullock carts. As already stated, Nepal has the lowest mileage of motorable roads in relation either to surface area or to population of any country in the world. This situation has now begun to change.

6. Nepal did not start building motorable roads outside the Kathmandu Valley until 1953-55. The first roads were built in the Terai and inside the Kathmandu Valley. With the help of the Indian Army, the Tribuwan Rajpath from Bhainse to Kathmandu was opened in 1956. About the same time a Road Transport Organization (RTO) was created by means of a tripartite agreement between Nepal, the United States and India. This organization, financed mainly by the United States and India, aimed at building 900 miles of road, generally north-south, of which 300 miles would be paved. Some significant results were obtained but the program proved to be too ambitious. Sometimes projects were started without sufficient advance engineering studies. Difficulties arose frequently due to differences about the standards to be used, and paralyzed the work. In 1963 it was mutually agreed to terminate the RTO and seek other means for building roads. Two other major roads were also built in this period: one by the British Army from Biratnagar to Dharan, and the other by the U.S. AID in the Rapti Valley from Hitaura to Narayangath. Now Nepal is primarily using bilateral agreements where the donor country directs the road-building work. The assisting governments, however, cooperate closely with the existing road organization of the Government. A major road from Kodari to Kathmandu is being constructed by Mainland China under this kind of arrangement. A small mileage is currently being built entirely by the Road Department of the Nepal Government.

7. As has been stated, at the present time there are 284 miles of all-weather roadway (see Tables E-1 and E-2 in Vol. III, and the map on Page 17) of which 155 miles or 54 per cent are black-topped, and 36 miles (or 11 per cent) are unpaved. In addition, there are 339 miles of all-weather road now under construction or definitely committed for the second Five-Year Plan period. In addition to these permanent roads, there are many dry season roads or motorable tracks, particularly in the Terai, but in general they have not involved large investments. Some of them, however, do have permanent culverts. The longest network is the system of footpaths in the Hills. These are often very narrow and are located in mountainous areas.

8. There are numerous connections between the internal Nepalese network of tracks and trails and the networks of the neighboring countries. At present, the only connections with motorable roads, however, are with India. With the completion of Kodari Road there will be a motorable connection to Tibet (China). The principal connections are summarized in

the Table E-14, Vol. III. The best international road connections are those which tie into the National Highway Network in India. This network reaches the Nepal border only at Naksalbari on the east, Birganj on the south, and Tanakpur on the west.

9. The Government's organization for formulating policy and plans for roads, and for carrying them out, is still in its infancy and needs to be strengthened. There is a Roads Department in the Ministry of Public Works, Transport and Communication. This Department is presently organized and operated so that all attention is centered on new road construction. Little or no attention is given to the vital matter of road maintenance (see Table E-3, Vol. III). In Chapter 7 the Mission has analyzed the organizational problem involved and appropriate recommendations are made. Highlights of these have been carried into the Master Plan, and those requiring immediate implementation incorporated in the Five-Year Plan.

B. Road Transport

10. No scientific traffic survey has ever been made in Nepal, so it is not possible to give traffic volume data for all parts of Nepal. There are, however, bits and pieces of information which can be used to prepare estimates for some sections of road.

11. On the footpaths in the Hills most commodities are transported by porters even along those trails where mules or ponies can be used. All sorts of items are transported in this manner, even entire automobiles, heavy machinery and sick people. This results from the fact that in many areas pack animals are not raised, principally because all available ground is cultivated to feed human beings and there is little land left for animal fodder and grazing.

12. However, in some mountain areas, Mustang for example, pack animals such as mules, yaks, and even sheep are used. They remain in the mountains during the wet season, and come down to the foothills in the dry season.

13. Some mountain trails are crowded and the traffic moving on them is impressive. On the Tansen-Butwal path, for example, at present an average of more than 5,000 porters pass per day. This would correspond to a movement of 40,000 tons per year and is a larger volume of freight than is handled on many all-weather motorable roads in other countries. This path will be replaced by the Sunauli-Pokhara road now under construction. However, there are other paths where estimates indicate existing traffic of 10,000 to 20,000 tons per year, e.g. Dharan-Dhankuta, Narayanghat-Gurkha and Nepalganj-Dailekh. These examples, however, do not cover all possible routes of high density traffic, as there are many routes for which no data exist. This could only be ascertained by a comprehensive study.

14. In the Terai, bullock and water buffalo are the animals most used for transport. Elephants and camels are also used, to a lesser extent. The bullocks and buffaloes usually draw wooden carts well adapted to this type of ground. Traffic is generally dispersed over a large number of small trails, and is seldom concentrated on one route. This is particularly true of east-west traffic. North-south tracks generally follow high ground and most are passable all year. The east-west routes can only be used in the dry season.

15. On motorable roads the common means of transport is, of course, the car and truck. Experience indicates that these have entirely replaced the porters along these routes. The kind of truck in most common use on the better roads is a five-ton capacity diesel. On the poorer roads, only small trucks with one to three tons' capacity are used. Motorable roads in the Terai are also heavily used by animal-drawn carts.

16. There are 5,093 motor vehicles licensed to operate in Nepal (see Table E-13), which include 1,161 trucks, 290 buses, and 1,089 motorcycles and motor scooters. More than 85 per cent of these are registered in Kathmandu. There are no data as to the rate of growth of the motor vehicle fleet in recent years. On-the-ground observation gives the impression there has been a significant increase, say 25 per cent to 50 per cent, in the past two to three years. The present private investment in road transport vehicles is estimated by the Mission at NRs 120.0 million (based on replacement cost).

17. Traffic on existing roads is indicated in Table E-1 (Vol. III). The most intensively used road (that having the highest density of traffic) is the Birganj-Amlekhganj Road, with about 200 vehicles per day.

18. From these data and from tentative estimates of fuel consumption it is assumed that the present annual vehicle-miles in Nepal are more than 20 million (including traffic in and around towns).

19. Observed prices of transport are given in Table E-11 of Vol. III. These are homogenous, so one can accept the following as the average transport cost of moving one ton one mile:

Porter	NRs 15.0
Pack animal	7.0
Bullock cart	4.0
Truck transport	1.3
Railway	1.0
Airway	11.1

These figures are not always exactly comparable for different lengths of journey. However, they are useful in showing some general orders of magnitude.

20. An analysis of the price of transport by truck is given in Table E-12 in Vol. III. This appears high as compared with accepted prices in other countries. That is principally due to the relatively low admissible load capacity per truck, and to a load factor of 0.5 (meaning the vehicle moves under load in one direction only) which reflects the fact that traffic is badly unbalanced. The proportion of taxes and duties, including the road-cess (or road toll) is normal when compared with other countries similar to Nepal.

21. Finally, there are no fully-equipped automotive maintenance shops in the entire country, with the possible exception of two or three operated by the larger aid-giving countries for the maintenance of their own equipment. There are some small machine shops but these are generally poorly equipped and not staffed with trained mechanics. The need for automotive maintenance shops is related to the availability of spare parts and trained mechanics. When spare parts are freely available, the adequacy of maintenance shops becomes less important. However, in Nepal obtaining spare parts is a major problem. This contributes to the high cost of truck operation.

C. Railways

22. There are three railways in Nepal, all narrow-gauge (2' 6") lines: 1) The Nepal Government Railway (NGR) from Raxaul in India to Birganj and Amlekhganj, 29 miles; 2) The Nepal-Janakpur-Jaynagar Railway (NJJR) running 18 miles from Jaynagar in India to Janakpur; 3) The Kosi Railway, a construction railway running from Bathnaha and Birpur in India along the Kosi River to Chatra and Dharan Bazaar, 46 miles.

23. India is both a major source of traffic moving into Nepal and a principal market for exports. Within India, the railways are now the principal transport media, and indications are that they will remain so for many years. For this reason, the Indian Railways and connections to them, are of importance to Nepal. It is significant that the largest traffic across the Nepal-India border is at points close to principal Indian railheads.

24. The first two railways are owned and operated by the Government. Until the last few months their operation was under the control of the Transport Department in the Ministry of Public Works, Transport and Communication. The efficiency of both railways is low, primarily due to the lack of competent management. Further, the management has not learned how to reduce and simplify the paper work involved in shipping by rail, thereby making the service difficult and unattractive to the shipper. Recently, however, management was transferred to the new Nepal Transport Corporation which hopefully will bring improvements in management and operation.

25. The third railway was constructed for use in bringing stone, machinery and materials to the site of the Kosi barrage. It is operated as a part of the Kosi project and is not available for the movement of public goods.

26. The Nepal Government Railway (NGR), constructed in 1927, was for 30 years a part of the principal avenue of commerce between India, Kathmandu and inner Nepal. During this period it was a profitable undertaking even though the track and equipment were never properly maintained and expenses were high. Following the opening of Tribuwan Rajpath into Kathmandu in 1956 and the paving of the road from Birganj to Amlekhganj in 1962, rail traffic and revenues fell sharply.

27. All NGR traffic must be transshipped at Raxaul to and from the meter-gauge Indian Railways. It is handled again at Birganj where all cars are unloaded for Nepal customs inspection, and then reloaded. Goods destined to Kathmandu and the interior of Nepal must be transshipped again at Amlekhganj to trucks for further movement. No through handling or billing of freight has ever been offered; each shipper must make his own arrangements for local labor, for loading, unloading, for transshipment, and with all connecting carriers. At each handling point some portion of the shipment "disappears" and some is damaged or spoiled. The total movement is slow and long delays are commonplace. With the opening of the highway to Kathmandu through truck movements became possible on a single-freight billing document and without the two intermediate handlings and with smaller in-transit losses. The savings and advantages were immediately obvious to all shippers. As a result, the railway has drifted into increasing disuse, disrepair, and financial loss (see Table G-6, Vol. III).

28. The NGR is now in such a bad state of physical repair that its continued operation will be both physically difficult and exceedingly costly. The physical life of the line and its equipment is exhausted. Complete rehabilitation of the track and the purchase of necessary rolling stock would cost about NRs 7.5 million (or about U.S. $1.0 million).

29. Effective operation of the line is further complicated by the gap between the terminus of the railway at Amlekhganj and the beginning of the ropeway to Kathmandu at Hitaura, which requires an intermediate handling by truck.

30. The Nepal-Janakpur-Jaynagar Railway (NJJR) was originally built in the 1930's to move timber from the Terai just above Janakpur to the Indian Railway at Jaynagar. When all timber in the area had been cut, the line was given to the Government for continued operation. Its principal source of traffic and revenues are the religious pilgrims from India to the Hindu shrine at Janakpur. Freight has not been a dominant factor in its operation since its discontinuance as a lumbering line.

Although the line has never been well maintained, it has not fallen into the complete disrepair of the NGR. Two new locomotives were purchased in 1962. The track and rolling stock are in fair-to-poor condition. The 15-mile dry-season line from Janakpur north to Bizalpura has been partially rebuilt into a permanent all-weather line. Work on this project has been stopped because it is not clear what additional traffic can be generated thereby. (See Table G-4, Vol. III.) There also are plans for extending this line about seven miles further north from Bizalpura to Lalbhitti.

31. The NJJR is similar to the NGR in that all freight must be transshipped to and from the meter-gauge Indian Railways at Jaynagar. Nepal customs inspection is at the far end of the line in Janakpur. Almost all traffic is destined to Janakpur and has to be off-loaded there, so this customs inspection has posed no additional problems or expense. However, with the opening of the Bizalpura extension it could pose a problem. There is no paralleling road.

32. The present NJJR line can be completely rehabilitated from Jaynagar to Janakpur at a comparatively modest cost --- NRs 3.0 million (about U.S. $0.4 million) including the purchase of some new rolling stock.

33. The Kosi Railway was built in 1957 to move gravel and stone from the quarries near Dharan and Chatra to the site of the new Kosi River barrage and to carry construction materials and machinery from Bathnaha, where it connects with the meter-gauge Jogbani line of the Indian Railways, to Birpur and Bhimnagar (site of the Kosi barrage). (See Table G-8, Vol. III.) Its operation for construction purposes may be continued for another one to three years, at which time the Indian Government plans to offer it as a gift to Nepal. This line handles only construction materials and is not used for the public movement of freight or passengers.

D. Ropeway

34. The original ropeway in Nepal was built from Bhimphedi, at the end of a narrow but truckable road leading from the NGR railhead at Amlekhganj, over the mountains into Kathmandu. For about 20 years it was the only means for transporting freight into or out of the Kathmandu Valley other than by porter. In recent years it suffered from poor management and lack of maintenance.

35. In 1960 a plan was developed for replacing the old and worn-out ropeway with a new line. It was originally planned to have the new ropeway extend from Amlekhganj into Kathmandu. This plan was later reduced in scope due to higher-than-planned costs and a lack of foreign aid funds, and the line was only constructed from Kathmandu to Hitaura. The new line constructed by U.S. AID was opened in April 1964, and the old line was removed. In the first few months following its opening, operations of the new ropeway were erratic for three principal reasons: 1) derailments due

to some elements of faulty design in the system (which have now largely been overcome); 2) power failures due to weaknesses in the basic supporting electrical power system; and 3) lack of competent management and direction. Since November 1964, most of the mechanical problems have been solved, and the line has been operating well.

36. The new ropeway is handling substantially larger volumes than moved on the old line (Table G-2, Vol. III). Its total capacity based on working only 200 eight-hour days per year is 40,000 tons. In November 1964, the most recent month for which data are available, the ropeway worked at 80 per cent of this rate (Table G-1, Vol. III).

37. In recent years the Tribuwan Rajpath has carried substantially more freight than has moved over the ropeway. However, the new high-capacity ropeway now has the ability to handle one-third or more of all present traffic between Hitaura and Kathmandu (currently estimated to be about 100,000 tons per year).

38. From the financial reports of the Nepal Transport Corporation (Table G-2, Vol. III) it is apparent that the ropeway is now operating at a profit. Its present rates have been set at a level calculated to meet all expenses when operated at 63 per cent of capacity in a nine-hour day, and at 51 per cent of capacity in a twelve-hour day. If the line is consistently operated over 12 hours per day, lower rates will be possible. One point of danger is that present rates, when added to trucking charges from Raxaul to Hitaura and delivery charges in Kathmandu, will be little different from the through rate now offered by competing trucks.

39. In spite of the favorable outlook, the ropeway management must face some difficult problems in seeking and retaining traffic. First and foremost is the practice of the Government of commandeering all ropeway capacity for days at a time, necessitating long delays in shipments destined to private industry. As a result, the ropeway has lost one of its best customers (NCCN) and other private shippers avoid it. The second is the widespread Nepal practice of purchasing and shipping large amounts at scattered, irregular intervals with the result that at certain seasons the demand for transport service is in excess of capacity, while at other times (often not more than a few weeks away), there is very little freight to be moved. Although some cyclical and seasonal movements of freight are common throughout the world, the fluctuations in Nepal are extreme. Some exercise of judgment and caution in government purchasing and shipping policies would help overcome some of these problems, in addition to saving shipping costs and reducing shipping time and delays.

E. Waterways

40. The use of waterways within Nepal is very limited. Existing rivers are used for some movement of rice, paddy and merchandise to

and from India during the wet season. The Gandak River in particular has a regular river fleet. The construction of the barrage across the Kosi River has resulted in the recent appearance of some wet season boat commerce between areas at or near the barrage and points upstream as far as Chatra. There is also some river commerce from below the barrage into India during the wet season. There are no navigable canals.

41. Rivers are also used for floating logs out of the Hill forests to the Terai in areas where transportation by other means is difficult or impossible.

F. Airports

42. There are 30 operating airfields in Nepal (see Table F-1, Vol. III). Of these, 12 are ICAO-approved airports serviced by scheduled flights of Royal Nepal Airlines Corporation (RNAC) and 18 are used solely for special flights and charter planes. Of these 30 airfields, 14 are located in the Terai or Inner Terai, of which nine receive scheduled RNAC service. Sixteen are in the mountains and are mostly short STOL fields which can be used only by small planes. Only three of the mountain airports receive RNAC services (Kathmandu, Gurkha and Pokhara).

43. In terms of traffic handled, the most important commercial airports are Kathmandu, Bhairawa, Pokhara, Biratnagar and Simra.

44. Gaucher Field at Kathmandu is the main gateway to Nepal for international and tourist travel, and is by far the largest and most important airport in Nepal. It is currently in the process of being expanded by the construction of a new 6,600 ft. paved runway which will enable it to accept commercial planes larger and heavier than the DC-3. The work is being financed by U.S. AID. There are no hangars or shelters for planes here, although it is the sole RNAC maintenance base. The passenger terminal building is crowded and grossly inadequate for the passenger, mail, and cargo traffic it must handle. It is also very unattractive and offers the international traveler a poor impression of Nepal.

45. The Indian Aid Mission to Nepal is providing major assistance through a program for the improvement of four airports in the Terai: Biratnagar, Janakpur, Simra, and Bhairawa. Janakpur and Bhairawa now have 3,300 ft. paved runways under construction, together with necessary terminal buildings and staff quarters, and should be operational in 1965. Present plans are to move the Biratnagar Airport to a new location and build completely new facilities, including a 3,300 ft. paved runway. Simra airport will be assisted with runway improvements. These new runways will handle DC-3 planes, but nothing larger.

G. Air Transport

46. Air transport in Nepal began in 1950 with the construction of an airport in Kathmandu by the Indian Aid Mission, and the inauguration of service between Kathmandu and Patna. From 1953 to 1958, India Airlines (IAC) provided local services within Nepal, in addition to international services to and from India. In July 1958 RNAC was formed and operated initially as a private corporation, 51 per cent owned by the Government. In 1959 the Airline was incorporated into the Government, provided with more planes, given cabotage rights for Nepal, and began taking over all IAC local services in Nepal. In 1960 operations were expanded to include international services to India in competition with IAC. On April 25, 1963 the Royal Nepal Airline Corporation Act formally organized the Airline as a government corporation with authorized capital of NRs 10 million.

47. Although Nepal's topography favors air transportation relative to other modes of transport, it also provides some major problems and obstacles. The high mountains and deep valleys present problems in air navigation, airport construction, and access to and from the airport.

48. The dominating weather characteristic is the four-month monsoon season extending from early June until early October. Monsoon rains lasting more than one or two days are rare; there is sunshine for a few hours nearly every day. In the Terai the monsoon clouds have an upper limit of 10,000 ft. and are usually 1,000 ft. above the ground, thus allowing enough room for planes to operate either above or below the cloud base. Over the Midlands, the monsoon clouds gain altitude as they move north, with their upper limit reaching about 15,000 ft. The higher mountains generally remain free of clouds though the deep river valleys, such as the Kali Gandaki and the Marsyandi, have clouds on their hill flanks but otherwise are generally free of overcast. During most of the rainy season more or less regular VFR air transport operations are possible on all but a few routes. The major factor limiting RNAC operations during the monsoon season is airport runways, many of which are too soft and muddy to be used in wet weather.

49. The Ministry of Public Works, Transport and Communications through its Department of Civil Aviation nominally manages all airports and civil aviation activities in Nepal. Within the Department there has been no clear organization charged with the responsibility for aviation matters --- airports and aviation have been all mixed with the ropeway and the railways. One result is that there has been little airport planning and management, and no overall coordination of all aviation activities. There is, however, a de facto operating entity for aviation in the form of three experts provided by the International Civil Aviation Organization (ICAO) arm of the United Nations, attached to the Department. There are signs that this situation has been improved by the transfer of the ropeway and the railway to the Nepal Transport Corporation.

50. Royal Nepal Airlines Corporation has flexible operations which encompass both regularly scheduled services and non-scheduled flights between different parts of the country. In the six years since it began operations, it has experienced steady growth in traffic, routes and service. From 1959 through 1963 the number of passengers handled more than doubled. (See Table F-8, Vol. III.)

51. The Mission found that RNAC's traffic is highly seasonal, and directionally unbalanced. These are both situations which lead to operational and financial difficulties.

52. Modern aviation makes exacting demands in aircraft maintenance. In a country like Nepal, off the main traffic routes of world commerce and without technological experience or training, aircraft maintenance presents serious problems. To make matters worse, RNAC has no proper maintenance base or facility, and only limited shop and store space. Repairs to the aircraft are carried on in the open because there is no cover. Engines and parts, very sensitive to corrosion, are left out of doors for lack of covered space. This leads to slow work and high costs, especially during the wet season.

53. An examination of the RNAC's statement of revenues and expenses for 1962/63 shows that the operation was conducted at a loss. The figures for 1963/64 fiscal year were not available to the Mission but on the basis of fragmentary data it is assumed there have been some operational improvements over the previous year though losses were still incurred. This is discussed in more detail in Chapter 10. If the RNAC is to become an effective transport instrument, positive ways must be found to improve its financial position. Additional finances are also needed to modernize the RNAC fleet.

54. Nepal also has a second air transport operation: The Royal Flight. This comes under the management of the Military Secretary of His Majesty the King. It operates a fleet of four planes (see the footnote in Table F-6, Vol. III) which are not registered with ICAO or maintained to ICAO standards. It soon will have two more. Most of these planes were gifts to His Majesty the King, though some were purchased. Royal Flight exists primarily to provide accommodation for His Majesty and the Royal Family. In the past it has offered some limited charter and contract services to the general public, at times in direct competition with RNAC though it does not observe ICAO standards and recommended practices, and is not under the control of the Department of Civil Aviation. Information concerning Royal Flight's operations and finance were not available to the Mission.

Planning Objectives and Priorities

55. Having taken stock of the existing transport facilities in Nepal, the Mission set about clarifying the objectives of a transport plan and determining the broad priorities. In formulating a master plan the Mission has taken a simple approach consistent with the present early stage

of the Nepal Government's planning exercise. From its examination of the economy of Nepal the Mission concluded that (1) the absolute level of incomes and economic activity is somewhat higher than the tentative estimate of GNP would imply; (2) the economy is growing; (3) in the light of past investment now maturing and the new investment now contemplated, the economy could reasonably grow at an annual rate of 3 per cent in the next Plan period; (4) there are identifiable areas of economic activity which influence and generate the need for transportation (see Paragraph 21 in Chapter 1, plus the detailed descriptions in Chapters 4 and 5); and (5) there are special high priority problems currently facing the Nepal Government which could be alleviated by the provision of better transportation facilities.

56. In drawing up the Transport Plan it was clear that increased investment was necessary (a) to maintain the capacity and efficiency of existing transport facilities, (b) to provide additional capacity to move a larger volume of goods and people in the coming years, (c) to make possible further development of available resources, and (d) to develop other sectors of the economy for which improvement in transportation is an important precondition.

57. The special high priority problems facing Nepal which can be ameliorated by improved transport are: (1) food distribution; (2) food shortages; (3) the rising cost of living, particularly in the Hill areas and in Kathmandu Valley; (4) transport bottlenecks restricting the benefits of maturing existing investments from accruing to the country; (5) transport bottlenecks inhibiting the exploitation of tourist potential; (6) concentrations of population in areas which are completely inaccessible except on foot; and (7) concentration of investments and services in Kathmandu which have resulted in heavy pressures on the physical transport facilities supporting the city and valley.

58. Despite its historic independence, Nepal's emergence as a modern nation is recent, and the inability of the Central Government to communicate with the regions within the country constitutes a serious drawback to administrative efficiency and can have far-reaching consequences for maintenance of political unity. In developing a transport network the Mission has taken for granted that political stability and administrative efficiency are basic preconditions for sustained economic growth, and therefore are objectives of the Plan.

A. An Integrated Approach

59. Because modern transport facilities in Nepal are still in their early infancy, with no long period of historical development, this makes the taking of an integrated approach much easier. There are few historical vested interests which are hostile to the promotion of the most suitable modes of transport in accordance with Nepal's present-day needs.

60. Provision is made in the Master Plan for the development of Panchayat road and airport programs that can be integrated with the national system. In this way local feeder roads and airports can be constructed in places and in time sequence which will bring greatest net benefit. The transport system in Nepal is too recent to require a specialization and division of roles assigned to the different forms. Each form requires maximum flexibility, so that it can serve combined purposes. Coordination also implies the establishment of uniformities to prevent unnecessary transfer of goods from one mode of transport, or kind of vehicle, to another and to permit the free flow of vehicles from one area of jurisdiction to another. In Nepal, the costs of transshipment of goods are particularly high, and there are considerable delays, damages and losses involved.

61. The Master Plan also attempts to integrate the recommendations for new and expanded transport facilities with existing mechanical transport facilities, traditional trails and trade routes within Nepal, and the river system. In view of the fact that Nepal is landlocked, it was also important to insure that the internal system is adequately linked to external transport facilities.

B. Priorities between Systems

62. In preparing this Plan, the Mission examined and weighed the possibilities, advantages and disadvantages of using all forms of mechanical transport. In so doing, it covered roads and road transport, airports and air transport, railways, ropeways, pipelines and waterways.

63. Constructed waterways were not considered because they do not have year-round dependability. The climatic characteristics of Nepal with its very heavy monsoon rains and long dry periods restrict effective use of constructed waterways to only a few months out of the year. While it is possible to build waterways having year-round reliability, the initial investment and the operating costs are both so high as to make this a completely impractical choice for Nepal. This should not bar the use of natural waterways wherever they exist.

64. A pipeline was considered for the possible movement of petroleum products between the Terai and Kathmandu. Normally, pipelines have too large a capacity to be economic or practicable in such a limited economy. However, there may be some possibility of constructing a small-diameter line running through the mountains which would be economic in comparison to the use of small tank trucks on the Tribuwan Rajpath. This is recommended as the subject of a separate feasibility study. Its function would be to relieve traffic on the Rajpath.

65. Ropeways were considered for several routes in Nepal. In general, they are expensive to construct per mile of line, though a complete

installation may cost less than a road or a railway in rugged terrain because it can "jump" from mountain to mountain. Ropeways are extremely inflexible as to their use; they cannot easily accept liquids or large packages. This presents problems when they are to be used as a general utility freight carrier. However, they are very efficient where a uniform bulk commodity, such as a mineral ore or coal, is to be moved in constant volume. They may have a future role in forestry and mineral development, but they are considered by the Mission as too inflexible for general developmental use.

66. Railways were considered for possible use in all parts of Nepal. However, they are economical only when there are large volume movements --- generally in the order of 200,000 tons or more per year --- or when special circumstances are involved. Generally, there is insufficient present or potential future traffic volume to justify extensive rail operations in Nepal except under the special circumstances surrounding the problem of traffic at principal Indian border crossings. For this reason, an extensive rail network was considered as both impractical and uneconomic.

67. However, at the more important border crossings to India where there is extensive traffic moving to and from the Indian Railways, there are advantages to be gained in the form of reduced costs by combining short terminal railways with the construction of improved rail-to-truck transfer facilities which would also incorporate India-Nepal customs facilities.

68. Airports are both expensive to build and to maintain. Air transport is costly to operate. Because of these, aviation is a high-cost form of transport. However, it possesses special advantages in that air transport facilities can be put in place quickly, and are not subject to all the geographic limitations of ground transport. For these reasons, air transport is initially given a high priority in this Transport Plan. As a National Highway System is built and begins to reach more parts of the country, air transport will be used less for development purposes and more on those high-volume routes which can provide the traffic and pay the high rates needed to keep air transport economic and practical.

69. Roads and road transport are selected for development as the prime transport media in Nepal for three principal reasons: (1) they bring the largest amount of economic development in relation to the total expense; (2) over a long span of time they provide the lowest cost total transportation; and (3) they can be used in many ways for many different purposes. Further, roads can operate effectively and economically on a relatively small scale because they do not require large-scale management and service organizations. On the other hand, road construction is costly, ranging from a low of NRs 0.6 million per mile in the Terai to NRs 1.5 million per mile (and up) in the mountains.

70. By way of comparison between air and road, the cost of moving one ton of merchandise from Kathmandu to Pokhara by truck (assuming there is a road) would be about NRs 150 based on present truck running costs and including no allowance for road maintenance. The cost of moving that same ton of merchandise by plane, based on present RNAC tariffs, is NRs 934 plus handling costs at each end of the trip. If road maintenance expenses are considered, the total cost of the truck movement would range between NRs 400 and NRs 700, depending upon the volume of traffic using the road. If all airport and other costs were included in the RNAC figure, the cost of air transport would be substantially over NRs 1,000. On the other hand, substantially larger investments are needed for highways than for air transport. And the highway brings benefits to many local communities which cannot be reached by air.

C. Limitations on the Preparation of This Plan

71. In preparing this Plan the Mission was faced with a number of limitations which had to be taken into consideration. First, the gaps in available data relating to the economy and to the volume and pattern of traffic movement presented special problems. Although the Mission uncovered more information than was previously thought to exist, some vital basic data still do not exist. The limitations of time involved in preparing this Plan did not permit field surveys and the generation of new data to fill these gaps. As a result, the Mission was forced to collect many bits of information from different sources and attempt to reconcile them by applying economic and transportation judgments. These limitations were sufficiently serious to restrict the means by which the data could be systematically correlated and analyzed. Secondly, the incompleteness of the other sectoral programs in the Plan hindered the establishment of transportation priorities by the Mission. In deciding the projects recommended here, the Mission did not know the details of investments in other sectors of the economy for this next Five-Year Plan period. Sufficient flexibility, however, has been provided in the Transport Plan to permit changes in projects.

Highlights of the Master Plan

72. The overall Plan presented here calls for the development of a basic transportation network designed to serve the principal needs of the country for the long run. It combines a skeletal system of national highways with a program for the development of a commercial air transport network and some small trans-border terminal railways. The Plan calls for new construction plus improved maintenance and operation of existing facilities, including the ropeway and RNAC. The system of national highways in the Master Plan is to be supplemented by a system of local roads. The Mission has not dealt with this aspect in the Plan except insofar as it affects the organization of the Roads Department.

73. Some principal recommendations of the Plan are:

- a strengthened Roads Department having the skill, competence and equipment to maintain roads and airport runways properly, and to assist the Panchayats in doing supplementary work;

- construction of a National Highway System of approximately 2,500 miles reaching all of the more heavily populated regions of the country;

- providing the means for creating a system of Panchayat roads --- generally local roads built and maintained by the Panchayats;

- establishing a system of ten commercial airports having 5,000 ft. paved runways and designed for year-round service by RNAC;

- a reorganized Royal Nepal Airlines Corporation equipped with better planes and designed to operate as a self-supporting commercial airline;

- provision of three cross-border meter-gauge terminal railways closely tied to the Indian Railways and designed to simplify customs and reduce handling costs;

- rehabilitation of the NJJR narrow-gauge cross-border line from Jaynagar to Janakpur;

- improved operation and management of the Kathmandu ropeway;

- creation of a system of automobile and truck servicing and maintenance depots.

74. The Plan also contains provision for future adjustments to allow for changes in anticipated rates of growth or availability of funds, discovery of major mineral deposits having commercial value, etc. --- none of which can be accurately predicted at this time.

75. Very roughly it appears that all of the essential elements in this Master Plan can be built in about 30 years at an annual level of effort and with financial resources not substantially greater than are being counted upon for this coming Plan period. With more effort and more resources, it could be built sooner. In other words, it is a plan capable of achievement within a reasonable period of time.

76. In the following pages, the individual components of this overall Plan are presented and discussed briefly. A more detailed discussion of each segment of the Plan and its background appears in Chapters 3 and 5.

77. A map outlining the general Plan appears on the following page.

A. The Road Transport Plan

78. The Road Plan presented here is based on the following:

- establishing a classification of roads, including a distinction between national highways and Panchayat roads;
- strengthening the Roads Department (to be called the Roads Authority) for better handling of maintenance, improvement and construction work;
- mobilization of the Panchayats for road construction and maintenance;
- development of a national system of highways.

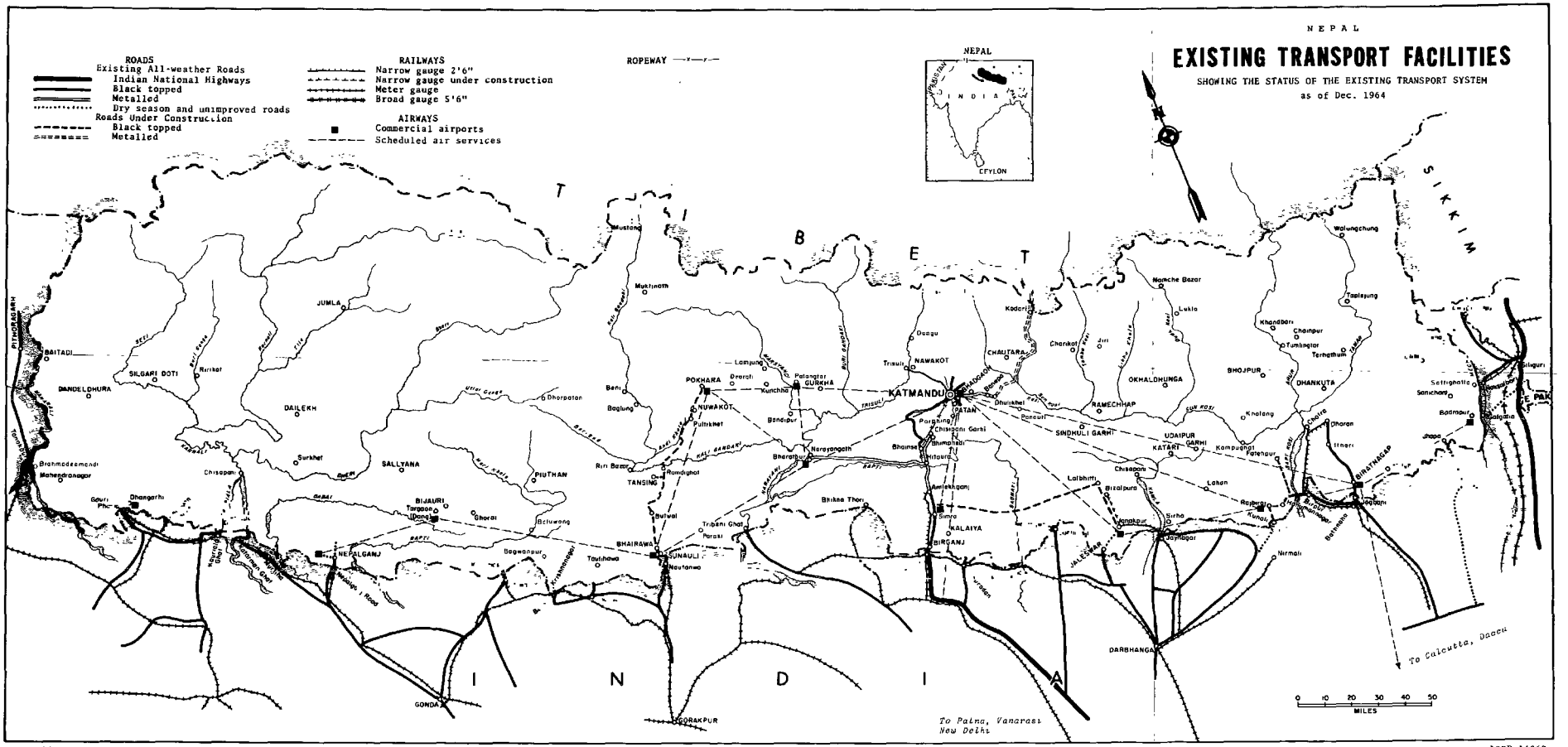
79. The development of a National Highway System must necessarily be spread over a long period of time due to the high level of investment involved. However, the rationalization of road construction and road maintenance is a timely and critical problem in need of immediate and continued attention.

80. In making this Plan the Mission has attempted to take a conservative view of what is possible of achievement. There could occur a favorable combination of circumstances which would make possible larger efforts than are provided for in this Transport Plan.

81. (a) Classification of Roads and Distinction between National Highways and Panchayat Roads. The Mission advises there be two distinct systems of roads in Nepal. The first would be a system of heavily used all-weather roads, called the National Highway System. This would constitute the skeleton on which local systems of dry-season roads and/or trails can be based. The National Highway System must serve all areas with heavy population density but be kept as short as possible. The second would be all roads outside the National Highway System and would be mainly local roads. The first is in charge of a centralized, well-equipped and well-staffed organization called the Road Authority. The second is in charge of the Panchayats.

82. There are three reasons behind this recommendation:

- The construction and maintenance of all-weather roads in difficult terrain is very expensive. With a limited budget and a limited staff there is danger in trying to extend a national system too far. The RTO experience shows the dangers of trying to do too much too quickly. It also demonstrated the futility of building long mileages of low-standard roads which rapidly become useless.



JUNE 1965

IBRD-1486R

- The full cost of maintaining all-weather roads is high. If it is intended to have the new Road Authority operate within the general level of receipts from road-cess and other user taxes, care must be taken to include only heavily-trafficked roads in the program requiring constant care. In general, routes having less than 10,000 tons' traffic a year cannot be justified economically and should not be included in the system. Roads with over 50,000 tons should automatically be included. The financial impact of maintaining roads having low density of traffic is explained in Chapter 6, Paragraph 24.

- The Panchayats have demonstrated a willingness to build local roads. They have also shown that if they are directly concerned and responsible they will work with stronger energy and will display more interest in maintaining the roads they build. It seems to the Mission that in a country with so many remote areas, this represents an effective way to mobilize Panchayat forces and resources as a means of reducing the burden on the Central Government.

83. One must accept that in some cases there will be local roads constructed by the Panchayats which generate sufficient traffic to justify building and maintaining an all-weather road. When this occurs, these roads should be offered to the Road Advisory Commission for possible classification as a part of the National Highway System. This will happen most often in the case of roads which are built locally and earlier than anticipated in the Master Plan, along with some local sections not included a priori in the Master Plan.

84. The classification of roads involves both administration and finance. The Mission proposes a very simple classification:

National Highway System. This includes all roads built and entirely maintained by the Road Authority. The roads to be included in this system will be proposed by the Road Advisory Commission. (For a description of the Road Advisory Commission, see Chapter 7, Paragraph 2.)

Panchayat Roads. This category includes all roads built and maintained by the Panchayats. Among these, we propose selecting and separately identifying those roads which have real economic or geographic interest or value. These would be called "Panchayat classified roads," and would be eligible to receive some technical or even financial help for construction or improvement from the new Road Authority. Their maintenance would be the exclusive responsibility of the Panchayat. The "Panchayat classified road system" should include those Panchayat roads which are in the Master Plan scheme but constructed locally in advance of the Master Plan.

Trails. This category includes those tracks and trails maintained by the Panchayats or villages (by definition trails are footpaths and are not motorable). As in the preceding category, some of these could be officially recognized as "classified tracks and trails" and be eligible for technical and, in limited cases, financial help from the new Road Authority. In this way, assistance can be provided for meeting more troublesome problems, such as suspension bridges.

85. The precise classification of specific segments of roads into the National Highway System, Panchayat classified roads, classified tracks and trails, should be proposed to the Government by the Road Advisory Commission after careful examination of all the economic and financial consequences of such a classification.

86. (b) Strengthening the Roads Department. Until recently the total mileage of all-weather roads in Nepal was low. All major expansions of the road system have generally come from foreign organizations which have both constructed and maintained the roads. The Roads Department section of the Ministry of Public Works, Transport and Communication is weak, poorly organized, and generally in no condition to handle the mounting problems of highway construction and maintenance. Recognizing that this condition cannot go on indefinitely, the Government has started some reorganization of the Roads Department, and is interested in evolving a practical means for assuming its responsibilities.

87. When the Mission arrived in Nepal the Roads Department was a single entity in name only. It consisted of three basically independent organizations, their only tie being to the Joint Secretary of the Ministry:

- the Kodari Road Project Office;
- the East-West Highway Department; and
- the Roads Department itself.

88. The two former were responsible for the construction of the specific roads named; the last was in charge of construction and maintenance of all other roads, and of some suspension bridges along the trails and tracks.

89. The Roads Department has a central office in Kathmandu, seven divisions, and eight sub-divisions. Some of these divisions exist only on paper, and most of those which do exist in reality are poorly staffed.

90. In order to cope with this situation, it is recommended that the three present organizations be consolidated into a single organization with a single head and a common supporting staff to be known as the Road Authority. This paper organization must then be staffed with competent people. Its principal activities will be to:

- maintain, and in some cases improve, all roads in the National Highway System;

- give technical assistance to the Panchayats for the construction of roads, bridges, and improvement of difficult sections of trails;

- build new all-weather highways.

91. The basic features of the new organization will be:

- a strong central organization, including a reinforced planning and engineering design section;

- permanent local divisions, much stronger than at present, and having adequate mechanical equipment. These will be the actual work groups handling road maintenance, road improvement and Panchayat assistance;

- temporary agencies for construction of major new road projects;

- centralized heavy equipment divisions for ownership, staffing and maintenance of heavy road equipment for use by the local divisions.

92. A specific plan for reorganizing the Roads Department is given in Chapter 7.

93. (c) Mobilization of the Panchayats for Road Construction and Maintenance. The Panchayats can supply voluntary labor as well as finance for local road projects. However, these by and of themselves are not sufficient to avoid waste of limited resources, so some organization is necessary. Projects have to be drawn up, some construction has to be engineered, and the work has to be supervised in order to maximize the utilization of available resources.

94. The Mission recommends:

- the use of technicians within the district Panchayats. These overseers or engineers should be recruited and paid for by the Panchayat and be a permanent member of the Panchayat organization. Such technicians must be able to organize and manage small works such as construction of culverts and tracks. They also must be able to prepare cost estimates and present projects to the Panchayat Council for allocation of the necessary money and labor. The overseer will also be the normal channel of communication between the Panchayat and the local division of the new Road Authority.

- The local road division should assist each Panchayat:

    - in doing more complicated engineering work. For example, it should assist in the location of a difficult bridge or prepare the drawings for this bridge. While the Road Authority can provide some technical assistance, the Panchayat will be required to reimburse it for all assistance given.

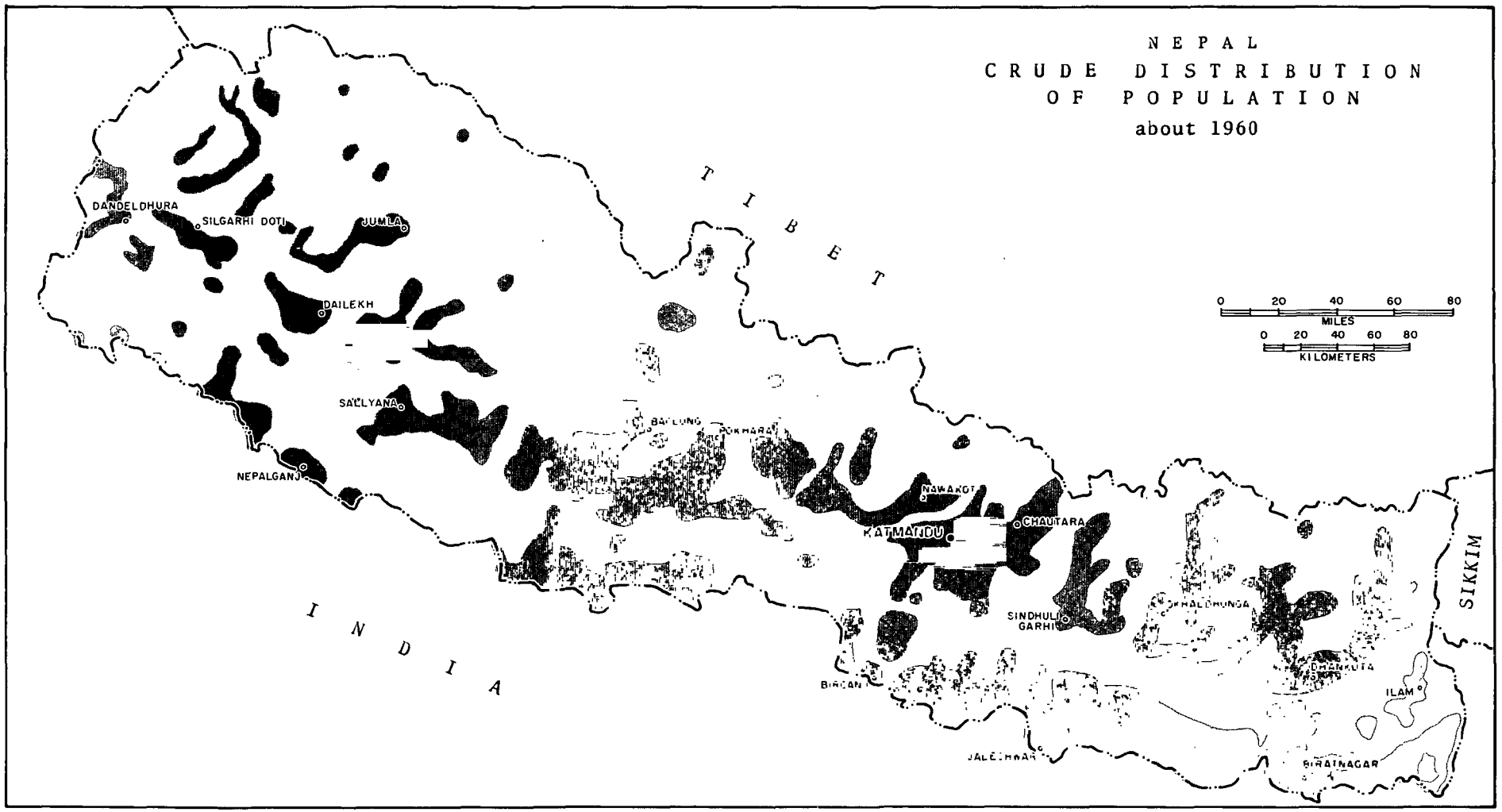
    - with mechanical equipment such as trucks, motor graders, etc., in order to build or maintain Panchayat roads. This help will be given on request and should be paid for by the Panchayat.

95. It may be possible for the Central Government to interest a group of Panchayats in associating themselves in order to construct a section of the National Highway System, using locally generated finances, in addition to planning and building local roads. The responsibility for the whole project, however, should rest with the Road Authority. Such contributions from Panchayats would hasten the pace at which the National Highway System can be constructed.

96. (d) The Development of a National Highway System. As has been explained elsewhere, there is no long-term plan for a road system in Nepal. The only existing firm intent is to build a highway from east to west. There is no clear or consistent policy with respect to north-south roads. Against this background, the need for a long-term plan for roads is quite apparent. It will facilitate building an integrated road system on a coherent basis and without waste. It will let everyone know in advance where and when good, all-weather roads will be laid.

97. General Pattern of the National Highway System. There are two broad population concentrations in Nepal (see the following population distribution map): one along the Terai, and the other in the Hills somewhat back from the Terai. Between the two there is a zone of forest with poor and unstable land, which is lightly populated. The largest volumes of trade and the most important traffic is generally north-south. However, because the country is a long east-west strip there is need to provide some internal linkages between east and west.

98. In the mountains it appears that porters tend to follow a "crow's flight" route, ignoring the ups and downs of the trails. These trails are often so steep and tortuous that it is impossible (or, at the least, inadvisable) to follow their alignment with a motorable all-weather road. Having studied the problem carefully, it seems to the Mission that the best general strategy to use in preparing a master plan is to follow principal river valleys. In this way, construction, maintenance and transport costs all can be reduced.



JUNE 1965

IBRD-1487R

99. In the Terai, north-south routes present few problems, and are generally easy and economical to construct, because they can follow the local watersheds and thereby generally avoid wet ground and river crossings.

100. More troublesome is the problem of east-to-west linkages along the Terai --- the most obvious route for running the length of the country. From a purely technical and cost point of view, the best route for such a linkage is at the northern edge of the Terai at the base of the foothills. Here river crossings are easier, and construction material (principally gravel) are in abundant supply. This is the route which had already been selected for the main border-to-border East-West Highway when the Mission arrived in Nepal. However, the selected route completely bypasses all principal areas of population and of agriculture and industrial activity. These are generally located farther south in the Terai, near the Indian border. Often greater economic benefits can be obtained from a road serving these areas to the south, even though costs would be higher. Further, estimates prepared by the Mission indicated that the volume of through traffic over the longer linkages would be small.

101. This Mission is of the view that an east-to-west highway is necessary from an administrative point of view. Upon examining the problem closer and in greater detail it was found that a system of roads having local utility and value could be linked to provide a through highway. In this way, the resulting highway would have both administrative and economic value. The economic justification of the route proposed relates to access to local and central markets, movement of commercial and export crops, greater concentration of north-south cross-border traffic, improved agricultural development resulting from access to more markets, etc.

102. Specific Pattern of a National Highway System. In order to clarify the discussion of the Plan, and to organize our material in a presentable form, we have set out some 12 geographical divisions or areas based solely on transport planning and engineering considerations. These areas are shown in green on Map 2 (Page 34). Individual reports on each area appear in Chapter 5 and summarize all known data, as well as listing existing facilities and needs. In this way the individual components of the scheme can be studied separately.

103. The Master Plan. A map showing a master plan for highways appears on Page 34. This is the proposed National Highway System. The network shown represents 2,500 miles of road, of which 284 now exist and 734 are expected to exist at the end of the coming Plan period (1970). Of the total mileage, 2,500 represent the priority network. An additional 300 miles are second priority northern linkages to Tibet which might be added at some later date. About 30 per cent of the priority network is in the Terai.

104. Construction Standards for the National Highway System. Detailed specifications and standards are not needed for planning at this early stage. However, for the purpose of this Master Plan the Mission has adopted four generalized standards as shown in the following table. The technical information behind these selections is given in Chapter 6.

	Terai Asphalted	Foothills Gravelled	Kathmandu Valley Asphalted	Mountain
Design speed (km./hr.)	100	80	80	High as possible
Right of way (feet)	80	80	80-100	50-80
Formation width (feet)	34	32	32-48	15-30
Paving width (feet)	12	32	24	12-24 1/
Bridge or causeway width (in lanes)	1-2	2	2	1
Average cost (in thousands of NRs)	600-950	400	950	1,200-3,000

1/ Mountain roads will generally be gravelled but asphalted on steep sections, and width will be determined by local circumstances.

105. Need for Feasibility and Engineering Studies. The road system in the Master Plan is a first attempt at designing a National Highway System. In several instances it was impossible, within the limitations of this Mission, to establish the alignment, or even the general route itself, for particular roads, such as in the Sallayan-Piuthan area.

106. In the discussions by area concerning route locations (Chapter 5) when we say that a road must follow a valley, it is not intended that it should be built close to the bed of the river, but that it should make use of the generally large channel dug by the river either at the bottom, on terraces or even on top of the lower hills following the course of the river.

107. As is true on road projects throughout the world, it is necessary to have two kinds of supporting studies. The first is a feasibility study, which fixes the best alignment of the roads from both a technical and an economical standpoint. It also tries to evaluate the economic benefits to be realized to help in the choice of construction priorities.

The Mission advises the extensive use of feasibility studies in each area, and that these studies should form a part of the next two Plans so that the work for the entire country is completed within ten years. A list and definition of the feasibility studies recommended for the Third Plan are explained in Chapter 3. The remaining feasibility studies will be made in the Fourth Plan period. The second group of studies would be engineering design studies. These are purely technical; they are the specific engineering designs for each road section necessary for a contractor before he commences actual construction of the road.

108. Maintenance of Road Vehicles. Although it lies outside of the public sector, the matter of providing competently staffed and fully equipped automotive maintenance shops for use by the general public is of the greatest importance. Providing such facilities requires three essential ingredients, all of which are exceedingly scarce in Nepal today: 1) properly trained and skilled maintenance managers and mechanics; 2) the necessary machine tools; and 3) a reliable source of replacement parts.

109. A system of well-located repair and maintenance depots is an urgent necessity. However, bringing them into being in the private sector will require some specific action by the Government in order to facilitate the purchase and importation of essential tools and spare parts, and to encourage foreign nationals skilled in automotive maintenance to work in Nepal during a transition period while Nepalese mechanics and managers are being trained. With these thoughts in mind, the Mission recommends that NIDC be requested to give preferred attention to the establishment of automotive maintenance facilities.

B. The Railway Plan

110. Consideration was given to the construction of railways in the mountainous regions of Nepal and east-west in the Terai. These were ruled out as grossly uneconomic because of their cost and the small volumes of traffic available for movement by rail.

111. The present run-down condition of the Nepal Railways provides an opportunity for a complete reappraisal of their future role in the development of the country. This has been done as a part of the preparation of the Master Plan. Under this Plan, the principal function of railways in Nepal will be to facilitate and improve the movement of goods into and out of Nepal across the Indian Border. This will be done by, in effect, extending the most important Indian Railways into Nepal. These lines necessarily must be geared to the standards and operations of the Indian Railways line to which they are attached. For this reason, all lines (except one) are recommended as meter gauge with provision for conversion to broad gauge when and if the Indian Railways make the shift. Within Nepal each line would have a complete, independent railway station with its own customs staff and transfer facilities.

112. The Master Plan calls for the following railway developments:

- Construction of a new meter-gauge line from Raxaul-Nepal Siding to North Birganj (site of the present railway station) by way of a new alignment, roughly 1/2 mile to the west of the highway. The new railway would have a major terminal and customs station at North Birganj designed to facilitate movement of freight between truck and rail. Its principal purpose is to simplify and reduce the cost of moving freight across the Nepal-India border. At a later date, should industrial development and traffic so warrant, the line could be extended north to the Sugar Factory, Simra, or even Hitaura. See map on Page 66.

- Upon opening of the new line, close the present narrow-gauge Raxaul-Amlekhganj line.

- Construct a new meter-gauge switching line from Jogbani, about two miles, to a new combination freight-customs terminal in Biratnagar. See map on Page 67.

- Rehabilitate the present Nepal-Janakpur-Jaynagar Railway narrow-gauge line for use until the new highways serving Janakpur are completed and operational. Extension of the line north to Bizalpura and Lalbhitti should be completely dependent upon the planned development of forestry and timber, and of sand and gravel exports.

- The construction of a new meter-gauge line from Nepalganj Road (in India) about five miles to Nepalganj (in Nepal). As at Birganj and Biratnagar this would have a combination terminal-customs installation designed to facilitate rail-to-truck transfers, and to simplify and reduce the cost of moving freight across the Nepal-India border.

- No specific provision is made in the Plan for the Kosi Railway because it does not seem to have any natural function, and its future is so highly dependent upon what India does (or does not do) with the section from Bhimnagar and Birpur to Bathnaha. (There are proposals, as yet undecided, to convert it to meter gauge and link it to the Indian Railways at Bathnaha and perhaps Nirmali.)

113. Consideration was given to several other proposals for a railway north of Birganj, including extension to Simra and Hitaura, all of which were rejected for economic reasons. Further details are included in Chapter 8.

C. Ropeways

114. The Master Plan specifically and explicitly calls for the continued operation of the new ropeway between Hitaura and Kathmandu. This is a vital transport link between the Terai and the populous Kathmandu Valley. Because of the high cost of transport on the Tribuwan Rajpath, and because of its limited capacity, it is extremely important that this ropeway be kept in good mechanical condition and be operated efficiently and well at all times.

115. The Government's ability to realize the maximum economic benefit which is presently available in the ropeway depends heavily upon the competence of the management to which it is entrusted. Allowing it to operate at a loss will reduce the resources available to the Government to finance other important development projects essential for the growth of the economy.

116. As was stated earlier, ropeways are considered as too expensive and too inflexible to be practical tools for the opening and development of the inaccessible mountain areas of Nepal. Even so, special consideration was given to the possibility of constructing a ropeway from Dharan Bazaar to some point at or near Dhankuta. Although a ropeway can be built for less than the cost of a road, it was rejected because:

- There would be no immediately available, reliable source of electric power along the route.

- It would be unable to handle people.

- It is very inflexible as to the types of commodities it can carry.

- It requires trained and skilled mechanics to provide the continuing maintenance required to keep its operation economic.

- It would further drain the extremely limited supply of competent managerial staff who could be utilized far more profitably elsewhere. Without competent management, the ropeway would be costly and not economic.

- It would not provide any substantial transport improvement for the large population in the Arun-Tamar basin which lives two or more days' walk from Dhankuta.

117. The ropeway was rejected in favor of a road network as described in the road section of the Plan.

118. Consideration was also given to the construction of ropeways from Narayangath to Bandipur, and from north of Nepalganj to Surkhet and/or Dailekh. These were rejected in favor of road networks for the same reasons cited above.

D. Waterways

119. No specific provision is made in the Plan for the construction or operation of waterways.

120. The extreme variances in water level and water velocity which prevail in Nepal's principal rivers between the dry and the wet season make year-round operation of constructed waterways almost impossible. The construction of canals, dams, locks and other devices which could be built to overcome these problems is far too costly to be supported by the low levels of traffic now prevailing, or in sight for the next 15 to 20 years. Further, these facilities are expensive to operate and maintain.

121. However, this does not mean that existing natural water routes cannot or should not be used to the maximum extent possible on an ad hoc basis, without new fixed investment.

E. The Air Transport Plan

122. During the early stages of development in Nepal, air transport is playing and will continue to play an important role in bringing transportation into remote areas. With the growth of the National Highway System envisaged in the Master Plan, air transportation's place in the economy of Nepal will be in the rapid movement of people and goods over longer distances. In a mountainous country, such as Nepal, the economic benefits of air transportation are greater than in more tractable areas.

123. The Master Plan deals with four aspects of aviation. These are:

(a) Organization of Civil Aviation;
(b) Royal Nepal Airlines Corporation;
(c) Royal Flight; and
(d) Airports.

124. (a) Organization of Civil Aviation. The Mission recommends strengthening the Civil Aviation Department within the Ministry of Public Works, Transport and Communications. The present organization is not adequate to meet the growing needs of aviation in Nepal. The director of the Civil Aviation Department should formulate air services policy, be responsible for liaison with government departments, airlines, international organizations, and various aid missions and should oversee the management, operation and maintenance of the country's principal commercial airports. He should report directly to the Assistant Minister (Transport) in the Ministry of Public Works, and should have two assistants,

one dealing with Civil Aviation matters, and the other directly concerned with the management and operation of airports.

125. The Department should be provided with facilities to record, compile and collate the information needed to determine the trends and requirements of civil aviation in Nepal.

126. (b) Royal Nepal Airlines Corporation. The continued growth of RNAC's services is an essential part of the Mission's plan for the rapid economic development of Nepal. The impact of air transportation on the economic development of small mountainous countries has been successfully demonstrated in many parts of the world.

127. In the Master Plan RNAC is assigned three responsibilities: (1) to facilitate internal economic development of Nepal; (2) to earn foreign exchange for Nepal; and (3) to provide rapid and convenient communication between various parts of the country for administrative purposes. To enable the RNAC to reach these goals the following are recommended:

- RNAC should be given more freedom from day-to-day government intervention.

- The Government should provide capital needed for the operation and expansion of the airline, enabling it to operate its own budget independent of the Government.

- RNAC should make plans now for the early replacement of its present fleet of DC-3 planes.

- The internal organization of RNAC should be modified in such a manner that there is one general manager and three assistant managers, with all department heads reporting to the assistant managers. This is discussed in more detail in Chapter 10.

- RNAC should be supplied with the facilities and means needed for doing its maintenance and non-engine overhaul work at Kathmandu.

- RNAC should have one or two smaller planes which can be used for charter, government, and mail services at ICAO-approved STOL fields.

128. Other recommendations of the Mission are of short-term nature and are discussed under the Five-Year Plan in the following chapter.

129. (c) Royal Flight. The Royal Flight generally serves non-commercial purposes. Because its planes are not registered with ICAO and are not licensed for civil aviation uses it should continue to be a strictly non-commercial operation.

130. (d) Airports. It will be necessary for the present alignment of commercial airports to go through a gradual period of change and adjustment as the National Highway System is extended into areas presently served by air. It is anticipated that the need for the continued operation of some airports on a commercial basis may gradually diminish. For this reason, the following airports should be the subject of further study as to their long-range commercial usefulness:

Bhadrapur - upon opening of the new road from Biratnagar.

Bharatpur - upon opening of the new road north to Bandipur, Gurkha and Pokhara.

Dang - upon opening the new road into the Western Inner Terai Rapti Valley connecting to Nepalganj.

Gurkha - upon opening the new road system connecting Pokhara, Kathmandu and Narayangath-Bharatpur.

Rajbiraj - upon opening of the new road from Hanumanagar and Biratnagar, and from Janakpur.

131. It is also anticipated that new commercial airports will be needed to serve mountain areas. Specifically recommended is the construction of a new field at or near the site of the present STOL field at Tumlingtar in the east. It is further recommended that there be feasibility studies concerning possible commercial airports in the Sun-Kosi basin (such as Okhaldhunga), in the northern Karnali area (such as Jumla), in the west at Silgari Doti, and relocation of the present Dhangarhi airport to a site nearer Mahendranagar.

132. The following existing commercial airports are recommended for long-term improvements:

Kathmandu - Construction of hangars, new terminal buildings, supply sheds, and rationalization of necessary support facilities such as lights, radio, maintenance shops, parking, etc.

Bhairawa - Extension and strengthening of the new runway to accept planes up to 100,000 lbs. gross weight.

Biratnagar - Construction of an entirely new major airport on a new location, with a 7,000 ft. runway capable of accepting planes up to 250,000 lbs. gross weight, terminal buildings, lights, staff quarters, hangar, workshop, and a goods storage godown.

Janakpur - Extension and strengthening of the new runway to accept planes up to 100,000 lbs. gross weight.

Nepalganj - Construction of an entirely new airport, possibly in a new location, capable of eventual expansion to include a 7,000 ft. runway which can accept planes up to 250,000 lbs. gross weight, and with provision for terminal building, lights, staff quarters, and a goods storage godown.

Pokhara - Construction of a 7,000 ft. paved runway capable of accepting planes up to 70,000 lbs. gross weight, new terminal building, staff quarters and freight godown.

133. Specific plans for each of the airports presently having air service are detailed in Chapter 10, beginning on Page 191 of Volume II.

134. In order to streamline air transport operations, it is also desirable that there be established a long-range program aimed at providing weather reports and forecasts at principal airports, plus some reliable means of communication between principal airports.

Chapter 3

THE TRANSPORT SECTOR OF THE THIRD PLAN 1965/66-1969/70

Finance for the Transport Sector

1. For the Five-Year Plan, a tentative allocation of NRs 460 million was made for the transport sector by the Government with the following distribution of this allocation among the various modes of transport:

	in million NRs
Roads	410.0
Aviation	35.0
RNAC Improvements	15.0
Ropeway	No allocation
Railways	"
Waterways	"

2. It was estimated that 25 per cent of this finance would be in local currency and 75 per cent in foreign exchange. It was assumed that the foreign exchange component would be contributed in the main by the United States, India, the U.S.S.R., Mainland China, and possibly the United Kingdom. The exact amount of each individual contribution was not yet known.

3. In working with these targets the Mission further assumed that:

(a) There is a small element of flexibility in these ceilings and, if essential projects are identified which require additional financing, a small amount resulting from savings in other sectors could be transferred to the transport sector.

(b) If it is essential, a part of the local finance component could also be made convertible into foreign exchange.

(c) The above ceiling covers only development expenditures and the capital costs of maintenance installations. The current expenditures on maintenance and management (including routine betterment and improvement) of the Roads and Aviation Department will be a charge on the regular budget of the Government.

(d) The above ceiling includes expenditures already committed for roads and aviation, to the following extent:

Roads	NRs 283.0 million
Aviation	NRs 17.5 million

(e) The ceiling does not include the cost of work on feeder roads, air strips, suspension bridges, etc., to be done by the Panchayats which would contribute to an expansion of the transport facilities.

(f) The ceiling includes only a minimal provision for purchase of new aircraft by RNAC.

(g) A small investment may be required in the railways but this will not disturb other targets to any significant extent.

(h) The total cost of projects to be started in this Plan period would exceed the financial target set for the Five-Year Plan period.

4. In looking at the Government's tentative financial allocations, the Mission observed that approximately one-third of the total planned expenditure in the public sector was allocated for transport development. This appeared as a reasonable starting point for the Mission's inquiry. As stated above, however, nearly 65 per cent of this expenditure had been committed to projects before the Mission's work began, leaving only approximately 35 per cent to be planned for. The Mission reviewed the projects for which commitments had been incurred, and made recommendations for changes which are incorporated in this Plan. The Mission then attempted to construct a five-year transport plan in physical terms taking into consideration Nepal's needs and performance capacity. The cost of the projects thus identified exceeded the resources tentatively allocated. The projects were then subjected to a further screening on the basis outlined in the subsequent section of this chapter to arrive at the Plan which is presented here. The financial requirements that emerged were as follows:

	in million NRs
The Road Plan	423.54
The Air Transport Plan	84.00
The Ropeway Plan	--
The Railway Plan	9.20
The Waterway Plan	--
The Pipeline Plan	0.30
	517.04

5. This total exceeds the allocation in the Government's tentative framework by NRs 57.04 million. The road allocation exceeds the original target by NRs 13.54 million, the aviation and RNAC allocation by NRs 34.00 million and the railway allocation by NRs 9.2 million.

6. The major item contributing to the increase is the purchase of aircraft for RNAC which hitherto had not been brought into the Plan's financial framework. It is the Mission's view that this expenditure should be integrated into the Plan as it is an essential part of the Mission's recommendations relating to air transport. Its inclusion will also give the Government a clearer picture of its financial commitments.

7. These new investment targets must be reconciled with the original targets, in consultation with the Government of Nepal, at the time the draft Plan is presented to them for their concurrence. At that time, the Government itself will have a clearer picture of the financial resources available and of other sectoral priorities.

Selection of Projects

8. In selecting projects from the Master Plan for inclusion in the Five-Year Transport Plan, the Mission accepted, with some modification, those projects for which funds had already been committed by the Nepal Government. These absorbed nearly 65 per cent of the allocated resources. In selecting projects for the remaining 35 per cent, first priority was given by the Mission to maintenance and improvement of important existing transport facilities and to strengthening the administrative capacities of their managerial organizations. In recognition of the urgent need for rapid expansion of the Road Plan, the Mission gave second priority to assignment of funds for advanced feasibility and engineering studies, so that additional construction projects would be ready for financing early in the subsequent Plan period. Third and last priority went to the initiation of new construction projects selected from the Master Plan.

9. The basic method used by the Mission for selecting construction projects was, as far as practicable, by measuring cost against returns and benefits. In a few cases, such as the railway, a straightforward analysis was possible. But in most cases, available data are scarce. In the absence of sufficient reliable economic data, it was necessary to use the collective judgment of the Mission. Even so, the selection was especially difficult because the need for improvement and expansion of transport in all parts of Nepal is very urgent. From the data available to the Mission, it was judged prima facie that many investments would yield economic returns, some well in excess of their costs over a 15-year period.

10. The selection had to be made from among the urgently needed and economically feasible projects within the limits set by the availability of financial and administrative capacity.

11. Basically, the system used for selecting the projects presented in the Third Transport Plan was as follows:

(a) The Mission identified the geographical areas most urgently in need of transport.

(b) All the projects suggested by the Master Plan in these selected areas were sifted through and each one measured as far as possible against available economic data. Those appearing to have higher economic return were selected.

(c) Because available economic resources are so very limited and road construction costs in Nepal are so high, due to topographic features, a further screening was made on the basis of quick-yielding investments.

(d) The final selection was made on the basis of the Mission's judgment using three additional general considerations:

(i) projects involving large investments in areas where transport facilities already exist were given a later priority, in order to avoid unnecessary duplication;

(ii) projects were allocated so as to have some in areas of immediate need, some in areas of maturing need and some in areas of future need;

(iii) the necessity of having a reasonable geographical distribution of the investment in all major parts of the country.

12. As far as possible some attempt has been made to quantify the benefits of the investments proposed. In the case of railways and air transport, which are organized on some sort of commercial basis, this proved possible to do. In the case of roads, no straightforward comparison of costs and benefits could be made. For its own guidance, however, the Mission did attempt to work out some crude calculations to establish a prima facie case for each of the new investments recommended in road construction. Because of the very tenuous nature of the calculations, they have not been included in the report. In attempting these calculations, it was recognized that these investments would give Nepal specific and direct benefits, as well as many general and indirect benefits. The indirect benefits may, in the long run, be more important than the direct benefits. The more specific and direct benefits are set out in the respective sector plans as a justification for each investment. All these benefits will not of course flow automatically. They are dependent to one degree or another on government policy and the actions taken to support that policy. In this regard the coordination of transport with developments in the other sectors of the economy is most important.

The Third Plan (1965/66-1969/70)

13. In essence the Mission's program consists of the following kinds of activity:

(a) rehabilitation of existing facilities, such as the railroad, to replace deferred maintenance necessary to permit them to operate effectively and to handle the traffic which now presents itself;

(b) strengthening the administrative capacity of existing transport organizations to facilitate planning, maintenance and improvements in road transport and aviation;

(c) feasibility studies to permit the identification and ordering of future investment in a considered and rational manner;

(d) new construction, particularly on roads, to fill the existing requirements and expand the capacity to meet predictable traffic growth.

14. Finance is provided for the following types of projects:

(a) construction of 13 new roads;

(b) construction of one new commercial airport;

(c) improvements to existing roads, airports and railways;

(d) completion of airport projects now under way;

(e) construction of two new terminal railways;

(f) reorganization of the Ministry of Public Works, Transport and Communications; the Roads Department; and of the Royal Nepal Airlines Corporation;

(g) purchase of new equipment for RNAC.

Summary Table

FIVE-YEAR TRANSPORT PLAN
1965/66-1969/70

	Expenses in Millions of NRs					
	Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
The Road Plan						
Strengthening the Roads Department	9.24	1.10	1.79	2.10	2.15	2.10
Feasibility Studies	5.50	1.80	3.30	0.20	0.20	-
New Road Construction Projects	125.80	2.50	4.20	8.00	46.40	64.70
Previously Committed Projects	283.00	85.80	88.20	82.00	27.00	-
Total Road Plan	423.54	91.20	97.49	92.30	75.75	66.80
The Railway Plan	9.20	1.20	4.80	3.10	0.10	-
The Ropeway Plan	-	-	-	-	-	-
The Pipeline Plan	0.30	0.30	-	-	-	-
The Air Transport Plan						
Airports	32.80	8.86	6.13	5.88	5.83	6.10
Civil Aviation	.55	.12	.15	.15	.07	.06
RNAC Immediate Capital Needs	11.40	2.59	4.20	2.73	.94	.94
RNAC Purchase of New Planes	39.25	8.00	8.00	8.00	8.00	7.25
Total Air Transport	84.00	19.57	18.48	16.76	14.84	14.35
GRAND TOTAL	517.04	112.27	120.77	112.16	90.69	81.15

A. The Road Plan

15. The Five-Year Road Plan is made up of three principal parts, each of which is discussed briefly in the following text:

(a) a program for strengthening the Roads Department;

(b) a program of feasibility studies;

(c) specific construction projects.

NEPAL

MASTER PLAN

STATUS OF EXISTING TRANSPORT-SYSTEM
as of Dec. 1964

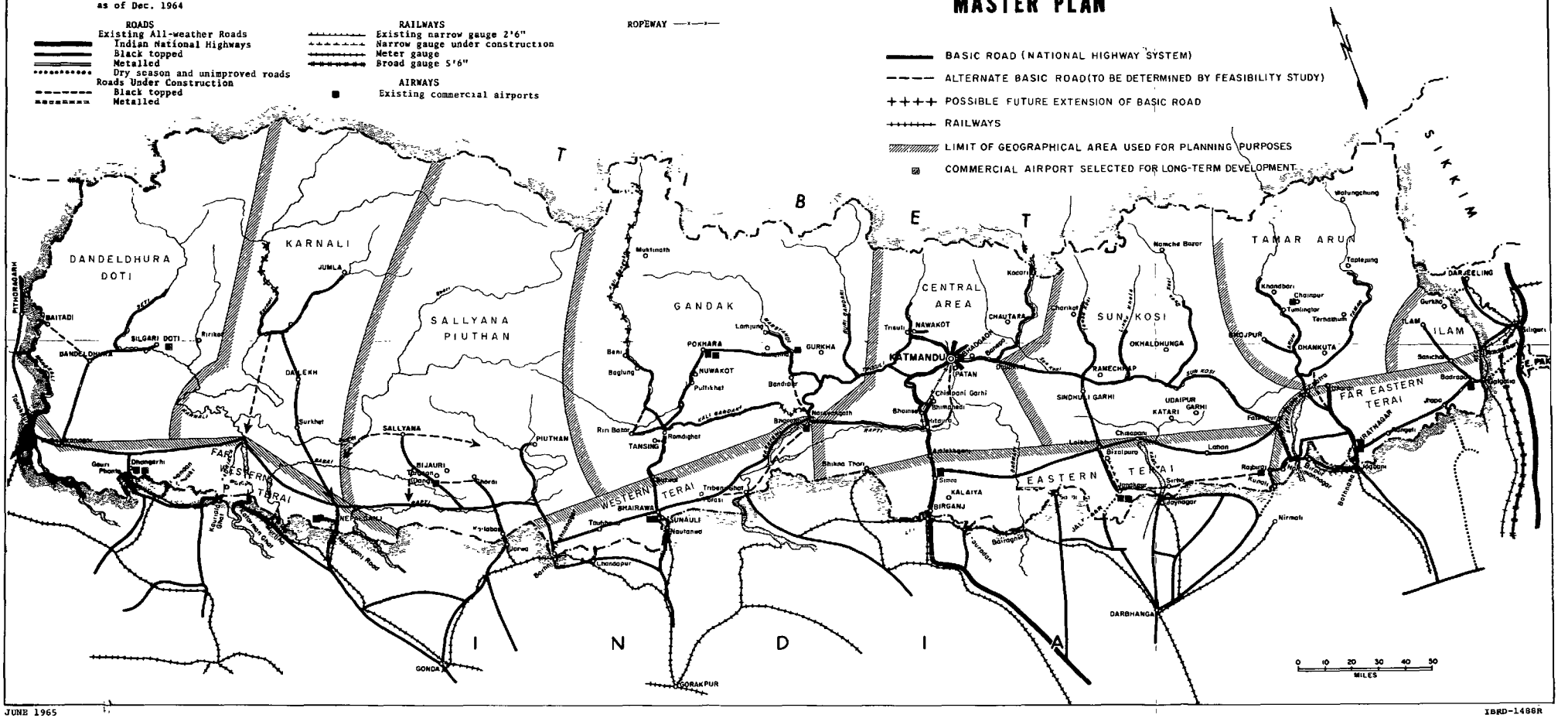
ROADS
- Existing All-weather Roads
  - Indian National Highways
  - Black topped
  - Metalled
  - Dry season and unimproved roads
- Roads Under Construction
  - Black topped
  - Metalled

RAILWAYS
- Existing narrow gauge 2'6"
- Narrow gauge under construction
- Meter gauge
- Broad gauge 5'6"

ROPEWAY

AIRWAYS
- Existing commercial airports

- BASIC ROAD (NATIONAL HIGHWAY SYSTEM)
- ALTERNATE BASIC ROAD(TO BE DETERMINED BY FEASIBILITY STUDY)
- POSSIBLE FUTURE EXTENSION OF BASIC ROAD
- RAILWAYS
- LIMIT OF GEOGRAPHICAL AREA USED FOR PLANNING PURPOSES
- COMMERCIAL AIRPORT SELECTED FOR LONG-TERM DEVELOPMENT



16. (a) Strengthening the Roads Department. The general organization of the department is modified so there is a single head to the organization, proper administrative and planning staff services are added and operations are separated between heavy equipment, road maintenance and road construction. This is shown in the organization chart which appears in Chapter 7, Page 168.

17. This proposed organization requires investment support in order to provide the buildings and heavy road maintenance equipment necessary for the proper conduct of its work assignments.

	Expenses in Thousands of NRs					
	Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
Central Laboratory building	130					
Furniture	20					
Fixed Laboratory equipment	40					
Mobile equipment (2 trucks and field equipment)	150					
Total	340	100	240			
Heavy Equipment Department						
Major repairs to existing equipment	2,000					
Replacement of retired maintenance equipment	2,000					
Additional maintenance equipment required for expanded work assignments	1,700					
Total	5,700	1,000	1,100	1,200	1,200	1,200
Replacement and improvement of fixed equipment in the Kathmandu and Hitaura Mechanical Division garages	200		100		100	
Construction of a new local division office building	400					
Furniture and office equipment	150					
Mechanical fixed equipment	200					
Total	750		350	400		
Opening of a second new local division	750				350	400
Purchase of mobile equipment (cars, jeeps, trucks and rollers)	1,500			500	500	500
GRAND TOTAL	9,240	1,100	1,790	2,100	2,150	2,100

18. The details of the recommended strengthening program are given in Chapter 7 of this report. In summary, the following principal moves are made in creating the new Roads Authority:

- The whole operation is consolidated under a single administrative head.

- A new Road Advisory Commission is created to assist in dealing with difficult problems of general policy.

- The Administrative Department is strengthened to handle matters of personnel, accounting and procurement.

- The Planning Department is strengthened and reorganized to handle long-range planning (including coordination of Panchayat road programs), road and bridge engineering design, and soil testing.

- A Heavy Equipment Department is formed to handle all matters related to the ownership, maintenance and use of mechanical road maintenance equipment. This Department will train and supply qualified operators as well as handle all matters of servicing and maintaining the equipment.

- A Maintenance Department is created for the purpose of coordinating all road maintenance work. This organization will have local division headquarters wherever there is sufficient work to justify it.

- A new Road Construction Department is formed by combining the construction activities of the present Roads Department. It is planned that all actual construction work will be done by contractors. The principal work of this division will be to maintain all relations with contractors and to provide on-the-site supervision of the work. This work will require senior engineers.

19. (b) Feasibility Studies. Eight studies are recommended in order to prepare for the initiation of major construction projects in the Fourth Plan, 1969/70-1974/75:

	Expenses in Millions of NRs					
	Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
Highway Feasibility Study Projects						
Far Eastern Terai and Ilam	0.4	0.2	0.2	-	-	-
Tamar-Arun Basin	0.7	0.3	0.4	-	-	-
Sun Kosi Basin	1.2	0.4	0.8	-	-	-
Eastern Terai	0.6	0.2	0.4	-	-	-
Gandak Area	1.1	0.3	0.8	-	-	-
Western Terai	0.4	-	-	0.2	0.2	-
Parasi-Taulihawa	0.2	0.1	0.1	-	-	-
Sallyan-Piuthan area	0.9	0.3	0.6	-	-	-
	5.5	1.8	3.3	0.2	0.2	-

20. These feasibility studies are deliberately concentrated in the first two years of the Plan period so they can be combined into two major contracts large enough to attract consulting engineers of high caliber. The Narayangath-Parasi project is delayed solely because of the problems associated with the Gandak Dam, which probably will not commence for about two years.

21. The areas selected for the feasibility studies shown in this Plan period (see Map 4) cover most of the highway projects in the Master Plan, with the exception of the Central area and the areas in the Far West. The Central area was omitted from this Plan because there is already a skeletal network of roads in being, and in this Plan period one new highway (the Kodari road), and some smaller roads in the Kathmandu Valley will be added. The Simra-Janakpur road will also connect into this network. The Far Western areas were excluded because the thinking in regard to this area is still in a pre-planning stage. The development of a road network will to a large extent depend on the outcome of the feasibility studies which are being currently conducted on the Karnali project.

22. (c) New Road Construction Projects (other than previously committed projects) are of three general types: border crossings into India (NRs 10.5 million), servicing high-potential Terai areas (NRs 98.6 million), and local service roads (NRs 9.4 million). The details are as follows:

Miles		Expenses in Millions of NRs					
		Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
3	Bhadrapur-Mechi	5.0	-	0.1	0.1	2.4	2.4
55	Biratnagar-Bhadrapur	53.4	-	0.9	0.5	20.0	32.0
46	Parasi-Taulihawa	45.2	-	0.4	0.8	18.0	26.0
8	Mahendranagar-Mahakali	5.5	0.1	0.2	1.2	3.0	1.0
6	Nepalganj Airport Road	3.2	-	0.2	3.0	-	-
-	Improvement of Other Roads and Bridges	12.0	2.4	2.4	2.4	2.4	2.4
-	Engineering Design Studies	1.5	-	-	-	0.6	0.9
		125.8	2.5	4.2	8.0	46.4	64.7

Bhadrapur-Mechi (border crossing). This is a three-mile road from Bhadrapur to the Mechi River, and a bridge across the river. The location of the bridge and the road will be fixed in the feasibility study of the Far Eastern Terai. Location and construction of the bridge will require negotiation with India. Estimated cost for the initial feasibility study is NRs 0.2 million, engineering is NRs 0.2 million, and construction NRs 4.8 million.

This road will be Nepal's eastern border gateway to India. In the first year following completion of the bridge, it is tentatively estimated that bridge traffic will be in the order of 40,000 to 45,000 tons. The opening of the road from Ilam will produce an additional 10,000 tons or so. The benefit of this road will come from two principal activities: the first is lower cost transport in the Bhadrapur-Galgalia area; the second is that this road provides a link whereby areas to the west (Jhapa, Rangeli and Biratnagar) will be able to reach Indian markets not easily accessible in all seasons (West Bengal and Assam). The route is of particular significance because it will provide the only direct access from Nepal to the broad-gauge lines of the Indian Railways.

A large measure of the benefit from this project will stem from the value of its linkage to the Biratnagar and Ilam roads.

Biratnagar-Bhadrapur (high potential Terai). This road will run about 55 miles from Biratnagar through Rangeli and Jhapa to Bhadrapur where it will meet the Bhadrapur-Mechi road described above. At Biratnagar this road will connect with the present route to the Kosi barrage and the road system reaching north and west from there. The alignment will be determined by the feasibility study at the start of this project. Estimated cost for the initial feasibility study is NRs 0.2 million, engineering is NRs 1.4 million, and construction NRs 52.0 million.

In the first year following the opening of this road, it is tentatively estimated that traffic will be about 40,000 tons at the Bhadrapur end and about 20,000 tons at the Biratnagar end. Traffic is expected to grow quite rapidly at the Biratnagar end as this area continues its growth as a major marketing and manufacturing center.

This is a very densely populated, very fertile area which provides the largest surplus of food grains. Therefore a major immediate benefit from this road, other than lower transport costs, will come from the ability of cultivators in the Biratnagar-Rangeli area to sell their food grains in West Bengal at substantially higher prices (the price differential between Bihar and West Bengal for rice is currently NRs 80 per ton). This road will also facilitate the development of forest processing industries in the Jhapa area.

As has been stated elsewhere in this report, the area between the Kosi River and the eastern border is one having very high production potentials, and where substantial past investments are now maturing. For the accumulated benefits of these past investments to be realized, immediate improvements in transportation are necessary.

Parasi-Taulihawa (high potential Teria). This is a 46-mile road reaching east and west from Bhairawa. The alignment will be developed by the feasibility study at the beginning of the project, but will probably follow the present dry-weather track. Estimated cost for the initial feasibility study is NRs 0.2 million, engineering is NRs 1.2 million, and construction NRs 44.0 million.

This road will perform four specific functions: (a) To channel existing import and export traffic which presently goes over the Indian border in many small streams into a principal market and export center at Bhairawa. This is tentatively estimated to be about 30,000 tons per year. (b) To provide a

means for moving a substantial part of the 90,000 tons of sugar cane needed for the new sugar factory in Bhairawa. (c) As the Master Plan matures this road will form a part of the connection to Narayanghat, Hitaura and Kathmandu on the east, and to Krishnanagar and Piuthan on the west. (d) This road will also connect with the new Sunauli-Pokhara road.

The Mission has identified this as an area where substantial new investment and economic activity will occur during this Five-Year Plan period. This will include:

- new and expanded economic activity at Bhairawa, such as new industries, expanded marketing and storage of agricultural products, and generally increased commerce;

- increased trade following the opening of the Sunauli-Pokhara road, particularly the movement of food grains to the mountains;

- new agriculture, power and industrial development arising from the Gandak project;

- a developing forest products industry.

Mahendranagar-Mahakali (border crossing). This is an eight-mile road from Mahendranagar, which is an important western center, to the Mahakali River and the Tanakpur Railway across the river in India. This will generally follow the present dry-weather track, and the location of the bridge will be determined by engineering considerations. Location and construction of the bridge will require negotiation with India. Estimated cost for engineering is NRs 0.3 million and for construction NRs 5.2 million.

This road will be the gateway from India to the Kanchanpur district of the Far Western Terai and to the Dandeldhura-Silgari-Doti areas in the Hills, and will help in the opening of these areas for future agricultural and forestry development. It is tentatively estimated that traffic on this road will be in the order of 20,000 tons in the first year of operation.

Nepalganj Airport Road (local service). This six-mile road is intended to replace a four-mile dry season road and a two-mile track. It will link the Nepalganj airport with the town. Estimated cost for engineering is NRs 0.1 million, and construction NRs 3.0 million.

Nepalganj is an area of future growth which must rely heavily on air transport in the early stages of its development. It is the only airport of importance in Nepal not connected to town by an all-weather road. This new road will also provide a base for locating new industries and other activities in Nepalganj as the city grows.

Improvement of other Roads and Bridges (local service). NRs 12.0 million has been provided for the construction and improvement of local service bridges and roads in Kathmandu Valley and elsewhere.

Engineering Design Studies. In addition to the investments itemized above, the Mission has provided NRs 1.5 million for engineering design studies to be taken up towards the end of this Plan period and based on the results of the feasibility studies, so that there will be some projects ready at the beginning of the subsequent Plan period.

23. (d) Previously Committed Road Projects. These are projects which were committed by the Nepal Government before the start of this Mission's work. The Mission reviewed all these roads, and found some with a higher rate of return than others. The Mission is of the view that the Government might have obtained better value if all these roads had been subject to feasibility studies in advance of actual construction. However, the Nepal Government has already made firm commitments on many of them, and funds have been disbursed and construction started on several. These projects, on which work has been started and funds disbursed, have been left intact. They have been carried forward into the Transport Plan as follows:

Miles		Expenses in Millions of NRs					
		Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
7	Rajbiraj-Kunali	3.4	2.0	1.4	-	-	-
27	Fatehpur-Rajbiraj		(included in Kosi Project)				
10	Kathmandu-Dashenkali	1.8	1.8	-	-	-	-
2	Kathmandu-Balaju	0.2	0.2	-	-	-	-
64	Kodari Road	40.0	20.0	10.0	10.0	-	-
84	Simra-Janakpur	97.0	20.0	35.0	35.0	7.0	-
128	Sunauli-Pokhara	137.0	40.0	40.0	37.0	20.0	-
-	Kathmandu Valley Bridges	3.6	1.8	1.8	-	-	-
322		283.0	85.8	88.2	82.0	27.0	-

24. The three other commitments which the Mission reviewed are:

Lalbhitti-Itari Road (NRs 140.0 million). In developing the priorities for its road projects, the Mission gave a higher priority to areas east of the Kosi River. It is also the Mission's view that the question of where this road should be located (foothills vs. lower Terai) is in need of further study. Provision has been made in the Plan for this feasibility study. Because crossing the Kosi River is a difficult and expensive proposition, the Mission believes this should be tied in with future Kosi River Dam projects, as spelled out in the Master Plan. For these reasons, the Mission has postponed this project to the Fourth Plan.

Janakpur-Jaleswar Road (NRs 7.8 million). Only a token expenditure has been incurred on this project to date. The Mission concluded that it would be better to make a smaller investment in the existing Jaynagar-Janakpur Railway. On this premise, the highway would merely duplicate an existing facility. The saving effected could be invested in other more urgent projects. Therefore this road has been omitted from this Plan period.

Birganj-Kalaiya Road (NRs 4.2 million). This road appears more in the nature of a feeder road than a part of the National Highway System. As such it has been taken out of the Plan, though it should be included in the development activities of the Panchayats concerned.

25. The Mission understands that the Nepal Government intends to enter into two further commitments, one of which aims at extending the east-west linkage from Naryangath to Bhairawa, and the other at permitting Mainland China to select another sector of road within the Master Plan for its already-committed funds. The Mission has already included in its recommendations construction of the section of the Naryangath-Bhairawa road between Parasi and Bhairawa. The only problem involved is the staging of the work so that it does not inflate the road budget in this Plan period (because of the danger of diverting resources from other vital sectors) and the difficulty of providing adequate road maintenance.

26. The Nepal Government has reached an agreement in principle with the Government of India covering construction of a 400-mile east-to-west highway linkage between Mechi River and Janakpur, and between Bhairawa and the Mahakali River on the western border. These linkages are provided for in the Master Plan, and it is understood construction will be phased in a manner that will not inflate the road program in any one Plan period.

B. The Railway Plan

27. A small program of investment for railways is recommended early in the Second Five-Year Plan for the purpose of reducing the cost, time, pilferage and damage involved in moving freight across the Nepal border to and from the Indian railheads at Raxaul and Jogbani. These sites were selected because of the large volumes of traffic crossing the border at these points (estimated to be 150,000 tons annually at Birganj and about 65,000 tons at Biratnagar). It is also recommended that the Nepal-Janakpur-Jaynagar Railway be rehabilitated between Jaynagar and Janakpur.

	Expenses in Millions of NRs					
	Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
Nepal-Birganj Terminal Railway						
Construction	3.0	0.3	2.7	-	-	-
Purchase of 20 freight cars	0.6	-	0.6	-	-	-
Biratnagar Terminal Railway of Nepal						
Construction	2.0	-	0.2	1.8	-	-
Purchase of 10 freight cars	0.3	-	-	0.3	-	-
Nepalganj Terminal Railway						
Feasibility Study	0.1	-	-	-	0.1	-
Nepal-Janakpur-Jaynagar Railway						
Rehabilitation and Construction	3.0	0.7	1.3	1.0	-	-
Economic Feasibility Study of Bizalpura and Lalbhitti Extension	0.2	0.2	-	-	-	-
	9.2	1.2	4.8	3.1	0.1	-

28. The first step in this program would be to negotiate an agreement with the Indian Railways to provide train operations on the three cross-border terminal railways suggested in the Master Plan: Nepalganj, Biratnagar and Birganj. The general idea is for the Indian Railways to provide all freight cars, use their own locomotives, and maintain all rolling equipment necessary for the operation of these terminal railways. The Indian Railways would bill each local Nepal railway separately for the actual cost of services provided. For its part the Nepal Government would buy the number of meter-gauge railway cars needed to offset those used on the Nepal Railways, as described in Chapter 8, and would contribute these to the Indian Railway meter-gauge rolling stock pool. It would also be desirable to have the Indian Railways maintain all track, charging the Nepal Railways for actual work performed at cost. The Nepal Railways could operate the terminals in

Nepal, collect all revenues and assume all responsibility for the operation. The role of the Indian Railways would be solely that of a contractor.

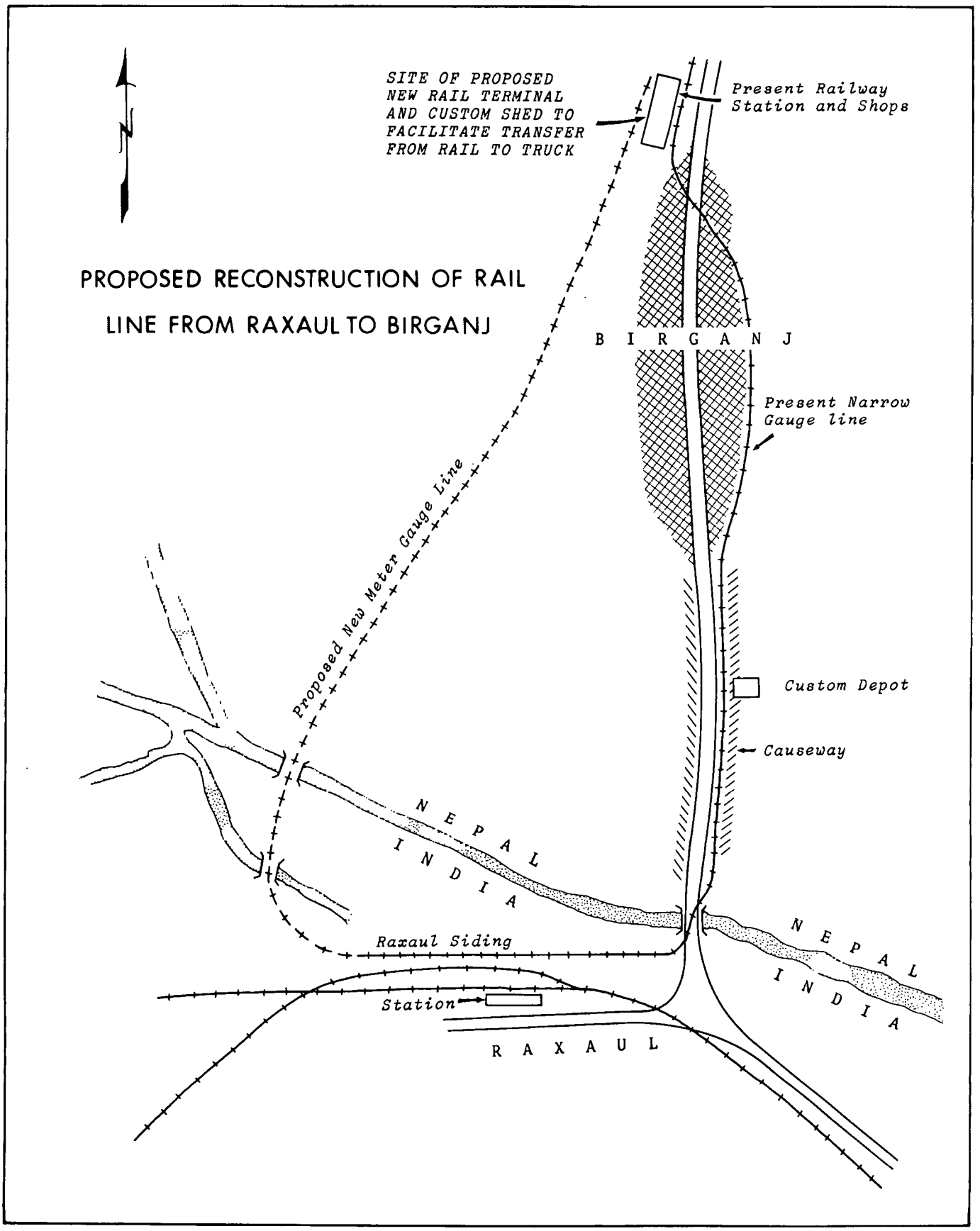
29. A vital part of the justification and economy of these cross-border railways lies in the design and operation of the new terminal facilities in Nepal. These should be designed by foreign engineers who have had experience with rail-truck-customs terminal handling. The Government should also make a special effort to find and train the administrators necessary to operate these terminals effectively.

30. The construction of a new Nepal-Birganj Terminal Railway is recommended. This would be approximately three miles long, would cost NRs 3.0 million, and would be constructed on a new alignment to the west of the present highway (see map following). It will perform a new function and will not simply replace the NGR. A new rail-truck-customs terminal would be constructed on the site of the present NGR station and shops. Construction of a petroleum storage facility here is not recommended so long as the existing one at Raxaul remains adequate. Engineering design work on this railway should follow completion of negotiations with the Indian Railways (possibly 1965/66), with construction in the second year of the Plan, 1966/67. There is no practical alternative to this Plan. Improvement of the highway, or construction of an entirely new road would cost about NRs 2.0 million, but would not solve the problem of high costs at the present Indian Railway terminal in Raxaul. The present NGR narrow-gauge line cannot perform the necessary terminal function because of the change of gauge at Raxaul.

31. Construction of a second terminal railway is recommended at Biratnagar, to be known as the Biratnagar Terminal Railway of Nepal. This line would be barely two miles long (see following map) and would cost NRs 2.0 million. The key to its justification lies in the design and operation of the terminal. The one difference from Birganj is that the new terminal should include some petroleum storage tanks. Engineering design work should be done in the second year of the Plan, 1966/67 with construction in the third year. The alternative to this Plan would be improvement of existing roads, estimated to cost about NRs 1.0 million which in turn would necessitate a major readjustment in local activities, and would still leave the Indian railway terminal handling problem unsolved.

32. The Master Plan makes provision for a third such terminal railway, the Nepalganj Terminal Railway. Although construction is not recommended in this Plan period, a feasibility survey of the proposed line should be undertaken in the last year of the Plan period. This survey would help establish the timing as to when this line should be built.

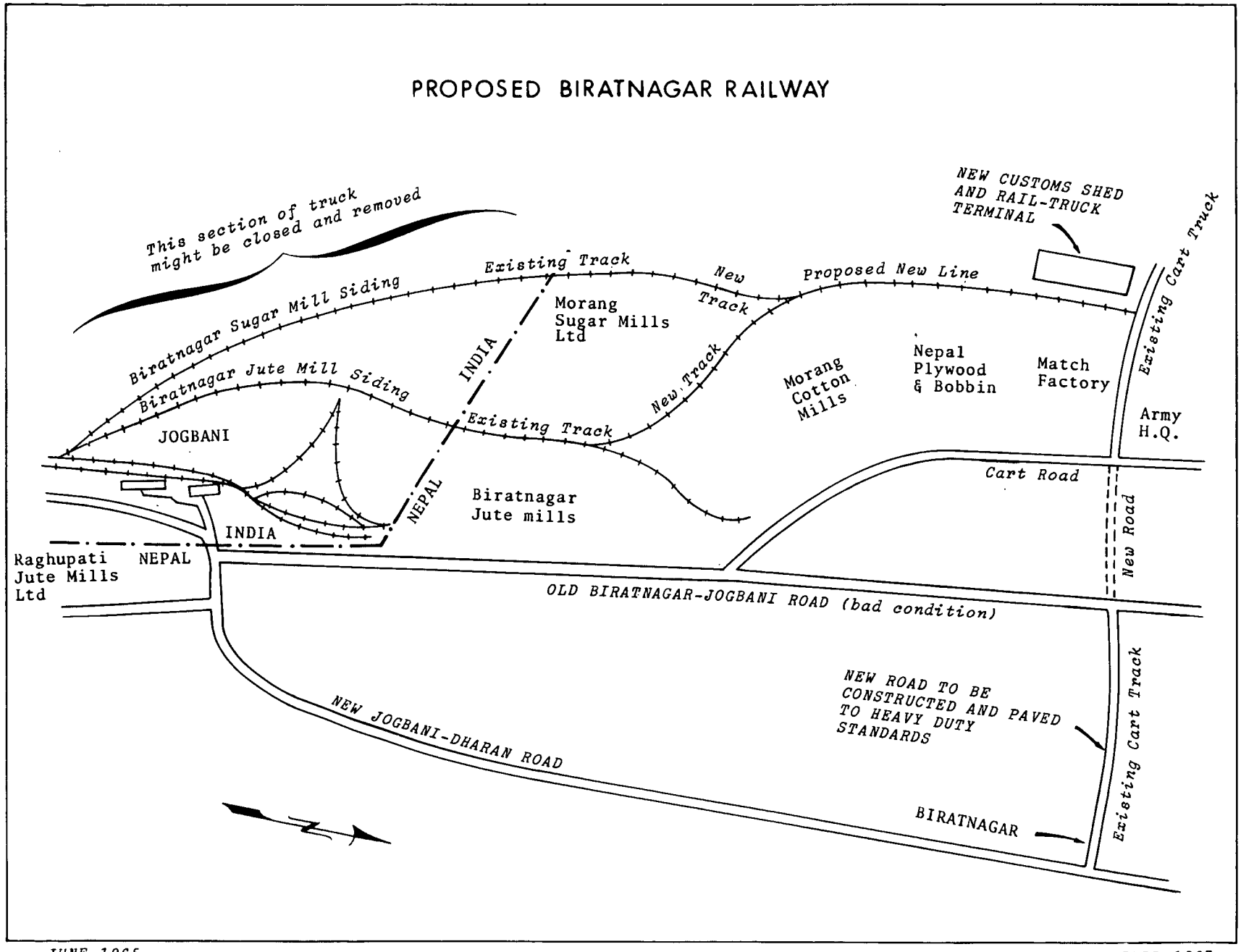
MAP 5



JUNE 1965

IBRD-1565

MAP 6



JUNE 1965

IBRD-1567

33. These terminal railways are specifically designed to lower the cost of moving freight into and out of Nepal by way of the Indian Railways, plus reducing the very substantial concealed costs resulting from loss and damage. At the present time, these savings are estimated to be at least one rupee NC per ton. With larger volume, the savings will increase rapidly. During the Third Plan period, it is estimated these will yield about a 20 per cent return on the investment. In the Fourth Plan period, the return will be about 40 per cent.

34. Continued operation of the Nepal Government Railway is not recommended. The physical life of its plant and equipment is completely exhausted and the cost of rehabilitation is high - and would not solve the serious problem of changing gauge at Raxaul. However, it would be desirable to use the NGR to haul sand and gravel for the construction of the new meter-gauge terminal line before being closed, providing this can be done promptly and NGR costs and losses can be kept down during this interim period. This narrow-gauge line is in such poor physical condition that it is of doubtful value to the Birganj sugar factory. Further, it cannot be operated much longer without some major rehabilitation and/or reconstruction (estimated to cost NRs 7.5 million). However, if a feasibility survey of the transport needs of the sugar factory (not provided in this Plan) should develop some practical means for utilizing the few physical remains of this Railway, it can be turned over to them. However, this feasibility study may demonstrate that a highway or a meter-gauge railway would be substantially better. The abandonment of this line will permit some widening and improvement of the causeway road between Raxaul and Birganj.

35. There are no immediate plans for the construction of a highway from Janakpur to Jaynagar in India. The construction of such a highway would cost about NRs 11.0 million. Rehabilitation of the NJJR (which operates at a profit) would cost about NRs 3.0 million. Therefore, the continued operation of the Nepal-Janakpur-Jaynagar Railway is recommended. This railway is in need of some rehabilitation and repair if its operations are to be kept economic. An engineering study to develop the specific minimum rehabilitation requirements for the line between Janakpur and Jaynagar should be made early in the first year of the Plan. For the purpose of this study, the intent is to keep the railway operational and reasonably efficient for about five to ten years. The railway's value beyond that time is questionable and should be reviewed during the Fourth Plan. The cost, including the engineering study, is estimated to be about NRs 3.0 million. Actual rehabilitation work should start as soon as the engineering plans are ready and be carried into the second year of the Plan.

36. The operation of NJJR extension from Janakpur to Bizalpura presents serious problems. It is doubtful that the line, as it now exists, can ever be economic. There remains some possibility of recapturing the value from these sunk investments if the extension can be tied in with plans for developing timber production and the organization of a larger sawmill in

the foothills to the north. It would require, however, that the new sawmill be located so that it would be easily accessible by rail from the proposed NJJR terminal at Bizalpura - i.e., that the rail line extension could be constructed to the sawmill site at low cost.

37. Another potential source of traffic and revenue for NJJR would be the movement of sand and gravel from the foothills to Janakpur and into India for use in road work and general construction. This traffic is extremely sensitive to costs, so if it is to be developed profitably costs must be kept low. This means some very inexpensive way must be found for transferring sand and gravel from narrow-gauge to meter-gauge cars at Jaynagar.

38. Provision is made for a feasibility study of the extension to Bizalpura and beyond, costing NRs 0.2 million. If these studies, plus the traffic development strategies just mentioned, are not adequate to provide an economic base for this northern extension, its continued construction is not recommended.

39. The Master Plan calls for the transfer of the NJJR from the Ministry of Public Works, Transport and Communications to the new Nepal Transport Corporation as is discussed later in this chapter, under the Nepal Transport Corporation.

40. The rehabilitation of the NJJR is intended to lower the direct and indirect costs of its operation, thereby making possible better service at more reasonable rates. It is also designed to permit a delay in the construction of roads in this area, permitting road funds to be used where the total returns will be greater.

C. The Ropeway Plan

41. The Master Plan calls for the continued operation of the ropeway, with particular attention to the competence of the management to which it is entrusted. This subject is discussed later in this chapter, under the general heading of the Nepal Transport Corporation.

42. No new investment is required for the ropeway other than that required to link existing ropeway electric motor stations to a reliable source of electric power, which can be done by tying them into the new Trisuli-Hitaura-Birganj 66 Kv power line. This will necessitate rebuilding or replacing the short stretch of the old power line in poor condition still being used for the ropeway, and the purchase of the necessary step-down transformers. It is assumed these are proper charges against the power sector and therefore are not included in this Plan. Completion of this work at the earliest possible opportunity is assumed as a necessary precondition to the effective and economic operation of the ropeway.

43. The purpose of this Plan is to lower and stabilize the cost of transporting foodstuffs and general supplies into the Kathmandu Valley. An efficiently run ropeway can make a contribution to revenue rather than be a drain on it.

D. The Pipeline Plan

44. There exists a possibility of relieving the traffic load on the Tribuwan Rajpath and reducing the cost of petroleum products in the Kathmandu Valley by means of a pipeline. It is expected the expansion of road transport in the Valley, the future shift by RNAC to turbo-prop planes, and a general increase in the use of petroleum for heat, will result in a rapid increase in the demand for petroleum products during the Third Plan period.

45. Pipelines normally are considered as economic only when extremely large volumes are to be transported. However, the unusual topography between Simra and Kathmandu, with three mountain ranges to be crossed (two of them major), opens the possibility that a new and different kind of small-diameter pipeline through the mountains may prove economic. Whether such a pipeline is in fact feasible and economic lies beyond the competency of this Mission, but inquiries have indicated that it may be both feasible and attractive. Accordingly, provision is made in this Plan period for a NRs 0.3 million feasibility study of this project. If the project proves feasible, construction should be started early in the Fourth Plan period, 1969/70-1974/75.

E. The Air Transport Plan

46. The Air Transport Plan is composed of three essential parts:

(a) improving the commercial airports and constructing one new commercial airport;

(b) strengthening the Civil Aviation Department;

(c) improving the operations of RNAC.

The cost of this program is as follows:

	Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
		(in millions of NRs)				
Airports	32.80	8.86	6.13	5.88	5.83	6.10
Civil Aviation Department	.55	.12	.15	.15	.07	.06
RNAC-General Operations	11.40	2.59	4.20	2.73	.94	.94
RNAC-New Planes	39.25	8.00	8.00	8.00	8.00	7.25
Total	84.00	19.57	18.48	16.76	14.84	14.35

47. (a) Airports. At the present time construction and improvement work is going on or is contemplated at five airports: Bhairawa, Biratnagar, Janakpur, Kathmandu and Simra. The work on Bhairawa and Janakpur will be completed prior to the initiation of the Third Plan. These will, however, result in airports inadequate to handle any new planes purchased by RNAC. The Mission recommends continuation of present construction plans at Kathmandu and Simra. Janakpur and Bhairawa present special problems which are discussed in Chapter 9. The plans for Biratnagar, however, should be modified with a view to building a much larger installation. The reasons for this modification are as follows:

1. The planned economic development of Biratnagar area will require a larger airport than the one for which the designs are ready, and one equipped to handle international traffic.

2. Biratnagar should become a crew base and terminal point for RNAC operations.

3. There are possibilities of using Biratnagar for direct tourist and Gurkha movements to and from overseas points.

A new airport is recommended at Tumlingtar in the hilly section of Eastern Nepal. The details of this selection are given in Chapter 9.

48. Improvements at Kathmandu's Gaucher Airport are given high priority. The expenditure for this airport recommended by the Mission represents a total commitment of NRs 39 million, spread over a period of about ten years from 1964 to 1973. Of this, NRs 18 million would be spent during the five-year Plan period. The remaining portion would be carried to the next Plan. These figures include NRs 6 million for the completion of the runway now under construction. The details of this Plan are given in Chapter 9, beginning on page 197.

49. A new terminal building at Gaucher is a necessity. Temporary improvements are being made to the present terminal building which will suffice for three or four years. However, Kathmandu is Nepal's most important airport, and vital to its tourist industry. Therefore NRs 4.0 million are provided to start construction of a new terminal building in the fourth and fifth years of the Plan period, with the idea that it would be completed during the following Plan.

50. Analyses were made as to the physical needs of other airports served by RNAC and the urgency and approximate cost of the improvements considered essential. The total cost of the Mission's recommended construction program (excluding Kathmandu) is NRs 106.4 million, of which NRs 31.3 million is to be spent during the Third Plan period. A summary by years and by airports is given in the following table:

Mission-Recommended Airport Expenditures under the Third Plan 1965/66-1969/70

(in thousands of NRs)

Airport	Total Cost of Long-Term Program	Airport Expenditures during the Third Plan					
		Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
Bhadrapur	25	25	25	-	-	-	-
Bhairawa	3,000	180	40	50	50	40	-
Bharatpur	150	150	60	60	30	-	-
Biratnagar	19,790	8,415	1,605	1,605	1,605	1,800	1,800
Dang	273	273	-	135	38	100	-
Dhangarhi	4,000	1,048	-	350	340	288	70
Gurkha	118	118	40	38	40	-	-
Janakpur	3,000	735	30	95	60	50	500
Kathmandu	39,315	17,810	6,000	3,000	3,000	2,810	3,000
Nepalganj	19,790	910	300	200	160	150	100
Pokhara	4,000	315	60	75	60	60	60
Silgarhi-Doti	8,000	65	-	-	-	30	35
Simra	25	25	25	-	-	-	-
Tumlingtar	6,480	2,735	670	520	500	500	545
Total	107,966	32,804	8,855	6,128	5,883	5,828	6,110

The program for each airport is given in detail in Chapter 9. This program includes NRs 1,514,000 in radio and communication facilities, as shown in the summary table at the end of Chapter 9.

51. (b) Civil Aviation Department. The Mission has recommended the strengthening of the Civil Aviation Department within the Ministry of Public Works, Transport and Communications for the purpose of creating and pulling together operations necessary for the support of aviation, as discussed earlier in paragraph 49 of Chapter 2. Particularly important is the creation within the Department of a staff especially concerned with the planning, management and operations of airports, together with the provision of trained managers for each of the more important airports---especially Gaucher at Kathmandu. In addition, this Department should be responsible for the operation and maintenance of navigational aids and for the creation and operation of a meteorological forecasting service. Implementing these programs will require the following capital expenditures:

	Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
	(in thousands of NRs)					
Navigation aids	450.0	123.0	123.0	122.0	42.0	40.0
Meteorological services	100.0	-	25.0	25.0	25.0	25.0
	550.0	123.0	148.0	147.0	67.0	65.0

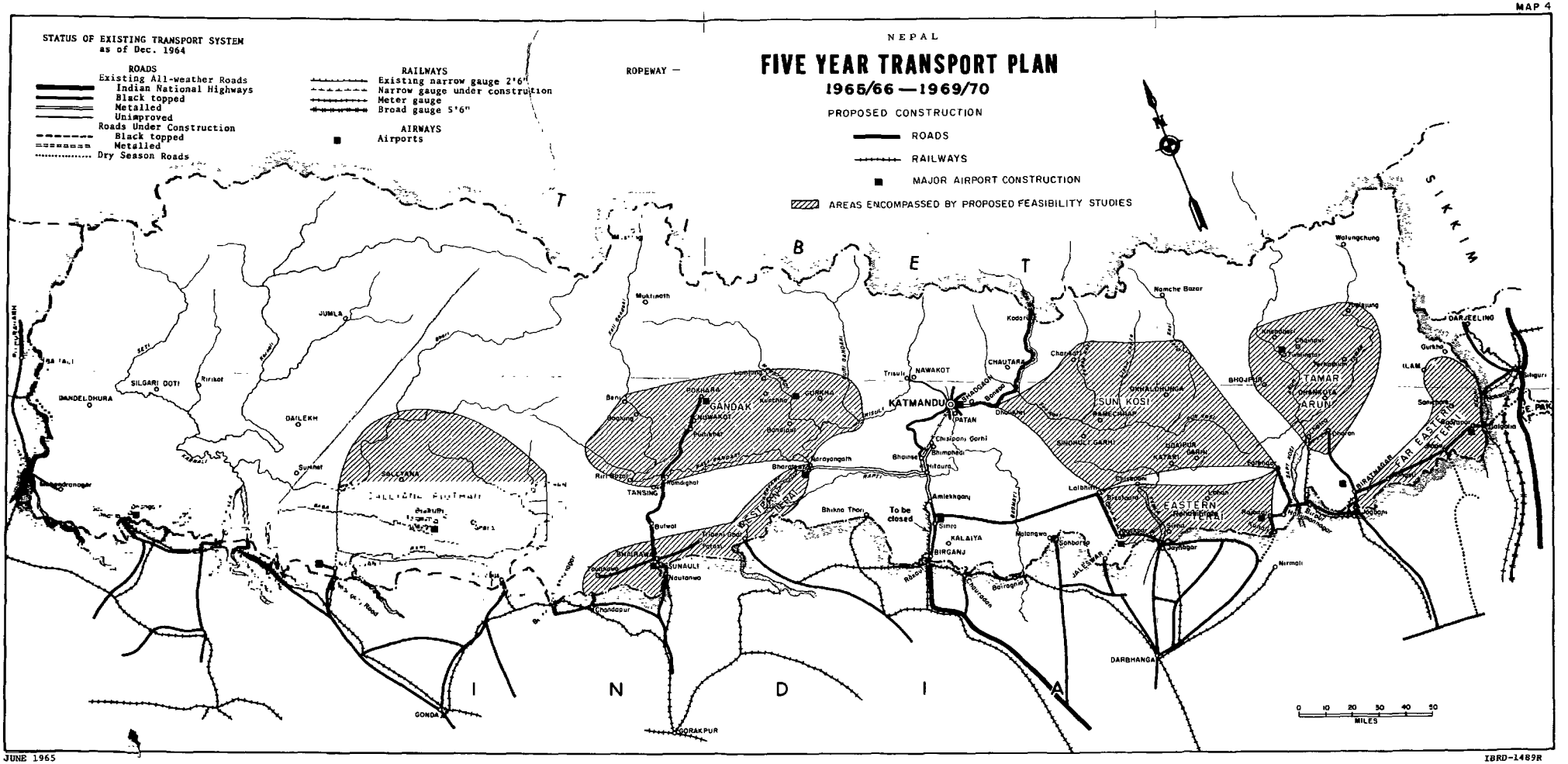
These programs are discussed in further detail in Chapter 9. The cost of navigational aids equipment for individual airports was included in the airport totals given in the previous paragraph and is not included here.

52. (c) Improving the Operations of RNAC. The Plan contemplates the conversion of RNAC into a commercial self-supporting organization. This has organizational, financial, operational and managerial implications which are fully discussed in Chapter 10. RNAC needs financial assistance in order to carry out this conversion. Its first need is for an initial grant of capital which will enable it to have sufficient working capital to sever its day-to-day financial reliance on the Government, plus sufficient additional capital to provide facilities needed now for an efficient operation. Its immediate needs are estimated at NRs 11.4 million as follows:

	Total	1st Year	2nd Year	3rd Year	4th Year	5th Year
		(in thousands of NRs)				
Additional working capital	500	500	-	-	-	-
Construction of new central office building	2,500	500	500	500	500	500
Construction of local booking offices and staff quarters	785	160	160	160	160	145
Motor transport vehicles	860	40	500	30	40	250
Workshop equipment, tools and instruments	6,200	1,000	3,000	2,000	200	-
DC-3 ground handling equipment	350	350	-	-	-	-
Office equipment	200	40	40	40	40	40
NRs	11,395	2,590	4,200	2,730	940	935

53. Secondly, RNAC needs capital to finance its changeover to newer, more efficient planes as replacements for the DC-3 fleet and to purchase a new turbo-prop STOL plane, as recommended by the Mission. The capital required to finance the purchase of new planes is estimated as follows:

	(in thousands of NRs)
New planes, including spare parts, ground handling and maintenance equipment	NRs 35,000
Airplane selection expense	250
Training of pilots, maintenance crews, etc.	2,500
Equipment introduction cost	1,500
	NRs 39,250



JUNE 1965

IBRD-1489R

54. The Mission recommends that some of this capital be provided by having His Majesty's Government make an initial capital contribution. Although the Government's subscription to RNAC's initial capital was set at one million shares of no par value stock, no cash payment was ever made to RNAC. The Mission recommends that the Government pay for these shares at a rate of NRs 25 per share. This NRs 25.0 million payment of capital would meet all immediate needs and leave the airline in good condition to seek the balance of its needs from other sources.

Financial Implications

A. Implications for the Current (Regular) Budget

55. Apart from the investment requirements, the Five-Year Transport Plan will have a significant impact on government finance, which must be dealt with in the current (regular) budget. This impact will come from a rapid increase in the annual maintenance expenses for transport facilities. Some of this increase will result from the necessity of observing higher standards of maintenance in all areas, if the country is to realize maximum economic benefits from the facilities it now possesses. The rest of the increase will arise from the growing magnitude of the facilities to be maintained, and the necessity of accumulating funds for capital replacement of maintenance equipment.

56. For the purposes of the Plan, the Mission expects that its recommendations for improvements in the management of RNAC, the ropeway and the railway will be implemented and that these operations will be able to meet their maintenance expenses from their own revenues. It is also assumed that the capital replacement cost of the maintenance equipment used will be included in the equipment charges placed against individual projects.

57. However, the recommended changes within the Transport Ministry will increase its budgetary needs. In the case of road transport, it appears to the Mission that by 1969/70 the cost of running the new Road Authority will increase from its present level of NRs 1.3 million to NRs 3.0 million, and that road maintenance costs will increase from NRs 1.2 million to approximately NRs 6.5 million. Later, when all the construction recommended in this Plan period is completed, road maintenance costs will increase to about NRs 10.0 million.

58. Airports will present a somewhat similar problem, except that it will be a little longer in coming. There will be problems of taking care of delicate radio, air navigation and weather recording instruments as well as airports themselves. The cost of maintaining sophisticated modern electronic and mechanical devices will be high. There will also be the necessity of repairing hard-surface runways at main airports, though this is not expected to be either a problem or a heavy expense during this Plan period. The present cost of aviation administration is about NRs 0.2 million,

and is expected to increase by 1969/70 to about NRs 1.4 million, including the cost of airport maintenance.

59. Up to the present time, maintenance has presented few budgetary problems to the Nepal Government. In 1963/64, the collections from road cess were NRs 4.1 million, while the Roads Department's maintenance budget was only NRs 1.2 million. Available cost-revenue records for the airports are unreliable, but the Mission has the impression that the few known airport maintenance activities have cost less than revenues.

60. As a matter of policy, the Government should at least aim at maintaining its National Transport System by charges on the users of these facilities. In Nepal the road cess, motor fuel taxes, registration fees, airport duties on lubricants, tires and vehicle parts, landing fees, and the airport tax are levied at present. These, however, are not directly earmarked for transport expenses. The Mission is of the view that while the present budgetary practice could continue, the level of maintenance expenditures should be related to receipts from user charges.

61. The road and airport programs envisaged in this Plan will generate increased revenues from existing user charges. In the case of roads, the revenue potentials appear to be adequate to meet all expenses. However, continued use of the road cess as the principal user charge will present increasingly complex administrative problems for the Government. The Mission recommends, therefore, that the Government begin consideration now of shifting to broader-base sources of road revenue which would be easier and less costly to collect, such as fuel and tire taxes. This could be supplemented, where necessary, by retaining the road cess on a very limited number of the more costly roads, such as the Tribuwan Rajpath, the Pokhara road, and the Kodari road.

62. In the case of airports, as the Plan proceeds the Mission expects expenses will increase more rapidly than revenues - principally because of the necessity of staffing airports and maintaining sophisticated electronic equipment. Because there are so many unsettled variables involved (such as aircraft selection, schedule frequency, etc.), the Mission is unable to estimate the shortfall precisely. It expects the Government will use all available means to generate adequate user revenue, but in the meantime it may prove necessary to bridge the gap with general revenues.

B. Foreign Exchange

63. The foreign exchange requirements for the public sector investments in the Plan are for the most part discussed elsewhere in this report. As long as the greater part of the investment in transport is to be financed by grant assistance, there is no repayment obligation in foreign exchange.

64. The purchase of planes for RNAC, rolling stock for the railways and maintenance equipment for the Roads Department have been included in the Plan, but it is conceivable that these may have to be partly financed by loans from abroad. In this event repayment obligations would arise and would need to be provided for, keeping in mind that RNAC is a major foreign exchange earner.

65. There would also arise some additional foreign exchange requirements in the private sector consequent to the Plan, and up to now not included in it. The Mission is of the view that additional export receipts, tourist income, and the other earnings or savings in foreign exchange resulting from the Plan should provide most of these foreign exchange needs during this Plan period. In general, this would include enlargement of the private sector fleet of vehicles not included in the Plan, replacement parts, increased fuel imports, etc., which the expanded facilities would require.

Some Recommendations Relating to Implementation

A. Ministry of Public Works, Transport and Communication

66. This is the official arm of the Government most concerned with transport planning, administration, operation and regulation. In view of the tremendous responsibilities which rest upon this Ministry, it is neither organized nor staffed so that it can cope with them with any reasonable competency.

67. At the present time, the transport portion of the Ministry seeks to:

- maintain full control over all road construction programs;
- operate the railways;
- operate the ropeway;
- handle all aeronautical programs;
- construct and manage airports.

Conspicuously missing are highway maintenance, airport maintenance, transport planning, highway and vehicle use regulation.

68. The Plan presented in this report calls for three separate organizational changes which affect this Ministry:

- The operation of the railways and the ropeway should be completely transferred to the Nepal Transport Corporation, as discussed later in this chapter.

- The three different road departments should be combined into a single Road Authority which will also take on responsibility for highway maintenance. This new Authority would be the highway sector of the Ministry. The details of this Plan were discussed earlier in this chapter under the specifics of the Five-Year Road Plan.

- All aviation responsibilities should be combined into a single Aviation Department, which would handle all aviation matters (such as meteorology, navigation aids, licensing of pilots, etc.), plus the management, operations, and maintenance of airports.

Implementing these changes will necessitate some internal adjustments and allocations within the Ministry.

B. Nepal Transport Corporation

69. The Nepal Transport Corporation (NTC) was created by the Nepal Government in January 1965 for the purpose of pulling together some of its transport interests. Although a private corporation, it operates under the jurisdiction and policy guidance of the Ministry of Public Works, Transport and Communication. The railway, the ropeway and some trucking operations are specifically within its purview. The Mission agrees that the NTC should take over the management of the railways and the ropeway.

70. With the completion of the planning exercise represented by this report, it has become clear to the Mission that the Nepal Transport Corporation (NTC) has the potential of exerting a strong influence on transport cost and effectiveness throughout the country by demonstration.

71. Outside of the major transport problems arising from the lack of adequate physical facilities, the most difficult problem facing the country is the acute shortage of skilled transport operators and managers. Because of this, available physical facilities are poorly used, fall into disrepair due to the lack of proper maintenance, and transport charges are set without regard for the true cost of the service. The net result is economic waste.

72. The Mission believes there is grave danger that the NTC, being a new organization, may over-extend itself by attempting to take on more operations than it can effectively manage. This could well result in chaos, and a further decline in transport efficiency and effectiveness. For this reason, and because there now are some skilled motor transport operators already available in Nepal, it is recommended that the NTC concentrate on the operational side of the ropeway and the railways where the need is greatest and most pressing. It is also recommended that the NTC should not engage in any trucking business in competition with private truck operators, but that it may make use of trucks to supplement its ropeway and railway operations.

73. It is suggested that the NTC operate the ropeway and each railway as separate entities, each with its own operating management. The NTC can then provide certain scarce skills collectively for the group, such as administrative accounting (cost control), rate making (or establishing the prices to be charged), terminal handling, insurance and protection from damage or loss, revenue protection, traffic development and central booking.

74. It is also recommended that an NTC objective should be to manage its operations so as to be as nearly self-supporting as possible. That is, in general, the rates charged should be representative of the cost of the service provided, including the cost of servicing the invested capital.

75. For the ropeway, it is suggested that the ropeway management arrange to have a trucking service between Raxaul-Birganj and Hitaura, and handle freight through from Raxaul or Birganj to Kathmandu on a single shipping document for a single charge which covers all the different operations. While this trucking service should be a part of the ropeway operations, the actual truck operations should be performed by some outside truck operator under contract to the ropeway. The contract may require that the truck operator perform the following services:

- own, maintain, staff, and insure all the vehicles required for the service;
- provide a specified number of round trips per day on specified schedules between Raxaul-Birganj and Hitaura;
- provide guarantee or insurance against loss, theft, or damage of all goods while in his possession; and
- provide additional services as called for under the terms of the contract.

In return for these services, the ropeway guarantees the payment of a certain minimum sum, regardless of whether or not the services are required or used

on any particular occasion. It also undertakes to pay an additional sum for each extra trip or service provided. Under this arrangement, the motor transport operator pays a fine, or an extra charge or a rebate, to the ropeway each time he fails to perform, or to arrange with someone else to perform in his behalf, the services required in the contract.

76. Should the NTC find it necessary to operate its own trucks as a part of its ropeway services, it is recommended that this be used as a demonstration of good business practice. This will require close and careful attention being given to the maintenance, care and use of the trucks (which necessarily entails some extensive driver training and education). It will also necessitate finding or establishing a maintenance base capable of giving the trucks the mechanical attention they need.

77. In managing the railways the NTC should shift the burden for the mechanical operation of the railways to the Indian Railways, as suggested by the Mission. The NTC can then concentrate on managerial areas more in need of attention, such as terminal handling, administrative cost control and management, through billing of freight, providing proper and economic transit handling and storage (including the operation of storage godowns and perhaps even tank farms for petroleum products), means for expediting clearance through Indian and Nepal Customs, and means for reducing transit loss and damage. These seemingly minor factors in fact account for nearly 75 per cent of the actual cost 1/ of moving freight in Nepal today. Consequently, major reductions in transport costs - and improvements in trade - are possible by attention to these factors.

78. Additional comments concerning the management of the ropeway and railways are included in the earlier portion of this chapter dealing with the Plan.

79. The construction of the proposed terminal railways presents the problem of providing freight cars (or goods wagons) for use on them. In this case, the simplest and most economic effort would be for the Nepal Government to buy a number of new meter-gauge cars and place them in the Indian railway meter-gauge equipment pool to be used anywhere in India. This would offset any Indian cars used to operate the local Nepalese terminal railways. Compensation is arranged by establishing standard per day (per diem) charges for the use of each car, with the charges adjusted somewhat to allow for any major differences in first cost or current condition. Under this arrangement,

---

1/ The actual cost of freight movement is much more than the simple rate charged by a single carrier. For example, in moving paddy or rice into and out of India the following must be considered: the cost of loading the truck or cart; tips to border guards; tips to customs officials; unofficial "road tolls" at many border crossing points; transfer cost (from cart or truck to rail car); and loss in transit. These do not include the actual cost of customs duty. Loss in transit averages 15 per cent to 20 per cent.

the Indian Government would pay the Nepal Government a per diem charge for each Nepal-owned car operated in India. When the Nepal-owned cars are operated inside of Nepal, these charges would be paid by the local Nepal railway using the car. In turn, each Nepal railway would pay the Indian Railways a per diem charge for each Indian car they use. This is a long-established method for the joint use of railway equipment in common use throughout the world. Provision is made in the Plan for the purchase of 20 freight cars for use in this equipment pool in time for the opening of operations on the new Nepal-Birganj Terminal Railways, with an additional 10 purchased for the opening of Biratnagar Terminal Railway of Nepal.

80. The administration of this Nepal Government Railway Equipment Pool account should be handled by the Nepal Transport Corporation. The funds for the purchase of this equipment have been included in the Plan.

81. The principal return intended from the purchase of equipment for the Indian Railway meter-gauge freight car pool are included in benefits quoted for the railways earlier in this report. If both of the terminal railways are managed efficiently and well, there is a possibility that these cars may earn the NTC as much as NRs 1,600 per year in additional profits, a bonus of 5 per cent to 10 per cent per year on the investment. However, realization of this profit is highly contingent upon skill in management.

C. Maintenance of Private Motor Vehicles

82. One of the major transport problems in Nepal is the high cost of motor vehicle operation, as mentioned elsewhere in this report. To some degree, providing better roads will help reduce these costs. Another factor is the matter of equipment maintenance---or rather, the absence of it. At the present time there are few maintenance facilities. The question of maintaining government vehicles is discussed in Chapter 7.

83. Most commercial road transport in Nepal is conducted in privately-owned vehicles. The Mission recommends that the Government provide some incentive to the private sector to establish garages, workshops and service stations to maintain private vehicles of all kinds. Implementing this will require careful attention to three principal factors:

- obtaining fully trained and qualified mechanics;
- obtaining and maintaining the necessary tools and servicing facilities;
- establishing a reliable and continuously available source of spare parts.

To some degree this can be accomplished in cooperation with the suppliers of motor vehicles, fuel and equipment.