

CHAPTER 5 DIRECTIONS OF TRANSPORT PLANNING

5.1 Towards Improvement of Railway Productivity and Profitability

(1) Introduction

The share of Pakistan Railway (PR) for both passenger and freight, has been in steady decline since its creation in 1947. There is considerable evidence to suggest that PR is failing to carry all the traffic on offer to it, and potential rail traffic is being diverted to other modes or not transported at all. This has a damaging effect on the economy of the whole nation.

A number of studies on PR's operations and finances have been undertaken since the mid 1980's in an attempt to identify the causes of these failings, and to put forward corrective measures. The general conclusion is of a vicious circle of decline, in which PR has high costs and poor levels of service because of a lack of investment in recent years to replace old and obsolete equipment. This situation has been exacerbated by the allocation to rail of a declining share of the transport budget in successive FYPs.

A number of other deficiencies were noted. Operating practices remained unaltered since the 1950's despite marked changes in the levels of demand for various services. Tariffs were not being set on a commercial basis, and a number of staff were being employed and branch line services run because of a reluctance on the part of Government to see them terminated.

In the transport demand projection of this study, the role of PR was highlighted and a considerably high growth rate was assumed for PR, particularly for freight transport. This section reviews the financial performance of the railway over the period 1980-81 to 1992-93 to see what changes there have been in financial viability and productivity, and to assess what further changes need to be made to improve PR's operating and financial performance.

(2) Intermodal Relation with Road Transport

It is generally accepted that railway system has a higher fixed costs in transporting people or goods than road based transport system, but lower operating costs per km. Thus road transport would, in general, use less resources for a short journey, and railway would use less resources for longer trips. For both passenger and freight transport, there will be "break-even" distances at which the total cost of a trip by road or railway will be equal.

In Pakistan, as analyzed based on road and rail transport costs, this distance was 275 kms for passenger and 750 kms for freight. These may be regarded as theoretical break-even distances. Actual break-even distance was, however, 775 kms for passenger and 1450 kms for freight. The large deviation between actual values and theoretical values is considered to be representing the inability of PR and its eroded market. It is important to fill these gaps not only for PR but for the economy of entire nation.

(3) Financial Performance

1) General

The annual accounts, as presented in the PR annual Yearbook, show both revenue and expenditure on a steadily rising trend, with the difference between them declining sharply since 1987-88, suggesting that the recent reforms have been effective in turning the railway a round financially. Forward projection of this trend suggests that break-even, or even a profit, on operations could be achieved by the end of the 8th FYP period.

When analyzed carefully, however, situation changes.

Direct revenue from passengers has remained remarkably steady throughout the period under review, rising slightly in recent years. Freight, and thus overall, revenue was on a rising trend to 1987-88, but fell sharply in 1988-89, since when (with the exception of 1990-91) it has also been steady. The introduction of Public Service Obligation (PSO) payments in 1990-91 has lifted income to an all time high in 1992-93.

Real costs rose steadily up to 1990-91, since when they have been in decline. Within these

trends, fuel has been declining since 1982-83 with the fall in world oil prices and the steady elimination of steam locomotives, but staff costs and ORE (Other Revenue Expenditure) exhibit are on an increasing trend. Interest payments peaked in 1987-88, but the recent fall is more attributable to interest rate reductions than to a fall in the amount borrowed.

Annual losses peaked in 1988-89, the year the reforms started, but have only declined markedly since because of the PSO payments - the underlying financial performance of PR has not improved noticeably.

2) Relationship Between Revenue and Transport Task Performed

There has been a slight increase in revenue per passenger train km since 1989-90. However, it is striking to note that revenue per freight train km is much higher than revenue per passenger train km. Since 1988-89 it has increased from 3.6 times as much as passenger services per train km run to nearly 5 times as much in 1992-93.

PR analysis presented in the annual Corporate Plan indicates that freight services as a whole are profitable (and some bulk/block services exceedingly so), whereas no group of passenger services covered their costs (and most did not even cover their direct, "variable", costs), although a few express trains did cover full costs. It follows that, given a shortage of locomotives, and of track capacity in some parts of the network, where freight demand warrants and wagons are available, it would improve PR's finances to cancel passenger trains and run freight trains instead.

Since most freight trains run south empty, freight can generate much more revenue than passengers per train run.

3) Staff Costs

Staff costs form an ever increasing percentage of PR's total costs. Staff numbers have remained relatively constant, despite the closure of some lines and the replacement of labour intensive steam locomotives.

PR's inability to shed redundant labour is highlighted by the costs assigned to operating staff in the 1992-93 budget estimates, in which steam locomotives as a group cost more than diesel locomotives as a group, and very much more per locomotive. It seems that staff are not being laid off or transferred when steam locomotives are withdrawn, and are even still being paid mileage allowance.

4) Costing

The procedure currently followed on PR is "top down". Expenditure is first separated into "direct" - costs directly associated with the running of services - and "general" - overhead items which do not vary directly with the level of traffic carried.

The costs are averaged over the whole system, and do not adequately identify the costs of individual sections of line or services. It is almost impossible to estimate costs accurately enough for a commercial railway seeking to optimize financial performance.

PR is aware of this deficiency, and consultants from the Irish railway CIE are working with them to develop a "bottom up" cost allocation methodology to identify costs at a micro level.

It is to be hoped that the new PR costing system will allow both PR and the government to optimise expenditures on the railway.

5) Accounting

There are also deficiencies in the calculation of some of the items included in the accounts which mean that the accounts (as published in the Yearbook) lead to a false financial picture of PR.

Firstly there is a rebate of the payment of a return on government's past capital investment. This payment was estimated at Rs902 million for 1992/3. At present this merely involves the cancellation of equal items in the annual revenue and expenditure balance.

Secondly, and more seriously, the annual payment to the DRF (Depreciation Reserve Fund)

is not calculated by reference to the value (either book or replacement) of PR's assets. Under these circumstances accountants recommend the use of "current cost" accounting, in which DRF payments are based on the modern equivalent asset value (MEAV). A realistic estimate of the DRF payment needed in 1993 under current cost accounting would be Rs4-5 billion, 3-4 billion higher than that actually made.

6) Summary

Table 5.1.1 presents an alternative view of PR's 1992-93 Profit and Loss statement, using current cost accounting and treating the business as a going concern.

Table 5.1.1 PR 1992-93 Profit and Loss Account Re-stated

	Rs. mn	Rs. mn
Earnings (excluding PSO)	7,679	
less Operating Expenses	6,846	
Profit on Operations		833
less Depreciation	4,500	
Other Revenue Expenditure	1,617	
Foreign Interest Charges	614	
Return on Government Capital Investment	902	
Unsupported Loss		(6,800)
add PSO	1,352	
Rebate of Return to Government	902	
Annual Deficit		(4,546)

Source : PR yearbook 1992-93, Railway Board Budget Estimates
1992-93JICA analysis

Assessed as a self financing going concern, PR would have a loss of Rs6.8billion with operating revenues being only 56% of costs. This is reduced to Rs 4.5bn by the PSO and interest rebate. It is clear that, even with government support payments, PR is some way away from commercial viability, and that a considerable amount of work is needed if this is to be achieved.

(4) Productivity

1) Transport Task Achieved

As for passenger traffic, the significant features are that while passenger numbers have more than halved during the period, passenger km have considerably increased. Thus the average distance traveled has more than doubled, showing an increasing demand for long distance travel.

The main feature of recent freight traffic is a sharp decline in tonnes lifted between 1987 and 1991. Tonne km performed have not fallen to the same extent, and average haul has exhibited a rising trend.

2) Staff

PR's fleet was still increasing in the early 1980's as new diesel locomotives were still being delivered, but since then has been in decline as investment has ceased and older locomotives have been withdrawn. Staff numbers have not fallen to the same extent, and staff per locomotive has increased.

Of particular concern is that the decline in labour productivity has accelerated in the last 5 years, i.e. since the operations reforms were introduced to make the railway more commercially oriented and efficient. A major contributory factor seems to be the inability of PR to lay off staff (particularly steam shed and operating staff) that it no longer needs.

3) Train Productivity

PR operate a few passenger railcars, but they are old and their number is declining. All freight operations and almost all passenger operations are locomotive hauled.

The number of train km (excluding railcars) run per year per locomotive has been declining since 1989, despite the introduction of measures to improve the efficiency of PR. Annual train km per locomotive in use is currently around 80-85,000. As about 90 diesel and 30 steam locomotives are only used for shunting, the distance per locomotive on the line will be around 100,000km a year.

The average distance run both by freight and passenger trains are rising steadily as short distance local and branch line services are withdrawn, although there has been little increase in the average distance for freight trains since 1989. Given the long hauls available in Pakistan, both distances (270-280 kms) are surprisingly short, indicating that a large number of short trips are still being operated.

The average load per train run is falling for passenger, but rising slightly for freight. The freight load is surprisingly low at around 200 tonnes, given a potential train length of 70 (2-axle) wagons carrying 22 tonnes each - 1,540 tonnes. The figures indicate that a large number of relatively lightly loaded trains are still being run.

4) Management

Management control of PR seems to be weak. There appears to be an inability to make even small changes in operating practice that would improve efficiency.

Even where overseas finance is available, progress is slow. Work on the OECF funded locomotive factory at Risalpur commenced in 1984, but the first locomotive was only produced in 1993, and work on the factory will continue into the 8th FYP period. In addition to the delay in opening and the low level of output, a further potential problem with the factory is the estimated cost of locomotive production there of around Rs94 million per unit. It is generally assumed that a basic 2,000HP diesel locomotive can be bought on the world market much cheaper than this.

(5) Recommendations

1) General

There is an urgent need to improve the operational efficiency and financial performance in order to undertake its appropriate share of the transport task and reduce the burden it places on the annual and development budgets. While PR continues to run at a loss it would merely transfer government expenditure from the capital account (FYP budget) to the current account (PSO).

In addition to the projects included in the 8th FYP, there is a need to:

- increase revenue;
- reduce costs; and
- work assets harder.

2) Enhancing Income

Revenue can be increased through a combination of carrying more traffic for a given level of expenditure, concentrating on more remunerative traffic, and raising tariff levels in real terms. Additional traffic can be achieved by better marketing to fill unused capacity (e.g. mail coaches and southbound freight trains). PR has already implemented marketing initiatives and is concentrating on its more profitable operations.

Raising tariff levels in real terms has been identified as a way for PR to reduce its deficit, as much traffic is carried at government controlled rates. Freight traffic is already being carried at commercially negotiated rates. PR is still in the process of identifying the most remunerative and profitable freight traffic to pursue, and further improvements in real revenue per tonne km can be anticipated.

As for passenger traffic, even with total freedom to set fares, PR would not be able to raise rates much without pricing traffic off the railway, especially as substantial improvement is being made to the parallel road network. The only realistic way in which PR can increase

revenue per passenger km is to upgrade its services (as has already been done with the introduction of economy class on longer distance passenger services).

This requires a combination of greater comfort (which requires investment) and reduced journey times. Travel time can be reduced not only by higher line speed, which also requires investments, but also by eliminating lightly used stops and reducing the standing time at some stations. This would lead to a reduction of 10 to 15% in long distance journey times. The Shalimar express is typical. Conceived as a 15 hour, no station stop, express between Lahore and Karachi, it now has 10 intermediate stops and a running time of 16 hours 50 minutes. Only one stop is operationally necessary (at Khanewal, to change locomotives) and only one (at Multan) consistent with the train's original status. It is understood that many of the additional stops are due to political lobbying.

In other countries fares vary by the speed of the train as well as distance and level of comfort provided. The freedom to run, and charge for, premium services could be a useful addition to PR's passenger income.

3) Cost reduction

Major cost reduction for any given level of operation is not likely to be possible until a "bottom-up" cost allocation system is operating which will enable the actual cost of providing each service, and regional variations in that cost, to be identified. Steps which could be taken in advance of such a system include removal of excess personnel and of old and unnecessary rolling stock.

Elimination of obsolete rolling stock leads to savings in maintenance and fuel (particularly for steam locomotives). Disposal of old freight wagons releases space in marshaling yards for more efficient use by remunerative activities, and may even allow entire yards to be sold off or converted to other uses (e.g. dry ports).

A thorough review, preferably by foreign management consultants, should be undertaken into the number and grade of staff PR actually needs for its current and projected future workload. If it proves politically or socially impossible to make staff redundant, those not actually needed to run the railway could be transferred to a labour reserve, with their cost added to the PSO request.

Costs can also be reduced by closing little used branch lines and withdrawing lightly used local services. For passenger services this would have little effect on PR's finances, as savings would be offset by a reduction in the PSO, but it would free locomotives for more important transport tasks. Freight services could be substantially rationalised, concentrating resources on trains between a limited number of freight yards, local collection and delivery being done by PR controlled road services rather than lightly used local freight services. In addition to reducing costs, this also releases assets for more profitable main line services.

4) Asset Utilisation

The results of railway capacity analysis indicated that there is surplus track capacity in most parts of the system without double tracking or signal upgrading (although this may well be justified by allowing trains to run faster, making better use of rolling stock). Even where there are potential capacity constraints, for example, Khanewal-Raiwind section, there are under-utilised alternative routes (via Kasur or Faisalabad) that some freight trains could use.

Where branch line services are to be retained, they could be cut back to a shuttle between the junction station and the branch line terminus, freeing track capacity on the main line and allowing a more frequent service on the branch with the same assets. Freight locomotive and wagon productivity can be increased substantially by concentrating resources on scheduled non- (or limited-) stop block or bulk trains between major centres, coupled with road distribution. Operation of scheduled freight has been estimated to more than double the productivity of the locomotives and wagons involved. A scheduled container service between Keamari and Lahore Dry Port proposed in the 1992 UNCTAD Multi-modal Transport report would have almost doubled the capacity on offer while only using the same

wagon resources. Similar increases in wagon and locomotive productivity are expected after the planned introduction of high capacity bogie wagons during the 8th FYP period.

These services would require termination of the current practice of only dispatching trains when all wagons are loaded. Initially trains would need to depart on schedule with empty wagons even in the peak direction until yard/loading efficiency and demand caught up with improvements in train operation efficiency. If 8th FYP targets for wagons loaded per day and wagon turnround are met, freight capacity would more than double to over 14 billion tonne km, rather than the 9.25 billion envisaged in the plan. This could be achieved with existing locomotive resources if freight on main lines is scheduled and averages only 30km per hour.

5.2 Promotion of Multi-Modal Transport

(1) Introduction

The term "multi-modal transport" could be used to refer to any journey in which the passenger or goods being moved uses more than one mode of transport (road, rail, air or sea/water), and would thus be applicable to most journeys involving modes other than road, as road is almost invariably used for the first and last legs of a multi-leg journey.

Multi-modal transport usually incorporates measures to facilitate the easy transfer of goods from one mode of transport to another. Two principal forms are practiced in various parts of the world; containerization and piggy-back.

This section considers the prospects for greater use of multi-modal transport in Pakistan.

(2) Problems of Existing Multi-modal Transport in Pakistan

Pakistan's external trade is currently almost entirely conducted by sea through the ports of Karachi and Qasim. Imports dominate by both weight and value. However, most imports and about 50% of exports are bulk materials, unsuitable for containerisation. The flow of general cargoes and manufactured goods, which are suitable for containerisation, is thus more balanced.

Despite the absence of specialised container handling equipment, a remarkably high percentage of containerisable cargoes are actually containerised, exceeding 84% for exports. Karachi probably has the highest TEU turnover of any port without a dedicated container terminal. However, most of this containerised trade is not using multi-modal transport in Pakistan but is being stuffed or stripped in Karachi port.

The report of the 1992 UNCTAD Multi-modal Transport and Trade Facilitation Programme estimated that at least 50% of all containerised goods had an inland origin or destination and that up to 90% of this trade was stuffed or stripped in Karachi, traveling break-bulk in Pakistan. This means that in 1992-93 at least 250,000 TEU had potential inland origins and destinations. In fact PR handled just over 20,000, most of them to or from Lahore Dry Port (LDP), while road handled a smaller number.

The UNCTAD report identified a number of reasons shippers were not using the multi-modal transport potential of the ISO container in Pakistan. Among these were:

- unduly restrictive customs procedures, both at Karachi and inland dry ports;
- port congestion at Karachi and inland sites;
- a lack of suitable vehicles for the transport of containers; and
- slow transit times between inland cities and Karachi, particularly by rail.

There are relatively few multi-axle articulated vehicles and even fewer specialised lightweight skeletal trailers used for carrying ISO containers in Pakistan. Most road transport of containers is by overloaded vehicles, some of them wholly unsuited to carrying this type of load. There are no specialised rail vehicles. PR mainly uses drop-side bogie flat wagons with a

capacity of 2 TEU, and some 4-wheel (1 TEU) wagons.

Transit times are slow. For Keamari-Lahore (1230km) NLC take 5 days (average 10.25 km per hour). Private trucking firms would take 2 days or less, but are restricted in the loads due to customs clearing at inland dry ports. PR takes 2-4 days, depending on the number of times the train has to stop to allow higher priority trains to pass and whether there are any BKF wagons (which have ball bearings and need to be checked every 400km) in the train.

Given the difficulty in hiring a suitable vehicle for the inland transport of containers and the slow transit times, while private trucks can carry any un-bonded goods, it is understandable that many shippers find it preferable to use traditional break-bulk road transport and stuff/strip containers and deal with customs formalities at Karachi.

(3) Future Prospects

1) Demand

By assuming that the proportion of containerised to total freight transport demand is the same for all zones, the forecasted freight O-D matrices can be factored to the potential demand for multi-modal transport. This is presented in Table 4.5.2 of the previous chapter. The estimated potential multi-modal transport demand in relation to dry ports is about 100,000 TEUs in 1997-98 and about 220,000 TEUs in 2005-06.

However, this projection may well be underestimates, taking into account that a high proportion of bulk imports are consumed at the ports and that the catchment area of the dry ports may be larger than the NTPS zone, particularly for Quetta and Lahore. If, via dedicated road feeder services, the dry ports were able to attract all potential inland containerised freight, the demand for inland transport of TEU would be about four times higher than the above projection.

On the basis of these estimates, 90% of potential containerised freight for Lahore already was containerised in 1992-93. This indicates the success of the established LDP in attracting multi-modal transport, and shows the potential at the other sites. It should be noted that LDP has been open since 1974, but containerised traffic has only been significant since 1987.

It is clear that there is considerable untapped potential for multi-modal container transport in Pakistan, and that this will almost quadruple by 2005-06.

2) Facilitating Multi-modal Transport

The 1992 UNCTAD report made a number of suggestions for improving customs procedures, container yard efficiency and inland transport.

Almost all improvements in inland container services will require some investment in new equipment - vehicles, cranes, CFS, improved dry ports etc. However, the UNCTAD report proposed a scheduled container rail service between Keamari and LDP 5 days a week, requiring a 7 day turnaround time. This would only use existing wagons and locomotives. It would roughly double productivity by operating the train to a timetable instead of the current practice of only dispatching trains when full.

The UNCTAD plan would have a capacity of 36,400 TEU a year, compared to the 19,000 operated on this route in 1992-93. A further proposal was for subsequent investment in European-style skeletal wagons, which would be lighter and faster than the existing rolling stock. If the additional capacity were fully utilised, a scheduled MBKF service would generate over Rs90 million more revenue for almost no increase in operating costs. The skeletal wagon service could generate a further Rs67 million.

Initially, as indicated above, 5 trains per week may offer excess capacity to LDP. It is important, while shipper confidence in the new service is building, that the train should run on schedule, whether it is full or not. Spare capacity to and from LDP could be utilised by offering capacity to other dry ports on the same service.

PR can thus test the market for multi-modal services with a minimum of capital investment merely by changing its operating and marketing practices in respect of container specials. If

this is successful, the Multan/Lahore service could be further upgraded with a fleet of skeletal wagons, and the MBKF re-deployed to introductory (scheduled) specials to Quetta and Rawalpindi/Peshawar.

Improved rail services would need improvements in road haulage facilities for containers. These would be needed both for local collection and delivery of containers at the dry ports and Karachi, and also for longer distance road services to areas not served by rail. The vehicle favoured for this purpose elsewhere in the world is a tractor and skeletal semi trailer combination.

Use of the (expensive) tractor units can be maximised if semi-trailers are detached on delivery to a site, leaving the tractor free to collect another semi-trailer at the same (or a nearby) site while the container is being stripped/stuffed. This may require some changes in vehicle registration procedures, with separate registration of tractors and semi-trailers.

To cope with increased demand port facilities will need to be improved. For inland sites smaller facilities are recommended, with overhead cranes to transfer boxes direct between rail and road vehicles or a storage stack.

The long distances covered by some freight movements in Pakistan suggest that there is potential for road on rail piggy-back services where road collection/delivery is needed at both ends of the rail haul. However, the extent of the market is unknown, but it is likely that substantial improvements in PR transit times and efficiency would be needed before shippers would consider it worthwhile to send loaded semi-trailers by rail.

A potential future multi-modal market is transit traffic between the ports and Central Asia. This could move by road throughout, but would be ideal rail traffic, either in ISO containers or piggy back, between the ports and suitable railheads at Taxila (KKH), Nowshera (Lowari-Chitral-Tajikistan route), and Peshawar (Khyber Pass-Kabul route). Restoration of through rail services to Kabul is also a longer term possibility.

5.3 Opportunities for Private Sector Involvement in Transport in Pakistan

(1) Introduction

The 8th FYP envisages much of the future investment in industry and infrastructure in Pakistan to come from the private sector, and incorporates strategies to support such investment, particularly foreign investment.

Within the 8th FYP period such investment in transport is expected to be limited to road vehicles, air transport and sea transport, but in the longer term private sector involvement in all aspects of transport is possible.

This section briefly reviews current and potential future private sector initiatives in Pakistan's transport industry and infrastructure.

(2) Rationale and Mechanisms for Private Sector Participation

1) Why Private Sector

In the past it was considered necessary for the public sector to play the main role in the provision of transport because of economies of scale. Transport networks were natural monopolies, and public ownership or regulation was advocated to protect consumer's interests. Transport services were also argued to benefit from economies of scale as well as the external costs and benefits accruing to parties who are neither the users nor providers of the service, which cannot easily be taken into account in free market economics. Thus it was argued that the government needed to determine the optimal level of service to be provided, from which it is only a short step to argue that the government should be the provider of the service. A further reason is to seek to ensure Government control over transport in periods of emergency, and many consider that this is best achieved by having ownership. This reason for the public ownership is frequently used regarding railways and ocean shipping.

While all the above reasons for public control may still be valid, the view has gained ground in recent years that the private sector is much better, providing the public sector can retain overall legal and regulatory control, in tighter control of costs, more dynamic management style, more responsive to changes in technology and demand, and the ability to mobilise private capital for investment in transport projects.

Although governments can generally raise funds more cheaply than the private sector, the use of alternative sources of funding is very important, particularly in developing countries with limited current budgets and large outstanding loan commitments.

2) Mechanism

There are a number of mechanisms for increasing the involvement of the private sector in transport. Among them are:

- outright privatisation - sale of existing public sector owned infrastructure or transport operations, either to an existing company or by corporatisation of the public sector body accompanied by floatation on the stock market;
- private sector provision of new infrastructure (and any associated transport services) under franchise, either in perpetuity or for a concession period;
- changing laws to permit private sector participation in activities previously restricted to the public sector;
- leasing assets or letting management contracts to the private sector, with the public sector retaining ownership; and
- inviting private sector operators to tender to operate services in place of or alongside services operated by the public sector.

(3) Road

1) Infrastructure

There are very few privately owned and operated roads available for use by the general public anywhere in the world. Considerable interest has been shown recently, however, in commissioning new roads from private sector construction consortiums, with the private sector funding the construction and retaining ownership or management of the road after completion.

Under the Build-Operate-Transfer (BOT) system construction companies are invited to build the road in exchange for the right to operate it as a toll road for a number of years, the concession period, after which the infrastructure is handed over to the public highway authority. Such roads need to be of high quality, limited access, expressways in order to attract sufficient traffic willing to pay a high enough price to repay the investment. A number of BOT highways, bridges and tunnels have already been built, and more are being commissioned. However, none has been open for long enough to judge whether the system is achieving the forecast benefits. Problems have already arisen in Thailand and Hong Kong, with disputes over interpretation of contracts, the concessionaire's freedom to set commercial charges, and subsequent construction of rival roads not considered at the time of bidding. In some cases, public sector subsidy or contribution (land purchase and clearance, feeder roads, tax holidays) has been required to attract investor interest.

There are no private sector roads in Pakistan, and none are currently planned. There are a number of examples of private sector management contracts, but these are restricted to the collection of tolls on certain bridges and roads. There are plans to toll new and upgraded sections of the national highway network, but NHA would retain ownership and control of the roads. BOT toll roads could be considered in the future as the need for a high grade motorway system becomes greater, and even self-funding highway authorities. There are, however, a number of potential problems.

BOT concessionaires are unlikely to be prepared to take on the maintenance and accident liabilities imposed by current driver behaviour in Pakistan, particularly in connection with

the overloading of goods vehicles. Self-funded highway agencies would need revised rates of vehicle taxation, most of which is import duties on vehicle and spares at present. A further disadvantage is that there are currently five major public sector highway authorities (NHA and the four provincial C+W departments). Arranging adequate and equitable autonomous funding for all these agencies could prove difficult, and considerable further study would be needed before recommending such a system in Pakistan.

2) Services

Road transport services worldwide are already overwhelmingly provided by the private sector, particularly freight transport services. Current opinion is that there are no major economies of scale in road transport.

Most road transport in Pakistan is already provided by the private sector, and the government is currently pursuing fiscal companies, however, all bus companies operate at a loss. Although private operators' financial status is not clear statistically, they seem to be marginally profitable, since there are constant new entries to the market. It is reported that company owners claim the difficulty to prepare funds for depreciation under the current fare regulation policy.

NLC was established by the Federal Government and has been transporting strategic commodities mainly to/from Karachi under specific contracts with government agencies. They indicated a profitable operation in the past and purchased new cargo fleet recently. The presence of NLC could be a distortion in the freight haulage market, given their potential for cross-subsidisation from military resources and the allocation of certain movements of strategic goods. Privatization of NLC should be studied and realized in accordance with the government policy.

The financial status of the private operators is little known. However, market mechanism is functioning and the prevailing fare rates are determined in the market without government intervention. Given the generally healthy state of the private sector, there seems to be little justification to promote public ownership of any road transport services.

(4) Rail

Recent development in economic theory advocates separation of ownership of rail infrastructure and services on it, to make the structure of rail services similar to road services.

All rail infrastructure and services in Pakistan are in public ownership. PR has suffered from a lack of investment in recent years, and is running with increasingly old and dilapidated equipment, as well as using outdated and inefficient operating methods.

It would undoubtedly benefit from an injection of private sector dynamism and capital, but PR made an estimated loss on a current cost asset replacement basis, before explicit government subsidy, of Rs6.8 billion. It is doubtful that any aspect of PR's activities is profitable, even bulk freight haulage, and it is difficult to see where any private sector interest is going to come from.

Areas already explored include privatisation of ticket sales on some sections and on-train catering. Other potential areas of involvement include provision of modern and reliable specialised freight wagons by some shippers, but this would also require changes to PR's current practice of running freight trains on an ad-hoc basis, with no guarantee of departure or transit times. Manufacturing operations (locomotives, etc.) could be sold off as viable industrial concerns, and some aspects of maintenance bought from private sector suppliers.

PR should initially be moved towards the commercial railway that the 8th FYP envisages by giving it the status of a public corporation, similar to that of PIA, and an internal structure that will promote a commercial, profit or efficiency based culture within the railway. The physical and social geography of Pakistan is favourable to rail transport, and forecast levels of demand would appear to support elements of a profitable (and privatisable) railway if present operating efficiencies can be overcome and new capital investment is attracted.

(5) Sea

1) Infrastructure

Many ports world-wide are in private ownership, while in other countries ownership is public, either by the state or the city or province.

There are only two major ports in Pakistan, at Karachi and Port Qasim, with relatively little competition between them, as Qasim is a specialised bulk goods port. While they are both constituted as public sector port trusts, there is already some use of private sector contractors and management.

There are considerable further opportunities for the introduction of private services and management into these ports. In particular, container shipping lines are expressing interest in taking over the management of several berths and constructing modern dedicated container terminals there. Competition, and therefore efficiency, would be enhanced if more than one operator were involved.

2) Services

Most shipping services worldwide are operated by private companies. However, some countries maintain state owned shipping lines for reasons of security of supply. Pakistan falls into the latter category, with a national carrier, PNSC. However, the bulk of goods moving through Pakistan's ports are delivered or collected by non-Pakistan registered ships.

PNSC has made limited investment in new vessels in recent years, and now suffers from having an ageing fleet. It is not competing well for cargoes, even to or from Pakistan. Outright privatisation is a possibility, but the line probably needs a fresh injection of public sector capital to modernise its fleet, and a management overhaul, before serious interest from the private sector would be forthcoming.

(6) Air

1) Infrastructure

The great majority of public "commercial" airports world-wide are in public ownership, and many of them are in joint civil/military use. All commercial airports in Pakistan are in the public sector. Eight are jointly operated by the CAA and the Air Force, the others are solely operated by the CAA.

CAA's accounts show it to be profitable, but there is concern that there is insufficient maintenance expenditure. Income is largely (85%) from air-side activities, mainly landing fees. Only three airports have any significant amount of traffic, Karachi, Lahore and Islamabad. No breakdown of income and expenditure on an airport by airport basis has been seen, but it is likely that these three airports are profitable, while all the others sustain substantial losses.

CAA is anxious to reduce the net cost of maintaining the outlying airfields. However, outright privatisation as a group is not a realistic option given the joint military use of 8 of the fields. Although there are some options, the best options in the short-term seem to be the transfer of the management of some airfields to the local authority (with safety standards still set by CAA) and introduction of private sector management (e.g. BOT terminal concessions at Lahore and Islamabad, where facilities fall well short of international standards) at those airport where there is the potential for increased commercial activity.

2) Services

It is understood that PIA is now profitable on a commercial accounting basis, and is expected to be able to fund its own fleet renewal programme during the 8th FYP period without the need for any injection of government funds. Outright sale or floatation on the stock market is thus a possibility.

Encouragement has recently been given to the private sector to enter the internal air transport market on a limited scale, but it is understood that early experiences have not been successful.

New entrants have had difficulty in getting certification for their planes and pilots from CAA, and have withdrawn (possibly temporarily) from the market, alleging CAA bias against the private sector. It is possible that these small private operators will return to the market if clear standards and guidelines on their participation are given by government and CAA.

5.4 Trade and Communications with Central Asian States

(1) Introduction

After the breakup of the Soviet Union, new independent countries have emerged in central Asia. These countries, including Turkmenistan, Tajikistan, Uzbekistan, Kazakhstan, Kyrgyzstan and Azerbaijan are currently seeking for means to develop through strengthening of trade relations with the surrounding countries. Pakistan, also in search for development opportunities, is located in the south of these countries and expects to have transit routes there. Due to possible complement ability in natural/human resources and religious proximity, the trade and communications with the Central Asian States (CAS) seem to have a huge potential. The existence of Karachi Port would be an apparent advantage for Pakistan.

(2) Future Prospects

In the long-term, nobody doubts that a huge potential exists in the conceived trade between Pakistan and CAS. In short-term, on the contrary, most opinions are pessimistic in view of the conflicts between neighboring countries and the continuing Afghan civil war. There is no guarantee that current political and social instability that have dominated in the region, whether international or internal, would cease in several years. In addition, there is another difficulty in estimating the possible magnitude of trade due to the absence of reliable data. Even with data, however, it would be extremely difficult to carry out this task because most of the conceived trade is a new phenomenon that never happened before. Thus it is considered unrealistic for the time being to show a responsible perspective for future trade with CAS. This is presumably a work to be done by statesmen with strong leadership and firm philosophy.

Nevertheless, a huge trade potential exists between Pakistan and CAS, e.g.:

- Meat, vegetable, fruits and manufactured goods such as textile products, vehicle and electric apparatus (from Pakistan to CAS).
- Wheat, cotton, natural gas and minerals such as chromite and manganese (from CAS to Pakistan)
- Wheat, cotton, natural gas, minerals and manufactured goods (to/from CAS through Pakistan)

Natural gas could be transported by pipeline through Pakistan and processed in Karachi into LNG for export or domestic consumption. It is considered important to prepare for the possible increase of the trade and communications with CAS and remote areas such as Europe and the Far East. This includes:

- Development of ports in Karachi equipped with modern facilities for handling containers, quick transshipment between road/rail;
- Construction of national high-standard trunk roads;
- Determination and efficient utilization of railway trunk lines; and
- Improvement in traffic management and customs procedure

In other words, what is necessary for improving Pakistan's national transport network would also be needed for the trade with CAS countries. In addition to this, experiments such as the recently opened air flight services between Pakistan and CAS should be further pursued to deepen mutual understanding on both sides.

5.5 Needs and Options for Institutional Reform

(1) Introduction

The ease of implementation of the infrastructure projects and transport policies proposed for the 8th FYP and later Plan periods will be influenced by the strength and organisational efficiency of the governmental agencies charged with managing that implementation.

The structure and organisation of government institutions in the transport sector in Pakistan have remained substantially unchanged for a number of years, yet the tasks they are being asked to undertake have changed markedly in the last few years. This change in emphasis has now been formalised in the 8th FYP, but there are few formal proposals for institutional changes.

A review of the way in which public sector involvement in the transport sector is organised and managed, from Ministerial level down, would therefore seem appropriate at this time. This section identifies some of the areas such a review could examine.

(2) Ministerial Organisation

At present responsibility for transport is divided between a number of Ministries, notably Ministry of Communications and Ministry of Railways, which means that decisions on overall transport policy need to be taken at Cabinet or Prime Ministerial level. A single Ministry to handle National Government's involvement with all modes of transport might be a more appropriate institution to manage and organize an increasingly commercial transport sector.

In addition to the existing transport related functions of the Ministry of Communications, the new Ministry should assume National Government responsibility for the railways and, to the maximum extent, airports. This would provide, at Ministerial level, a forum for debate of an integrated transport policy. It would also be a platform for liaison with other Ministries and the Planning Commission on the transport needs and implications of proposals in other sectors of the economy. As well as overseeing the management of the transport infrastructure and services provided by National agencies, the Ministry should also supervise agencies involved in transport related research and feasibility studies.

While centralizing responsibility for transport in a single Ministry, the extent of that responsibility can be reduced if day to day works currently undertaken at ministry level are devolved to other levels of Government. Possible areas include the corporatisation of the railway and the transfer of day to day responsibility for some infrastructure to Provincial or District levels of government, or even to the private sector.

(3) A Pakistan National Railway Corporation

At present PR is effectively run by the secretariat of the Ministry of Railways, most of whom also sit on the Board of PR. The railway is thus a government department, and the staff are civil servants. It seems an appropriate time to examine the options for re-structuring PR into an efficient commercial railway.

One possibility is of a government owned corporation, similar to PIA, with Ministerial representation on the board. Ownership and overall direction of the railway would remain in the public sector, but day to day running of the railway would be passed to commercially oriented managers with clearly defined targets and responsibilities. Moreover, given the hope for gains in railway productivity and profitability, such a structure would be suitable for the privatisation of the railways, if that was politically desirable.

A number of other countries are adopting alternative approaches to the commercialisation and ultimate privatisation of their state railways. These should be examined in the review to identify the best corporate structure for PR to achieve the conflicting commercial and social tasks it faces.

(4) Division of Responsibility between Federal and Other Levels of Government

At present the Federal Government has sole responsibility for Pakistan's shipping, ports, aviation and rail industries, while roads and road transport are largely the responsibility of the Provincial Governments. This situation has arisen in an ad-hoc manner over a number of years, and it may be appropriate to re-examine the division of responsibilities for the transport sector in Pakistan.

1) Local Railways

A possible future corporate structure for PR would have a national organisation responsible for the main lines, but would transfer responsibility for local branch lines located wholly within a Province to the Provincial authority.

This would allow greater local involvement in specifying the level of service to be provided and in assessing the balance between the social benefit derived and the operating subsidy required. As local lines are understood to not even cover their operating costs from revenues, this transfer of responsibility would also need an increase in Provincial funding, which might initially have to be in the form of an additional transfer of Federal funds.

In Pakistan, it might be appropriate as a first step to transfer operation of certain lines, in particular the metre gauge network in Sindh, to local control and operation.

2) Local Airfields

Domestic air services are operated to more than 40 destinations within Pakistan, and all airfields are run by the Federal CAA (some shared with the Air Force). Many of these airfields receive only one or two flights a week, but air transport is seen as an essential component for National integration due to the distances involved and the difficulty of making some journeys by road, particularly in winter.

Local involvement in running the airport can result in the scale of the airport operations being more closely related to the air transport needs of the local community, and also to staffing and operational efficiencies. National involvement would be limited to setting and enforcing minimum construction and safety standards.

While the busy international gateways are operated by private sector companies or concessionaires, local airports could be run by Provincial or Municipal agencies. National supervision would be exercised, by the CAA setting standards for aircraft, airports and staff, and controlling use of the air-space.

CHAPTER 6 MID-TERM PROPOSALS FOR 2005-06

6.1 Planning Guidelines

One of the purposes of this study is "review of the National Transport Study for the 7th Five Year Plan", and it consists of the following four items;

- a. Review of implementation of the present Master Plan / Investment Programmes for the 7th FYP,
- b. Analysis of the present condition of the national transport system in Pakistan,
- c. Identification of the problems of the national transport system and present Master Plan, and
- d. Updating of the demand forecast in the previous study.

As these items above are analyzed in depth in each sub-sector of the Study, only the essentials are described in this section.

(1) Economic Development Scenario as a Framework of National Transport Planning

- GDP annual growth was projected to be 7.0 %, 6.3 %, 6.2 % during 8th, 9th and 10th FYP, comparing with 6.0 %, 5.7 % and 5.7 % for each FYP proposed in the previous master plan, and the target in 2005-06 was established in spite of the low growth in 1992-93.
- Basic policies for economic growth announced in the 7th FYP, such as vitalization of the private sector, introduction of foreign investment and deregulation / decentralization of economic control and management, are being succeeded into the 8th FYP and after.
- Various infrastructures are to be established / improved in order to cope with the rapid increase of demand of various services which occurs as a result of formation of fixed capital and assets for production / services during the 8th FYP. They are energy / water supply and transport infrastructure, etc.

(2) Updated Traffic Demand Forecast

- Updating of the demand forecast was carried out in accordance with the following steps;
 - Review of the overall methodology and update of traffic data up to 1992-93,
 - Compilation of the present traffic flow data: road, railway and air,
 - Re-projection of macroscopic demand: land and air,
 - Re-projection of port traffic by commodity,
 - Careful consideration on modal split between road and rail,
 - Projection of container traffic between ports and inland dry-ports.
- Since the traffic demand was forecasted, in general, in accordance with the economic activities foreseen in the previous stage, transport planning policy by mode, etc., the followings are pointed out as a result of comparison (in 2005-06) with the previous NTPS;
 - 20 % higher volume of the port traffic, especially in export in line with the industrialization policy.
 - Land traffic: 30 % higher in pass-kms and 15 % higher in ton-kms, reflecting higher growth rate of GDP.
 - Rail traffic: though approximately 60 % of the total land traffic ton-kms was allocated to rail in the previous NTPS, it was mitigated to about 34 % in this study as the previous target was deemed to drastic. In this study, however, the target is still high at 18 % increase per annum (1992 to 1997) and 6 % (1998 to 2006).
 - Air traffic: a slightly higher projection in domestic cargo traffic (10 %), no difference in pass-kms.

(3) Basic Planning Policy by Mode

1) Road Planning

The major projects identified for the road sector are :

- Increase of road capacity: widening, bypass, tunnel
- Consolidation of road standards among NHA, Province, and others.
- Strengthening of maintenance and rehabilitation, etc.

Major sections to be improved were selected based on the following :

- Comparison of estimated traffic demand with road capacity, by traffic assignment simulation for 1997-98 and 2005-06.
- Functional grade of each link, in accordance with the proposed standard.
- Commitment of the projects by related agencies.

In addition to the above, various proposal / recommendations are made in the study to be realized by the early years of 21st century;

- Integrated road network of provincial roads with national highway,
- Regional socioeconomic development strategy aspect, in the northern area and Balochistan,
- International trunk road linkage toward the Central Asian States, etc.

2) Railway Planning

Railway improvement plan was examined along the following direction;

- Pakistan Railways, with a nationwide network already in place, should explore investment options to maximize the efficiency of these facilities.
- Limited investment resources must be deployed for efficient improvement; along the highest priority lines.

The priority projects were examined through the availability of following measures;

- Strengthening transport capacity (facilities)
 - Doubling of tracks
 - Electrification
 - Rehabilitation of track
 - Revamping of signaling
 - Repair of bridges
 - Revamping of alignment
- Strengthening transport capacity (rolling stock)
 - Increasing of the amount
 - Raising of the performance
 - Revamping of the maintenance system / facility
- Introduction of high-speed trains to improve passenger transport
- Improving freight transport
 - Construction of new freight terminals
 - Modernization of container transport
- Modernization of management information system and communication network

3) Port Planning

The mid-term plan for port focused on the improvement of two major ports, Karachi and Qasim.

First of all, the functional allotment between the two ports was discussed. It was concluded that the function of both ports in the future was almost the same, despite their difference historical background. The development of two ports for the year 2005-06, thus, should be well coordinated.

The projects for the plan were studied based on the following concerns;

- Effective utilization of the existing facilities
- Establishment of the container terminal
- Modernization of dry bulk terminal
- Additional liquid terminal

In addition to the above two ports, the development of other minor ports was also examined. They are :

- Gwadar deep sea port, and
- Keti Bunder port

4) Shipping

As no acquisition of any modern ships was made since the 5th FYP, the fundamental planning conditions remain same as that of the previous NTPS.

Various recommendations were made together with necessary fleet proposals;

- Modernization of merchant fleet
- Upgrading of PSW's organization
- Introduction of new Merchant Shipping Act
- Participation of private sector in shipping
- Availability of source of funds over ship financing
- Strength of sea linkage
- Restructuring of PNSC

5) Airport and Aviation Planning

In order to meet the future traffic demand and secure the safe operation at each airport, the following mid-term proposals were made :

- Islamabad and Lahore airports should be immediately developed as the capital airports and the international airports in Pakistan. Karachi airport should be improved as the hub airport.
- Airport facilities should be improved to meet the increasing demand and the introduction of larger aircraft, with proper maintenance.
- The construction of small feeder airports might be justified from the view point of the civil minimum of transport service in the region. They should be planned to accommodate F-27 class in the near future.
- Air navigation systems also should be newly planned / upgraded, taking into consideration internationally acknowledged standard levels and future development.
- Expansion of the service route network, and promotion of tourism.

6.2 Summary of Major Proposed Projects and Costs

Proposed projects and their estimated costs are tabulated in Table 6.2.1, as the summary of the revised mid-term plan for the year 2005-06. They consist mainly of physical infrastructure development projects. Other proposals/recommendations, not quantified in terms of project cost, are described in the main volume.

Table 6.2.1 Major Proposed Projects and Costs, for Mid-term (2005-06)

Sub-Sector	Major Projects	Rs. billion	(%)
Railways :		145.6	(37.1)
	Track Renewal	7.1	
	Rehabilitation of Rolling Stock	6.6	
	Procurement of Rolling Stock	75.0	
	Signaling	7.3	
	Speed-up / Double Tracking	13.3	
	Electrification	17.4	
	Container Transport Improvement	2.4	
	Modernization / Others	3.2	
	Miscellaneous	13.3	
Roads :		119.8	(30.5)
	Motorway	9.5	
	N-5	37.8	
	N-55	15.7	
	Kohat Tunnel	2.4	
	Sukkur Bypass	2.0	
	Coastal Road	10.5	
	Other National Highways	30.9	
	N-70	3.9	
	Provincial Highways	7.2	
	Maintenance / Rehabilitation	n.a	
	Others	n.a	
Ports :		19.9	(5.1)
	Karachi Port	12.1 (8.4) *	
	Qasim Port	7.8 (6.3) *	
	Others	0.0	
Airport / Aviation :		107.3	(27.3)
	Airport Development	16.3 (7.3) **	
	Aviation Development	90.9 (90.9) **	
Grand Total		392.6	(100.0)

Note : 1) * = by private sector
 ** = by corporate sector

The Preliminary benefit-cost analyses were carried out in order to assess the economic viability of the proposed projects. This mainly focuses on the analysis of mid-term master plan, as a whole package of projects proposed by sub-sector, since most of the projects during 8th FYP are on-going or already committed. The results show those proposed projects economically viable.

Project Package	B/C Ratio	EIRR
- Major road construction (priority sections) :	1.15-3.94	17-35%
- Railway improvements:	1.10	16%
- Ports development	1.21	12%
- Airport & civil aviation:	1.09	17%

Figure 6.2.1 Proposed Projects of Road Development for 2005-06

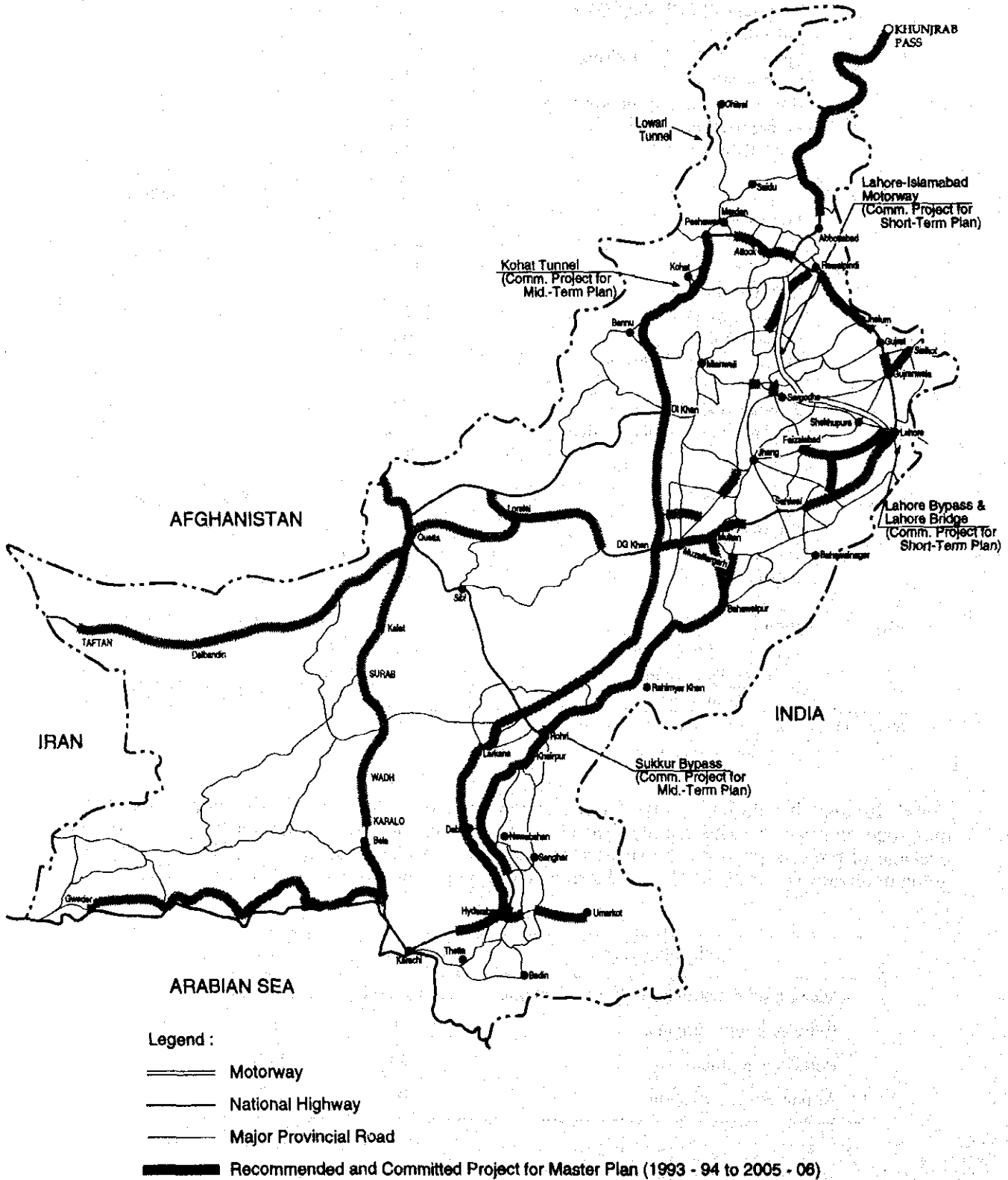


Figure 6.2.2 Proposed Projects of Railway Development for 2005-06

Project	Existing Section	Proposed Section
1. Doubling Track	Karachi - Lodhran, (Lahore), (Rawalpindi)	Lodhran - Shekhupur, Shahdara Bagh - Chaklala, Shahdara Bagh - Faisalabad
2. Electrification	Multan - Lahore	Karachi - Multan
3. Rehabilitation of Track	---	Primary 'A' & 'B' and Secondary Sections
4. Automatic Block Signaling	Karachi - Hyderabad	Hyderabad - Rawalpindi
5. Tokenless Block Signaling & Color Light Signal	Rohri - Jacobabad Multan - Wazirabad	Kotri - Habibkot, Khanewal - Peshawar
6. Electric/Relay Interlocking	Karachi - Hyderabad, Rohri - Samasata	Hyderabad - Rohri, Samasata - Lahore
7. Centralized Train Control System	(Karachi)	Karachi - Rawalpindi
8. Communication Network	Karachi - Multan Multan - Wazirabad, Kotri - Jacobabad, Jacobabad - Khanewal	Lodhran - Shekhupur, Multan - Lahore, Jacobabad - Quetta Khanewal - Peshawar

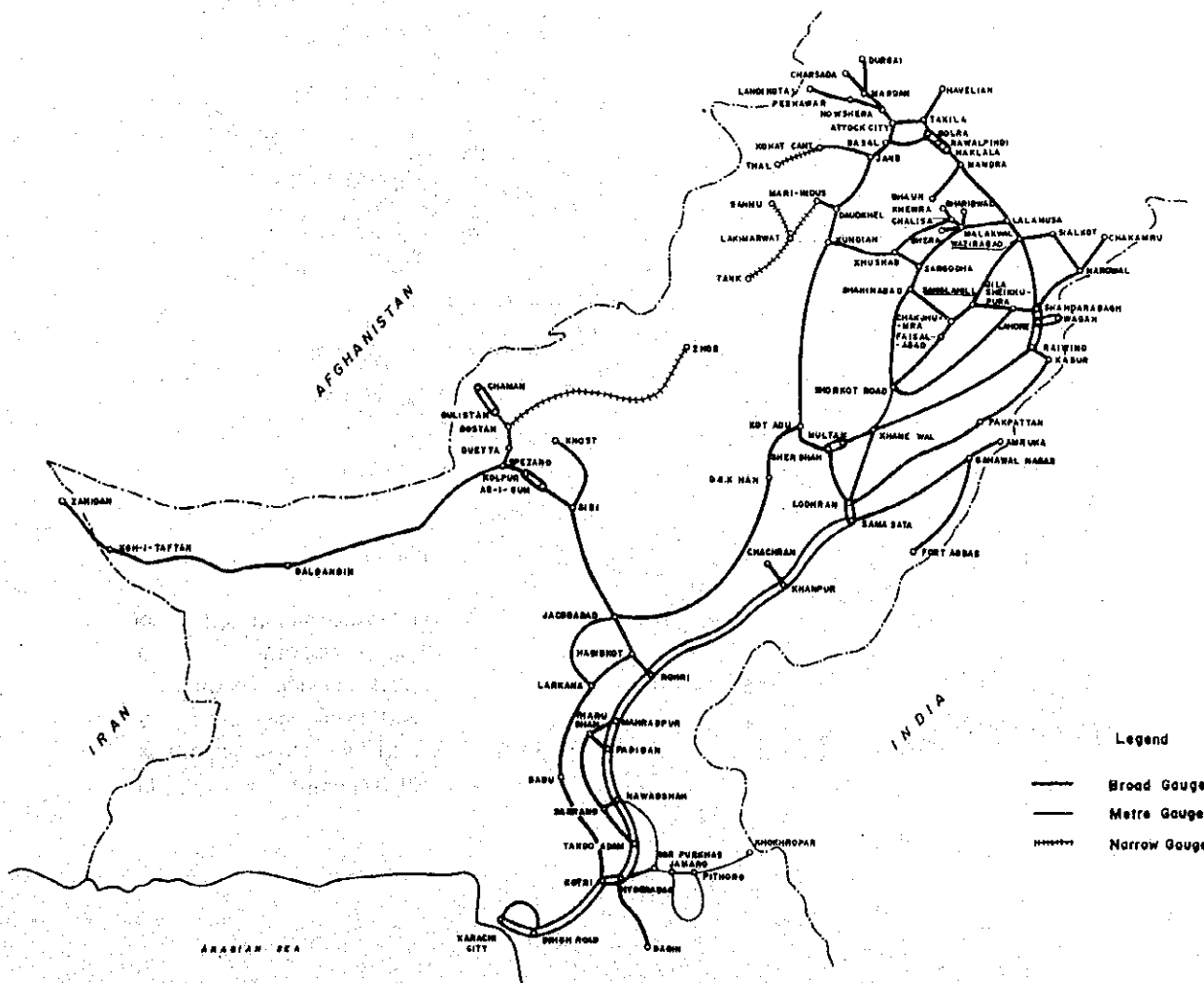


Figure 6.2.3 Proposed Projects of Port Development for 2005-06

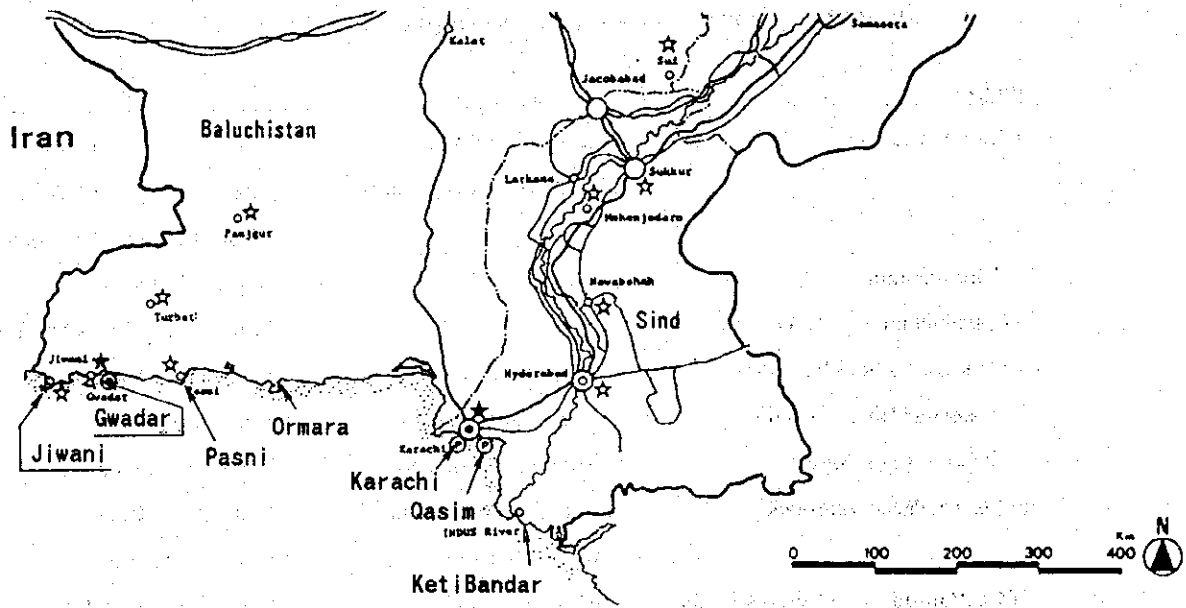
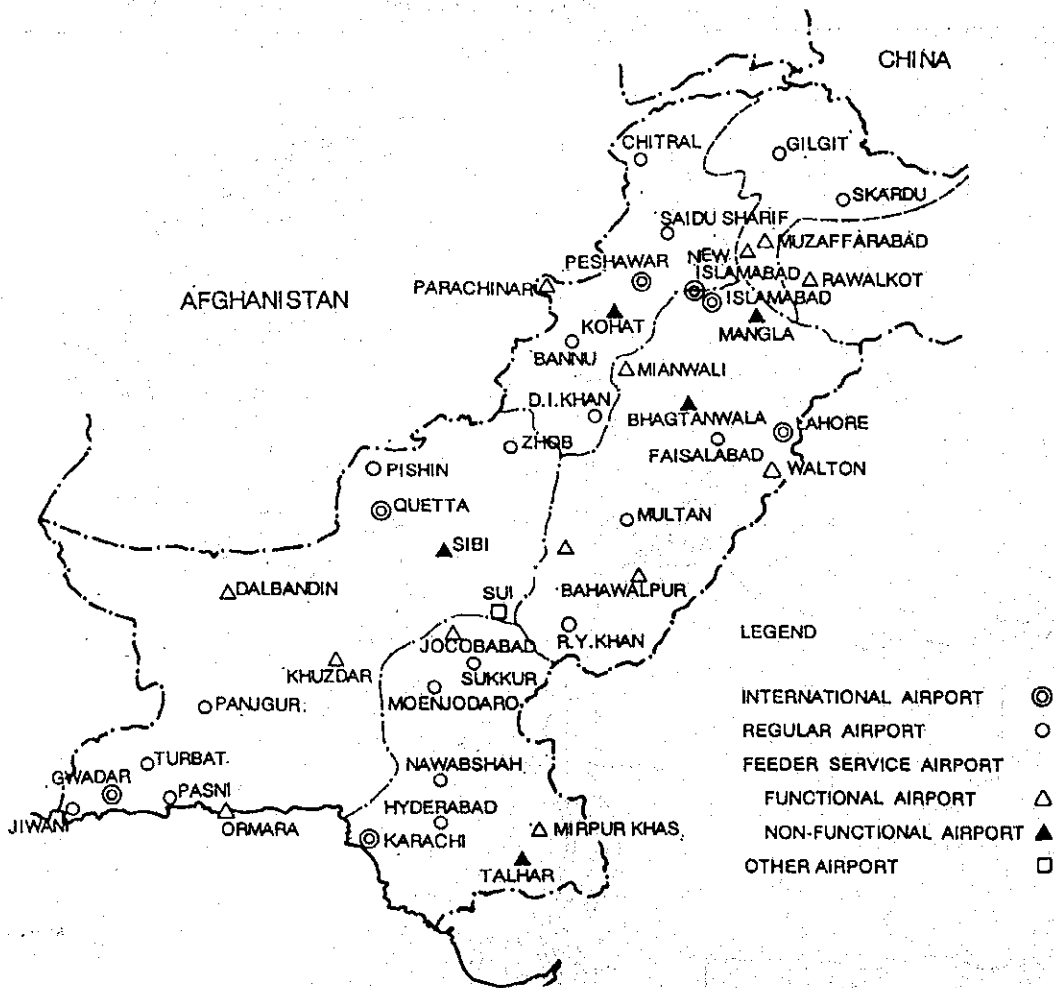


Figure 6.2.4 Proposed Projects of Airport Development for 2005-06



CHAPTER 7 SHORT-TERM PROPOSALS FOR 1997-98

7.1 General

The proposals as the short-term transport plan (during the 8th FYP period) are composed of various physical infrastructure improvement projects, together with recommendations on policy options and reforms of institutions and agencies in the transport sector.

Since the 8th FYP is already authorized by the Government of Pakistan and is effective, the recommendations in this study were made based on the selection of priority projects from the mid-term proposals in consistency with the existing the 8th FYP.

The traffic demand by each transport sub-sector was forested as a basic target of the plan for 1997-98, as shown in Table 7.1.1.

Table 7.1.1 Target of Traffic Demand for Short-term Planning

Sub-sector	Items	1992-93	1997-98	Annual Growth Rate (%)
Road planning				
	No. of vehicle trips per day (000)	159	208	5.6
	Pass-kms/year (million)	71,071	96,615	6.3
	Ton-kms/year (million)	28,636	30,180	1.0
Railway planning				
	Pass-kms per year (million)	16,511	22,790	6.7
	Ton-kms per year (million)	6,051	13,692	17.7
Port planning				
	Dry cargo per year (000 ton)	16,138	20,132	4.5
	Liquid cargo per year (000 ton)	14,093	17,418	4.3
	Containerized (000 ton)	5,142	7,684	8.4
Airport Planning				
Domestic				
	Pass/year (000)	3,861	5,668	8.0
	Ton/year (000)	42	59	7.0
International				
	Pass/year (000)	4,128	5,049	4.1
	Ton/year (000)	130	164	4.8

7.2 Summary of Planning by Sub-sector

(1) Road Planning

1) Planning Directions

The selection of priority projects in road sub-sector was carried out from the following viewpoints :

- At first, all inter-regional trunk roads were classified by administrative / functional categories, and their present conditions were examined in comparison with the proposed design standards adopted in the current draft plan of the NHA.
- Traffic assignment simulation on the existing / proposed road network was conducted with the projected traffic demand for the year 1997-98. As a result, some sections of the network, such as the section of N-70 between Multan and D.G.Khan, were found to be widened to cope with the increasing traffic demand in the future. Most of the on-going

national highway projects (namely, committed projects) were reevaluated to be reasonable in view of future traffic demand.

- c. Major improvement projects of national highways under the 7th and 8th FYPs, which are on-going / committed projects, such as Lahore-Islamabad Motorway, Indus Highway, Lahore Bypass, Kohat Tunnel, Sukkur Bypass, etc., are included into the recommended project list with due consideration.
- d. In addition to the above, strengthened effort for maintenance and rehabilitation was identified to be necessary to upgrade the performance of the entire road network.

2) Proposed Projects

The following road improvement projects were identified for proposal :

Table 7.2.1 Summary of Road Improvement Projects for 1997-98

Item	(Rs. million)
	Short Term Completion (8th FYP)
National Highway Committed	
1. Motorway	9,460
2. N-5	29,796
3. Lahore Bypass	3,220
4. N-25	2,240
5. N-55	9,882
6. Kohat T & BP	1,800
7. Sukkur Br.	1,000
8. N-70	1,341
9. N-40	1,987
10. Others (N-35, etc.)	7,448
11. Meklan Coast Rd.	2,000
National Highway Newly Recommended	
1. N-70	681
Total of National Highways	70,855
Province Highways Newly recommended	2,371
Grand Total	73,226

(2) Road Transport Planning

Major planning directions are as follows :

1) Passenger Transport Service:

There is no planned investment from the Federal Government on this sub-sector in the 8th FYP, since provincial governments are in charge of regulation of public transport service.

Although provincial governments are not positive in regulating and rationalizing public transport service, the public can obtain better services in the future through the following :

- a. Establishment of statistical data accumulation system on public transport services in PTA and RTAs.
- b. Analysis on fare and cost of commercial services in order to rationalize the fare rate.
- c. Periodical market surveys (supply and demand) to restructure the service network / routes.

2) Cargo Transport Service:

The followings should be taken into account :

- a. Fare determination in the market mechanism should be maintained.

- b. A feasibility study on overall mechanism of excessive loading, road surface deterioration, traffic safety and transport industries, should be conducted in order to improve the current situation.

3) Accident Reduction:

- a. Training of traffic police
b. Accident analysis

(3) Railway Planning

In line with the planning directions of the mid-term proposals, the short-term priority should be placed on establishing high-speed, reliable operation over the main Karachi - Lahore - Peshawar corridor, and particularly on enhancing freight transport capabilities which produced significant revenues. PR's targets for the 8th FYP are :

- Wagon turn around time 7 days,
- Daily engine-kms per engine in use (goods) 300 kms,
- Daily system loading of wagons 2,300 wagons,
- Percentage of ineffective locomotives 15 %.

The priority projects for the year 1997-98 were selected after a preliminary economic evaluation. They are listed in Table 7.2.2.

Table 7.2.2 Summary of Railway Improvement Projects for 1997-98

No.	Projects	Estimated Cost (Rs. million)		Remarks
1	Track Renewal	3,550		
	Rail		2,700	
	Sleeper		850	
2	Double Tracking	4,000		
	Lodhran - Shershah		720	
	Multan - Raiwind		2,800	
	Shahdara Bagh - Faisalabad		480	Partial provision
3	Upgrading KYC-LLM section	3,300		
4	Automatic Block Signaling	540		Partial provision
	Karachi - Lahore			
5	Electric/Relay Interlocking	720		Partial provision
	Karachi - Lahore			
6	Centralized Traffic Control System	300		Partial provision
	Karachi - Lahore			
7	Electric Locomotives Revamping	800		
8	Diesel Electric Locos	10,400		
	Procurement (3000 HP / 2000 HP)		6,900	
	Rehabilitation		3,000	
	Traction Motor		500	
9	Procurement of Wagonmovers	300		
10	Procurement of Wagons	4,400		
11	Replacement of Coaches	4,400		
12	Improvement of Rolling Stocks	3,000		
	Air Brake		1,000	
	Roller Bearing		1,000	
	Air Conditioning		1,000	
13	Electrification	360		Partial provision
	Samasata - Khanewal			
14	Information System and Communication System	930		
	Management Information System		330	
	Communication System		600	
15	Misc. and Minor Projects	3,700		
	Total	40,700		

(4) Port Planning

In formulation of the short-term proposals for the port sub-sector, the following basic policies and strategies were determined :

- 1) Improvement of port facilities to meet the forecasted demand in consistency with the mid-term plan.
- 2) Establishment of full scale container terminals both in Karachi and Qasim.
- 3) Effective utilization of the existing facilities.
- 4) Encouragement of the private sector in port development and operation.

The short-term port projects are listed in Table 7.2.3.

Table 7.2.3 Summary of Port Development Projects for 1997-98

Name of Project (No. of Berths)	Project Cost	(Rs. in million)
		Remarks
Karachi Port		
Jinnah Bridge Phase-II *	796	
Bucket Dredger & Ancillary Craft *	552	
Oil Terminal OP-V *	530	
Reconstruction of Berths No. 5-8	1,800	
Container Terminal (5)	4,704	Private Sector
Feasibility Study on Container Terminal	33	
Modern Warehousing Complex	160	Private Sector
VSP Tugs, Pilot Boats and Storage Area	200	Private Sector
Computerization	15	
Sub Total	8,790	
Qasim Port		
Phase-1 *	324	
Deepening of Navigation Channel for 75000 DWT ships	765	
Oil Terminal *	2,500	Private Sector
Container Terminal (2)	1,568	Private Sector
Bulk Water Supply to Industrial Area	390	
New Liquid Berth	200	Private Sector
Computerization	10	
Sub Total	5,757	
Others		
Other Projects	25	
Sub Total	25	
Total	14,572	

Source : JICA Study Team

Note : * ongoing project.

(5) Planning of Shipping

The short-term proposals of shipping sub-sector, unlike the previous FYPs, are entirely for the private sector, taking into account the government policy.

The acquisition of the following ships by both PNSC and NTC was planned.

for PNSC;

Seven new full container ships of 1,200/1,800 TEU capacity,

Two bulk carriers of 60,000/70,000 DWT,

One edible oil tanker of 25,000/30,000 DWT, and

10,000 TEU steel containers.

for NTC;

One crude oil tanker of 70,000/80,000 DWT, and
One product tanker.

(6) Airport / Aviation Planning

In the light of the mid-term plan, the following policies / strategies were identified for short-term proposals.

- 1) Improvement of major airports, Karachi, Lahore and Islamabad, should be of top priority.
- 2) Other airports should be improved corresponding to the traffic demand. Quetta and Peshawar international airports have higher priority.
- 3) Aeronautical Communication and Control projects are given high priorities.
- 4) Purchase of necessary aircrafts.
- 5) Encouragement of private sector participation.

Table 7.2.4 List of Airport Improvement Projects for 1997-98

Project Name	Cost (Rs. million)
Public Sector	4,108
1. New Terminal Complex at Lahore	3,200
2. Development of Sukkur Airport as Alternate Airport to Karachi	222
3. New Feeder Airport Development	320
4. Air Navigation System for Sukkur	198
5. Air Navigation for Other Feeder Airport	168
Corporate Sector	4,725
1. Improvement of Karachi Airport	1,017
2. Improvement of Islamabad Airport	196
3. Improvement of Lahore Airport	72
4. Improvement of Other Airports	1,900
5. Aeronautical Communication and Control Project (AC&C)	336
6. Air Navigation System for Karachi Secondary Runway	138
7. Air Navigation System for Other Airports	585
8. Rescue and Fire Fighting service	274
9. Other On-going Projects Islamabad	207
TOTAL	8,833

Table 7.2.5 List of Aviation Projects for 1997-98

Item	Outline	Cost (Rs. million)
1. Purchase of Aircraft	1 - Wide Body Class (A-300)	2,400
	7 - Airbus A310-300	14,700
	2 - Boeing 737-30	2,100
	3 - New Turbo Prop	1,107
	Total	20,307
2. Replacement of Aircraft		8,400
3. Development of infrastructure	Construction/Development of Workshops, hangars and cargo complexes etc.	1,020
Total (Aviation)		29,727

7.3 Summary of Total Proposed Project Cost

The estimated cost of the proposed projects is summarized below.

Table 7.3.1 Summary of Proposed Projects and Costs for 1997-98

Sub-Sector	Major Projects	Rs. million	
Roads:		73,226	
	Motorway	9,460	
	National Highway (committed)	60,714	
	National Highway (recommended))	681	
	Provincial Highway (recommended)	2,371	
Railway:		40,700	
	Track Renewal / Improvement	10,850	
	Signaling / Control System	1,560	
	Rolling Stocks	23,300	
	Electrification / Information System	1,290	
	Others	3,700	
Ports:		14,572	
	Karachi Port	8,790	(5,064)*
	Qasim Port	5,757	(4,268)*
	Others	25	
Airport / Aviation:		38,560	
	Airport Projects	8,833	
	Aviation Projects	29,727 *	
Total		167,058	

Note: * private / corporate sector

As for the multi-modal transport which has been emphasized in this study, the cost was estimated as presented in Table 7.3.2. This cost is included in the railway sub-sector in the main report.

Table 7.3.2 Cost for the Proposed Multi-modal Transport

	(Rs. million)	
1. Improvement of Karachi Dry Port	400	
Track & Signal	40	
Civil Works	100	
CFS	100	
Equipment	160	
2. New Construction of Lahore Dry Port	1,400	
Track & Signal	100	
Civil Works	500	
CFS	250	
Equipment	400	
Others	150	
3. Other Dry Ports (Kundian, Sargodha)	400	
4. 600 Flat Container Wagons	1,300	
Total	3,500	

This includes the urgent improvement of the Karachi Port, particularly in relation to the container transport that is an emerging market not only for freight forwarders but for PR as well as for the proposing private operators for the container terminal. The total cost has been estimated at about Rs. 3.5 billion, of which 40 % shall be used for construction / improvement of the existing inland dry ports. Also nearly 40 % of the cost is proposed for the purchase of container wagons for PR. PR is supposed to carry, at least, 1.1 billion ton-kms in 1997-98 and 2.3 billion ton-kms in 2005-06 only for this market segment.

In relation to the involvement of the private sector into transport industry, the port sub-sector expects Rs. 9.3 billion of private investment mainly for container terminals and oil terminal. In the airport / aviation sub-sector, most of the project cost is expected from corporate/private sector, such as Rs. 16.3 billion for Karachi airport improvement and Rs. 29.7 billion for aviation project (purchase of aircrafts, etc.). In the road and railway sub-sectors, however, no private investment was assumed except for road transport services which have been traditionally dominated by the private sector.

7.4 Project Components by Sub-sector

7.4.1 Roads

Improvement of the road network is given high priority in the development strategy. Domestic and foreign funds have been introduced on those improvement projects. Most of the projects is continuation from the pervious FYP and some will be taken over in the next medium term.

Table 7.4.1 Project Components, Road

Items	Contents	Sections
1.	Construction of Motorway (committed)	
	New construction of a full 4-lane highway exclusive for motor vehicles; access control with interchanges and no level crossing.	
		Lahore - Sargagha - Islamabad: 335km
2.	Dualization & Rehabilitation of N-5 (committed)	
	Dualization of N-5, entire section from Karachi to Peshawar, has been going on (total: 1,750km). Works spread over a number of sections and are mostly the construction of additional two lanes in parallel to the existing alignment. Simultaneously, rehabilitation of the existing sections is carried out.	
		1)Hala - Moro - Rahimiya Khan, etc.: 538km
		2)Bahawalpur - Multan - Mianchunu: 167km
		3)Sahiwal - Okara - Lahore: 150km
		4)Gujranwala - Rawalpindi, etc.: 200km
		5)Chablat - Nowshera: 72km
	New construction of bypass including a bridge over Ravi River(phase I).	
		6)Lahore Bypass: 18km
		Total: 1,145km

3. Improvement of Other National Highways (committed)

Upgrade of national highways, which are mostly of one lane with poor/bad conditions of surface and structures, to the normal undivided 2-lane paved highways (W= 7.3m).

1)N-25, Uthal - Khuzdar - Quetta - Chaman	437km
2)N-55, Jamshoro - DG Khan - Peshawar	757km
3)N-40, Norkhundi - Mastung	479km
4)N-70, Qilla Saifullah - Loralai	72km
5)N-35, Mansehra - Khunjerab	274km
6)Kohat bypass & tunnel	26km
7)Sukkur bypass & bridge	6km
8)Coastal road	372km
9)Others (repair & rehabilitation)	-
Total:	2,423km

4. Widening of N-70 (newly recommended)

Widening the section between Multan and Muzaffargah from the existing 2-lane (W=6.0m) to a normal 4-lane national highway (W=14.6m), to increase in capacity of 74,600 PCU.

1)Multan - Muzaffargah	34km
------------------------	------

5. Improvement of Provincial Roads (newly recommended)

Improvement of some sections in provincial roads in widening to a normal 2-lane road with width of 6.0m.

1)Balchistan, Sanjawi - Loralai	27km
2)Balchistan, Quetta - Sanjawi	185km
3)Punjab, Chauk Munda - Dara Din Pana	28km
4)Punjab, Chauk Munda - Rangpur	32km
5)Punjab, Sihal - Taragang	90km
6)Punjab, Sihal - Rawalpindi	40km
Total:	402km

7.4.2 Railway

The proposed projects for the 8th FYP period are composed of the following components, taking into consideration some on-going and committed projects from the 7th FYP.

Table 7.4.2 Project Components, Railway

Purpose	Contents of Project	Location/Section/Quantity
1. for Expansion of Transport Capacity		
1-1. Improvement of Signaling		
	1-1-1. Automatic Block Signaling	Hyderabad - Lahore
	1-1-2. Electric/Relay Interlocking	Hyderabad - Rohri & Samasata - Lahore
	1-1-3. Centralized Train Control System	Jungshahi - Lahore

Purpose	Contents of Project	Location/Section/Quantity
	1-2. Truck Renewal	
	1-2-1. Rail Replacement	Primary A & B, Secondary Sections (3,666km)
	1-2-2. Sleeper Replacement	- do -
	1-3. Extension of Electrified Section	Part of Samasata - Khanewal
	1-4. Double Tracking	
	1-4-1.	Lodhran - Shersha
	1-4-2.	Multan - Raiwind
	1-4-3.	Shardara(Lahore) - Faisalabad
	1-5. Rolling Stock Improvement	
	1-5-1. Revamping Electric Locomotives	
	1-5-2. Diesel Electric Locomotive	
	Procurement of Diesel Electric Loco.	30 Loco.s (3,000HP/2,000HP)
	Rehabilitation and Traction Motor	
	1-5-3. Procurement of Wagon Movers	
	1-5-4. Procurement of Wagons	3,300 wagons
	1-5-5. Procurement of Coaches	1,100 coaches
	1-5-6. Repair (Air brake, Roller bearing, Air conditioning, etc.)	
	2. for Modernization	
	2-1. Management Information System	
	<i>Computerizing the operation control system using the existing microwave network.</i>	
	- Wagon control system,	
	- Locomotive operation control,	
	- Fuel & lubricant control,	
	- Stores budgeting, provisioning & procurement,	
	- Payrolling & personnel system.	
	2-2. Expansion of Communication Network	
	Completion of communication network for on-going sections.	
	Lahore - Multan	
	Peshawar - Rawalpindi	
	Peshawar - Khanewal	
	3. for Freight Transport Improvement	
	3-1. Expansion of Container Transport	
	Increasing in daily handling capacity by reduction in the turn around time of freight trains.	
	3-2. Improvement of Lahore Dry Port	
	Development of Lahore Dry Port including its relocation.	
	4. for Passenger Transport Improvement	
	4-1. Establishing Regular Operation	
	4-2. Improving Accommodations	
	5. Others, Miscellaneous	
	- Plants and machinery for sheds	
	- Depots and workshops, including stores inventory	
	- Electrical works	
	- Bridge renewal	
	- Extension of loops and sidings at stations	
	- Investment for minor branch lines	
	- Office facilities, etc.	

7.4.3 Ports

The projects proposed in port sub-sector are the facility developments mainly for the terminals both in Karachi and Qasim ports. They are summarized as follows:

Table 7.4.3 Project Components, Port

Port	Items	Description
1. Karachi Port		
	1-1. Jinnah Bridge Phase II	Construction of grade-separated road in the port area for smooth traffic flow. On-going project and succeeding into 8th FYP
	1-2. Harbour crafts procurement	Bucket dredger, hopper barges, marine crafts, tugs, etc.
	1-3. Reconstruction of berths	Since the berths No. 5 to 8 at East wharf had serious settlement problems due to design defect, they should be reconstructed.
	1-4. Container terminals (5 berths)	Though four berths are proceeding under BOT scheme, additional one berth to be constructed for full scale container terminal.
	1-5. Oil terminal OP-V	Already completed and in operation.
	1-6. Feasibility study	Feasibility study on modernization of Karachi port, because present conversion works to container berths are being proceeded without F/S.
	1-7. Modern Warehouse	
	1-8. Tug, pilot boats	Succeeding into 8th FYP.
	1-9. Computerization	Central on-line data bank with interlinks to port users and associated organizations.
2. Port Qasim		
	2-1. Phase I	On-going project
	2-2. Deepening navigation channel	Deepening & widening the navigation channel for passage of 75,000 DWT ships.
	2-3. Oil terminal	Completion of the new oil berth and related facilities, now under construction.
	2-4. Container terminal (2 berths)	Two berths for container by private sector.
	2-5. Bulk water supply	Water supply facilities to the industrial area. (on-going)
	2-6. New Liquid berth	A new liquid berth for edible oil and additional storage tanks.
	2-7. Computerization	Central on-line data bank with interlinks to port users and associated organizations.
3. Others		
	3-1. Gwadar	Construction of deep sea port by private sector
	3-2. Keti Bandar	

7.4.4 Airport and Aviation

Proposed projects in airport and aviation sector are listed as follows:

Table 7.4.4 Project Components, Airport/Aviation

No.	Airport	Outline of Project
Airports		
-1. New Islamabad Airport	(Islamabad)	Study on new airport construction
-2. Improvement of Islamabad Airport	Islamabad	Rehabilitation & extension of runway
-3. Improvement of Lahore Airport	Lahore	Construction of new passenger terminal building Construction of departure lounge, rehabilitation of apron and taxiway, car parking improvement.
-4. Improvement of Karachi Airport	Karachi	Extension of secondary runway, overlay of main runway, completion of terminal facilities (4 pass. boarding bridges, moving walkways, etc.).
-5. Alternate Airport to Karachi	Sukkur	Development of the airport as the alternate to Karachi airport, including expansion of runway and navigation system, etc.
-6. Improvement of Other Airports	Moenjodaro	Extension of runway for B-737 operation
	Multan	Widening of runway for A-300 operation
	Bahawalpur	Extension & widening of runway, apron, PTB and car park.
	DI Khan	Extension & widening of runway, apron, PTB and car park.
	Gilgit	Extension of runway for B-737 operation
	Quetta	Extension of apron, PTB and car park.
	Gwadar	Extension & widening of runway, apron, PTB and car park.
	Pasni	Extension & widening of runway, apron, PTB and car park.
	Turbat	Extension of runway, apron, PTB and car park
	Zhob	Overlay of runway and related works
	Faisalabad	Extension of apron, PTB and car park.
	RY Khan	Extension of runway, apron, PTB and car park
	Bhagtanwala	Extension of runway, apron, PTB and car park
Walton	Extension of apron, PTB and car park.	
Peshawar	Extension of apron, PTB and car park.	
Chitral	Overlay of runway	
Skardu	Extension of apron, PTB and car park.	
-7. New Feeder Airports	Mansehra & DG Khan	Construction of new feeder airports with air navigation system development
-8. Aeronautical Communication & Control		Remaining works of the on-going project
-9. Air Navigation System for Other Airports		Development of air navigation systems

No.	Airport	Outline of Project
-10. Other on-going projects	Islamabad	Repair of main runway, construction of domestic departure lounge, improvement of drainage system
	Lahore	Improvement of riding quality of runway
	Sukkur	Overlay of runway for B-737 operation
	Quetta	Rectification of apron flood lights
-11. Rescue and Fire Fighting Service		Procurement of crash fire and rescue vehicles
Aviation		
-1. Purchase of Aircraft		One (1) wide body class Seven (7) Airbus A310-300 Two (2) B 737-30 Three (3) New Turbo Prop
-2. Replacement of Aircrafts		
-3. Development of Infrastructure		Construction/Development of workshops, hangars and cargo complexes, etc.

CHAPTER 8 PROJECT PROFILE AND INITIAL ENVIRONMENTAL EXAMINATION

In this chapter, the outline of proposed projects for short-term (upto 1997-98) is summarized in the following forms;

1. Project profile,
2. Investment schedule by sub-sector,
3. Summary of initial environmental examination (IEE).

8.1 Major Project Profile

PROJECT PROFILE

Sub-sector: Road	No. RD-1	Project Name: Construction of Motorway	Location: Lahore - Islamabad		
Development/Implementation Body: National Highway Authority		Ministry in charge: Ministry of Communications	Foreign Assistance: Technical: <input checked="" type="checkbox"/> Yes No Financial: <input checked="" type="checkbox"/> Yes No		
Brief Description of Project:					
<p>The construction project of Motorway will realize the first class highway to Pakistan compatible with international standards. It is planned to be used only by motorized vehicles with toll gates at interchanges. The motorway project is located between Lahore and Islamabad passing cities by Sheikupura, Sargoda and others. The route will not only give these local cities better access to Lahore and Rawalpindi, but also share part of long distance traveling vehicles on N-5. The project has been under implementation since 1991-92 with the initial schedule to be completed in 1995-96. The traffic is estimated at 15,700 - 2,500 pcu/day in 1998 depending on the toll level which will be decided by NHA shortly.</p>					
Project Components:					
<p>The motorway has been designed to have two carriageways separated by median, access controlled by gate at interchanges, and grade-separated. Major components are:</p>					
Length	: 335 km				
Number of lane	: 2 lanes in each carriageway				
Carriageway width	: 3.5 m x 2 = 7.0 m				
Pavement composition					
Asphalt wearing course	: 5 cm				
Asphalt base course	: 8 cm				
Aggregate base course	: 30-35 cm				
Aggregate sub-base course	: 15-30 cm				
<p>Motorway New Construction</p>					
Initial Environmental Examination:					
As for environmental impacts, please refer to section 8.3 of this Summary Report.					
Estimated Project Cost: (in 8th FYP)		(Rs. million) 9,460	Status: On-going, Fund from Korea		
Investment Schedule	Before 1993-94	the 8th FYP period			beyond 1997-98
	1993-94	1994-95	1995-96	1996-97	1997-98
1) Motorway 					

PROJECT PROFILE

Sub-sector: Road	No. RD-2	Project Name: Dualization and Rehabilitation of N-5	Location: Karachi - Peshawar																					
Development/Implementation Body: National Highway Authority		Ministry in charge: Ministry of Communications	Foreign Assistance: Technical: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Financial: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																					
Brief Description of Project:																								
<p>Construction of an additional carriageway along the existing National highway N-5 has been implemented since the 7th FYP at various sections, through which the capacity will increase from 19,000 pcu/day to 74,600 pcu. Simultaneously, rehabilitation projects of the existing two lane carriageway have been under way. The high priority has been given to upgrade the capacity of N-5, which is the main arterial highway linking Karachi, Multan, Lahore, Rawalpindi and Peshawar. The entire work of 1,750 km (100%) is on-going: 410 km (23%) was completed in the 7th FYP; 1,120 km (64%) is underway in the 8th FYP; and 220 km (13%) is scheduled in the 9th FYP.</p> <p>Traffic volume varies from section to section; the average-daily-volume in pcu. in 1998 is estimated in this study as follows:</p>																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Section</th> <th style="width: 30%;">Distance</th> <th style="width: 40%;">pcu/day</th> </tr> </thead> <tbody> <tr> <td>1) Hara-Rahimiya Khan, etc.</td> <td>538 km</td> <td>26,300</td> </tr> <tr> <td>2) Bahawalpur-Mianchunu</td> <td>167 km</td> <td>19,000</td> </tr> <tr> <td>3) Sahiwal-Okara-Lahore</td> <td>184 km</td> <td>23,500</td> </tr> <tr> <td>4) Gujranwala-rawalpindi</td> <td>200 km</td> <td>33,800</td> </tr> <tr> <td>5) Chablot-Nowshera</td> <td>72 km</td> <td>27,800</td> </tr> <tr> <td>6) Lahore Bypass (phase I)</td> <td>18 km</td> <td>27,300</td> </tr> </tbody> </table>				Section	Distance	pcu/day	1) Hara-Rahimiya Khan, etc.	538 km	26,300	2) Bahawalpur-Mianchunu	167 km	19,000	3) Sahiwal-Okara-Lahore	184 km	23,500	4) Gujranwala-rawalpindi	200 km	33,800	5) Chablot-Nowshera	72 km	27,800	6) Lahore Bypass (phase I)	18 km	27,300
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5) Chablot-Nowshera	72 km	27,800																						
6) Lahore Bypass (phase I)	18 km	27,300																						
Project Components:																								
<p>The additional carriageway is designed as the class I highway to be constructed along-side of existing N-5 alignment, separated by median space or barrier.</p> <p>Dualization & Rehabilitation (N-5) 2-1 ~2-5 N-5 Dualization</p>																								
Existing																								
Improvement																								
Initial Environmental Examination:																								
As for environmental impacts, please refer to section 8.3 of this Summary Report.																								
Estimated Project Cost:		33,016 (Rs.million)	Status: On-going, Fund from W.B.																					
Investment Before Schedule 1993-94	the 8th FYP period					beyond																		
	1993-94	1994-95	1995-96	1996-97	1997-98	1997-98																		
1) Hara-Rahimiya Khan, etc.	██████████	██████████	██████████	██████████	██████████	██████████																		
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5) Chablot-Nowshera	██████████	██████████	██████████	██████████	██████████	██████████																		
6) Lahore Bypass (phase I)	██████████	██████████	██████████	██████████	██████████	██████████																		

PROJECT PROFILE

Sub-sector: Road	No. RD-4	Project Name: Widening of N-70	Location: Multan - Muzaffargah																					
Development/Implementation Body: National Highway Authority		Ministry in charge: Ministry of Communications	Foreign Assistance: Technical: <input checked="" type="checkbox"/> Yes No Financial: <input checked="" type="checkbox"/> Yes No																					
Brief Description of Project: The N-70 Highway links to cities of Multan, Muaffargah, DG Khan, Loralai and Qilla Sarifullah in to total distance of 411 km. Multan and DG Khan are important urban centers in the southern region of Punjab Province, which have development potential in various economic subsectors. Traffic assignment for the 1998 showed the volume of 24,600 pcu/day on the section. The existing section Multan-Muzaffargah is of 2 lane highway with the traffic capacity of 19,000 pcu/day, which will be not sufficient to meet the traffic demand in 1998. The section should be widened to a four lane highway.																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Section</th> <th style="width: 20%;">Distance</th> <th style="width: 40%;">pcu/day</th> </tr> </thead> <tbody> <tr> <td>1) Multan-Muzaffargah</td> <td style="text-align: center;">34 km</td> <td style="text-align: center;">24,600</td> </tr> </tbody> </table>				Section	Distance	pcu/day	1) Multan-Muzaffargah	34 km	24,600															
Section	Distance	pcu/day																						
1) Multan-Muzaffargah	34 km	24,600																						
The project is the widening of the existing 2 lane highway to 4 lane highway which has the capacity of 75,000 pcu/day.																								
Major Components: The widening work should be conducted to use the existing alignment. An example of the four-lane road formation is shown below:																								
<table style="width: 100%; border: none;"> <tr> <td style="width: 40%;">Number of lane</td> <td style="width: 20%;">: 4 lanes in each carriageway</td> <td style="width: 40%;"></td> </tr> <tr> <td>Carriageway width</td> <td>: 3.65 m x 2 = 7.3 m</td> <td style="text-align: right;">N-70 Multan - Muzaffargah</td> </tr> <tr> <td>Pavement composition</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">Asphalt wearing course</td> <td>: 5 cm</td> <td style="text-align: right;">Existing</td> </tr> <tr> <td style="padding-left: 20px;">Asphalt base course</td> <td>: 5-15 cm</td> <td></td> </tr> <tr> <td style="padding-left: 20px;">Aggregate base course</td> <td>: 15-35 cm</td> <td></td> </tr> <tr> <td style="padding-left: 20px;">Aggregate sub-base course</td> <td>: 15-45 cm</td> <td></td> </tr> </table>				Number of lane	: 4 lanes in each carriageway		Carriageway width	: 3.65 m x 2 = 7.3 m	N-70 Multan - Muzaffargah	Pavement composition			Asphalt wearing course	: 5 cm	Existing	Asphalt base course	: 5-15 cm		Aggregate base course	: 15-35 cm		Aggregate sub-base course	: 15-45 cm	
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Aggregate base course	: 15-35 cm																							
Aggregate sub-base course	: 15-45 cm																							
Initial Environmental Examination: As for environmental impacts, please refer to Section 8.3 of this Summary Report. Impact in land use and community should be examined, and drainage patterns should be checked.																								
Estimated Project Cost:		(Rs. million)	Status: New recommendation																					
681																								
Investment	Before	the 8th FYP period				beyond																		
Schedule	1993-94	1993-94	1994-95	1995-96	1996-97	1997-98	1997-98																	
1) Multan-Muzaffargah																								

PROJECT PROFILE

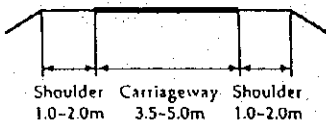
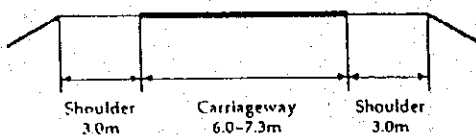

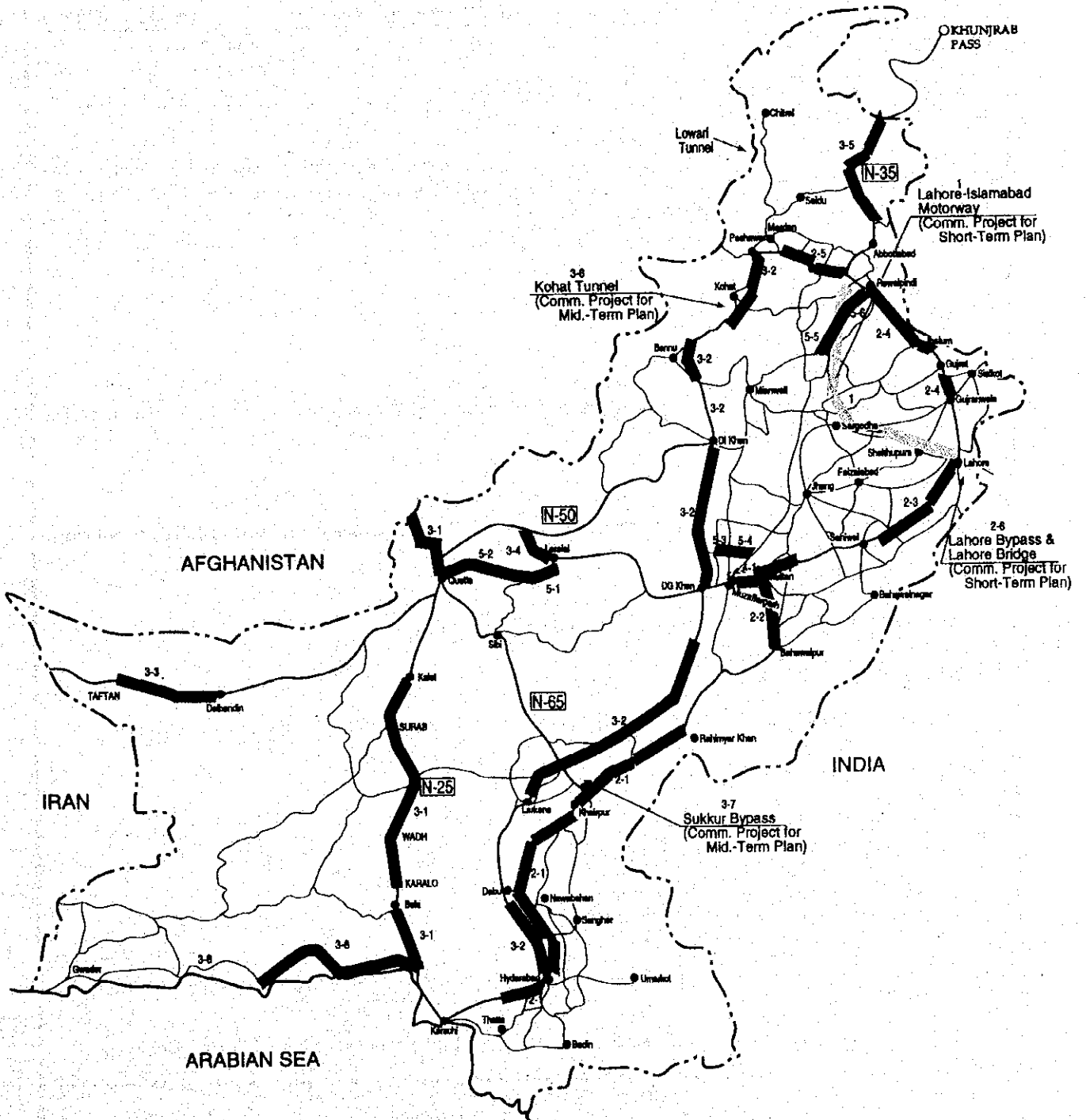








Sub-sector: Road	No. RD-5	Project Name: Improvement of Provincial Roads	Location:																					
Development/Implementation Body: C & W Department of Provincial Government		Ministry in charge: Ministry of Local Government and Rural Development	Foreign Assistance: Technical: <input checked="" type="checkbox"/> Yes No Financial: <input checked="" type="checkbox"/> Yes No																					
Brief Description of Project:																								
<p>The roads in the country can be divided into 2 groups: the national highways and provincial highways. The latter network stretches from the framework of national highways extending to regional and local and agricultural areas. However, main provincial roads are one-lane surfaced type which has a low capacity of 3,200 pcu per day. This type of one-lane road should be improved to have one lane in one direction. Traffic assignment for 1998 showed some sections having a larger volume than the capacity of one lane road. They are selected subject for the study and improvement in this period of the 8th FYP.</p>																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Section</th> <th style="width: 20%;">Distance</th> <th style="width: 20%;">pcu/day</th> </tr> </thead> <tbody> <tr> <td>1) Balchistan, Sanjawi-Loralai N-25 Uthal-Chaman</td> <td style="text-align: center;">27 km</td> <td style="text-align: center;">3,700</td> </tr> <tr> <td>2) Balchistan, Quetta-Sanjaawi</td> <td style="text-align: center;">185 km</td> <td style="text-align: center;">3,700</td> </tr> <tr> <td>3) Punjab, Chauk Munda-Dara Din Pana</td> <td style="text-align: center;">28 km</td> <td style="text-align: center;">6,700</td> </tr> <tr> <td>4) Punjab, Chauk Munda-Raugpur</td> <td style="text-align: center;">32 km</td> <td style="text-align: center;">6,700</td> </tr> <tr> <td>5) Punjab, Sihal-Tanagang</td> <td style="text-align: center;">70 km</td> <td style="text-align: center;">4,300</td> </tr> <tr> <td>6) Punjab, Sihal-Rawalpindi</td> <td style="text-align: center;">40 km</td> <td style="text-align: center;">4,500</td> </tr> </tbody> </table>				Section	Distance	pcu/day	1) Balchistan, Sanjawi-Loralai N-25 Uthal-Chaman	27 km	3,700	2) Balchistan, Quetta-Sanjaawi	185 km	3,700	3) Punjab, Chauk Munda-Dara Din Pana	28 km	6,700	4) Punjab, Chauk Munda-Raugpur	32 km	6,700	5) Punjab, Sihal-Tanagang	70 km	4,300	6) Punjab, Sihal-Rawalpindi	40 km	4,500
Section	Distance	pcu/day																						
1) Balchistan, Sanjawi-Loralai N-25 Uthal-Chaman	27 km	3,700																						
2) Balchistan, Quetta-Sanjaawi	185 km	3,700																						
3) Punjab, Chauk Munda-Dara Din Pana	28 km	6,700																						
4) Punjab, Chauk Munda-Raugpur	32 km	6,700																						
5) Punjab, Sihal-Tanagang	70 km	4,300																						
6) Punjab, Sihal-Rawalpindi	40 km	4,500																						
Major Components:																								
<p>Those one-lane provincial roads (w=3.5-5.0 m) are proposed to be a 2-lane width, 2x3.0=6.0 m in this master plan level. The final road formation should be decided in the initial feasibility study. The proposed road with the width at 6.0 m will have the following components:</p>																								
Length	: varies																							
Number of lane	: 1 lanes in each carriageway																							
Carriageway width	: 3.0 m x 2 = 6.0 m Existing																							
Pavement composition																								
Asphalt wearing course	: 5 cm																							
Asphalt base course	: 5-15 cm																							
Aggregate base course	: 15-35 cm																							
Aggregate sub-base course	: 15-45 cm																							
	 <p style="text-align: center;">Shoulder Carriageway Shoulder 1.0-2.0m 3.5-5.0m 1.0-2.0m</p>																							
	<p style="text-align: center;">Improvement</p>  <p style="text-align: center;">Shoulder Carriageway Shoulder 3.0m 6.0-7.3m 3.0m</p>																							
Initial Environmental Examination:																								
As for an environmental impact, please refer to Section 8.3 of this Summary Report. Impact in land use and community should be examined, and drainage patterns should be checked.																								
Estimated Project Cost:		(Rs.million)	Status: New recommendation																					
2,371																								
Investment	Before	the 8th FYP period				beyond																		
Schedule	1993-94	1993-94	1994-95	1995-96	1996-97	1997-98	1997-98																	
1) Sanjawi-Loralai 2) Quetta-Sanjaawi 3) Chauk Munda-D. D. Pana 4) Chauk Munda-Raugpur 5) Sihal-Tanagang 6) Sihal-Rawalpindi																								

Figure 8.1.1 Proposed Road Projects (for Short-term)



Legend :

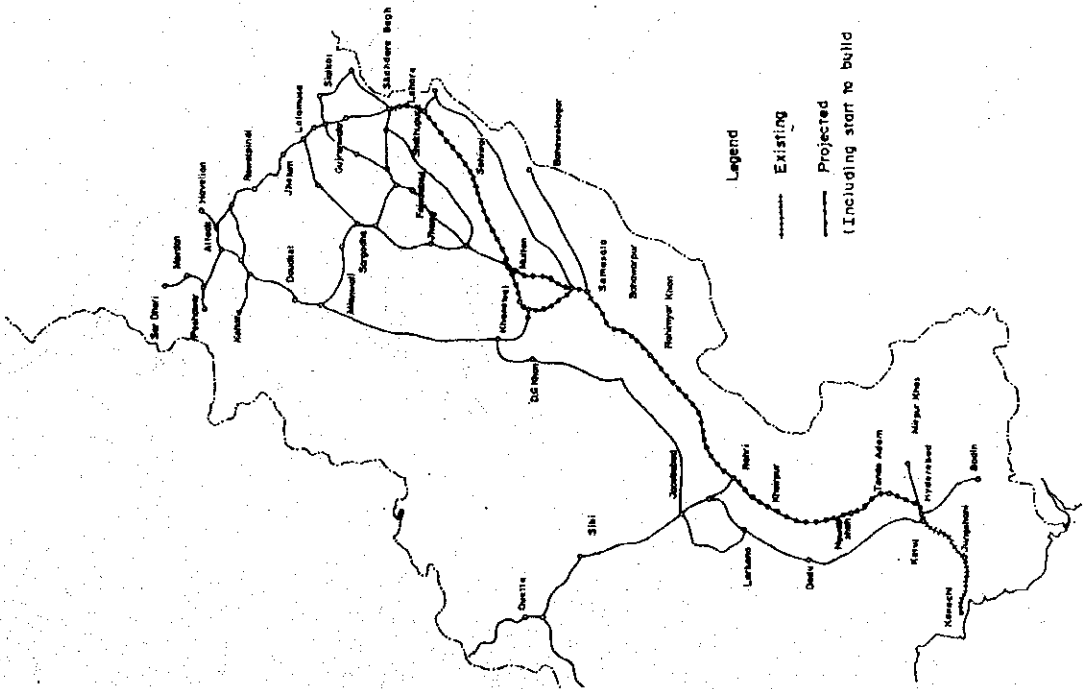
- | | | | |
|---|-----------------------|---|---------------------------------------|
|  | Motorway |  | Motorway |
|  | National Highway |  | Dualization & Rehabilitation (N-5) |
|  | Major Provincial Road |  | Improvement (Other National Highways) |
| | |  | Improvement (N-70) |
| | |  | Improvement (Provincial Roads) |

PROJECT PROFILE

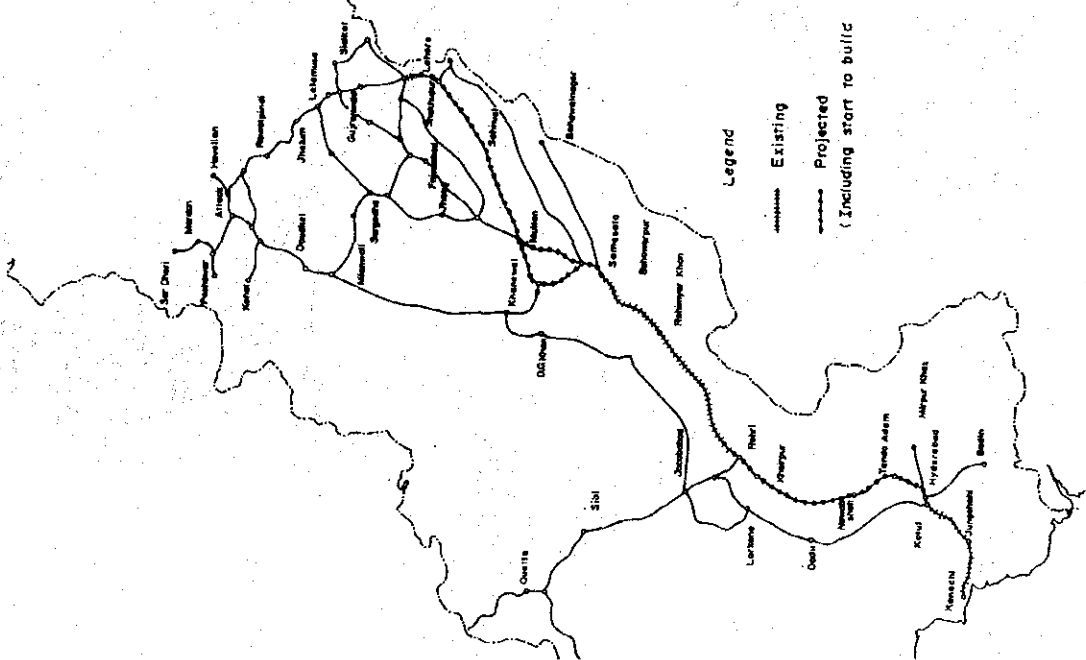
Sub-sector: Railway	No. RW-1	Project Name: Expansion of Transport Capacity of Trunk Line	Location: Main Line of PR			
Development/Implementation Body: Pakistan Railways (PR)		Ministry in charge: Ministry of Railways	Foreign Assistance: Technical: <input checked="" type="checkbox"/> Yes No Financial: <input checked="" type="checkbox"/> Yes No			
Brief Description of Project:						
<p>Improvement of physical assets in replacement of over-aged facilities and in purchase of new ones are in urgent need in order to raise productivity of PR, and placed in the priority group of development programs in the 8th FYP. Capacity improvement projects on trunk lines are categorized as follows:</p>						
Project Components:						
1) Improvement of Signaling and Train Control System:						
<p style="padding-left: 40px;">Installation of automatic block signal, electric/relay interlocking & train control system on the trunk line; Hyderabad - Lahore (1,223 km)</p>						
2) Track Renewal:						
<p style="padding-left: 40px;">Renewal in Tracks in primary A, B & secondary sections; Rails of 1,742 km and sleepers of 1,228 km in total.</p>						
3) Extension of Electrified Section:						
<p style="padding-left: 40px;">Electrification of Samasata - Khanewal section; 118 km.</p>						
4) Double Tracking:						
<p style="padding-left: 40px;">Double tracking of Lodhran - Shershah (72 km) and Multan - Raiwind (248 km) sections.</p>						
5) Rolling Stock Improvement:						
<p style="padding-left: 40px;">Rolling stock purchases are recommended;</p> <ul style="list-style-type: none"> - Revamping DE Locos. 101 Locos. - Procurement of DE Locos. 53 Locos. - Procurement of wagons 3,300 wagons. - Procurement of coaches 1,100 coaches. - Rehabilitation of engines, repair works, etc. 						
Initial Environmental Examination:						
<p style="padding-left: 40px;">Scarce environmental impacts, except double tracking project. Please refer to section 8.3 of Summary Report.</p>						
Estimated Project Cost:		(Rs. million)	Status: On-going			
		36,070				
Investment Schedule:						
	Ranking	1993-94	1994-95	1995-96	1996-97	1997-98
the 8th FYP period						
1) Improvement of Signaling	B					
2) Track Renewal	A					
3) Extension of Electrified Section	C					
4) Double Tracking	B					
5) Rolling Stock Improvement	A					

Figure 8.1.2 (A) Improvement of Signaling (1997-98)

(1) Automatic Block Signaling



(2) Electric - Relay Interlocking



(3) Centralized Train Control System

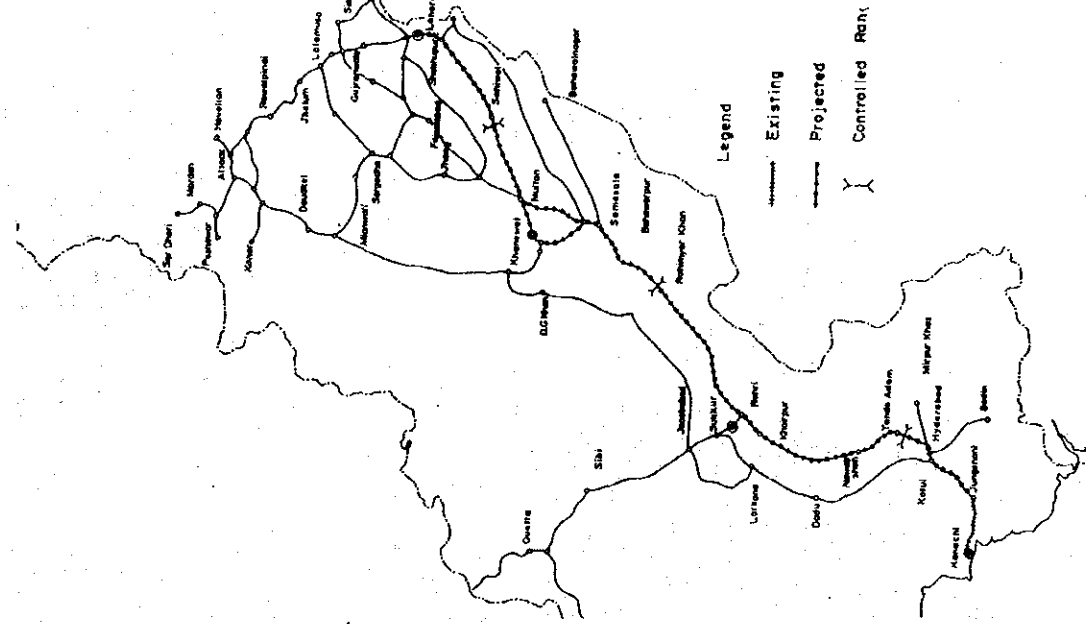
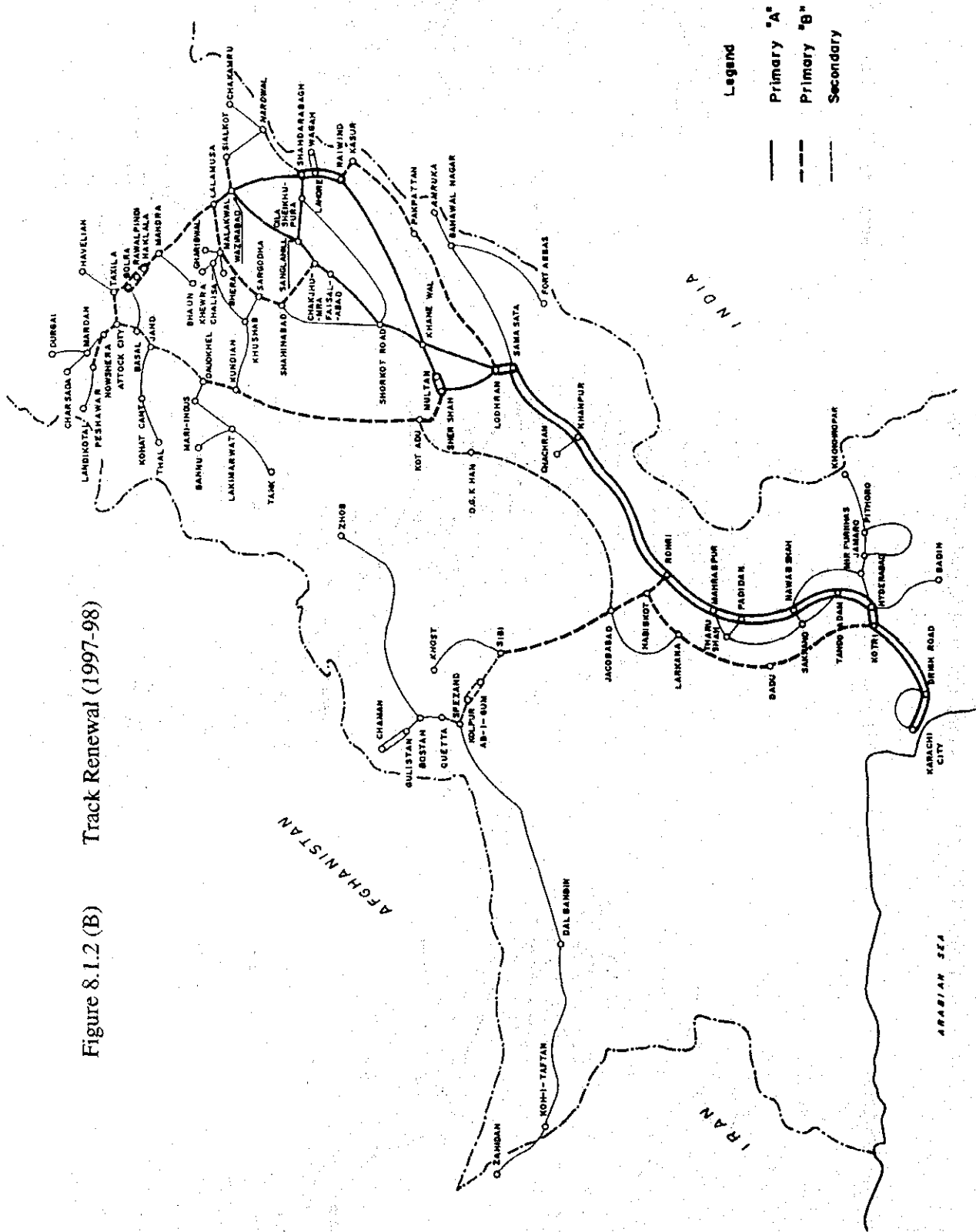


Figure 8.1.2 (B) Track Renewal (1997-98)



PROJECT PROFILE

Sub-sector: Port	No. PT-1	Project Name: Comprehensive Development of Karachi Port	Location: Karachi Port	
Development/Implementation Body: Port and Shipping Wing Karachi Port Trust		Ministry in charge: Ministry of Communications	Foreign Assistance: Technical: <input checked="" type="checkbox"/> Yes No Financial: <input checked="" type="checkbox"/> Yes No	
<u>Brief Description of Project:</u>				
<p>Development of Karachi port as a modern international port to cope with the increasing cargo volume; 11 million tons of dry cargo and 12 million tons of liquid cargo per year, in 1997-98.</p> <p>There are various on-going projects from the previous FYP period, such as a conversion of existing general cargo berths into four container berths, an oil berth construction, Jinnah Bridge (Phase II) construction, etc. In addition to these on-going projects, some additional facilities are recommended to be developed together with other necessary studies.</p>				
<u>Project Components:</u>				
1) Development of Container Terminals:				
<p style="padding-left: 40px;">Construction of five (5) container terminals, converting the existing general cargo berths into container berths; No. 12 - 17 at East Wharf & No. 22 - 29 at West Wharf. Length: 300m, Depth: -12.0m.</p>				
2) Reconstruction of Berths No. 5 - 8:				
<p style="padding-left: 40px;">Reconstruction of four (4) general cargo berths, damaged/poor structure condition, at East Wharf.</p>				
3) On-going Projects from the previous FYP:				
<p style="padding-left: 40px;">Jinnah Bridge (Phase II), Oil Terminal Construction (OP-V) ; completed and in operation from December 1994 Purchase of Bucket Dredger & Ancillary Crafts</p>				
4) Other Related Projects:				
<p style="padding-left: 40px;">Feasibility Study on Containerization of Terminal, Modern Warehouse Complex Building, VSP Tugs, Pilot Boats and Storage Area, Computerization of Management System.</p>				
<u>Initial Environmental Examination:</u>				
<p style="padding-left: 40px;">As for environmental impacts, please refer to section 8.3 of Summary Report.</p>				
Estimated Project Cost:	(Rs.million)	Ranking in the Sub-sector:		
8,790		(A)	B C	
<u>Investment Schedule:</u>		the 8th FYP period		
	1993-94	1994-95	1995-96	1996-97 1997-98
1) Development of Container Terminal			██████████	██████████
2) Reconstruction of Berths No. 5 - 8		██████████	██████████	██████████
3) On-going Projects from 7th FYP	██████████	██████████	██████████	██████████
4) Other Related Projects			██████████	██████████

PROJECT PROFILE

Sub-sector: Port	No. PT-2	Project Name: Development of Port Qasim	Location: Port Qasim	
Development/Implementation Body: Port and Shipping Wing Port Qasim Authority		Ministry in charge: Ministry of Communications	Foreign Assistance: Technical: <input checked="" type="checkbox"/> Yes No Financial: <input checked="" type="checkbox"/> Yes No	
<u>Brief Description of Project:</u>				
<p>The port, in full operation since 1983, has one (1) iron & coal berth and seven (7) multi purpose berths, and handled 6.5million tons of dry cargo and 1.8million tons of liquid cargo in 1992-93.</p> <p>The necessary facility development is required in order to handle the allocated cargo demand; 9.2million of dry cargo (dry bulk, wheat, container and iron ore & coal) and 5.8million of liquid cargo in 1997-98.</p>				
<u>Project Components:</u>				
1) Deepening of Navigation Channel:				
<p>The feasibility study on 'deepening and widening the navigation channel for passage of 75,000 DWT ships' was carried out and PQA places a high priority on completing the project during 8th FYP period.</p>				
2) Oil Terminal:				
<p>A new oil berth was constructed and in operation from December 1994.</p>				
3) Container Terminal Construction:				
<p>The conversion of existing berths No. 5 -7 into two container berths is being proceeding under BOT scheme by private sector. Length: 300m, depth: -12m.</p>				
4) New Liquid Berth:				
<p>A new liquid berth for edible oil and additional storage tanks. Depth: -10m.</p>				
5) Computerization:				
6) Other On-going Projects:				
<p>Phase I: Bulk Water Supply:</p>				
<u>Initial Environmental Examination:</u>				
<p>As for environmental impacts, please refer to section 8.3 of Summary Report.</p>				
Estimated Project Cost:		(Rs.million)	Ranking in the Sub-sector:	
5,757			(A) B C	
<u>Investment Schedule:</u>		the 8th FYP period		
	1993-94	1994-95	1995-96	1996-97 1997-98
1) Deepening of Navigation Channel				██████████
2) Construction of Oil Terminal		██████████		
3) Container Terminals				██████████
4) New Liquid Berth Construction				██████████
5) Computerization			██████████	
6) Other On-going Projects				██████████

Figure 8.1.3.A Layout Plan of Karachi Port

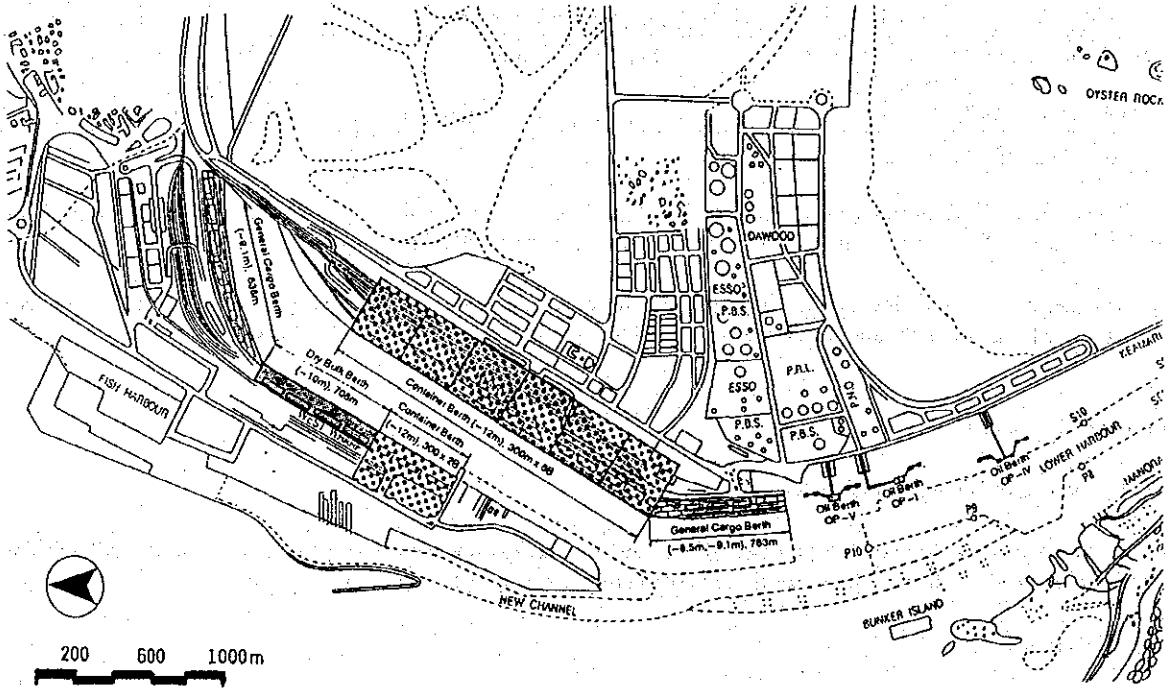
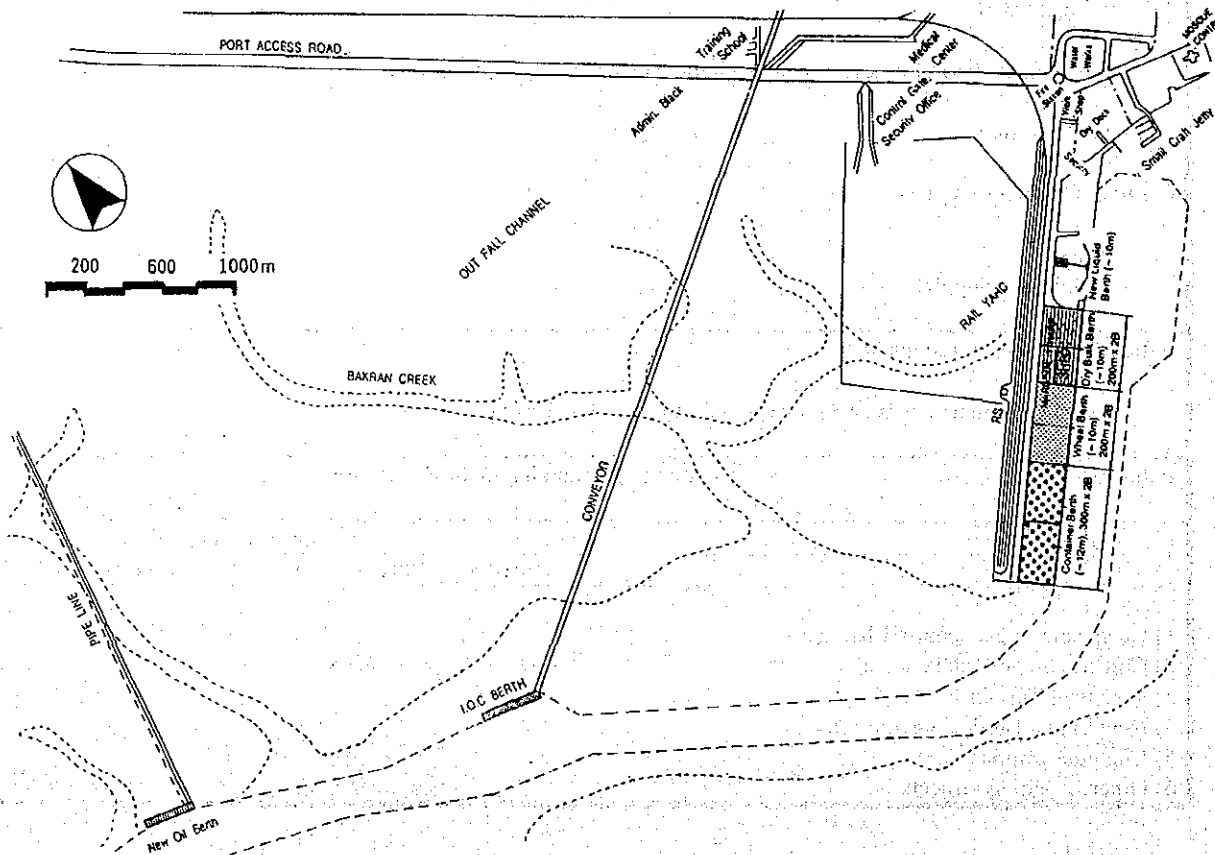


Figure 8.1.3.B Layout Plan of Qasim Port



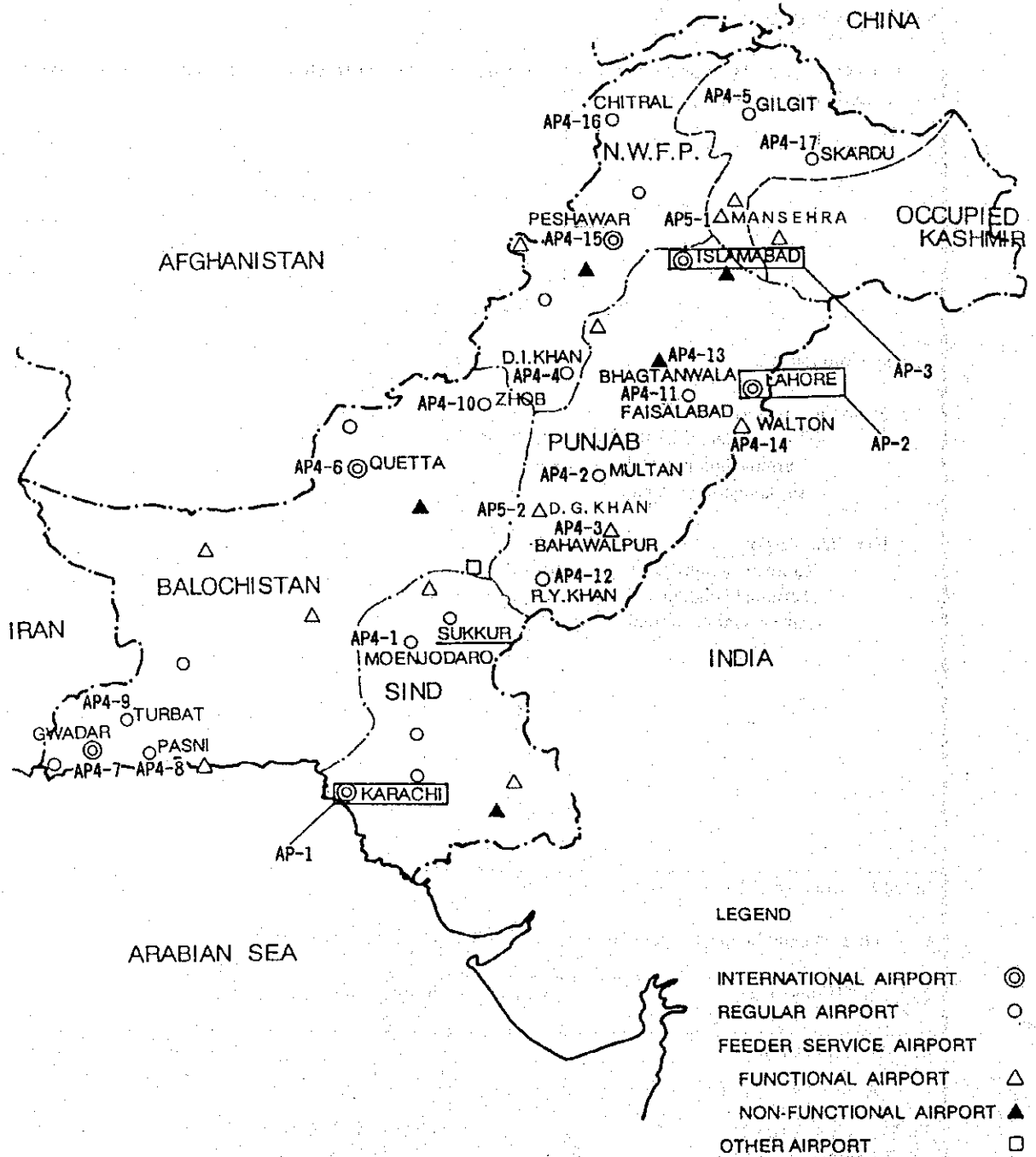
PROJECT PROFILE

Sub-sector: Airport	No. AP-3	Project Name: Improvement of Islamabad Airport	Location: Islamabad Airport
Development/Implementation Body: Civil Aviation Authority		Ministry in charge: Ministry of Defense	Foreign Assistance: Technical: Yes <input checked="" type="checkbox"/> No Financial: Yes <input checked="" type="checkbox"/> No
<p>Brief Description of Project:</p> <p>The existing runway length is not sufficient for the B747 international flights departing from Islamabad. Therefore, international flights are operated with take off weight restriction of the present time. Rehabilitation and extension of the runway will be required in order to ensure a smooth, safe and full load aircraft operation.</p> <p>The existing terminal building is aged and it has been saturated with the present passenger demand. New departure lounge is being constructed to provide relief.</p>			
<p>Project Components:</p> <ol style="list-style-type: none"> 1. Rehabilitation and Extension of the Runway: <ul style="list-style-type: none"> - Extension of runway: 610 m x 46 m, - Rehabilitation of existing runway, - Airfield lighting system. 2. On-going Projects: <ul style="list-style-type: none"> - Repair of the main runway, - Construction of domestic departure lounge, - Improvement of the drainage system. 			
<p>Initial Environmental Examination:</p> <p>As for environmental impacts, please refer to section 8.3 of this summary report.</p>			
Estimated Project Cost:		(Rs million)	Ranking in the Sub-sector:
246			(A) B C
Investment Schedule:			
the 8th FYP period			
	1993-94	1994-95	1995-96 1996-97 1997-98
1) Rehabilitation and Extension of the Runway		=====	
2) On-going Projects		=====	

PROJECT PROFILE

Sub-sector: Airport	No. AP-5	Project Name: New Feeder Service Airports	Location: Mansehra & DG Khan
Development/Implementation Body: Civil Aviation Authority		Ministry in charge: Ministry of Defense	Foreign Assistance: Technical: Yes <input checked="" type="checkbox"/> No Financial: Yes <input checked="" type="checkbox"/> No
Brief Description of Project:			
<p>Feeder service airports were planned to connect remote areas of the country with the air links for the purpose of regional development in those areas.</p> <p>The two airports, at Mansehra and D. G. Khan, will be constructed in accordance with this policy during the 8th FYP period. (On-going project)</p>			
Project Components:			
<p>1. Mansehra Airport:</p> <ul style="list-style-type: none"> - Runway; length 1,830 m, width 30 m, - Terminal building and car parking, - Air navigation system. <p>2. DG Khan Airport:</p> <ul style="list-style-type: none"> - Runway; length 2,440 m, width 30m, - Terminal building and car parking, - Air navigation system. 			
Initial Environmental Examination:			
As for environmental impacts, please refer to section 8.3 of this summary report.			
Estimated Project Cost:		(Rs. million)	Ranking in the Sub-sector:
488			A B Ⓒ
Investment Schedule:		the 8th FYP period	
	1993-94	1994-95	1995-96 1996-97 1997-98
1) Mansehra Airport	=====		
2) DG Khan Airport	=====		

Figure 8.1.4 Location of Proposed Airport Projects



8.2 Investment Schedule

The proposed projects for the short-term plan (8th FYP) were segregated from the mid-term master plan (target year 2005-06), taking into consideration various conditions of projects such as priority, on-going projects, financial constraint, etc. This shows the budget allocation during 8th FYP period and for the next stage.

The yearly budget allocation during the 8th FYP period, 1993-94 to 1997-98, is tabulated by sub-sector as shown in Table 8.2.1 to 8.2.4.

Table 8.2.1 Budget Allocation for 8th FYP Period (Road)

Seq.No.	Projects Items	Investment Cost (Rs. million)					
		Total (8th FYP)	1993-94	1994-95	1995-96	1996-97	1997-98
Road							
1	Motorway (Lahore - Islamabad) *	9,450	3,150	3,150	3,150	0	0
2	Dualization & Rehabilitation (N-5) *						
-1	Hala - Rahimiya Khan, etc.	14,302	2,860	2,860	2,860	2,860	2,862
-2	Bahawalpur - Mianchanu	4,767	950	950	950	950	967
-3	Sahiwal - Lahore	3,576	720	720	720	720	696
-4	Gujranwala - Rawalpindi	3,873	780	780	780	780	753
-5	Chablat - Nowshera	3,278	650	650	650	650	678
-6	Lahore Bypass	3,220	460	820	650	650	640
	Sub Total	33,016	6,420	6,780	6,610	6,610	6,596
3	Improvement (Other National Highways) *						
-1	N-25 Uthal - Chaman	2,240	450	450	450	450	440
-2	N-55 Jamshoro - Peshawar	9,882	1,980	1,980	1,980	1,980	1,962
-3	N-40 Norkhundi - Mastung	1,987	200	450	450	450	437
-4	N-70 Qilla Saifullah - Loralai	1,341	130	300	300	300	311
-5	N-35 Mansehra - Khunjerab	2,790	560	560	560	560	550
-6	Kohat Bypass & Tunnel	1,800	90	90	540	540	540
-7	Sukkur Bypass & Bridge	1,000	0	100	300	300	300
-8	Coastal Road	2,000	100	100	600	600	600
-9	Others(Repair & Rehabilitation)	4,656	930	930	930	930	936
	Sub Total	27,698	4,440	4,960	6,110	6,110	6,076
	Total (1+2+3)	70,164	14,010	14,890	15,870	12,720	12,672
4	N-70 Multan - Muzaffargah	681	70	150	150	150	161
	Total of National Highways	70,845	14,080	15,040	16,020	12,870	12,833
5	Improvement of Provincial Roads						
-1	Sanjawi - Loralai (widening)	159	20	40	40	40	19
-2	Quetta - Sanjawi (widening)	1,092	110	240	240	240	262
-3	Chauk Munda-Dara Din Pana(widening)	165	20	40	40	40	25
-4	Cahauk Munda - Rangpur (widening)	189	20	40	40	40	49
-5	Sihal - Taragang (widening)	531	50	120	120	120	121
-6	Sihal - Rawalpindi (videning)	236	20	50	50	50	66
	Sub Total	2,371	240	530	530	530	542
	Total	73,216	14,320	15,570	16,550	13,400	13,375

Table 8.2.2 Budget Allocation for 8th FYP Period (Railway)

Seq.No.	Project Items	Investment Cost (Rs. million)					
		Total (8th FYP)	1993-94	1994-95	1995-96	1996-97	1997-98
Railway							
1	Automatic Block Signaling	540	0	0	180	180	180
2	Electric/Relay Interlocking	720	0	0	240	240	240
3	Centralized Traffic Control System	300	0	0	100	100	100
4	Track Renewal	3,550	710	710	710	710	710
5	Electrification	360	0	0	120	120	120
6	Double Tracking	4,000	0	1,000	1,000	1,000	1,000
7	Upgrading KYC - LLM section	3,300	0	0	1,000	1,000	1,000
8	Electric Locomotives	800	0	200	200	200	200
9	Diesel Electric Locos.	10,400	1,000	1,200	1,800	3,800	2600
10	Procurement of Wagon movers	300				0	300
11	Procurement of Wagons	4,400	0	1,000	1,000	1,000	1,000
12	Replacement of Coaches	4,400	0	0	1,100	1,100	1,100
13	Improvement of Rolling Stocks	3,000	600	600	600	600	600
14	Improvement of Container Traffic		0	0	300	700	500
15	Information System/Communication System	930	60	180	320	270	100
16	Misc. and Minor Projects	2,200	237	609	557	352	445
Total		40,700	2,607	5,499	9,227	11,372	10,195

Table 8.2.3 Budget Allocation for 8th FYP Period (Port)

Seq.No.	Project Items	Yearly Allocation (Rs. million)					
		Total (8th FYP)	1993-94	1994-95	1995-96	1996-97	1997-98
Port							
1	Karachi Port						
-1	Jinnah Bridge Phase-II *	796	200	200	200	196	0
-2	Bucket Dredger & Ancillary Craft *	552	492	60	0	0	0
-3	Reconstruction of Berths No.5-8	1,800	0	300	500	500	500
-4	Container Terminal (5)	4,704	0	0	568	2,136	2000
-5	Reconstruction of Oil Berth (OP-V) *	530	265	265	0	0	0
-6	Feasibility Study on Container Terminal	33	0	20	13	0	0
-7	Modern Warehousing Complex	160	0	40	40	40	40
-8	VSP Tugs, Pilot Boats and Storage Area	200	0	50	50	50	50
-9	Computerization	15	0	5	10	0	0
	Sub Total	8790	957	940	1381	2922	2590
2	Qasim Port						
-1	Phase-I *	324	0	81	81	81	81
-2	Deepening of Channel for 75,000 DWT ships	765	0	0	0	380	385
-3	Oil Terminal *	2,500	800	800	800	100	0
-4	Container Terminal (2)	1,568	0	0	0	568	1000
-5	Bulk Water Supply to Industrial Area	390	0	90	100	100	100
-6	New Liquid Berth	200	0	0	0	100	100
-7	Computerization	10	0	3	7	0	0
	Sub Total	5,757	800	974	988	1,329	1,666
3	Others						
-1	Other Projects	25	0	0	10	10	5
	Sub Total						
Grand Total		14,572	1,757	1,914	2,379	4,261	4,261

Note : * on-going project
P by private sector

Table 8.2.4 Budget Allocation for 8th FYP Period (Airport/Aviation)

Seq.No.	Project Items	Total (8th FYP)	Yearly Allocation (Rs. million)				
			1993-94	1994-95	1995-96	1996-97	1997-98
Airport							
1	New Islamabad Airport :	-	-	-	-	-	-
2	Improvement of Islamabad Airport	196	54	100	42	-	-
3	Improvement of Lahore Airport	3,272	72	800	800	800	800
4	Improvement of Karachi Airport	1,155	354	361	285	-	-
5	Alternate Airport to Karachi	400	-	-	222	178	-
6	Improvement of Other Airports	1,900	20	175	562	427	716
7	New Feeder Airport	488	-	488	-	-	-
8	Aeronautical Communication and Control Project	336	200	136	-	-	-
9	Air Navigation System for Other Airports	605	120	120	120	120	125
10	Other On-going Projects	207	100	107	-	-	-
11	Rescue and Fire Fighting Service	274	-	90	90	94	-
Total		8,833	721	2,370	2,197	1,904	1,641
Aviation							
1	Purchase and Replacement of Aircraft	28,707	3,780	5,568	6,249	7,230	5,880
2	Development of Infrastructure	1,020	200	200	200	200	220
Total		29,727	3,980	5,768	6,449	7,430	6,100

8.3 Initial Environmental Examination

As the Initial Environmental Examination (IEE) is described in detail in Chapter 12 of the Volume II, results are summarized as follows:

The significance of environmental impacts of transport sectors, in general, is recognized as shown in Table 8.3.1.

Table 8.3.1 Comparison of Environmental Impacts of Alternative Transport Sector

ACTIVITY	ROAD NETWORKS				RAIL TRANSPORT		AIRPORTS AND AIRTRAVEL		PORTS, HARBOURS, & SHIPPING		
	CONSTRUCTION	OPERATION	DUALISATION	TUNNELS	ELECTRIFICATION	DUALISATION	NEW AIRPORT	NEW AIRCRAFT	NEW PORTS	MORE SHIPPING	INLAND WATERWAYS
ENVIRONMENTAL ITEM											
SOCIAL ENVIRONMENT											
1 RESETTLEMENT	OO/T	OO	OO	OO	O	O	OO	O	O	O	OO
2 ECONOMIC ACTIVITIES	O	B	B	B	B	B	B	B	B	O	B
3 TRAFFIC & PUBLIC FACILITIES	OO/T	B	B	B	B	B	B	B	B	O	B
4 SPLIT OF COMMUNITIES	O	OO	OO	O	O	OO	O	O	O	O	O
5 CULTURAL PROPERTY	O	O	O	O	O	O	O	O	O	O	O
6 WATER RIGHTS & RIGHTS OF COMMONS	O	O	O	O	O	O	O	O	O	O	OO
7 PUBLIC HEALTH	O	O	O	O	O	O	O	O	O	O	O
8 WASTE	OO/T	O	O	OOO	O	O	O	O	O	O	O
9 HAZARDS & RISK	O	OO	OOO	OO	OO	OOO (2)	OO	OOO	O	OOO	OOO
NATURAL ENVIRONMENT											
10 TOPOGRAPHY & SOILS	OO/T	O	O	OO	O	O	OOO	O	OO	O	O
11 SOIL EROSION	O	OO	O	O	O	O	O	O	O	O	O
12 GROUNDWATER	O	O	O	O	O	O	O	O	O	O	O
13 HYDROLOGICAL SITUATION	OOO/T	OO	OO	OOO	O	O	O	O	O	OOO	OOO
14 COASTAL ZONE	O	O	O	O	O	O	O	O	OOO	OOO	OOO
15 FAUNA & FLORA	O	OO	OO	O	O	O	O	O	OO	O	OOOO
16 METEOROLOGY	O	O	O	O	O	O	O	O	O	O	O
17 LANDSCAPE	OO/T	OO	OO	OO	O	O	OOO	O	O	O	O
POLLUTION											
18 AIR POLLUTION	OO	OOO (1)	OOOO	OOO	B (3)	B	OOO	B (4)	O	O	O
19 WATER POLLUTION	O	O	O	OO	O	O	O	O	OOO	OOO	OOO
20 SOIL CONTAMINATION	O	O	O	O	O	O	O	O	O	O	O
21 NOISE & VIBRATION	OOO/T	OOO	OOO	OOO	B (3)	B	OOOO	B (4)	O	O	O
22 LAND SUBSIDIENCE	O	O	O	O	O	O	O	O	O	O	O
23 OFFENSIVE ODOUR	O	OOO (1)	OO	OO	B (3)	B	OO	B (4)	O	O	O
LEGEND											
NOTES											
O = NO ENVIRONMENTAL EFFECTS	(1) SMOKE EMISSIONS FROM VEHICLES										
OO = SOME LIMITED EFFECTS	(2) ACCIDENTS ON TRACK WITH PEDESTRIANS OR ANIMALS										
OOO = SIGNIFICANT EFFECTS	(3) LESS NOISE, LESS AIR POLLUTION										
OOOO = SEVERE EFFECTS	(4) NEW AIRCRAFT HAVE LOWER NOISE LEVELS AND GENERATE LESS FUMES										
B = BENEFICIAL											
T = TEMPORARY											

The following tables are the summarized results of IEE by the proposed project.

Table 8.3.2 Summary of IEE by Sector (Road)

Project Name	I.E.E. Need	Environmental Aspects
1 Motorway (Lahore - Islamabad)	○	There may be an increase in noise levels but a decrease in air pollution due to higher fuel efficiency and increased dispersion due to faster moving traffic.
2 Dualization & Rehabilitation (N-5)		
-1 Hala - Rahimyar Khan, etc.	○	If the new road is dual carriageway then safety should improve due to carriageway separation. For roads with large volumes of high speed traffic it is necessary to prevent uncontrolled crossing. Footbridges should be provided. If herds of animals need to cross the road then footbridges are not appropriate and underpasses may be necessary. Otherwise accidental killing of animals can lead to strong local opposition. Changes of drainage patterns should be checked. Many areas are already suffering salinity problems due to inadequate drainage. Nee to carefully consider landuse issues and avoid protected areas such as national parks. Opening up of previously inaccessible areas can bring benefits to the local residents through access to medical facilities, schools and markets. Conversely such easy access can allow illegal hunting which with 4 WD vehicles and high powered rifles can exceed permitted bag limits. Creation of new roads can encourage congregation of nomadic villagers with their animals. If forage, grazing and water are inadequate then overuse of foodstocks and water occurs. Soil erosion and loss of arable land can result. Overloading of resources should be considered by taking an integrated planning approach. Coastal roads along the Makran coast may open beaches to tourists. There area protected areas due to turtle breeding (endangered species) and this access must be carefully controlled to prevent interference with breeding patterns. Conservation areas should be avoided. Reduction in congestion in city centres will alleviate air pollution from heavy vehicles. Main noise source is air horn on trucks which would be removed from city centres.
-2 Bahawalpur - Mianchanu	○	
-3 Okara - Lahore	○	
-4 Gujramwala - Rawalpindi	○	
-5 Chablat - Nowshera	○	
-6 Lahore Bypass	○	
3 Improvement (Other National Highways)		
-1 N-25 Uthal - Chaman	○	
-2 N-55 Jamshoro - Peshawar	○	
-3 N-40 Norkundi - Mastung	○	
-4 N-70 Qilla Saifu. - Rakui	○	
-5 N-35 Manse. - Khunjerab	○	
-6 Kohat Bypass & Tunnel	○	
-7 Sukkur Bypass & Bridge	○	
-8 Coastal Rd.	○	
-9 Others	○	
4 N-70 Multan - DGK, widening	◎	
5 Improvement of Provincial Roads		
-1 Bal. Sanjawi - Loralqai (widen)	◎	
-2 Bal. Quetta - Sanjawi (widen)	◎	
-3 Pun. Munda - DD Pana (widen)	◎	
-4 Pun. Rangpur - Munda (widen)	◎	
-5 Pun. Sihal - Taragang (widen)	◎	
-6 Pun. Sihal- Rawalpindi (widen)	◎	

Note: ○: IEE Needed (Study completed)
 ◎: IEE Needed (Study required)
 -: IEE not necessary

Table 8.3.3 Summary of IEE by Sector (Railway)

Project Name	I.E.E. Need	Environmental Aspects
1 Automatic Block Signaling Karachi - Lahore	-	Some minor temporary disturbance during construction due to track widening.
2 Electric/Relay Interlocking Karachi - Lahore	-	
3 Centralized Traffic Control System	-	<p>Any new transportation interchange will encourage tertiary facilities such as roadside shops, foodstalls, and workshops alongside the road in 'ribbon development.'</p> <p>If allowed to develop in an uncontrolled manner this can be unsightly. Specific areas should be set aside for these facilities with areas allocated to prevent vehicles abruptly pulling on and off main highways.</p> <p>Vehicle repair facilities should be removed from the main road by an imposed setback. Their location can be indicated by signage, but as their appearance is usually of the scrap yard type and unsightly they should be assigned a specific location away from the main road.</p> <p>Electrification will increase power demand on the national grid which is already overloaded. This demand should be included in the national energy sector balance.</p>
4 Track Renewal Rail Sleeper	○	
5 Electrification Samasata - Khanewal	-	
6 Double Tracking Lodhran - Shershar Multan - Raiwind	○	
7 Upgrading KYC - LLM section	○	
8 Electric Locomotives Revamping	-	
9 Diesel Electric Locos. Procurement(3,000 HP/2,000 HP) Rehabilitation Traction Motor	○	
10 Procurement of Wagon movers	-	
11 Procurement of Wagons	-	
12 Replacement of Coaches	-	
13 Improvement of Rolling Stocks Air Brake Roller Bearing Air Conditioning	-	
14 Improvement of Container Traffic Karachi Dry Port Lahore Dry Port Other Dry Ports	○	
15 Information System and Communication System Management Information System Seat Reservation System Communication System	-	
16 Misc. and Minor Projects	-	

Note: ○: IEE Needed (Study Required)
- : IEE not necessary

Table 8.3.4 Summary of IEE by Sector (Port)

Project Name	I.E.E. Need	Environmental Aspects
1 Karachi Port		
-1 Jinnah Bridge Phase-II *	○	<p>Liquid products terminal requires pipelines and tank farms for storage. All tank farms should have protective bunds to contain 110% of storage capacity of largest tank. If above ground, pipeline should be protected from vehicles by crash barriers.</p> <p>Dredging is required to maintain channel depth. Dumping ground of collected silt should be specified to avoid increased turbidity by dumping in breeding or spawning grounds or close to mangroves.</p> <p>Mangroves should be preserved as they assist in the control of siltation at Port Qasim.</p> <p>LPG is classed as a potentially hazardous material due to its explosive nature. Any storage in excess of 20 tonnes is potentially hazardous. Influence of explosion/fireball can be several hundreds of meters. The location of any LPG storage should be carefully considered as it may act as an initiating event to other nearby facilities such as oil storage tanks.</p> <p>Grain and fertiliser bulk storage in hoppers can lead to high concentrations of fine dust and air pollution control equipment may be necessary.</p> <p>Extensive dredging may ultimately be needed. The nearby mangroves of Gwatar bay should be considered when deciding where spoil is to be tipped.</p>
-2 Bucket Dredger & Ancillary Craft *	○	
-3 Reconstruction of Berths No.5-8	⊙	
-4 Container Terminal (5+2)	⊙	
-5 Reconstruction of Oil Berth (OP-V) *	○	
-6 Feasibility Study on Container Terminal	-	
-7 Modern Warehousing Complex	⊙	
-8 VSP Tugs, Pilot Boats and Storage Area	⊙	
-9 Computerization	-	
2 Qasim Port		
-1 Phase-I *	○	
-2 Deepening of Navigation Channel for 75,000 DWT ships	⊙	
-3 Oil Terminal *	○	
-4 Container Terminal (2)	⊙	
-5 Bulk Water Supply to Industrial Area	⊙	
-6 New Liquid Berth	⊙	
-7 Computerization	-	
3 Others		
Other Projects	⊙	

Note: ○ : IEE Needed (Study completed)
 ⊙ : IEE Needed (Study required)
 - : IEE not necessary

Table 8.3.5 Summary of IEE by Sector (Airport/Aviation)

Project Name	I.E.E. Need	Environmental Aspects
Airport		
1 New Islamabad Airport : Construction of a new Airport	⊙	<p>New international airports are intended to accommodate large long haul aircraft. Schedules are arranged to allow convenient arrival times at foreign destinations and this can imply night flights. Noise levels from fully loaded long range aircraft on take off can be excessive if sensitive areas are located beneath the flight path. These include residential property, hospitals and schools. Restrictions on take off at night may be necessary. Landing at night may be permissible.</p> <p>Close liaison with the town planning authorities should be maintained. Orientation of runways is usually dictated by operational requirements. For new runways, and new noise sensitive buildings checks should be made on their relative location. Noise contours should be plotted based on the fleet mix to determine planning constraints. In high noise areas other development can be encouraged such as factories, warehouse or perhaps offices.</p> <p>New terminals allow more passengers which require more infrastructure. This includes additional potable water supply, waste disposal, car parking, low cost transport to city centre, and waiting facilities for family members accompanying departing Haj passengers.</p> <p>In general purchase of new aircraft will improve noise conditions as older noisier aircraft are phased out. Wide bodied aircraft and airbus are new generation of relatively quiet aircraft due to high bypass ratio engines. Older aircraft such as 737 and some turboprops can be noisy on takeoff.</p>
2 Improvement of Islamabad Airport : Rehabilitation and extension of the runway	⊙	
3 Improvement of Lahore Airport : Construction of a new terminal complex extension of runway	⊙	
4 Improvement of Karachi Airport : Extension of the secondary runway, overlay of the main runway, etc.	⊙	
5 Aiternate Airport to Karachi : Sukkur airport	⊙	
6 Improvement of Other Airports : Expansion of the runways, aprons, carpark and terminal buildings, etc.	-	
7 New Feeder Airport : Construction of new feeder airports	⊙	
8 Aeronautical Communication and Control -	-	
9 Air Navigation System for Other Airports : Development of air navigation system in other airports	-	
10 Other On-going Projects	-	
11 Rescue and Fire Fighting Service : Procurement of crush fire and Rescue Vehicles	-	
Aviation		
1 Purchase and Replacement of Aircraft	-	
2 Development of Infrastructure : Construction / Development of workshops, hangars and cargo complexes, etc.	-	

Note: ⊙: IEE Needed (Study required)
-: IEE not necessary

CHAPTER 9 CONCLUSION AND RECOMMENDATIONS

9.1 Objectives of the National Transport Plan Study

The National Transport Plan Study (NTPS) is a research for development, which was conducted as one of the JICA's technical assistances. The study covers the field of transportation comprehensively for the nation of Pakistan. Successive effort of three studies is note-worthy. The studies are:

- The First NTPS 1981-83;
- The Second NTPS 1986-88;
- The Third NTPS 1994-1995.

Each of the above NTPS had an objective to contribute to the 5th, 6th and 7th Five Year Plans (FYPs) of Pakistan respectively. The JICA study team and Pakistan counterpart worked on the study together. The result of these studies has been reflected in FYPs as well as annual development programs. Each NTPS also had a role in technology transfer to the counterpart through analysis of current conditions and other planning works. Among these achievements, the result of NTPS has resulted to formulate the following projects:

- Indus Highway Construction Project (OECF, 1989-)
- Comprehensive Study in Transport System in Lahore (JICA, 1989-91)

Further, various data collected, analyzed and projected in the course of the NTPS was referred and used frequently as bases of analyses and forecasts by the Pakistan government and international aid agencies.

The NTPS has thus achieved a number of tasks, and, hopefully, the results of the 3rd NTPS (this study) will be used fully.

9.2 Conclusion

One of the objectives of this study is to review the master plan previously prepared by the JICA team.

The mid-term Master Plan, targeted for the FY 2005-06, was reviewed in accordance with the results from the Seventh Five Year Plan. Overall, the scenario of urgent transportation infrastructure development necessitated from the continuous economic growth in industry and increased transportation demand, has not been changed. The summary of the scenario is the following:

- The levels of production and consumption on major commodities forecasted within the economic framework resulted to overestimate by 10% in the FY 1992-93; however, with promotion of economic development policies, about the same or even higher growth rate will be expected for the FY 2005-06.
- The results from the macroscopic demand forecasts are as follows:
 - The previous demand forecasts on freight volume handled at seaports for the FY 1992-93 underestimated by 22% in import, but they overestimated slightly in exports. With the promotion of industrialization and export development policies, and especially with a factor of volume increase in container freight, commodity volumes both in import and export are expected to raise for the FY 2005-06; they will increase by 20% from the previous forecasts.
 - As for the land transport, the previous forecasts in terms of passenger-kms and ton-kms did not differ from the real values. For the FY 2005-06, the demand increases on passenger volume by 30% and freight volume by 15% are expected.

- In the previous forecasts, modal shift to rail transport was emphasized. For that reason, the forecasts on rail freight transport did not predict the reality as expected. In this study, modal split on rail and road was reconsidered, and with the consideration, demands on freight and passenger volumes were forecasted. The values of demands for the FY 2005-06 were set at 65% on freight volume and 120% on the passenger volume of the values forecasted in the previous study.
 - On road transport, both passenger and freight actual volumes were higher by 15% in the FY 1992-93 than the previous forecasts. For the FY 2005-06, higher demands were forecasted in this study than the previous master plan, since rapid modal shift from road to rail was not assumed.
 - The demand on air transport in the FY 1992-93 has been increasing as predicted in the previous NTPS. Other than the slight increase in freight transport, the mid-term forecast does not differ much from the previous study.
- Facilities development required by each transport sub-sector are described in Chapter 6 as the mid-term proposals. Following is the summary:
- Road Sector

Motorways that are not mentioned in the master plan are being developed; widening to four lanes of the route N-5 and improvement of the route N-55 are on-going. As with the capital investment on road development, by the FY 2005-06, the major arterial network will be completed, and improvement and repair/maintenance of local roads are expected to become the main theme of the road sector.
 - Rail Sector

Locomotive factories and rail track improvement have been implemented, but the investment is far from being effective. Its efficiency will be expected to improve after the capital investment planned in the Eighth Five Year Plan. Large and concentrated investments on major routes and high priority sections are proposed.
 - Port Sector

Construction of berths, exclusive for oil, and Jinnah Bridge construction were implemented, but improvement for containerization has not reached the level of satisfaction. Facility improvement for containerization in the ports of Karachi and Qasim is the major theme in the mid-term plan. Positive involvement of private sector is encouraged.
 - Sea Transport Sector

The recommendation on sea transport, which consists of fundamental reform of regulations and structures of organizations, revitalization of sea transport sector by promoting private investment and acquisition of new ships, is the same as the previous master plan, because specific improvement in this sub-sector has not been recognized since the Sixth Five Year Plan.
 - Airport and Air Transport Sectors

Plans, such as establishment of private airline companies, and completion of the Karachi new terminal building, have been implemented. This sub-sector is progressing well compared with other sub-sectors. Investment on this sub-sector, such as major airport improvements and modernization of airport operations systems, is expected. Involvement of private sector is encouraged as in the sea transport sub-sector.
- Containerization of freight transport (multi-modal transport), which has been mentioned often throughout this report, is an urgent planning issue, which must be handled by long term efforts of developing and improving related facilities with due consideration of the study results from UNCTAD.
- Policies of privatization have been developed on each sector; port, sea transport, airport and

air transport. Nevertheless, specific measures were to be developed further for implementation. As well as the sectors mentioned, on other sectors, development shall be accelerated as much as possible, not only by means of public funding sources but by other financial sources.

- After the collapse of the Soviet Union, a new theme of international transport was evolved in relation to the newly created Central Asian States. Availability of data would not allow thorough research on the subject; however, the locational advantage of Pakistan would make the theme a significant subject for the nation's growth. The theme shall be formalized from wider view-points with due consideration of containerization and seaport improvement mentioned previously.

9.3 Further Studies

The transport infrastructure development shall continue further from the Eighth Five Year Plan on, as proposed in this study. Further detailed studies, which were excluded from this study, are recommended to be prepared simultaneously. Following are examples of related studies on transportation.

(1) Transport Sector Industry Study

System of transport sector; structures of business establishments, management conditions, capital movement, and regulations and unwritten rules, has not been so far studied comprehensively. Even the government, under the project-oriented department structure, has not grasped the current conditions. Especially, on road transport, mainly operated privately, no study is available. Under such condition, effective policy on transport is hardly realized. Survey type of study is recommended.

(2) Provincial Road Development Plan

Major arterial network, with emphasis on national highways, was included in this study; networks of provincial roads shall be studied especially in the provinces of Punjab and Sindh to establish systematic improvement policies.

(3) Comprehensive Regional Development and Local Road Improvement Plan

Currently, local road improvement plans, which conform with the Regional Comprehensive Development Plan from social and economic development view-points, do not exist in NWFP, Baluchistan and northern areas. Such plan shall be prepared in near future.

(4) Karachi Port Modernization Study

Karachi Port handled containers of 500,000 TEU in the FY 1992-93, and the volume is expected to grow as the nation's economy grows. But spatial limitation of the port and its out-dated facilities, which are haphazardly placed, limit the cargo handling capacity. The capacity limitation will be improved by employing efficient cargo handling, operation and management systems, reconfiguring facilities and reviewing land use in a limited spatial allowance. The modernization of the port shall meet increasing freight volume of the port.

The existing master plan (target year, FY 2007-08) on the Karachi Port shall be reviewed, and feasibility studies (target year, FY 1997-98) which related to short term improvement plans shall be conducted.

(5) Study on Electrification of Major Rail Routes

Only 3% or 300km of the Pakistan Railway is for electric cars in Pakistan. Factors of operation efficiency of locomotives and energy efficiency call for extensions, especially, of Khanewal-Lahore section. Past studies shall be reviewed comprehensively; a master plan, which shall coordinate individual improvement plans and feasibility studies on each route shall be conducted.

(6) Moghalpura Factory Modernization Study

Out-dated facilities of repair and maintenance of Moghalpura Factory is one of the causes of the low rate of locomotive deployment capacity. As one of the only three repair and maintenance shops, the role of the factory has become more significant, since the handling capacities in the Central Factory in Rawalpindi and the Karachi Factory have their limitations. A feasibility study for modernizing the factory shall be necessary.

(7) Local Airport Improvement Study

Aside from the three major airports (Karachi, Lahore and Islamabad), where airport development is relatively well coordinated supported by large transport demand, local airports have been developed without a master plan. Most of the local airports suffer from financial losses.

Conditions of local airports, including facilities and levels of services, shall be studied to vitalize demand of air transport. The study also shall propose effective and efficient local airport improvement plan, level of improvement, prioritization, and improvement scheduling.

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