

Chapter 5. OVERALL TRANSPORT POLICY

5.1 Review of Existing Development Plan

The Medium Term Development Framework (MTDF) published in May, 2005 declares an ambitious goal for Pakistan to be a developed, industrial, just and prosperous country within 25 years, by attaining 7-8 per cent annual economic growth. To support such rapid growth, MTDF envisages a total investment of about Rs.8.0 trillion during the five years of 2005/06 – 2009/10. The amount corresponds to 1.3 times of GDP in 2004/05. Out of Rs.8 trillion, the fixed investment is Rs.7.3 trillion, of which 65% is expected to come from the private sector and 35% from the public sector.

Total investment in the transport sector is planned to be over Rs.573 billion, of which Rs.304 billion is to be by public investment. Prior to discussing a long-term developing policy and strategy of PTPS, the MTDF was reviewed, and summarized in the followings.

5.1.1 Overall Policy and Strategy of MTDF

The overall policy and strategy of MTDF are summarized in Table 5.1.1. The PTPS is one of the actions in accordance with the policy (1) and the strategies (1) to (4) are included in the TOR of PTPS.

Table 5.1.1 Overview of MTDF Policy and Strategy for Transport Sector

Overall Policy and Strategy of Transport Sector	
Policy	(1) Development of a comprehensive and integrated transport policy during MTDF (2) Establishment multimodal transport system (3) Emphasis on asset management of the existing system (4) Enhanced private sector participation
Strategy	(1) Enhancement of regional connectivity to improve links to the Central Asian States, Iran, Afghanistan and India (2) Improvement of transport planning, prioritization and rationalizing public sector expenditure and mobilization of resources from users and private sector (3) Reforms of institutions governance (4) Adoption of an integrated and holistic approach for more productive, efficient and reliable transport system aiming at lower transport cost

Source: MTDF

5.1.2 Policy and Strategy of Transport Sub-Sectors of MTDF

Table 5.1.2 presents the policy and strategies of each transport sub-sector. Every sub-sector shows the general direction of private sector participation. The MTDF expects private sector investment in transport sector to reach 47% of total investment. The Pakistani experience shows, however that private capital will not be easily induced to participate in the road and railway sub-sectors unless each PFI/PPP project is deliberately structured.

As a whole, the road sub-sector emphasizes improvement of existing facilities and better operation, rather than new construction. New road projects are limited to those with high economic return. Improvement of cross-border routes is also highlighted in order to enhance the hub-function of Pakistan to the surrounding countries.

Table 5.1.2 Policy and Strategy of Transport Sub-Sectors of MTDF

Sub-Sector	Policy and Strategy of Transport Sub-Sector
Road	<ul style="list-style-type: none"> (1) Optimal utilization of the existing capacity with emphasis on rehabilitation and upgrading (2) Selective and cost efficient investment in economically viable new roads, including expansion of the rural network (3) Development/improvement of road network to facilitate transport and trade with Iran, Afghanistan, Central Asian States and India (4) Development of innovative financing mechanisms and enhancement of private sector participation (5) Priority to roads maintenance and safety (6) Effective control of overloading on the roads (7) Enhancement of capacity of the road sector agencies
Railway	<ul style="list-style-type: none"> (1) Revitalization of railways into a more commercially oriented entity, while retaining the railway network in public ownership (2) Corporatization of railways (3) Induction of private sector capital and management expertise into the sector, particularly into railway support industries and train operations (4) Emphasis on inland freight traffic handled by the railways, to achieve maximum utilization of inherent capacity
Ports & Shipping	<p><u>A. Port</u></p> <ul style="list-style-type: none"> (1) Upon the concept of “Landlord port”, the port’s responsibilities are limited to (a) provision of fixed infrastructure such as land wharves and buildings; (b) ownership of wharves, buildings, harbour structures, navigational aids and electrical installations; and (c) control and regulatory functions with respect to services of the port and port conservation and development. (2) All port operations would be done by private sector (3) The Port Authorities would be made fully autonomous <p><u>B. Shipping</u></p> <ul style="list-style-type: none"> (1) Speedy enactment of the Merchant Shipping Ordinance (2) To allow Pakistan ship owner to act as if they are located in EPZ (3) Encouragement of local banks toward extension of financial assistance to potential ship owners (4) Amendment of bilateral shipping agreement (5) Institutionalization of role of freight forwarding agencies for efficient movement of cargoes (6) Revitalization of Pakistan Marine Academy
Airports & Aviation	<ul style="list-style-type: none"> (1) CAA should limit its role to regulatory function with ADA providing the aviation infrastructure and services (2) Pakistani private airline on international routes should be encouraged and be allowed to operate on viable domestic routes (3) The landing and fuel charges should be brought at a with the neighbouring countries (4) PIA and private airlines are to be treated at par in levy of duties and taxes for import of aircrafts and spares

Source: MTDF

As for the railway sub-sector, “revitalization”, “corporatization” and “privatization of operation” are keywords. In order to step toward this direction, the sub-sector will require painful structural reform and a sizable amount of additional investment in order to improve substandard railways and renovate superannuated rolling stock.

The port and the airport sub-sectors intend to promote further private sector participation by limiting the government agencies role to “landlord” and regulatory functions.

5.2 Planning Goal

Based on the understanding of policies and strategies of the current MTFD, the Study Team tried to set up a planning goal and long-term policies/strategies targeting the year of 2025 in order to clarify the basic planning directions of PTPS.

The planning goal of PTPS was set as follows, which may be appropriate in most of long-term transport plans at the national level. “Proper level of services” may vary by economic conditions and for particular problems of the country.

Planning Goal of PTPS
“Accomplishment of safe, stable and sustainable transportation system and network with an adequate level of services, enough to support people’s economic and social activities”

To approach the goal, three policies and seven strategies have been selected in PTPS.

Three Policies

- A. Transport system to support economic and social activities
- B. Transport network to support balanced growth of regional economy
- C. Transport system to realize optimal modal share

Seven Strategies

1. Development of financially realizable master plan
2. Transparent Prioritization
3. Pursuit of Road Safety
4. Inter-modal Facilities Development
5. Cross-border Facilities Development
6. Institutional Capacity Enhancement
7. Environmental Consideration

To set up those policies and strategies, those of the MTFD are fully taken into account and then the basic planning directions are illustrated as shown in Figure 5.2.1.

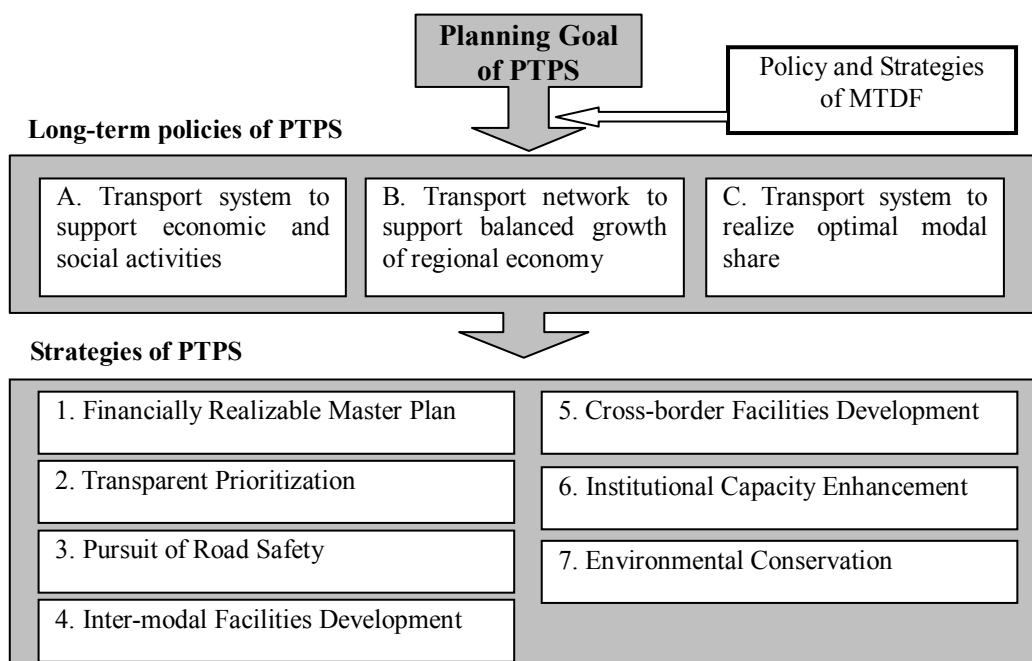


Figure 5.2.1 Long-term Policies and Strategies of PTPS

5.3 Long-Term Policies of PTPS

5.3.1 Policy A. Development of transport system to support economic and social activities

The MTDF says that about 4.2 million vehicles are currently operated on about 258,000 km road network (page 441). If the national economy grows at such a high rate of 7 to 8 percent per annum as the Government aims, traffic volume will definitely increase by more than five times the present level. On the other hand, the present road network is still in poor condition. Multi-lane roads are very limited and most provincial roads are 3.5 – 4.0 meters wide, where even small vehicles can hardly pass each other. Under such conditions, not only will traffic accidents increase, but transportation time will become longer and cost are even more. Even now, the MTDF estimates Rs.220 billion or 8.5% of GDP is annually lost due to the inadequate and insufficient transport system (p.442), which will hinder economic growth and reduce export competitiveness unless the transport system is not properly developed.

In this study, project identification and prioritization will be made firstly from the economic point of view and then by other factors such as: social needs, development effects and environmental impacts not because they are less important, but due to the difficulties of quantitative analysis required for such factors.

Economic evaluation of a project will be conducted for each project based on the present and future traffic, through “with and without” comparison. Main sources of economic benefit are savings in vehicle operating cost (VOC) and travel time cost (TTC) attributable to the project. Decreased traffic accident by the project will be taken into account, if necessary. The future traffic and accruing benefit are estimated through assignment of OD volume on the network consisting of the national and provincial roads, railways, ports and airports.

To support economic activities, the transport network has to be stable and not affected seriously by a natural disaster or social incidents. Major economic centres (large cities, industrial centres, ports, etc.) are interconnected mutually by plural trunk roads or railways so that in case of one link is severed, another will be available.

Under Policy A, the focal points for project identification and formation will be as follows:

- Supporting economic activities by connecting major economic centers with motorways or national highways
- Demand oriented project formation to avoid traffic congestion
- Establishment of stability by providing alternative mode or route
- Increase of urban bypasses
- Development or improvement of inter-modal facilities
- Strengthening of international routes
- Management and effective utilization of existing resources

5.3.2 Policy B. Development of transport network to support balanced growth of regional economy

Pakistan has two dominant corridors of development: one is the north-south corridor along the Indus basin from Karachi to Lahore/Rawalpindi/Islamabad and the other is east-west corridor from Lahore to Peshawar via Rawalpindi/Islamabad. Economic activities and population are concentrated along these corridors, mainly due to geographical and natural conditions. As a result, a significant economic disparity is observed between the corridors and other areas.

Beside this regional disparity, there is an income gap between urban and rural areas. The poverty ratio (the percentage of people below the poverty line) is much higher in rural areas than in urban areas. (Table 5.3.1)

Table 5.3.1 Regional Disparity in Pakistan, 1998/99

Province	Average Monthly Income per capita (Rs/month)			Poverty Ratio (%)		
	Whole	Urban	Rural	Whole	Urban	Rural
Panjab	1033	1390	889	33.0	25.5	36.0
Shindh	1053	1347	828	26.6	16.1	34.7
NWFP	796	1211	725	42.6	29.2	44.9
Balochistan	979	1073	965	22.8	24.3	22.5
Pakistan	1001	1354	854	32.2	22.4	36.3

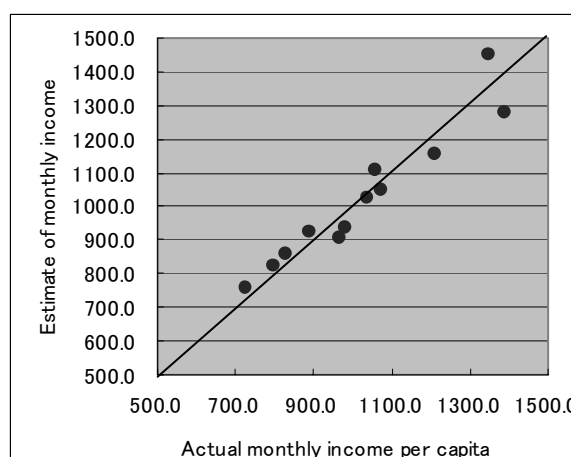
Source: Average monthly income from Household Integrated Survey (HIES) P.10 Table 2.5.C, 1998/99, FBS, 2001

Poverty Ratio from “Pakistan, Guideline for Assistance” JICA, 2003

As no district-wise data directly expressing poverty level are available in HIES, 2001, five social indicators have been selected as proxy variables in order to see the regional distribution of poverty by district. These are:

- 1) Percentage of the unvaccinated population of age below 10 years,
- 2) Percentage of illiterate household members of age 10 years and above,
- 3) Percentage of household without drinking water inside the house,
- 4) Percentage of household without electricity for lighting, and
- 5) Percentage of household with wood only as cooking fuel source.

These indicators are well-known to have a close relation to poverty. At province level, actually, the multiple regression of average income per capita on those indicators shows a good fit and a high correlation coefficient of 0.95. The geographical distributions of those indicators are shown in Figure 5.3.2. The estimates of average monthly income using the multi-variable regression equation and actual income show a good correlation as shown in Figure 5.3.1.



Source: JICA Study Team

Figure 5.3.1 Correlation of actual monthly income and estimate

As poverty alleviation is one of the most important policies of the Pakistani Government and international donors, proper consideration should be paid to the projects in and around relatively poorer area in addition to their economic viability.

Under Policy B, the focal points for project identification and formation will be as follows:

- Harmonization of transport network development with regional development policies and plans
- Network development aiming at alleviation of poverty and regional disparity
- High priority setting on transport projects in poorer areas
- Project implementation by utilization of local materials and procurement of local labor force
- Effective monitoring of the effects of projects and other poverty alleviation measures and projects affect

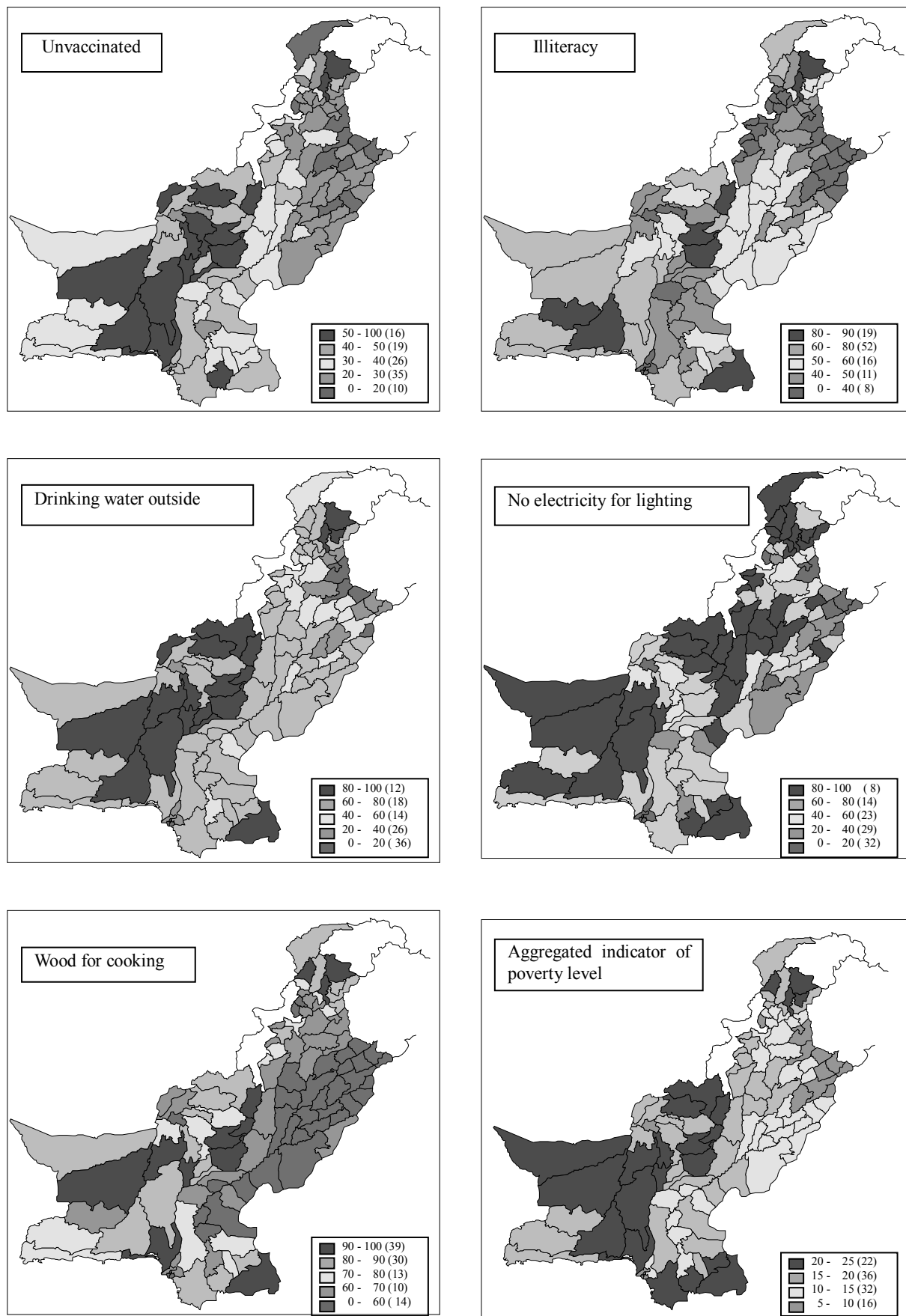


Figure 5.3.2 District-wise Social Indicators as Proxy Variables of Poverty

5.3.3 Policy C. Transport system to realize optimal modal share

The Pakistani Government has been emphasising the importance of a multi-modal transport system. In Pakistan, multi-mode transport means transport by road and rail. Air transport of cargo is also important but the volume is small and river transport is negligible.

It is believed, in general, the unit transport cost (operating cost) of rail is lower than that of road, while capital cost (costs of infrastructure and rolling stock) of rail is higher than that of road, even including road construction cost and maintenance cost. Therefore, the cost curves of the two modes will meet at some point (Figure 5.3.3). The breakeven distance is usually in the range of 150 to 500 km. It depends on the fixed costs (of which, the main part is for loading and unloading) and the variable costs of the two modes and also on the volume of cargoes.

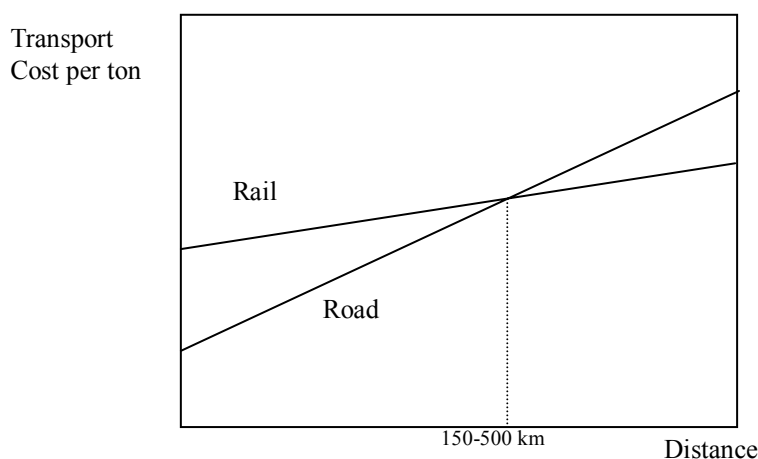


Figure 5.3.3 Breakeven Point of Transport Cost by Road and Railway

Taking into account the economic advantage of railway transport, PTPS proposes a target share of railway at 20% in 2015 and 34% in 2025 as stated in Chapter 4.3.3. By attaining this target modal shift from road to rail, a sizeable economic benefit is expected to accrue. If comparing the economic costs of two modes, direct economic benefit is estimated at Rs. 20.6 billion in 2015 and Rs. 64.1 billion in 2025 (estimated in PTPS), even disregarding the savings in transport cost due to the mitigation of road congestion. The cumulative benefit during 2015 to 2025 will reach Rs. 426 billion (US\$ 7.1 billion) and then, at least the amount will be economically justifiable for realization of target modal share.

Under this policy C, focal points for project identification and formation will be as follows:

- Minimization of transport cost by multi-modal transportation
- Fare competition between road and rail
- Modernization of railway system through rehabilitation with improvement to railway infrastructure and facilities, renewal of rolling stock and institutional reform of management and operation
- Development and improvement of inter-modal facilities
- Introduction of research works suitable for local conditions

5.4 Development Strategy of PTPS

Seven strategies have been selected to develop the long-term transportation master plan, PTPS.

5.4.1 Development of Financially Realizable Master Plan

A master plan should not be a mere “wish list”, but a practical list for which the total amount is in the financially feasible range according to the scale of the national economy and government budget. The MTDF plans to invest Rs.573 billion or 9.3% of GDP in 2004/05 for five years of 2005/06 to 2009/10, that is, 1.8% per annum. As the annual investment in the transportation sector is usually in the range of 1.5 to 3.0% of GDP in developing countries, the investment plan of the MTDF is rather modest as far as the transportation sector is concerned.

Based on the economic growth scenarios stated in Chapter 4, an analysis of a reasonable range of transport investment in the coming 20 years is presented in Chapter 6.1.2 and the range was estimated to be Rs. 3.7 to 5.1 trillion (US\$ 62 – 85 billion). As the revenue of the Government can hardly keep up with the economic growth, the majority of the investment should be shouldered by the private sector.

In general, however, PFI/BOT scheme are not easy to apply to a transportation projects because of the huge investment, long cost recovery period and limited users’ affordability; such a project then needs prudent preparation works and in most cases, public and private joint participation (PPP scheme) will be necessary.

- Preparation of an investment plan according to the national economy
- Expansion of financial sources and proper allocation
- Application of “Beneficiary pay” principle or “Causer pay” principle
- Participation of private sector

5.4.2 Transparent Prioritization

The budget of the Pakistan Government has been tight compared to the huge demand for transportation investment, so project prioritization is important in these kind of master plan studies. The method adopted for prioritization has to be logical and reasonable. It should also be understandable and agreeable to most stakeholders. Above all, the method and process should be clear and transparent. Figure 5.4.1 shows the procedure taken in this Study for priority setting on candidate projects.

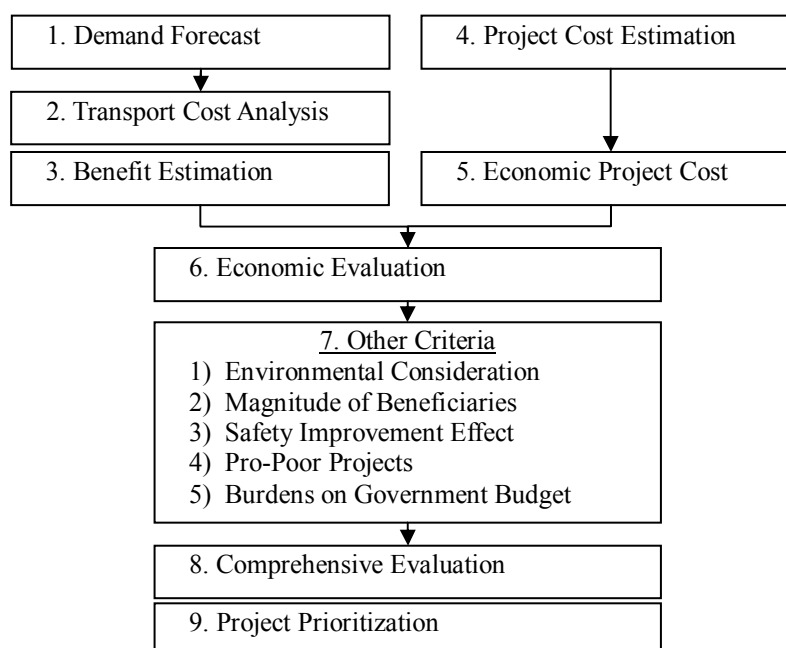


Figure 5.4.1 PTPS Procedure of Project Prioritization

The economic return of a project is regarded as the most dominant criterion in determining the priority of the project, because the economic growth is one of the most important objectives of the MTDF. After setting priority on all candidate projects from an economic view point, those projects are re-evaluated on other criteria and finally, comprehensive priority setting will be done. How to set the relative weights among evaluation criteria is being studied. Regarding the prioritization, focal points are:

- Consensus among stakeholders on evaluation criteria and relative weight among them
- Technology transfer to the counterpart team on prioritization technology.

5.4.3 Pursuit of Road Safety

As the number of vehicles increases, traffic accidents have been increasing also in Pakistan. Overloading on trucks accelerates the rate of increase in accidents. As for rail, three fatal accidents have been occurring in the past five years mainly due to poor communication systems. As traffic accidents will increase in parallel with transport demand, traffic safety will become a more important issue in the future. Focal points for traffic safety are:

- Physical improvement and good maintenance of road and rail systems
- Strict regulation enforcement especially on overloading and transporting hazardous freight
- Establishment of rescue system
- Development a system for traffic accident statistical data
- Traffic safety education to drivers and school children

5.4.4 Inter-modal Facilities Development

Why inter-modal? For a variety of reasons, and due to regional diversities, production and consumption of goods takes place in geographically separate locations. In this competitive world, it is essential that the transport costs of both imported and exported goods are kept low. This requires good accessibility, and use of most appropriate and efficient mode or modes of transport. For example, for the movement of large volumes of goods over long distances it is efficient to use bulk movement modes: railways or shipping, as appropriate. However, one of the key drawback of multi-modal or single mode transshipment facilities is the increase in the number of times goods have to be handled, i.e. loaded and unloaded - contributing to the increase in the cost of transportation.

The minimum criteria for an efficient and cost-effective inter-modal terminal would be to at least take account of the following points:

- The location of such termini is “accessible” for all modes using the terminal,
- All modes using the facility should have adequate transport infrastructure and carrying capacity,
- The design of such a facility should allow safe and efficient transfer of goods through the use of technology and material handling devices,
- Handling of goods is made efficient through unitization, i.e. handling only containerized goods, and container stuffing and unpacking takes place elsewhere,
- Make effective use of communication systems such that clients are aware of the status and location of their freight,
- Through systemized and simplified documentation, allowing easy processing of goods through customs and excise checks and payment of dues. For example, clearance of goods at Lahore airport requires payment of dues to at least six or seven different agencies, which could easily be paid at a single counter.

This is particularly true of multi-modal terminals such as ports, and major inland freight termini usually called “dry ports”. Such single or multi-modal inland termini could also be used for the local distribution of goods for large local populations and export collection points for industrial centers for the export of goods.

Pakistan, with its vast area of over 790,000 sq-km and few population centres with access to the ports at or near Karachi, adopted the use of “dry ports” since the mid-1980s. This had the key impact of reducing the congestion at Karachi port, and leaving it to be an efficient multi-modal terminal and not become a distribution center for the whole country.

There are about 20 dry port termini in Pakistan in cities other than Karachi. As one would expect, the majority of these are in large conurbations in the provinces of Punjab, Sindh and NWFP. PTPS traffic and transport survey programme would cover a number of these facilities. Further analyses of their function, importance, processing capacity, likely improvements and location of additional such terminal would be covered in this study.

It could be commented that the PTPS strategy for efficient and cost effective movement of goods in Pakistan involves effective use of all available modes of transport, and propose s further transport infrastructure development, where necessary, to promote economic growth as anticipated by MTFD.

5.4.5 Cross-border Facilities Development

Pakistan has several thousand kilometres of land borders with its neighbouring countries: Iran, Afghanistan, China and India. Beyond these countries Pakistan could act as a major transshipment route for the land locked countries of central Asia, which have enormous growth potential and wealth of mineral deposit. A Pakistan with efficient land transport infrastructure and ports for import export would gain enormously by providing the key access routes to the warm waters of the Indian Ocean and Persian Gulf.

The PTPS strategy towards cross-border trade of Pakistan with its neighbouring countries and the Central Asian states is two-fold:

- a. Improve bi-lateral trade with neighbouring countries through harmonization of political relations, promoting not only trade but tourism and other such activities, and
- b. Provide seamless transshipment route for Afghanistan and the Central Asian states farther away.

1) Cross-Border Trade with the Four Neighbouring Countries

The recent thaw in political relationship has seen an increase in cross-border movement of goods and people. However, there is a long way to go before the people of these nations could travel across each other’s land without restriction in the way Europeans do. The trade with these countries has started to pick-up and should be encouraged by:

- Reducing bureaucratic paper work,
- Simplifying the custom and excise formalities,
- Providing facilities for fast track processing of passport checks through enhanced use of technologies,
- Improving transport infrastructure of all modes to international standards ensuring adequate capacity,
- Provision of multiple cross-border facilities between neighbours across several thousand kilometres of borders.

PTPS as part of its extensive traffic and transport survey programme across Pakistan has conducted surveys at most cross-border facilities. In developing the transport master plan for Pakistan, due consideration will be given to these facilities.

2) Role of Pakistan as Transit Trade Route

Pakistan could play a pivotal role in the development of the economies of Central Asian states and that of Afghanistan by providing them with transit routes to the ports of the Gulf and Indian Ocean. Afghanistan and China are already using the historic trade routes for access to the ports in Pakistan. However, trade is limited due to:

- Poor inter-modal transshipment facilities at border crossings,
- Limited through movement of goods due to limitations imposed by each country,
- Lack of facilities for through passage of goods and people
- Poor capacity transport links between border crossing and to the nearest dry-ports and overland routes to major ports at Karachi
- Inadequate high capacity rail links for bulk movement of goods,
- Totally unimpressive performance of current railways in terms of frequency, delivery of goods on time, insurance against loss and damage to goods, and so on
- Little or no provision for handling of containers for inter-modal transfer
- Lack of secure and modern warehousing facilities for storage of goods
- Outdated documentation and billing processes, and so on.

For Pakistan to act as trade route for these nations, PTPS would recommend strategies on how to enhance cross-border facilities. Currently, a number of projects are on the way to improving the poor facilities outlined above, for example, widening the road section at the border crossing between India and Pakistan at Lahore. The data from cross-border surveys is being processed to assess the inadequacy of facilities for future recommendations to follow.

5.4.6 Institutional Capacity Enhancement

Construction and maintenance of roads has been devolved from the Central Government to the local government in accordance with the devolution policy. However, financial sources have not necessarily been transferred to local government, along with the transfer of responsibility. In addition, some local governments have not yet acquired the absorptive capacity in planning, design, cost estimate, evaluation bidding, etc.

Both at the central and local level, institutional capacity for research and training functions do not appear to be sufficient. To meet the increasing demand for such functions, institutional enhancement will be needed.

- Enhancement of training function for government personnel, inclusive of traffic police
- Enhancement of transport research institute, particularly in creation, collection and maintenance of transport statistical data
- Encouragement for universities and colleges to create faculties of transport planning and design

5.4.7 Environmental Consideration

Protection of the environment and environmental awareness has been common for some time in Pakistan. GOP has taken measures towards improving and protecting the environment through legislation, education, and public participation. Such programmes are in their infancy. In preparing the PTPS due consideration will be given to environmental laws, rules, regulations and issues. Key points for consideration are:

- Preparation of environmentally sustainable transport master plan,
- Environmental assessment to be an integral part of project evaluation and prioritization process,
- Recommending full environmental impact assessment of all proposed projects before implementation,
- All proposed transport infrastructure projects to follow environmental laws, rules and regulations at all stages of the project, i.e. before, during and after construction,
- Fare compensation for land and loss of livelihood of land owners
- Propose mitigation measures to reduce adverse impacts, and
- Not to allow worsening of environmental conditions, where the current environment has already suffered degradation due to neglect and over-sight of the past decades.

Chapter 6. DEVELOPMENT STRATEGY

6.1 Development of Financially Realizable Master Plan

In this section, the national financial situation was analysed and the possible investment budget for the Master Plan was calculated. In order to increase funds for transport sector, strengthening of the road tax was recommended and target investment level with road tax was proposed. Financial reforms of NHA and PR were proposed to ensure the financial stability for the Master Plan. Finally, private sector involvement in transport sector was analysed because private sector investment is essential for the transport development.

6.1.1 Analysis of Financial Situation of Pakistan

(1) General Information Regarding Pakistan National Budget

Fiscal deficits have continued to appear in the National budget of Pakistan. Table 6.1.1 shows the trend in fiscal deficits as a percent of GDP. These fiscal deficits may lead to the massive public debts. Table 6.1.2 shows the trends in public debts from fiscal year 2001/02 to fiscal year 2004/05. According to Table 6.1.2, public debt has ranged from 60 to 80% of GDP. The increase in debts leads to increased interest payments and contributes to inflexibility in budgetary expenditures.

Table 6.1.1 Proportion of Deficit of GDP

(Unit: %)

FY	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97
Revenues	16.9	19.2	18.1	17.5	17.3	17.9	15.8
Expenditures	25.7	26.7	26.2	23.4	22.9	24.4	22.3
Overall Fiscal Deficit	8.8	7.5	8.1	5.9	5.6	6.5	6.4
FY	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Revenues	16	15.9	13.5	13.3	14.2	14.9	14.3
Expenditures	23.7	22	18.7	17.2	18.8	18.6	17.3
Overall Fiscal Deficit	7.7	6.1	5.4	4.3	4.3	3.7	2.3

Sources: Pakistan Economic survey 2004/05

Table 6.1.2 Trends in Public Debt

(Unit: Rs. Billion)

	2001/02	2002/03	2003/04	2004/05 (July - March)
Debt (in Rupees)	1,715.2	1,853.7	1,987.8	1,982.3
Debt (in Foreign Exchange)	1,984.1	1,891.3	1,807.7	1,944.4
Total Debt.	3,699.3	3,745.0	3,786.6	3,926.7
GDP	4,401.7	4,821.3	5,532.7	6,547.6
As % of GDP	84%	78%	68%	60%

Sources: Pakistan Economic survey 2004/05

(2) Inflexibility of Budgetary Expenditures

The problem regarding the National Budget of Pakistan lies in the inflexibility of the budgetary expenditures. Interest payments and the defence sector account for approximately 40 to 50% of the total expenditures. This situation is forcing the budgetary expenditure to be inflexible. Table 6.1.3 shows the details of budgetary expenditures.

Table 6.1.3 Details of Budgetary Expenditures

FY	1997/98		1998/99		1999/2000		2000/01	
	Rs. Billion	%	Rs. Billion	%	Rs. Billion	%	Rs. Billion	%
Total	634.0	100.0	647.8	100.0	709.1	100.0	717.9	100.0
Current Expenditures	529.9	83.58	547.3	84.49	626.4	88.34	645.7	89.94
Interest Payments	202.4	31.92	220.1	33.98	262.2	36.98	249.3	34.72
Defence	136.2	21.48	143.5	22.15	150.4	21.21	131.2	18.28
Development Expenditures	104.1	16.42	98.3	15.17	95.6	13.48	89.8	12.51

FY	2001/02		2002/03		2003/04 (Estimated)	
	Rs. Billion	%	Rs. Billion	%	Rs. Billion	%
Total	826.3	100.0	898.2	100.0	955.8	100.0
Current Expenditures	700.2	84.74	791.7	88.1	774.9	81.1
Interest Payments	273.9	33.15	235.3	26.2	226.3	23.7
Defence	149.3	18.06	159.7	17.8	180.4	18.9
Development Expenditures	126.2	15.27	106.5	11.9	180.9	18.9

Sources: Pakistan Economic survey 2004/05

According to the Medium Term Development Framework (MTDF), transport is an important sector of the economy contributing 10% of the GDP and over 17% of the Gross Capital Formation. In addition, the development expenditure in the transport sector from 2001/02 to 2004/05 is calculated to be Rs. 145 billion, and the average budgetary annual expenditure during this period is Rs. 29 billion. Considering that the total annual development expenditure is around Rs. 100 billion (see Table 6.1.3), the development expenditure on the transport sector is 30% of the total. This percentage indicates that the Pakistan Government regards transport as one of the most important sectors to be developed. The details of expenditure in the transportation sector from 2001/02 to 2004/05 are described in Table 6.1.4.

Table 6.1.4 Details of Development Expenditures (2001/02-2004/05)

(Unit: Rs. Million)

	Government	Self Financing / Corporation	Public-Private / Private Financing	Total
Railway	31,195	0	0	31,195
Road	98,868	0	10,890	109,758
Port & Shipping	14,800	3,112	4,950	22,862
Airways	0	10,709	7,964	18,673
Total	144,863	13,821	23,804	182,488

* Expenditures for the NHA and Provincial Road Programme are included.

Sources: Annex I in Section 29 of MTDF (2005/10)

(3) Medium Term Development Framework (MTDF)

The Planning Commission (hereinafter referred to as the Commission) is in charge of preparing the MTDF. The ministries of the national government are required to submit the documents, which is called Planning Commission Pro-forma (hereinafter referred to as "PC"), to the Commission for approval to start and proceed development projects. The PC can be classified into four types from "PC1" to "PC4". Each PC has the following role.

- PC1: Proposal of Development Projects
- PC2: Feasibility Study of Proposed Development Projects
- PC3: Progress Report to Monitor
- PC4: Evaluation of the Projects

The PC1 includes an outline of the project, project cost estimation, financial resources for the project, and so on. With the financial data of PC1, the Commission prepares the MTDF, which includes the budgetary allocation. Table 6.1.5 shows a summary of the fund resources described in the MTDF. As described in Table 6.1.5, the investment plans funded by the “Self Financing / Corporation” and the “Public-Private / Private Financing” equals to around 48% of the total investments, while the investment plans funded by the “Government” equals to around 52%. This indicates that the financial capacities of the implementing agencies and private participation are significantly important in order to realize the MTDF especially in the Port & Shipping Sector and Airways Sector.

Table 6.1.5 Investment Plans for Transport Sector (2005/06 – 2009/10)

(Unit: Rs. Million)

	Government	Self Financing / Corporation	Public-Private / Private Financing	Total
Railway	59,549	0	0	59,549
Road	216,850	0	30,796	247,646
Port & Shipping	12,732	32,237	71,737	116,706
Airways	0	127,288	6,600	133,888
Total	289,131	159,525	109,133	557,789
%	51.8%	28.6%	19.6%	100.0%

* Expenditures for the NHA and Provincial Road Programme are included.

Sources: Annex II in Section 29 of MTDF (2005/10)

On the other hand, the role of the Federal Government is still vital in the Roads and Railways Sector. The scheduled allocation of funding of the Federal Government is described in Table 6.1.6.

Table 6.1.6 Allocation of Funds of Government (2005/06 – 2009/10)

(Unit: Rs. Million)

FY	2005/06	2006/07	2007/08	2008/09	2009/10	Total
Road	32,350	36,300	41,400	49,800	57,000	216,850
Railways	9,849	11,000	12,000	13,200	13,500	59,549
Port & Shipping	3,744	2,122	1,299	1,889	3,678	12,732
Total	45,943	49,422	54,699	64,889	74,178	289,131

Sources: Annex-3(a) in Section 29 of MTDF 2005/10

These figures only refer to funds regarded as necessary to develop the transport sector. Therefore, the funds allocated in each year are not guaranteed to be provided in the annual budget. In addition, since 40% of the expenditure is for interest payments and the defence sector, there is a risk that expenditure on interest and defence will outweigh expenditure on the development of the transport sector.

In order to avoid this risk, it is essential to establish more sustainable financial schemes for roads and railways through strengthening the financial capacity of the implementing agencies, promoting private financing, and formulating schemes to maintain funds for the development outside of the National Budget.

(4) Foreign Direct Investments

Table 6.1.7 shows trends of the foreign investments. Pakistan has been introducing reforms to attract the inflow of foreign investment since the early 1980s. However, the total foreign investments exceeded Rs. one billion only in the fiscal years 1994/95 and 1995/96. After fiscal year 1995/96, foreign investment declined until the fiscal year 2000/01. Thereafter, the improvement in the country's economic environment and upward revision of the country's credit ratings may contribute to attracting large inflows of foreign investment. Consequently, the amount of foreign investments increased from fiscal year 2002/03.

Table 6.1.7 Trends of Foreign Investment

(Unit: USD Million)

FY	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98
Direct Investment	306.4	354.1	442.4	1,101.7	682.1	601.3
Portfolio Investment	136.8	288.6	1,089.9	205.0	267.7	221.3
Total	443.2	642.7	1,532.3	1,306.7	949.8	822.6
FY	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Direct Investment	376.0	469.9	322.4	484.7	798.0	949.6
Portfolio Investment	27.3	73.5	-140.4	-10.0	22.1	-27.7
Total	403.3	543.4	182.0	474.7	820.1	921.9

Sources: Pakistan Economic survey 2004/05

Table 6.1.8 shows trends of foreign direct investments by economic groups. The major sectors attracting Foreign Direct Investments (FDI) are the Oil & Gas, Telecommunications and Financial Sectors. According to the MTFD report, the transport sector recently opened new avenues for FDI, after which the area of intra-city transport was able to capture larger investment from Middle Eastern investors. Besides macroeconomic stability and wide-ranging structural reforms, Pakistan now has a robust financial system. However, the cost of doing business remains high due to bureaucratic hurdles, high utility prices, multiplicity of taxes and high tax rates. The legal and regulatory infrastructure also needs to be improved. These problems should be dealt with in a decisive manner.

Table 6.1.8 Trends of FDI in Main Economic Groups

(Unit: Million USD)

Economic Group	2001/02	2002/03	2003/04
Power	36.4	32.8	(14.2)
Chemical , Pharmaceutical & Fertilizer	17.8	92.4	28.5
Construction	12.8	17.6	32.0
Mining & Quarrying, Oil and Gas	274.8	188.2	203.5
Petro-Chemical & Refining	5.0	3.0	72.4
Food, Beverages & Tobacco	(5.1)	7.0	4.5
Textile	18.4	26.1	35.4
Transport, Storage & Communication	35.2	114.1	230.7
Machinery Other Than Electrical	0.1	0.4	0.7
Electronics	15.9	6.7	7.5
Electronic Machinery	10.5	10.5	8.7
Financial Business	3.5	207.5	242.1
Trade	34.2	39.1	35.6
Tourism / Paper & Pulp	0.8	1.5	1.8
Cement / Sugar	0.5	1.3	2.3
Others	23.9	49.4	57.9
Total	484.7	797.6	949.4

Sources: Pakistan Economic survey 2004/05

(5) Activities of Donor Agencies

The major donors in Pakistan are the Government of Japan (JICA & JBIC), the World Bank and ADB. According to the Pakistan Transport Sector Assistance Strategy Note (Report No. 24354-PAK) released by the World Bank, major donor activities in Pakistan’s transport sector of Pakistan from 1990 to 2002 were as follows.

- Government of Japan: medium term National Transport Plans, National Highways (Indus Highway), rural access roads, railways and a proposed light rails mass transit system for Lahore;
- World Bank: Transportation Policy formulation, the National Highways System (N-5 expansion and network maintenance), Railways, Karachi Port and Trade & Transport Facilitation; and
- ADB: National Highways (Sukkur Bypass), provincial highways, farm-to-market roads, Port Qasim and Trade & Export Promotion.

Recent activities of the World Bank and ADB are as follow.

a) World Bank

The World Bank is now supporting privatization of Pakistan Railways. In February 2005, the World Bank held discussions with the Ministry of Finance, Ministry of Railways and the Planning Commission regarding Restructuring of Pakistan Railways. Based on the Aide Memoire of the discussion, the World Bank was requested to assist the implementation of new financial systems for the railway entity. The assistance includes establishing the specifications and implementing a financial and management information system to facilitate business approaches to railway management and the introduction of private sector operations into the rail system. The cost of proposed package of the assistance would be approximately USD 750,000, based on the assumption that consultants would provide two-thirds of the input. Table 6.1.9 shows a list of recent financial assistance of World Bank since 2000.

Table 6.1.9 List of Financial Assistance of World Bank

Project ID	Project Name	Approval Date	Closing Date	Total Project Costs (Million USD)	Committed Amount (Million USD)
P082621	NWFP Community Infrastructure Project II (NWFP CIP2)	20-May-04	31-Dec-09	53.3	37.1
P010556	Highways Rehabilitation	23-Dec-03	30-Jun-09	261.4	200

Sources: World Bank web-site

b) ADB

Most of the recent projects assisted by ADB are mainly for the road sector.

Currently ADB is completing a technical assistance (TA-4508 (PAK): Facilitating PPP Initiatives in National Highway Development). This technical assistance (TA) aims at supporting the NHA to design appropriate mechanisms to accelerate national highway and motorway development through increasing private sector financing. The primary task of the TA is to review and analyze the existing policy, regulatory & institutional frameworks for private sector involvement in financing, constructing, operating and maintaining national highways and motorways. ADB is now proceeding with another TA to promote the private partner participation in the following steps.

In addition, ADB has proposed that funds be established to provide the financial resources for road maintenance of the local road network. According to ADB, while the road network controlled by the National Highway Authority has financial resources for the maintenance, the local road network does not have sufficient financial resources. In order to enhance the financial resources for the maintenance of the local road network, ADB has recommended

that local governments establish road maintenance funds for the local road network. However, in order to realize this recommendation, there still remain a lot of issues to be resolved and the recommendation is now under discussion among the stakeholders.

Table 6.1.10 shows a list of recent financial assistance of ADB since 2000.

Table 6.1.10 List of Financial Assistance of ADB

Project ID	Project Name	Approval Date	Closing Date	Total Project Costs (Million USD)	Committed Amount (Million USD)
LOAN: PAK32058-01	Road Sector Development Project	19-Dec-01	Dec-07	236	150
LOAN: PAK32058-03	Punjab Road Development Sector Project	31-Oct-02	N/A	150	150
LOAN: PAK34333-01	Balochistan Road Development Sector Project	20-Nov-03	N/A	267.3	185.7
LOAN: PAK34333-02	Community Development and Poverty Reduction Project	20-Nov-03	N/A	1.25	1.0
LOAN: PAK36052-01	NWFP Road Development Sector and Sub regional Connectivity	18-Nov-04	Jun-10	423.6	301.2
LOAN: PAK37559-01	Sub regional Connectivity and Trade Facilitation I	2005 (Expected)	N/A	290	290
Grant: PAK38617-01	Enhancing Road Improvement Benefits to Poor Communities in NWFP	28-Apr-05	28-Apr-08	1.0	1.0

Sources: ADB web-site

6.1.2 Possible Investment Budget for the Master Plan

(1) Case of Investment Level for Sustainable Development

According to the JBIC/ADB/World Bank Joint Study “Infrastructure in East Asia: The Way Forward”, the fund requirement for the transport sector is US\$23.5billion for Manila by 2015, US\$10.3billion for Jakarta by 2020 and US\$14.0billion for Ho Chi Minh by 2020 (excluding maintenance of existing infrastructure). This is equivalent to 2.6%, 0.7% and 2.5% of GRDP. The low requirement for Jakarta is mainly due to the existing accumulation of infrastructure (railways, expressways, etc). Though largely different by city, if 1-4% of GRDP is continuously invested in urban transport infrastructure (including maintenance of existing infrastructure), urban transport system can be sustained. Therefore, the “2.5% of GDP” can be regarded as one of the criteria of the investment level for the sustainable development of urban transport system.

If this criterion is applied to the national transport system and kept until 2025, the amount of total investment in the sector from 2005/06 to 2004/25 is estimated at around Rs. 6.4 trillion. Table 6.1.11 shows the estimated investment level in the GDP Middle Growth Case discussed in section 4.2.

Table 6.1.11 Case of “2.5% of GDP” Investment (2005/06-2024/25)

(Unit: Million Rs.)

	Federal Government	Self Financing / Corporation	Public-Private / Private Financing	Total
Railway	681,350	0	0	681,350
Road	2,481,164	0	352,363	2,833,527
Port & Shipping	145,678	368,851	820,804	1,335,332
Airways	0	1,456,410	75,516	1,531,926
Total	3,308,192	1,825,260	1,248,683	6,382,135

Source: Prepared by JICA Study Team with Data from the MTDF

(2) Case of MTDF

The MTDF 2005/10 envisages investments of Rs. 558 billion¹ in the transport sector, which equals 1.46% of the predicted GDP (Market Price) in the same period (total amount of GDP from 2005/06 to 2009/10). If this trend continues until 2025, the amount of total investment in the sector from 2005/06 to 2024/25 is estimated at around Rs. 3.7 trillion. Table 6.1.12 shows the estimated investment level in the GDP Middle Growth Case.

Table 6.1.12 Investment Level under MTDF (2005/06-2024/25)

(Unit: Million Rs.)

	Federal Government	Self Financing / Corporation	Public-Private / Private Financing	Total
Railway	398,146	0	0	398,146
Road	1,449,865	0	205,903	1,655,768
Port & Shipping	85,126	215,537	479,636	780,299
Airways	0	851,051	44,128	895,179
Total	1,933,138	1,066,588	729,666	3,729,392

Source: Prepared by JICA Study Team with Data from the MTDF

¹ The entire amount of allocation the MTDF 2005/10 envisages is RS. 573 billion, which includes the miscellaneous non-investment expenditures.

(3) Investment Level from 2000/01 to 2004/05

Based on the discussion so far, the assumed investment level for each case has a huge gap of Rs. 2.6 trillion (Rs. 6.4 trillion in the “2.5% of GDP” Investment Case and Rs. 3.7 trillion in the MTDF Case). On the other hand, the investment in the road & railway sector is greatly constrained by the financial resources of the Government. According to the investment level in the past, realizing the “2.5% of GDP” Investment Case seems to be extremely difficult.

From 2001/02 to 2004/05, while the total GDP (market price) in this period can be estimated at Rs. 21 trillion, the investment in the transport sector in the same period amounted to Rs. 182 billion, which equals only 0.86% of the estimated total GDP. If this trend continues until 2025, the amount of total investment in the sector from 2005/06 to 2024/25 is estimated at around Rs. 2.2 trillion. Table 6.1.13 shows the estimated investment level in the GDP Middle Growth Case.

Table 6.1.13 Investment Level under MTDF (2005/06-2024/25)

(Unit: Million Rs.)

	Federal Government	Self Financing / Corporation	Public-Private / Private Financing	Total
Railway	233,447	0	0	233,447
Road	850,105	0	120,728	970,833
Port & Shipping	49,913	126,377	281,226	457,516
Airways	0	499,000	25,874	524,874
Total	1,133,464	625,377	427,828	2,186,669

Source: Prepared by JICA Study Team with Data from the MTDF

Therefore, under the current situation, the “2.5% of GDP” Investment Case requires strong and deliberate decisions from the Government.

(4) Proposed Investment Level

Establishing a sustainable funding mechanism for infrastructure development enables the investment level to get closer to the “2.5% of GDP” Investment Case. However, a sudden jump from the current level to 2.5% can hardly be expected, so 1.46% of the MTDF is assumed for 2006 – 2010 and thereafter the rate should be gradually raised toward 2.5%. As a result, the average proportion of GDP in transport sector investment for the period of 2006 – 2025 would be 2.0%. The cumulative investment amount would be Rs 5,106 billion (US\$ 8.5 billion) which is regarded as an appropriate investment amount for the said period (Table 6.1.14).

Table 6.1.14 Target Investment Level at 2.0% of GDP

(Unit: Million Rs.)

	Federal Government	Self Financing / Corporation	Public-Private / Private Financing	Total
Railway	545,080	0	0	545,080
Road	1,984,931	0	28,1890	2,266,822
Port & Shipping	116,542	295,080	656,643	1,068,266
Airways	0	1,165,128	60,412	1,225,541
Total	2,646,554	1,460,208	998,946	5,105,708

Source: Prepared by JICA Study Team with Data from the MTDF

(5) Road Tax for Transport Sector

a) Road Tax Scheme for Road and Rail Sector

As mentioned earlier, according to the projected financial allocation in the MTFD 2005-10, in the Port & Shipping Sector and Airways Sector, around 95% of the total investment is expected to come from “Self Financing/Corporation” and the “Public-Private/Private Financing”. The financial status of the implementing agencies is sufficient to finance the development in the Port & Shipping Sector and Airways Sector.

On the other hand, in the road and railway sector, it is necessary to establish sustainable financial schemes by formulating system that provide funds for the development of infrastructure and strengthening the financial capacity of the implementing agencies. In order for that, the following actions are recommended;

- To segregate the road tax revenue from the general consolidated budget of the government by creating an independent account for road tax, which can then be used only for the development of the road and railway infrastructure, and
- To recover the full maintenance costs from the users of the infrastructures.

It is desirable to use road taxes for the development of the railway sector because development of the railway infrastructure can reduce the burden on the road infrastructure, reduce traffic congestion, and benefit the environment.

b) Estimation of Road Tax Revenue

The major component of road tax revenue is from Surcharges on POL, and there is a strong correlation between the growth in GDP and the demand for petrol and diesel fuel. Therefore, it can be assumed that future increase in GDP may cause an increase in POL consumption that may lead to increased road tax revenues. Table 6.1.15 shows the relationship of the above-mentioned components and the GDP (Market Price) from 1990/91 to 1999/2000.

Table 6.1.15 Relationship between GDP and Road Taxes

(Unit: Rs. Million)

	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
Surcharge on POL	9,670	9,138	8,007	12,956	9,576	12,361
Others	1,351	1,407	1,484	1,534	2,087	1,815
(A)Total	11,021	10,546	9,490	14,489	11,663	14,176
(B)GDP (Market Price)	1,016,724	1,205,204	1,333,041	1,561,104	1,865,922	2,120,173
(A)/(B) (Percentage)	1.08%	0.88%	0.71%	0.93%	0.63%	0.67%
	1996/97	1997/98	1998/99	1999/2000	Average	Percentage
Surcharge on POL	15,861	17,661	26,128	32,101	15,346	88.4%
Others	1,997	2,394	2,966	3,081	2,012	11.6%
(A)Total	17,858	20,055	29,093	35,182	17,357	100.0%
(B)GDP (Market Price)	2,428,312	2,677,656	2,938,379	3,147,167	2,029,368	-
(A)/(B) (Percentage)	0.74%	0.75%	0.99%	1.12%	0.86%	-

Sources: Prepared by JICA Study Team with Data from World Bank and Pakistan Economic survey 2001/02

As shown in Table 6.1.15, the percentages of road tax revenues of GDP were approximately at the same level from 1990/91 to 1999/2000. Therefore, it can be assumed that the road tax revenues are proportional to the GDP (market price). Based on this assumption, the future road tax revenues can be estimated based on the projected future GDP and the average percentages of the road taxes of the GDP from 1990/91 to 1999/2000 (0.86%). Table 6.1.16 shows the estimation of future road tax revenues.

Table 6.1.16 Road Tax Estimation

(Unit: Rs. Billion)

Fiscal Year	2005/04 -2009/10	2010/11 -2014/15	2015/16 -2019/20	2020/21 -2024/25	Total
GDP Middle Growth Case	323	448	608	805	2,183

Sources: Prepared by JICA Study Team

c) Proposed Investment Level for Infrastructure Development

On the other hand, the total amount of investment to be financed by the government for the development of the road & railway sectors is calculated at approximately Rs. 2.5 trillion in the “2.0% of GDP” Investment case and 1.8 trillion in the MTFD Case. Table 6.1.17 shows the amounts of the investment costs to be financed by the government in each case, which is accompanied by percentages of estimated road tax revenues.

Table 6.1.17 Comparison between Estimated Revenues and Financing from Budget

(Unit: Rs. Million)

	Funding Required from Budget			Percentages of Estimated Revenues
	Road	Railway	Total	
“2.5% of GDP” Investment Case	2,481,164	681,350	3,162,514	144.8%
“2.0% of GDP” Investment Case	1,983,998	544,824	2,528,822	115.8%
MTDF Case	1,449,865	398,146	1,848,011	84.6%

Sources: Prepared by JICA Study Team with Data from the MTFD

According to Table 6.1.17, the investment level in the case of “2.0% of GDP” exceeds the projected road tax revenues by 16% and requires extra resources. One of the ways to achieve the extra resources is to issue government bonds etc. However, interest payments are one of the reasons that are forcing the budgetary expenditure to be inflexible. Therefore, it may be difficult for the government to raise funds through extra borrowings to compensate the gap between the investment level in the case of “2.0% of GDP” and the road tax revenues.

On the other hand, the investment level in the MTFD case can be realized with 85% of the projected road tax revenues. However, the remaining 15% of the projected road tax revenues should not be used for other purposes because the road tax revenues collected from road users must be returned to the transport sector through infrastructure development. Otherwise the road users will bear an unnecessary financial burden, which may put the development of the transport sector at risk.

Accordingly, it can be concluded that projected road tax revenues shown in Table 6.1.16 (Rs. 2.2 trillion) can be regarded as the future investment level. Table 6.1.18 shows the allocation of this proposed investment level. The percentages of road sector and railway sector investment in Table 6.1.18 are based on the same proportions of investment allocation as the MTFD. Therefore, it is recommended to revise the percentages of the investment allocation based on the development policy of the transport sector.

Table 6.1.18 Resource Allocation under Proposed Investment Level

(Unit: Rs. Million)

	Road	Railway	Total
2004/05 - 2009/10	253,112	69,507	322,619
2010/11 - 2014/15	351,478	96,519	447,997
2015/16 - 2019/20	476,773	130,926	607,699
2020/21 - 2024/25	631,691	173,468	805,159
Total	1,713,055	470,421	2,183,475
Percentages	78.5%	21.5%	100.0%

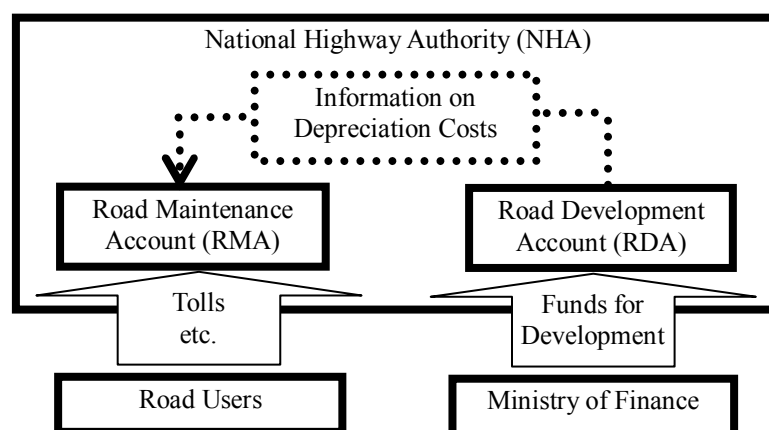
Sources: Prepared by JICA Study Team with Data from the MTFD

6.1.3 Financial Reform of Road and Rail Sectors

(1) Financial Reform of NHA

a) Road Maintenance Account (RMA)

By strengthening the function of the RMA, the funds for maintenance of existing roads can be separated from the National Budget, which is often influenced by the fluctuating political situation of Pakistan. This indicates that it is possible for maintenance funds for existing roads to be guaranteed from the revenues of the NHA, while the expansion of the road network shall be based on the transport policy of Pakistan with financing from the National Budget. In order to strengthen this scheme, it is recommended to establish the Road Development Account to efficiently control and monitor the funding for the development. Figure 6.1.1 shows a concept of the above-mentioned system.



Sources: Prepared by JICA study team

Figure 6.1.1 Introduction of Road Development Account for the NHA

This scheme is based on the idea that the government issues funds to the NHA for the development of the road network through the RDA, while the NHA maintains the road with the RMA which accumulates toll revenues from road users. By setting the RDA, the Government or the NHA can control the efficiency of the road development work with monitoring the cash flow of the RDA. On the other hand, by strengthening the function of the RMA, it will become easier to use the toll revenues from road users only for the maintenance of existing road network.

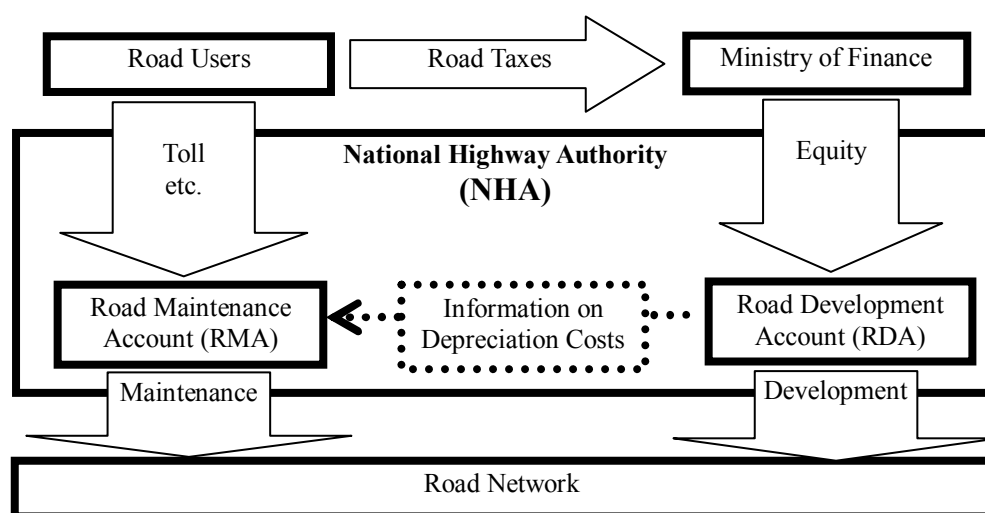
The arrow in Figure 6.1.1 from the RDA to the RMA does not mean cash flows, rather, it shows information on the depreciation costs to be recovered from toll revenues. The depreciation costs are expected to occur in the accounting process of the RDA because the fixed assets acquired with the fund of the RDA are recorded as a book balance of the RDA. On the other hand, since the depreciation costs are to be a part of the replacement costs of the existing facilities, the depreciation costs have to be recovered from toll revenues. However, since the depreciation costs are expected to occur in the book balance of the RDA, the amount of the depreciation costs to be recovered from toll revenues cannot be recognized in the RMA, which leads to a cash shortage for future replacement. In order to avoid this problem, it is necessary to include the amount of the depreciation costs in the calculation of the toll revenues required to balance the budgets of the RMA.

b) Accumulated Debt of NHA

At present, the government finances the NHA with loans for the development of the road network and expects the NHA to repay the loans with its toll revenues. In other words, the government intends to recover the development costs of the road network with the toll

revenues of the NHA. Under the current scheme of funding to the NHA, the financial burden caused by the development of the road network over commits the RMA, which may cause a cash shortage for the maintenance of the existing road network.

In addition, as mentioned earlier, the cash injections for the road network development are expected to be recovered by increasing road taxes and not from NHA's toll revenues. Therefore, the cash injection to the NHA for the network development should not be in the form of loans. In order to avoid those problems, it is recommended to convert the debts of the NHA to equity, which indicates the shares of the government, not the obligation of the NHA. Figure 6.1.2 shows a summary of the recommended scheme.



Sources: Prepared by JICA study team

Figure 6.1.2 Flow of Funds for the NHA after the Financial Reform

Even though the repayment of cash injections to the NHA is not required under this scheme, there are several ways for the government to recover the cash injection in the future.

The Ministry of Finance (MOF) is currently conducting the “Available Options for Sustainable Financing of NHA’s Programme” to determine feasible options for the sustainable financing for the NHA. In the draft report of the study conducted by the MOF, the revenue surplus shall be positive after 2012, and cumulative surplus shall be positive after 2020 as shown in Table 6.1.19.

Table 6.1.19 Estimation of Revenue Surplus

(Unit: Billion Rs.)

FY	2005	2006	2007	2008	2009	2010	2011	2012	2013
Revenue Surplus after Maintenance	0.5	9.0	-12.8	-12.9	-13.0	-13.0	-13.0	-0.5	0.4
Cumulative Surplus	0.5	9.5	-3.3	-16.2	-29.2	-42.2	-55.2	-55.7	-55.3

FY	2014	2015	2016	2017	2018	2019	2020	2021	2022
Revenue Surplus after Maintenance	1.4	2.6	4.0	5.6	7.5	9.6	12.1	15.0	18.3
Cumulative Surplus	-53.9	-51.3	-47.3	-41.7	-34.2	-24.6	-12.5	2.5	20.8

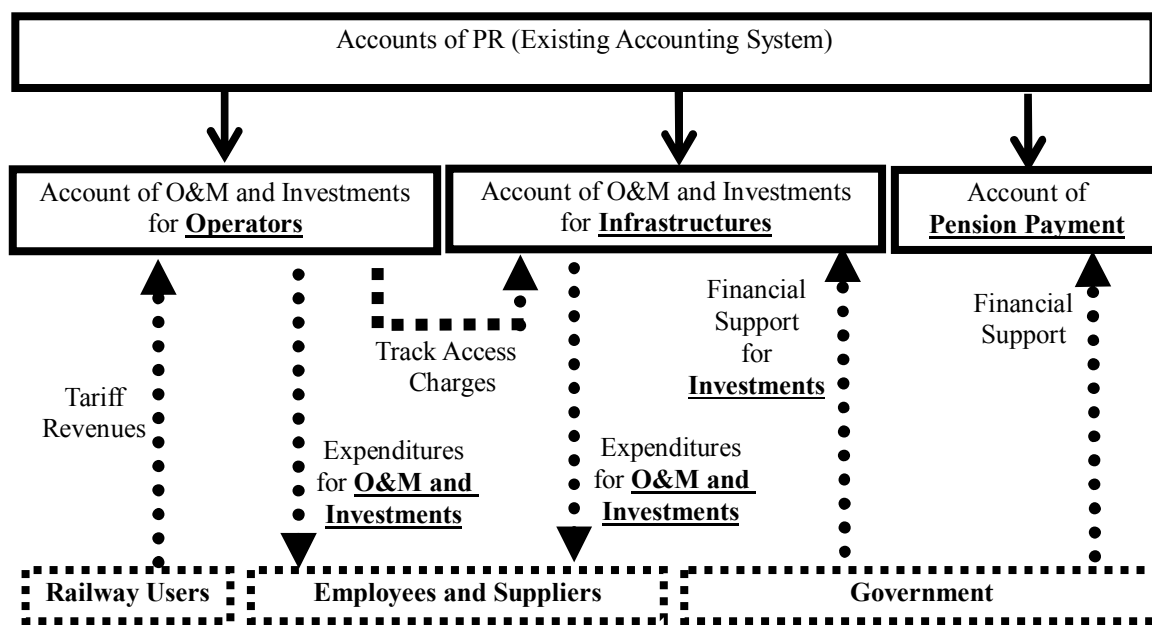
Sources: Prepared by JICA Study Team with Draft Report of “Available Options for Sustainable Financing of NHA’s Programme”

Since the commutative cash surpluses are expected to show positive figures from 2021 (see Table 6.1.19) the government and the NHA can choose whether to (1) pay dividends, (2) fund some development out of revenue, or (3) buy back its own equity (share buy-backs being the equivalent to repaying loan principal.) to recover the cash injections after the NHA's toll revenues grow sufficiently.

(2) Financial Reform of Pakistan Railways (PR)

a) Separation of Accounts by Business Units

In order to clarify the possible inefficiency and improve the operation & maintenance (O&M) and investments, a new accounting system should be introduced, which separates the accounts by business units. Figure 6.1.3 shows a concept of the new accounting system.



Sources: JICA study team

Figure 6.1.3 Concept for New Accounting System

The existing accounts of the PR can be separated into the Operator Account, the Infrastructure Account and the Pension Payment Account.

Under this proposed accounting system, tariff revenues from railway users are collected in the Operator Account, which treats the cash flow of the O&M and investment activities with regards to rolling stocks. The Track Access Charges shall be charged to the Operator Account from the Infrastructure Account, based on the usage of the infrastructures. The Track Access Charges accumulated in the Infrastructure Account are used for the O&M of the existing infrastructure. In the case of expansion of the railway network, the government allocates the necessary funds to the Infrastructure Account.

When the above-mentioned accounting system is introduced, it is recommended to set account managers who are responsible for the Profits & Losses of the Operator Account and the Infrastructure Account. In the above-mentioned accounting system, if the Operator Account and the Infrastructure Account create losses, the government is required to provide necessary financial support. In this case, it becomes evident that the compensations for each account are due to the inefficient management by the account managers. In order to obviously evaluate the performance of the account managers, it is recommended to replace the present financial systems with a modern commercial accounting practice which is compliant with International Accounting Standards (IAS).

With regards to the Pension Payment Account, even though the Pension Payment is not the costs related to the current business operation, the PR is obligated to pay for it. Therefore, theoretically, those costs need to be charged to the Operator Account and the Infrastructure Account. The increase in the Pension Payments may bear severely on the Operator Account and the Infrastructure Account, which may lead to the fund shortages for the O&M and investments. Therefore, in order to avoid the financial burdens of those Accounts, the

government should consider creating a separate account for the Pension Payments, which can then be compensated by the National Budget.

By separating the accounts shown above, it will become easier to analyse the causes of losses. In addition, the separation of the accounts can contribute to creating possible measures to improve the O&M and investments activities as follow.

- With regards to the O&M and investment activities of the Operators, it can be considered to take measures for privatization or private financing.
- With regards to the O&M of the infrastructures, it can be more efficient through partial private participations etc.
- The development of the railway networks shall be based on the clear transport policy with financing from the National Budget.
- The payment of pensions shall be funded by the government.

The concept of the above-mentioned accounting system is based on the scheme of the Road Sector that the government issues funds to the NHA for the development of the road network, while the NHA maintains the road with the toll revenues from road users. Therefore, after developing the recommended accounting system, it can be considered to privatize the Operator Account and create a new scheme that the government issues funds to the Investment Account for the development of the railway network, while the O&M of the railway network is funded by the Track Access Charges accumulated in the Investment Account.

In order to realize the above-mentioned measures, the accounting system should be improved as the first step.

b) Privatization of Operator Account

The O&M and investment activities of the Operators can be conducted or financed by private companies, as well as the road sector. In the road sector, while the users of the infrastructures are private, the public organizations (governments or governmental implementing agencies) concentrate on financing and controlling the infrastructure development. It is also possible in the railway sector that the public organizations concentrate on the development of railway infrastructures by segregating the Operator Account from the governmental account through privatization and permitting new operators to use the railway infrastructures with the Open Access Policy. Figure 6.1.4 shows the concept of the privatization of the Operator Account and private financing with the Open Access Policy.

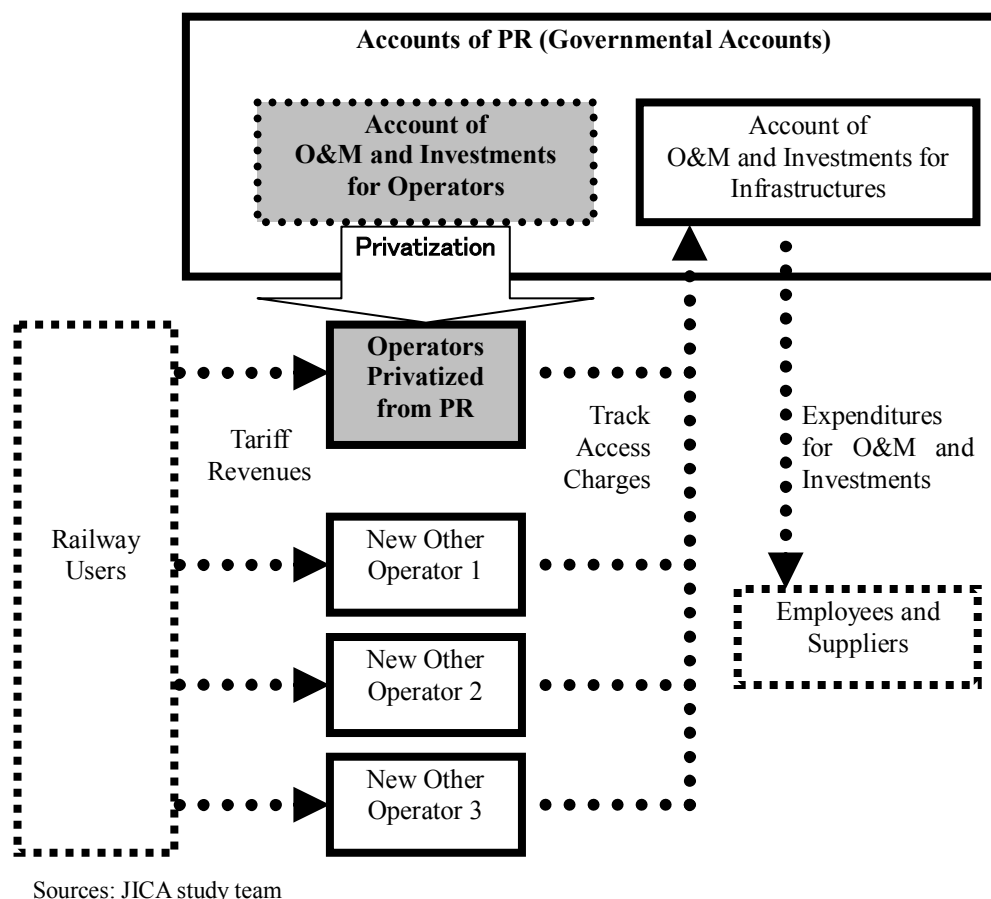


Figure 6.1.4 Business Structure of the Railway Sector after Privatization of Operators

As described in Figure 6.1.4, the Operator Account privatized from the governmental account shall compete against new operators under the proposed scheme and this competition is expected to promote the improvement of business efficiency. In addition, the segregation of the Operator Accounts is expected to reduce the governmental financial burden accompanied by the O&M and Investments activities in the Operator Accounts. Under this scheme, the governmental organizations are expected to maintain the railway infrastructures in good condition, introduce the Open Access Policy, and set an adequate level of the Track Access Charges.

6.1.4 Private Sector Involvement in Transport Sector

(1) Introduction

The Government of Pakistan (GOP) formulated a ten year investment plan for the transport sector (2005-2010). Of the total investment requirement around 48% is expected to be from the self financing/Corporation and the public-private/private sector. The importance of the financial self-reliance of implementing agencies and private sector participation in the development of the transport sector is highlighted in the Medium Term Development Framework 2005-20010(MDTF).

In Pakistan, there are several projects that have been implemented under a BOT or BOO basis and most of them are in the port and shipping subsectors. In the aviation subsector privatization is well advanced by PIA and it is only a matter of time before the CAA will be going through the institutional reform. In the railway subsector, sweeping reform is taking place and the opportunities for private sector involvement will be enhanced. Lastly, the private sector involvement in highways and motorways has not been successful and it remains questionable whether the BOT or PPP can finance the targeted projects.

(2) Port and Shipping Subsector

Private financing, including on a BOT or BOO basis, have so far been successfully promoted by Karachi Port Trust (KPT) and Qasim Port Authority (PQA) for the development, construction, and operation of terminals and berths. For example, Karachi International Container Terminal (KICT) has been in operation since 1998 and it was originally leased out by KPT to APL, Pakistani company, on a BOT basis for 20 years. Moreover, a Pakistan International Container Terminal (PICT) was the first private terminal to be owned and operated by a Pakistani company. However, it was leased to Trustees of the Port of Karachi for 21 years from June 2002.

At present, PQA is promoting privatization for the port development, and the following privately operated terminals have been established: Iron Ore and Coal Berth (IOCB): This berth was built by PQA and has been leased to Pakistan Steel: PQA is responsible for maintenance. IOCB commenced operation in 1980 and the equipment for unloading and transferring the ore and coal to Pakistan Steel has been installed and is maintained by Pakistan Steel. The berth has been leased to Pakistan Steel.

Qasim International Container Terminal (QICT): The agreement was signed in 1995 between PQA and a group of companies led by P&O Port-Australia, and QICT commenced operation in 1997. Berth Nos.5 to 7 of the marginal wharf including a 400m back up space has been leased to the owners of QICT on a BOO basis.

FOTCO Oil Terminal: The agreement was signed between PQA and FOTCO in 1992. The terminal was constructed on a BOO basis, and the charges for a minimum of 4 million tons of heavy furnace oil per year have been guaranteed by the GOP. Engro Vopak Terminal: The agreement was signed between PQA and Engoro Chemical, Pakistan and VOPAC Holland in 1998. The terminal was constructed on a BOO basis.

Only Marginal Wharf berths No. 1 to 4 are under direct management of PQA. Berth No.1 is being used for liquid bulk handling and berths Nos. 2 to 4 for dry bulk.

(3) Aviation Subsector

Pakistan International Airlines (PIA) was incorporated in Pakistan in 1956 under the Pakistan International Airline Corporation Act. 1956. In 2004, PIAC sold 5.74% of its share via an IPO. The second offering of 5% shares of PIA was offered. CAA was planning to build the new Islamabad International Airport on a BOT basis. It has acquired a large tract of land for the new airport construction. It is unknown, however, whether the CAA is pursuing the BOT idea or not.

Currently, CAA operates more than 40 airports within Pakistan. International trend is that most airports are increasingly operated by private sector or local authorities. Usually, the private sector will be involved in the larger, busier airports where income from commercial services to passengers is greater than income from aircraft landing fees. The private sector will not be involved in the airport where commercial opportunities do not exist, and as an alternative the government brings in the local authorities to run the operation.

CAA, a public corporation, has three roles: Regulator, Developer and Operator. This creates a conflict of interest for the government in the aviation sector. The CAA role needs to be limited to a regulator. In the UK, for example, the Civil Aviation Authority sets safety standards and undertakes air traffic control in UK air-space, but it does not operate any commercial airports. These airports are operated by British Airport, a private company and local authorities.

CAA's role as regulator, financier, developer, and operator creates a conflict of interest and the government need to start thinking about reforming the management of Pakistan's aviation sector. To make Pakistan's CAA function as the regulator that sets safety standards for aircraft, airports and staff and that controls the use of air-space like the UK Civil Aviation

Authority, opportunities for private sector involvement will be enhanced. The idea of the private sector participation in the new Islamabad International under a BOT or PPP arrangement presents a challenge for the privatization of the aviation industry in Pakistan.

(4) Railway Subsector

Private sector participation in the railway industry has not been successful so far. In order to increase private sector participation the government published an “Open Access Policy (OAP)” in 1996 for effective utilization of railway infrastructure through “unbundling” the railway services. The goal of the government was to rebuild the railway industry’s commercial capabilities and reputation for quality services. GOP solicited private sector bids to transport fuel oil by rail on behalf of Pakistan State Oil (PSC) to upcountry private power stations. There was no positive reaction from the targeted private sector. In April 1997, the government went a step further to privatize Pakistan Railways. In the GOP’s plan, PR was to be restructured into three core businesses— freight, passenger and infrastructure, plus residual entity— and sold to the public. The plan did not succeed and instead impacted negatively on the operation of PR and infrastructure development and conservation.

A sweeping institutional reform for PR has been under consideration and the plan calls for a new public corporation with more autonomy and powers in its governance. The new enterprise will be able to provide the opportunities for private sector involvement in operations of freight transport and railway related industries.

(5) Road Subsector

GOP has, over the past decade, attempted to attract private sector investments into highways and motorways but it has not been successful. There are reasons attributing to the unsuccessful attempts, including (i) poorly developed domestic capital market and lack of access to long term debt, domestic and international; (ii) a fragile macro-economic situation, (iii) absence of a legislative framework. (iv) lack of experience in BOT and PPP projects in both public and private sectors; (iv) inherent risks of investment in the public works, particularly, in highways and motorways, and (v) absence of criteria for project selection.

In the Five Year Plan of NHA, Rs.91 billion is envisaged to be financed by BOT/PPP for its highways and motorway projects. In the past, NHA attempted to attract private capital for the construction of M-2: Islamabad-Lahore Motorway (367 km) on a BOT basis. A concession agreement was executed with Daewoo as the sponsor/contractor but the motorway was completed by traditional public financing through a direct loan of US\$667 million from Daewoo by the GOP’s guarantee. Five years after completion of the M-2, NHA still owes Daewoo US\$793 million. Construction of M-3: Pindi Bhattian – Faisalabad Motorway (53 km) was also initiated on a BOT formula but the BOT contract was terminated for technical reasons. The motorway was completed by the original contractor, again through a traditional public finance. Currently, NHA are negotiating the construction of M-4: Faisalabad–Multan Motorway (243 km) on a PPP basis.

To accelerate the national highways and motorways development by private sector involvement, the NHA has enlisted the following projects in its Five Year Plan that will be financed on a BOT/PPP basis. The total value of these projects is estimated at US\$820 million, contributing 25% of the Five Year Plan

- (i) Karachi-Hyderabad Motorway (M-9)
- (ii) Faisalabad-Khanewal Motorway (M-4)
- (iii) Karachi-Kakar Motorway (M-7)
- (iv) Peshawar Northern By-Pass
- (v) Rawalpind By-Pass & Tarnol Interchange
- (vi) Lakpass Tunnel
- (vii) Shahdara Flyover
- (viii) Karachi Northern By-Pass

(6) Problems in the Selection of the BOT/PPP Projects

NHA needs to recognize that by the application of a BOT/PPP concept to the highways, unless they are willing to participate in equity, it will change the NHA's role as the investor/borrower, since this role has to be delegated to private sector investors. By delegation of all the risks, including financing, the construction, operation and maintenance of highways and motorways will be allocated to private sector investors. This will considerably increase the project cost (sometimes up to 30%-40%) due to, among other things: (i) private sector borrowing from commercial banks and capital markets always costs more than sovereign borrowing, (ii) a considerable amount of operational and management expenses, i.e. quality control, surveying, permission and licensing fees, etc. (these costs are hidden among normal costs related to financing every day's activities of NHA administration) and (iii) the main contractor/investor, accepting lump sum, turnkey, fixed price construction contract conditions, is tempting to accelerate the reimbursement of their equity or part of it by construction works.

A key element that should always be evaluated carefully, in this respect, is the estimated time period by which the projects would probably have to be delayed until such an opportunity arose. On that basis, for the time period under consideration the "socio-economic" benefits at stake, i.e. the cost of the project not being implemented at an optimal date, could be calculated. The period starts in the year when traditionally used parameters characterizing project efficiency such as net present value (NPV) or internal rate of return (IRR) exceed previously approved and generally acknowledged threshold values which characterizes "matured" projects. The amount of "socio-economic benefit in jeopardy" should be compared to the cost increase caused by private sector involvement in financing the project. If, and when, the ratio of the benefits in jeopardy and the cost increase is above 1.0 or exceeds a previously identified and approved limit say 1.5, then, the selection of the project is justified.

The motorway concessions are generally evaluated using quite sophisticated cost-benefit or multicriterial analysis, providing a set of efficiency indicators (NPV, IRR, Benefit-cost Ratio, etc.) measured against approved earlier threshold values of these indicators attributed to project classified as matured, economically viable or socio-economically justified. The methodology of economic and financial evaluation aiming at preparing transport infrastructure investment decisions are slightly different in case of infrastructure projects intended to be financed entirely publicly or through PPP based on limited recourse financing. In the former case capital recovery or depreciation are not counted generally among maintenance and operation expenditures, since NHA is not obliged to follow corporate accounting practice.

In practice, this comparative analysis can not be performed due to the lack of professional expertise and experience in the both public authorities and private sector as well. The economic benefits analyses, furthermore, need to cover the commercial and financial analysis as if they are corporate projects with a cash flow and other essential criteria. Carrying out economic benefit analysis combined with political and strategic benefits may not be enough to be criteria of investor's terms and conditions to participate in road projects equitable agreement, need to be counted in the financial and commercial analysis.

For the private sector to show interest, a venture must be profitable. For roads, this implies a good income from tolls and perhaps government subsidies as well in the form of "shadow traffic" or a government guarantee on debt service like the case of the M-2. Toll levels are commonly constrained by the existence of alternative routes that are free. The Kohat tunnel illustrates this point. Many trucks, even laden trucks, struggle over the hill rather than pay the toll to use the tunnel. NHA is already tolling all the national highways and motorways. PPP is not a solution to funding roads. Unless the criteria for the selection of the BOT/PPP projects are established and applied diligently, the costs increase by financing on a BOT/PPP basis will impact negatively on NHA budget.

6.2 Transparent Prioritization

6.2.1 Administrative Framework

(1) Introduction

Transport infrastructure plays a key role in the nation's economic and social development and the economic development of Pakistan heavily depends on the improvement and modernization of key transport systems. High economic loss from congestions and poor quality roads and maintenance and inability to fill the gap between supply and demand for transport services and supporting infrastructure have been of grave concern to the Government of Pakistan (GOP), and these problems need to be addressed by improving governance in the transport sector.

The development of an efficient transport system has been hindered due to multiple reasons: One of them is the resource constraints and others include: (i) multiple objectives for medium-term and long-term investments, resulting in misplaced priorities, (ii) poorly justified investments, (iii) lack of implementation capacity and (iv) insufficient private sector participation. Over the past five years the GOP has taken a number of actions to address these key constraints such as the finalization of a new Ten-Year Plan (2005-2010) or MTFD, the formulation of an integrated transport policy, the revitalization of railways and the improvement of new trade and transport facilitation.

To strengthen the implementation capacity of federal agencies, provincial governments need to be supported by an integrated national transport policy, streamlined decision-making process and procedures for investment programs and co-ordination mechanisms at various levels. Research and development and institutional and regulatory reforms are also required. Last but not least, the creation of an environment for private sector investment, particularly direct foreign investment (DFI), and institutional and regulatory reforms required for creating market force and attracting private sector participation in railways, national, provincial and urban road networks.

(2) Administration of Transport Sector

At present, responsibility for transport is divided among four federal ministries, four provincial governments and seven autonomous authorities:

- Ministry of Communications (MOC) - responsible for the national road sub sector,
- Ministry of Railways (MOR) - responsible for railways
- Ministry of Defence (MOD) - responsible for airports and civil aviation, and
- Ministry of Port and Shipping (MOPS) responsible for ports and shipping.

Post and Telecommunications, which was under MOC has been merged into the Ministry of Information and Technology (MOIT). Until 2001 MOC and MOR were separate ministries and they were merged into a single ministry for a brief period of time and they were separated again in 2002. Under these federal ministries there are number of autonomous and semi-autonomous organizations, i.e. National Highway Authority (NHA) under MOC, Karachi Port Trust (KPT), Qasim Port Authority (QPA) and Pakistan National Shipping Corporation (PNSC) under MOPS, and Civil Aviation Authority (CAA) and Pakistan International Airlines (PIA) under MOD, all are accountable to their respective federal ministries.

At the Provincial level, Communications and Works departments of 4-provinces (Punjab, Sindh, NWFP, Balochistan) are responsible for the provincial road network. Following the implementation of the Devolution Plan, a majority of the intra-district provincial road networks have been devolved to the districts.

(3) Structural Problems of Transport Administration

In the absence of a single ministry to deal with all modes of transport the decision concerning the sector development programmes/projects and their prioritization needs to be taken by the central government. Currently, the formulation of development programmes and projects in the transport sector is highly compartmentalized and not based on intra-sectoral priorities. There are multiple federal ministries, provincial governments and autonomous authorities that are responsible for the administration of the transport sector (hereinafter referred collectively to as the “Implementation Agencies”). There is no forum of debates amongst these government administrations to ensure an integrated and coordinate approach to the formulation of development programmes and projects. Instead, these sponsoring ministries and provincial governments have been competing for PSDP allocation based on an “urgent” basis to obtain budgetary support and external assistance, often ignoring the implications on the other sector developments. The result of the lack of inter- and intra-sectoral coordination, as the MTDF points out, is huge economic losses. Beside economic loss, the uncoordinated approach to the selection of the projects and mismanagement of investments hinders social development and causes ecological degradation.

Problems could be caused by, to a certain extent, the deficiencies of the implementation capacities but, to a greater extent, to the misallocation of PSDP that have resulted from the lack of inter and intra-sectoral prioritization, lack of monitoring and auditing of the implementation of programmes. In spite of the fact that the transport sector has accounted for 20-30% of PSDP in recent years, Pakistan’s public transport systems continue to suffer from poorly targeted investments, neglect of essential maintenance, traditional labour and uncommercial practices and obsolete general purpose distribution systems that have led to severe capacity bottlenecks, high transport costs, poor safety standards and low levels of services. As MTDF points out the industrial and commercial growth and export competitiveness are handicapped by an inadequate and outmoded infrastructure.

6.2.2 Decision-Making Regarding PSDP

Public Service Development Programmes (PSDP) is an annual budgeted programme that is approved by the Central Government. National transport projects can be carried out under the endorsement of PSDP.

(1) Programme Approving Bodies

Sponsoring Federal Ministries submit their programme proposals to Planning and Development Division and passed on to the Approval Bodies for examination and approval. The approved programmes become the PSDP.

a) The National Economic Council (NEC)

NEC is headed by the Prime Minister (PM). Its members include Minister of Commerce & Industry, Minister of Petroleum & Natural Resources, Minister of Water and Power, Minister of Education, Minister of Environment, Advisor to PM for Finance & Economic Affairs, Special Assistant to PM Social Sector, Chairman Board of Investment, Chairman Privatization Commission, Chairman Planning Commission, Governor of State Bank and Cabinet Secretary, Special invitations to secretaries and other members.

b) Annual Plan Coordination Committee (APCC)

APCC is headed by Deputy Chairman Planning Commission and its members include Finance Division, Planning Division, Economic Assistance Division (EAD), Federal Ministries and Provincial Governments.

c) Priority Committee

Priority Committee is headed by Additional Secretary Budget Financial Division (Chairman) and its members include Finance Division, EAD and Implementation Agencies.

(2) Approval Process of PSDP

PSDP covers all social and economic sectors, i.e. infrastructure, social development and finance. Infrastructure includes water, power, energy and transport sectors. Transport sector is comprised of roads, railways, ports and shipping and aviation sub-sectors. Proposals for investment programs are prepared independently by the Implementation Agencies and reviewed and approved by a centralized review and approval mechanism: Priority Committee, Annual Plan Coordination Committee (APCC) and the National Economic Council (NEC). Projects of the Implementation Agencies must be included in the PSDP and they are scrutinized by Central Development Working Party (CDWP) and Executive Committee of National Economic Council (ECNEC) before they are funded.

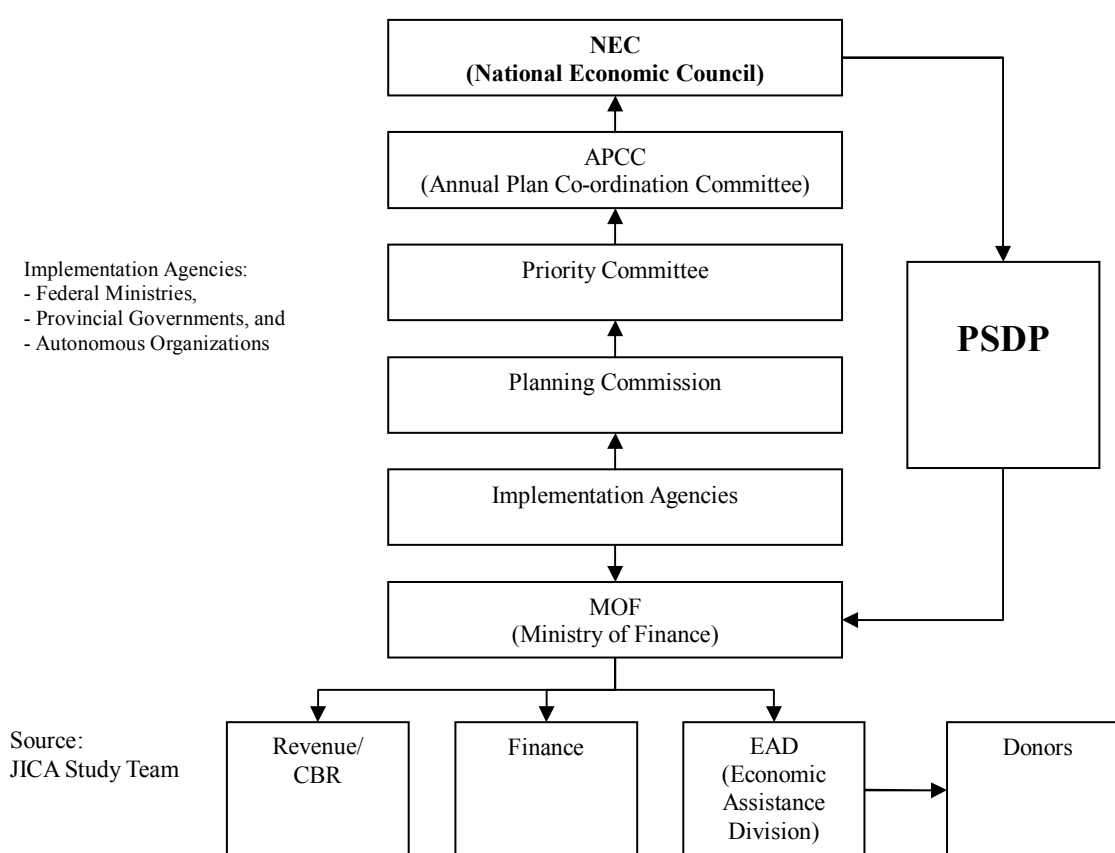


Figure 6.2.1 Approval Process Regarding PSDP

6.2.3 Decision Making Regarding Projects

(1) Project Approving Bodies

a) Executive Committee of National Economic Council (ECNEC)

ECNEC is headed by the Federal Minister of Finance and its members include Federal Ministers of economic ministries, Provincial Governors/Chief Ministers or their nominees and Provincial Ministers concerned. The functions of the ECNEC are:

- To sanction development schemes in the public and private sectors
- To allow moderate changes to the plan and the plan allocations

- To supervise the implementation of economic policies laid down by the NEC or the Government

b) Economic Coordination Committee (ECC) of the Cabinet

ECC is headed by the Federal Minister for Finance and Federal Ministers of economic ministries as its members. It attends to all urgent day to day economic matters and coordinates the economic policies initiated by the various Divisions of the Government. It keeps vigilance on the monetary and credit situation and makes proposals for the regulation of credit in order to maximise production and exports and to prevent inflation. It gives approval to the projects in private sector and public sector energy projects.

c) Central Development Working Party (CDWP)

The development projects exceeding a certain financial limit prepared by Federal Ministries, Provincial Governments, Autonomous Organizations, etc. are scrutinized for the purpose of approval by the CDWP which is headed by the Deputy Chairman, Planning Commission and which includes as its members the Secretaries of the federal ministries concerned with the development and the heads of Planning Departments of the Provincial Governments. Federal Ministries which are permanent members of the CDWP should not be represented below the rank of Additional Secretary. Similarly, the concerned Federal implementation agencies should be represented at the level of Head of the Department or Additional Secretary. The schemes approved by CDWP costing above Rs.500 million are submitted to ECNEC for final approval.

d) Departmental Development Working Party (DDWP)

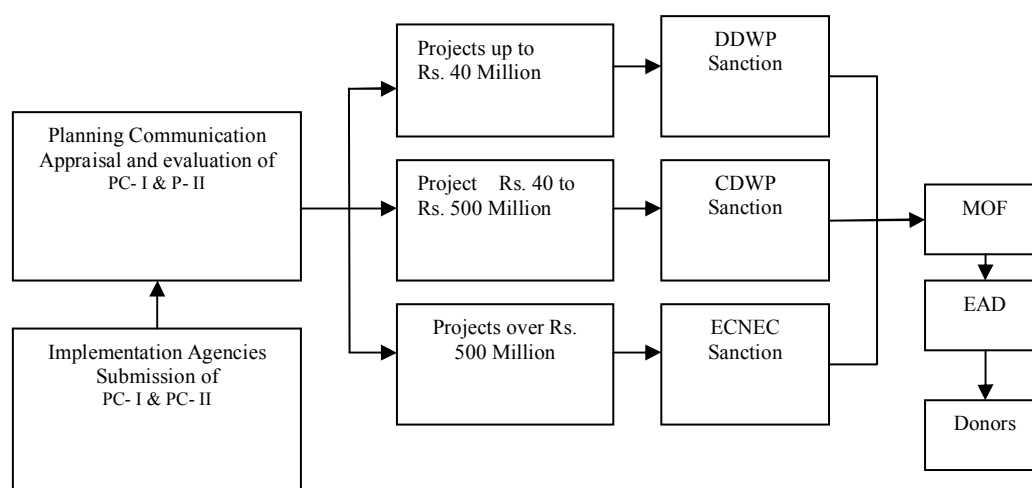
It a body for approving development project/programmes for federal Ministries/ Division/ Department according to their approved financial limit which is set at Rs. 40 million. It is headed by the respective Secretary/Head of Department and includes representatives of finance division and concerned Technical Section in the Planning and Development Division

e) Provincial Development Working Party (PDWP)

Each province has a PDWP which is headed by the Chairman, Development Board/Additional Chief Secretary (Development) and includes Secretaries of the Provincial Department Concerned with development, as its members. PDWP scrutinise various projects for inclusion in the Annual and Five Year Plan. It is competent to approve projects up to Rs.5 billion. Projects exceeding this limit are submitted to the CDWP and ECNEC for approval. All projects requiring foreign funding or federal government financing or federal government guarantees are submitted to CDWP and ECNEC for approval.

(2) Approval Process and Procedures for Projects

Federal projects are approved in accordance with the process illustrated below:



ECNEC = Executive Committee of National Economic Council
 DDWP=Departmental Development Working Party
 CDWP=Central Development Working Party
 MOF= Ministry of Finance
 PDD= Planning and Development Division
 EAD = Economic Assistance Division

Source: JICA Study Team

Figure 6.2.2 Approval Process and Procedures of PTPS Projects

a) Federal Projects

Submission of Projects to Approving Bodies

Projects sponsored by the Federal Ministries/Autonomous organizations apply for funding of projects that are included in the PSDP by submitting to the Planning and Development division an original of PC-I/PC/II. The PC-I is a proposal for development Projects while PC-II is Feasibility Study of Proposed Development Projects.

A copy of the PC-I/PC-II is sent to the respective Financial Advisor of Financial Division for comments before submitting the same to the members of the DDWP/CDWP. A project proposal by the Federal Ministries/Autonomous organizations must be supported by a statement that the project has been seen and approved by the Secretary of the Ministry concerned.

Processing of Projects

As soon as a copy of PC-I/PC-II is received by a member of the Planning Commission, DDWP and CDWP, its examination must be conducted expeditiously so that the same is approved/rejected in accordance with the time schedule. So far as the Planning and Development Division is concerned the schedule is as under:

- Registration and circulation of projects to all the Sections of the Planning Commission and other members of CDWP = 1 day
- Finalization of comments for consideration by CDWP=4-6 weeks

The Planning and Development Division has to ensure that PC-I/PC-II has been prepared correctly and according to the prescribed procedures. In case, the PC-I is found to be deficient it will be returned to the sponsors with the approval of Secretary (Planning)/Deputy Chairman, Planning Commission under intimation to all members of the CDPW.

Procedure for Meetings of Approving Bodies

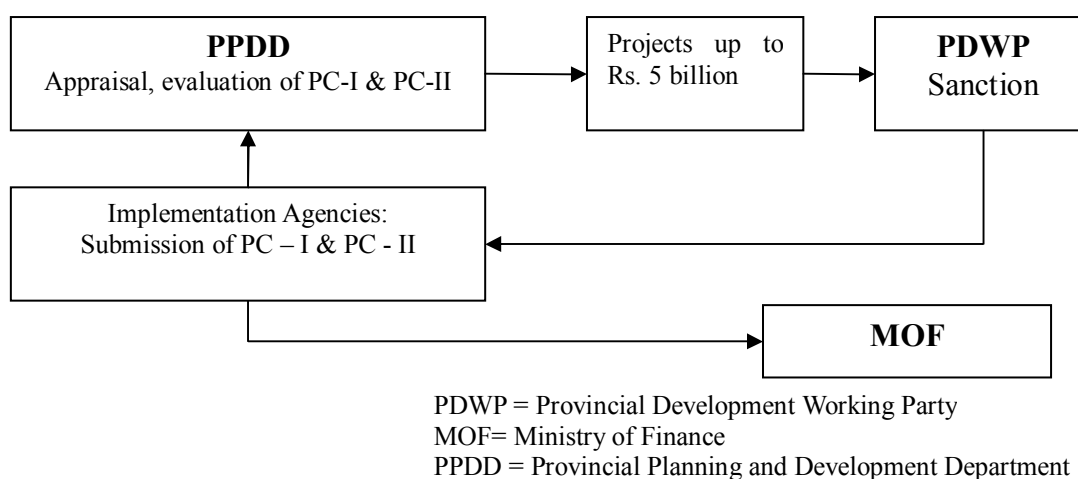
The CDWP and ECNEC meet regularly every month and every six weeks, respectively. The procedure for approving projects should be streamlined so that a project is approved within 2 months. The Planning and Development Division provide the secretariat for CDWP.

The minutes of the CDWP meeting are recorded by the Planning and Development Division and circulated to those represented at the meeting and other agencies concerned. The agencies represented on the CDWP are, however, expected to take action required by them without waiting for the minutes. The minutes of CDWP are treated as confidential. The minutes/record of discussion of ECNEC are also treated as secret. However, discussions of ECNEC in respect of PSDP projects would be unclassified unless specially classified by the Planning and Development Division.

The approved project becomes eligible for funding from MOF. Funds are released quarterly to the accounts of Implementation Agencies. For a project requiring foreign funding it will be channelled through Economic Assistant Division (EAD) to Donors.

b) Provincial Projects

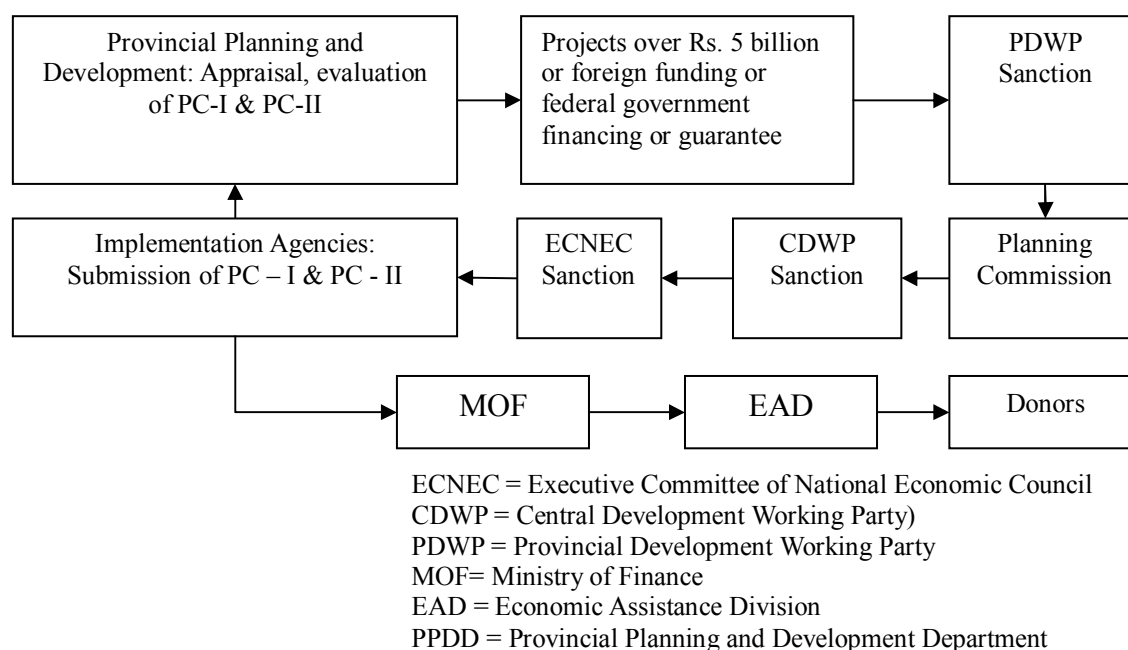
Provincial Development Working Party (PDWP) has the power to approve a project up to Rs.5 billion. Provincial Ministries submit PC-I/PC-II to Provincial Planning and Development Department for approval by the PDWP. The approval of a project costing over Rs.5 billion or requiring foreign funding or federal government financing or guarantees requires the approvals of CDWP and ECNEC. In this case the PDWP makes recommendation to CDWP through Planning Commission. CDWP evaluates the project and makes recommendation to ECNEC for approval. After ECNEC's approval the project will be sent back to PPDD for submission to MOF and/or EAD. The diagrams below show the process and procedures regarding provincial projects up to Rs. 5 billion.



Source: JICA Study Team

Figure 6.2.3 Approval Process Regarding Provincial Projects up to Rs. 5 billion

Provisional projects valued at over Rs. 5 billion or that require foreign funding or federal government financing or federal government guarantee require the approval of CDWP and ECNEC. Projects costing below Rs.5 billion requiring foreign funding or federal government guarantee are processed through the above bodies and passed on to the Planning and Development Division where they are examined by the various Technical Sections concerned and a Working paper is prepared and placed before the CDWP. ECNEC then approves them by the recommendation of CDWP. The basic principle of review of projects, both at the federal and provincial levels, is that projects are examined jointly and simultaneously rather than in succession. (Refer to “Procedure for Preparation and Approval of development Schemes” approved by NEC in July, 1959). In accordance with the Procedure, copies of PC-I/PC-II have to be sent by the sponsoring provincial governments to the Planning and Development Division and other members of the CDWP for simultaneous examination.



Source: JICA Study Team

Figure 6.2.4 Approval Process Regarding Provincial Projects above Rs.5 billion

6.2.4 Issues for Decision-Making on Transport Sector

(1) Characteristics of Decision Making for Projects and Programmes

A close examination of the process and procedure for the decision making concerning the programs and projects reveal that there are no institutional checks and balances that determine the intra-sectoral priorities with a ‘bottom-up’ approach to the budgeting system. Priority Committee, APCC and NEC review the development programmes from the angle of the budgetary, regional, political and strategic compatibilities and conformities while CDWP and ECNEC function as institutional checks and balances and determine inter-sectoral priorities. Determination of intra-sectoral priorities are, therefore, left to be unchecked or passed over to the Cabinet or Prime minister. In the absence of an approved national transport policy the prioritization of investments in transport sector largely depends on an ad hoc and highly political decision.

(2) Needs for a National Transport Policy and a Intra-Sector Co-ordination

The central government decision-making process for investments in the transport sector may have developed deficiencies like poorly targeted investments and maintenance neglect, etc. These deficiencies are also caused by the absence of approved national transport policy and the intra-sectoral coordination mechanisms. The sector development and investment plan needs to be prepared based on long-term objectives and within the framework of an approved national transport policy. Furthermore, the formulation of the investment programmes need to be initiated by the sector’s Implementation Agencies and presented to a high level forum for debate so as to define the needs and requirements and determine the priority. In the absence of a single ministry the decision on the investments may be politicized and the competition among the Implementation Agencies for PSDP allocation intensifies as the resource constraints increase.

Whether a national transport policy and an intra-coordination mechanism are the issues to be addressed immediately or not there is an advantage to having an approved national transport policy and coordination mechanism. Under the new arrangements the central government will be able to focus more on the programmes rather than on individual projects. The

attention of the government on planning, coordination, financing and regulating on programme basis is urgent in the case of the transport sector, and it must cover major areas, particularly neglected ones such as highway safety, urban transport systems, R&D, human resource development, institution building and organizational reform.

6.2.5 Institutional Reform

(1) Introduction

The transport sector is currently administered by four federal ministries, four provincial government and six autonomous authorities. The absence of a single ministry “Ministry of Transportation” that encompasses all subsectors has created negative effects on the improvement and modernization of key transport systems in Pakistan. It is a well known fact that the railways and roads have been competing since 1976 while the Karachi and Qasim Ports have coordination and cooperation problems. Under these circumstances it is necessary to establish a forum where these competing federal agencies can meet regularly and debate the issues and problems relating to transport.

One of the negative effects of the misallocation of PSDP and maintenance neglect is the current situation where the maintenance backlog has become an alarming proportion and the condition of 47% of the national highway network which caters to more than 70% of the total inland traffic, is classified as “poor”. Improvement on the NHA management of maintenance now needs to concentrate on the research and development in construction materials and design standards applicable to Pakistan.

(2) Negative Effect of Transport System on National Economy

The formulation of development programmes and projects in transport sector is highly compartmentalized. There is no institutional mechanism that facilitates the coordination amongst the federal ministries, autonomous authorities and provincial governments responsible for the transport sector to ensure an integrated and coordinated approach to the formulation of sector development programmes. The MTDF makes a case by stating that “the performance of the transport system has been poor, with high economic losses from congestion and poor quality roads and a mismatch between supply and demand for transport and supporting infrastructure. There are logistics constraints, which impede competitiveness of the country’s trade and industrial development. It is estimated that the inadequate and inefficient transport system is imposing a cost to the economy in excess of Rs.220 billion annually or 8.5% of the GDP, constraining economic growth, reducing export competitiveness, and hindering social development” (Prefer to MTDF p.442).

The sorry state of the transport system described in MTDF should not be taken lightly. Beside the enormous economic loss the negative effects of unplanned system and mismanagement of investments hinder social development and ecological degradation. Problems could be caused by, to a certain extent, the deficiencies of implementation capacity but, to a greater extent, to the monitoring and auditing the implementation of programmes. The absence of an integrated transport policy and lack of inter-and intra-sectoral coordination are also root causes of the negative effects of investment. In any account, the Government, considering the financial constrains, needs to take radical steps to minimize the losses and liabilities caused by the transport administration such as those pointed out by MTDF. The transport system should contribute to rather than hinder economic growth and the problems will persist unless steps are taken to remove the root causes. Some of the measures which are imperative would be the institutionalization of intra-sectoral coordination and cooperation throughout the PSDP and PSDP project approval process.

(3) Needs for a National Transport Policy

Lack of the co-ordination efforts by the federal ministries, provincial governments and autonomous authorities in charge of transport systems could be one of the causes for the

inability of the government in the optimum utilization of the financial capacity of the country. In this regard, MTDF stated that “The development of an efficient transport sector has also been hindered due to misplaced priorities and the absence of an approved transport policy” (Refer to MTDF p.442.).

The role of an approved national transport policy can play in the PSDP and PSDP projects should not be underestimated. The design of the Policy needs to focus, first, on the few major areas to achieve maximum return on the investments already made. The policy need to be based on the scientific principles and techno-economic reality. A well conceived policy will provide a framework for the planning, financing and implementing sector development and a base on which the distribution of tasks amongst measures the central government, federal ministries, provincial governments and autonomous authorities for the mitigation of the negative effects caused by the past mismanagement of investments.

Furthermore, the problems of the current state of the transport system are, to a large extent, due to the PSDP and PSDP projects approval process and the implementation capacities. Decision-makers, in this regard, need to factor in the capacities of the implementation agency in allocating funds and this will require a strengthening of monitoring and evaluation of project implementation. Should a national transport plan and intra-coordination mechanisms be timely and properly constituted, the central government will be able to focus on the programme rather than individual projects with more attention on the critical areas such as traffic safety, urban transport systems, human resource development, R&D, institution building and regulatory reforms.

(4) Need to establish a Transport Coordination Mechanisms

The centralized mechanisms for review and approval of PSDP are mainly concerned with checks and balance of inter-sectoral and macro-economic contexts. Once the development programs for each subsector are allocated, other centralised project review and approval mechanisms (CDWP and ECNEC) provide institutional checks and balances and determine inter-sectoral priorities. The coordination among the ministries must be done before the PSDP and debated on the matters relating to the integration of all modes of transportation on which the sectoral prioritization of investment are based.

Issues and problems of intra-sectoral co-ordination was addressed in the past studies. For example, a national transport plan study undertaken by JICA in 1995 expressed¹ concern over the lack of intra-sectoral coordination and cooperation and recommended restructuring of a number of ministries into a single Ministry to handle all modes of transport. The rationale behind the proposal was that such a restructuring would provide, at the ministerial level, a forum for debate of transport related issues and the pursuit of an integrated transport policy and create a platform for liaison with other ministries and with the Planning Commission on the transport needs and implications of other sectors of the economy.

A similar proposal was made in 1999 by the World Bank and, in its “Transport Sector Development Initiative² (TSDI)” to create of a ‘National Transport Policy Board’ and a unified ‘Ministry of Transport’ that encompasses all subsectors in order to fill the gap.

The ADB, in a study³ conducted by a short-term consultant in 2003, put forward a set of recommendations, including the establishment of a high-level ‘Transport Council’ to a working-level ‘Transport Coordination Committee’. Subsequently, ABD organized a Technical Assistance in 2004 to assist the Government in the formulation of a comprehensive transport policy as a follow up to the findings of the TSDI. No progress has been made to date.

¹ Study on National Transport Plan in the Islamic Republic of Pakistan, JICA 1995, Final Report/Volume II, p.11-61

² Transportation Sector Development Initiative, World Bank 1999

³ “National Transport Policy-Assessment of Critical Transport Sector Needs” ADB 2003

To address the issues and problems of a national transport policy and coordination the JICA study proposed the following institutions.

(5) The Establishment of Transport Coordination Mechanisms

It is recommended that in order to remedy the current status of the transport system and create sustainable planning and implementation for sector development programmes, a three-tiered coordination mechanism be created consisting of (i) a high-level Transport Policy Council, (ii) a working-level Transport Coordination Committee, and (iii) an Institute for Transport Policy Studies.

a) Purposes and functions

Transport Policy Council

The Council shall consist of Chairman, Planning Commission, Minister, Ministry of Communication, Minister, Ministry of Railways, Minister, Ministry of Defence, Minister, Ministry of Ports and Shipping and Provincial Governors/Chief Ministers or their nominees from four provincial governments. The Council is to formulate a national transport policy and strategy and to facilitate coordination among the sectors in accordance with the national transport mandate.

Transport Coordination Committee

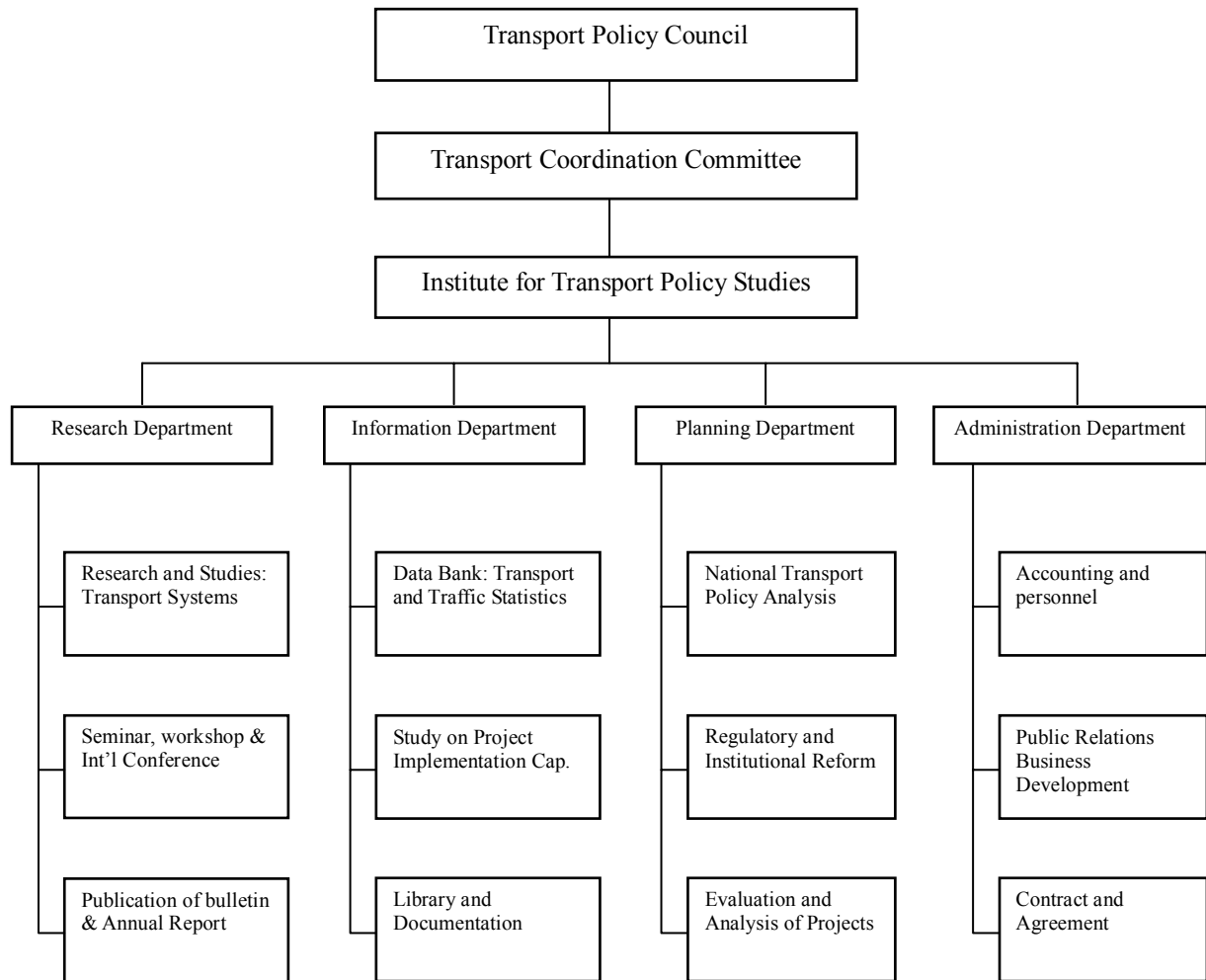
The Committee consists of a Deputy Chairman, Planning Commission, Joint Secretaries, Ministry of Communication, Ministry of Railways, Ministry of Defence, Ministry of Port and Shipping, representative from Finance Division, Economic Assistance Division (EAD), Provincial Governments and autonomous authorities.

Institute for Transport Policy Studies (ITPS)

The Institute is to provide a secretariat to support the Council and Committee and carry out research and development to provide technical support to the Council and Committee in the policy formulation and coordination.

The new Institute will have four functional departments; Research, Information, Planning and Administration:

- Research Department will focus on the research and analyses of the problems and needs of the country's transport sector development. It will also conduct research and studies on the international practices of the improvement and modernization of transport systems, including the institutional and regulatory reforms, privatization, private sector project financing (BOT and PPP). It will be responsible for the organization of seminars and workshops and the publication of annual research report and bulletins.
- Information Department will focus on the collection and dissemination of information and data relating to transport and traffic and the establishment of a data bank in which all transport and road traffic related statistics, including traffic volumes, number of traffic accidents, vehicular registrations and driving licenses, etc. are kept. The Data Bank will also keep all the results and findings of transport and traffic studies conducted by bilateral and multi-lateral aid agencies.
- Planning Department will focus on the financial, economic and technical evaluation of sector development programs and projects, including the implementation capacities. It will also provide technical and substantive support to the Council during the formulation of a national transport policy.
- Administration Department will be responsible for the accounting, human resource development and public relations, including conduct of transport projects, planning course/Technical Lectures/Seminars in cooperation with the Research Department.



Source: JICA Study Team

Figure 6.2.5 Transport Policy and Coordination Mechanisms

b) Utilization of the National Transport Research Centre (NTRC)

The existing National Transport Research Centre (NTRC) was established in 1974 as a technical support section of the Planning Commission to provide the needed research and development for planning and approval of transport projects. The mission statement of NTRC was to achieve self-sufficiency in the fields of transport planning, road engineering and road safety through indigenous R&D work. NTRC was collecting information and data relating to transport sector for the country. This included historical data regarding road designs, vehicular accident and driving licenses. NTRC also acted as a counterpart to a various national and international agencies including this and past JICA Studies on Pakistan Transport Plan.

It would be a logical move to restore the much needed R&D activities in Pakistan’s transport development and, in establishing a new national institute as a part of the new transport policy and coordination mechanism, the existing qualified professional staff and assets of the NTRC could be transferred to the new Institute except for those involved in the R&D on pavement design. The NTRC’s existing road research staff and material testing facility could be transferred to the proposed Highway Research and Training Centre.

6.3 Pursuit of Road Safety

6.3.1 Current Situation

(1) Regional Traffic Safety

Motor vehicle crashes are currently ranked ninth among the world's disease burdens, and is projected to rank third by 2020. Developing countries are the site of nearly three quarters of the ten million motor vehicle crashes annually. Asia and the Pacific region suffer 44% of the world's road deaths but have only 16% of the total motor vehicles. (Reference "Report on Vulnerable Road Users in the Asian and Pacific Region", ADB, 1998).

These numbers are based on official statistics and under-reporting of road fatalities is extensive, in some cases (e.g. China) it is estimated that the actual number of road deaths is over 40% greater than reported.

Bangladesh has the highest rate of deaths per vehicle population whilst Malaysia is reported to have the highest fatality risk as a percentage of the population. (See below)

Motorisation has increased at a rapid rate in Asia, largely with the growth in motorcycles. The number of motor vehicles doubled in Pakistan over the last 20 years. The personal risk of being killed in a road crash has more than doubled in most Asian countries.

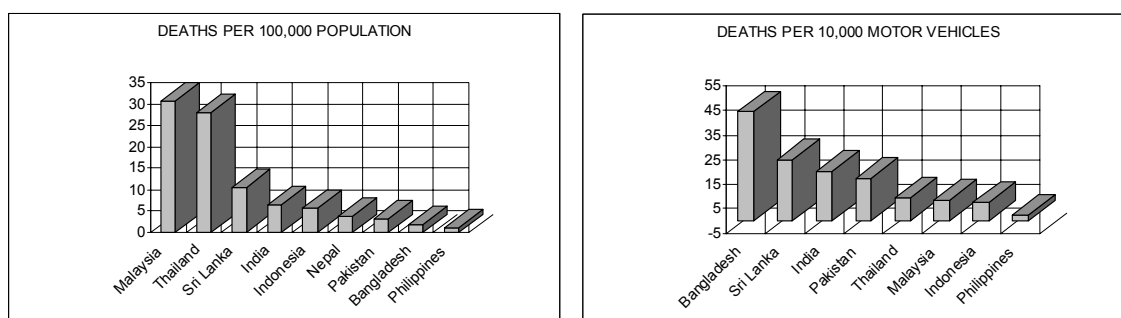


Figure 6.3.1 Traffic Accidents Death Rate in the World

(2) Economic Costs

Road deaths and injuries should be reduced for humanitarian reasons but on economic grounds alone they consume financial resources. Road safety appraisals illustrate the economic benefits of investing in national road safety programs, apart from the humanitarian aspects.

A previous study (Four acre and Jacobs, 1977) estimated road crashes cost on average of 1% of a country's GNP, but a higher range, 1 to 3% has been suggested by the World Bank and others.

The calculated cost of road crashes can vary with the valuation method used, and at least six different methods have been proposed. (Hills and Jones-Lee 1981, 1983). This is significant, as the cost attributed to road accidents must be balanced against the expenditure on prevention or minimisation of traffic injury and or fatalities. Two general approaches are:

- 'gross output' or 'human capital' (HC) method (loss of potential earnings)
- 'willingness to pay' (WTP) method

If accident costs and values are intended for use in cost-benefit analyses then the most appropriate method is willingness to pay. However, there is difficulty in obtaining reliable empirical estimates. In this case the gross output approach is preferable but it must be modified to capture the 'humane' aspect by a further allowance for 'pain, grief and suffering' of those involved in road crashes. It is generally accepted that the annual cost of road crashes

is about 1% in developing countries, 1.5% in transitional countries, and 2% in highly motorised countries.

(3) Non-Reporting of Accidents

A study on motor vehicle injuries in Pakistan has found that 61% to 86% of such injuries may go uncounted in official police statistics. (“Injury Prevention”, A. Hyder, Johns Hopkins Bloomberg School of Public Health, September 2000.) The study's results indicate that the numbers of motor vehicle crashes, injuries and fatalities in the country have increased steadily during the 40-year period after 1956, and that commercial vehicles contribute disproportionately to these injuries.

The investigation shows that the total number of motor vehicle crashes increased 14-fold between 1956 and 1996, while the number of lives lost in crashes increased 16 times. The report also stated that buses and public service vehicles, which in Pakistan account for 12 to 35% of the total number of registered vehicles in any given year, are involved in over 60% of motor vehicle crashes and 90% crash deaths.

Interviews with motor vehicle crash survivors showed that 14% of crashes were investigated and registered by the police, whereas a previous study found that 39% were investigated by the local city police.

Since commercial vehicles travel many more kilometers annually than cars, their risk for crashes is heightened. As commercial vehicle production has not kept pace with population growth existing vehicles in this category are increasingly overloaded, further contributing to increased injury and fatality rates per crash.

In the event of an accident, the injured are treated by the local emergency response services. This means that an accident on a motorway or national highway may have to wait several hours for fire brigade and ambulance facilities to arrive. Motorway police, and regular police, have no facilities or training to deal with medical or hazardous situations.

(4) Legal Situation

The need for strengthened legislation has been recognized and action was taken through Ordinance No. XL of year 2000 with the passing of the National Highways Safety Ordinance, 2000. This ordinance is supplemented by the “Highway and Motorway Code” which is a booklet issued by the National Highways and Motorway Police, under the Ministry of Communications. It updates and replaces the Pakistan Highway Code of 20 years earlier. This is a general guide meant to be used by driving schools in teaching persons to drive and pass the driving test. It is not clear that this extends to all roads and all road users who come under the authority of the district and city police forces.

6.3.2 Policies for Road Safety

(1) Main Issues Requiring Action in Pakistan

The NHA have recognized that there are many issues requiring action and detail them in their Annual Report. These include:

- Fragmentation of responsibility for road safety issues
- Lack of reliable credible information and data
- Inadequate coordination of remedial measures

NHA have identified several fundamental factors as being responsible for the high accident rate:

- Road conditions particularly surface, shoulders and markings
- Need for many single lane roads to be minimum of two vehicle width, with adequate shoulders, and provisions for night driving

- Poor driving standards particularly at night when drivers use high beam or extra lights with no regard for oncoming traffic
- No proper driving instruction program or driving test procedure
- Weak enforcement of traffic rules and regulations
- No effective vehicle registration system, poor licensing system and weak inspection system for old vehicles for road worthiness/safety
- Overloading of vehicles: too many passengers on public transport and too heavy a load on commercial vehicles
- Public travelling on trucks and other forms of commercial vehicles

(2) Remedial Measures

The following measures have been identified as necessary steps to improve traffic safety, reduce fatalities and injuries.

a) Actions by Federal Government

- A public awareness campaign to change attitude of drivers and general road users
- Consensus building between authorities (NHA, police) and commercial road users to reach agreement on practical and acceptable measures to reduce overloading
- Provision of affordable financing scheme to allow commercial transporters to replace old vehicles with new
- Consistent training of highway (NHA) provincial and local traffic police

b) Actions by Provincial Governments

- Initiate improved vehicle registration system to prevent prolonged use of over age vehicles
- Improve vehicle licensing procedure
- Improved road worthiness testing so vehicles which have been structurally modified after registration are identified
- Improvement of driving instruction schools
- Enforcement of driving test procedures to obtain licence under uniformed and consistent rules
- Improve personal licensing procedure

c) Actions by NHA

- Improve signage and use internationally accepted symbols
- Ensure signs are not just nominated in English but in local language; maybe better to use internationally accepted signage and symbols.
- More safety measures on roads such as lane markings, “cats eyes”, safety barriers and hard shoulders
- Adequate provision of crossing points for pedestrians such as foot bridges or underpasses with provision for movement of animals and hand drawn vehicles.

d) Actions by Police

- Stronger enforcement of traffic rules and regulations
- Local police and motorway police to be provided with more facilities and training to deal with medical or hazardous situations
- Enforcement of passenger number restrictions and stopping places of public transport
- Enforcement of prevention of overloading of buses, commercial vehicles and use of trucks as passenger vehicles
- Enforcement of speed limits
- Removal of encroachments that effectively reduce carriageway width
- Strict control of agricultural vehicles on highways, particularly at night, with adequate lights and rear markings such as reflectors
- Use of correct lighting on vehicles at night: that is red lights on rear and white lights on front, not the opposite; prohibition of bright lights on rear of vehicles; enforcement of use

of dipped headlights; and unnecessary use of spotlights on front of vehicles.

- Strict control of use of agricultural vehicles for goods movement and carrying of passengers on narrow urban / rural roads
- Provision of new, or strengthening of existing, emergency response services such as ambulances, paramedics, fire brigade and hazardous situation response teams.
- Training

The above aspects give a comprehensive list of issues to be addressed. It may be appropriate to hold seminars and training exercises for specific groups, such as:

- Traffic safety education in primary, junior and high schools
- Periodic Traffic Safety Campaigns by the police in cooperation with local people and NGOs such as ARUP
- Seminars for authorities such as police and administrators
- Round Table working groups with road users such as commercial operators and transporters

6.4 Intermodal Facilities Development

6.4.1 Current Situation

(1) Introduction

In an efficient strategic transportation environment multi-modal terminal/facilities are essential and have a definite role to play. These facilities provide an interface between long haul and short distance movements of people and goods. For an efficient and cost effective use of transport infrastructure it is important to make use of high capacity transport systems for medium to long distances, where as for shorter journeys of people from these multi-modal facilities to inner city area or for the distribution of goods to local shops/markets or even homes, the use of low capacity transport systems is most desirable.

The location, design and operation of these facilities need to be optimized to keep the cost of transport down. In the case of strategic transportation (inter-city - which is the subject of this study) such terminals have a vital role to play. For the movement of freight, these terminals include seaports, rail goods yards and freight terminals, and dry ports (inland freight terminals with facilities for customs clearance and processing of documentation). In the case of passenger transportation such terminals include airports, railway stations, and long distance bus terminals.

Seaports, airports and railway stations have been studied and discussed under the respective headings of these transportation systems. This section is therefore devoted to cargo/freight centres (dry ports) and passenger terminals.

(2) Freight Terminals in Pakistan

Pakistan has two major seaports and both of these are located at the southern end of the country. The rest of the country relies on these ports for imports and exports. But the majority of the country's population centres and industrial heartland (except the port city of Karachi) lies in the province of Punjab at a distance of 600 to 1200 km from the ports. This requires efficient movement of goods over land for import and export over land.

Because of excessive bureaucracy, the cost of "land access to/from port" within Pakistan could easily be several times the cost of maritime transportation to the origin/destination country. The main reasons and issues for this could be summarized as:

- Lack of containerization, mostly due to lack of container handling equipment inland, and lack to transportation facilities for the movement of containers. Therefore, it is essential that country's inland transportation infrastructure matches that of the maritime infrastructure.
- Non-Simplification of trade/customs documents: In Pakistan this seems an impossible task, as in most cases it is considered a job creation scheme, whether any document(s) is necessary or relevant is neither understood by authorities, and neither does the public have the right to question the "Government" officials. e.g. someone clearing goods at Lahore airport may have to make several cost charges at several points, as each agency has its own levies and does not trust an other agency/department to collect levies on their behalf, with the inherent reason of receiving "commissions" at each stage of payments.
- Lack of Efficient Freight Forwarding Agencies – for efficient collection and delivery of goods where a third party collects and deliver goods. In Pakistan this "third party logistics" is almost in its infancy, and mostly used for domestics movement of goods, and a little for import and export. However, there are agencies that will handle your goods and carry out custom clearance for both import and or export.

In the past (early seventies) the port handling and customs clearance was so poor that it lead to ports being clogged with goods needing approval for both import and export. As result, ships had to wait for days, further adding to the cost of transportation, and Pakistan

continuously lost its competitiveness in import and export. Mainly in order to alleviate the clogging of the port rather than to improve the efficiency of inland transport, the Government started to set up dry ports further inland, where customs clearance “blessings” could be obtained rather than only at the port.

There are several such ports dotted around Pakistan, some closer to big cities, some within the city (e.g. Lahore), while the location of others had benefits to some third parties, and had nothing to do with the efficient handling and carriage of goods. In order to understand the operation of these ports traffic surveys were conducted at ten (10) dry ports in Pakistan. Table below summarises the survey results. It can be seen that none of these ports handled “large” volumes of goods by any standards. The highest volumes were observed at Lahore, Faisalabad, and Port Qasim itself. Even the traffic at Karachi dry port was found to be less than that observed at other Inland sites, given that Karachi is the biggest metropolis of Pakistan.

PTPS study examined these results. As the traffic volumes were so low at all these centres, only qualitative and collective judgments could be made about their location, use, operation, and future role as a part of this strategic study. Any close analysis and approach would need further detailed analysis and more data collection, for that “dry port”. This was considered to be not necessary for this study.

Table 6.4.1 Summary of Dry Port Traffic Survey Results

Dry Port City	Survey Date	Total (In+Out) Trucks	Trucks Interviewed
Lahore	30-August-05	245	34
Karachi	3-September-05	206	88
Quetta	5-September-05	40	40
Peshawar	1-September-05	43	32
Multan	10-September-05	24	16
Rawalpindi	6-September-05	10	10
Hyderabad	31-August-05	33	21
Port Qasim	3-September-05	244	100
Faisalabad	2-September-05	251	33

Source: PTPS Traffic Surveys

(3) Long Distance Bus Terminals

In almost every city of Pakistan there is a long distance bus terminal. The main reason is that most of the inter-city travel is by public bus, due to low car ownership, high cost and low access and poor service of railway, and very high cost travel by Air.

The main traffic survey carried out for PTPS revealed that on almost all major/minor intercity roads about one-third of the traffic is public buses. This proves the points made in the above paragraph, about the use of buses as almost the only means of inter-city travel.

The operation of intercity public buses is almost entirely in private hands, with little or no government subsidy. However, the fares are set by the Government, and generally obeyed by the operators. Such intercity bus services are also available in a variety of level of services. That varies from non-stop comfortable/ convenient air conditioned services to over crowded buses with passengers occupying every inch of space, including the roof. In any case the majority of these services operate out of bus terminals. The high-end of the market tend to have their own terminal, operated by the bus company exclusively for their own company buses.

Whereas the lower end of the market operations start and stop from Public bus terminals, usually provided and operated by city authorities. These terminals are usually located with reasonable access to local intra-city transport services. In the case of Lahore, a nice terminal was built and operated by the city authorities in the mid-1960s. Now it is considered a disgrace for such a historic city, and what makes it current condition seem even more

unbearable is its close proximity to world class monuments such as Badshahi Mosque and Lahore fort. Hence a lot could be proposed for such termini. The surveys and comments from passengers noted during the interviews from other cities were also less than encouraging.

6.4.2 Policies for Intermodal Facility Development

(1) Freight Terminal

- Only in the case of Lahore could it be said that the city needs a better, well planned, and operationally efficient “freight terminal”. Such a center should combine the handling of both international and domestic goods movement operation at one location. The location of such a terminal would have to be out side the city, and not within the city link to the existing terminal. The most suitable location from a simple qualitative assessment is somewhere north of the River Ravi with access to National Highway N-5, Motorway M-2, and the Lahore – Sheikhpura Road and, especially, the railway Junction of Lahore. As from such a location the terminal could serve both the domestic market of Lahore and at the same time act as a regional collection and distribution centre for the Northern areas of Lahore district, and the districts of Narowal, Gujranwala, Sheikhpura. These districts do have considerable industrial outputs for transportation to the rest of Pakistan and abroad. The main advantage of this location is the excellent road and rail accessibility it offers for the movement of long haul operation and at the same time access to Metropolitan Lahore would be easy and convenient.
- In order to promote refrigerated transport, investment in cold storage warehouses is necessary at the two ports in Karachi and freight terminals in major large cities. As the capital cost of cold storage facilities and the maintenance cost are expensive in general, it is necessary to establish a multi-modal transport system for refrigerated transport, namely, “cold chain”. Railway should be included in the cold chain and cold storage warehouses should be constructed in dry depots of Pakistan Railways.

(2) Long Distance Bus Terminal

- General amenities at these locations should be improved for convenience of passengers and for the access/egress of local distribution modes of transport.
- Relocation of such terminals is not necessary the answer, the answer lies in controlling the activities which takes place within the confines of the bus terminal area, which could easily be carried out elsewhere, such as overnight parking, routine maintenance and oil change, etc etc.
- Their operation could be enhanced by making them public/private control, where private sector has vested interest in its up-keep and smooth operation.
- A single bus terminal from which both low and higher class services could operate is also more favourable than allowing the high-end of the market its own luxury confines. In such cases some cross-subsidy for social reason could provide a wider choice of services to more customers. Thus improving the access to public of all types of services.
- Bus Terminal location(s) could be more than one for a single city depending upon its geographical size, location, geographical constraints of access to/from inter-city bus routes, and the volume of demand from each direction or inter-city route.
- Location of local distribution modes is also essential, and should be fully taken into consideration. An integrated intercity-bus and local mass transit system could be ideally planned, located and operated by single public/private authorities for the best interest of the public at large.

6.5 Cross Border Facilities Development

6.5.1 Current Situation

(1) Introduction

Pakistan has common borders with four countries, namely, Iran in the west, Afghanistan in the north, China in the north east and India in the east. The main overland trade routes with these countries are:

- | | | |
|----|----------------------|----------------------|
| 1. | Taftan (Balochistan) | (Pak-Iran border) |
| 2. | Chaman (Balochistan) | (Pak-Afghan (South)) |
| 3. | Torkham (NWFP) | (Pak-Afghan (North)) |
| 4. | Sust (Gilgit, N.A.) | (Pak-China) |
| 5. | Wagah (Punjab) | (Pak-India) |

The movement of vehicles from neighbouring countries is regulated by bilateral agreements on a reciprocal basis. In all cases, vehicles of Pakistan and neighbouring countries are allowed up to the nearest custom posts which are, in all cases, located well inside the countries. The conditions at each location are briefly described below.

a) Taftan (Pak-Iran)

The customs post for Taftan is located at Quetta. Iranian trucks are allowed up to Quetta, 635 km inside the country and Pakistani trucks are allowed up to Zahidan, 100 km inside Iran. They operate on *Carnet de Passages en Douane*, issued by Automobile Associations of the two countries on a reciprocal basis. The vehicles to and from Quetta are escorted by Customs staff stationed for that purpose. However, some scrap from Iran is downloaded at Taftan where NLC has built a scrap yard. There is a nominal Customs staff at Taftan to check documents and arrange escort for movement to Quetta. The Immigration authorities check passports and visas at the border. Security at the border is provided by paramilitary forces, FC, rangers, etc. stationed at the border who are responsible for opening and closing of the gate at the mutually agreed timings on both sides. The border is open from dawn to dusk.

Pakistan and Iran are also linked by rail. There is a broad gauge line from Quetta to Zahedan (732 km). There are two passenger trains a month, running from on the 1st and 15th of every month from Quetta to Zahedan and 3rd and 17th from Zahedan to Quetta¹. However, they carry few passengers, as buses on the route take much less time (less than 12 hours) and charge less.

In addition, there are two or more goods trains a month with 40-50 wagons of 20 ton capacity. Customs formalities by Pakistan Customs are performed at Taftan Station on the Pakistan side of the border and on Iran side of the station by Iranian Authorities.

b) Chaman (Pak-Afghan)

At Chaman, Custom's post is located in the city 3.5 km away from the border. On the Afghanistan side, the nearest town is Spin Boldak, 8.5 km inside Afghanistan, but the main Custom Post is at Kandahar where most of the imports and exports are processed. Afghan trucks are allowed upto Chaman in Pakistan and Pakistani trucks can go up to Kandhar. However, due to security conditions in Afghanistan, few Pakistani trucks go to Afghanistan. Most of the goods are carried by Afghan trucks.

Chaman is also linked by rail by a broad gauge from Quetta. Out of the distance of 142 km, 60 km are double track from Gulistan to Chaman. The rail passes under the Khojak Pass through the longest tunnel in Pakistan. There is a daily passenger train service in each

¹ Pakistan Railways, Time and Fare Table, Nov. 2004 – April 2005.

direction and numerous goods trains, according to traffic requirements.

Transit trade of Pakistan moves by rail only in accordance with the Agreement of 1965, which recognises two border points only, namely, Torkham and Chaman. Goods arriving by train are transhipped at railway yard where a separate customs post is located. Onward, goods vehicles are escorted by Customs Authorities up to the Afghan border.

c) Torkham (Pak-Afghan)

Torkham handles the largest amount of cross border traffic in the country. Its Custom post is located in the west of Peshawar beyond the famous Khyber Pass. As for Chaman, Afghan trucks can come up to Peshawar from where goods are transhipped to rail or road vehicles. They carry mainly dry/fresh fruits, vegetables, poultry, marble, minerals and so on. Similarly, Pakistan trucks can go up to the nearest Afghan custom post at Jalalabad. However, in view of current security situation in Afghanistan, few do that. The major cargo items are cement, steel, oil, machinery, etc.

Peshawar is the main rail head in the north. All Afghan transit goods which arrive from Karachi by rail are moved to transit sheds at city and cantonment stations from where they are loaded on trucks for onward movement. A truck terminal is also located near a cantonment railway station for other than transit goods to and from Afghanistan. Customs clearance is done at city and cantonment railways stations and truck terminal/dry port in the city.

The vehicles cleared by Customs in Peshawar are sealed and escorted to the border. There is some custom staff at the border as well for receipt and dispatch of vehicles. They check seals and in certain cases goods as well and let the vehicles cross the gate. The security and opening/closing of gates is the responsibility of paramilitary forces stationed there for that purpose. The gate is open from dawn to dusk.

Because of traffic congestion, trucks are not allowed on roads in the city during daytime. They have to wait for to enter and leave the city, sometimes up to 12 hours.

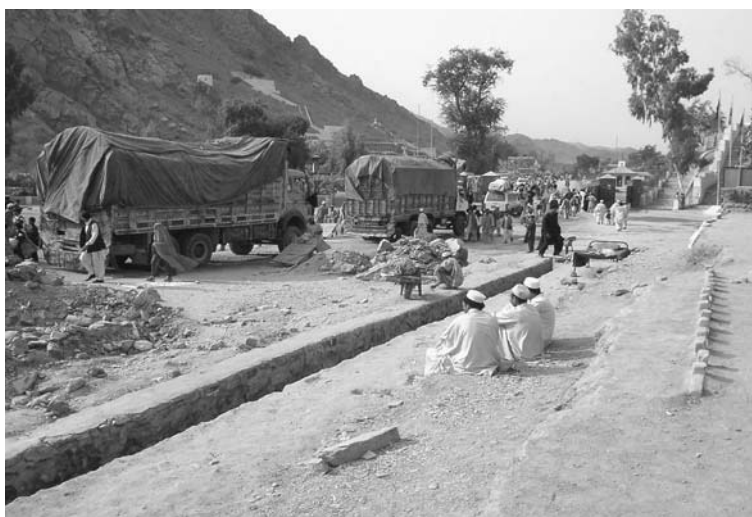


Photo: Torkham Border Post

d) Sust (Pak-China)

The Pak-China border is located at the Khunjerub Pass, 4,600 m above sea level. Sust is a Custom and Immigration post 75 km from the border at 1,800 m altitude. The border is snow covered in winter and becomes impassable frequently. Smooth traffic movement is only assured in summer only (May-November). There is only security staff at the border who check gate passes and let the vehicles go.

As for other places, Chinese trucks are allowed up to Sust and Pakistan trucks can go up to

the nearest custom post in China, 100 km inside the country. However, the movement of vehicles is more restricted here. Only vehicles of designated transport agencies of the two countries can operate vehicles. The agency responsible on the Pakistan side is Northern Area Transport Corporation (NATCO). They also operate passenger coaches. Similarly, there is a Chinese state agency operating trucks and coaches.

Return loads are not allowed by either country. Chinese vehicles bring their goods to Sust and go back empty. Similarly, Pakistani vehicles go up to Chinese the nearest Chinese Custom Post and come back empty. A warehouse has been built at Sust with the help of China where transshipment is carried out.



Photo: Khyber Pass

e) Wagah (Pak-India)

Wagah is located 28 km from Lahore city centre. The only trade allowed at Wagah is some Pakistani vegetables and poultry and Afghan dry and fresh fruits to India. The goods are unloaded on the Pakistan side, inspected by custom staff there and carried by hand by Pakistani security cleared labour across no man's land and then handed over to Indian labour for clearance by their Customs and onward movement. At present, only relief goods from India for the large earthquake that hit the Kashmir area of Pakistan on October 8th, 2005 are allowed back-to-back loading/unloading. The border is open from dawn to dusk.

There is also passenger traffic including regular buses connecting Lahore and Delhi two times a week both by Pakistani and Indian bus companies (four round trips in total). They cross the border on foot, completing custom and immigration formalities on both sides. Tourist cars can pass the border based on the usual *Carnet de Passage* procedure.

A significant amount of import and export goods are carried by rail. Wagah rail station is located some two km west of Wagah road crossing. There are two trains both incoming and outgoing every week. Pakistani and Indian rolling stock is used on a six-month rotation basis. Each train consists of 10 passenger cars (capacity 600 per train) and 2-3 freight cars (one 20 foot container per car). Although there are no legal constraints on the cargo items imported/exported, no high value or manufactured goods are being traded. Customs formalities of this traffic are carried out at Wagah railway station on the Pakistan side and Atari Railway station on the Indian side.

(2) Present Traffic Volume

a) Cross-border Traffic

Table 6.5.1 summarizes the results of the PTPS field survey which was conducted from August 30th to September 8th, 2005 on five (5) cross-border points between Pakistan and neighbouring countries.

Table 6.5.1 No. of Vehicles Counted and Goods Tonnage Estimated Across Border Posts, 2005

	Taftan (Iran)	Chaman (Afghan)	Torkham (Afghan)	Sust (China)	Wagah (India)	Total
No. of Vehicles/day						
motorcycle	0	0	0	0	0	0
car	0	0	27	0	0	27
minibus	0	0	16	4	0	20
large bus	0	0	24	2	0	26
light truck	4	16	91	9	0	120
medium truck	4	10	86	0	3	103
heavy truck	21	36	19	1	7	84
container truck	0	1	138	34	1	174
agriculture equipment	0	0	0	1	0	1
total	29	63	401	51	11	555
Goods Tonnage/day						
motorcycle	-	-	-	-	-	-
car	-	-	-	-	-	-
minibus	-	-	-	-	-	-
large bus	-	-	-	-	-	-
light truck	20	20	426	45	0	511
medium truck	27	79	645	0	30	781
heavy truck	420	689	127	20	140	1,396
container truck	0	12	784	383	12	1,191
agriculture equipment	-	-	-	-	-	-
total	467	800	1,982	448	182	3,879

Note: both incoming and outgoing directions

Source: PTPS field survey

Judging from the results, the volume of cross-border traffic remains relatively low. Only Torkham has higher levels of traffic, with about 400 vehicles a day and 700,000 tons of goods per year. This accounts for about 70% and 50% of the total Pakistani cross-border traffic for vehicles and goods tonnage, respectively. Particularly with India, road traffic volume is still minimal despite the current government initiatives to improve the relationship between Pakistan and India.

Bus and/or passenger coach are also operated across the border. Although details are yet to be confirmed, the following is known:

- With Iran, passenger buses operate several times a month between Quetta and Zahedan
- With Afghanistan, a bus is operated reportedly once a day through Chaman between Quetta and Kandahar. But this was not recorded in the PTPS traffic count survey. Through Torkham, five (5) regular bus services are available daily between Peshawar and Kabul. PTPS survey counted 16 minibuses and 24 large buses a day for both directions.
- With China, the PTPS survey counted four (4) minibuses and two (2) large buses a day for both directions. Although the Pak-China agreement on transit traffic refers to regular passenger coach services, their frequency is unknown.
- With India, there are four (4) regular round bus services between Lahore and Delhi through Wagah.

Regarding rail traffic, the following is known:

- With Iran, there are two (2) regular round services of passenger trains a month through Taftan between Quetta and Zahedan. More goods trains are operated on the same route.
- With Afghanistan, one (1) round trip by a passenger train and several round trips by goods trains are operated every day up to the Chaman border. No train services are available at the Torkham border (upto Peshawar only).
- With China, there is no railway link.
- With India, there are two (2) round trips of passenger cum goods trains a week between Lahore and Delhi.

b) Commodity Trade with Neighboring Countries

Table 6.5.2 shows the commodity trade in 2003 between countries of the Region.

Table 6.5.2 Commodity trade between countries of the Region, 2003

US\$ Million												
(from) / (to)	PAK	IND	IRA	AFG	CHI	KAZ	KYR	TAJ	TRM	UZB	Rest	Total
Pakistan		77	94	492	433	9	7	0	1	3	11,579	12,695
India	332		928	144	3,585	74	38	4	19	15	57,890	63,029
Iran	99	261		227	1,764	49	28	75	129	70	31,086	33,788
Afghanistan	47	40	1		1	0	0				120	209
China	1,503	3,674	1,863	26		1,572	245	21	79	147	429,098	438,228
Kazakhstan	252	9	411	49	1,720		164	76	37	138	10,071	12,927
Kyrgyzstan	1	1	7	6	69	56		19	2	16	405	582
Tajikistan	3	4	15	0	18	7	3		0	74	673	797
Turkmenistan	4	9	38	81	4	49	0	32		0	3,503	3,720
Uzbekistan	5	27	109	0	200	90	39	133	0		3,122	3,725
Rest of the World	13,303	73,099	22,172	580	404,966	6,503	193	521	2,183	2,501		
Total	15,549	77,201	25,638	1,605	412,760	8,409	717	881	2,450	2,964		

Source) compiled from Commodity Trade Statistics Database, UN and World Development Indicators, WB

Pakistan's commodity trade with adjacent countries of the Region is not active so far. The largest amount of exports to neighbouring countries is to Afghanistan, but this is still only about 4% of total exports. The largest amount of imports from neighbouring countries is from China, which accounts for about 10% of the total. Most of the trade with China is seaborne, and it has little to do with cross-border transport.

The trade with double-landlocked Central Asian States is still at a very low level except for the imports to Pakistan from Kazakhstan. This is considered to be oil and other mineral products.

Apart from Pakistan, the regional trade seems to be dominated by China. Its trade with India, Iran and Kazakhstan is significant and is growing rapidly.

(3) Current institutional Arrangement

As to cross-border transport, Pakistan has entered a bilateral or multilateral agreement with neighboring countries as briefly described below:

a) With Afghanistan

Pakistan first entered a transit cross-border trade agreement with Afghanistan in 1958. However, in 1965, a new agreement came into force. Actually the new one is an amendment of the old one, but a mixture of both is used as customs formalities at present. The new agreement stipulates the following, among others:

- guarantee to each other the freedom of transit to/from their territories
- designates two routes, i.e. Peshawar – Torkham and Chaman – Spin Boldak

- impose no taxes, duties and charges of any kind except actual transport and administrative expenses
- for Pakistani government to provide earmarked sheds and open spaces in Karachi Port Area for transit goods to/from Afghanistan
- recognize the importance of the Kabul – Torkham – Peshawar route (suggesting the possibility to extend the railway from Landi Khana to Torkham)
- appoint liaison officers on both sides
- ensure the most favourable treatment with each other

Although not stated clearly, it is assumed that the mode of transport would be rail. In this context, this agreement has been already outdated at present where road transport is dominant everywhere.

In addition, there is reportedly a “sister” agreement regarding Afghan transit cargo to India. Although the signed document cannot be found anywhere, actual practises follow this agreement; the only possible route is Torkham – Wagha, and the transportable goods are limited to dried and fresh fruits from Afghanistan.

b) With China, Kyrgyzstan and Kazakhstan

Pakistan, China, Kyrgyzstan and Kazakhstan have agreed in 1995 to the following points on land transit trade:

- Border posts and Land Routes

a. Border posts

Pakistan :Sust and Karachi seaports.
China :Khunjerab, Torugard and Khorgos
Kyrgyzstan :Torugard and Ak-Jol
Kazakhstan :Kordai and Khorgos

b. Land Routes

Karachi Seaports (Pakistan) to Peshawar (N-55) or Karachi Seaports to Islamabad/Rawalpindi Dry Port (N-5 or Motorways) to Hassanabdal - Gilgit - Sust (Pakistan) - Khunjerab (China) - Kashgar - Torugart(China) - Torugart (Kyrgyzstan) - Bishkek - Ak-Jol (Kyrgyzstan) - Kordai (Kazakhstan) - Almaty - Khorgos (Kazakhstan) - Khorogos (China), and Vice versa.

- No vehicle duties and taxes on transit transport except for the cost of rendered services
- Uniform customs procedures and formalities
- Providing sheds and open spaces at points of entry/exit in addition to the efforts of infrastructure improvement
- Equal national treatment in relation to freight and other charges
- Right to apply all prohibitions and restrictions deriving from national legislation of each country
- Free transit not only to member countries but also non-member countries
- Appointment of liaison officers in each country

However, the Khunjerab Pass which links Pakistan with China has an altitude of 4,600 m and it often becomes impassable from November to May due to snow and ice. Moreover the both sides of this pass are high steep mountain areas that make road maintenance extremely difficult. Due to these natural conditions, which are hard to overcome, the role of this agreement is quite limited for Pakistan. For other member countries, this agreement seems to be very effective in view of the current surge of goods from China to Central Asian Countries.

In addition, prior to this agreement, Pakistan tried to enter an agreement with China in 1993 on the general rules of international road transport. Although this agreement is yet to come

into force, vigorous negotiations are being done at present with the Chinese government. Principles and basic procedures as to permission issuance for regular and non-regular transport services are stipulated there.

c) With India

There is no agreement between Pakistan and India as to cross-border trade. However, actual trade is being carried out as stated earlier, though at a minimal scale. This has reportedly become possible through ad-hoc communications between the two countries.

Regarding railways, however, there is a fairly long history of negotiations on cross-border rail operations. In 1976, both governments finally entered into an agreement to resume railway operations across the border after long discussions. It remained valid until 1991 when a new agreement was reached. It was reviewed again in 2001, but soon after this, on December 31st, 2001, railway operations were suspended due to political conflict. After two (2) years, in December 2003, a new agreement was reached and rail operations were resumed from the beginning of 2004.

The following is an outline of the 2003 agreement:

- to resume international train operations between Lahore and Amritsar in January 2004
- to carry international traffic only
- to limit train running between sunrise and sunset
- to share the rakes for running passenger services equally by the two railways
- to limit the weight of passenger luggage below 35 kg per person (50 kg for first class)
- other detailed procedures relating to rates, fares, document processing, problem solving, penalties, mechanical fitting, etc.

According to a report of Gulf News of January 7, 2006, India and Pakistan agreed on January 6, 2006 to reopen a second railroad link on February 1 between Khokrapar, a border town of Sindh province and Munabao, a desert town in western India. The passenger train would be called 'Thar Express', named after the desert that straddles the border of the region. To begin with, it would be a weekly service and trains will alternate every six months: a Pakistani train will cross into India to Munabao for the first six months of the year, followed by an Indian train for the remaining six months.

In addition, the commencement of new regular bus services is now under negotiation between Pakistani and Indian governments. It is expected to become valid soon.

d) With Iran

There are two (2) agreements between Pakistan and Iran. One is about cross-border railway operation agreed in 1959 and the other is regarding road transport across the border agreed in 1987.

The outline of the old agreement on railway operation is:

- The North Western Railway located in Lahore transferred the section it operated inside Iran (Zahedan to Pak-Iran border) to Iranian State Railways. The Iranian Railways in turn transferred the control of the section to the North Western Railway with all immovable assets. The North Western Railway is responsible for train operation on the section including the supply of rolling stock.
- The schedule of Standard Dimensions relating to the broad gauge shall be used.
- Mirjawa shall be the only junction for mechanical interchange and joint billing.
- The Iranian State Railways shall make payment for power for running, coaches, shunting, repair, relief train, etc.
- For passengers and freight, Iranian portion is collected by the Iranian State Railways at Mirjawa and Pakistani portion by the North Western Railway at Mirjawa as well.
- The Iranian State Railway will not charge for coals for railway use on the section.

- Other procedural matters.

The 1987 agreement for cross-border road traffic and transport between the two (2) countries does not include transit movement. Its outline is:

- Internal transport is prohibited.
- Each authorized company of either country is allowed to appoint its representative at the final destination in the other country.
- Drivers need to have an international driving license.
- The trucks used are exempted from charges and taxes levied on foreign vehicles.
- The route of transportation is limited to Quetta – Taftan – 72 Post – Mirjawa – Zahedan.
- Other rules on vehicle weight and dimensions, violations, joint commission, etc.

6.5.2 Policies for Cross Border Facility Development

(1) Conditions to Accelerate Cross-border Transport

In general, the conditions which determine the magnitude or importance of cross-border transport are:

- Natural
- Political/institutional
- Economical (complementarity and potential growth)
- Social/cultural
- Competition with sea and air routes

a) Natural Conditions

Pakistan generally has severe constraints in natural conditions with the neighbouring countries.

- The only exception is with India. The border area is well populated, flat and equipped with roads and railways. Moreover, the largest activity centers of both countries are located near the border; Lahore and Delhi.
- The border area with Afghanistan is mountainous, both for the Torkham route and Chaman route. The bald rocks of the mountains are extremely fragile and the roads and railways are poorly maintained. However, activity centers are located relatively near the border (Kabul/Jalalabad and Peshawar for Torkham route, and Kandahar and Quetta for Chaman route).
- With Iran, the natural conditions of the border area are not so friendly to cross-border traffic. Several hundred kilometers of desert lies on both sides of the border, and the border is located very far from the activity centers of both countries.
- China border is the most prohibitive, having the Khunjerab Pass of 4,600m high which practically restricts cross-border movement only to summer. Moreover, the area lying on both sides of the border is steep mountains or hazardous desert for more than 1,000 km. Road maintenance is very difficult due to frequent landslides and falling rocks. Furthermore, there is no alternative potential route over the Pamir Plateau.

b) Political Environment

The political environment surrounding Pakistan and the surrounding countries is a delicate matter. Pakistan has good political relations with China, partially because of the need to stand together as a counterpoise to India. Although the interrelations with Afghanistan and Iran are stable so far, their attitude on cross-border trade is protectionist in general. The interrelation with India has long been quite hostile and remains so at present despite the recent initiatives taken by both governments.

Reflecting the history of political conflict to some extent, the institutional arrangement on cross-border trade is poor if existing, as described in the previous sections. In most cases, the existing agreements impose a number of irrational constraints on cross-border movements.

Some cover only a fragment of entire cross-border transport while some others are outdated.

Although the political environment is one of the absolute determinants of quality and quantity of cross-border transport, it is not a matter for planning nor projection. Political decisions have to come first.

c) Economical Condition

The economical conditions of both countries determine the magnitude of cross-border trade if other conditions are the same. This is related not only to the economic scale but the mutual complementarity of the economies of the related nations. Table 6.5.3 compares GDP and trade volume of neighboring countries with Pakistan. Although this is quite indicative, the following can be pointed out:

- The trade volume between Pakistan and Afghanistan is almost equivalent to 10% of Afghanistan’s GDP. Hence cross-border trade is more critical to Afghanistan than to Pakistan.
- The trade between Pakistan and India is negligible compared to the economic scale of both nations.
- The trade of Pakistan with China and Iran is still small and identical in relative terms compared to their GDP. In absolute terms, however, China is 10 times larger than Iran or Pakistan.
- The trade of Pakistan with Central Asian States is still underdeveloped. Considering that Pakistan has an agreement with China and Afghanistan in relation to transit trade, the future possibility of increasing trade between Pakistan and CAS would be large.

Table 6.5.3 Comparison of GDP and Trade Volume with Pakistan of Neighboring Countries

	A GDP 2003 (US\$ million)	B Trade Volume with Pakistan 2003 (US\$ million)	A-B
India	600,637	409	1,469
Iran	137,144	193	711
Afghanistan	4,708	539	9
China	1,417,000	1,936	732
Kazakhstan	29,747	261	114
Kyrgyzstan	1,909	8	239
Tajikistan	1,553	3	518
Turkmenistan	6,201	5	1,240
Uzbekistan	9,949	8	1,244

Source) World Development Indicators, WB and Commodity Trade Statisti

d) Social/cultural

Socially and culturally, Afghanistan is the nearest to Pakistan. Iran and CAS come next because of the common religion. China is quite different in social/cultural features from Pakistan though its Xinjiang Wigur Province has an Islamic tradition. Social/cultural characteristics of India seem to be similar to Pakistan by appearance and by history. However, both people deny this resemblance.

e) Competition with Sea and Air Routes

Pakistan has sea and air routes between Iran, India and China as an alternative means to land cross-border transport. Particularly for bulky or high-value goods and long-distance passengers, sea and air are much more economical and efficient than land transport. For Afghanistan and CAS, however, land transport can play a vital role. For these landlocked or doubly landlocked countries, cross-border transport is essential except for long-distance

city-to-city passengers and high-value goods. Moreover, land transport of this type contributes to vitalize the life of people living in poor remote border areas.

Table 6.5.4 Comparison of Cross-border Trade

	Natural	Political	Economical	Social/ cultural	Modal Competitio
India	***	*	***	*	**
China	*	***	**	*	*
Afghanistan	*	**	**	***	***
Iran	**	**	**	**	*

Note) *** favorable ** fair * bad

(2) Preceding Examples in Asia

The following describes briefly some preceding trials for improving cross-border transport.

a) Asian Highway

The concept of Asian Highway (AH) was advocated at first in the 1950s by the UN. The purpose was to contribute to accelerate the social and economic developments as well as to boost international and regional trade and tourism by linking Asian countries by road. Due, however, to the lack of fund and geopolitical situation affected by the Cold War, the road development was not smoothly conducted except for some countries. It was the late 1980s when bright signs were observed. As a result of the dissolution of the Cold War and the introduction of market mechanisms in socialist countries, globalization has become highlighted and infrastructure of international communication and transportation became important tools for promoting trade and attracting foreign direct investment. This tailwind has revitalized the Asian Highway. Particularly when China, Mongolia and Myanmar became members of AH in 1988-1990, the region restarted the efforts to realize the Asian Highway Network.

Led by ESCAP, the AH now has 32 member countries from Japan on the east end to Turkey on the west end. Pakistan has long been a member country since its foundation in 1959. Donors have been vigorously supporting the development of AH roads inside Pakistan. The AH network is now composed of numerous roads amounting to about 141,000 km.

b) The GMS Cross-Border Transport Agreement

The GMS Cross-Border Transport Agreement (GMS Agreement) initially advocated by the Asian Development Bank is a multilateral instrument to facilitate cross-border transport. The GMS Agreement includes references to existing international conventions that have demonstrated their usefulness in a number of countries. Similar initiatives are also undertaken by ASEAN. The GMS Agreement covers all the relevant aspects of cross-border transport facilitation.

These include:

- a. single-stop/single-window customs inspection
- b. cross-border movement of persons (i.e., visas for persons engaged in transport operations)
- c. transit traffic regimes, including exemptions from physical customs inspection, bond deposit, escort, and phytosanitary and veterinary inspection
- d. requirements that road vehicles will have to meet to be eligible for cross-border traffic
- e. exchange of commercial traffic rights
- f. infrastructure, including road and bridge design standards, road signs and signals

The GMS Agreement will apply to selected and mutually agreed upon routes and points of entry and exits in the signatory countries (Cambodia, China, Lao, Myanmar, Thailand and

Vietnam). Although some countries seem to be reluctant to proceed, bilateral talks are still continuing.

c) Central Asian Republics Economic Cooperation (CAREC)

The CAREC initiative, supported by ADB, intends to enhance economic cooperation among Kazakhstan, Kyrgyzstan, Uzbekistan, Mongolia and the Xinjian Uygur Autonomous Region of China. In its phase I program 1997-1998, infrastructure needs and policy issues that impede cross-border trade were identified, and in the phase II (1999-present), several projects selected in the previous phase have been assessed for implementation focusing mainly on trade, road railway and electric power.

However, most countries of this region have trade-restrictive policies due to their similarity of economic structure, and the deteriorated infrastructure and political instability in some countries further adds difficulties in promoting cross-border trade. As a result, the share of intraregional trade in total trade has decreased during the period 1998 to 2003; 3.4 to 1.8% for Kazakhstan, 24.8 to 16.6% for Kyrgyzstan and 32.6 to 22.4% for Tajikistan. Obstacles for cross-border trade are numerous. In addition to high customs tax and import quotas imposed by Kazakhstan, China, etc., there are transit fees, high loading/unloading cost and corrupt border practises.

Hence, the CAREC initiative has not been so successful so far. However, the volume of cross-border trade has been rapidly increasing in these years between China and CAS countries particularly Kazakhstan, and cross-border infrastructure is being improved as well. Moreover, CAREC countries have taken steps to simplify the procedures of cross border transport. A transit agreement was signed in March 2004 between Kyrgyzstan and Kazakhstan, and a similar agreement is being negotiated between Tajikistan and Kyrgyzstan.

6.5.3 Recommendations

- Since it is impossible to have a clear perspective for the future on the political environment surrounding cross-border transport of Pakistan, it would be more realistic for the Pakistan government to concentrate on the interrelation between:
 - Afghanistan and Central Asian States in the short term, and
 - India in the medium to long term.
- The outdated and prohibitive agreements with neighbouring countries regarding cross-border trade and transit trade should be amended and updated. With Afghanistan, the 1958 and 1965 agreements on transit traffic should be amended to cover both road and rail, and both bilateral and transit traffic. The fees, taxes and procedures needed on the border should be clearly and transparently stipulated so that arbitrary judgement of customs officers can be avoided. In addition, the border offices of both Pakistan and Afghanistan should be linked directly by data communication to avoid duplication of document processing and declaration of different figures (weight, value, etc) at both sides. With India, the same arrangement should be taken as well in principle. However considering the hostility seen at present even between the labourers of both sides, at least back-to-back loading/unloading of trucks should be allowed immediately to avoid ridiculous inefficiency.
- At present, the time required for goods transportation by truck is reportedly 25 days from Karachi Port to Jalalabad in Afghanistan. Out of these 25 days, only 1-2 days are consumed in the Torkham Pak-Afghan border. This means that cross-border transport cannot be enhanced solely by improving the cross-border facility. Strengthening of port functions and road/rail development/improvement must be pursued in combination with the proposed enhancement of cross-border facilities.

Figure 6.5.1 illustrates the existing international corridors and the future new international corridors. Recently, the government of Pakistan launched “National Trade Corridor Improvement Program (NTCIP)”, which intends to strengthen the existing international corridor for transport of import and export goods. The development of multi-modal facilities should be incorporated in the program.



Source: JICA Study Team

Figure 6.5.1 Proposed Corridor Development of Cross Border Route

6.6 Institutional Capacity Enhancement

6.6.1 Institutional Capacity of Road Administration

Mismanagement of investments has led to inadequate road rehabilitation and maintenance, resulting in rapidly deteriorating roads and a large and ever increasing maintenance backlog. There is also an urgent need to develop management and professional skills in the institutions that are tasked with managing the road network. The need for institutional strengthening and well designed road sector development plans are particularly apparent at the provincial level, where the greater portion of the network exists. Institutional deficiencies of the national and provincial road administrations are not unique from other sub-sectors: i.e. over-staffing, low salary structure, lack of management and operational improvements, absence of research and development, and highly centralized decision-making. What is unique is the NHA's role; it has a dual function as both financier as well as executor. This may have contributed to problem of poorly justified investments, maintenance neglect and the selection of projects without confirming the scope of the work to the need, checking cost inflation, insuring quality control, doing research and development to protect investments. Governments, in the past, provided infrastructure, operated transport and regulated the system. These are conflicting roles to being financier, executor, auditor, and regulator at the same time. There is a need to re-organize NHA so that it becomes only a financing and regulatory agency and the project execution functions can be transferred to the provincial departments of Communications and Works. NHA will be able to exercise strict financial and quality control checks.

(1) NHA's Mismanagement of Investments

The NHA project portfolio (Rs. 276 billion) is a product of unplanned and uncoordinated investments in the transport sector during the early 1990s. The centralized project review and approval mechanisms – CDWP and ECNEC – which are supposed to provide institutional checks and balance and determine inter-sectoral priorities, were compromised and totally bypassed by the powerful National Highway Council (NHC) headed by the Prime Minister to enable rapid approval of politically high profile projects. In addition to dualization and rehabilitation of existing national highways, the NHA's ambitious highway expansion program included a grandiose motorways construction program. New projects were poorly justified and prioritized with a bias towards capital construction over asset conservation. A proliferation of new projects without completing ongoing projects and ineffective management of project implementation has resulted in very limited economic benefits from the investments, significant deterioration in traffic conditions along some heavily travelled national highway sections, delays in completion and the subsequent increase in construction costs.

(2) Governance Improvement

Amendment to the NHA Act 1991 has restored the centralized review and approval of all NHA's projects by the CDWP/ECNEC. The 2001 amendment removed the Board's power to approve projects of more than Rs.60 million and for projects over Rs.100 million the NHA Executive Board is required to submit PC-I to CDWP and ECNEC for review and approval like other implementing agencies. During the past five years NHA management has been strengthened, streamlined and right sized. Overall agency staffing has been reduced from 1900 to 1400. Standard Operating Procedures have been developed and a system of enhanced staff accountability and merit based promotions has been introduced. In addition, NHA has recruited a chartered accountant and other financial management professionals from the market to strengthen its financial management capacity.

(3) Implementation Capacity

At present, NHA management has three-tiers: Policy, Management and execution. Policy is set by the Chairman, Board members and NHA's Director General (Administration). Management is carried out by Board members, NHA's General Managers and Directors. Execution of physical tasks is carried out by NHA's General Managers, Directors, Deputy Directors and Assistant Directors. NHA is in charge of enforcement on only 9,000 of the total road network of 258,000 km in the country. This represents about 3% of the entire road network yet the traffic on the motorways and national highways is 75% of the commercial road traffic in the country.

(4) Maintenance Management

a) Control and Enforcement of Overloading

Overloading of trucks has caused extensive damage to the highway network. Overloading control and enforcement efforts over the past two decades have been very limited and largely ineffective. Overloading, coupled with high summer time temperatures have proven the inapplicability of the commonly accepted international standards of pavement designs.

b) Maintenance Backlog

A persistent bias in favour of capital construction, together with the modal shift from rail to road and significant increase in vehicle axle loads has caused a rapid and premature deterioration of the road network. The national highway network has developed a huge maintenance backlog now requiring Rs. 30 billion per annum to restore it to acceptable conditions.

c) Financing of Development Program

NHA's development programme is approved annually by the central government. Financing is currently provided by the Government in the form of Cash Development Loans (CDLs). The government allowed NHA to borrow Rs.140 billion in the form of the CDLs at an interest rate of 13%, resulting in the outstanding Rs.23 billion "Foreign re-lent loans", US\$58 million of foreign direct loans from Turkish Exim Bank for the construction of the M-1 Motorway and US\$667 million from a Korean contractor (Daewoo) for the M-2 Motorway by government guarantees (payment of US\$188 million has been made so far but a balance of US\$793 million still remains) and US\$200 million from the World Bank's National Highway Improvement program (NHIP) loan. According to a recently published report, at the end of this financial year, NHA will be in arrears of loan payments by Rs.100 billion. (Refer to the Final Report Available Options for Sustainable Financing of NHA's Programme, January 2005 prepared by Dr. Ronald R. Alan, Consultant)

d) Financing of Maintenance Cost

Maintenance of the national highway network is funded annually by grants from the federal government separately from PSDP. The fund, however, is insufficient to cover the needs of maintenance of national highways. In order to supplement the fund for maintenance NHA has been taking various measures including increasing revenues by toll rate escalation. At the same time, NHA has been requesting funds from external assistance that focuses on the reconstruction and improvements of national highways, i.e. National Highway Improvement Program (NHIP) by the World Bank.

6.6.2 Institutional Reform of Road Administration

(1) Maintenance Management

Current situation where the maintenance backlog has become an alarming proportion and according to the results of the 2004-05 RAMD Study on pavement conditions by NHA, the condition of 47% of the national highway network, which caters to more than 70% of the total inland traffic, is classified as “poor”. (The level of deteriorations on provincial roads is less critical in comparison with those on the national highway network). At the rate of deterioration of the network, road administration needs to focus on the network maintenance management and devote a substantial portion of its financial and human resources to capital development. The maintenance management programme needs to be supported by accelerated research and development efforts and tighten the quality and cost control through the enforcement of new design standards and material specifications which will be developed by new research and development efforts on an urgent basis.

(2) Research and Development

Problems of pavement deterioration can be slowed down through pavement thickness design and material specifications for the local environment and traffic conditions. NTRC, the research wing of MOC, launched a comprehensive research program of test sections covering flexible and semi-rigid pavement for evolution of pavement thickness design procedures specifically for Pakistan. NHA, faced with the problems of pavement deteriorations has not utilized the existing research centre. Instead, it has accepted the technical and financial assistance to create two separate research centres under the NHA, one by the World Bank and the other by JICA. The World Bank’s research centre will be a part of NHIP. Meanwhile, the existing National Transport Research Centre (NTRC) has within the premises a pavement testing facility and qualified professionals specializing in pavement design and materials. To avoid duplication and wasting the financial and human resources, the existing and proposed R&D facilities need to be combined into a single research and training centre. The facilities and professionals of the NTRC Road Research Section need to be transferred to the new centre as the first step of the consolidation.

(3) Private Sector Participation in National Highways and Motorways

With so many projects competing for PSDP allocation of additional financial resources, and to achieve the objectives defined by economic policy, there is no choice but to pursue a BOT approach in full knowledge of the cost inflation. NHA has been the main recipient of public sector funding and external assistance, bilateral and multilateral. Under these circumstances, it might be questioned whether it is worthwhile for NHA to invite the private sector to join in the financing of multi-million dollar motorway construction in the hope that by doing so these already matured projects may be implemented sooner than if they were to wait for public funding opportunities. The key element that should always be evaluated carefully, in this respect, is the estimated time period by which the projects would probably have to be delayed until such an opportunity arose. On that basis, for the time period under consideration the “socio-economic” benefits at stake, i.e. which would be lost if the project was not implemented at an optimal date, could be calculated. The period starts in the year when traditionally used parameters characterizing project efficiency such as net present value (NPV) or internal rate of return (IRR) exceed previously approved and generally acknowledged threshold values which characterize mature projects. That amount is the “socio-economic benefit in jeopardy” and should be compared to the cost increase caused by private sector involvement in financing the project. If, and when, the ratio of the benefits in jeopardy and the cost increase is above 1.0 or exceeds a previously identified and approved limit, say 1.5, then, the selection of the project is justified.

6.6.3 Railway Administration

(1) Institutional Reform for the Pakistan Railways

PR was organized as a subordinate department of the Ministry of Railways and this form of organization proved increasingly ineffective in coping with competition, as PR's pre-eminent position was increasingly challenged in the post deregulation era.

In 1995, the JICA Study on National Transport Plan in the Islamic Republic of Pakistan recommended the creation of a Pakistan Railway Corporation, similar to PIA, with Ministerial representation on the board. The ownership and overall direction of the railway would remain in the public sector, but day-to-day running of the railway would be passed on to commercially oriented managers with clearly defined targets and responsibilities. The study concluded that, ultimately, given the hope for gain in railway productivity and profitability, such a structure would be suitable for the privatization of the railways, if that was politically desirable.

In 1997, GOP announced its strategy for the privatization of Pakistan Railways. The strategy is to restructure PR into three core businesses—Passenger, Freight and Infrastructure. A new public entity—Railway Resettlement Agency will be created to retain all surplus assets and liabilities, including labour, real estate, debts and environmental clean up obligations. In addition, a new Railway Regulatory Authority will be established under a new regulatory framework to regulate the largely private sector rail industry. This plan failed and impacted negatively on the morale of the PR employees.

In 2004, after 10 years of JICA recommendation and unsuccessful attempts at privatizing PR in 1997, GOP decided to create the Pakistan Railways Corporation. The objectives and reasons were:

- To promote railway as the preferred mode of transport in the country;
- To grant Pakistan Railways Corporation sufficient autonomy to operate and to enable it to compete against other modes of transport effectively;
- To allow the Corporation to procure finances directly from banks/market on suitable terms.

The new Board consists of a Chairman, a CEO, and nine directors: three from the GOP, three from the Corporation and three from the private sector. The CEO will be recruited from the private sector. The GOP provides the Board with more autonomy and power over its governance.

(2) Management Reorganization

The institutional reform calls for:

- Shifting from the strong social service aspects of the management structure to a commercially oriented railway,
- Increasing performance by creating lines of business management which enhance management responsibilities and accountabilities and enable profit centre accounting,
- Curtailment of surplus employees is among the top priorities
- Create a sustainable financing structure

Financial structure of PR has been ad hoc and unsustainable with no value-for-money testing, or monitoring to underpin budgetary support. During the 1990s no investments were made in the railway infrastructure except the procurement of locomotives. In the absence of clear long-term plans or short-term goals and the “Shock Treatment” of 1998, the railway has failed to achieve sufficient PSDP allocation to cover maintenance of the rolling stock and rail structure. As a result, the infrastructure and rolling stock are obsolete and require a substantial amount of investment to function as one of the key transport systems of the country. Reform of Pakistan Railways is discussed in the Chapter 8.

6.7 Environmental Consideration

6.7.1 EIA Regulations

In 1997, the National Assembly passed the 1997 Pakistan EP Act, which subsumed the 1983 ordinance. This act requires IEEs and EIAs for all developmental projects.

Environmental impact assessment of all development projects whether public or private is a legal requirement under section 12 of PEPA 1997, which became operational in 2001. Project categories, which require an IEE, are listed in Schedule 1 (See Table 6.7.1) and the projects for which an EIA is required are in Schedule 2.

The Pakistan EPA Review of IEE and EIA Regulations, 2000 (The 2000 Regulations) prepared under PEPA 1997 define the procedures for IEEs and EIAs, and give legal status to the Pakistan Environmental Assessment Procedures, prepared by the Federal EPA in 1997.

The number of EIA reports submitted to EPAs has increased from 6 in 2000 to 29 in 2004 and the number of IEE's from 31 in 2000 to 189 in 2004.

Mandatory list for EIA or IEE regarding the transport sector is as follows.

Table 6.7.1 Mandatory List for EIA / IEE

List of Projects Requiring an EIA (Schedule 2)	List of Projects Requiring an IEE (Schedule 1)
<ul style="list-style-type: none"> ■ Mining & Mineral Processing <ul style="list-style-type: none"> · Major mineral development including; mining & processing of coal, gold, copper, iron, and precious stones · Major smelting plants · Major non-ferrous metals, iron and steel rolling ■ Transport <ul style="list-style-type: none"> · Major Ports and Harbors development · Major Airports · Federal or Provincial Highways or major roads greater than 5 crore rupees in value. Maintenance (rebuilding or reconstruction of existing roads is excepted from the requirement of an EIA). · Major railway works ■ Environmentally Sensitive Areas <ul style="list-style-type: none"> · Any project which will be situated in an environmentally sensitive or critical area should be carefully investigated, and the results communicate to the Responsible Authority, who will advise whether an EIA is necessary (see "Guidelines for sensitive and critical areas"). ■ Any other projects that the EPA may require 	<ul style="list-style-type: none"> ■ Mining & Mineral Processing <ul style="list-style-type: none"> · Commercial extraction of sand, gravel, limestone, clay and other minerals not included in Schedule A. · Crushing, grinding and separating processes · Minor smelting Plants ■ Transport <ul style="list-style-type: none"> · Ports and Harbors Development for ships less than 500 gross tons · Federal or Provincial Highways (except maintenance, rebuilding or reconstruction of existing metalled roads) less than 5 crore rupees in value. ■ Any other projects that the EPA may require.

6.7.2 EIA Procedure

No proponent of a project can proceed unless it has filed an Initial Environmental Examination (IEE) with the Federal Agency and received approval. No proponent of a project which is likely to cause adverse environmental effects can proceed unless an EIA has been approved by the Federal Agency.

After filing the IEE, the Federal Agency must respond within 10 working days and state if the submission is acceptable or not, or if an EIA is required. If acceptable, the agency is required to review the IEE and approve it within 45 days. If an EIA is required, the Agency

must review the EIA and give approval subject to conditions, within 90 days, require that the EIA be re-submitted after any stipulated modifications, or reject the project.

Every review of an EIA must be carried out with public participation but no commercially confidential information will be disclosed during the public participation unless such disclosure is in the public interest. The Federal Agency must communicate its approval or otherwise within four months from the date the IEE or EIA is first filed. If the submission is complete and complies with procedure, but no response is given, then the IEE or EIA shall be deemed approved. The Federal Government can, at its discretion, extend the four month period if justified by the nature of the project.

The Federal Agency must maintain separate registers for IEE and EIA projects, which contain brief particulars of each project and a summary of decisions taken. These registers are to be open to the public.

6.7.3 Environmental Management Plan

The project proponents will be responsible for ensuring implementation of the environmental mitigation measures recommended in the IEE or EIA. An Environmental Management Plan (EMP) should be prepared during the EIA/planning phase and should include specific mitigation measures, environmental monitoring requirements, institutional arrangements and budget.

The EMP is a crucial document and should be prepared during the IEE/EIA. It must be approved by the EPA and included in the contractual obligations imposed on the contractor.

Implementation of the EMP during construction is the responsibility of the contractor. The contractor is responsible for environmental monitoring and reporting. The project proponent must ensure that the performance of the contractor is in accordance with EMP. The contractor should submit a report on EMP implementation annually.

6.7.4 JICA and Pakistan EPA Guidelines

A comparison has been made between JICA guidelines and the requirements of the Pak-EPA. There are no significant differences.

JICA does include Strategic Environmental Assessment (SEA), which the Pak-EPA does not; however, MOE would like to see this included at a policy level. Resettlement is included in both guidelines, however MOE admit they do not have capacity to assess such issues.

At technical levels there are no essential differences. A comparison is given below in Table 6.7.2.

Table 6.7.2 Comparisons of Requirements of JICA and Pak-EPA Environmental Guidelines

Scope of Impacts to be Assessed in Environmental Assessment	
JICA	Pak - EPA
Direct and immediate impacts of projects	Site selection
Derivative, secondary and cumulative impacts	Indirect impacts on natural resources
Environmental impacts of a trans-boundary or global scale e.g. global warming	Project Related Impacts
Impacts on natural environment:	Impacts on natural environment:
Air	Air quality
Water, water usage	Water quality, water supply, storm water management, ground water, flooding
Soils, ground subsidence, sedimentation, geographical features	Soil stability, soil erosion, sedimentation
Waste	Safe storage of materials on construction site
Accidents	Construction hazards, traffic accidents, disaster response plan
Ecosystems, biota	Flora and fauna (biota), destruction of habitats (ecosystems), loss of species
Noise & vibration	Noise & vibration
Social considerations	Social considerations:
Migration of people, social institutions & infrastructure local decision-making institutions; existing social infrastructures and services	Displacement of existing uses, breakdown of community cohesion; provide replacement community facilities
Involuntary resettlement	Adequate resettlement and compensation to allow viable lifestyle to continue.
Local economy, employment and livelihood distribution of benefits and losses and equality in the development process	Economic issues, loss of livelihood
Land use and utilization of local resources	Landscape, visual amenity, induced land change
Cultural heritage	Cultural heritage
Infectious diseases such as HIV/AIDS.	Health, spread of disease
Local conflict of interests, vulnerable social groups: poor, indigenous peoples, gender, children's rights	

6.7.5 Current EIA Issues

(1) Key Issues

An overview of the key environmental issues facing Pakistan is presented below:

The amount of “available water” in Pakistan has been decreasing at an alarming rate and is approaching the “water scarcity level” of 1,000m³ per capita. Fresh water resources are polluted from discharge of untreated industrial and municipal wastes. Rivers are allegedly polluted by discarded waste from road construction and soil run off during heavy rain.

Air pollution is increasing, especially in urban areas. Pakistan EPA surveys detected levels of suspended particulate matter six times higher than WHO guidelines. ‘Smog’ seriously affects almost the entire province of Punjab during December and January every year.

Noise pollution has become a serious issue in major urban centres.

Degradation and encroachment into natural forests, rangelands, freshwater and marine ecosystems are destroying habitats leading to loss of biodiversity. At least four mammal species, including tiger, swamp deer, lion and rhinoceros, are known to have become extinct from Pakistan, while at least 10 ecosystems of particular value for species richness and uniqueness of their floral and fauna are critically threatened. Deforestation loss is

occurring at a rate of 0.2-0.5% per annum. New roads opening up such protected areas are thought to worsen this situation.

Pakistan is an energy inefficient country. It uses approximately the same energy to generate \$1 of GNP as the USA.

The above situation has arisen due to a number of factors including high population growth rate, prevailing poverty, unplanned urban and industrial expansion, insufficient emphasis on environmental protection in the government policies, lack of public awareness and education and lack of institutional capacity and resources for effective environmental management. (Reference Draft National Environmental Policy 2005-15, Ministry Of Environment, Government of Pakistan, March 2005)

(2) Guiding Principles

The following guiding principles have been adopted to address these environmental concerns:

- Principle of sustainable development.
- Principle of equitable access to environmental resources.
- Creation of demand for a better environment.
- Respect and care for the environment.
- Integration of environment into planning and implementation of policies, programs and projects.
- Changing personal attitudes and behaviors.
- Precautionary principle.
- Polluter pays principle.
- Substitution principle.
- Improving the efficiency of usage of environmental resources.
- Decentralization and empowerment.
- Extensive participation of communities, stakeholders and the public.
- Accountability and transparency.
- Increased coordination and cooperation among federal and provincial governments, NGOs, private sector and academia.
- Increased regional and international cooperation.

(3) Benchmarks and Targets

The current environmental benchmarks and future targets are;

- Increase renewable energy production (wind, solar, bio-gas etc.)
- Increase forest cover from the current level of 4.8% to 5.7% in 2010 and 6% in 2015.
- Increase land area protected for the conservation of wildlife from current level of 11.3% to 11.5% in 2010 and 12% in 2015.
- Finalize standards for ambient air quality and noise by 2006.
- Increase the number of petrol and diesel vehicles using CNG fuel from 280,000 currently to 800,000.
- Reduce, by 2010, the percentage of sulphur in high speed diesel fuel oil from 1% to 0.5%.
- Establish 40 ambient air quality and 25 water quality monitoring stations by 2015.
- Phase out two-stroke rickshaws by replacing them with four-stroke rickshaws or alternative modes of transport.

(4) Institutional Issues

The requirements for protection of the environment during construction of any major transportation projects are well defined in law and the legal procedures are laid down in regulations. These regulations give details of the procedures to be followed in the preparation

of an IEE or EIA, the timing of the preparation, the authorities to be consulted, the responsibilities of all parties involved, and the follow up procedure necessary to ensure that agreed remedial measures are implemented correctly.

The Project Proponents such as NHA or the Provincial Highway Authorities do not have the capability to produce such documents. They need to hire a consultant to do this but even so, it would be better if each project proponent had an environmental officer of environmental cell embedded in its organization to supervise consultants.

Even when the IEEs/EIAs are prepared the Provincial EPAs or the Federal EPA and Ministry of Environment do not have the capability to review the documents adequately or dispute statements made.

The IEEs/EIAs should contain an EMP (Environmental Management Plan) which is to be implemented by the contractor. However, often contractors complain that they were not involved in the preparation of the EMP so regard its implementation as impractical. This is an invalid argument as the implementation of the EMP is required in the contract, and by agreeing to the contract, the contractor accepts responsibility for implementing the EMP.

The implementation of the EMP should be enforced by the EPA but the project proponent is responsible for checking that the contractor is following the EMP requirements. The contractor should submit regular reports to the project proponent who should forward these to the EPA. In the event of non compliance, the project proponent should discipline the contractor by regulating payment.

Enforcement of the conditions stipulated in the IEE/EIA is difficult and often contractors do not follow the EMP requirements. The improvement to Murree Road has been given as an example where contractors were dumping left over spoil material in the river and increasing sediment levels.

On a more general level, the Federal Ministry of Environment would like to be more involved in decision-making at a strategic level as it feels decisions on projects have already been made before it is consulted.

Chapter 7. ROAD PLAN

7.1 Planning Approach

7.1.1 Introduction

As stated in Chapter 5, one of the main policies of the Master Plan is to develop a transport system to support people's economic and social activities so as to decrease regional disparities and realize the optimal modal share between road and railway.

Among others, economic growth is given the top priority under the current national development plan and transportation has to shoulder an important role to attain high economic growth.

7.1.2 Planning Process

(1) Demand – Supply Analysis

Table 7.1.1 illustrates the flow of the planning process for the road network in PTPS.

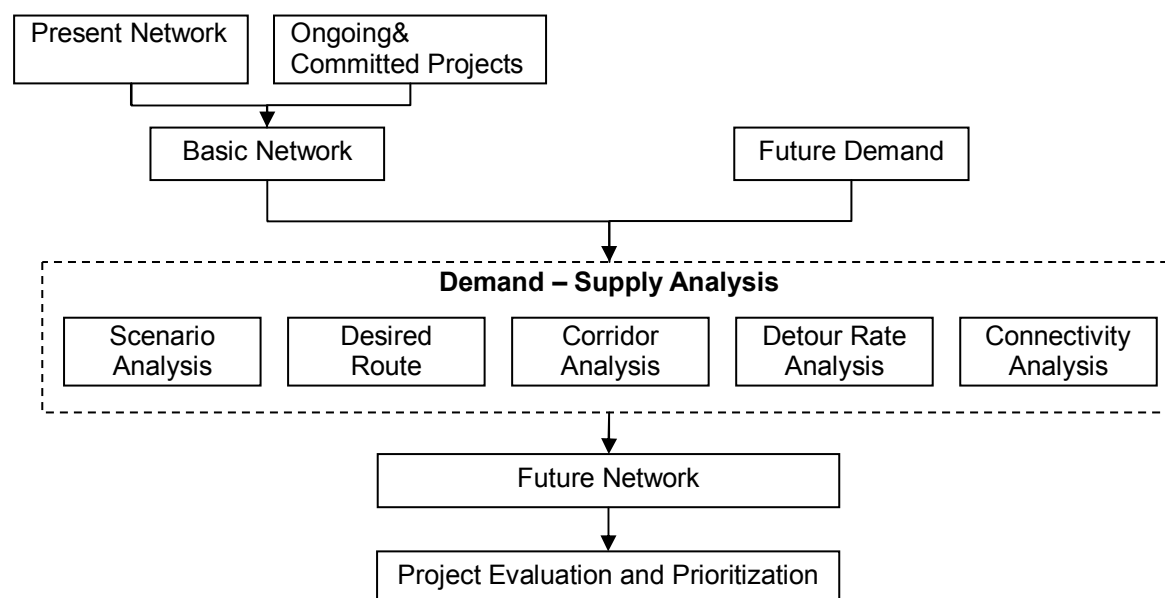


Figure 7.1.1 Procedure for Road Network Planning

The first step of the planning is to determine a basic road network that can be regarded as the minimum investment case and the basic scenario for demand and supply analyses. The road network in the near future, after all the on-going and committed projects are completed, was regarded as the basic network.

In addition to the basic network, “MTDF Network” was prepared to analyze a likely scenario that assumes all MTDF projects be completed but no other projects be done. Since MTDF is a government plan and has already been approved, MTDF Network should be the starting point for the road plan.

Based on these road networks, the following analyses were carried out.

- Scenario Analysis,
- Corridor Analysis,

- Desired Route Analysis,
- Detour Rate Analysis,
- Connectivity Analysis

Scenario Analysis

This analysis includes several scenarios. “Do-Minimum Scenario” shows what will happen if no project is implemented other than the on-going and committed projects. Similarly, “MTDF Scenario” shows the future situation with MTDF Network.

Corridor Analysis

This analysis compares traffic demand and capacity of transport corridors. If traffic demand exceeds the capacity along a corridor, capacity expansion of the corridor can be identified as an important transport issue. Based on the corridor analysis, future requirements of additional capacity of highway corridors are identified and proper measures such as widening of existing roads and new road construction are selected for each corridor. By doing this, new road projects are planned.

Desired Route Analysis

This analysis clarifies the desirable routes that road users prefer, on the assumption that all roads have unlimited capacity and therefore no congestion occurs.

Detour Rate Analysis

This analysis picks up pairs of two large cities between which the shortest route is very far compared to the distance in a straight line. It is economically desirable that large cities are mutually connected with a short route. For a pair of two large cities with a high detour rate, a possibility of a short cut route should be looked for.

Connectivity Analysis

This analysis identifies necessary alternative routes between large cities. Highways should be continuous along a corridor, so connectivity is one of factors to examine in a road network. In addition, the highway network should be stable, ensuring against a disaster or an accident. Every pair of two large cities should be connected with plural routes in order to provide a vehicle with an alternative route on any occasion.

(2) Road Network Formulation

The master plan road network was proposed based on the result of the demand - supply analysis. In formulating the road network, various factors such as regional development and natural resource exploitation were considered. Necessary projects for the master plan network were identified.

(3) Project Evaluation and Prioritization

The identified projects were evaluated economically (and financially if necessary), in order to determine their priority.

7.1.3 Ongoing and Committed Projects

In order to make the base network, on-going and committed projects were identified. Currently there are a number of road projects being carried out. In addition, there are new projects that have already been committed by authorized agencies and will start soon. Figure 7.1.2 shows the locations of these projects by donor agencies, and project sections are described in Table 7.1.1.

Table 7.1.1 List of Ongoing and Committed Projects

No.	Project Name	No.	Project Name
	Ongoing Projects		
10	Makran Coastal Road (Balochistan)	250	Bridge over River Chenab at Shershah
20	Islamabad – Pashawar Motorway (M-1)	260	Interchange at Khangah Dogran on M-2
30	Pindi- Bhattan Motorway (M-3)	270	Interchange at Sial More on M-2
40	Karachi Northern Bypass	280	Lala Musa – Gulyana Thotha Rai Bahadur Road
50	Lyari Expressway	290	Nowshera – Chakdara, Dir-Chitral N-45
60	Islamabad-Muzaffarabad Road	470	N-5 Rehabilitation Project
72	Indus Highway Project (Phase-III)	540	Kalat –Quetta – Chaman Section (N-25)
80	Mansehra – Naran – Jalkhad Road	551	Peshawar-Torkhan Dual Carriageway
100	Rahim Yarkharn Bahawalpur (N-5)	552	Malana Junction-Sarai Gambia Dualization
110	Okara Bypass	553	Badabher – Dara Adam Khel
120	Karian – Rawalpindi (N-5)	554	Sarai Gambia-Bannu-Miran Shah-Ghulam Road
130	Chablat Nowshera (N-5)	650	Kohat Tunnel Access Road, JBIC
140	Lowari Tunnel & Access Road	670	Karao-Wad Section, JICA
			Committed Projects
150	Bridge on River Jhelum at Azad Pattan AJK	480	Rehabilitation of 518km of N-5, WB
160	Improvement of N-65 Dera Allah Yar Nutal Section	530	Gujranwala-Hafizabad-Pindi Battian, WB
170	Improvement of N-65 Nutal-Sibi-Dhadar Section	561	Hub – Uthal Section N25, ADB
180	Improvement of KKH (N-35), NWFP	562	Multan – Muzaffargarh, ADB
190	D.I.Khan Mugharl Kot Section (N-50)	563	Khanozai-Mughalkot N50, ADB
200	Improvement of N-70 Qila Saifullah Loralai Bewata	564	Hassanabdal-Abbotabad-Mansera, ADB
210	Ratodero-Shahdakot-Khuzdar Section (M-8)	565	Sukkur-Jacobabad, ADB
220	Gwadar – Khuzdar Road (M-8)	566	Tarnol-Fatejangh-Jand, ADB
230	Khori-Quba Seed Khan Section	567	Qila Saifullah – Loralai –Wiagum Rud, ADB
240	Realignment of N65 near Jacobabad	570	Malakand Tunnel/Bypass, ADB

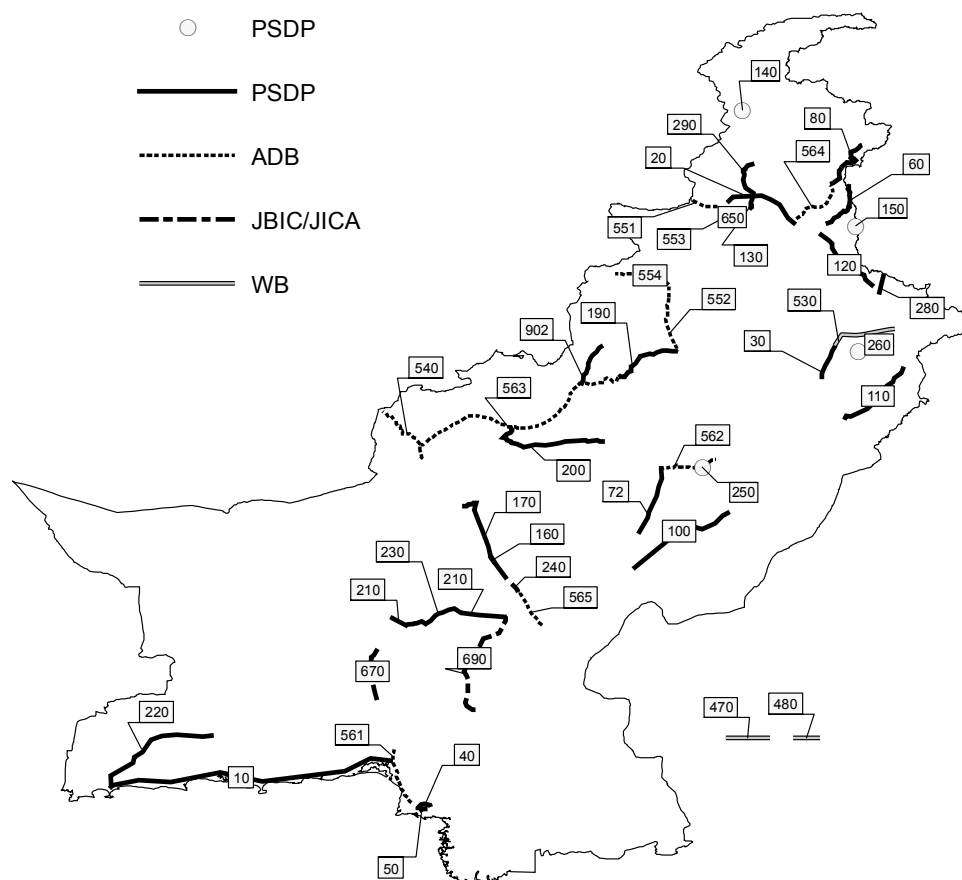


Figure 7.1.2 Location of Ongoing/Committed Projects

7.2 Demand- Supply Analysis

7.2.1 Growth in Travel Demand

Forecast growth in travel demand to 2025 is expected to be more than 3-fold. Growth rate is expected to be higher in the 1st decade than in the following 10 years, and the demand for both freight and personal travel by road is expected to double over the next ten years.

Table 7.2.1 Growth of Transport Demand (Interzonal Transport)

Year	Passenger or ton (mill/year)			Pax-km or ton-km (bill/year)		
	2005	2015	2025	2005	2015	2025
Passenger	780	1,455	2,497	154	293	517
Freight	241	440	748	99	185	329

Note: Projection by JICA Study Team

On the other hand, on-going and committed projects will not be enough to increase the road network capacity to such a degree to meet with future demand. Figure 7.2.1 illustrates the road network after the on-going and committed projects are completed with information of the number of lanes. It is noticeable that after a number of on-going and committed projects, the network will not be greatly expanded from the existing network, and most of roads will still be 1-lane or 2-lane.

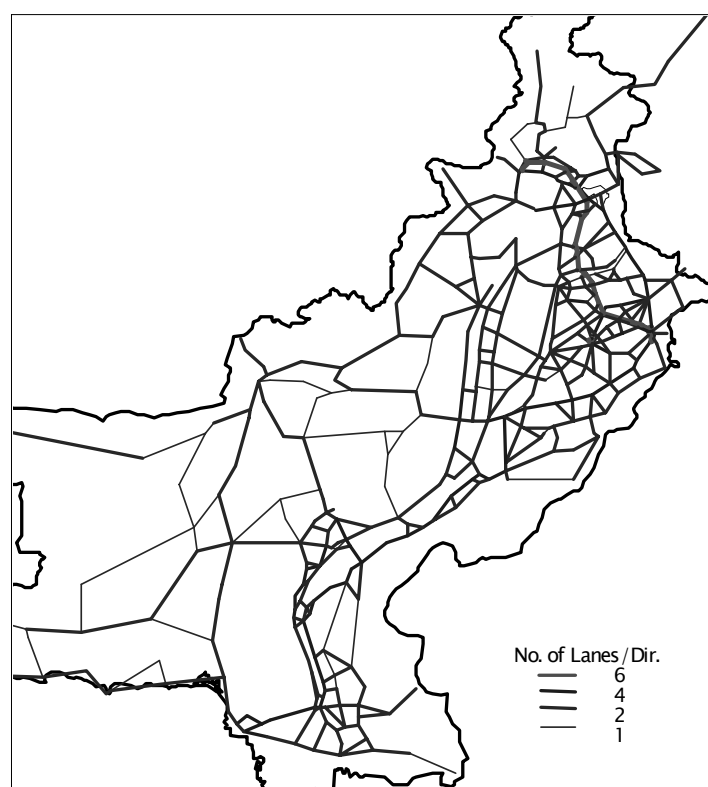


Figure 7.2.1 Road Network after current projects

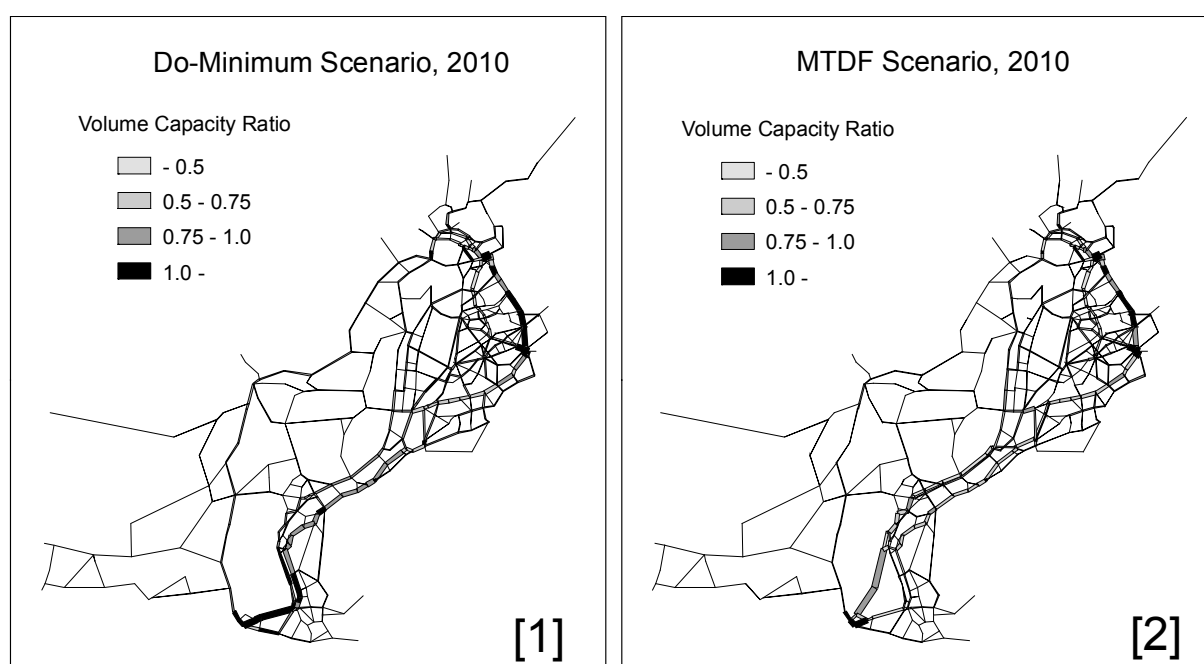
7.2.2 Scenario Analysis

Traffic assignment was carried out to calculate traffic volume on roads for the following scenarios:

- **Do-Minimum Scenario:** Only on-going and committed projects are carried out.
- **MTDF Scenario:** Only and all MTDF projects are carried out.
- **Modal Shift Scenario:** All the necessary projects for the target modal share are carried out as well as all MTDF projects.

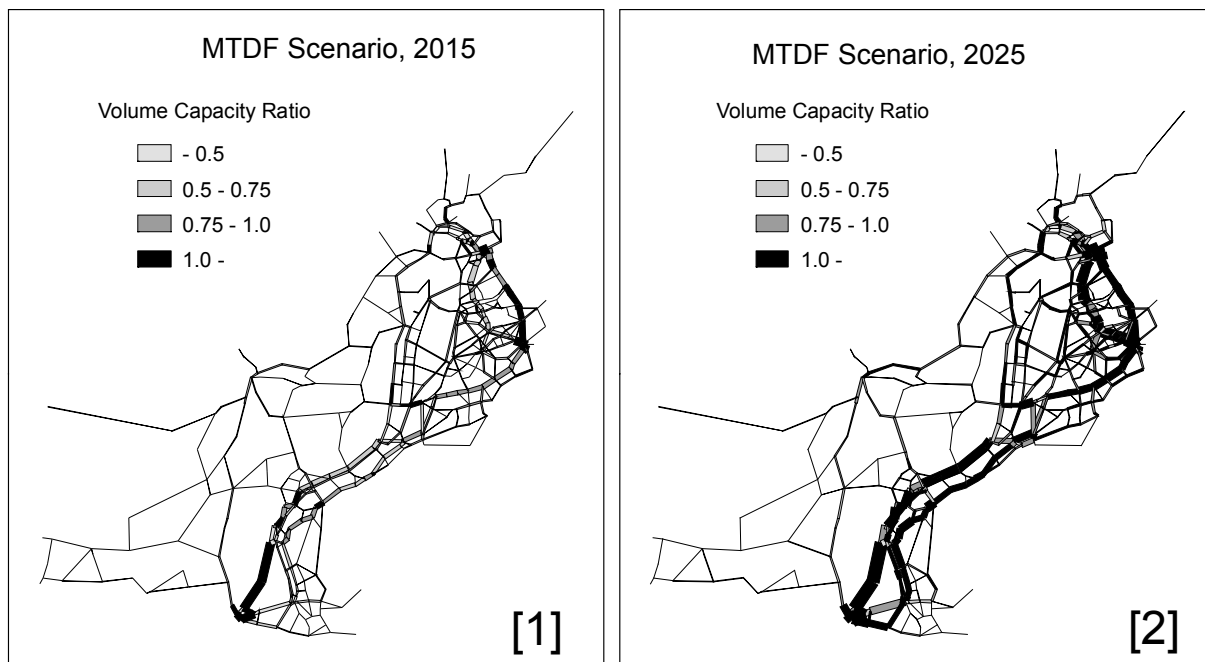
The results are shown in Figure 7.2.2, Figure 7.2.3, and Figure 7.2.4. The daily traffic volume is expressed as the width of each link and volume to capacity ratio is expressed as grey colours of four categories. Although daily capacity does not necessarily mean the ultimate capacity of a road in a day, there are some important findings as:

- Ongoing and committed projects can provide necessary capacity to some extents in 2010 as shown in Figure 7.2.2 [1]. Other projects are required in addition to these projects to improve service level at some points.
- MTDF projects provide sufficient capacity in 2010 as shown in Figure 7.2.2 [2]. and it will be able to provide necessary capacity to some extents up to 2015 as shown in Figure 7.2.3 [1]. However, MTDF will not be able to provide minimum service in 2025 as shown in Figure 7.2.3 [2].
- If the target modal share is achieved, the road network by MTDF is sufficient up to 2015 as shown in Figure 7.2.4 [1], but the level of service will be still low in 2025 as shown in Figure 7.2.4.



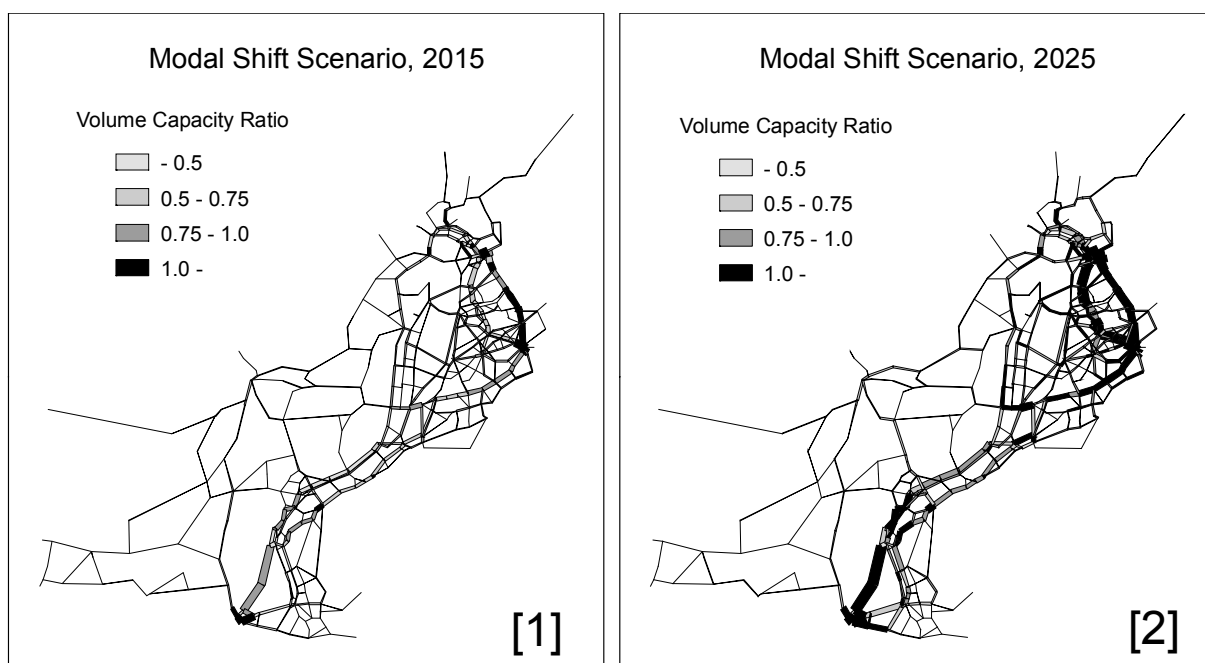
Source: JICA Study Team

Figure 7.2.2 Traffic Assignment for Do-Minimum and MTDF Scenario (2010)



Source: JICA Study Team

Figure 7.2.3 Traffic Assignment for MTFD Scenario (2015, 2025)



Source: JICA Study Team

Figure 7.2.4 Traffic Assignment for Modal Shift Scenario

7.2.3 Desired Route Analysis

Figure 7.2.5 compares the two results of traffic assignments of 2025 demand for capacity constrained case and capacity unconstrained case. The network constrained case shows a considerable diversion from congested highways to others whose distance is relatively longer than the shortest paths. If capacity is unlimited, road users choose the shortest paths. Whereas, the unconstrained case shows that traffic volume along shorter routes is not necessarily significant. This implies that the average trip length on the network is relatively short and opportunities to divert on to shorter routes are limited.

Other results can be drawn from this analysis as follows:

- N-5 will have been the most important corridor for road users those who prefer the shortest routs between their origin and destination.
- High travel demand is expected for two direct routes, Karachi – Dadu (M-7) and Hyderabad – Sukkur (a provincial road along Nara Canal in Sindh).
- There will have been few road users who regard M-2 as the shortest route between Rawalpindi and Pindi Bhattian, assuming other roads have unconstrained capacity.

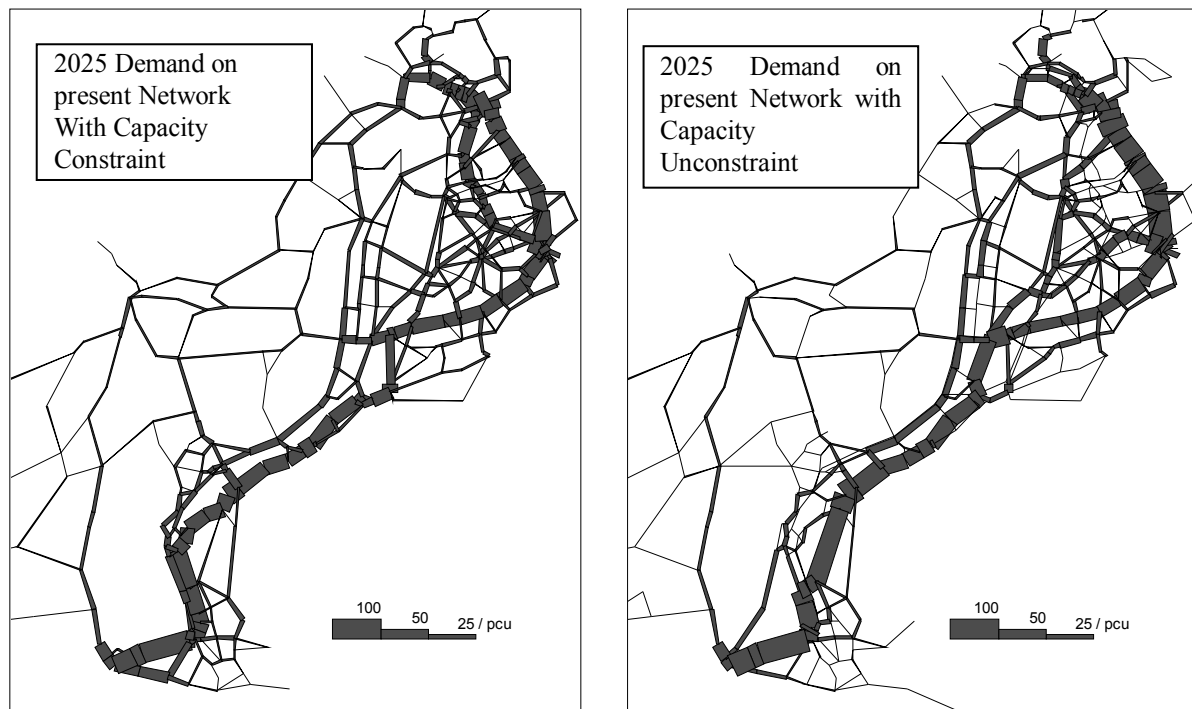


Figure 7.2.5 Assigned Traffic of 2025 Demand on Current Network

7.2.4 Corridor Analysis

Figure 7.2.6 depicts the travel demand for 2005, 2015 and 2025 by three histogram bars, and the cross line defines the current capacity along each corridor. The analysis across 10 major corridors in Pakistan illustrates that:

- All corridors west of the Indus have sufficient capacity to 2015, but four corridors out of five would need additional capacity to meet the projected 2025 demand.
- The scenario to the east of the Indus reflects that the current network capacity would only be sufficient for the next five years or so. Beyond that additional capacity is essential, and on three out of four corridors the additional capacity requirement is more than double the current capacity.

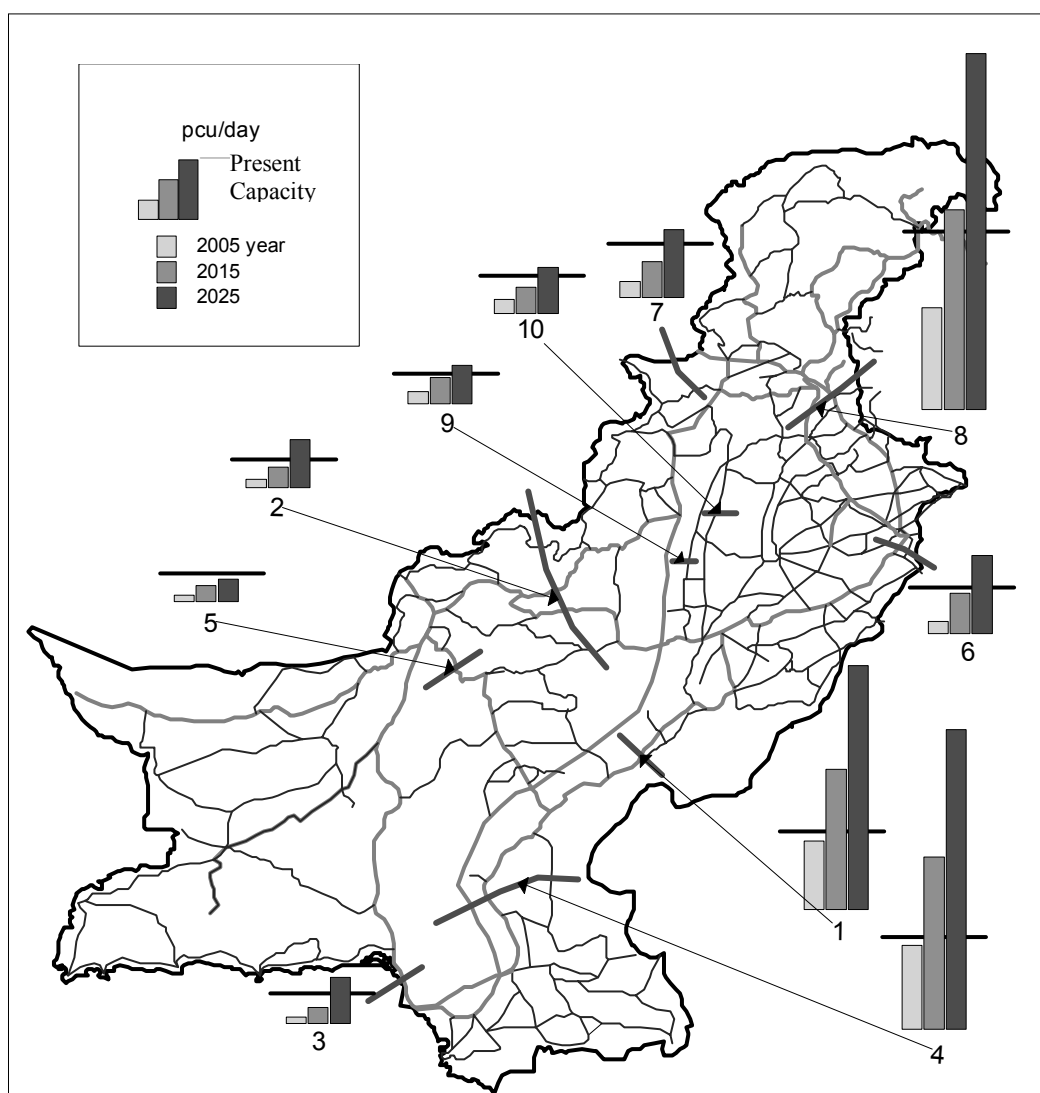


Figure 7.2.6 Demand and Supply Gap on Screen Lines

7.2.5 Detour Rate Analysis

Detour rates were calculated among the 12 largest cities. City pairs with higher detour rate are shown in Figure 7.2.7. The cities having good connection with other cities are Lahore, Islamabad, Sialkot and Gujranwala. On the other hand, Peshawar and Quetta are connected to other major cities at a long distance (high detour rate). Road network should be improved to lessen those higher rates.

Table 7.2.2 Distance and Detour Rate among Major Cities

	Population 1998	1	2	3	4	5	6	7	8	9	10	11	12
1 Karachi	9,339	-	1,033	941	1,147	737	147	1,072	1,106	596	974	1,124	683
2 Lahore	5,443	1.20	-	119	270	314	900	71	377	714	168	110	351
3 Faisalabad	2,009	1.22	1.19	-	257	207	815	132	321	595	83	184	263
4 Islamabad	1,939	1.21	1.01	1.21	-	422	1,034	201	144	691	187	192	500
5 Multan	1,197	1.24	1.02	1.26	1.24	-	615	339	423	426	239	391	91
6 Hyderabad	1,167	1.19	1.18	1.20	1.18	1.21	-	943	1,006	553	855	996	553
7 Gjranwala	1,133	1.19	1.02	1.02	1.07	1.11	1.17	-	318	714	142	52	391
8 Peshawar	983	1.25	1.15	1.37	1.16	1.41	1.22	1.19	-	599	238	324	512
9 Quetta	565	1.21	1.20	1.21	1.16	1.25	1.28	1.18	1.21	-	576	759	458
10 Sargodha	458	1.23	1.02	1.31	1.23	1.29	1.20	1.14	1.46	1.24	-	183	314
11 Sialkot	422	1.18	1.06	1.01	1.17	1.09	1.15	1.02	1.20	1.18	1.15	-	443
12 Bahawalpur	408	1.23	1.32	1.32	1.23	1.03	1.21	1.16	1.35	1.37	1.28	1.14	-

Note:

Detour rate is defined as the ratio of road distance between two cities to the distance of a straight line directly connected the two cities.

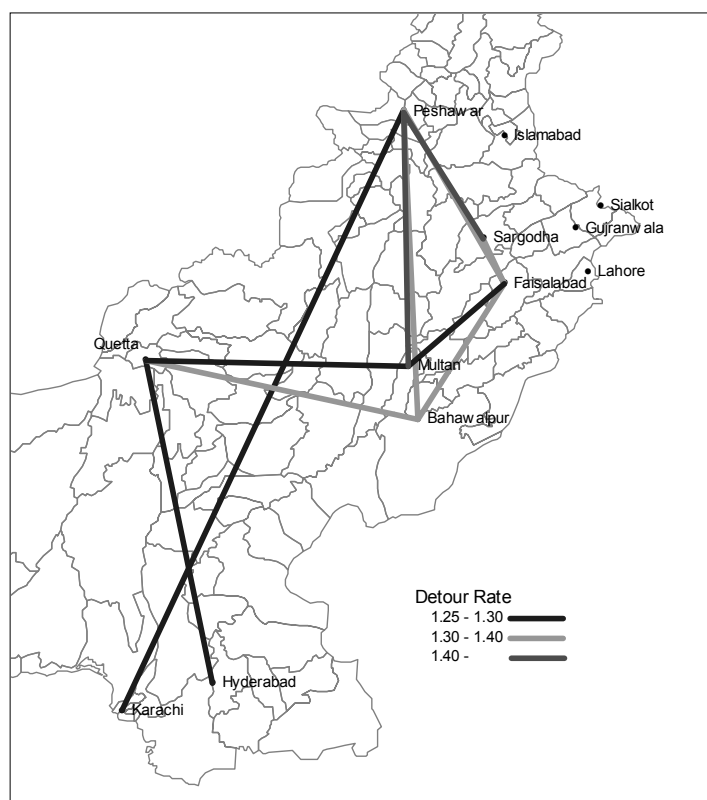
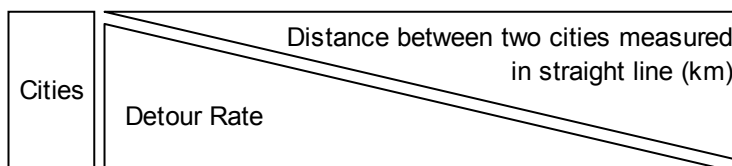


Figure 7.2.7 Geographical Distribution of High Detour Rates

7.2.6 Implications of the Analyses on Road Planning

The implications of the analysis on the road planning are summarized as follows.

- M-7 and a new road between Hyderabad and Sukkur along Nara Canal can be nominated as new shortcut road of N-5.
- Road capacity of N-5 and N-55 in Sindh Province should be expanded as early as possible. Construction of new roads or dualization of N-55 can be considered.
- Road capacity of N-5 and M-2 between Rawalpindi and Lahore should also be expanded. Access control of N-5 and traffic control in urban area are important because construction of new roads may be difficult along this corridor.
- New bridges are necessary for the River Indus, Jhelum, Chenab, Ravi and Sutlej. River crossing demand is very high in Punjab Province.
- M-4 will significantly reduce the detour rate between Multan and Faisalabad, and can be given high priority.

7.3 Development Plan

7.3.1 Pakistan Motorway Network

Currently, 10 motorways (M1 – M10) of 2,667 km are planned or already operated. In addition to these, 9 more motorways (M11 – M19) with total extension of 2,140 km were identified and proposed by the PTPS. Table 7.3.1 and Figure 7.3.1 detail the current, committed, and indicative motorway network of Pakistan, as modeled by PTPS. The network development has two salient features: 1) It diversifies the demand away from the current single N/S corridor of N5, and 2) in the case of failure of one corridor, the alternative routes could be used effectively.



Figure 7.3.1 Location of Proposed Motorway Network

Table 7.3.1 List of Proposed Motorway Network

Code	From	To	Distance (km)	No. of Lane	Cost (US\$ Million)	Remark
M-1	Islamabad	Peshawar	155	6	447.7	On-going
M-2	Lahore	Islamabad	367	6	-	Existing
M-3	Faisalabad	Bhatian	53	4	-	Existing
M-4	Faisalabad	Multan	243	4	368.0	BOT/PPP
M-5	Multan	Rajanpur	220	4	700.0	BOT/PPP(ADB)
M-6	Rajanpur	Ratodero	270	6	360.0	PSDP
M-7	Kakkar	Karachi	270	6	300.0	PSDP
M-8	Ratodero	Gwadar	900	2	480.0	PSDP
M-9	Karachi	Hyderabad	136	6	116.7	To be widened
M-10	Karachi		53	6	-	Existing
M-11	Chakwal	Shorkot	289	4	476.9	Proposed by PTPS
M-12	Lahore	Faisalabad	137	4	226.1	Proposed by PTPS
M-13	Lahore	Sialkot	136	6	336.1	Proposed by PTPS
M-14	Sialkot	Bhatian	180	4	297.0	Proposed by PTPS
M-15	Quetta	Khuzdar	327	4	323.2	Proposed by PTPS
M-16	Hyderabad	Ratodero	287	6	278.4	Proposed by PTPS
M-17	Bargah	Rajanpur	280	4	195.7	Proposed by PTPS
M-18	Khairgarh Fort	Shorkot	276	4	193.5	Proposed by PTPS
M-19	Khuzdar	Bela	228	4	364.8	Proposed by PTPS

Source: JICA Study Team

The total cost of these nine motorways is estimated to be US\$ 2,892 million. The main planning points are as follows:

- While industrialization is deemed to be a key factor in Pakistani economic growth, industries have recently been locating in Punjab north of Faisalabad, especially around Sialkot and Gujranwala. To support these industries, the existing M-3 should be extended to the north to Sialkot via Gujranwala (M-14). At the same time, Lahore is connected directly with Sialkot (M-13) and Faisalabad (M-12).
- Among the four provincial capitals, only Quetta is served with no planned motorway. In order to provide an alternative route of N15, a motorway was proposed by the PTPS (M-15). In the long term, this line should be extended to the south (M-19) and connected with M-7.
- The other routes were planned mainly to provide shorter routes than the route taking M-1 to M-10.

7.3.2 Highway Network

The highway network configuration in Pakistan has almost been completed. However, most sections except N-5 are single lane roads (one lane per direction), which has a limited capacity as well as problems to secure safe traffic. Therefore, the main focus of road investment will be “widening” rather than “new construction”.

By 2025, many highways will need widening into dual-2 carriageway due to heavy demand exceeding present capacity, especially in Punjab province. Figure 7.3.2 shows the highways to be widened and improved. They will be examined at the evaluation stage for their economic viability and appropriate timing of implementation.

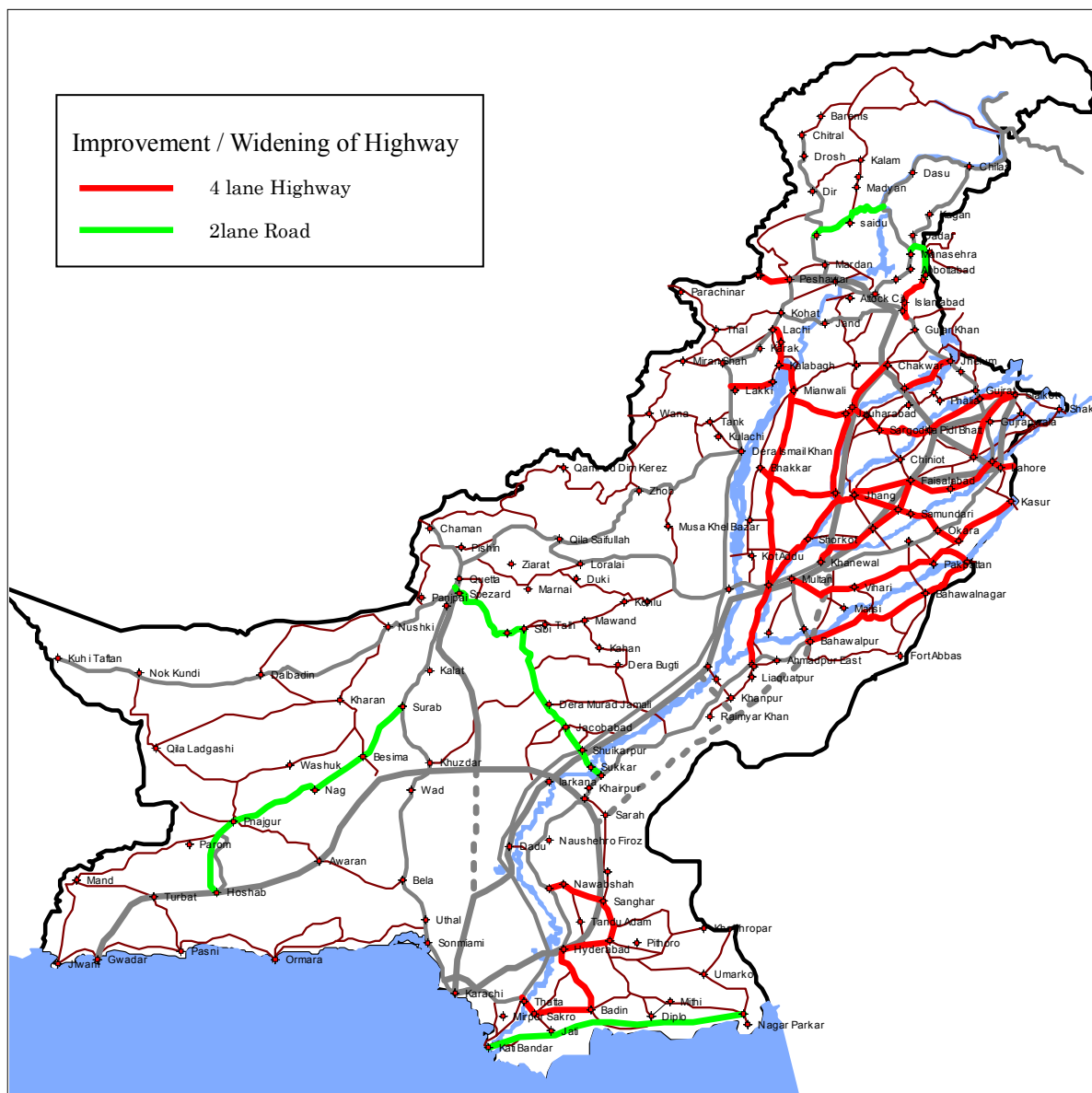


Figure 7.3.2 Highway Improvement and Widening Plan

7.3.3 Cross River Development

The density of bridges over the vast network of rivers in Punjab could be considered, to be low for such a populous area by any standards. This is particularly true for the river Indus. In order to improve the cross-river interaction of communities for more balanced regional growth and increased flow of goods, WB is currently studying nine candidate locations to select four sites for new bridges. In addition provincial authorities have also indicative plans to enhance cross-river community interaction by proposing nine bridges in Punjab province for implementation in the medium to long term future.

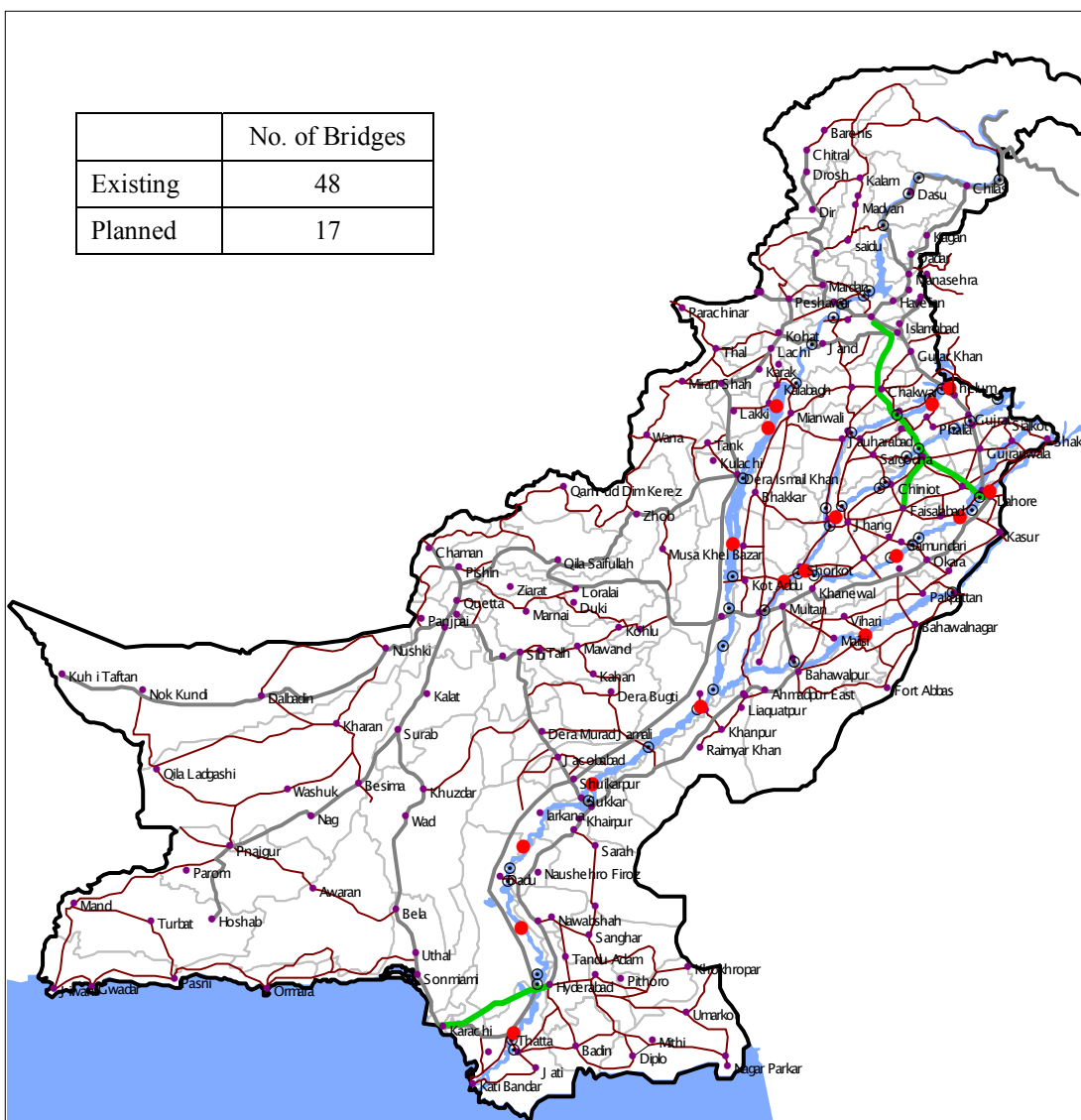


Figure 7.3.3 Existing and Proposed Bridges

7.3.4 Bypass Schemes

(1) Needs of Bypass

Most medium to small cities of Pakistan have developed along the major arterial roads. In almost all cases the development has been gradual from small town to large town, and medium size city to large city, just growing totally unplanned as ribbon development. The increase in road space has hardly kept pace with the growth in communities. To alleviate the traffic congestion, bypass schemes have been implemented in a number of cities, and numerous new schemes have been planned. The densities of by passes in the figure below illustrate the insatiable need for such highway schemes. This is also considered a quick fix to major traffic problems.

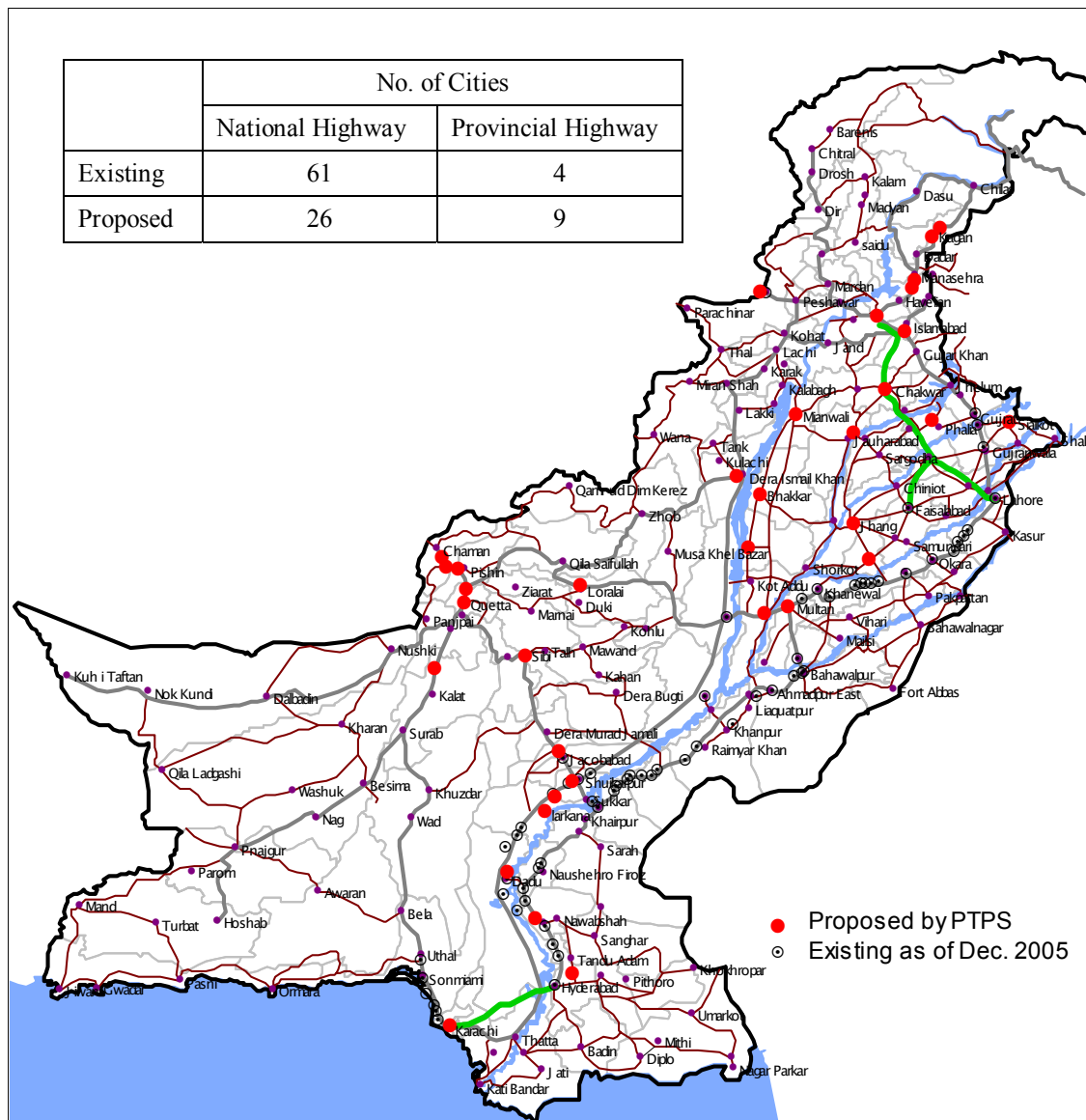


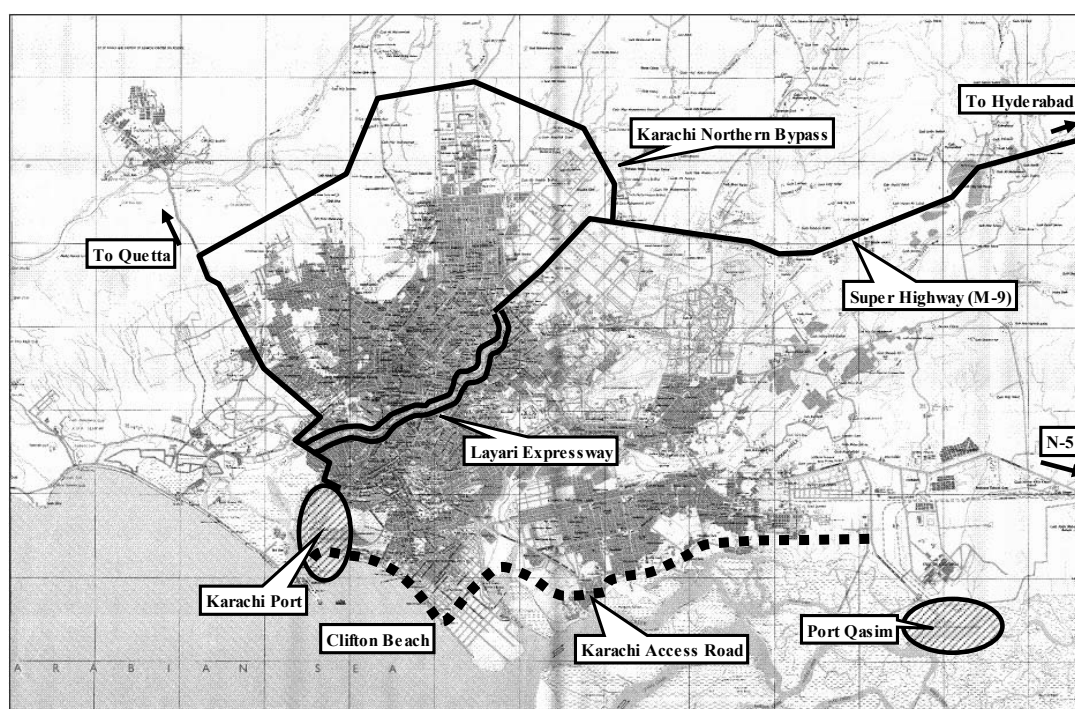
Figure 7.3.4 Location of Existing and Proposed Bypasses

(2) Karachi Access Road

Karachi Access Road (37.5km) connects Karachi port and Qasim port directly. This road prevents Karachi city from being congested with freight from Karachi/Qasim ports. The Access Road, combined with the Karachi Northern Bypass, will form an outer ring road and will contribute largely to modify the transport problems in Karachi city.

The Access Road is planned to pass through southern area of Karachi city avoiding residences, buildings and mangroves. It will begin from the east side of the bridge over the Baba Channel, which is planned by the Karachi Port Trust to construct through BOT scheme. The M.A. Jinnah Road in east wharf will be connected to the Access Road by ramp structures to secure direct access to the port area. The Access Road will run easterly mostly along sea coast with viaduct structures in the section along the Clifton Beach and the sections crossing urban areas, eventually reaching Qasim Port.

This Access Road will be used more effectively to manage freights from the Karachi Port if a container dry port is planned in the Qasim Port area. In planning this road, the road alignment and road structure should be studied carefully to minimize land acquisition, resettlement and construction cost. Impacts should be assessed on natural and social environment such as mangrove, resettlement and so on.



Source : JICA Study Team

Figure 7.3.5 Karachi Access Road

(3) Lahore Strategic Peripheral Route

The Punjab P&D Department proposed a strategic route that would act as a bypass for the “strategic” intercity traffic that currently has to find its way through the urban streets of Lahore. The route as proposed would be a major step towards the long term plan of directly linking the Pakistan motorway, international route to/from India (via GT Road & Ferozepur Road), and the strategic radial intercity routes to/from Lahore, thus keeping much of the through traffic out of the city’s urban streets. In addition it would allow intercity movement of goods vehicle to cross Lahore 24-hours a day. The project would need a full-scale planning, engineering and evaluation feasibility studies.

Figure 7.3.6 depicts an indicative alignment, and the exact alignment would be the outcome

of a comprehensive feasibility study. Table 7.3.1 gives the indicative costs and phased development programme for the entire route. These costs are based on the ultimate design of a motorway standard dual-3 road, with grade separated interchanges. However, it could be built in phases, where section C and D could be built as dual-2 and later expanded to be dual-3, when the dual section is near capacity.

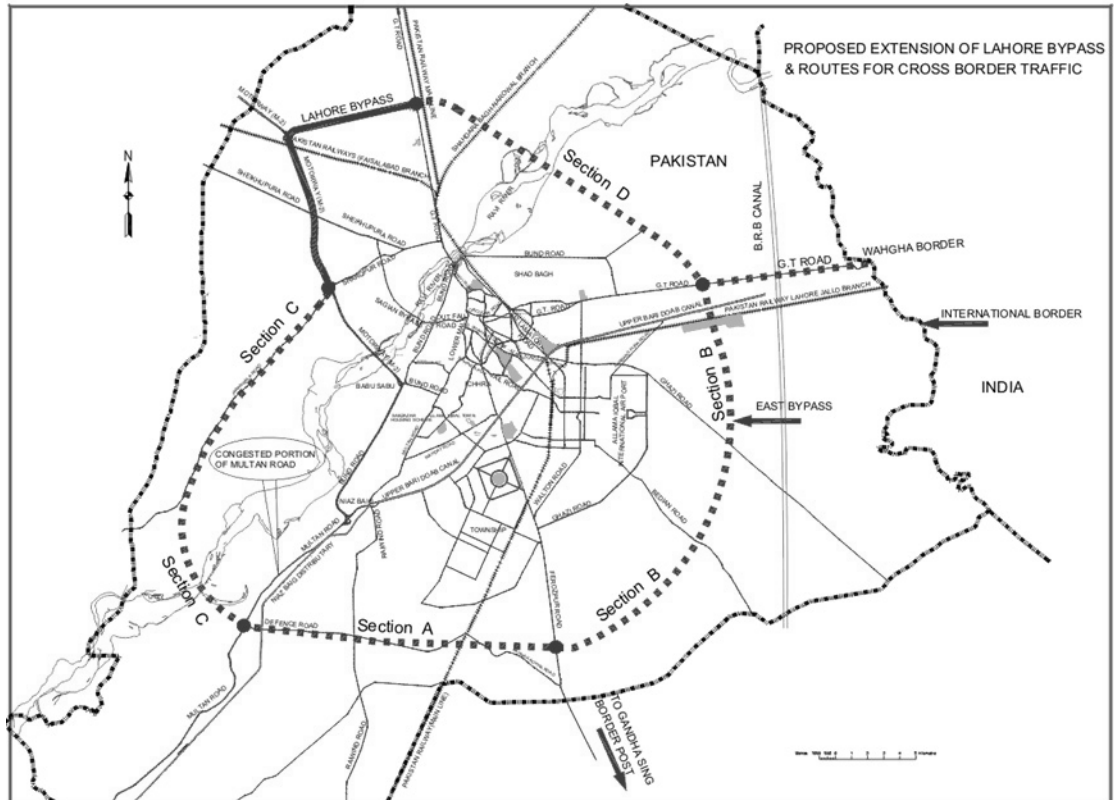


Figure 7.3.6 Location Map of Lahore Strategic Peripheral Route

South-West Section 'A' (Length ~18 km)

This approximately 18km section would provide a direct link from Multan Road with Ferozpur road. In addition it would also intercept other major radial routes (Raiwind road) and a number of key local radial roads. This section would also enhance the accessibility of the fastest growing medium to high income urban area of Lahore.

It would have four major interchanges, including three where it crosses major intercity roads: Multan Road, Raiwind Road and Ferozpur Road. Seven other major links of carriageway width of 30 to 50 meters have been proposed in the City Master Plan, which would cross the proposed alignment. Some of these roads are currently under construction as the area is being developed by public and private entrepreneurs

South-East Section 'B' (Length ~22 km)

This section is between Ferozpur Road and G.T. Road. Both of these roads are expected to have direct links to India and are being upgraded to dual-3 lane configuration to carry the expected heavy demand. Other intercity routes that would have interchanges include: Harike Road and Bedian Road. Areas close to Ferozpur Road and G.T. Road are mostly industrial and low income housing. The central part would pass through the low density, high income and high vehicle ownership area of Defense Housing. This section would also have direct access route to Lahore International Airport and the current dryport of Mughalpura.

This section is proposed to have three major interchanges, and may include additional access and egress ramps for radial routes. This section is intended to be the second major phase of the project, after the completion of Phase I.

West South-West Section ‘C’ (Length 22 km)

This section on the west side of the Ravi River is considered to be third priority section. It would start from Faizpur Interchange on Lahore Bypass (M2) to Multan Road on the east side of Ravi, passing through Nankana District via Sharqpur Town area. This section is considered important, because Multan Road section between Shahpur Interchange and Defense Road has commercial landuse on both sides and is already congested.

This section would therefore also act as a bypass for through traffic currently using Multan road and Bund road between Niaz beg and M2 Ravi Bridge. This section would need a new dual-3 bridge over River Ravi, and interchanges at Multan Road, M2 and one for local area of Sharqpur.

North-Eastern Section ‘D’ (Length 22 km)

This section is considered to be of lowest priority, as the immediate hinterland is mostly flood plain and it is not planned for development in the near to medium term future. Therefore it placed in Phase IV of the entire route development programme. This section would provide a direct route from G.T Road in the east to N5 and M2 in the north at Kala Shah Kaku.

In the long term this section would relieve the pressure on the remainder of the peripheral route, and would be needed in the long term. There would be at least one interchange with access road from the Bund Road. Interchanges would be required at G.T Road and N5/Kala Shah Kaku Interchanges. A bridge over Ravi to the north is also planned, and the cost is included in the Table 7.3.2.

Table 7.3.2 Lahore Strategic Peripheral Route Development Plan

Section	Length (km)	Total Cost	Project Phasing (Years)							
			1	2	3	4	5	6	7	
A	18	6,240	2,840				1,700	1,700		
B	22	5,810		3,260				2,550		
C	22	4,640			3,780				860	
D	21	6,650					5,800			850
Total	83	23,340	2,840	3,260	3,780	7,500	4,250	860	850	
Section A	Multan Road to Ferozepur Road									
Section B	Ferozepur Road to G.T. Road (East)									
Section C	Faizpur Interchange to Multan Road via Sharqpur on the West Bank of Ravi									
Section D	G.T. Road East to G.T. Road West at Kala Shah Kaku, the northern section across Ravi									
Sec. A – D	Cost without Interchanges = 15,680									
Sec. A – D	Interchange Cost= 7,660									

Source: Punjab Province

7.3.5 Road Maintenance

This section discusses road maintenance mainly quoting the discussion from the Transport Note No. TRN-4 (World Bank, June 2005).

(1) Importance of Road Maintenance

In Pakistan, more emphasis has been placed in the past on new construction to extend the road network rather than maintaining the road infrastructure assets. The allocated fund for maintenance was always insufficient to meet the minimum level of demand from road administrators, and as the consequence, maintenance backlogs have been accumulated. The deteriorated roads cannot be brought back to the original level of service at reasonable expenditure, which leads to a need for major rehabilitation or reconstruction.

As is generally understood, postponing of road maintenance results in high direct and indirect costs. If road defects are repaired promptly, the cost is modest. The repair costs progressively rise in line with the years of neglecting of repair. If defects are neglected, an entire road section may fail completely, requiring full reconstruction at three times or more the cost of maintenance. Delayed maintenance causes indirect costs as well. It results in increased vehicle operation costs and threatened road safety.

At NHA, it is increasingly recognized that greater emphasis and more spending on road maintenance are necessary to preserve the national road infrastructure asset. A road fund was established in 2001 with the World Bank support, and NHA has increased its spending on maintenance, however, NHA should spend more to reduce the backlog of maintenance.

(2) Type of Maintenance

Road maintenance comprises “activities to keep pavement, shoulders, slopes, drainage facilities and other structures and property within the road margins as near as possible to their as-constructed or renewed condition” (Permanent International Association of Road Congress: PIARC 1994). Maintenance must be done regularly with a goal to preserve the assets, not upgrade them. It includes minor repairs and improvements to eliminate the cause of defects and to avoid excessive repetition of maintenance efforts.

For management and operational convenience, road management is generally classified as routine, periodic, or urgent.

1) Routine Maintenance

Routine maintenance aims “to ensure the daily passability and safety of existing roads in the short-run and to prevent premature deterioration of roads” (PIARC 1994), and comprises small-scale works conducted regularly. Frequency of activities varies but is generally once or more per week or month. Typical activities include roadside verge cleaning, and grass cutting, cleaning of silted ditches and culverts, patching, and potholes repair.

2) Periodic Maintenance

Periodic maintenance covers activities on a section of road at regular and relatively long intervals, aiming at preservation of the structural integrity of the road. The maintenance operations tend to be large scale, requiring specialized equipment and skilled personnel. It costs more than routine maintenance and requires specific identification and planning for implementation and often even design. Activities can be classified as preventive maintenance and include resurfacing, overlay, and pavement reconstruction. Resealing and overlay works are generally undertaken in response to measured deterioration in road conditions. Repaving is needed about every eight years.

3) Urgent Maintenance

Urgent maintenance is undertaken for repairs that cannot be foreseen but require immediate attention, such as collapsed culverts or landslides that block a road.

Maintenance does not include rehabilitation, building shoulders, or widening of roads. If the sections to be rebuilt constitute more than 25 percent of the road length, the work is rehabilitation, not maintenance.

(3) Maintenance Cost

Maintenance costs vary with road condition, traffic volume, geographic location, climate conditions, work methods, technical equipment and other factors.

NHA has established a system to prepare an annual maintenance program using the World Bank's HDM-IV. Yearly data of road condition, traffic condition, etc. are collected, by subletting the work to local consultants.

It is understood that at the provincial level, ADB is supporting the assessment of medium-term road maintenance needs with a similar approach as NHA, assessment of funding sources, and design and implementation of funding mechanism. Before establishment of the system, the worldwide routine and periodic maintenance costs data from the World Bank's ROCKS (Road Costs Knowledge System) Database (refer to Table 7.3.3) can be referred to as a guideline for preparation of the maintenance plan. The Transport Note No. TRN-4 suggests to start assuming US\$500 per kilometre per year for routine maintenance at the municipal level and US\$500 – 750 per kilometre per year for maintenance at the national level.

Table 7.3.3 Worldwide Road Maintenance Cost Data – ROCKS

Unit: US\$/km

Work Class	Work Type	Predominant Work Activity	Average	Minimum	Maximum
Routine	Routine Maintenance	Unsealed 2-lane Highway	1,037	277	2,027
		Bituminous 2-lane Highway	2,289	347	5,580
Periodic	Grading	Light Grading	110	51	205
		Heavy Grading	522	323	876
	Gravel Resurfacing	Regravelling	14,912	1,879	65,038
	Bituminous Pavement	Fog Seal	8,946	2,805	15,783
	Surface Treatment Resurfacing	Slurry seal	10,337	3,526	27,520
		Single Surface Treatment	18,876	5,295	38,607
		Double Surface Treatment	27,502	10,684	45,277
	Asphalt Mix Resurfacing	Asphalt Overlay < 40 mm	41,676	12,878	82,320
		Asphalt Overlay 40-59 mm	68,070	21,021	126,131

Source: World Bank's ROCKS Website

In developed countries, it is said that a budget equivalent to 2-2.5 percent of the value of road infrastructure should be dedicated to road maintenance each year in order to maintain an optimum level of service. However, the actual expenditure does not reach this level even in the developed countries. According to the recent survey conducted in several European Union countries, the UK makes the largest investment, but it is about 1.8 percent of the total network value.

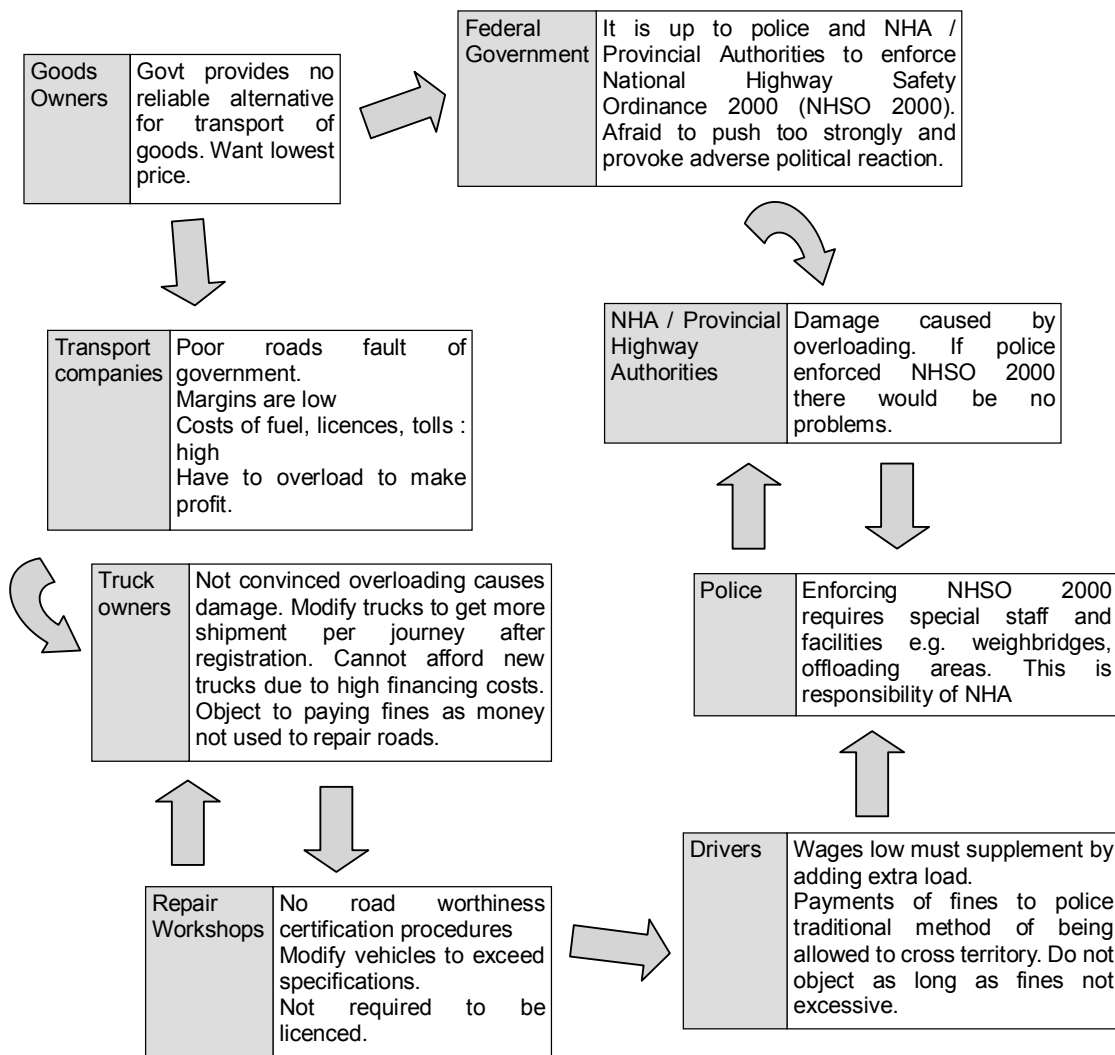
In Pakistan, the appropriate investment level for road maintenance should be determined through accumulation of its own data and analysis, and maintenance criteria should be determined.

In order to address the under-financing problem of road maintenance, the Government of Pakistan has started an off-budget financing arrangement by establishing a road fund called Road Maintenance Account. The NHA has introduced a fee-for-service concept on the national highways. Toll revenues and receipts from all sources specifically earmarked for road maintenance are channelled through the road fund. However, NHA still has difficulty to secure the required fund for road maintenance.

(4) Axle Load Control

a) Basic Approach to Overloading

Overloading by trucks is another serious issue in Pakistan that causes road damages as well as traffic accidents and hinders smooth traffic flow. Overloading is a complex problem involving many different stakeholders and requires a major change in attitude among many groups. Issues can be understood as shown in Figure 7.3.7 and Table 7.3.4.



Source: JICA Study Team

Figure 7.3.7 Overloading Vicious Circle

Table 7.3.4 Overloading Vicious Circle

Stakeholder	Responsibility	Attitude & Status	Action Required
Goods Owners	Pay for shipment of goods	Complain there is no reliable alternative for transport of goods. Want lowest price.	Consider alternative transport of goods e.g. railways.
Transport companies	Service providers	Consider poor condition of roads to be fault of poor design / construction by government. Complain margins are so low and costs of fuel, licenses, tolls, protection money so high they have to overload to make profit.	Transport companies to be registered. Use only registered vehicles.
Truck owners	Compelled by law to register trucks.	Not convinced overloading causes damage. Modify trucks to get more shipment per journey after registration. Cannot afford new trucks due to high financing costs. Object to paying fines as money not used to repair roads.	Register trucks, maintain annual licences and road worthiness certificates. Employ qualified drivers and check their credentials. Pay fair wages to drivers.
Drivers	Drive trucks and deliver goods.	Wages are so low must supplement by adding extra load sometimes unknown to owner. Consider payments of fines to police traditional method of being allowed to cross-territory. They are unaware of laws. Do not object as long as fines not excessive.	Extra training for drivers. Risk loss of license if break regulations.
Federal Government	Legal Regulations. Passed National Highway Safety Ordinance 2000 (NHSO 2000)	It is up to police and MOC / Provincial Authorities to enforce laws. Afraid to push too strongly and provoke adverse political reaction.	Improve alternatives for goods transport e.g. railways, containers. Provide soft loans to transporters for new vehicles. Set up central authority to regulate road transport sector. Centralizes licensing procedures
NHA / Provincial Communications, Works and Services Departments	Construct and maintain roads	Overloading causes damage. If police enforced NHSO 2000 there would be no problems.	Enforce registration of vehicles. Enforce Road worthiness certification process.
Police – Highway Police, traffic police and regular police are very different bodies.	To enforce NHSO 2000	Enforcing NHSO 2000 requires special staff and facilities e.g. weighbridges, offloading areas. This is responsibility of police, NHA and provincial authorities.	Enforce NHSO 2000 with special staff, weighbridges, offloading areas in collaboration with NHA et al. Set up central registry of offenders. Suspend licenses of habitual offenders.
Repair Workshops	Modify vehicles to exceed specifications. Not required to be licensed.	As there are no real roadworthiness certification procedures not concerned.	Only modify vehicles in accordance with regulations on roadworthiness certifications. Failure to do so results in loss of licenses.

Source: JICA Study Team

b) Supporting Projects

Overloading is a complex problem involving many different stakeholders. It is a longstanding traditional practice and requires a major change in attitudes among many groups.

Active Steps Required:

Effective registration of vehicles with the government

New vehicles are legally required to be registered. This registration procedure must include the use and capabilities of the vehicle, e.g. number of persons permitted to be carried on a passenger vehicle, or tare weight and permitted load weight on a commercial vehicle. This data should be recorded on the registration documents and shown on a plate attached to the vehicle.

Transporters to be required to keep records of goods shipped

Transporters should be required to keep records of manifests giving details of good moved and produce these if demanded to show they are operating within legal limits.

Road worthiness test centres to check for vehicle modifications to chassis and load bearing capacities

Vehicles are often modified after registration with strengthened chassis and larger vehicle bodies, but brakes are not improved. Commercial vehicles are required to obtain fitness certificates from the Motor Vehicle Inspection (MVI) Branch of the Police every 6 months under the West Pakistan Motor Vehicle Ordinance 1965. This test should be used to detect modified vehicles and if detected they should be required to reregister.

Weighbridges and inspectors for checking of laden/unladen weight, mechanical fitness, tyre pressure permits, driver's license, registration books

Weighbridge operators are often persuaded to permit vehicle to proceed by financial inducement or intimidation as the vehicle belongs to an influential person. Weighbridges should be linked to a central registry so individual vehicles can be identified by number plates and the data once recorded cannot be tampered with to avoid prosecution.

Training for drivers in maintenance, understanding of traffic laws and the need for its observance

Many drivers do not have any proper training or licenses. This needs to be rectified with checks on drivers' credentials.

Loading capacities of trucks and trailers to be visibly marked.

This should be carried out at the registration stage and cross checked by the MVI.

Road markings and signs acknowledging low literacy rate amongst drivers

Many drivers are illiterate and cannot read road signs. Symbols which are internationally recognized and easily understood should be adopted.

Transport companies given soft loans to purchase modern trucks.

Loans for vehicles are currently given at extortionate interest rates and this is cited as a reason for not replacing old vehicles. Viable loans could be offered linked to companies and drivers performance.

Promoting use of containers to prevent open body trucks “overloading by volume”

Encouragement of the use of containers to replace the old open topped Bedford trucks would enforce a height restriction on vehicles.

Trucking business being under the control of a single ministry

Fragmentation of responsibility and authority is an issue. A single authority controlling all roads would preclude this.

Regulations governing truck repair workshops

Repair shops regularly modify trucks outside their design parameters. Workshops preparing vehicles for the MVI inspection should be licensed and checked.

Training of regular police in traffic issues

Traffic police have just been established in Islamabad. Some 200 police officers have been trained in traffic management issues by the Motorway Police and commenced operation in December 2005. However they only control the Capital Area. Similar units should be created in all major cities and their authority eventually extended to all roads.

Coordination between all stakeholders to implement requirements of National Highways Safety Ordinance 2000

It is noted that on 23.11.2005 a meeting was held in the Federal Ministry of Communications, attended by all the provincial highway departments, at which all these issues were discussed. Implementation plans were put forward and it now remains to be seen if the necessary finances are made available.

7.3.6 Cost Estimation Design Standard

The present “Standards for Roads in Pakistan (NHA)” specify the functional classification of roads, which was prepared based on the recommendations in the previous JICA study in 1995. There are four basic classes, i.e. Motorways and Expressways, Primary Roads, Secondary Roads and Tertiary Roads.

The Motorways and Expressways (MW and EW) are four or six lane divided highways. The access of the Motorways is fully controlled, while the access of Expressways is partially controlled.

The Primary Roads are basically the National Highways and Provincial Roads on the primary routes. They are further split into three categories i.e. Primary I (P-I), Primary II (P-II) and Primary III (P-III), depending on the number of lanes and pavement of shoulders.

Secondary Roads (S-I) are the Provincial Roads which serve as feeder roads for the primary routes. The Tertiary Roads (T-I) are basically the collector roads for the secondary network.

The road standard for each class is shown in Table 7.3.5, and respective typical cross section in Figure 7.3.8. The present study focuses on the inter-regional road network, which corresponds to the network of the Motorways and Expressways and the Primary Roads.

Table 7.3.5 Road Standards

Classification	No. of Lanes	Design Speed (km/hr)	Planning Guideline (Traffic)		Typical Cross Section						Application and Type of Pavement
			Vol. Limit (pcu/day)	Level of Service v/c (Ratio)	Carriageway Width	Line Width	Shoulder Width (m)		Formulation (m)	R.O.W. (m)	
							Right	Left			
Motorways and Expressways (MW and EW)	Min. 4-Lane Access Controlled	F: 120 H: 90	80000	C (0.70)	7.3	3.65	3	3	29.6 (Minimum)	63	AC or P.C.
Primary I (P-I)	4-Lane Divided	F: 110 H: 100 M: 80	60000	C (0.70)	7.3	3.65	3	3	27.6 (Minimum)	63	AC
Primary (II) (P-II)	2-Lane Treated Shoulder	F: 100 H: 80 M: 60	34000	C (0.70)	7.3	3.65	3	3	15.3	63	AC
Primary (III) (P-III)	2-Lane Un-Treated Shoulder	F: 100 H: 80 M: 60	24000	C (0.70)	7.3	3.65	3	3	15.3	63	AC/TST
Secondary (S-I)	2-Lane Narrow	F: 80 H: 60 M: 50	20000	C (0.70)	6	3	3	3	14	33	AC/TST

Source: National Highway Authority, “STANDARDS FOR ROADS PAKISTAN”

Abbreviation: F: Flat Area

H: Hilly Area (Rolling Area)

M: Mountainous Area

R.O.W.: Right of Way

V/C Ratio: Volume/Capacity

P.C.: Portland Cement

SH: Shingle

AC: Asphalt Concrete

TST: Triple Surface Treatment

Note: Guideline Factors of Average Passenger-car Equivalent of Trucks and Buses (Heavy Vehicles)

Flat Area 3.0, Hilly Area 4.0, and Mountainous 6.0

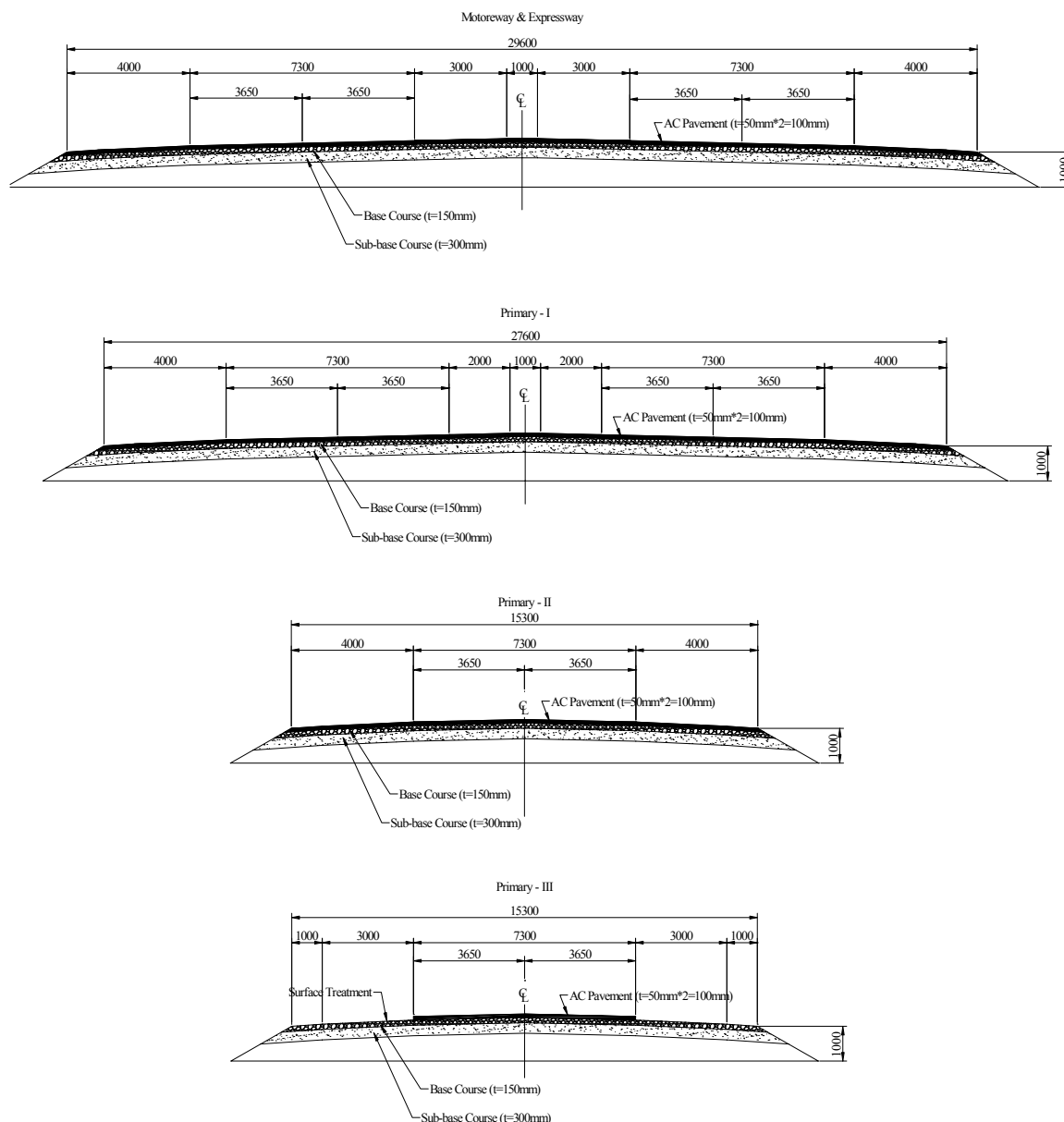


Figure 7.3.8 Typical Cross Sections

7.3.7 Cost Estimation

(1) Road Infrastructure

Construction costs of newly proposed projects were estimated by the following method, which was used in the previous JICA study. Per kilometre construction cost was inflated based on comparison of the unit rates of major work items between two points of time, i.e. 1994 in the previous study and 2005 in the present study, based on the following conditions:

- Typical cross section for each class is as explained in 6.3.6. Since there is no significant difference in the road standard and cross sections from those assumed in the previous study, per kilometre quantities of major work items are considered to remain unchanged.
- Pavement thickness selection was also referred to the result of the previous study which calculated the thickness of each layer in accordance with Road Notes 29 and 31 and referring to the AASHTO method. The following grouping of design traffic expressed in cumulative number of standard axles also referred to the previous study.

Table 7.3.6 Category of Cumulative Standard Axles

Group	Cumulative Number of Standard Axles for 10 years (in million)		
A	-	-	0.1
B	0.1	-	1.0
C	1.0	-	6.0
D	6.0	-	10.0
E	10.0	-	40.0
F	40.0	-	-

Source: JICA Study Team

The present unit rates of major work items were obtained from NHA. Table 7.3.7 shows a comparison of the unit rates consisting of labor, materials and equipment costs plus overhead and profit between 1994 and 2005. The 2005 rates are 0.9 and 3.6 times higher than the 1994 rates.

Table 7.3.7 Comparison of Unit Rates

(Unit Rs.)

Item	Unit	1994	2005				Estimation of this study	Ratio 2005/1994
			Province					
			Balochistan	Punjab	Sind	NWFT		
Earth Work								
Clearing/Grubbing	m2	6	9.40	9.30	9.40	9.27	9	1.50
Embankment (Common Ex.)	m3	123	146.08	144.14	145.04	144.28	145	1.18
(Rock Ex.)	m3	-	353.50	349.91	351.89	349.94	351	-
(Borrow Ex.)	m3	120	157.12	155.13	159.17	155.17	157	1.31
Cutting								
(Common)	m3	47	102.51	101.03	101.54	101.46	102	2.17
(Rock)	m3	74	271.07	265.87	268.16	266.36	268	3.62
Pavement								
Wearing Course (Ac)	m3	3758	6,149.57	6,179.06	6,147.67	6,045.42	6,130	1.63
Tack Coat	m2	12	11.25	11.81	11.05	11.79	11	0.92
Prime Coat	m2	33	29.24	28.64	28.75	28.46	29	0.88
Base Course (Agg.)	m3	517	810.33	914.71	872.08	777.35	844	1.63
Sub Base (Agg.)	m3	353	645.37	705.51	689.19	543.20	646	1.83
D. Surface Treatment	m2	113	111.76	114.91	110.99	112.70	113	1.00
T. Surface Treatment	m2	84	135.43	139.60	134.67	136.54	137	1.63
AC Base	m3	3,180	5,434.23	5,482.24	5,440.85	5,346.47	5,426	1.71
Drainage/Structures	Ls/km	*1					*1.5	1.50
Bridges	m2						*0.18	
Safety/Traffic Facilities	Ls/km	*0.5					*0.75	1.50

Note : *indicate million Rs.

Source : National Highway Authority (NHA), 2005 <http://www.nha.gov.pk/Info/Csr.asp>

Per kilometre construction cost was calculated based on the sum of the inflated cost of earthworks, pavement works, minor bridge/structure works and safety facilities, added by general items cost (5-10%) and physical contingency (10-15%). The estimated per kilometre costs for new roads and improvement categories of projects are shown in Table 7.3.8 and Table 7.3.9.

Construction costs of long bridges over the Indus River and its tributaries and viaducts were estimated separately.

The project costs were estimated as the sum of construction cost, engineering cost (assumed

10% of construction cost), land acquisition and compensation cost and administration cost (assumed to be 2% of construction cost).

Table 7.3.8 Per Kilometer Construction Cost for New Roads

(Million Rs./km)

Classification of Highways/Roads					
Items	MW and EW	P-I	P-II	P-III	S-I
Clearing/Grubbing	0.30	0.30	0.18	0.18	0.17
Earth Work	12.18	9.74	5.90	5.90	5.31
Pavement					
C.S. AXLES-C					6.82
C.S. AXLES-D			7.96	7.94	7.12
C.S. AXLES-E	20.61	19.78	11.36	11.34	10.01
C.S. AXLES-F	28.72	28.39	15.67	15.64	
Drainage/Structures	3.00	3.00	1.50	1.50	1.50
Safety/Traffic Facilities	1.50	1.50	0.75	0.75	0.75
Total					
C.S. AXLES-C					16.73
C.S. AXLES-D			18.74	18.72	17.07
C.S. AXLES-E	46.99	39.47	22.65	22.63	20.40
C.S. AXLES-F	57.13	49.37	27.60	27.57	

Source: JICA Study Team, based on the previous JICA study in 1995

Note: The above figures are in case of flat terrain. These figures are multiplied by 1.70 and 2.30 are in case of rolling and mountainous terrain.

Table 7.3.9 Construction Cost per Kilometre for Road Improvement

Group	Classification	Design Class Exit.-Prop.	C. Standard Axles	Unit Cost (Rs Million/km)
Construction Due to Capacity Deficiency	Duel Carriageway/ Widening and Rehabilitation	PII-PI	E	35.40
			F	46.53
			Mean	40.97
		PIII-PI	E	35.66
			F	46.79
			Mean	41.22
		SI-PI	E	35.91
			F	47.05
			Mean	41.48

Source: JICA Study Team, based on the previous JICA study in 1995

Note: The above figures are in case of flat terrain. These figures are multiplied by 1.15 and 1.30 are in case of rolling and mountainous terrain.

(2) Vehicle Fleet

As has been estimated in Chapter 3.5, about 700,000 new buses and 1.6 million new trucks will have to be introduced over 20 years (2005/06 – 2025/26). The total procurement cost of these vehicles is estimated at about Rs. 5,517 billion.

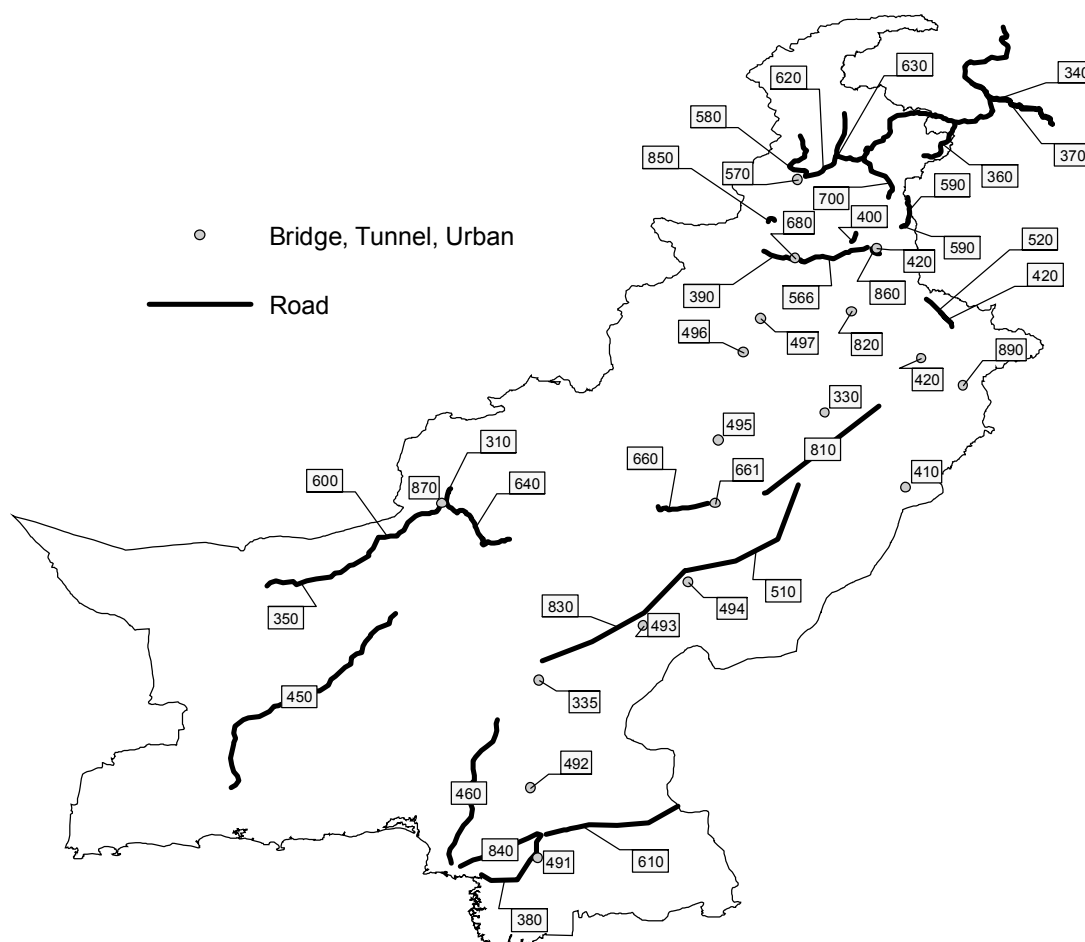
7.4 Master Plan Projects

7.4.1 Candidate Projects

(1) New Projects in MTFD

All the new projects in MTFD¹ other than on-going and committed projects should be included in the Master Plan. There are 54 projects in this group, consisting of 5 motorway projects, 12 bridge projects, 4 bypass projects, 2 tunnel projects, and others. The total project cost is estimated at about Rs. 330 billion.

The new projects in MTFD are listed in Table 7.4.1, and Figure 7.4.1 shows the location of these projects.



Source: JICA Study Team (Projects were mapped from the MTFD lists.)

Figure 7.4.1 Location of New Projects in the MTFD

¹ The project list of road in MTFD was updated several times. JICA Study Team could not follow all the changes. The projects in “New Projects in MTFD” include such projects once listed in project lists of old version but excluded from the later version.

Table 7.4.1 List of New Projects in MTFD

No.	Name ¹⁾	Type ²⁾	Cost
310	Improvement of Quetta Western Bypass	I	225.5
340	Five Bridges on Gilgit Skardu Road, S-1	N	214.7
350	Noshki- Dalbadin Section (165 Km) (N 40) Balochistan	I	1,986.0
360	Jhalkhad- Chillas Road (63 Km) N-15	I	1,827.3
370	KKH-Skardu Road S-1 (167 Km)	I	4,000.0
380	Ghaggar Phatak Bridge to Kotri N-5	N	2,850.0
390	Jand-Kohat National Highway N-80 (46 Km)	I	1,000.0
400	Link Road from M-1 GT Road to Hazara Road Bypassing Hassanabdal	N	500.0
335	Bridge over River Indus at Larkana	N	2,500.0
410	Dhakpattan Bridge (P.M directive)	N	520.0
415	Dadu Ratodero (150 Km) Fence+Ser. Rd N-55	I	3,750.0
330	Bridge over River Indus at Chund (Riwaz)	N	700.0
420	Other Projects (Interchanges on M-2,Urban Areas Development etc)	N	3,000.0
450	Widening & Improvement of Hosahb-Nag-Bsima Surab (459 Km)	I, W	12,100.0
460	Karachi-Hub-Dureji-Kakar Motorway (M-7) 270 Km	N	18,000.0
491	Bridge between Kotri Bridge and Sajjawal Bridge	N	2,500.0
492	Bridge between Kotri Bridge and Dadu Moro	N	2,500.0
493	Bridge between Kandhkot and Ghotki	N	2,500.0
494	Ravi cum Road bridge over Indus linking Chachran with Mithanokot	N	2,500.0
495	Bridge over Indus linking Taunsa and Leiah	N	2,500.0
496	Bridge over Indus at Kalur Kot	N	2,500.0
497	Bridge over Indus linking Mianwali with Isa Khel	N	2,500.0
500	ITS & Corridor Management along the Corridor		6,000.0
830	Ratodero-Rajanpur Motorway Section (M-6), 270 Km	N	21,600.0
520	N-5 (Gujranwala-Kharian-Sara e Alamghir, 98 Km) service road along with fence	I	4,200.0
600	Lakpass-Noshki Section (120 Km), N-40	I, W	3,600.0
640	Improvement of N-65 Quetta- Dhadhar Section (127 Km)	I, W	6,350.0
580	National Highway N-45 (Chakdara-Dir, Kalkatak- Chitral) 120 Km	I, W	6,000.0
590	Murree- Kohala-Muzaffarabad-Chakothei (S-2)Road N-75, 120 Km	I, W	6,000.0
610	Hydrabad-Khokhrapar (222 Km)	I, W	8,880.0
620	Chakdara- Kalam Road (130 Km)	I, W	6,500.0
630	Khwaza Khela- Besham Road (66Km)	I, W	3,300.0
690	Ratodero-Sehwan (200 Km) N-55	I, W	6,000.0
660	N-70 (D.G Khan-Sakhi Sarwar-Bewata, 165km) incl. Ghazi Ghat Bridge.	I, W	6,200.0
680	Bridge over River Indus at Khushalgrah (N-80)	N	3,500.0
700	Rehab/Improv/Widening of KKH (Mansehra-Khunjarab, 712km)	I, W	18,500.0
810	Faisalabad-Multan Motorway M-4	N	22,080.0
820	Periodic Overlay on M2 & Realignment of Slat Range	I	11,840.0
510	Khanewal-Lodharan-Uch Sharif-Mithankot-Rajanpur Motorway M-5	N	42,000.0
840	Karachi-Hyderabad Motorway M-9 (136km)	W	7,000.0
850	Peshawar Northern Bypass (26km)	N	3,078.1
860	Rawalpindi Bypass (28km) & Tarnol Interchange N-5	N	3,489.1
870	Lakpass Tunnel (N-25)	N	570.5
890	Shahdara Flyover N-5	N	4,500.0

1) Names are not necessarily the same as indicated in MTFD.

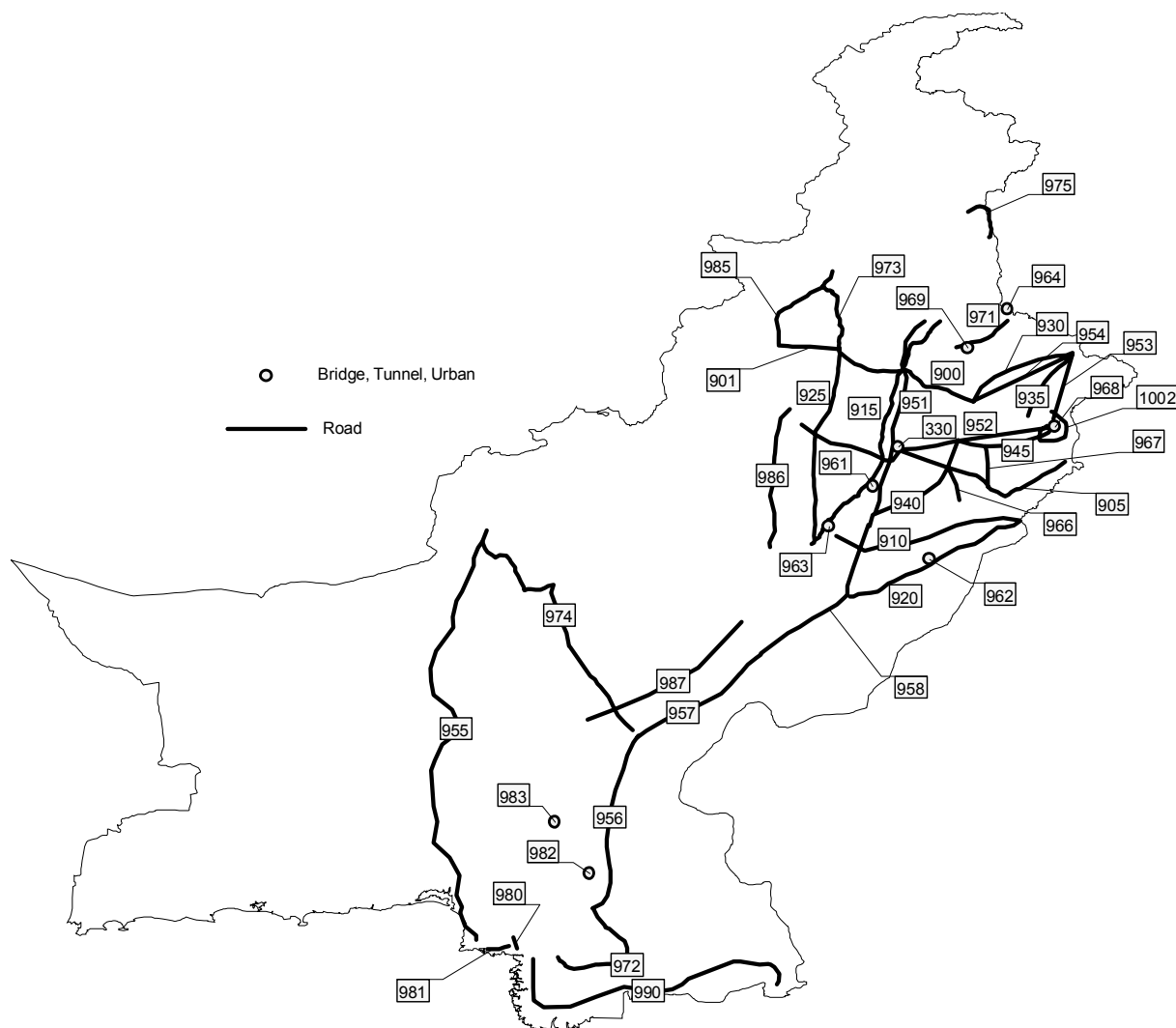
2) I: Improvement, N: Construction, W: Widening, D: Dualization

Source: MTFD, NHA, JICA Study Team

(2) Proposed Projects in PTPS

For network development, PTPS proposes new motorways, dualization of provincial highways, new bridges on major rivers, and new bypass roads at major cities other than those included in MTDf. This involves nine motorways at a total cost of Rs. 183.7 billion, 23 provincial road projects at Rs. 516.8 billion, 19 bypass projects at Rs. 45.5 billion, and 11 bridges at Rs. 12.1 billion. In addition to these projects, port access roads in Karachi, the second Kohat Tunnel and other highway projects are proposed. The total cost of the proposed projects in PTPS is estimated at about Rs. 830 billion.

The projects are listed in Table 7.4.2 and the location is indicated in Figure 7.4.2. The costs were estimated based on unit costs calculated in Chapter 6.4.2.



Note: Locations of bypass projects are excluded.
Source: JICA Study Team

Figure 7.4.2 Location of Proposed Projects in PTPS

Table 7.4.2 List of Proposed Projects in PTPS

Code	Name	Type	Cost
	Motorways		
951	M11 (Chakwal – Shorkot, 289km, 4-lane)	N	29,645
952	M12 (Lahore – Faisalabad, 137km, 4-lane)	N	8,673
953	M13 (Lahore – Sialkot, 136km, 6-lane)	N	12,575
954	M14 (Sialkot – Bhatian, 180km, 4-lane)	N	11,395
955	M15 (Quetta – Khuzdar, 327km, 4-lane)	N	32,143
956	M16 (Hyderabad – Ratodero, 287km, 6-lane)	N	29,336
957	M17 (Bargah – Rajanpur, 280km, 4 lanes)	N	20,526
958	M18 (Khairgarh Fort – Shorkot, 276km, 4-lane)	N	20,273
959	M19 (Khuzdar – Bela, 228km, 4-lane)	N	19,087
	Sub-total		183,653
	Highways		
985	N55 Dualization (Kohat – D.I.Khan)	W	14,230
986	N55 Dualization (D.I.Khan – D.G.Khan)	W	9,600
987	N55 Dualization (Rajanpur – Ratodero)	W	11,630
959	N55 (Dadu - Kotri) 4-lane	W	10,000
974	N65 Dualization	I	23,645
1002	Lahore Peripheral Road	N	24,299
	Sub-total		93,404
	Tunnel		
655	Second Kohat Tunnel	N	6,000
	Sub-total		6,000
	Bridges		
961	Bridge on River Chanab at Garh Maharaja, District Jang	N	1,000
962	Bridge on River Sultaj to link Chistan Burewala Road	N	500
963	Bridge on River Chanab near Head Mohammadwala	N	600
964	Jhelum, Gatalian Mirpur Bridge	N	1,250
330	Bridge on River Chanab at Chund	N	700
966	Bridge on River Ravi near Qutab Shahara	N	500
967	Bridge on River Ravi at Syedwala	N	600
968	6-Lane Bridge (4-lanes for roadway and two lanes for LRT Lahore – Shahdrah)	N	950
969	Victoria Bridge Linking Malikwal - Pind Dadan Khan.	N	1,000
982	Bridge on River Indus (Khanote – Hala old)	N	2,500
983	Bridge on River Indus (Dault pur – Shehwan)	N	2,500
	Sub-total		16,360
	Port Access Road		
981	Karachi Port Access	I	15,000
980	Qashim Port Access	I	3,878
	Sub-total		18,878
	Improvement/ Construction of Provincial Roads		
900	Punjab East-West Corridor- 1 (Sheikhpura - Mianwali)	I	55,068
915	Punjab North-South Corridor- 1 (Chakwal - Muzaffargarh)	I	70,122
905	Punjab East-West Corridor- 2 (Kasur - Bhakkar)	I	60,618
910	Punjab East-West Corridor- 3 (Sulemanki - Multan)	I	69,420
935	Sialkot – Sheikhpura – Sialkot Road	I	14,838
945	Lahore – Jaranwala – Faisalabad (Bypass) – Jhang Road	I	31,770
940	Fasalabad – Samundari – kacha Khu Road	I	22,818
925	Punjab North-South Corridor-2 (Mianwali – Muzaffargarh)	I	11,232
930	Sialkot – Wazirabad – Pindi Bhattan Road	I	24,648
920	Bahawalpur – Bahawal Nagar – Sulemanki Road	I	34,722
971	Pind D. Khan – Jhelum Road	W	4,462
972	Hyderabad – Badin – Thatta	W	11,048
975	Lower Topa – Mansehra Road	I	11,616
973	Mianwali – Shakardarra – Lachi Road	W	6,517
990	Sindh Coastal Highway	C	20,309
	Sub-total		454,586

Source: JICA Study Team

cont. of Table 7.4.2.

Code	Name	Type	Cost
Urban Bypasses in Punjab Province			
1011	Chakwal	N	1,380
1012	Bhakkar	N	850
1013	Khushab	N	1,275
1014	Mianwali	N	850
1015	Jhang	N	1,200
1016	Toba Tek Singh	N	960
1017	Mandi Bahauddin	N	1,290
1018	Sialkot	N	1,800
1019	Multan	N	1,900
1020	D.G.Khan	N	2,125
1021	Layyah	N	750
1022	Muzaffargarh	N	1,176
1023	Rawalpindi	N	8,000
1024	Lahore	N	16,900
1025	Gujranwala	N	3,430
1026	Bahawalpur	N	920
1027	Bahawalnagar	N	341
1028	Rahim Yar Khan	N	219
1029	Khan Pur	N	170
Sub-total			45,536
Grand Total			818,417

Source: JICA Study Team

Figure 7.4.3 illustrates the results of traffic assignment to the road network in 2025 after all the projects in PTPS are completed. The figure at left shows the results if the target modal share is achieved while the right figure shows the results if the road network needs to carry all the future demand of freight transport.

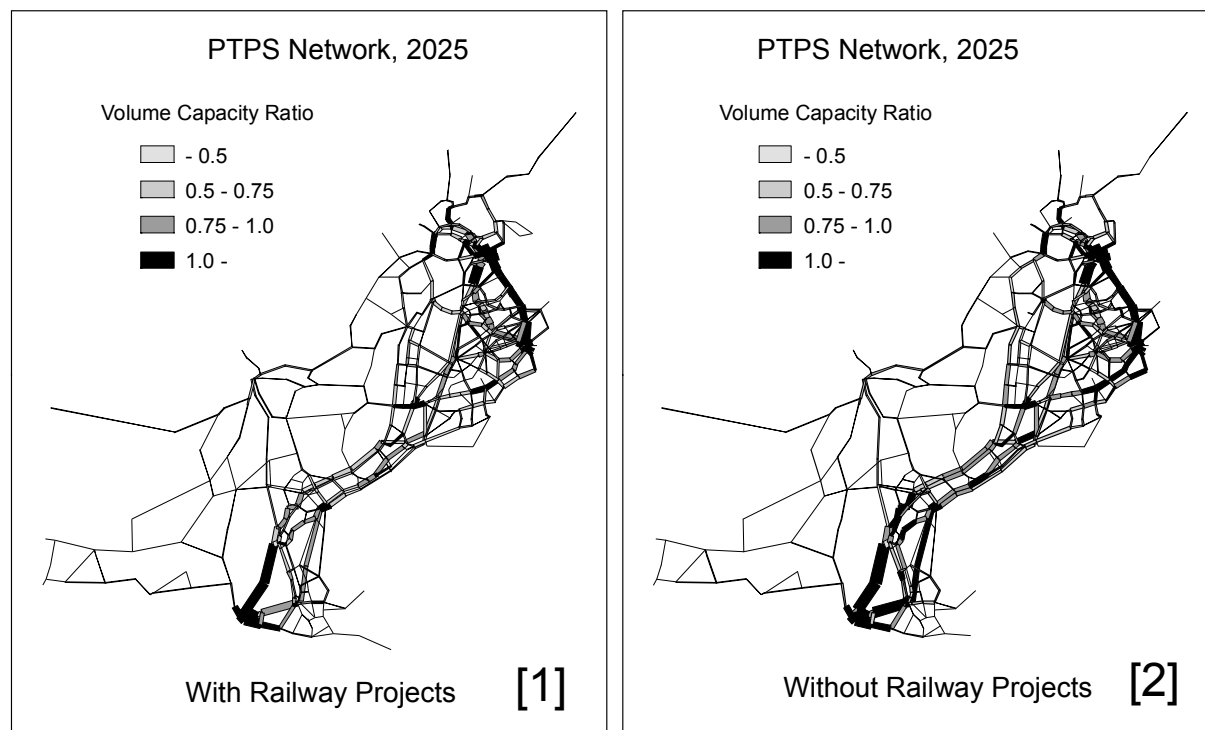


Figure 7.4.3 Traffic Assignment for PTPS Network

7.4.2 Project Evaluation

(1) Economic Analysis

Development of the transport system to support economic and social activities is one of the three transport policies of PTPS, and it is expected that each project in PTPS will contribute to economic growth in Pakistan. The economic analysis evaluated to what degree each project would increase economic benefit compared with the project cost. Economic Internal Rate of Return (EIRR) was calculated for each project to assess the economic validity based on the following assumptions:

- Economic benefit is calculated for motor vehicles – car, bus, and truck.
- Project benefits comprise the savings in vehicle operating cost (VOC) and passenger time cost.
- All road projects are implemented in four years (2006 – 2009) and are opened to traffic at the beginning of 2010.
- Evaluation period was set at 30 years from opening.
- Traffic demand for “without case” is the demand when the proposed modal share between rail and road is achieved. In other words, the proposed railway projects are built into the “without case” and “with case” models.

NTRC has unit VOC data that is commonly used for road projects in Pakistan. PTPS updated the unit VOC using the recent (2005) price data by vehicle type, and combined the data into three vehicle categories using vehicle composition rate taken from the PTPS Traffic Survey. The estimated unit VOC is shown in Figure 7.4.4.

Passenger time values for travelling were updated from those values in the previous JICA Study, applying escalation rates. The concept of opportunity cost was considered for the calculation. Table 7.4.3 shows the calculated passenger time values by vehicle category.

Table 7.4.3 Passenger Time Value

(Unit: Rs. /Hour)

Year	2005	2010	2015	2020	2025
Car	71	94	122	157	197
Bus*	156	207	269	345	434

Note: The values are combined from that of minibus and large bus into “Bus”

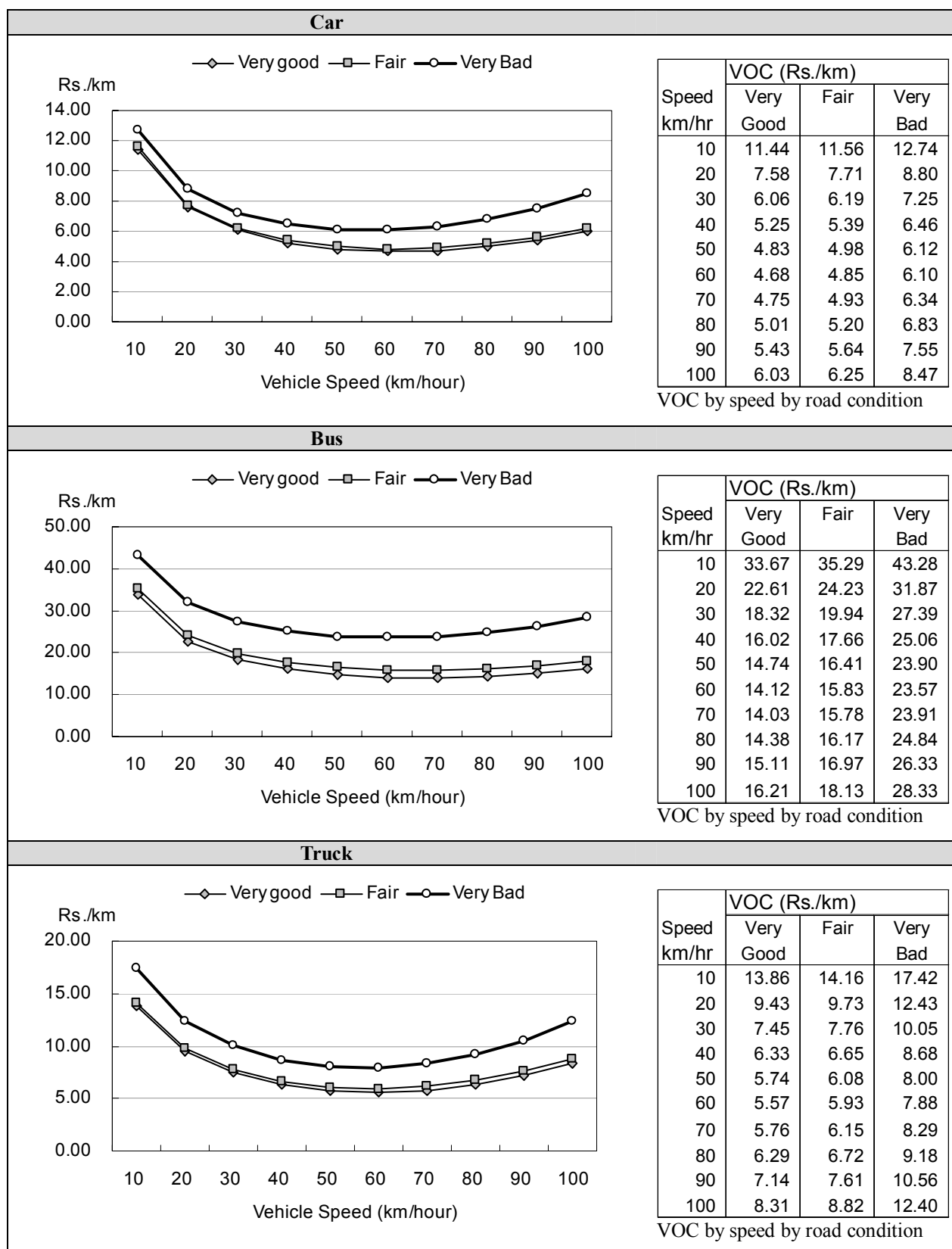
Source: JICA Study Team

Setting “with case” and “without case” is one of the principles of economic analysis, but it is almost impossible to consider all “with-without” sets when the number of projects is large. In order to evaluate many projects, two types of with-without case were considered based on which case is the base case. One type regards “without case” as the base case while the other case regards “with case” as the base. The difference is summarized in Table 7.4.4.

Table 7.4.4 Setting of With -Without Case

	Type-A	Type-B
Without Case	Only ongoing and committed projects are completed on the existing network.	Only the evaluated project is not completed among MTFD Projects on the existing network.
With Case	The evaluated project is added to the “without case” above.	All MTFD Projects are completed on the existing network.

Source: JICA Study Team



Source: JICA Study Team

Figure 7.4.4 Vehicle Operating Cost (Economic) by Vehicle Type by Road Condition

(2) Evaluated Projects

A number of traffic assignments were carried out based on the PTPS traffic model (refer to Chapter 4) to calculate the total VOC and the total travel time by vehicle category for each with case and the without case. Since the model was designed to calculate inter-district traffic volume, it is difficult or impossible to estimate intra-district or urban traffic. Therefore, traffic assignment has not been carried out for some projects such as bypass projects and small projects.

Table 7.4.5 shows the list of projects for traffic assignments. Some small projects were combined into other projects. For example, Khushalgarh Bridge project and Jand-Kohat Road project were combined into one project because the access road (Jand-Kohat) should only be improved together with construction of the Khushalgar Bridge. In addition to the individual projects, traffic assignment was carried out for the MTDF road network and the PTPS road network.

Table 7.4.5 List of Road Projects for Traffic Assignment

Code	Name	Cost Rs. Million	Mark*
335	Bridge over River Indus at Larkana	2500.0	M
350	Noshki-Dalbadin Section (165km) (N40), Balochistan	1986.0	M
380	N5: Ghaggar Phatak Bridge-Kotri	2850.0	M
450	Widening & Improvement of Hosahb-Nag-Bsima-Surab (459km)	12100.0	M
460	M-7 (Karachi-Hub-Dureji-Kakar Motorway) 270km	18000.0	M
492	Bridge, San-Sakarand	2500.0	M
493	Bridge (Khandhkot-Ghotki)	2500.0	M
494	Ravi cum Road Bridge (Chachran-Mithankot)	2500.0	M
495	Bridge (Taunsa-Leiah)	2500.0	M
496*	Bridge (Kalur Kot) & Access Road (50km)	3500.0	M
510	M-5 (Khanewal-Lodharan-Uch Sharif-Mithankot-Rajanpur)	42000.0	M
580	N-45 (Chakdara-Dir, Kahkatak-Chitral) 120km	6000.0	M
590	Muree-Kohala-Muzaffarabad-Chakothi (S-2), N-75	6000.0	M
600	Lakpass-Noshki (120km)	3600.0	M
610	Hyderabad-Khokhrapar (222km)	8880.0	M
631	Khwaza Khela-Besham, Chakdara-Kalam Road (630+620)	9800.0	M
640	Improvement of N-65 Quetta-Dhadhar Section (127km)	6350.0	M
655	2nd Kohat Tonnel project	7755.0	P
660	Muzaffargarh-D.G.Khan-Sakhi Sarwar-Bewata Section N70(165km)	6200.0	M
681	Khushalgarh & Jand-Kohat Road (680+390)	4500.0	M
700	KKH	18500.0	M
810	Faisalabad-Multan Motorway M-4	22080.0	M
830	M-6	21600.0	M
840	M-9	7000.0	M
900	Punjab East-West Corridor-1 (Sheikhpura-Mianwali Road)	55068.0	P
901	Mianwali-Lakki Road (973+497)	9016.6	P
905	Punjab East-West Corridor-2 (Kasur, Okara, Jhang, Bhakkar)	60618.0	P
910	Punjab East-West Corridor-3 (Head Sulemanki - Sultan Multan)	69420.0	P
915	Punjab North-South Corridor-1 (Chakwal-Khusab-Muzaffargarh)	70122.0	P
920	Bahawalpur, Bahawal Nagar Sulemanki Road	34722.0	P
925	Punjab North-South Corridor-2 (Mianwali-Muzaffargarh)	11232.0	P
930	Sialkot Wazirabad Pindi Bhattian Road	24648.0	P
935	Sialkot Gujranwala Sheikhupura Road	14838.0	P
940	Faisalabad, Samundari, Kacha Khu Road	22818.0	P
945	Lahore Jaranwala Faisalabad (Bypass) Jhang Road	31770.0	P
951	M11	29644.5	P
952	M12	8673.0	P
953	M13	12574.6	P
954	M14	11395.3	P
955	M15	51229.5	P
956	M16	29336.2	P
957	M17	20526.0	P
958	M18	20272.9	P
959	M08	10000.0	P
960	Bridge: Garh Maharaja-Shorkot, Chistian-Burewala, Head Mohammadwala, Lahore (961+962+963+330+967+968+969+966)	5350.0	P
971	Pind D.Khan-Jhelum (4-Lane)	4462	P
972	Hyderabad-Badin-Thatta (4-Lane)	11048.3	P
973	Mianwali-Shakardarra-Lachi	6516.6	P
974	N65 Dualization	23644.6	P
975	Lower Topa-Mansera Road	11616	P

Note : * M – MTDF Projects, P – PTPS Projects

: MTDF Road Network consists of existing road, on-going, committed, and MTDF Projects.

: PTPS Road Network consists of MTDF Road Network + PTPS Projects.

Source: JICA Study Team

(3) Economic Indicators

EIRR was calculated as well as Benefit-Cost Ratio (B/Cs) and Net Present Value (NPV) for road projects at a discount rate of 12% as shown in Table 7.4.6. Since each project was evaluated on the assumption that no other new projects would be carried out, it should be noted that the calculated values of EIRR is different from the EIRR values when each project is evaluated individually based on different assumptions for the “without-case”.

Major points of the result are:

- M-7 (construction) shows a high EIRR at 52.3% and the largest NPV.
- Similarly, M9 (widening) shows a high EIRR at 35.3% and large NPV.
- Among the bridge projects over the Indus River, the Khushalgarh Bridge has the highest EIRR at 22.1%.
- Dualization projects of provincial roads have low EIRRs, except for Mianwali-Muzaffargarh Road.
- Among the new motorway projects, M-16 shows high performance with EIRR at 23.0% and high NPV, as does the M-8 (M-19) project.
- M-11 and M-17 have EIRR near 15% and barely positive NPV.
- Motorway projects having low EIRR are M-11, M-12, M-14, M-15, and M-17.
- M-5, whose project cost is high at Rs. 42 billion, shows low EIRR
- KKH, whose traffic demand is small, shows low EIRR.
- Hosahb-Nag-Bsima Surab Road, where traffic demand is small and the project is not expected to increase traffic volume, shows very small B/C at 0.2.

Viewpoints for priority setting may be drawn from those points.

- M-7 and other projects having high EIRR such as bridge projects should be carried out in the MTFD period. Since some bridges compete with each other, it is necessary to consider the combination of the projects.
- Several MTFD Projects are not economically feasible, and some of them can be carried out after the MTFD period. However, most of such projects have strategic importance for regional development. Therefore, it is necessary to evaluate these projects against other criteria.
- On the other hand, several PTPS Projects that are economically feasible (e.g. 2nd Kohat Tunnel Project) should be candidates for short-term projects.
- Project costs for dualization of provincial roads are expensive compared to the economic benefit. It is necessary to divide the projects into several components so that the projects can be realized in a staged manner.

Table 7.4.6 Calculation of Economic Indicators

Code	Name ¹⁾	Type-A*			Type-B*
		EIRR %	B/C	NPV Rs. Million	EIRR %
335	Bridge over Indus (Larkana)	13.3	1.2	402	22.9
350	N40 (Noshki-Dalbadiin)	22.0	2.9	3,299	22.2
380	N5 (Ghaggar Phatak Bridge-Kotri)	47.1	21.0	50,409	23.4
450	Hosahb-Nag-Bsima Surab	-2.7	0.2	-8,983	2.4
460	M-7 (Karachi-Hub-Dureji-Kakar)	52.3	13.8	203,738	55.5
492	Bridge, Sansakarand	16.3	1.6	1,332	21.1
493	Bridge (Khandhkot-Ghotki)	6.7	0.5	-1,050	21.8
494	Ravi cum Road Bridge (Chachran-Mithankot)	17.8	1.7	1,504	26.1
495	Bridge (Taunsa-Leiah)	13.3	1.1	313	19.8
496	Bridge (Kalur Kot) & Access Road (50km)	8.7	0.7	-951	13.3
510	M-5 (Khanewal-Lodharan-Rajanpur)	7.9	0.6	-14,137	13.2
580	N-45 (Chakdara-Dir, Kahkatak-Chitral)	3.1	0.4	-3,243	13.5
600	N-75 Muree-Kohala-Muzaffarabad-Chakothi	4.8	0.5	-1,640	18.5
610	Hyderabad-Khokhrapar	3.6	0.4	-4,973	11.3
630+	Khwaza Khela-Besham, Chakdara-Kalam Rd.	7.8	0.6	-3,222	12.8
640	N-65 Quetta-Dhadhar Section	-2.6	0.2	-4,742	12.1
660	N-70 (Muzaffargarh -Bewata)	6.5	0.6	-2,471	13.2
681	Khushalgarh Bridge & Jand-Kohat Road	22.1	2.7	6,690	27.6
690	N55, Ratodero – Sehwan	15.4	1.5	2,590	33.3
700	KKH	0.8	0.2	-12,584	5.0
810	Faisalabad-Multan Motorway M-4	15.6	1.5	8,964	20.6
830	M-6	15.3	1.5	9,453	26.9
840	M-9	35.3	8.8	48,259	12.7
655	2nd Kohat Tonnel project	11.3	0.9	-557	These PTPS Projects were not evaluated because With-Case of Type B consists of only MTDf Projects and no PTPS Projects are included.
900	Sheikhpura-Mianwali Road	3.0	0.3	-34,025	
901	Mianwali-Lakki Road	5.0	0.5	-3,997	
905	Kasur, Okara, Jhang, Bhakkar	2.8	0.3	-37,759	
910	Head Sulemanki – Sultan Multan	-2.5	0.2	-52,032	
915	Chakwal-Khusab-Muzaffargarh	2.6	0.3	-41,634	
920	Bahawalpur, Bahawal Nagar Sulemanki Road	4.6	0.4	-19,415	
925	Mianwali-Muzaffargarh	15.7	1.5	4,658	
930	Sialkot Wazirabad Pindi Bhattian Road	-4.6	0.1	-18,856	
935	Sialkot Gujranwala Sheikhpura Road	N.A.	0.0	-12,872	
940	Faisalabad, Samundari, Kacha Khu Road	8.8	0.7	-6,236	
945	Lahore Jaranwala Faisalabad Jhang Road	3.7	0.4	-18,358	
951	M11	6.3	0.5	-12,734	
952	M12	8.1	0.6	-2,770	
953	M13	11.5	0.9	-749	
954	M14	1.1	0.2	-7,908	
955	M15	N.A.	0.0	-45,185	
956	M16	23.0	2.9	50,372	
957	M17	8.2	0.6	-7,263	
958	M18	11.6	1.0	-859	
959	M8	27.1	4.5	30,767	
960	7-Bridges	27.1	4.0	14,163	
971	Pind D. Khan – Jhelum (4-Lane)	13.4	1.2	696	
972	Hyderabad-Badin-Thatta (4-Lane)	8.9	0.7	-3,401	
973	Mianwali – Shakardarra – Lachi	12.8	1.1	492	
974	N65 Dualization	-13.6	0.1	-19,223	
975	Lower Topa-Mansera Road	-1.4	0.2	-8,120	
980	Qasim Port Access	17.6	1.9	631	

Name¹⁾: Some names are shorten from the original names in accordance with the width of the column.

Type-A: Without Case = Existing Network + Ongoing & Committed Projects

With Case = Existing Network + Ongoing & Committed Projects + The Project for evaluation

Type-B: Without Case = MTDf Network – The Project for evaluation

With Case = MTDf Network

Source: JICA Study Team

(4) Project Effectiveness

Economic benefit as economic-cost is an important criteria for project evaluation. On the other hand, projects should be evaluated to determine to what degree each project contributes to the transport policies described in Chapter 5. Therefore, the projects were evaluated from not only economic benefit but also the following project effectiveness in accordance with the transport policy.

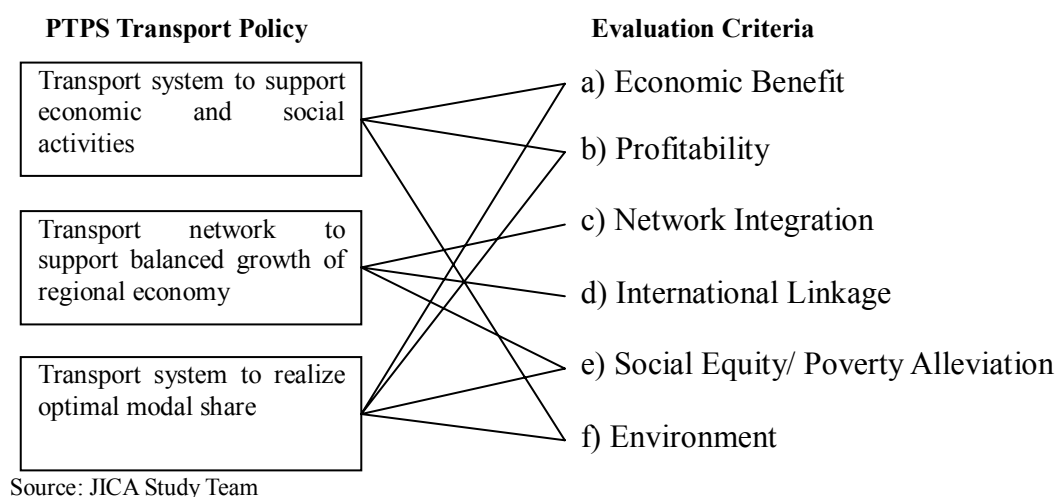


Figure 7.4.5 Criteria for Economic Evaluation

Economic Benefit: As indicators for economic benefit, EIRR, B/C and NPV were calculated as presented in the preceding sections.

Profitability: This evaluates the possibility of recovering the investment cost from revenue generating projects such as toll roads. To reduce the government financial burden, projects which may be implemented on a BOT or PPP basis are also evaluated.

Network Integration: This evaluates the contribution of the project to strengthen not only national trunk routes but also the connectivity of the overall transport network. Bridge projects that eliminate bottlenecks of crossing rivers and motorway projects that form the arteries of the nationwide road network are also attached high priority.

International Linkage: This evaluates the contribution of the project to strengthen international linkage to/from neighbouring countries focusing on links/gateways on the international routes

Social Equity/Poverty Alleviation: This evaluates social equity and poverty reduction. Road projects in mountainous areas and bridge projects on feeder roads in rural areas will provide the poor with access to markets and employment opportunities.

Environment: This evaluates social environment, natural environment and natural conditions. The following items are most critical conditions for project prioritization.

- *Impact on Natural Protected Area:* To avoid passing through or near national parks and Ramsar sites with respect to biodiversity conservation.
- *Impact on Cultural Protected Area:* To avoid passing through or near national monuments and World Cultural Heritage Sites with respect to cultural properties protection.
- *Resettlement:* To avoid passing high density residential areas to minimise resettlement.

(5) Rating

The proposed projects were evaluated in view of each criterion and graded in accordance with the rating shown in Table 7.4.7. EIRR is the basis for the rating of Economic Benefit Criteria. If EIRR was not calculated, the ratings of the similar projects were applied for such projects. In order to set the priority of the projects, the ratings were translated to points as shown in the “Point” column. The points were added up to calculate the total points. The results are shown in Table 7.4.8 and Table 7.4.9.

Table 7.4.7 Rating of Criteria for Project Evaluation

	Criteria	Rating	Point
1	Economic Benefit	a: Very High (EIRR >= 40) b: High (40 > EIRR >= 20) c: Good (20 > EIRR >= 12) d: Acceptable Level (12 > EIRR >= 6) e: Low (6 > EIRR)	20 15 10 5 0
2	Profitability	a: Significant b: Limited c: None	3 1 0
3	Network Integration	a: Significant b: Moderate c: Insignificant	6 3 0
4	International Linkage	a: Strong b: Moderate c: None	6 3 0
5	Social Equity/Poverty alleviation	a: Significant b: Less significant c: Neutral/Negative	6 3 0
6	Environment - Natural Protected Area - Cultural Protected Area - Resettlement	a: No expected serious adverse impacts b: Expected moderate adverse impacts which require detailed survey in F/S or design stage. c: Expected serious impacts*	3 1 0

Note: * “Rating c” is not necessarily mean as an unacceptable project from the view of environmental conservation. These evaluations are without mitigation measures, and providing some mitigation measure may improve the project prioritization. For example “Rating c” with mitigation measures becomes “b” or “a”.

Source: JICA Study Team

Table 7.4.8 Evaluation of MTDF New Road Projects

ID	Project Name	Total Cost (M Rps.)	Project Evaluation and Rating								Total Score (points)
			Economic Indicator	Profitability	Network Integration	International Linkage	Social/ Equity/ Poverty	Environment			
								Natural Protected Area	Cultural Protected Area	Resettlement	
350	N-40 (Noshki- Dalbadin Section), 165 Km	1,986	b	c	b	b	a	a	a	a	36
460	M-7 (Karachi-Hub-Dureji-Kakar) ,270 Km	18,000	a	a	a	c	c	b	b	c	31
492	Bridge between Kotri Bridge and Dadu Moro	2,500	b	c	a	c	b	a	a	b	31
840	N-9 (Karachi-Hyderabad), 136km	7,000	a	a	b	c	c	a	b	c	30
681	Khushalgrah Bridge & Jand-Kohat Road	4,500	b	b	a	c	c	a	a	b	29
850	Peshawar Northern Bypass (26km)	3,078	c	b	a	b	b	a	a	c	29
310	Improvement of Quetta Western Bypass	226	c	c	a	a	b	b	b	b	28
494	Ravi cum Road Bridge over Indus (Chachran - Mithankot)	2,500	c	c	a	c	b	a	a	a	28
870	Lakpass Tunnel (N-25)	567	d	c	a	a	a	b	a	b	28
410	Dhakpattan Bridge	520	d	c	a	a	b	a	a	b	27
520	N-5 Service Road (Gujranwala-Kharian-Sara e Alamghir Section)	4,200	b	c	c	b	b	a	a	c	27
610	Hyderabad-Khokhrapar (222 Km)	8,880	d	c	b	a	a	a	a	b	27
380	N-5 (Ghaggar Phatak Bridge - Kotri)	2,850	a	b	c	c	c	b	b	a	26
496	Bridge over Indus at Kalur Kot	2,500	d	c	a	b	b	a	a	a	26
810	M-4 (Faisalabad-Multan)	22,080	c	a	a	b	c	a	b	c	26
890	Shahdara Flyover N-5	4,500	b	b	b	b	c	a	b	c	26
340	Five Bridges on Gilgit Skardu Road, S-1	215	d	c	a	c	a	b	a	a	24
450	Hosahb-Nag-Bsima Surab Road, 459 Km	12,100	e	c	b	a	a	a	a	a	24
480	Rehabilitation of 518 Km of N-5	14,610	b	c	c	c	c	a	a	a	24
631	Khwaza Khela- Besham/ Chakdara-Kalam Road (66Km)	6,500	d	c	b	b	a	a	a	b	24
495	Bridge over Indus linking Taunsa and Leiah	2,500	d	c	a	c	b	a	a	a	23
690	Ratodero-Sehwan (200 Km) N-55	6,000	c	c	b	c	b	a	a	b	23
860	Rawalpindi Bypass (28km) & Tarnol Interchange N-5	3,489	c	b	b	b	c	a	a	c	23
360	N-15 (Jhalhad- Chillas Road), 63 Km	1,827	e	c	a	b	a	b	a	a	22
500	Intelligent Transportation System (ITS) Corridor Management	6,000	c	c	b	c	c	a	a	a	22
335	Bridge over River Indus at Larkana	2,500	c	c	a	c	c	b	a	b	21
400	Hassanabdal Bypass	500	c	c	a	c	c	a	b	b	21
491	Bridge between Kotri Bridge and Sajawal Bridge	2,500	d	c	a	c	b	b	a	a	21
493	Bridge between Kandhkot and Ghotki	2,500	e	c	a	b	b	a	a	a	21
600	Lakpass-Noshki Section (120 Km), N-40	3,600	e	c	b	b	a	a	a	a	21
700	KKH (Mansehra-Khunjarab), 712 Km	18,500	e	c	b	a	a	c	a	a	21
580	N-45 (Chakdara-Dir, Kalkatak-Chitral), 120 Km	6,000	e	c	b	a	a	a	b	c	19
370	KKH-Skardu Road S-1, 167 Km	4,000	e	c	b	c	a	a	a	a	18
510	M-5 (Khanewal-Lodharan-Uch Sharif-Mithankot-Rajanpur)	42,000	d	c	a	c	c	a	a	c	17
420	Other Projects (ICs on M-2,Urban Area Development etc)	3,000	c	c	b	c	c	b	b	b	16
660	N-70 (D.G Khan-Sakhi Sarwar-Bewata) & Ghazi Ghat Bridge.	6,200	e	c	a	c	b	a	a	b	16
640	Improvement of N-65 Quetta-Dhadhar Section (127 Km)	6,350	e	c	b	b	a	b	b	b	15
820	Periodic Overlay on M2 & Realignment of Slat Range	11,840	e	b	c	c	c	a	a	a	10

Source: JICA Study Team

Table 7.4.9 Evaluation of PTPS Road Projects in Order of Total Score

ID	Project Name	Total Cost (M Rps.)	Project Evaluation and Rating								Total Score (points)
			Economic Indicator	Profitability	Network Integration	International Linkage	Social/ Equity/ Poverty	Environment			
								Natural Protected Area	Cultural Protected Area	Resettle-ment	
956	M16	29,336	b	a	a	c	b	a	a	b	34
655	2nd Kohat Tunnel Project	6,000	c	c	a	b	a	a	a	b	32
960	7 Bridges in Panjab	700	b	c	a	c	b	a	a	b	31
987	N-55 Dualization (Rajapur-Ratodero)	11,630	b	c	b	c	b	a	a	b	28
953	M13	12,575	c	b	a	b	b	a	b	c	27
959	N55 (Dadu-Kotri) 4-lane	10,000	b	c	b	c	b	a	b	b	26
973	Mianwali-Shakardarra Lachi	6,517	c	c	a	c	b	a	a	b	26
957	M17	20,526	c	b	a	c	c	a	a	b	24
901	Mianwali-Lakki Road	2,500	d	c	a	b	b	b	a	a	24
980	Qasim Port Access	800	b	c	c	c	c	a	a	a	24
925	Punjab North-South Corridor-2 (Mianwali-Muzaffargarh)	11,232	c	c	b	c	a	b	a	c	23
971	Pind D. Khan-Jhelum (4-Lane)	4,462	c	c	b	c	b	a	a	b	23
830	Ratodero-Rajapur Motorway Section (M-6), 270 Km	21,600	c	b	a	c	c	b	a	b	22
958	M18	20,273	c	b	a	c	c	b	a	b	22
975	Lower Topa - Mansera Road	11,616	e	c	a	b	a	a	a	b	22
981	Sindh Coastal Highway	20,309	e	c	a	b	a	b	a	a	22
900	Punjab EW Corridor (Sheikhpura-Mianwali)	55,068	d	c	a	c	b	a	a	b	21
920	Bahawalpur-Bahawal Nagar-Sulemanki Road	34,720	e	c	b	a	a	b	a	b	20
910	Punjab EW Corridor (H. Sulemanki - Pak Pattan-Vehari-Multan)	69,420	e	c	b	a	b	a	a	c	18
986	N-55 Dualization (D.I.Khan-D.G.Khan)	9,600	d	c	b	c	b	a	a	b	18
940	Faisalabad, Samundari, Kacha Khu Road	22,820	d	c	b	c	b	a	a	c	17
951	M11	29,645	d	b	a	c	c	b	a	b	17
952	M12	8,673	d	b	a	c	c	a	b	c	16
905	Punjab EW Corridor(Kasur-Okara-Jhang-Bhakkar)	60,620	d	c	b	c	b	a	b	c	15
945	Lahore Jaranwala Faisalabad (Bypass Jhang Road)	31,768	d	c	b	c	b	a	b	c	15
955	M15 & M19	51,300	e	b	a	a	c	b	b	c	15
954	M14	11,395	e	b	a	c	c	a	a	c	13
985	N-55 Dualization (Kohat-D.I.Khan)	14,230	e	c	b	c	b	a	a	b	13
915	Punjab North-South Corridor-1 (Chakwal-Khushab-Muzaffargarh)	70,122	e	c	b	c	b	a	a	c	12
930	Sialkot-Wazirabad-Pindi Bahattian Road	24,648	e	c	b	c	b	a	a	c	12
935	Sialkot Gujranwala Sheikhupura Road	6,440	e	c	b	c	b	a	a	c	12
972	Hyderabad-Badin-Thatta (4-Lane)	11,048	d	c	c	c	b	b	b	b	11
974	Dualization of N65	23,645	e	c	b	c	b	b	b	b	9

Source: JICA Study Team

7.4.3 Implementation Schedule

(1) Short-Term Projects

The Medium Term Development Framework (MTDF), including five-year investment plan for the road sector, was approved by the Government, and NHA has revised the five-year plan. The first budgetary year has started and some projects have already been commenced. Accordingly, the projects in the revised MTDF should be given high priority for the short-term plan. Meanwhile, some projects that were newly proposed in PTPS proved to be economically feasible even if they are started in the next five years, and some were given a high score in the project evaluation in 7.4.2. However, since the very new projects need several years to start, such projects should be excluded as candidates for short-term projects. Another important factor is budget constraint, because PTPS proposes to increase investment in the railway sector. Figure 7.4.6 shows the accumulated cost of new PTPS proposed projects if they are selected from the candidate project list in ranking order. The total project cost of the top 16 is less than the target investment level and these projects are proposed to be the priority projects in the short-term projects. It is recommended not to select such projects with ranking lower than 16.

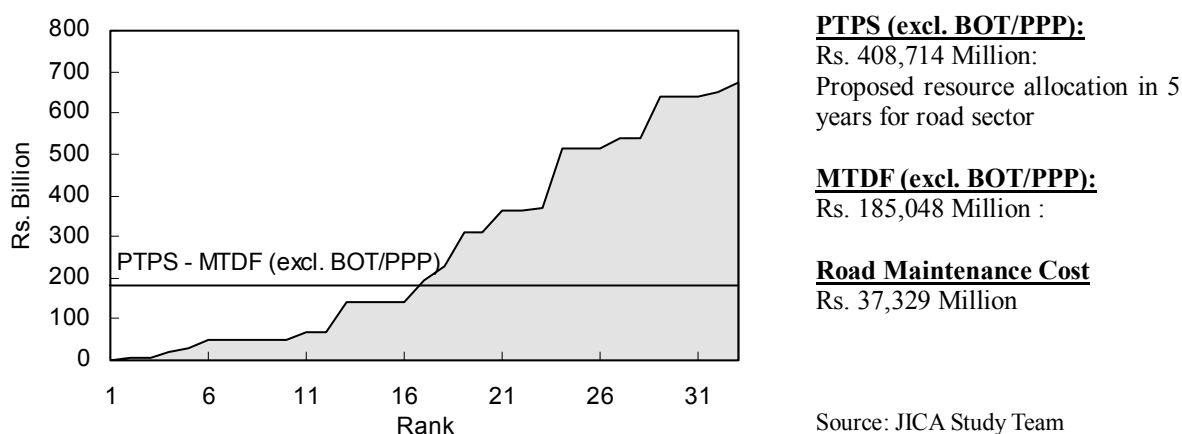


Figure 7.4.6 Accumulated Project Cost by Ranking

(2) Mid-Term and Long-Term Projects

The remaining projects were assigned as Mid-Term Projects and Long-Term Projects considering the maturity of the projects, traffic demand, balance of budget allocation, regional balance and other factors. Table 7.4.10 shows the implementation schedule of projects for the road sector.

Table 7.4.10 Implementation Schedule

No	Projects	Estimated cost (Rs. Million)	Master Plan (M/P)			Beyond the M/P 2025/26-
			2005/06 - 2009/10	2010/11 - 2014/15	2015/16 - 2024/25	
On-going						
10	Makran Coastal Road Balochistan	15,010	████████████████████			
20	Islamabad Peshawar Motorway (M-1)	26,862	██████			
30	Pindi Bhattian Motorway (M-3)	6,877	██████████			
40	Karachi Northern Bypass	2,928	████			
50	Layari Express Way	5,081	██████████			
60	Islamabad -Muzaffarabad Road	7,660	██████████			
70	Indus Highway Project (Phase III)	6,557	██████████			
80	Mansehra Naran Jalkhad Road (N-15)	3,821	██████			
90	Hala-Moro Section (N-5)	2,583				
100	Rahim YarKhan Bahawalpur Section N-5 (166 KM)	7,283	██████████			
110	Okara Bypass	3,912	████			
120	Kharian Rawalpindi(N-5)	5,174	████			
130	Chablat Nowshera (N-5)including flyover at Nowshera Cantt	3,700	██████			
140	Lowari Tunnel & Address Road	7,984	██████████			
150	Bridgr on River Jhelum at Azad Pattan AJK	71	██████			
160	Improvement of N-65 Dera Allah Yar Nutal Section	771	████			
170	Improvement of N-65 Nutal-Sibi -Dhadar Section	1,710	██████			
180	Improvement of KKH (N-35) NWFP	552	████			
190	D.I.Khan Mughal Kot Section (N-50)	1,903	████			
200	Improvement of N-70 Qila Saifullah Loralai Bewata	2,841	██████████			
210	Ratodero-Shahdakot-Khuzdar Section (M- 8)	1,421				
220	Gawadar -Turbat -Hoshab Section (Gawader, Khudar Road (650 km)	16,640	████████████████████			
230	Khori-Quba Seed Khan Section	4,000	██████████			
240	Realignment of N65 Near Jaccabad & Dera Allah Yar Town	478	██████			
250	Bridge over River Chenab at Shershah	1,023	██████			
260	Interchange at Khanqah Dogran on M-2	144	██████			
270	Interchange at Sial More on M-2	74	████			
280	Rehabilitation and Widening of existing road Lala Musa- Gulyana Thotha Rai	60	██████			
290	Nowshera-Chakdara-Dir-Chitral N- 45(81Km)	1,620	██████████			
300	Feasibility Studies	700	████████████████████			
470	N-5 Rehabilitation Project	19,943	████████████████████			
540	Kalat- Quetta-Chaman Section of N-25 (247)	6,671	██████████			
551	Peshawar-Torkham Dual Carriageway (46 Km)	12,787	██████████			
552	Malana junction- Sarai Gambila Dualization (117 Km)		██████████			
553	Badabher- Dara Adam Khel, Rehab of Existing road (28km)		██████████			
554	Sarai Gambila-Bannu-Miran Shah-Ghulam Khan (118km)		██████████			
650	Kohat Tunnel Access Roads	6,627	████			
670	N-25 Karao-Wad Section	2,500	██████████			

Source: JICA Study Team

Pakistan Transport Plan Study in the Islamic Republic of Pakistan (PTPS)

cont. of Table 7.4.10

No	Projects	Estimated cost (Rs. Million)	Master Plan (M/P)			Beyond the M/P 2025/26-
			2005/06 - 2009/10	2010/11 - 2014/15	2015/16 - 2024/25	
590	Murree- Kohala-Muzaffarabad-Chakothi (S-2) Road N-75, 120 Km	6,000	████████████████████			
610	Hydrabad-Khokhrapar (222 Km)	8,880		████████████████████		
620	Chakdara- Kalam Road (130 Km)	6,500		████████████████████		
630	Khwaza Khela- Besham Road (66Km)	3,300		████████████████████		
690	Ratodero-Sehwan (200 Km) N-55	6,000	████████████████			
660	N-70 (D.G Khan-Sakhi Sarwar-Bewata, 165km) incl. Ghazi Ghat Bridge.	6,200		████████████████		
680	Bridge over River Indus at Khushalgrah (N-80)	3,500		████████████████		
700	Rehab/Improv/Widening of KKH (Mansehra-Khunjarab, 712km)	18,500		████████████████████		
810	Faisalabad-Multan Motorway M-4	22,080		████████████████		
820	Periodic Overlay on M2 & Realignment of Slat Range	11,840	██████		██████	
510	Khanewal-Lodharan-Uch Sharif-Mithankot-Rajanpur Motorway M-5	42,000		████████████████		
840	Karachi-Hyderabad Motorway M-9 (136km)	7,000	████████			
850	Peshawar Northern Bypass (26km)	3,078	████████████████			
860	Rawalpindi Bypass (28km) & Tarnol Interchange N-5	3,489	████████████████			
870	Lakpass Tunnel (N-25)	571	████████			
890	Shahdara Flyover N-5	4,500		████████████		
(PTPS New Addition)						
Motorways						
951	M11 (Chakwal – Shorkot, 289km, 4-lane)	29,645			████████████████████	
952	M12 (Lahore – Faisalabad, 137km, 4-lane)	8,673			████████████████████	
953	M13 (Lahore – Sialkot, 136km, 6-lane)	12,575		████████████████		
954	M14 (Sialkot – Bhatian, 180km, 4-lane)	11,395			████████████████████	
955	M15 (Quetta – Khuzdar, 327km, 4-lane)	32,143				████████████████████
956	M16 (Hyderabad – Ratodero, 287km, 6-lane)	29,336			████████████████	
957	M17 (Bargah – Rajanpur, 280km, 4 lanes)	20,526				████████████████████
958	M18 (Khairgarh Fort – Shorkot, 276km, 4-lane)	20,273				████████████████████
950	M19 (Khuzdar – Bela, 228km, 4-lane)	19,087				████████████████████
Highways						
985	N55 Dualization (Kohat – D.I.Khan)	14,230		████████████████		
986	N55 Dualization (D.I.Khan – D.G.Khan)	9,600		████████████████		
987	N55 Dualization (Rajanpur – Ratodero)	11,630			████████████████	
959	N55 (Dadu - Kotri) 4-lane	10,000		████████████████		
974	N65 Dualization	23,645			████████████████	
1002	Lahore Peripheral Road	24,299		████████████████		
655	Second Kohat Tunnel	6,000		████████████████		
Bridges						
961	Bridge on River Chanab at Garh Maharaja, District Jang	1,000		████████████████		
962	Bridge on River Sultaj to link Chistan Burewala Road	500		████████████████		
963	Bridge on River Chanab near Head Mohammadwala	600		████████████████		
964	Jhelum, Gatalian Mirpur Bridge	1,250		████████████████		

Source: JICA Study Team

Pakistan Transport Plan Study in the Islamic Republic of Pakistan (PTPS)

cont. of Table 7.4.10

No	Projects	Estimated cost (Rs. Million)	Master Plan (M/P)			Beyond the M/P 2025/26-
			2005/06 - 2009/10	2010/11 - 2014/15	2015/16 - 2024/25	
330	Bridge on River Chanab at Chund	700		████████████████████		
966	Bridge on River Ravi near Qutab Shahara	2,660		████████████████████		
967	Bridge on River Ravi at Syedwala	2,700		████████████████████		
968	6-Lane Bridge (4-lanes for roadway and two lanes for LRT Lahore – Shahdrah)	950		████████████████████		
969	Victoria Bridge Linking Malikwal - Pind Dadan Khan.	1,000		████████████████████		
982	Bridge on River Indus (Khanote – Hala old)	2,500		████████████████████		
983	Bridge on River Indus (Dault pur – Shehwan)	2,500		████████████████████		
	Port Access Road					
981	Karachi Port Access	15,000		████████████████████		
980	Qashim Port Access	3,878	████████			
	Improvement/ Construction of Provincial Roads					
900	Panjab East-West Corridor- 1 (Sheikhpura - Mianwali)	55,068		████████████████████		
901	Mianwali-Lakki Road	5,378		████████████████████		
915	Panjab North-South Corridor- 1 (Chakwal - Muzaffargarh)	70,122			████████████████████	
905	Panjab East-West Corridor- 2 (Kasur - Bhakkar)	60,618		████████████████████		
910	Panjab East-West Corridor- 3 (Sulemanki - Multan)	69,420		████████████████████		
935	Sialkot – Sheikhupura – Sialkot Road	14,838			████████████████████	
945	Lahore – Jaranwala – Faisalabad (Bypass) – Jhang Road	31,770			████████████████████	
940	Faisalabad – Samundari – kacha Khu Road	22,818			████████████████████	
925	Panjab North-South Corridor-2 (Mianwali – Muzaffargarh)	11,232		████████████████████		
930	Sialkot – Wazirabad – Pindi Bhattan Road	24,648			████████████████████	
920	Bahawalpur – Bahawal Nagar – Sulemanki Road	34,722		████████████████████		
971	Pind D. Khan – Jhelum Road	4,462		████████████████████		
972	Hyderabad – Badin – Thatta	11,048			████████████████████	
975	Lower Topa – Mansehra Road	11,616		████████████████████		
973	Mianwali – Shakardarra – Lachi Road	6,517		████████████████████		
990	Sindh Coastal Highway	20,309		████████████████████		
	Urban Bypasses in Punjab Province			████████████████████		
1011	Chakwal	1,380				
1012	Bhakkar	850				
1013	Khushab	1,275				
1014	Mianwali	850				
1015	Jhang	1,200				
1016	Toba Tek Singh	960				
1017	Mandi Bahauddin	1,290				
1018	Sialkot	1,800				
1019	Multan	1,900				
1020	D.G.Khan	2,125				
1021	Layyah	750				
1022	Muzaffargarh	1,176				
1023	Rawalpindi	8,000				
1024	Lahore	16,900				
1025	Gujranwala	3,430				
1026	Bahawalpur	920				
1027	Bahawalnagar	341				
1028	Rahim Yar Khan	219				
1029	Khan Pur	170				

Source: JICA Study Team