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Country Report
Seminar on Practical Application of
Construction Technology
(JFY 2002)

NTRC: 244

Eng. Hameed Akhter

March, 2002

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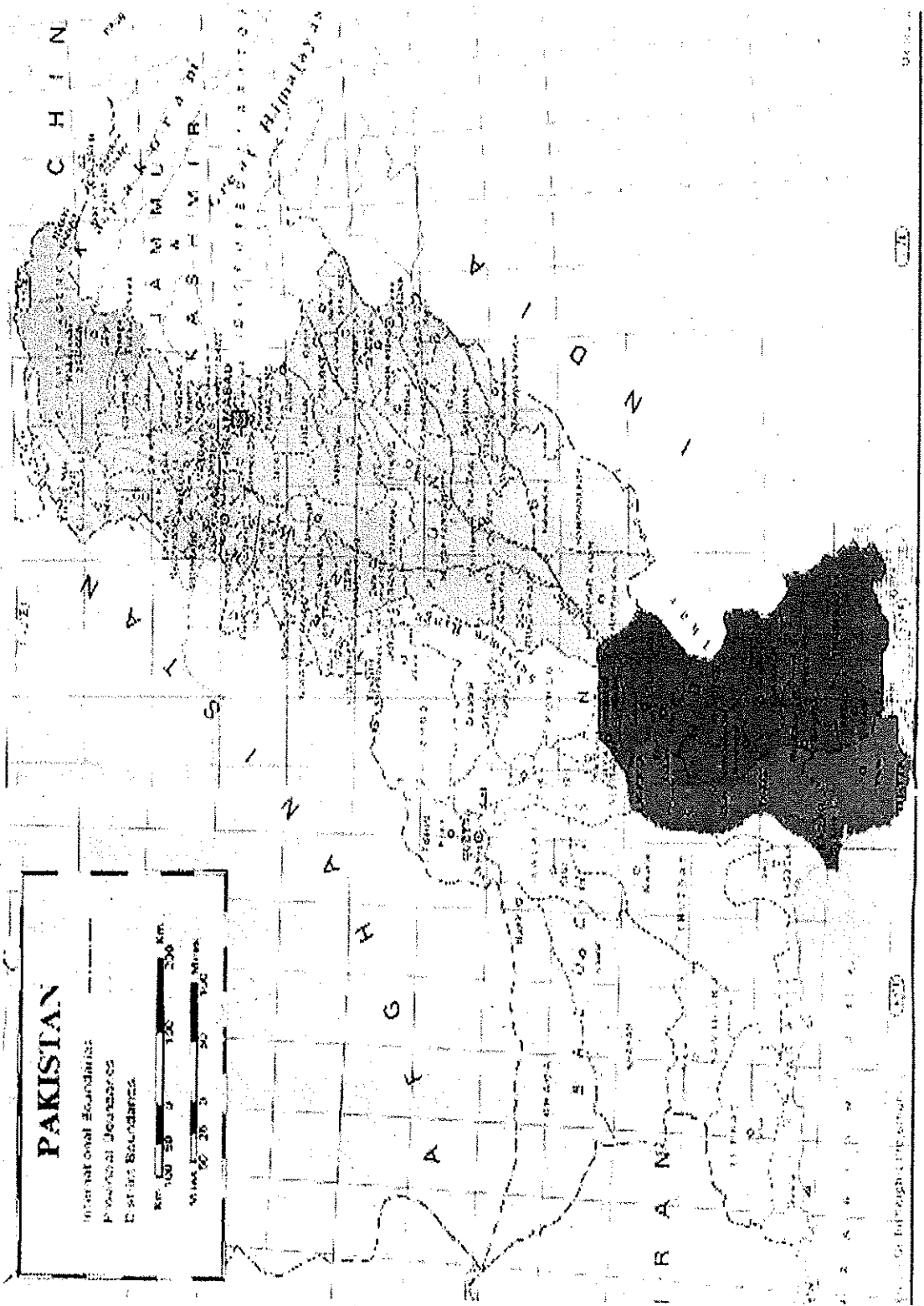
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 2. NTRC is the only R&D organization in the field of Transport Planning and Engineering in the country. It has completed about 250 research studies on various modes of transportation Recently GOP assigned NTRC the task of monitoring and evaluation of its development projects in road sector. Presently I am deputed with a team of engineers who visit under construction road project in the country and perform random Quality Checking of materials used and the workmanship on these projects. Finally the team prepares status report of each project so that remedial measures are taken accordingly.

4. ROAD CONSTRUCTION IN PAKISTAN

4.1 COUNTRY PROFILE

The Islamic Republic of Pakistan occupies a strategic location on the North West edge of South Asia. Covering an area of 796,095 square kilometers, between 23° – 42' and 36° - 55' North latitudes and 60°52' and 75°23' East longitudes. Pakistan at a strategic location in South Asia shares its South Western border with Iran, Northern border with Afghanistan and China and Eastern border with India. Arabian sea lies in South. This ideal location has merited Pakistan as most attractive for transit route to the land locked Central Asian countries. One can see from the map at **Figure – 1**, the mighty river Indus, which transcends from the snowy mountain ranges up in the North crosses the rich productive planes and ended into the Arabian Sea, bisects the country naturally.

Figure - 1



Pakistan comprises four provinces, namely; Punjab, Sindh, North West Frontier Province (NWFP) and Baluchistan. Provinces are divided into divisions and sub-divisions termed as Districts, other than these there are Federally Administered Tribal Areas (FATA) divided into Agencies and Federal Capital of Islamabad. Detail are as follows:

Table - 1 Administrative Divisions, Districts & Agencies

Province	Divisions	Districts
Punjab	8	34
Sindh	5	21
NWFP	7	24
Baluchistan	6	26
Total	26	105
FATA		
Agencies		7
Tribal Areas		6
Capital Area		1
Total		14

The last population census was conducted in 1998 and in that the population of the country was 131.5 million. Based on the 1998 census the population of the country as on First July 2001 is estimated as 140.5 million. With details as follows:

Table - 2 Population Distribution

Province	Current Population (million)
Punjab	78.0
Sindh	32.0
NWFP	19.2
Baluchistan	7.0
FATA	3.4
Capital Area	0.9
Total	140.5

Pakistan is among the low-income countries with per capita income of Rs.24528 (\$429)¹ and Gross Domestic Product of \$ 60.73 billion². The GDP has increased over the last decade (1990-91 to 1999-00) at the rate of 3.8 per cent per annum³. The country's population is around 140 million. Over the same period, the average growth rate per annum for the population was 2.7%, whereas, the per capita GDP increased just by 1 per cent per annum.

Pakistan is a country, where agriculture shares almost 26% of the value in Gross Domestic Product (GDP). It provides employment to 47 percent of the labors force and two third of

¹ Economic Survey, Statistical Supplement, 2000-01, Table 1.5

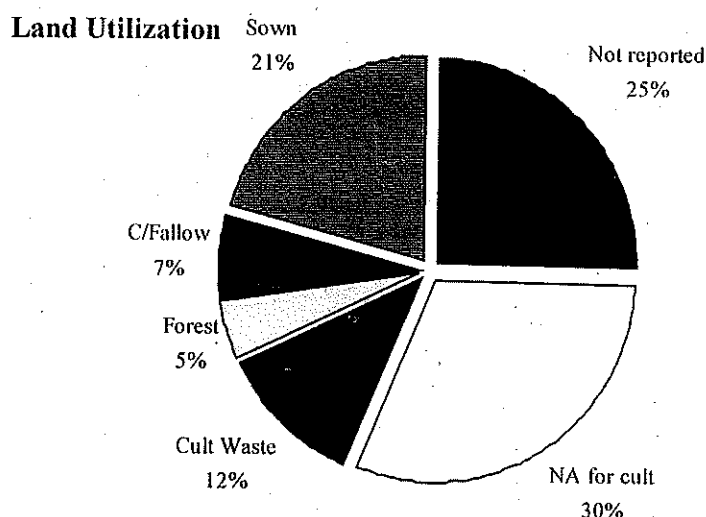
² Converted at the rate indicated by per capita income.

³ Average of growth rates from 1990-91 to 1999-00

the population living in rural areas is dependent on agriculture and related activities. Our main export earnings are provided by agriculture (cotton, cotton textiles, rice, etc.). Our industry is also agriculture based (textile, sugar, etc.). More than half the area of the country is either hilly or desert and is not available for cultivation. 28 percent of the area is cultivated as follows:

S.No	Description	Million Hectares	Percent of total
1	Total Area	79.61	100
2	Reported Area	59.28	74.5
3	Forest Area	3.61	4.5
4	Not available for cultivation	24.5	30.8
5	Cultivable Waste	9.29	11.7
7	Current Fallow	5.43	6.8
8	Net sown	16.45	20.7
9	Area sown more than once	6.41	8.1
10	Total cropped area	22.86	28.7

Source: Economic Survey, Statistical Supplement, Table -2



ECONOMIC STRUCTURE

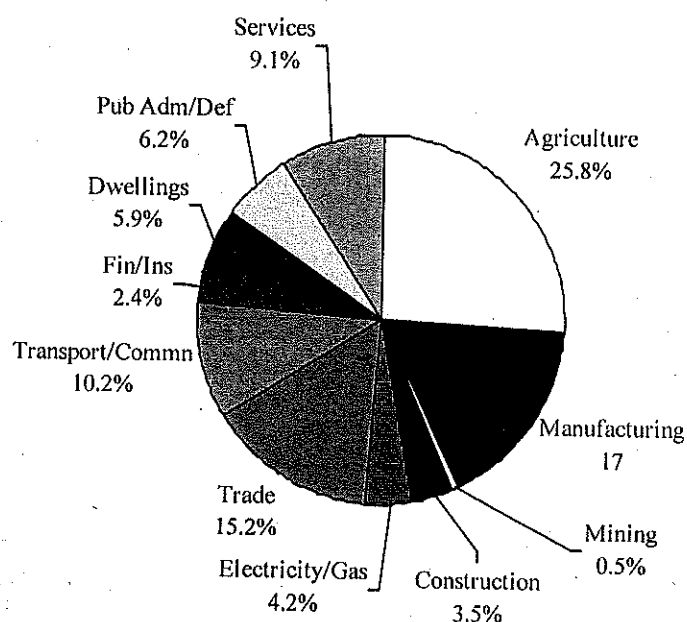
Gross Domestic Product (GDP)

Pakistan's gross domestic product during 2000-2001 was Rs. 3,472 billion in current prices. It provided per capita income -of Rs. 24,528 or US \$ 429. Agriculture remains to be the dominant sector of the economy contributing about 26 percent of value added. Industry (manufacturing) follows with 17 percent of value added, trade 15 percent, transport 10 percent; the sectoral distribution during the last 5 years is given below.

Table - 4 Sectoral Distribution of GDP (percent)

S.No.	Sector	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00
1	Agriculture	24.9	26.1	25.7	25.9	25.6	25.9
2	Manufacturing	17.3	16.8	16.5	17.1	17.3	16.8
3	Mining & Quarrying	0.5	0.5	0.5	0.5	0.5	0.5
4	Construction	4.0	3.9	3.8	3.7	3.4	3.5
5	Electricity & Gas distribution	4.0	4.2	4.0	4.2	4.2	4.3
6	Wholesale & Retail Trade	16.3	16.2	16.1	15.4	15.2	14.9
7	Transport, Storage and Communications	10.2	9.6	9.8	10.2	10.2	10.1
8	Finance and Insurance	2.5	2.7	2.9	2.2	2.4	2.5
9	Ownership of Dwelling	5.6	5.5	5.7	5.8	5.9	6.0
10	Public Admn. & Defense	6.4	6.2	6.2	6.2	6.2	6.3
11	Services	8.2	8.2	8.6	8.9	9.1	9.3

Sectoral Distribution of GDP (3 Year Avg)

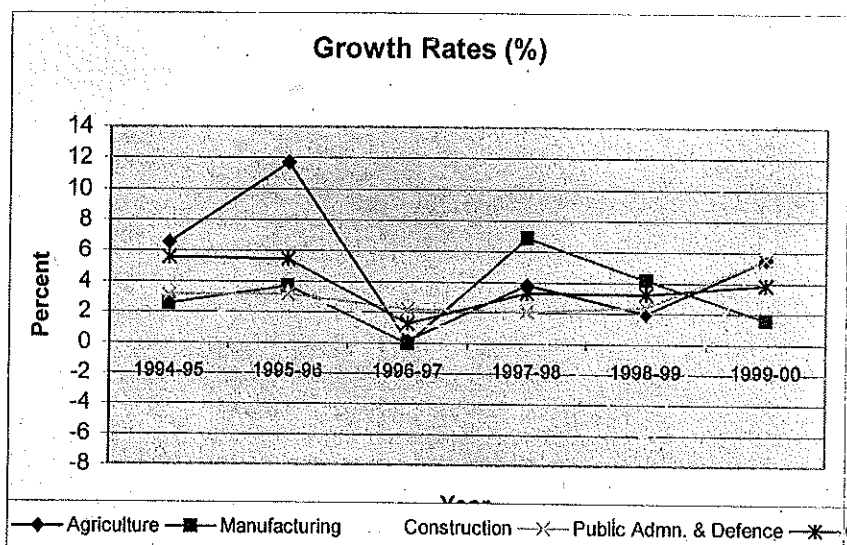
**Growth Rate**

The increase in GDP in constant prices of 1980-81 during the last 5 years was 3.6 percent per annum. However, taking account of factor incomes from abroad, which is negative, the growth rate is reduced to 3.4 percent per annum. The population increase over the same period being 2.4 percent, per capita income has increased at the rate of 1 percent per annum only. However, taking a different (dollar based) measure, per capita income has decreased from \$ 508 in 1994-95 to \$ 446 in 1999-00 - 2.6 per cent per annum decrease.

Table - 5 GDP/GNP Real Growth Rates (Percent)

S.No Sector	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00
1 Agriculture	6.57	11.72	0.12	3.82	1.95	5.54
2 Manufacturing	2.54	3.73	-0.07	6.93	4.18	1.57
3 Mining & Quarrying	-4.3	7.07	1.87	-9.7	3.64	7.67
4 Construction	1.01	3.25	1.09	1.26	-6.25	6.24
5 Electricity & Gas distribution	16.83	10.14	-2.91	8.96	3.47	7.84
6 Wholesale & Retail Trade	4.64	6.07	0.72	-1.13	2.14	2.50
7 Transport, Storage and Communications	4.14	0.84	3.76	7.21	3.08	3.90
8 Finance and Insurance	6.31	13.83	11.49	-23.95	15.04	6.87
9 Ownership of Dwelling	5.28	5.28	5.28	5.28	5.28	5.28
10 Public Adm. & Defense	3.13	3.17	2.21	2.03	2.40	5.56
11 Services	6.53	6.53	6.53	6.53	6.53	6.53
12 GDP (factor cost)	5.06	6.6	1.7	3.49	3.15	4.46
13 Net factor income from abroad	205.61	-146.04	-135.02	-21.46	6.62	-74.61
14 GNP (factor cost)	5.58	5.46	1.27	3.31	3.24	3.87

Source: Economic Survey 2000-01, Tab. 1.4



4.2 ROAD INFRASTRUCTURE IN PAKISTAN

At the time of independence, there were 50,367 kilometres of roads in the country of which 9,809 kilometres were paved and 40,558 kilometres were unpaved. Pakistan had a poor start in the matter of road network. Up to the seventies the growth in the road density was almost negligible. Afterwards concerted efforts were made for the improvement of road network of the country. Presently, Pakistan has a road network of 249,959 kilometres

of which 138,726 (55%) kilometres are paved and 111,233 (45%) kilometres are unpaved, that resulted a road density of 0.32 km/sq-km for the country in year 2001. Today Pakistan's road network is constituted of low volume formed tracks to multi-lane high speed Motorways, with a fair condition for traffic movements.

Status and Condition of the Road Network

Adopted road classification

For data collection and international comparison purposes Road network in the country is mainly divided in two types of roads i.e. High (paved surface) and Low (un-paved). Historical data of road length in the country based on above classification is presented in the following table:-

Year	High Type	Low Type	Total
1947-48	9809	40558	50367
1949-50	10829	43220	54049
1954-55	14889	46449	61338
1959-60	16489	47004	63493
1964-65	20220	51019	71239
1969-70	24253	47900	72153
1974-75	28222	50408	78630
1979-80	35890	58283	94173
1984-85	52120	66351	118471
1989-90	81981	80364	162345
1994-95	111307	96338	207645
1999-00	138200	110140	248340
2000-01	138726	111233	249959

Source: 1947-65: Economic Survey, Statistical supplement 1991-2 (Table 6.1)

1966-95: Economic Survey, Statistical Supplement 1999-00 (Table 13.1)

2000-01 Economic Survey, 2000-01 (Table 13.1)

Out of the 138,726 kilometres of High type roads, 8,845 kilometres are National Highways. The remaining of High type roads are under the Provincial Highway departments, District & Municipal Councils and Cantonment boards. Distribution of High and Low types of roads, prior to the introduction of devolution of powers plan in the country is detailed below:-

	<u>National</u>	<u>Provincial</u>	<u>*District</u>	<u>Total</u>
High Type	8845	74500	55381	138726
Low Type	-	26500	84733	111233
Total:	8845	101000	140114	249959

Road density (km/sq.km) is a parameter used internationally for the assessment of the development of any country. Following table presents an analysis of the road density in the country as well as its four provinces.

Table – 7 Road Density in the Country

Custodian	Road Length (km)				
	Punjab	Sindh	NWFP	Baluchistan	Pakistan
National Highways	2166	1268	2287	3123	8845
Provincial Roads *	40537	22688	14621	23152	101000
District Council*	41141	26669	14781	20779	103370
Municipal corporations	10632	21750	1077	1286	34745
Cantonment Board	938	578	346	138	1999
Total Length	95414	72953	33112	48478	249959
Area sq km	206250	140914	104741	347190	796095
Density km/sq km	0.46	0.52	0.32	0.14	0.31

* Data pertains to their jurisdiction prior to Devolution of Power Plan being implemented

Today roads are the most important and preferred mode of transportation in the country. They share about 87% and 88% of the country's domestic passenger and freight traffic respectively. The vehicle population is in excess of 3.5 million vehicles, growing at a rate of 7% per annum.

4.2.1 National Highways

For development and rehabilitation of intercity road network, Government of Pakistan created a body named **National Highway Authority** in 1991. The National Highway Authority (NHA) is responsible for a network consisted of *National Highways* and *Motorways* in the country, which caters for the needs of long distance inland and international traffic.

The NHA several years ago allocated reference numbers to their network to facilitate identification/reference in records and facilitate computer processing. The referencing system for the National Highways has been based on the **North-South** orientation of the country. National Highways running in **North-South** direction are designated by an odd number with alphabet "N" stands for National Highway, for example N-5 or N-55. Similarly, Highways running in **East-West** direction are designated by an even number with alphabet "N" for example N-70, N-40 etc. The National Highways are consisted of 8845-kilometer route length and some 9500 two-lane equivalent roads.

Details of the routes controlled by NHA are presented in Table - 8, while, **Figure – 2** shows these routes on map: -

Table –8 Route Length of National Highways & Motorways

S.No	Designation of National Highway	Route	Length (Km)
1	N-5	Karachi-Thatta-Moro-Multan -Lahore-R.Pindi-Peshawar-Torkham Highway	1819
2	N-10	Liari-Gawadar-Gabd	653
3	N-15	Mansehra – Naran – Jalkhad - Chilas	240
4	N-25	Karachi-Khuzdar-Quetta-Chaman Highway	813
5	N-35	Hassanabdul-Gilgit-Khungrab Highway	806
6	N-40	Lakhpas-Dalbandin-Nokundi-Taftan Highway	610
7	N-45	Nowshera – Dir - Chitral	309
8	N-50	Quetta-Muslim Bagh-Zhob-D.I.Khan Highway	531
9	N-55	Kotri-Shikarpur-D.G.Khan-D.I.Khan -Peshawar	1264
10	N-65	Sukkur-Sibi-Quetta Highway	385
11	N-70	Qila Saifullah – Rakhni – D.G.Khan - Multan	447
12	N-75	Islamabad – Satra Mile – Lower Topa –Kohala	90
13	S-1	Karakorum Highway (KKH) - Skardu	167
14	M-1	Peshawar – Islamabad Motorway	155
15	M-2	Lahore-Islamabad Motorway including 32-km Links and Lahore By-pass	367
16	M-3	Pindi Bhattian – Faisalabad Motorway	53
17	M-9	Karachi Hyderabad Motorway	136
Total			8845

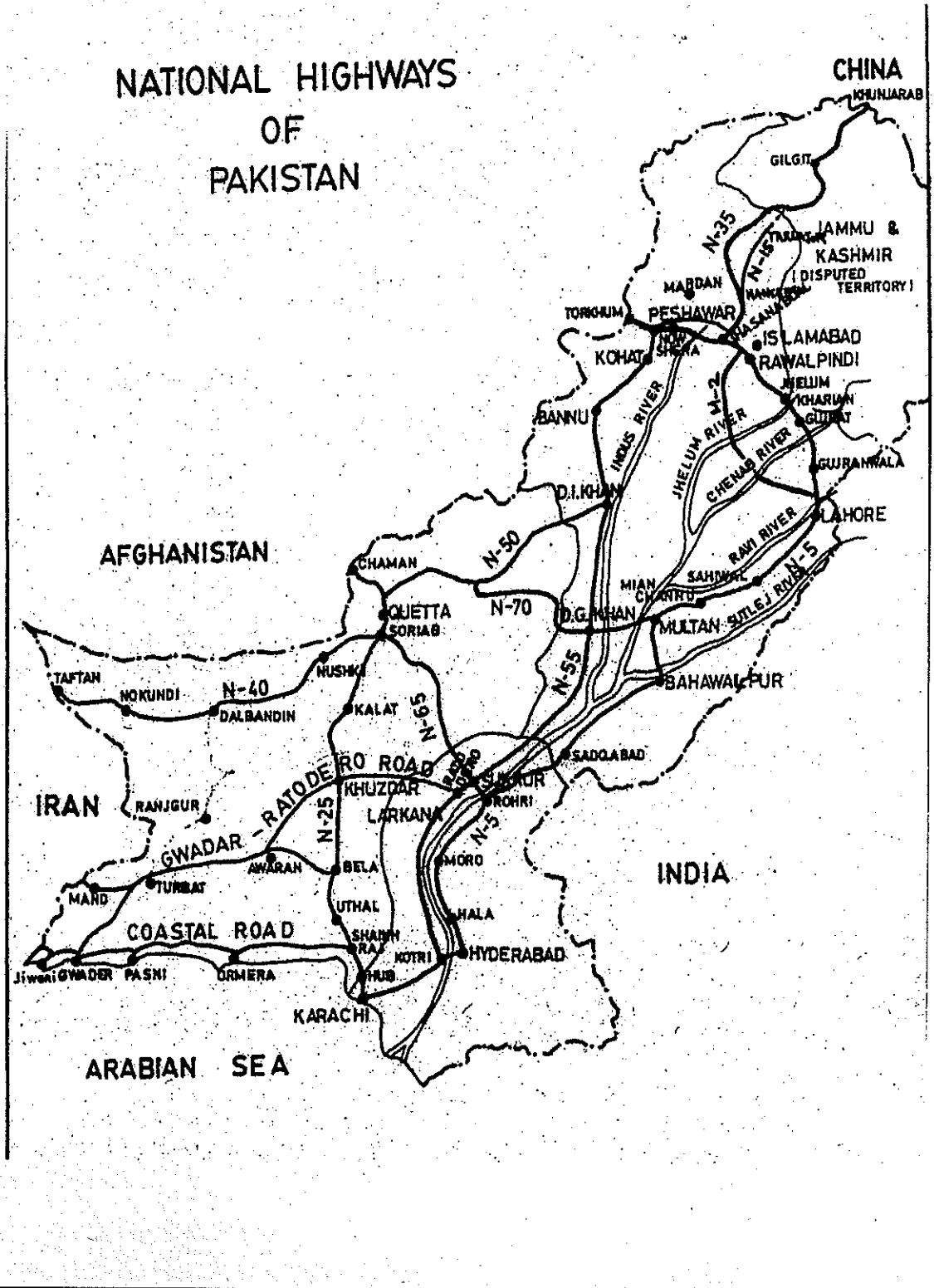
S = Strategic Road

M = Motorways

The main North-South link is designated, as N-5 with 1819-kilometer length. The route starts from the financial hub of the country called Karachi. It then passes through some major cities of Sindh. At the place called Sadiqabad it enters into Punjab. After crossing main cities of Punjab it enters into NWFP and ends at Pak-Afghan border at Torkham. N-5 is the lifeline of Pakistan. Under the improvement programme of this traditional link, dualization of road and rehabilitation of the existing pavement is being carried out.

In July 2000, work started on the first phase of construction of the 650 km long Makran Coastal Highway (N-10). The road will connect Karachi with Gabd on the border of Iran. The first phase of 247 km, passing through mountainous region between Liari and Ormara is started with the cost of US \$ 77 million and will be completed in three years.

Figure - 2



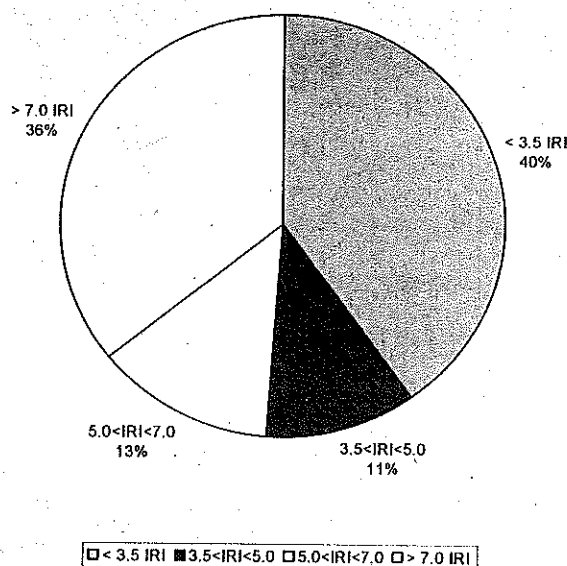
CONDITION OF NATIONAL HIGHWAY NETWORK

A recent study⁴ mentioned that the current state of the National Highways network of the country is in bad condition in terms of roughness (IRI), indicating the riding quality and crack area, which measures the structural integrity of the pavement. In 2000 it was measured that 49 % of the network had poor to very poor roughness (IRI > 5.0) and 11% of the network had crack area greater than 25 percent. The complete statistics are given in following tables.

Table - 9 National Highways Network Condition

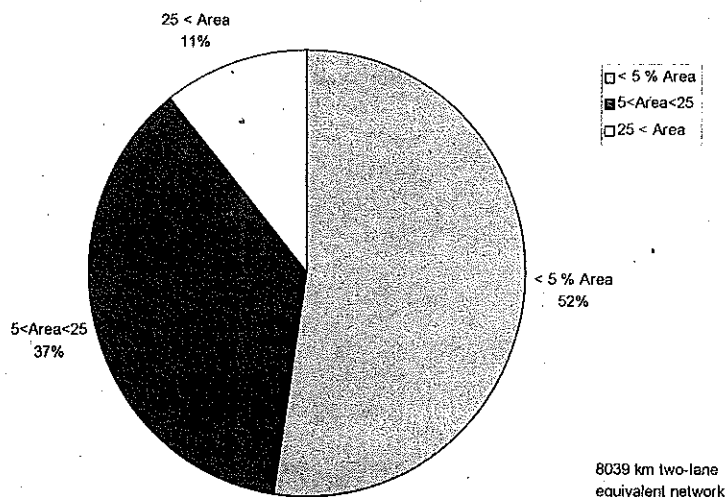
		Length				Length	
		(km)	(%)			(km)	(%)
Surface Type	Asphalt Concrete	3630	45	Roughness (IRI)	< 3.5	3211	40
	Surface Treatment	4409	55		3.5 - 5.0	899	11
	Total	8039	100		5.0 - 7.0	1046	13
					> 7.0	2883	36
					Total	8039	
Traffic (ADT)	< 1000	1620	20	Crack Area (%)	< 5	4207	52
	1000 - 3000	1997	25		5 - 25	2958	37
	3000 - 5000	1643	21		> 25	874	11
	5000 - 7000	1483	18		Total	8039	
	> 7000	1296	16				
	Total	8039	100				

Network Roughness Condition in 2000



⁴ Strategic Economic Analysis of National Highway Network by M/s Finnroad in 2001

Network All Crack Area in 2000



Other information related to the National Highway Network is annexed at Table-1 Appendix-A.

The study also analysed the National Highways network in order to define future road maintenance needs to prepare a six-year (2001-2006) road maintenance program. The analysis was done using Strategic Analysis Module of the new Highway Development and Maintenance Tools, HDM-IV, version 1.2.

The study concluded that National Highway Network of Pakistan is in bad condition by road user comfort standards and in fair condition by structural integrity of the network pavement. In order to eliminate the maintenance backlog and to preserve the existing network from further deterioration an amount of Rupees 7.7 billion per year is needed yielding a program with Net Present Value of 458 billion rupees. Even to maintain the network with current condition 2001 (Average network roughness of 6.24 IRI), five billion rupees per year is needed.

4.2.2 **PAKISTAN MOTORWAY PROJECT**

With the emergence of the Central Asian Republics in late eighties an enormous trade potential has been envisaged in the region, this could not be reaped with the present road network in the country. The idea of Motorways in the country was developed to meet the existing as well as future traffic demand of the country and to link the country's seaports with the land locked countries of Central Asia.

Pakistan Motorway Project will ultimately provide north-south link in the country joining Karachi, Multan, Faisalabad, Islamabad and Peshawar. It will join another highway passing through Dera Bugti, Khuzdar and terminating at Gwadar thereby establishing a vital link of Baluchistan with the other parts of the country. Figure -3 presents the alignment of Pakistan Motorway project.

Conforming to international standards (like Autobahn in Germany and Motorway in U.K), it will be at least four-lane divided, limited access highway with structures designed for six-lanes and speed of 120 km/hr. It will provide a completely uninterrupted flow of traffic allowing access and exit only at the ramps designed for this purpose. The facility will also have service areas at appropriate distances.

Peshawar – Islamabad Motorway (M-1)

This is first section of the Pakistan Motorway called Peshawar – Islamabad Motorway (M-1), which is approximately 155 kms long, and it is being constructed. The road has 6-lanes structures, however, presently paved for four lanes. Four interchanges at places Burhan, Swabi, Rashkai and Charsadda are proposed. Cost of the project is approximately US \$ 533 million.

Islamabad – Lahore Motorway (M-2)

The second section of Pakistan Motorway is 335 kms long and is a 6-lanes divided carriageway, controlled access, toll facility. The section was completed in November 1997. M/s Daewoo Corporation of South Korea constructed the project. Cost of the project is about one billion US \$. Figure - 4, shows the route alignment of Islamabad – Lahore (M-2) Motorway.

Figure -3

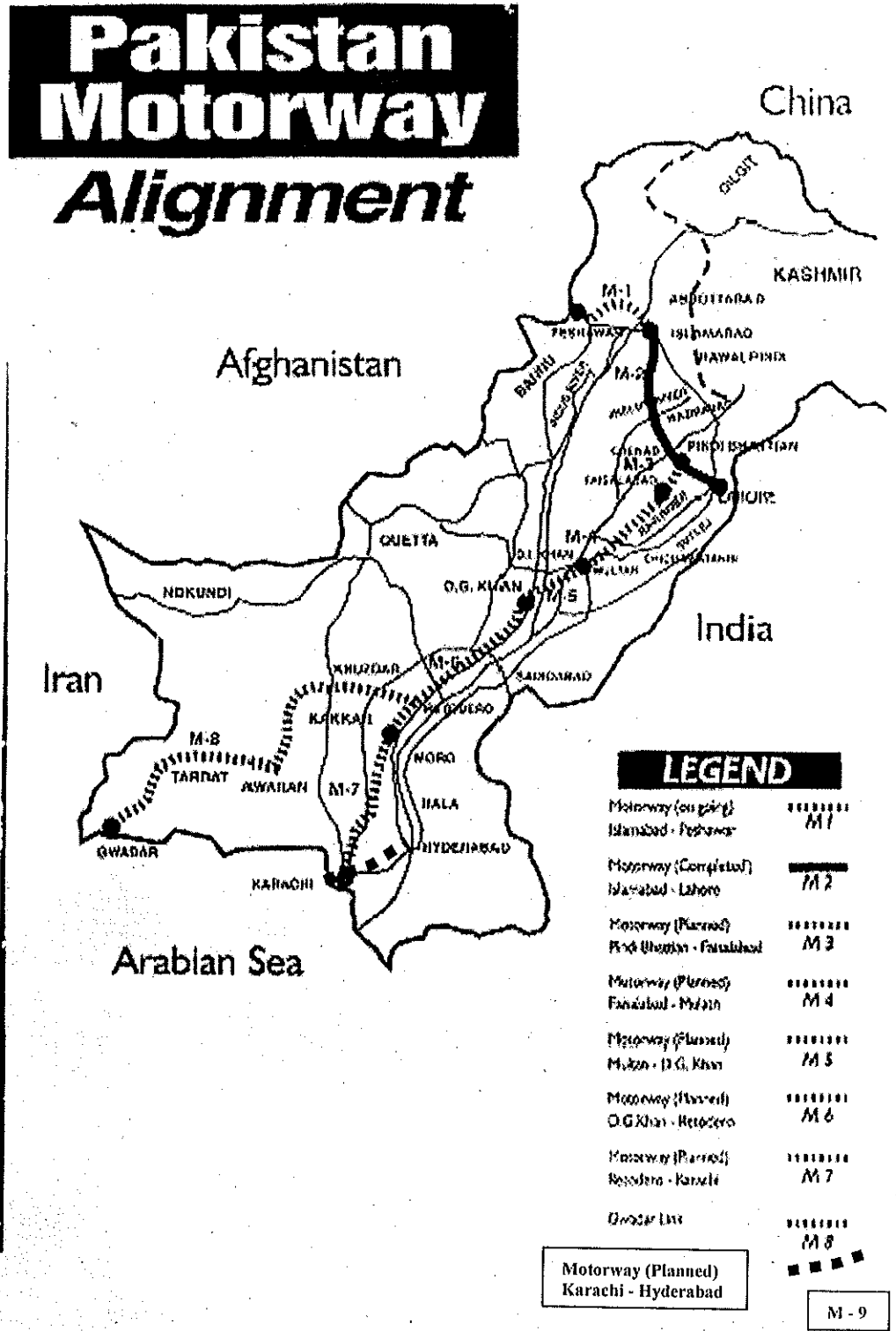
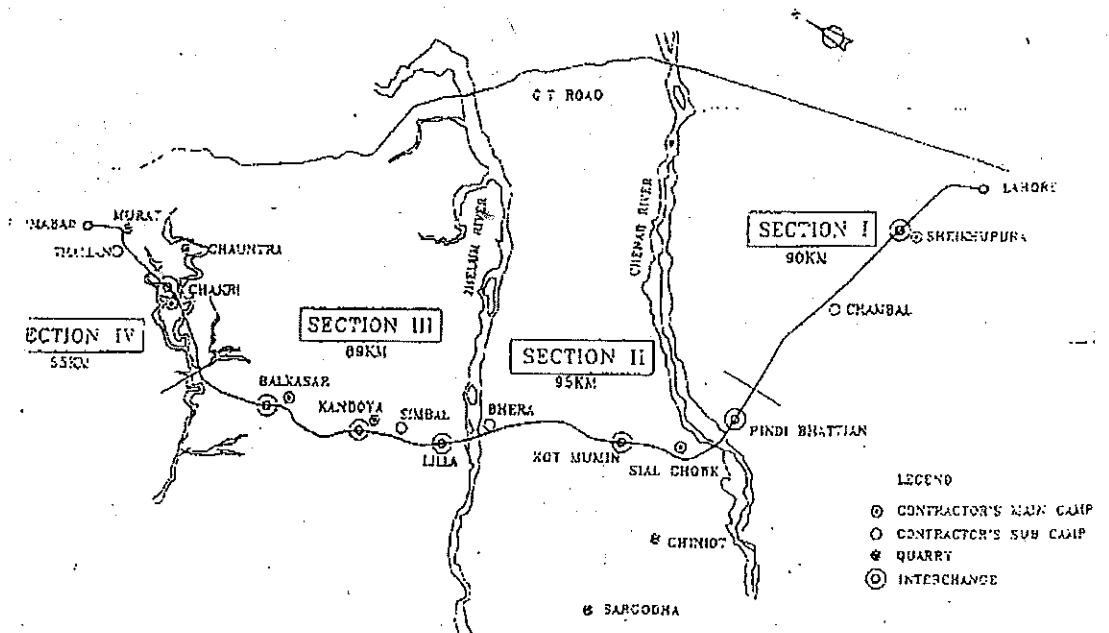


Figure - 4 Route Alignment of Islamabad - Lahore Motorway (M-2)



Pindi Bhattian - Faisalabad Motorway (M-3)

This is third section of the Pakistan Motorway, which is approx. 53 kms long. The section is 4 lanes access controlled, tolled facility with estimated cost of 75 million US \$. The work on the section is in progress and will be completed in three years period

Faisalabad - Multan Motorway (M-4)

This section of motorway is about 243 kilometer long. Two major cities of province Punjab will be connected via this Motorway link. The facility will be four lanes divided highway with 6-lane structures, The facility will be access controlled and tolled. Estimated cost of the project is about US\$ 500 million.

Karachi - Hyderabad Motorway (M-9)

Karachi and Hyderabad are the most populated cities of Sindh province. Major industries are also located in these cities. Karachi being the seaport city of Pakistan plays major role in the country's economy. Presently four lanes divided highway is serving the traffic. As the traffic between these two cities has crossed the limits of 80,000 pcu per day, there is a requirement to upgrade the facility. Under the improvement programme 2-lanes will be added to the existing 4-lane divided highway of 136 km length. The highway will be converted to access controlled tolled facility by constructing grade separated interchanges at various locations. Cost of improvement for 136 km long section will be Rs.8000 million.

4.2.3 Provincial Road Network

The provincial road network is developed and maintained by the Communications and Works Department (CWD) of each province. The provincial road network under the CWDs in all four provinces has diversity in many dimensions. Roads range from connections between high-density populations centers (District headquarters) having high volumes of traffic and those serving minor settlements in remote areas with very low traffic volumes. However, shortage of maintenance funds and the quality and efficiency of operations has led to severe deficiencies in the road transportation system at provincial level. For provincial road network funding for maintenance is much below the optimum level and even the available funds have not been utilized in an efficient manner.

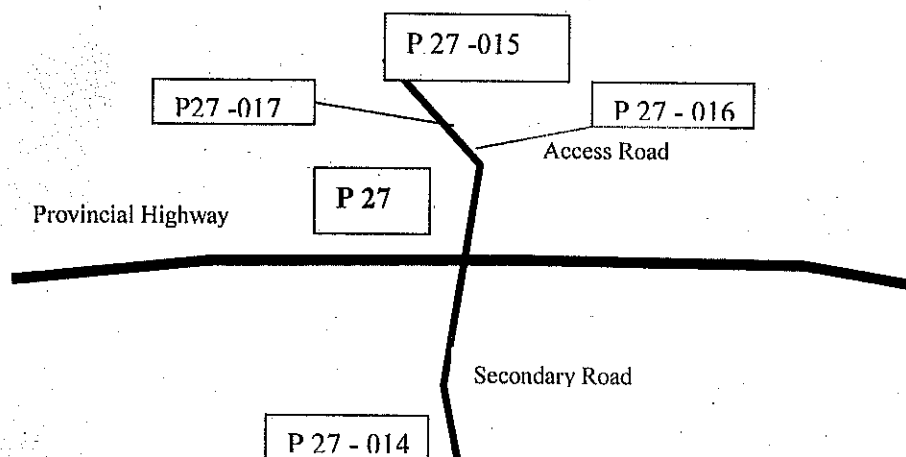
Observing the need to revamp the existing provincial road system The "Road Management Project"⁵ was carried out during (1996-2000) with the assistance of Asian Development Bank and World Bank. Under the project the **Pakistan Provincial Road Management System (PPRMS)** has been introduced into all the four provinces of the country with the aim to (1) *establish a unified road management system that would be operated by the CWDs, to improve the road maintenance operations (ii) to demonstrate the efficiency gains from privatized maintenance operations to introduce more efficient quality control procedures for the provincial road network.*

The **Pakistan Provincial Road Management System** developed a referencing system for provincial roads that divides their network in three functional classes based on the average daily traffic (ADT). Inter district roads with daily traffic volumes exceeding 500 vehicles per day have been designated as *Provincial Highways* denoted by letter 'H'. Roads linking two provincial highways or serving sub divisional (tehsil) level towns and traffic volumes in the range of 500 vehicles per day have been termed as *Secondary Roads* and allocated the letter 'S'. All others, either from farm to market or link road having traffic volumes below 100 vehicles per day have been called *Access Roads* denoted by letter 'A'. The *Provincial Highways* in each province were then numbered in sequence with two digit number and a letter (e.g P27). Here letter 'P' represent for Province *Punjab*, similarly 'S' stands for *Sindh*, 'F' termed for the NWFP, and 'B' stands for *Baluchistan*.

⁵ Final Report "Road Management Project" by M/o Environment, Local Government & Rural Development, Islamabad: July 2000

All others, *Secondary* and *Access roads*, are then numbered according to the nearest provincial highway, with an additional three-digit number (e.g P27 – 014) and a dash. Similarly, *S11 – 011* will depict a road in Province of Sindh emerging from provincial highway number *S11*.

Classification System of Provincial Roads



For the referencing system, there is no distinction between Secondary and Access roads. Although the provincial Highways are relatively fixed, it is anticipated that there may be changes in the future, upgrading Access roads to Secondary roads as local development takes place. This way each road in the administrative control of provincial highway departments was identified with a discrete referencing number and recorded in the Road database along with its name commonly used by the local populace. **Table – II to Table – V** annexed at Appendix-A presents the summary of district wise road lengths in each province administered by the provincial road department prior to devolution of power plan.

Pakistan Provincial Road Management System

The PPRMS (Pakistan Provincial Road Management System) is a Road Database and Works Programming (Economic Analysis Module) system together with utilities such as Data Extraction and Parameter Set. HDM-VOC 1.0 of the World Bank is used for estimation of vehicle operating costs and HDM-Manager for preparation of road deterioration models. The system has been used by provincial CWDs for last three years.

The main output of the system is a sorted list of candidate road links for road maintenance and rehabilitation programs, for one to five years, annually ranked by economic indicators and/or road condition.

The core of the PPRMS system is the set of decision rules, which were used to select maintenance treatments for each kilometer of road. The following road condition variables can be used in decision making: cracking, rutting, deflection, roughness and potholes. The threshold values used in selection are user defined, and they depend on traffic volume, road type and road class. Average province wise unit cost for different types of maintenance treatments worked out on the basis of NHA Composite Schedule of Rates (CSR) have been used for preliminary analysis of the provincial road network. The benefit of road maintenance are expressed as Payback Period (PP) of the investment as follows:

$$PP = \text{Cost of treatment} / \text{First year VOC savings}$$

Where

Cost of treatment = cost of selected maintenance treatment

First year VOC savings = decrease in vehicle operating costs after treatment

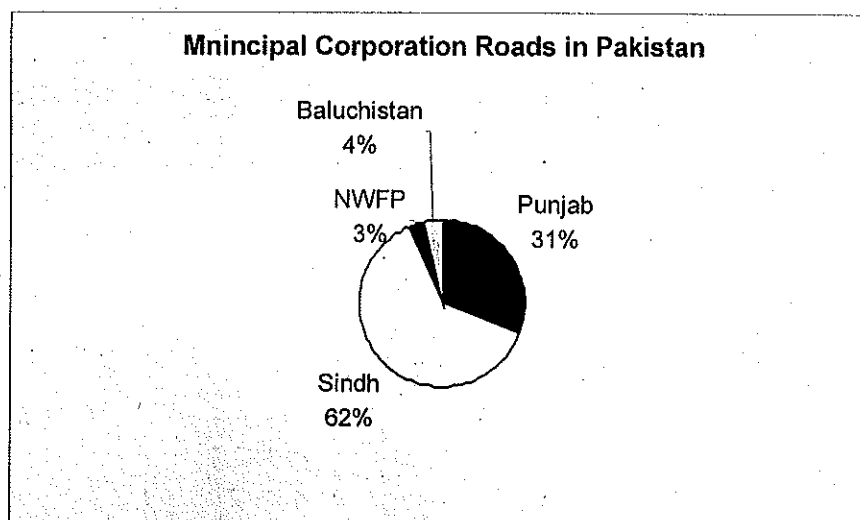
The table below summarizes the work plan for provincial roads on the basis of Rupees 30 billion per year strategy in terms of different maintenance treatments.

Table - 10

WORKS FOR SCENARIO: 30 BILLION RUPEES PER YEAR				
Maintenance Treatments	Works in Years 1-5		Works per Year	
	Kilometer	Rs. Million	Kilometer	Rs. Million
DST 25 mm	12879	4024	2579	805
Overlay 5 cm	23949	35199	4790	7040
Overlay 7.5 cm	1201	2478	240	495
Treat Gravel Roads	20152	24182	4031	4836
Reconstruction 30 Stab+ 5ac	2303	8021	460	1604
Reconstruction 30 gr+15ac	5409	18765	1081	3753
Reconstruction 15gr + 5ac	30286	57170	6057	11434
Total	96179	149839	19283	29967
Functional operations	36828	39223	7366	7844
Structural operations	59351	110616	11870	22123
Total	96179	149839	19238	29967
Asphalt Concrete roads	3860	6226	772	1245
Surface Treated roads	72167	119423	14435	23886
Gravel Roads	20152	24185	4031	4836
Total	96179	149839	19238	29967

The final analysis for the provincial road network available at the end of the program produced the following report:

Province	Road Type		Total (km)
	Low (km)	High (km)	
Punjab	1595	9037	10632
Sindh	1087	20663	21750
NWFP	345	732	1077
Baluchistan	566	720	1286
Total	3593	31152	34745



4.2.5 Three Year Development Programme

As the ninth five-year plan was not launched the Government of Pakistan approved a mid-term plan called "Three Year Development Programme 2000-2003" for the period 2000-01 to 2002-03 and it was decided that instead of the 'Detailed Annual Plan' published after the budget, a 'Three Year Development Programme' will be brought out in October every year. In addition to the mid term plan the Annual Plan, as a part of the Budget will continue to be prepared and published with the budget documents in June every year. In Pakistan development year starts from 1st July of Christians year. Other than the Annual PSDP provinces also prepare their Annual development plans under their annual budget. The mid term plan⁶ reflected the comprehensive agenda of General Pervez Musharraf 's government and based on following features: -

- Revival of the economy
- Reduce the fiscal and current accounts deficits
- Efficient and good governance
- A balanced and just approach towards all provinces
- Devolution of Power

⁶ Three Year Development Programme 2000-03, GOP, Planning Commission

Related to the Transport and Communications sector the three year programme addressed some issues as follows:-

- The declining trend of Railways
- The fare structure of Railways
- The road density still needed to be improved
- The rapid deterioration of existing road network due to lack of maintenance and excessive overloading by trucks
- Need to develop improved port infrastructure and operations through provision of dedicated terminals and deepening of navigation channels and rationalization of port tariffs

Keeping in view the above mentioned issues in the sector an allocation of Rs. 67.08 billion including Rs. 8.53 billion for Provincial roads is envisaged for the public investment through budget for three-year period. The break up is given in the following table: -

Table – 13 Budgetary Investments 2000-2003

Sub - Sector	Ministry	Allocation in Rs. Billion
Pakistan Railways	Railways Division	11.050
National Highways	Communications Division	45.200
Ports	Communications Division	0.129
Special Communications Organizations	Communications Division	0.335
Pakistan Post Office	Communications Division	0.048
National Transport Research Centre	Communications Division	0.038
Pakistan Telecommunications Authority	Telecommunications Division	1.536
Trade & Transport Facilitation Project	M/o Commerce	0.175
Pakistan Meteorological	M/o Defence	.002
Total (Federal)		58.513
Provincial Road	Provinces	8.530
Grand Total (Federal+ Provincial)		67.043

For the year 2001-2002 the federal government has earmarked an amount of Rs. 15614.22 million for the Ministry of Communications to run its annual PSDP, in it National Highway Authority shares 15060.850 million. Also for the year 2002-2003 the amount earmarked for the M/o Communications is Rs. 15673.90 million and for National Highway Authority is 15139.20 million.

Table – 14 present the development plan of NHA. An investment of Rs. 45.2 billion is proposed for the National Highways Programme for the Three Years Programme period. Major works include completion of on-going work on construction of Peshawar – Islamabad Motorway, Dualization of the National Highway N-5 and Up-gradation of Indus Highway N-55 Phase-III including Kohat tunnel. Also provision has been made for the construction of Makran Coastal Highway.

Table - 14.

National Highway Authority Five Year Investment Plan (2001 – 2006)

Sl.No	Name of Scheme	Cost (Throw-forward)	PSDP Allocation in Rs. Million for					Total Five Year Allocation (Rs. Million)
			2001-02	2002-03	2003-4	2004-5	2005-06	
1	2	3	4	5	6	7	8	9
1) On going								
1	Indus Highway Project	14382(631)	600	31	0	0	0	631
2	Kohat Tunnel and Access roads	6411(3369)	1700	984	685	0	0	3369
3	Fourth Highway Project	7875(58)	25	33	0	0	0	58
4	National Highway Improvement Program (WB)	8000(7400)	200	400	500	600	700	2400
5	Hala - Moro	2400(934)	750	100	84	0	0	934
6	Moro - Baberlo	4820(502)	100	150	252	0	0	502
7	Baberlo - Ubaro	3370(50)	50	0	0	0	0	50
8	Ubaro - Rahim Yar Khan	2055(200)	200	0	0	0	0	200
9	Rahim Yar Khan-Bahawalpur ACW (168 km)	7000(6434)	600	650	650	650	700	3250
10	Multan - Mianchannu	3500(43)	20	23	0	0	0	43
11	Okara - Lahore	3888(20)	20	0	0	0	0	20
12	Kharian - Rawalpindi	4890(150)	150	0	0	0	0	150
13	Chablat - Nowshera	2916(917)	400	517	0	0	0	917
14	Lahore-Islamabad Motorway (M-2)	39000(177)	100	77	0	0	0	177
15	Islamabad-Peshawar (M-1)	43740(32416)	1500	1750	1800	2070	2660	9780
16	N-40 Quetta - Dalbandin - Taftan	2760(26)	25	1	0	0	0	26
17	Improvement of KKH (N-35)	552(152)	152	0	0	0	0	152
18	Abbot bad - Barian - Nathiagali	1247(100)	100	0	0	0	0	100
19	Tall Parachinar Road Tari Mengal	545(12)	12	0	0	0	0	12
20	Ratodero - Shahdadkot-Khuzdar Road	1274(75)	75	0	0	0	0	75
21	Manshera - Naran-Jalkhad Road	3821(2412)	600	950	862	0	0	2412
22	N-50 Quetta-Qilla Saifullah-Zhob-DI Khan	2906(2525)	250	525	800	600	550	2725
23	Improvement of N-70 Qilla Saifullah-DG Khan-Multan	2934(2734)	200	550	1000	984	0	2734
24	Improvement of N-65 Dera Allah Yar-Nutal-Sibi Construction/Replacement of existing steel Bridges and Causeways	1359(1134)	400	450	284	0	0	1134
25	Bharakhu-Satra Mile	112(89)	89	0	0	0	0	89
26	Feasibility studies	155(12)	12	0	0	0	0	12
27		700(558)	20	40	50	446	0	556
(NEW)								
28	Pindi Bhatlan-Faisalabad (M-3)	3250	1000	1250	1300	1450	0	5000
29	Faisalabad-Multan (M-4)	10000	0	0	0	400	1800	2200
30	Makran Coastal Road	12000	2000	1500	1625	1625	1650	8400
31	Lyari Bypass	2000	500	500	500	500	0	2000
32	Karachi Northern Bypass	4500	500	750	950	1000	1150	4350
33	Islamabad-Muzafarabad Road	4097	350	400	450	450	475	2125
34	Northern Areas Road	1000	600	400	0	0	0	1000
35	Indus Highway Project Phase-III	6000	0	625	650	675	700	2650
36	Multan-DG Khan-Sakhi Sarwar (N-70) (160 km)	1920	0	420	450	500	550	1920
37	Gawadar-Turbat-Panjgor-Naushki	1907	0	0	0	716	1193	1909
38	Nowshera-Chakdara-Dir-Chitral (N-45) (309 km)	3090	0	0	0	300	350	650
39	Kuchlac-Zohab (316 km)	2529	0	500	750	800	479	2529
40	Chenab Bridge at Sher Shah	500	0	300	200	0	0	500
41	2nd Bridge on Indus at Ghazi Ghat	500	0	300	200	0	0	500
Total (NHA)		242891	13300	14176	14042	13766	12957	68241

2) Major investment projects on roads

Major Project	Executing Agency
• Islamabad-Peshawar (M-1)	NHA
• Pindi Bhatian-Faisalabad (M-3)	NHA
• Faisalabad-Multan (M-4)	NHA
• National Highway Improvement Program (N-5)	NHA
• Indus Highway Project & Kohat Tunnel (N-55)	NHA
• Coastal Highway (N-10)	NHA
• Karachi Northern Bypass	NHA
• Lyari Expressway	NHA
• Kuchlac-Zohab (316 km)	NHA
• Multan-DG Khan-Sakhi Sarwar (N-70) (160 km)	NHA
• ADB Assisted Rural Access Roads Project	MELG&RD
• Japanese Assisted Rural Access Roads Project	MELG&RD
• Rural Access Roads (FMR)	MELG&RD

3) Major Issues & Future Strategies related roads in Pakistan

1. Road transport sector contributes to Government revenues by way of taxes and duties on production and import of vehicles, parts, tires, tubes, petroleum and its products, fees on ownership and operation of vehicles, etc. Whereas Railways, Ports and Civil Aviation have integrated services, responsible for their own income and expenditure, road transport falls in the realm of public goods. The Government, as a public utility, provides Road infrastructure, whosoever, owns a vehicle can use the road free of cost with a few exceptions where tolls are charge. It is in this sector that a comparison of revenues and expenditure is of significance. A recent study carried out by the Government indicated that expenditure incurred by the government on construction and maintenance of roads is about 63 percent of the taxes and duties paid by the road user. Details are as follows:

Table - 15 Road Users Revenue and Expenditure (Million Rs.)

Description	Source	1991-92	1992-93	1993-94	1994-95	1995-96
Revenues	Federal	15866	16697	29397	27475	34449
	Provincial	1620	1575	1610	2298	2374
	Total	17486	18272	31007	29773	36823
Expenditure	Federal	6251	10449	10894	12221	16870
	Provincial	4998	5697	4325	6326	6330
	Total	11249	16146	15219	18547	23200
% of revenues		64.3	88.4	49.1	62.3	63.0

Source: National Highway Authority, Road User Charges/Road Fund Study, Part I, Wilbur Smith Associates [Table 3-1]

Observing the above situation it is needed that Government should increase its expenditures in the roads sub-sector.

2. Pakistan's public road network of 249,959 km including 8,500 km of National Highways. Overall 55% of the public road network is paved, whereas, National Highways are 100% paved. While National and Provincial Roads are adequate in extent though not in quality, Rural Access Roads (District Council) are inadequate in both the extent and quality to serve the needs of rural areas, where more than 70 % of the country's population lives. All-weather roads serve less than 30% of rural population. It is therefore greatly demanded to accelerate rural access roads programme.
3. Due to excessive axle load level, improper quality control and inadequate maintenance, the present road network in the country is deteriorating at an extraordinary pace. The bulk of investment in the road sector is being made for new construction (mega project). The NHA have tendered out and started execution of a large number of road projects without any plan and resources management for their maintenance. As a consequence, over the years, the road network has deteriorated beyond reprieve. At present. The maintenance grant is only 25% of the requirement creating a huge maintenance backlog. Similarly, provincial road departments are also facing great difficulties in maintaining their roads. Observing the situation a Dedicated Road Maintenance Fund is the need of the time, based on modern Roads Management System.
4. Another crucial issue is the non-availability of high degree professionalism in the departments responsible for road planning, design, construction and maintenance. High priority should be assigned to human resource development in the field.
5. Procedures for the tendering, award of contract, and construction supervision of road projects should be made more transparent. A proper road database should establish by the Provincial and the Federal road agencies for all kinds of information relating roads their classification, condition, traffic volumes, development and maintenance expenditures etc.
6. Efforts made in the past for the induction of private sector in the field of road development and preservation has not been fruitful. The Government should encourage private participation in the road maintenance and construction.

7. It should be mandatory for the concerned departments at both Federal and Provincial levels to make a provision for at least 1 percent of the new construction in their annual budget to be devoted to research about the subject.
8. To ensure that road transport is not over-burdened in future, the government has to encourage other modes of transport, particularly railways through modernization of the existing railway infrastructure.
9. Road accidents are a world wide problem, and result in over 1 million people killed and 10-15 million crippled or injured every year according to the WHO " World Health Report 1999". About 75% of these road deaths occur in developing countries, although they have 32% of all motor vehicles. In Asia-Pacific region alone, it is estimated that over 400,000 people are killed annually by road accidents and several million injured. Similarly, it is estimated that in 1999 in Pakistan some 7000 people were killed and 140,000 were injured. Studies carried out in the country mention some of the reasons for such alarming situations as (a) inadequate coordination in the implementation of safety countermeasures (b) inadequate efforts to improve hazardous locations or for safety-conscious planning (c) insufficient technical and financial resources to tackle the problem. In order to cope the problem it is needed that there should be a) A National Road Safety Council with adequate technical support b) Set up an effective computerized accident database, with a uniform accident reporting form.

4.2.6 The Issue

The pace of highway construction in our country has increased tremendously during the last two decades. The budget allocations for the highway sector alone now constitute about 20% of the country's total development outlay. As a result, pavements now represent one of the most costly public sector assets. These pavements are designed and constructed to last for a certain life period. Unfortunately, in our country, most of these highways fail prematurely either because of poor quality control, inadequate estimation of axle loads, extreme environment and loading conditions and poor analysis of material properties. Thus full benefits from the investment are not received but it also inflates operational costs of the vehicles and cause considerable delays in freight/passenger

movements. Sections of National Highways such as Nowshera – Chablat, Mian Channu-Sahiwal (N-5), Sarai Gambila-Karak (N-55), Karachi-Hyderabad (N-5) are some examples where pavements have failed prematurely. Lack of Quality control in the road construction project in Pakistan contributes the most in the above mention problems. Some basic issues related to the topic are briefed in following: -

4.3 What is Quality?

Quality in a material, component or structure means that it will fulfil certain defined requirements for an adequate period of time

4.3.1 What is Quality Control?

Quality Control is procedures developed in any industry to increase the homogeneity and consistency of its products, and to establish rational, objective for controlling production

Why Quality Control is needed for Road Projects?

- Road building is a process
- Roads are built to serve people
- Borrow money is used to construct roads
- Investment demands maximum benefit

Basis for Control of Quality in Road Project

The quality of the Final product (i.e the Road) is controlled, on one hand, by the design requirements that are specified in the plans, specifications, and on the other hand by how well the construction is executed and maintained.

Aspects of Quality Control during Construction Phase

There are two aspects of Quality Control in Road Construction

Determination of the quality during construction process

This aspect covers how to manage the construction process so as to provide the quality that is require to meet the design requirements, it is done by consultant or contractor

Determination of the quality of completed construction

This aspect is related to the finding of what quality has been achieved at completed construction. Mostly done by a third party other than client, consultant or contractor
A case study based on this aspect of QC in road project will be presented at later stage of my presentation

Where Quality Control Applies During Construction Phase

During the construction of roads, quality control is applied at:

- Levels and grades
- Construction techniques

- Consumption of various materials
- Strength of materials
- Degree of compaction
- Thickness of various layers
- Roughness of surface
- Shape of cross section

4.3.2 Tools of Quality Control in Road Projects

- ❖ **Visual Inspection**
 - Representative
 - Un-biased
 - Typical average condition

- ❖ **Material Testing Facilities**
 - In-place
 - In Laboratory
- ❖ **Statistical Analysis**
 - Mean, Mood, Median
 - Standard Deviation
 - Coefficient of Variance
- ❖ **Documentation**

4.4 CASE STUDY

The case study presented in this report is based on the NTRC Report titled "Quality Checking of Contract - 10 A (13-km Deferred Portion), IHP". A team of engineers including myself conducted the study.

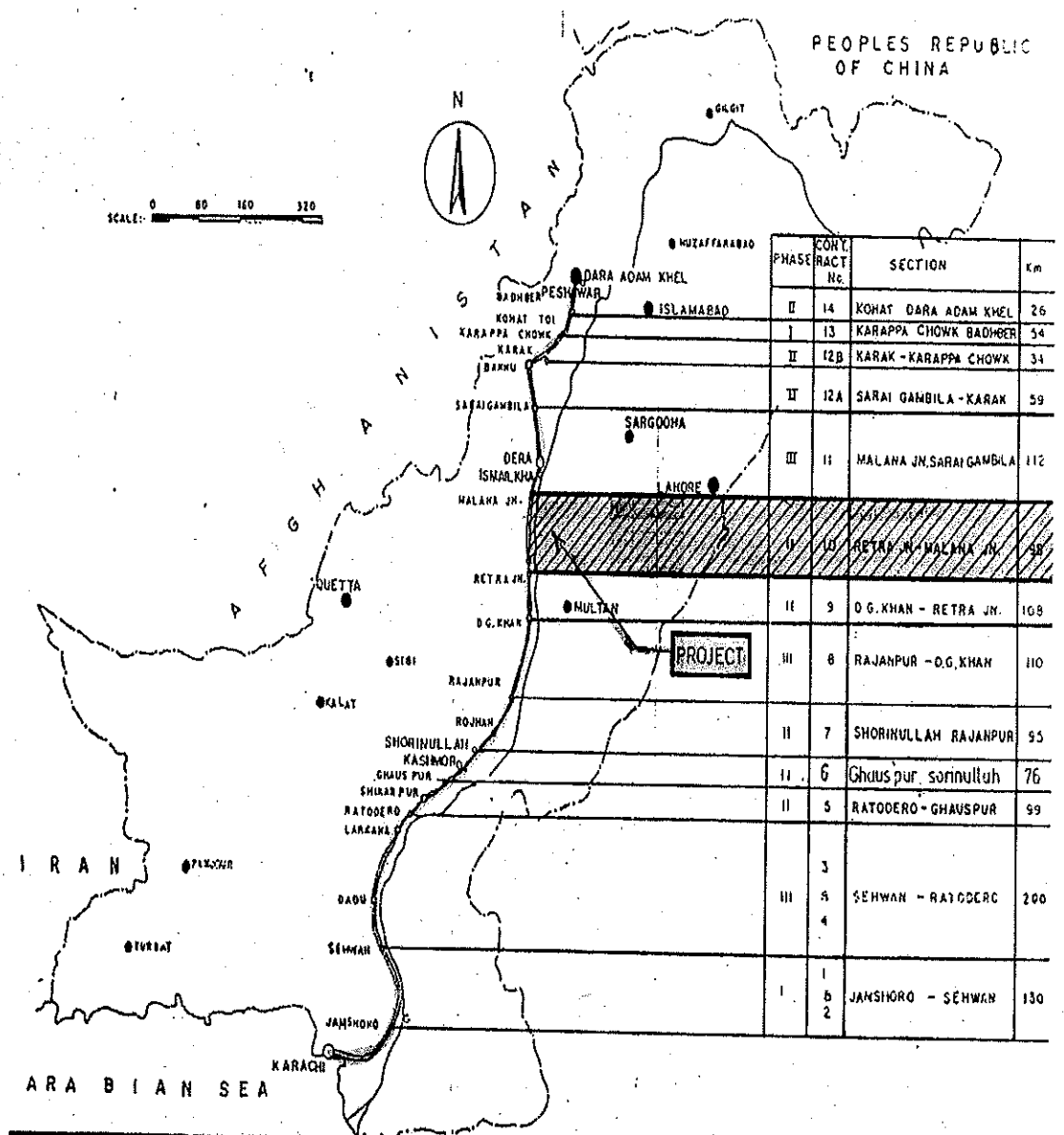
4.4.1 OBJECTIVE & SCOPE

The Ministry of Communications and Railways, requested NTRC to carry out the quality checking of the recently completed 13-km (deferred portion) of the contract 10 of Indus Highway Project

The scope of the study consisted of the following activities:

- a) Field observation
- b) Field testing and materials sampling
- c) Laboratory testing of the collected samples
- d) Analysis of results
- e) Report writing

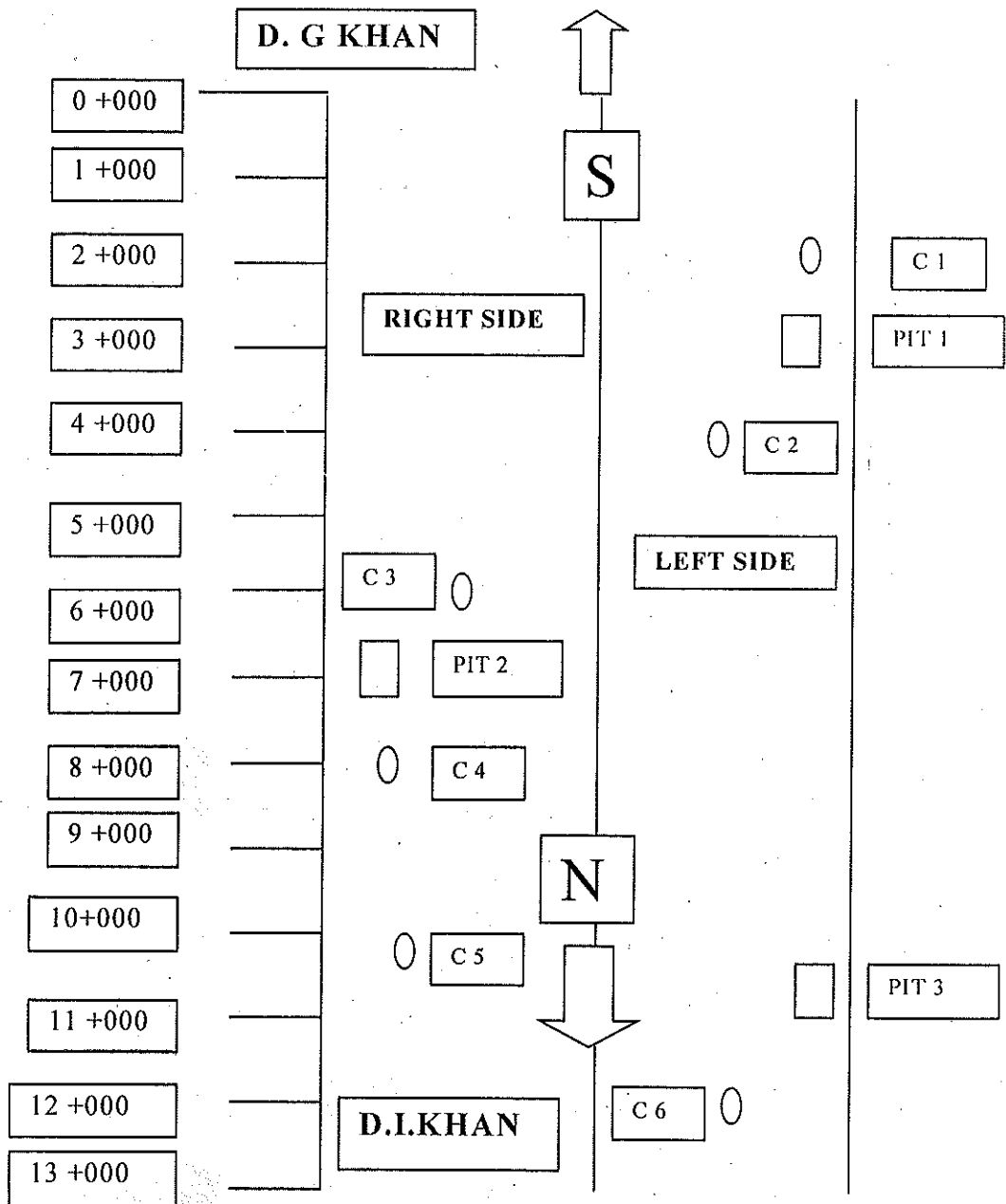
Figure – 5 Indus Highway Project Location Plan

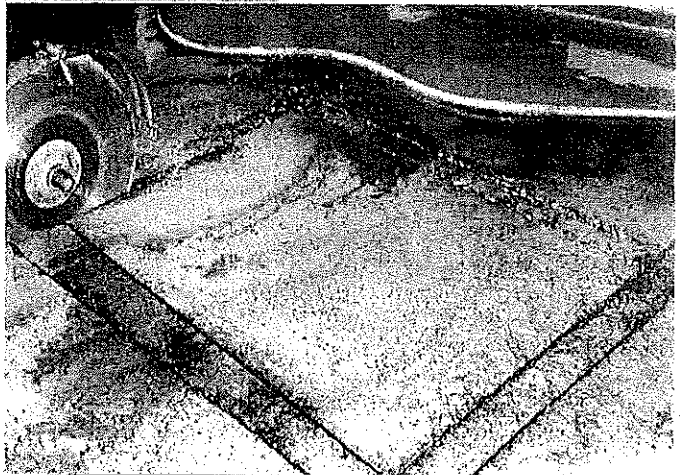
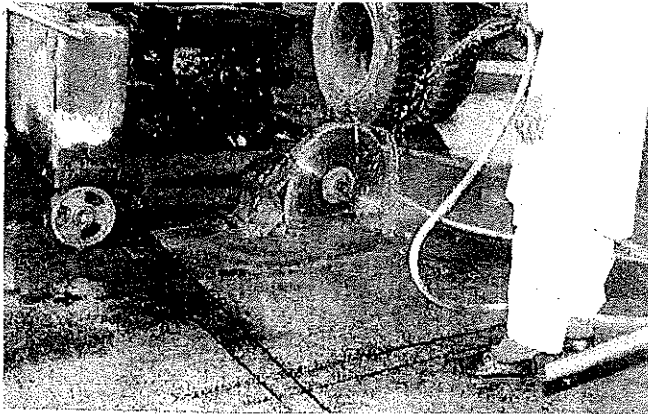


4.4.2 MATERIALS SAMPLING & FIELD TESTING

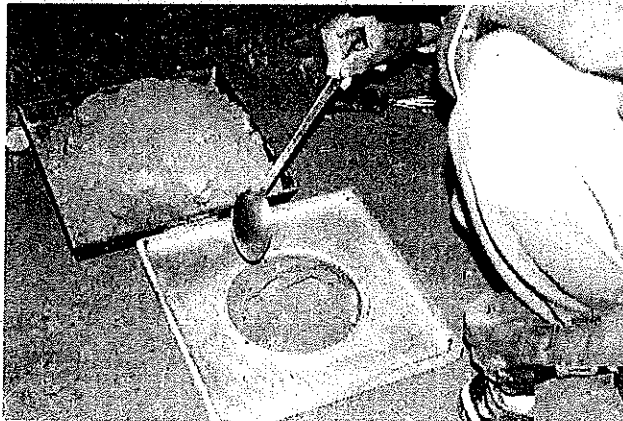
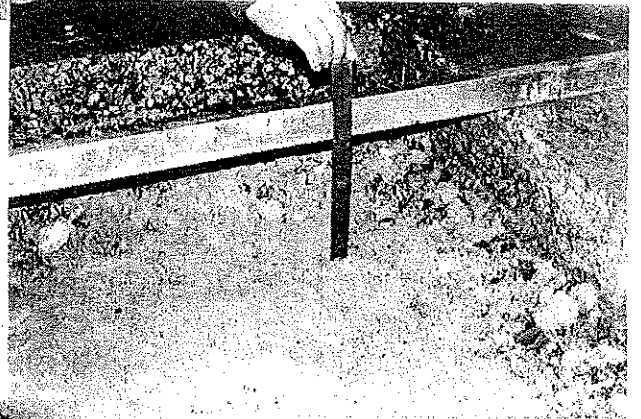
The road section referred for quality checking was nearly to completion and opened for traffic. In order to get the true assessment of the materials used and its workmanship on site NTRC team decided to go for open pit and coring survey.

Figure -6 Field Testing Plan





Photos 1-3 Test Pit under preparation.



Photos 4-7 Field Testing and Materials Sampling

Figure - 7

TEST PIT LOG

Road Number: N -55

Project Name: Indus Highway Project

Chainage : 3 + 000

Section: 10

Engineer: Hameed A

Position : North Bound

Date: 11-01-2001

Pit Number: 01

Depth in millimeters	Layer Thickness in mm	Classification	Description of Material	Field Density Test		Laboratory Density Test		Inplace Compaction %	Remarks
				Dry Density gms/cc	Moisture Content %	Maximum Dry Density gms/cc	Optimum Moisture Content %		
0		Wearing Course	Asphaltic Concrete						
100		Asphaltic Base	Asphaltic Concrete						
200		Aggregate Base	Crushed Aggregates	2.23	3.4	2.27	5.2	98	
300		Sub - base	Granular Material	2.25	3.4	2.25	4.8	100	
400									
500		Sub-grade	Borrow Material	2.054	9.9	2.115	8	97	
600									
700									

4.4.3 LABORATORY TESTING

Material Samples of different layers collected from three pits were tested in NTRC laboratories for standard tests as per AASHTO specifications

Sub-grade Material

- Classification as per AASHTO designation T 89-90, T 90-87 and T 27-88
- Compaction as per AASHTO designation T 191-86, T 180-90
- Strength as per AASHTO designation T 193-81

Sub-base Material

- Gradation as per AASHTO designation T 27-88
- Compaction as per AASHTO designation T 191-86, T 180-90
- Strength as per AASHTO designation T 193-81

Crushed Aggregate Base Material

- Gradation as per AASHTO designation T 27-88
- Compaction as per AASHTO designation T 191-86, T 180-90
- Strength as per AASHTO designation T 193-81
- Crushed Faces of Crushed Aggregate

Asphaltic Base Course Material

- Layer Thickness as per AASHTO designation
- Compaction as per AASHTO designation T 230, T 166
- Gradation and Bitumen Content as per AASHTO designation T 164-90
- Filler Bitumen Content Ratio

Asphaltic Wearing Course Material

- Layer thickness as per AASHTO designation
- Compaction as per AASHTO designation T 230, T 166
- Gradation and Bitumen Content as per AASHTO designation T 164 -90
- Filler Bitumen Content Ratio

4.5 RESULTS OF STUDY

Table - 16

Quality Check
(LHP)

PAVEMENT LAYER	ITEM	CRITERION	SAMPLE LOCATION (Km)			SPECIFICATION	REMARKS
			3+000	7+000	11+000		
Subgrade	Gradation	%#200 sieve	27	41	54	35	Too much fines at 11+000
	Strength	CBR%	40	34	24	15	Least strength at 11+000.
Subbase Course	Compaction	%	100	98	94	98	Under compaction at 11+000
	Thickness	mm	253	252	239	250	Least thickness at 11+000
Aggregate Base Course	Gradation	%2' sieve	100	100	93	100	Coarser Material at 11+000
	Compaction	%	99	NA	94	100	Under compaction at 11+000
	Thickness	mm	134	137	100	125	Deficient thickness at 11+000
Asphaltic Wearing Course	Thickness	mm	51	49	45	50	Deficient thickness at 11+000
	Bitumen	%	33	37	33	38	Lesser Bitumen at 3+000 & 11+000

RECOMMENDATIONS

- Develop the environment and culture for Quality in Road Construction in the country.
- There is an urgent need for the development of a minimum level of quality assurance.
- Provide training and encouragement to young engineers for adopting Quality Control procedures.
- Provide management, leadership and support at higher level in the government for Quality in Road construction.
- Achieve ISO 9000 certification for the management of National Highways.
- Communicate to current and potential contractors to go for ISO certification.
- Encourage the industry to develop the appropriate level of quality.

National Highway Network Evaluation

Link	Road	Sections	Sub	Start	End	Cell	Length	Surface	Width	IRI	Rutting	Cracking	Potholes	Car	Wagon	Bus	Small	Medium	Truck	Heavy	Truc	Total
1	N05(N)	1	1-1	15	148	P5AX	134	AC	7.30	2.53	19.29	1.50	0	1060	88	686	3298	1447	571	7150		
2	N05(N)	2	2-1	149	163	P5AX	15	AC	7.30	3.09	11.67	0.33	0	1060	88	686	3298	1447	571	7150		
3	N05(N)	3	3-1	164	209	P4AX	46	AC	7.30	2.12	6.11	0.33	0	1815	432	600	2768	91	45	5750		
4	N05(N)	4	4-1	210	250	P3AX	41	AC	7.30	3.00	0.00	0.00	0	780	195	371	2504	115	59	4023		
5	N05(N)	5	5-1	251	264	P3AX	14	AC	7.30	3.00	0.00	0.00	0	666	168	291	2427	97	305	3954		
6	N05(N)	6	6-1	265	320	P3AX	56	AC	7.30	3.00	0.00	0.00	0	1019	408	281	2437	141	257	4542		
7	N05(N)	7	7-1	321	345	P3AX	25	AC	7.30	3.00	0.00	0.00	0	539	175	188	1797	947	422	4067		
8	N05(N)	8	8-1	346	392	P3AX	47	AC	7.30	3.00	0.00	0.00	0	386	76	132	1771	1081	487	3933		
9	N05(N)	9	9-1	393	397	P4AX	5	AC	7.30	1.60	5.00	0.00	0	1259	435	212	2401	1401	826	6535		
10	N05(N)	9	9-2	398	437	P4AY	40	AC	7.30	3.05	13.43	9.71	0.04	1259	435	212	2401	1401	826	6535		
11	N05(N)	10	10-1	438	458	P4BY	21	AC	7.30	4.74	38.57	10.24	0.06	1174	423	297	2385	1299	769	6348		
12	N05(N)	11	11-1	459	483	P4BY	25	AC	7.30	3.96	19.00	6.00	0.06	1230	616	288	2354	1121	666	6275		
13	N05(N)	12	12-1	484	503	P4AX	20	AC	7.30	2.73	5.50	0.00	0	966	139	279	2809	1397	852	6442		
14	N05(N)	12	12-2	504	506	P4DX	3	AC	7.30	7.74	5.00	1.67	0	966	139	279	2809	1397	852	6442		
15	N05(N)	12	12-3	507	515	P4AX	9	AC	7.30	2.76	6.11	0.56	0	966	139	279	2809	1397	852	6442		
16	N05(N)	13	13-1	516	516	P4AX	1	AC	7.30	3.48	5.00	0.00	0	616	125	274	2258	1173	635	5083		
17	N05(N)	13	13-2	517	543	P4AX	27	AC	7.30	2.33	5.00	0.00	0	616	125	274	2258	1173	635	5083		
18	N05(N)	14	14-1	544	549	P3AX	6	AC	7.30	2.59	5.00	0.00	0	563	112	279	2055	1114	572	4696		
19	N05(N)	14	14-2	550	559	P3AX	10	AC	7.30	2.84	5.00	0.00	0	563	112	279	2055	1114	572	4696		
20	N05(N)	14	14-3	560	568	P3AX	9	AC	7.30	2.67	5.00	0.00	0	563	112	279	2055	1114	572	4696		
21	N05(N)	15	15-1	569	582	P4AX	14	AC	7.30	2.90	5.00	0.00	0	700	148	293	2218	1234	706	5300		
22	N05(N)	16	16-1	583	596	P4AX	14	AC	7.30	3.12	5.00	0.00	0	480	131	269	2260	1352	667	5160		
23	N05(N)	17	17-1	597	637	P4AX	41	AC	7.30	2.89	6.62	2.84	0.04	422	70	214	2216	1439	850	5212		
24	N05(N)	18	18-1	638	655	P3AX	18	AC	7.30	2.85	5.56	1.94	0.04	740	267	348	1725	1095	660	4835		
25	N05(N)	19	19-1	656	658	P3DZ	3	AC	7.30	9.93	50.00	50.00	0.1	339	57	234	1941	1457	874	4903		
26	N05(N)	19	19-2	659	663	P3DZ	5	AC	7.30	11.03	11.00	50.00	0.08	339	57	234	1941	1457	874	4903		
27	N05(N)	19	19-3	664	672	P3DZ	9	AC	7.30	9.40	22.78	27.22	0.08	339	57	234	1941	1457	874	4903		
28	N05(N)	19	19-4	673	676	P3CZ	4	AC	7.30	7.00	25.00	35.00	0.06	339	57	234	1941	1457	874	4903		
29	N05(N)	19	19-5	677	682	P3DY	6	AC	7.30	10.82	5.00	21.67	0.06	339	57	234	1941	1457	874	4903		
30	N05(N)	19	19-6	683	686	P3DY	4	AC	7.05	12.54	10.00	15.00	0.06	339	57	234	1941	1457	874	4903		
31	N05(N)	19	19-7	687	734	S3DZ	48	SD	6.49	9.36	18.96	28.23	0.08	339	57	234	1941	1457	874	4903		
32	N05(N)	20	20-1	735	753	S3DX	19	SD	7.30	7.26	7.11	1.32	0.04	227	59	256	1628	1356	695	4221		
33	N05(N)	20	20-2	754	756	S3CX	3	SD	7.30	6.97	5.00	5.00	0	227	59	256	1628	1356	695	4221		
34	N05(N)	21	21-1	757	767	S3DY	11	SD	7.30	9.82	5.91	9.09	0.06	231	74	81	1331	1077	651	3446		
35	N05(N)	22	22-1	768	792	S3DY	25	SD	7.30	9.58	10.60	11.20	0.06	571	155	157	1736	1198	698	4514		
36	N05(N)	23	23-1	793	832	S4DY	40	SD	7.23	7.72	20.38	17.00	0.04	1299	477	203	2144	1169	687	5978		
37	N05(N)	23	23-2	833	840	S4DY	8	SD	7.30	11.21	13.75	16.25	0.04	1299	477	203	2144	1169	687	5978		
38	N05(N)	23	23-3	841	844	S4DX	4	SD	7.30	8.93	5.00	5.00	0	1299	477	203	2144	1169	687	5978		

Link Road	Sections	Sub	Start	End	Cell	Length	Surface	Width	IRI	Rutting	Cracking	Potholes	Car	Wagon	Bus	small	Truck	medium	Truck	heavy	Truc	Total
159 N05(S)	79	79-1	1063	1108	S4CY	46	SD	6.78	6.81	8.50	8.75	0.04	1467	465	571	1561	852				503	5420
160 N05(S)	79	79-2	1109	1117	P4DZ	9	AC	7.30	13.46	9.44	45.00	0.04	1467	465	571	1561	852				503	5420
161 N05(S)	79	79-3	1118	1148	P4AX	31	AC	7.30	2.77	5.00	0.00	0	1467	465	571	1561	852				503	5420
162 N05(S)	80	80-1	1149	1174	P4AX	26	AC	7.30	2.52	7.22	2.22	0.04	1610	518	632	1474	668				493	5395
163 N05(S)	80	80-2	1175	1180	P4BX	6	AC	7.30	3.57	5.00	0.00	0	1610	518	632	1474	668				493	5395
164 N05(S)	81	81-1	1181	1190	S4CY	10	SD	7.30	5.28	5.00	24.29	0	1807	595	687	2052	577				680	6397
165 N05(S)	82	82-1	1191	1221	P4AX	31	AC	8.98	2.87	5.00	0.00	0	1807	595	687	2052	577				680	6397
166 N05(S)	83	83-1	1222	1238	P4BX	17	AC	7.23	4.06	5.00	0.00	0.04	1807	595	687	2052	577				680	6397
167 N05(S)	83	83-2	1239	1245	S4DX	7	SD	7.00	11.46	5.00	0.00	0.04	1807	595	687	2052	577				680	6397
168 N05(S)	84	84-1	1246	1260	S4DX	15	SD	7.00	7.84	5.00	0.00	0	1807	595	687	2052	577				680	6397
169 N05(S)	85	85-1	1261	1268	S5CX	8	SD	7.83	5.41	5.00	1.88	0	21683	8593	3894	5317	1244				775	41504
170 N05(S)	86	86-1	1269	1270	P5DY	2	AC	9.15	7.69	10.00	10.00	0	6667	3405	1254	2937	471				386	15119
171 N05(S)	86	86-2	1271	1287	P5DY	17	AC	8.50	8.24	5.59	17.35	0	6667	3405	1254	2937	471				386	15119
172 N05(S)	87	87-1	1288	1289	P5CY	2	AC	10.00	5.02	5.00	15.00	0	5858	2961	1077	2747	558				460	13661
173 N05(S)	87	87-2	1290	1294	P5DX	5	AC	8.30	8.75	5.00	3.75	0	5858	2961	1077	2747	558				460	13661
174 N05(S)	87	87-3	1295	1320	P5CY	26	AC	8.34	6.53	5.40	9.42	0.04	5858	2961	1077	2747	558				460	13661
175 N05(S)	87	87-4	1321	1328	P5AX	8	AC	7.30	2.07	5.00	0.00	0	5858	2961	1077	2747	558				460	13661
176 N05(S)	88	88-1	1329	1362	P5AY	34	AC	7.30	2.50	7.35	5.15	0	3311	2001	790	2898	526				469	9994
177 N05(S)	89	89-1	1363	1363	S5DZ	1	SD	7.30	13.75	15.00	50.00	0	2836	1475	895	2220	420				211	8055
178 N05(S)	89	89-2	1364	1380	S5CY	17	SD	7.21	5.58	7.35	9.12	0.04	2836	1475	895	2220	420				211	8055
179 N05(S)	90	90-1	1381	1388	P2AX	8	AC	7.30	2.85	5.00	3.75	0	860	741	302	200	8				5	2116
180 N05(S)	90	90-2	1389	1391	P2AX	3	AC	7.30	1.66	5.00	0.00	0	860	741	302	200	8				5	2116
181 N05(S)	90	90-3	1392	1397	P2AX	6	AC	7.43	2.55	11.67	0.00	0	860	741	302	200	8				5	2116
182 N05(S)	91	91-1	1398	1413	P5AX	16	AC	7.50	3.34	5.00	1.88	0	3588	1610	718	1925	284				171	8297
183 N05(S)	92	92-1	1414	1428	P4BY	15	AC	7.31	4.45	7.00	5.67	0.04	2434	1115	718	2059	414				158	6897
184 N05(S)	92	92-2	1429	1433	S4DY	5	SD	7.30	9.23	7.00	8.00	0.04	2434	1115	718	2059	414				158	6897
185 N05(S)	93	93-1	1434	1448	P5AX	15	AC	7.30	3.41	7.00	2.33	0	4066	2175	1093	1941	490				235	10000
186 N05(S)	94	94-1	1449	1473	P4BY	25	AC	7.30	4.92	17.08	9.58	0.04	2771	1342	560	1699	358				140	6869
187 N05(S)	95	95-1	1474	1474	P5DX	1	AC	7.30	8.69	5.00	0.00	0	2853	1545	574	1892	411				156	7432
188 N05(S)	95	95-2	1475	1491	P5AX	17	AC	7.30	2.78	5.00	0.00	0	2853	1545	574	1892	411				156	7432
189 N05(S)	96	96-1	1492	1492	P5AX	1	AC	7.30	2.00	5.00	0.00	0	3023	1882	720	2130	385				165	8305
190 N05(S)	96	96-2	1493	1503	P5AX	11	AC	7.30	3.17	8.64	0.00	0	3023	1882	720	2130	385				165	8305
191 N05(S)	97	97-1	1504	1522	P5BY	19	AC	7.30	4.77	12.37	8.68	0	4273	2509	840	2581	532				205	10941
192 N05(S)	98	98-1	1523	1552	P5BY	30	AC	7.30	4.17	9.00	10.50	0.04	7078	3362	1233	3534	433				190	15831
193 N05(S)	99	99-1	1553	1558	P5CX	6	AC	7.30	5.51	16.67	4.17	0.06	7065	2554	1077	4495	614				193	15998
194 N05(S)	99	99-2	1559	1569	P5DY	11	AC	7.30	7.20	26.82	10.45	0.06	7065	2554	1077	4495	614				193	15998
195 N05(S)	100	100-1	1570	1585	P5CY	16	AC	7.30	5.86	6.88	11.88	0.04	3559	1695	966	2185	248				128	8780
196 N05(S)	101	101-1	1586	1589	P5CY	4	AC	7.30	6.06	5.00	10.00	0.04	3349	1386	703	1985	241				66	7730
197 N05(S)	102	102-1	1590	1621	P5DY	32	AC	7.30	10.38	17.81	15.94	0.04	3349	1386	703	1985	241				66	7730
198 N05(S)	103	103-1	1622	1626	P5DY	5	AC	7.30	11.91	25.00	15.00	0.04	3269	1331	551	1814	241				106	7311

Link Road	Sections	Sub	Start	End	Cell	Length	Surface	Width	IRI	Rutting	Cracking	Potholes	Car	Wagon	Bus	Small	Truck	Medium	Truck	Leavy	Truc	Total
239 N25	113	113-1	546	551	P2AX	6	AC	8.68	2.06	13.33	3.33	0.04	489	149	163	655	69			0		1525
240 N25	113	113-2	552	577	S2DY	26	SD	6.01	8.16	15.00	25.00	0.06	489	149	163	655	69			0		1525
241 N25	113	113-3	578	583	S2DY	6	SD	5.55	10.50	15.00	24.17	0.08	489	149	163	655	69			0		1525
242 N25	113	113-4	584	635	S2DZ	52	SD	5.52	8.19	16.57	26.76	0.08	489	149	163	655	69			0		1525
243 N25	114	114-1	636	650	S3DY	15	SD	5.52	7.57	15.00	23.33	0.06	1856	543	329	1394	241			0		4364
244 N25	115	115-1	651	656	S5DZ	6	SD	5.88	7.66	15.00	30.00	0.06	3391	833	851	2380	548			0		8002
245 N25	115	115-2	657	661	S5DZ	5	SD	6.50	10.92	27.00	30.00	0.06	3391	833	851	2380	548			0		8002
246 N25	115	115-3	662	676	S5DY	15	SD	6.27	7.22	17.00	20.00	0.04	3391	833	851	2380	548			0		8002
247 N25	115	115-4	677	687	P5AX	11	AC	7.20	2.33	5.00	0.00	0	3391	833	851	2380	548			0		8002
248 N25	116	116-1	688	690	P5AX	3	AC	7.20	2.00	0.00	0.00	0	4496	534	762	2680	306			0		8778
249 N25	116	116-2	691	701	P5BX	11	AC	8.65	3.67	15.00	4.55	0.04	4496	534	762	2680	306			0		8778
250 N25	116	116-3	702	707	S5DZ	6	SD	7.18	7.59	23.33	25.83	0.06	4496	534	762	2680	306			0		8778
251 N25	116	116-4	708	712	S5CY	5	SD	7.66	5.54	17.00	9.00	0.04	4496	534	762	2680	306			0		8778
252 N25	117	117-1	713	731	P2DY	19	AC	6.72	7.28	18.68	21.84	0.04	1433	159	252	715	208			121		2889
253 N25	118	118-1	732	734	S2CZ	3	SD	6.00	6.62	15.00	38.33	0.04	879	134	153	536	139			57		1898
254 N25	118	118-2	735	771	S2DY	37	SD	6.00	9.27	19.59	20.14	0.06	879	134	153	536	139			57		1898
255 N25	118	118-3	772	777	S2DX	6	SD	6.00	7.06	15.00	3.33	0.06	879	134	153	536	139			57		1898
256 N25	118	118-4	778	795	S2DY	18	SD	6.00	10.18	20.56	11.67	0.06	879	134	153	536	139			57		1898
257 N25	118	118-5	796	799	S2DZ	4	SD	6.00	13.10	27.50	30.00	0.08	879	134	153	536	139			57		1898
258 N25	118	118-6	800	816	S2DY	17	SD	6.41	9.66	15.00	16.18	0.06	879	134	153	536	139			57		1898
259 N35	119	119-1	1	33	P4BY	33	AC	7.50	3.89	11.06	9.09	0	2540	1846	550	1043	137			130		6246
260 N35	120	120-1	34	54	P5BY	21	AC	7.50	4.08	15.95	25.00	0	3648	2121	537	1598	59			54		8017
261 N35	121	121-1	55	56	P5AX	2	AC	7.50	3.29	5.00	5.00	0	4588	2263	706	1800	41			115		9513
262 N35	121	121-2	57	66	P5CY	10	AC	7.50	5.12	10.00	10.50	0	4588	2263	706	1800	41			115		9513
263 N35	121	121-3	67	70	P5CY	4	AC	7.50	6.56	5.00	10.00	0	4588	2263	706	1800	41			115		9513
264 N35	122	122-1	71	71	P5BX	1	AC	7.50	3.83	5.00	5.00	0	4958	2598	294	1274	27			48		9199
265 N35	122	122-2	72	77	P5BY	6	AC	7.50	4.81	6.67	11.67	0	4958	2598	294	1274	27			48		9199
266 N35	122	122-3	78	80	P5CY	3	AC	7.50	5.74	8.33	8.33	0	4958	2598	294	1274	27			48		9199
267 N35	122	122-4	81	94	P5BX	14	AC	6.96	4.86	7.86	1.43	0	4958	2598	294	1274	27			48		9199
268 N35	123	123-1	95	115	P3CY	21	AC	6.79	5.08	7.38	5.71	0	2292	919	52	426	8			75		3772
269 N35	124	124-1	116	165	S2AX	50						0.04	403	325	39	296	3			0		1067
270 N35	125	125-1	166	191	S2AX	26						0.06	393	266	42	337	3			5		1045
271 N35	126	126-1	192	218	S2AX	27						0.08	632	279	26	275	6			2		1220
272 N35	127	127-1	219	257	S1AX	39						0.06	333	121	22	163	6			0		645
273 N35	128	128-1	258	294	S1AX	37						0.06	369	116	23	241	2			2		752
274 N35	129	129-1	295	352	S1AX	58						0.06	125	62	26	168	2			0		382
275 N35	130	130-1	353	416	S1AX	64						0.06	225	57	28	178	3			15		507
276 N35	131	131-1	417	470	S1AX	54						0.06	238	76	30	238	5			0		588
277 N35	132	132-1	471	500	S1AX	30						0.06	195	76	28	260	2			38		599
278 N35	133	133-1	501	540	S1AX	40						0.08	96	28	15	146	0			8		293

Link Road	Sections	Sub	Start	End	Cell	Length	Surface	Width	IRI	Rutting	Cracking	Potholes	Car	Wagon	Bus	small	Truck	medium	Truck	heavy	Truc	Total	
319 N50	144	144-2	58	60	S2CY	3	SD	3.78	6.00	20.00	15.00	0.04	790	123	31	293	5				14	1255	
320 N50	144	144-3	61	71	S2DZ	11	SD	4.09	11.38	24.09	25.91	0.06	790	123	31	293	5					14	1255
321 N50	144	144-4	72	76	S2DZ	5	SD	6.20	7.45	30.00	35.00	0.06	790	123	31	293	5					14	1255
322 N50	144	144-5	77	86	S2DY	10	SD	4.00	9.56	24.00	14.00	0.06	790	123	31	293	5					14	1255
323 N50	144	144-6	87	96	S2DY	10	SD	4.96	9.24	26.67	25.00	0.04	790	123	31	293	5					14	1255
324 N50	145	145-1	97	100	S1DZ	4	SD	4.19	8.71	25.00	38.75	0.04	508	115	14	260	17					32	945
325 N50	145	145-2	101	120	S1DZ	20	SD	3.86	10.19	29.00	32.00	0.04	508	115	14	260	17					32	945
326 N50	145	145-3	121	127	S1DZ	7	SD	3.47	12.26	25.00	35.00	0.04	508	115	14	260	17					32	945
327 N50	145	145-4	128	148	S1DY	21	SD	3.81	8.25	16.90	10.24	0.06	508	115	14	260	17					32	945
328 N50	145	145-5	149	153	S1DX	5	SD	4.00	7.01	15.00	5.00	0.06	508	115	14	260	17					32	945
329 N50	145	145-6	154	162	S1DX	9	SD	4.00	10.01	18.33	5.00	0.06	508	115	14	260	17					32	945
330 N50	146	146-1	163	216	S1DY	54	SD	4.47	9.26	24.72	22.13	0.06	80	43	5	92	36					3	261
331 N50	146	146-2	217	219	S1DY	3	SD	3.40	13.17	28.33	21.67	0.06	80	43	5	92	36					3	261
332 N50	146	146-3	220	226	S1DY	7	SD	3.40	8.87	22.14	12.14	0.06	80	43	5	92	36					3	261
333 N50	146	146-4	227	232	S1DZ	6	SD	3.40	14.19	42.50	45.00	0.08	80	43	5	92	36					3	261
334 N50	146	146-5	233	239	S1DY	7	SD	4.11	9.16	20.71	17.86	0.06	80	43	5	92	36					3	261
335 N50	146	146-6	240	263	S1DZ	24	SD	4.30	9.40	33.57	29.64	0.06	80	43	5	92	36					3	261
336 N50	146	146-7	264	271	S1DY	8	SD	3.78	8.62	22.50	7.50	0.04	80	43	5	92	36					3	261
337 N50	147	147-1	272	284	S1DY	13	SD	3.77	7.99	24.23	8.08	0.08	229	65	16	152	35					51	548
338 N50	147	147-2	285	289	S1CX	5	SD	5.50	5.93	15.00	5.00	0	229	65	16	152	35					51	548
339 N50	147	147-3	290	294	S1DY	5	SD	3.30	9.40	29.00	15.00	0	229	65	16	152	35					51	548
340 N50	147	147-4	295	305	S1DY	11	SD	3.35	12.12	30.45	20.45	0	229	65	16	152	35					51	548
341 N50	147	147-5	306	310	S1DY	5	SD	3.48	9.93	29.00	19.00	0	229	65	16	152	35					51	548
342 N50	148	148-1	311	329	S1DY	19	SD	3.60	8.56	28.13	21.25	0	79	5	30	32	0					6	152
343 N50	148	148-2	330	335	S1CY	6	SD	3.85	6.37	25.00	13.33	0.04	79	5	30	32	0					6	152
344 N50	148	148-3	336	338	S1DY	3	SD	3.90	7.55	21.67	8.33	0.06	79	5	30	32	0					6	152
345 N50	148	148-4	339	342	S1CX	4	SD	3.90	6.47	17.50	5.00	0.04	79	5	30	32	0					6	152
346 N50	148	148-5	343	354	S1DY	12	SD	3.90	7.43	17.50	6.67	0.06	79	5	30	32	0					6	152
347 N50	148	148-6	355	359	S1DY	5		3.90	11.50	32.50	15.00	0.06	79	5	30	32	0					6	152
348 N50	148	148-7	360	378	S1DY	19	SD	3.90	8.16	21.47	7.94	0.04	79	5	30	32	0					6	152
349 N50	148	148-8	379	382	S1DY	4	SD	3.90	11.19	25.00	15.00	0.04	79	5	30	32	0					6	152
350 N50	148	148-9	383	395	S1DY	13	SD	3.90	8.55	21.92	15.38	0.04	79	5	30	32	0					6	152
351 N50	149	149-1	396	427	S1BX	32	SD	7.30	4.50	0.00	0.00	0.06	105	11	24	44	0					3	187
352 N50	150	150-1	428	442	S1BX	15	SD	7.30	4.50	0.00	0.00	0.06	79	5	30	211	0					2	327
353 N50	151	151-1	443	528	S2BX	86	SD	7.30	4.50	0.00	0.00	0.06	564	18	72	311	42					60	1068
354 N55	152	152-1	1	4	P3AX	4	AC	7.30	2.46	5.00	0.00	0.04	1101	82	487	1471	204					137	3482
355 N55	153	153-1	5	125	P3AX	121	AC	7.30	2.17	5.08	0.00	0.04	423	97	106	515	2022					693	3856
356 N55	153	153-2	126	134	P3DY	9	AC	6.41	11.72	9.44	10.56	0.04	423	97	106	515	2022					693	3856
357 N55	154	154-1	135	169	S4DY	35	SD	6.30	9.95	8.64	18.33	0	597	389	69	318	2742					1247	5362
358 N55	154	154-2	170	173	S4DY	4	SD	6.30	13.73	5.00	15.00	0	597	389	69	318	2742					1247	5362

Table II

District Wise Length of Provincial Roads - Punjab (1998-00) Km

S.No	District	Road Class *			Total
		A	H	S	
1	Attock	324.3	287.0	414.2	1025.4
2	Bahawalnagar	928.8	269.6	240.3	1438.6
3	Bahawalpur	705.3	156.7	319.9	1181.9
4	Bhakkar	510.5	257.8	463.8	1232.1
5	Chakwal	561.2	271.9	312.8	1145.9
6	D.G. Khan	829.7		119.6	949.3
7	Faisalabad	1179.8	205.3	302.5	1687.6
8	Gujranwala	578.2	173.9	500.3	1252.3
9	Gujrat	461.8	130.6	403.9	996.3
10	Hafizabad	105.2	99.9	268.6	473.7
11	Jhang	511.7	496.3	190.8	1198.8
12	Jhelum	401.9	145.3	130.0	677.2
13	Kasur	873.4	79.2	267.8	1220.4
14	Khanewal	877.7	106.0	83.8	1067.6
15	Khushab	508.8	211.5	467.9	1188.2
16	Lahore	398.9	32.2	240.4	671.5
17	Layyah	469.8	185.2	217.1	872.1
18	Lodhran	512.8	139.8	136.1	788.6
19	Mandi-Bahou-Din	240.5	122.0	269.0	631.5
20	Mianwali	460.2	217.3	153.5	831.0
21	Multan	511.5	121.5	187.1	820.1
22	Muzaffargarh	441.4	449.7	212.6	1103.7
23	Narowal	221.4	131.5	285.2	638.1
24	Okara	1275.8	114.6	205.9	1596.2
25	Pak Pattan	412.3	136.6	162.9	711.8
26	Rahim Yar Khan	1213.5	117.3	332.7	1663.6
27	Rajanpur	439.1		121.9	561.0
28	Rawalpindi	941.1	268.0	432.7	1641.8
29	Sahiwal	684.9	70.9	164.8	920.5
30	Sargodha	780.6	224.0	584.8	1589.4
31	Sheikhupura	715.4	245.9	484.3	1445.5
32	Sialkot	572.8	287.5	342.3	1202.6
33	T.T. Singh	491.8	139.6	337.9	969.3
34	Vehari	737.4	234.7	315.0	1287.2
	Not specified	26.8			26.8
	Total	20906.1	6129.4	9672.1	36707.6

Source: Ministry of Local Government and Rural Development,
Road Management Project.

Note: Data covers Provincial Roads Surveyed by the Consultants
during 1998-2000.

- * A = Village/Farm to Market Roads (upto 12 ft wide)
- H = Provincial Roads (2 lane wide and more)
- S = Secondary Roads (1-2 lane wide)

Table - III

District wise Length of Provincial Roads - Sindh , 1998-00, (Km)

S.No	District	Road Class *			Total
		A	H	S	
1	Badin	411.3	333.8	733.2	1478.3
2	Dadu	755.2	125.9	711.9	1592.9
3	Ghotki	482.6	127.0	248.1	857.7
4	Hyderabad	1182.1	199.5	690.3	2072.0
5	Jacobabad	216.8	171.6	587.7	976.1
6	Karachi	165.0	84.3	261.5	510.8
7	Khairpur	1179.6	206.8	533.8	1920.1
8	Larkana	1056.6	218.7	707.5	1982.8
9	Mirpurkhas	398.5	190.1	327.0	915.7
10	Nawabshah	748.0	77.8	488.7	1314.5
11	Noshero Feroz	424.2	69.7	304.6	798.6
12	Sanghar	930.3	177.7	1028.1	2136.2
13	Shikarpur	432.7	34.3	309.6	776.6
14	Sukkur	233.9	48.2	173.7	455.8
15	Thar	100.4	121.3	81.6	303.3
16	Thatta	669.2	418.9	634.3	1722.4
17	Umerkot	462.2	77.0	290.2	829.5
Total		9848.8	2682.5	8111.8	20643.1

Source: Ministry of Local Governmetn and Rural Development
Project Management Cell.

Note: Data covers Provincial Roads Surveyed by the Consultants
during 1998-2000.

* A = Village/Farm to Market Roads (upto 12 ft wide)

H = Provincial Roads (2 lane wide and more)

S = Secondary Roads (1-2 lane wide)

Table - IV

District wise Length of Provincial Roads - NWFP, 1998-00 (Km)

S.No	District	Road Class *			Total
		A	H	S	
1	Abbottabad	134.8	58.0	229.6	422.3
2	Battagram	72.0	103.5	108.3	283.8
3	F.R. Kohat	83.6	0.0	0.0	83.6
4	F.R. Peshawar	135.8	0.0	0.0	135.8
5	F.R. Bannu	131.8	16.8	131.1	279.7
6	F.R. Tank	50.3	4.8	35.4	90.6
7	Bajour Agency	118.7	46.0	134.1	298.8
8	Bannu	226.1	40.0	250.9	517.0
9	Buner	87.5	87.1	133.2	307.9
10	Charsadda	163.0	106.5	116.3	385.7
11	Chitral	75.8	383.5	355.7	815.0
12	D.I. Khan	142.6	175.5	235.8	553.9
13	Dir	344.5	58.8	370.7	774.0
14	F.R. D.I. Khan	46.5	0.0	64.4	110.9
15	Haripur	97.3	99.9	210.1	407.4
16	Karak	30.5	0.0	205.1	235.6
17	Khyber Agency	308.3	29.8	208.7	546.8
18	Kohat/ Hangu	115.6	181.9	272.6	570.1
19	Kohistan	161.2	27.3	126.6	315.2
20	Kurram Agency	106.6	0.0	345.2	451.9
21	Malakand Agency	97.0	37.0	175.3	309.3
22	Manshera	57.5	252.7	347.0	657.2
23	Mardan	9.1	71.0	274.0	354.1
24	Mohmand Agency	190.4	72.6	104.4	367.4
25	North Waziristan Agency	148.7	210.7	184.6	544.0
26	Nowshera	174.0	37.0	174.1	385.1
27	Orakzai Agency	100.2	89.1	303.0	492.3
28	Peshawar	99.4	49.2	212.9	361.5
29	South Waziristan Agency	210.3	182.6	303.9	696.8
30	Swabi	167.5	98.2	152.1	417.9
31	Swat/ Shangla	378.9	212.5	173.3	764.6
32	Tank	24.9	97.2	188.7	310.8
	Total	4290.4	2829.3	6127.1	13246.8

Source: Ministry of Local Government and Rural Development,
Project Management Cell.

Note: Data covers Provincial Roads Surveyed by the Consultants
during 1998-2000.

* A = Village/Farm to Market Roads (upto 12 ft wide)

H = Provincial Roads (2 lane wide and more)

S = Secondary Roads (1-2 lane wide)

Table - V

District wise Length of Provincial Roads - Baluchistan, 1998-00 (Km)

S.No	District	Road Class *			Total
		A	H	S	
1	Awaran	40.0	409.0	860.0	1309.0
2	Barkhan	168.0	112.9	143.9	424.8
3	Bolan	131.8	190.2	172.1	494.1
4	Chaghai	102.4	525.3	317.0	944.7
5	Dera Bugti	75.0	403.2	229.0	707.2
6	Gawadar	320.0	629.0	47.0	996.0
7	Jaffarabad	157.1	126.0	64.0	347.2
8	Jhal Magsi	63.3	258.6	134.1	456.1
9	Kalat	173.0	141.6	895.8	1210.4
10	Kharan	0.0	791.0	526.0	1317.0
11	Khuzdar	403.0	253.0	738.0	1394.0
12	Killa Abdullah	115.0	215.6	445.1	775.7
13	Killa Saifullah	92.0	227.0	625.0	944.0
14	Kohlu Agency	52.0	534.0	257.0	843.0
15	Lasbela	87.6	8.3	302.0	397.9
16	Loralai	32.0	314.9	106.0	452.9
17	Mastung	23.2	12.4	334.1	369.8
18	Musakhail	106.0	99.0	117.0	322.0
19	Naseerabad	67.2	76.6	119.0	262.8
20	Panjgur	282.6	606.4	627.6	1516.6
21	Pishin	124.2	287.4	313.7	725.3
22	Pishin / Quetta	237.9	0.0	14.4	252.3
23	Quetta	2.5	182.5	141.4	326.4
24	Sibi	48.0	230.8	68.8	347.6
25	Turbat	335.0	616.0	507.0	1458.0
26	Uthal	478.1	286.0	34.0	798.1
27	Zhob	122.5	470.0	339.5	932.0
28	Ziarat	101.1	139.4	181.0	421.5
Total		3940.4	8146.3	8659.5	20746.2

Source: Ministry of Local Government and Rural Development,
Road Management Project Cell, Islamabad.

Note: Data covers Provincial Roads Surveyed by the Consultants during 1998-2000.

* A = Village/Farm to Market Roads (< 12 ft wide)

H = Provincial Roads (2 lane wide and more)

S = Secondary Roads (1-2 lane wide)