Paper No. 140

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Every country has its own special problems, closely linked with its economic and social environment, its natural resources and its climate. In the world of today every country has its own development priorities which are implemented in the development plans which it draws up for itself. One of these priorities is the development of means of transportation. As compared to other modes of transportation, roads are the most efficient and direct mode and as such they command immense importance so far as the economic development of a country is concerned. The importance of roads in our country can be well imagined from the fact that currently about 70% of the movement of goods and 80% of passengers is taking place over the roads.

At the time of independance the province of the Punjab inherited about 2600 miles of metalled roads, which connected only the important cities of the province. Over the years, the Punjab Highway Department has been able to add 8342 miles of roads and upto June 1985, the total mileage was over 11000. This when compared to the road mileage of other countries gives a very poor picture, as would be seen from the figures given in the following table.

LENGTH OF ROAD NETWORK AFTER POPULATION IN VARIOUS COUNTRIES Vs. PAKISTAN AND ITS PROVINCES

Territory	Area Thousands of sq.miles	Population Millions	Length of Road Network Thousands of miles	Area per mile of road Sq.miles	Population per mile of road Units
1	2	3	4	5	6
U.S.A.	3002	168.1	3509	0.9	48
France	212	47.0	447	0.5	105

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1	2	3	4	5	6
U.K.	89	55.0	199	0.4	276
Poland	120	30.5	177	0.7	172
Turkey	295	30.0	43	6.9	698
Morocco	142	8.6	32	4.4	268
Senegal	76	3.0	7.8	9.7	384
Ivory Coast	124	3.1	20.2	6.1	153
Ghana	91	6.7	12.2	7.5	549
Nigeria	371	34.6	36.9	10.1	938
Kenya	217	6.5	25.8	8.4	252
Zambia	283	2.5	21.7	13.1	115
Malawi	37	2.8	6.1	6.1	459
Rhodesia	150	3.1	37.2	4.0	83
Angola	479	4.8	23.2	20.6	207
Mozam-bique	299	6.6	16.6	18.0	398
South African Republic	•471	11.6	95.0	5.0	122
India	1215	378.0	441.0	2.8	857
Brazil	3273	59.8	284.0	11.5	211
Venezuela	351	5.9	20.0	17.5	295
Argentine Republic	1074	19.5	93.0	11.5	210
Ecuador	104	4.1	5.2	20.0	788
Pakistan	309	83.782	26.3	11.7	3186
(Punjab upto 30.6.1985)	79	51.7	11.0	7.2	4700

All figures are upto 1981-82 except figures for the Punjab, which are upto 30.6.1985.

According to the minimum standards laid down by the Ministry of Communications, Government of Pakistan and adopted by the Planning Division, road mileage per square mile of different categories of areas is given below :—

Highly developed industrial area	= 2.3 Miles
Highly developed agricultural area	= 1.7 Miles
Semi developed agricultural area	= 1.0 Miles
Well developed hilly areas	= 1.4 Miles
Mountaneous areas developed	= 0.7 Miles
Mountaneous areas under developed	= 0.5 Miles
Desert area	= 0.3 Miles

The average road mileage for the whole of Punjab hardly comes out to be 0.134 mile per square mile. The gross inadequacy of our road network can thus be easily envisioned.

Pakistan is primarily an agricultural country with about 70% of its population living in the rural areas. The development of rural areas is, therefore, vital so that the bulk of the population can play its pivotal role in the overall development of the country. The means of communications in the rural areas are generally katcha tracks which can be used in fair weather only. Providing better communication system is, therefore, the fundamental requirement of rural areas which can bring a revolution in the socio-economic conditions of the rural population in the country. Untill 1980-81 the responsibility for the construction and maintenance of rural roads rested with District Councils. They were assisted by Local Government and Rural Development Department. Because of limited financial resources, inadequate technical staff and road making machinery, the progress achieved in the construction of rural roads was insignificant as compared to the actual requirements. The details of total mileage of metalled roads constructed by District Councils and Local Government and Rural Development Department during the previous years are as under :—

Year	Total Mileage
1980 - 81	175.31 miles
1981 - 82	277.75 miles
1982 - 83	184.44 miles
1983 - 84	57.12 miles

Apart from metalled roads, the District Councils have constructed brick paved roads of about 781 miles during the same period.

With a view to assess the magnitude of the problem with regard to the construction of rural roads and the financial out-lay required an attempt was made by the Punjab Highway Department towards the preparation of a master plan of rural roads in the Punjab during the year 1979. According to this master plan the roads to be constructed were divided in the following three categories so as to provide all-weather metalled road links at atleast major villages.

i. Metalling of Existing Katcha Tracks

These were established tracks and land width required was already available. The metalling of such tracks will be economical because of free availability of land. The total length of such tracks was 1243 miles.

ii. **Roads for Population Centres with Population from Two Thousand to Five Thousand Persons**

In this category, roads were proposed to connect population centres of population between two thousand to five thousand inhabitants to existing metalled roads. The road mileage required under this category was 4262 miles.

iii. **Roads for Population Centres of Population from Five Thousand and above**

The total mileage required under this category was 945 miles. Thus the

total mileage required was estimated as 6450 miles. The approximate average cost of a 10 ft. wide metalled road with three coats of surface dressing is about Rs. 6.0 lac per mile. At this rate the cost of 6450 miles of road would be about Rs. 387.00 crore.

A ten year master plan for the construction of rural roads has also been prepared with the help of five consultants. The consultants were asked to make studies and draw-up a programme for connecting all villages in the Punjab having population of 1000 persons or more with metalled roads. The assignment was given o the consultants in December 1981 when there were only 5 Civil Divisions in Punjab. Civil Division wise details of roads required and their estimated costs were worked out by the consultants are given belwo :—

	Civil Division	Total Mileage	Cost (lacs)
1.	Rawalpindi	1211.94	16573.92
2.	Lahore	1227.92	23355.85
3.	Sargodha	2011.98	12131.02
4.	Multan	1310.93	9604.93
5.	Bahawalpur	1098.86	9083.57
	Total :—	6852.68	70749.29

Having realized the importance of rural roads in the development of rural areas and considering the inadequacy of financial and technical resources of District Councils and Rural Works Department, the Punjab Government decided to launch an ambitious programme for the construction of rural roads through the Punjab Highway Department during the year 1980-81. This programme is known as Farm to Market Roads Programme. According to this programme it was decided to construct over 100 miles of roads in each district. The salient feature of this programme is that the selection of the roads was entrusted to the elected representatives of the district councils. The roads were selected and approved by the district councils

with a majority resolution. The selected roads were examined by the Divisional Commissioners and forwarded to the Planning and Development Department with their recommendations. The final selection of the roads was done by the Governor Punjab. According to the programme notified by the Punjab Government a total length of about 3600 miles was to be constructed through out the province.

The implementation of the programme was commenced in the later half of the year 1980-81, and the year-wise details of the physical achievements and financial out-lay during the past five years are given below :—

Year	Expenditure in crore	Miles Constructed
1980 - 81	13.31	40
1981 - 82	34.20	603
1982 - 83	46.98	751
1983 - 84	56.88	876
1984 - 85	46.09	727
Total :	197.46	2997

The following design criteria has been adopted for these roads.

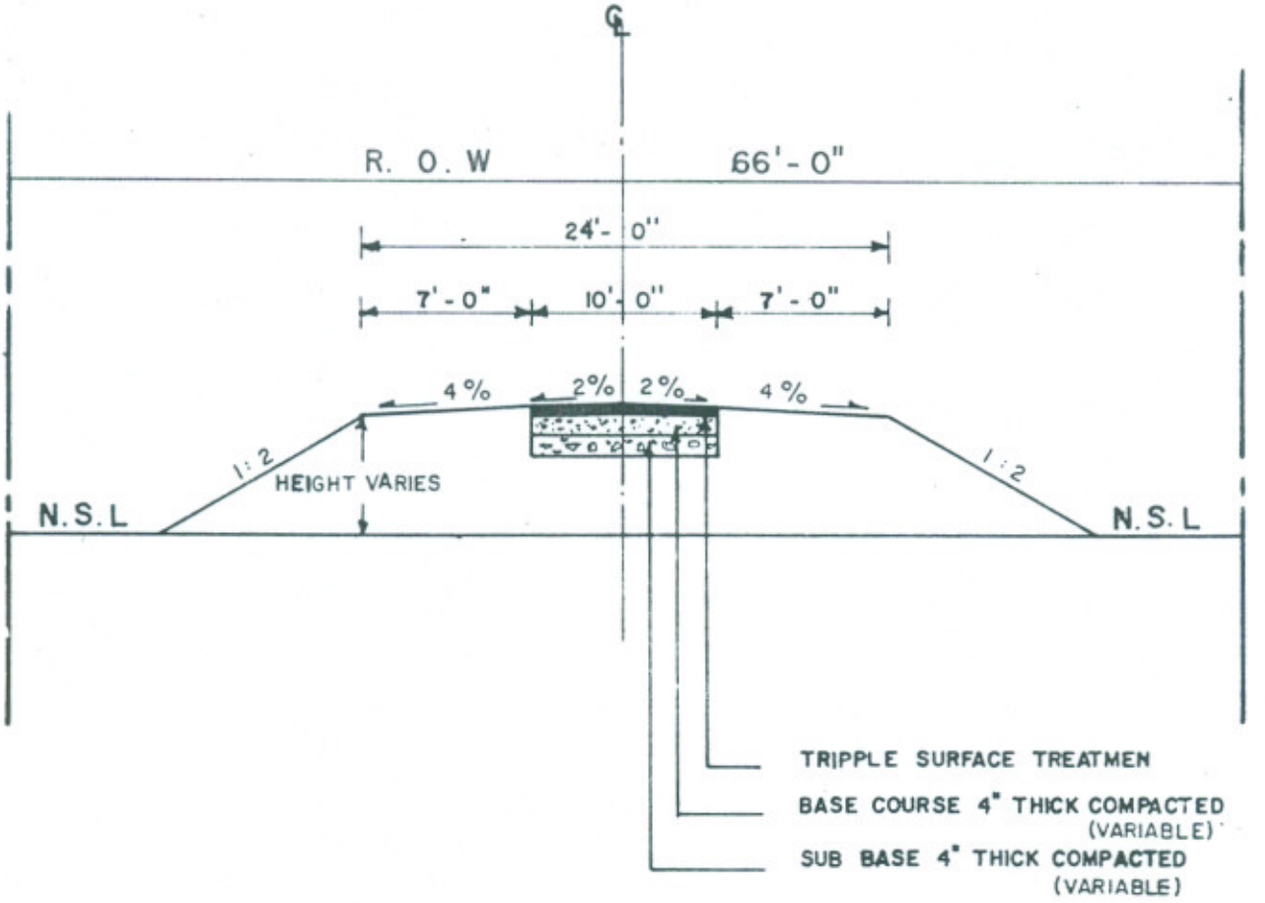
i.	Formation width	24 feet to 28 feet.
ii.	Average height of embankment.	3 feet.
iii.	Thickness of sub base.	4" to 6"
iv.	Base Course Material.	4" to 6"
v.	Surface dressing	3 coats of surface dressing using 67 lbs bitumen and 7.5 Cft bajri per hundred Sft of road pavment.

Initially a uniform crust thickness of 8'' with 4'' sub base and 4'' base course was adopted. The idea behind using this light specification was stage construction of these roads so that as much rural areas are opened up as possible with the available financial resources. The other consideration was that the traffic on these roads will generate gradually and the improvement and strengthening of these roads will be taken up as and when the need arises. The pavement is now being designed keeping in view the local soil conditions, sub.soil water level and the expected traffic.

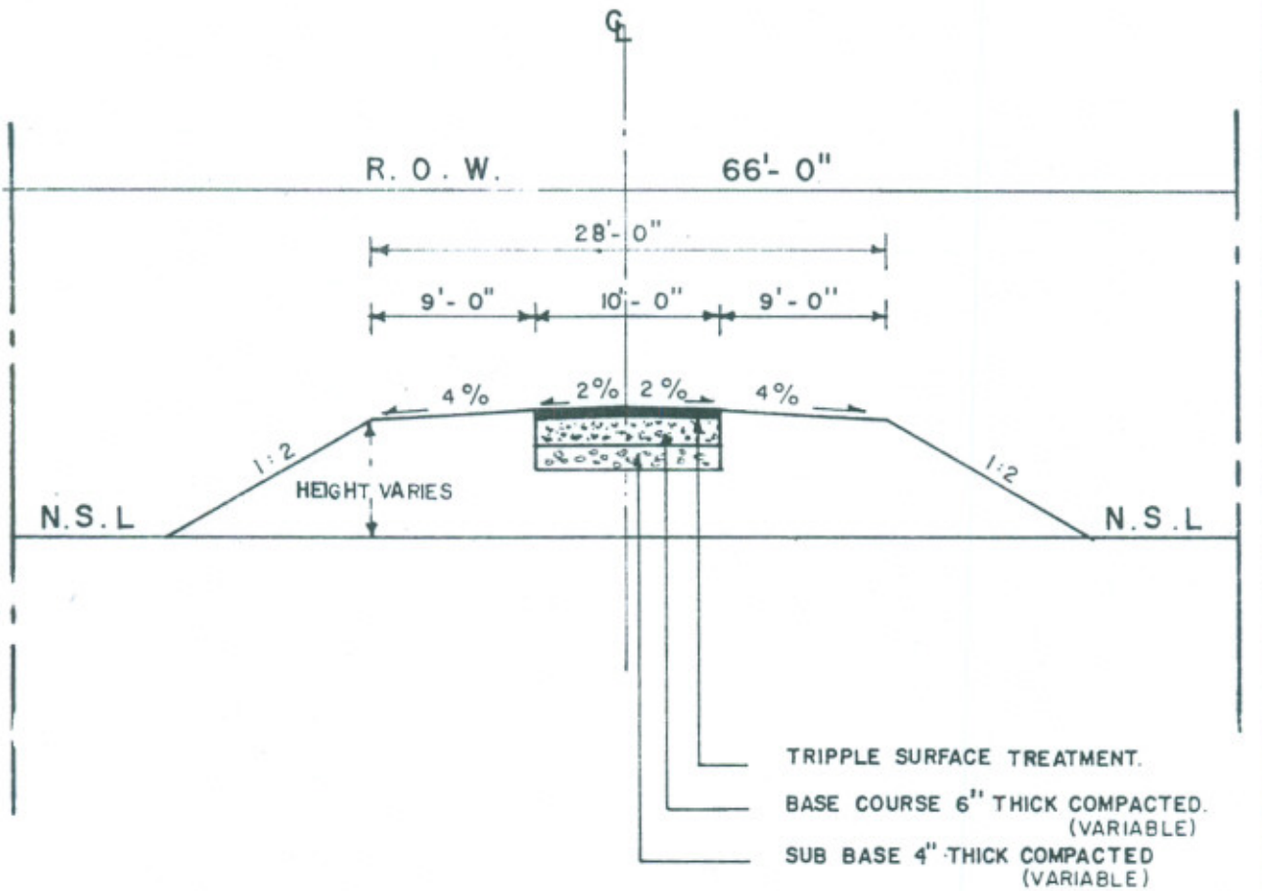
Local Participation

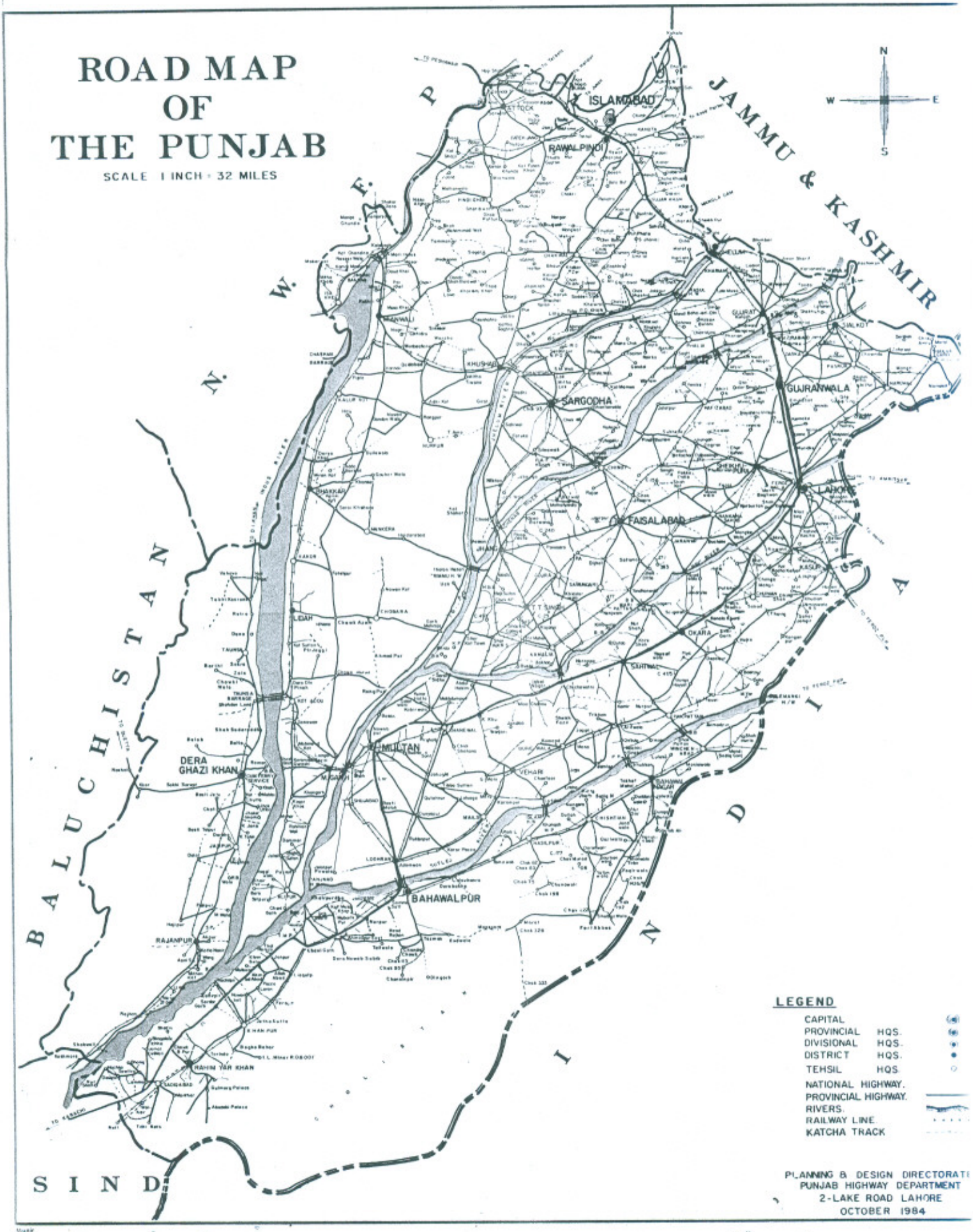
Another important feature of this programme is that the local inhabitants of the area through which the roads are planned are participating by donating land required for the road free of cost. They also permit taking of earth for making road embankment without charging any compensation.

TYPICAL CROSS SECTION
OF
RURAL ROADS



TYPICAL CROSS SECTION
OF
RURAL ROADS




ROAD MAP
OF
THE PUNJAB
SCALE 1 INCH = 32 MILES
N
W
E
S
ISLAMABAD
RAWALPINDI
JAMMU & KASHMIR
N. W. F. P
BALUCHISTAN
SARGODHA
GUJRANWALA
LAHORE
FAISALABAD
JHANG
LEIAH
TT SINGH
OKARA
KASUR
MULTAN
DERA GHAZI KHAN
VEHARI
BAHAWALPUR
RAJANPUR
RAHIM YAR KHAN
SIND
INDIA
LEGEND
CAPITAL
PROVINCIAL HQS.
DIVISIONAL HQS.
DISTRICT HQS.
TEHSIL HQS.
NATIONAL HIGHWAY.
PROVINCIAL HIGHWAY.
RIVERS.
RAILWAY LINE.
KATCHA TRACK
PLANNING & DESIGN DIRECTORATE
PUNJAB HIGHWAY DEPARTMENT
2-LAKE ROAD LAHORE
OCTOBER 1984