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ANNEX III to Report No. AS-85a

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

DEVELOPMENT PROGRAMING AND ECONOMIC CONDITIONS

IN PAKISTAN

ANNEX III

TRANSPORT

May 12, 1961

Department of Operations
South Asia and Middle East

CURRENCY EQUIVALENTS

4.762 rupees	=	U.S. \$1.00
1 rupee	=	U.S. \$0.21
1 million rupees	=	U.S. \$210,000
1 billion rupees	=	U.S. \$210 million

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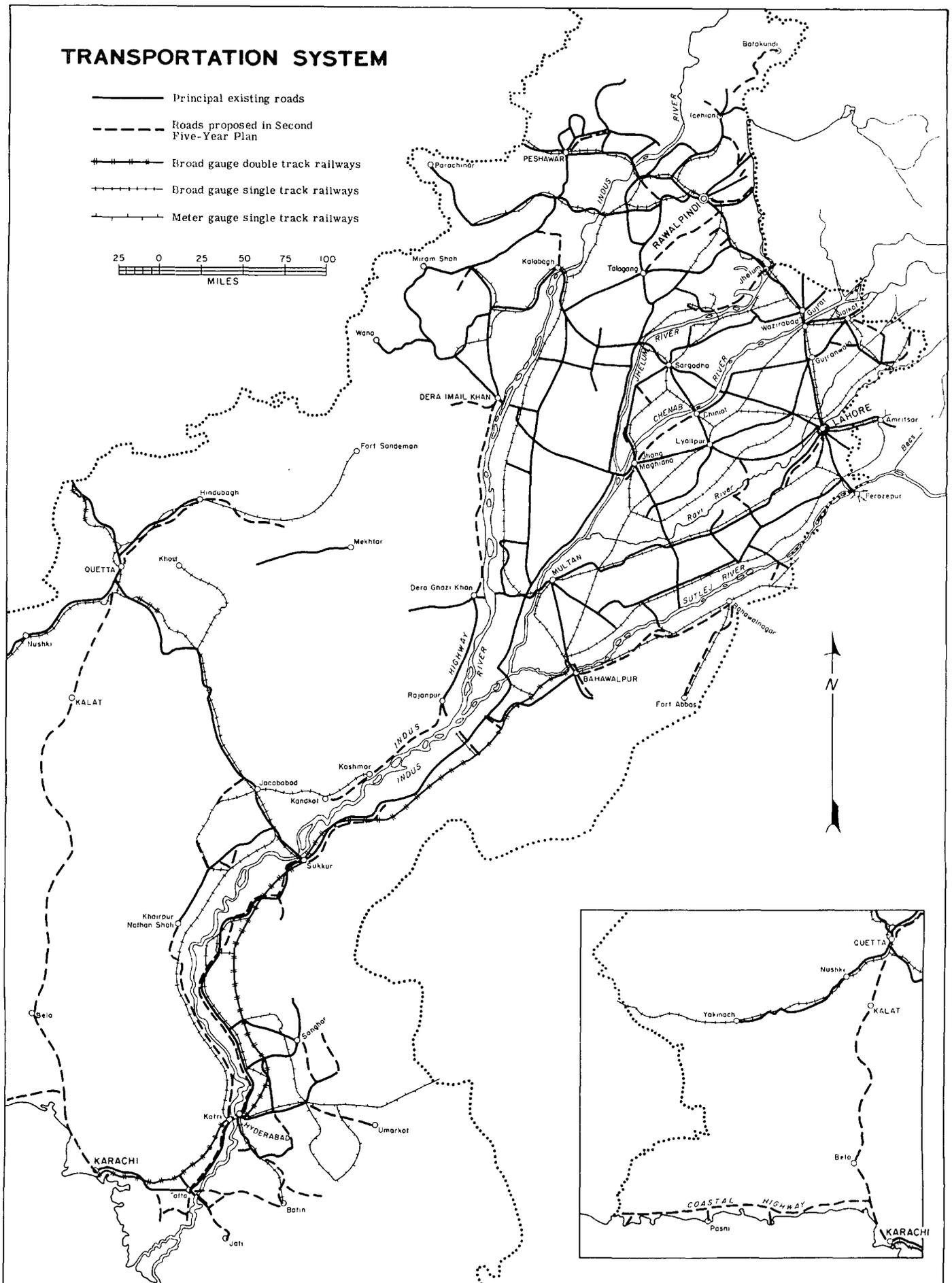
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WEST PAKISTAN

TRANSPORTATION SYSTEM

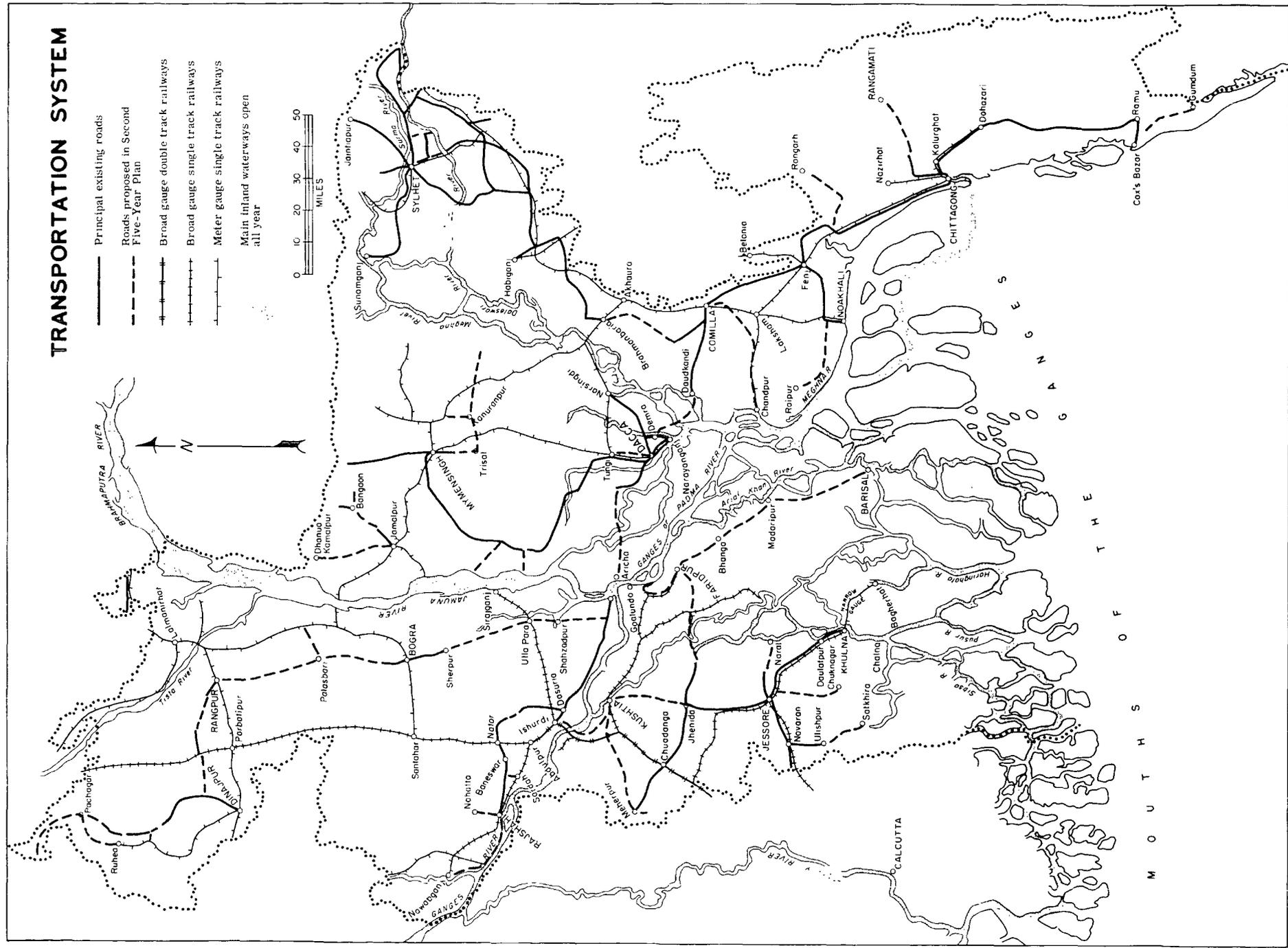
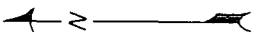
-  Principal existing roads
-  Roads proposed in Second Five-Year Plan
-  Broad gauge double track railways
-  Broad gauge single track railways
-  Meter gauge single track railways



EAST PAKISTAN

TRANSPORTATION SYSTEM

- Principal existing roads
- - - Roads proposed in Second Five-Year Plan
- +— Broad gauge double track railways
- +— Broad gauge single track railways
- +— Meter gauge single track railways
- Main inland waterways open all year



TRANSPORT

The Railroads

1. Both East and West Pakistan have well-developed rail systems to handle the essential bulk cargoes required to maintain economic activity. However, in West Pakistan, although the railroads handle bulk traffic, especially over long distances, there is also a substantial amount of road traffic, both by motor vehicles and by bullock carts. Short-distance feeder traffic is effectively handled by relatively slow-speed, low cost primitive animal and human transport. In East Pakistan, although the railroads also handle most of the long distance bulk transport, inland waterways dominate the feeder traffic. Both parts of the country, at Partition, inherited transport systems that were run-down and poorly maintained. Only 16% of the total railway mileage in the sub-continent were incorporated into Pakistan. The railroads having been over-used and poorly maintained throughout World War II consisted of a large quantity of track and rolling stock that was in very bad shape. The growth in railroad capacity has clearly not kept pace with the increase in the demand for services. The growth in national income during the past decade has been exceeded by the growth in transport demand. This is expected to continue through the Second Plan period.

Table 1: FREIGHT AND PASSENGERS CARRIED ON PAKISTAN RAILWAYS RELATED TO NATIONAL INCOME 1950/51 TO 1958/59 AND FORECAST FOR 1964/65

	<u>1950/51</u>	<u>1955/56</u>	<u>1958/59</u>	<u>1964/65</u>
National Income in crores of Rupees	1832.4	1951.6	2083.9	2600
<u>Passengers Carried on RR (million)</u>				
West Pakistan	69.7	87.2	106.3	137.2
East Pakistan	48.3	51.3	67.1	88.9
Total	<u>118.0</u>	<u>138.5</u>	<u>173.4</u>	<u>226.1</u>
Passengers per '000 Rs. of Nat'l. Inc.	6.5	7.1	8.3	8.7
<u>Passenger-miles Transported (million)</u>				
West Pakistan	3882.4	4408.7	5147.3	6208
East Pakistan	1839.6	1478.9	1721.6	2089
Total	<u>5722.0</u>	<u>5887.6</u>	<u>6868.9</u>	<u>8297</u>
Passenger-miles per '000 Rs. of Inc.	313	301	330	320
<u>Freight Carried in Tons ('000)</u>				
West Pakistan	7812	10652	12642	17712
East Pakistan	2913	3525	4385	7560
Total	<u>10725</u>	<u>14177</u>	<u>17027</u>	<u>25272</u>
Freight tons Carried per '000 Rs. of Income	0.59	0.72	0.82	0.98
<u>Freight tons Carried (million)</u>				
West Pakistan	2223	2874	3557	4968
East Pakistan	495	495	772	1098
Total	<u>2718</u>	<u>3369</u>	<u>4329</u>	<u>6066</u>
Ton-miles per '000 Rs. of Income	149	173	208	233

2. The railroads have indicated that to meet the transport requirements of the Second Plan plus the Indus Basin Settlement will cost some Rs. 700 million beyond the Rs. 960 million included in the Second Plan. The Planning Commission now intends to increase the railroad's allocation by Rs. 440 million. The Mission is satisfied that, in general, the plans for improving the railroads are sound. Progress has been encouraging. Goods moved in ton-miles during the First Plan period has increased by 38%. There are still, however, serious problems of congestion. Although the traffic situation confronting the railroads in West Pakistan has become somewhat easier in recent months as the result of the acquisition of a large number of wagons and some additional motive power, there is still a problem of moving cargo out of the Karachi port and in East Pakistan, the very steep increase in rail traffic has continued to cause congestion. The railroads expect that work now under construction should permit the demand to be met without congestion during most of the Second Plan period.

3. The basic problem for the next five years as far as the railroads are concerned is whether it will not only be able to eliminate congestion but also handle the especially large increase expected in bulk cargo without a deterioration in the service of carrying passengers and general cargo. During the coming year, imports of food grains may double. An agreement on increased imports of U.S.-aided agricultural commodities is now being reached. Preliminary estimates indicate that in a few years, as the result of the Indus project, annual traffic will increase by more than two million tons. The Mission strongly believes that the ability of the railroads to meet the requirements of the next years should be kept under constant review.

4. There are already indications that railroad traffic is growing somewhat faster than had been expected. The Mission, therefore, feels that it would be better to make sure the program is adequate and agrees that, with the exception of a few new lines, the proposed program, as approved by the Planning Commission, is necessary to enable the railroads to move the traffic now forecast for the Second Plan period. The alternative means of transport are too limited. Road transport, even in West Pakistan, is at too early a stage to assume any substantial part of the transport burden carried by the railroads. In East Pakistan, inland waterway improvements will require many years.

The Current Railroad Situation

5. In both East and West Pakistan, the railways as the backbone of the transport system carry a sizeable share of all traffic, in ton-miles as well as in passenger-miles. Goods traffic on the railways during the First Five-Year Plan period rose 30.7% in ton-miles in West Pakistan and 83% in East Pakistan. For both railways combined, the growth was 38%. Total ton-miles carried in 1959/60 reached 4,557 million. The very steep increase in East Pakistan is partly due to the fact that goods traffic was at a ten-year low the year before the First Five-Year Plan period (1954/55). Nevertheless, the increase of this traffic in 1959/60 even compared with 1950/51 was 74%. Passenger traffic in passenger-miles also showed considerable increase during the period, rising 27% in West Pakistan and 29% in East Pakistan.

6. The situation confronting the railroads in West Pakistan has become somewhat easier in recent months, the railways having acquired a large number of wagons, and some additional motive power, during the last year of the Plan. However, traffic demand still tended to exceed carrying capacity on some lines during the most recent busy season (December through May). In East Pakistan, the very steep increase in rail traffic has continued to result in a shortage in line and yard capacity. Work now under construction should eliminate the bottlenecks and permit the railroads to meet overall traffic demands. The Mission is satisfied that, in general, the plans and existing works of the railroad are sound.

7. The shortage of capacity on the railroads and the growth of transport demand has led to the Government's appointment of a Transport Allocation Board consisting of representatives of the Transport Agencies and of the Government Departments concerned, to regulate as far as practicable the shipment of bulk cargoes. The work of this Board is only now beginning but in the meantime, the railways set out to improve the availability of wagons by reducing the time permitted for loading and unloading of wagons from nine to six hours of daylight; by treating Sundays as working days for goods traffic; by increasing the number of unloading points at main terminals; and by increasing both the loads and speeds of trains and the number of long-distance through trains.

8. The current capacity shortage exists despite the large expenditures carried out by the railroads in recent years. The railway's First Five-Year Plan allocation amounted to Rs. 683 million. Actual expenditures up to June 30, 1960 are estimated to have been Rs. 804.6 million including foreign exchange of Rs. 527.6 million (US \$111 million). The excess in expenditure over the estimated amount was only to a modest degree an expansion in the size of the physical program. It was largely due to the increase in the prices of equipment plus the procurement of some additional equipment for Afghan Transit Traffic, not included in the original program. It also resulted from a three months' lengthening from April 1, 1960 to June 30, 1960 of the First Plan period because of a change in the fiscal year.

9. Traffic conditions have definitely been improved despite the continued existence of delays, bottlenecks and breakdowns. Since the middle of 1960, for the first time in several years, the West Pakistan railroad was able to move, on most of its lines, practically all traffic offered. This was mainly due to the fact that this railway had acquired about 4,000 new wagons and some additional motive power during the last 15 months of the Plan period. The true test, however, as indicated during the latest busy season shows that traffic still tends to exceed carrying capacity around port areas, in particular, when bunching of bulk cargo carrying vessels occurs. In both East and West Pakistan, shortage of food grain storage has tied down large numbers of grain-loaded wagons for weeks until storage space has become available.

10. The main traffic bottlenecks are attributable to the inadequacy of sectional and terminal capacities, outmoded signalling equipment, and in East Pakistan, to the shortage of wagons. A main obstacle to the smooth flow of traffic to and from Karachi is expected to be removed by the middle of 1961 when the Central Traffic Control of the Karachi-Landhi (18 miles) section become operational and the expanded Karachi City yard completed. Construction of the Karachi Circular Railway, which to some extent will also relieve congestion in Karachi, will not be completed until early 1962. In East Pakistan, the traffic situation will not improve substantially until new signalling equipment has been installed and the new Dacca yard is operational. These improvements will take at least until the beginning of 1963 to complete.

11. The operational improvements already achieved have been substantial. In both East and West Pakistan, the trains are heavier, faster and more efficient than they were five years ago, although the performance in West Pakistan has been somewhat ahead of that in East Pakistan. In general, the Mission believes that progress in the various operational fields has kept pace with the acquisition of new equipment and is satisfactory.

Table 2: COMPARISON OF OPERATIONS AND EQUIPMENT AVAILABLE ON PAKISTAN RAILWAYS BETWEEN 1954/55 AND 1959/60

	West Pakistan		East Pakistan Meter Gauge Lines	
	<u>1954/55</u>	<u>1959/60</u>	<u>1954/55</u>	<u>1959/60</u>
Freight Wagon-miles per day	34.5	39.1	13.0	17.0
Net load freight per train in tons	407	429	248	315
Net ton-miles per train hour	4376	4498	2091	2246
Passenger coach-miles per coach day	195	202	113	118
Number of locomotives on line	849	878	310	325
Number of wagons	25110	29851	12038	12026

Traffic on the Railways

12. The increase in passenger and goods traffic over the First Plan period has been substantial. The number of passengers carried has increased faster than the number of passenger-miles resulting from a heavy rise in suburban passenger traffic. In East Pakistan, freight carried increased at such a rapid rate that it regained much of the ground lost as the result of the disruptions due to Partition.

13. This performance in railway transport has exceeded the expectations of the First Plan. The Plan anticipated that rail traffic would increase at approximately the same rate as national output. As indicated earlier in this Annex, the increase in rail services has been much more rapid than income growth. Gross National Product grew about 15% whereas the number of passengers carried was increased 45% and the tonnage of freight 38%. As the predominantly agricultural economy of Pakistan becomes more and more market-oriented, this process may well continue.

14. The recent indications are for an especially large growth in traffic during the next few years. Traffic data for the period July 1, 1960 to November 30, 1960, the first five months of the Second Plan period show that in West Pakistan, ton-miles of freight carried has increased at an unprecedented rate of 22.9% and tonnage by 12% over the corresponding period of 1959. The number of passengers carried has increased by nearly 9%. The West Pakistan railways estimate that the increase in ton-miles for the year as a whole will be about 10%. In East Pakistan, the increase both in ton-miles and passenger-miles was about 6% in the first quarter of the current fiscal year as compared with the corresponding period of 1959.

Table 3: PASSENGER AND FREIGHT TRAFFIC ON PAKISTAN RAILWAYS
1954/55 THROUGH 1959/60

	<u>1954/55</u>	<u>1959/60</u>
<u>West Pakistan Railway</u>		
Passengers (in millions)	85.5	121.1
Passenger-miles (in billions)	4.4	5.5
Tons of freight (in millions)	9.9	12.1
Ton-miles of freight (in billions)	2.8	3.7
<u>East Pakistan Railway</u>		
Passengers (in millions)	45.7	69.1
Passenger-miles (in billions)	1.4	1.8
Tons of freight (in millions)	3.3	5.6
Ton-miles of freight (in billions)	0.5	0.9
<u>All Pakistan Railways</u>		
Passengers (in millions)	131.2	190.2
Passenger-miles (in billions)	5.7	7.3
Tons of freight (in millions)	13.2	17.7
Ton-miles of freight (in billions)	3.3	4.6

15. The railroads have prepared very detailed traffic forecasts for the Second Plan period. In West Pakistan, it is forecast that average annual increase in ton-miles of freight will be 7.4%, in tons carried 7.7% and in the number of passengers 6.0%. In East Pakistan, the forecast is a comparable average annual growth of 7.2%, 7.8% and 6.5% respectively. Commodity statistics have been analyzed in these projections and an effort made to relate forecasts to the expected increase in output resulting during the Second Plan period. In West Pakistan, it is expected that some 5,070,000 tons additional freight will have to be carried by the railroads during the last year of the Second Plan as compared to 1958/59. The effect of the additional grain imports from the U.S.-aided agricultural program has not been included in these figures and may add over one million tons per year.

Table 4: VOLUME AND COMPOSITION OF TRAFFIC ON WEST PAKISTAN RAILROADS
IN 1958/59 AND FORECAST FOR 1964/65

<u>Commodity</u>	<u>1958/59</u>		<u>1964/65</u>		Expected In- crease in Tonnage to be Transported (in '000)
	<u>Tons (in '000)</u>	<u>Ton-miles in Millions</u>	<u>Tons (in '000)</u>	<u>Ton-miles in Millions</u>	
Grains	1,726	580	1,924	679	198
Marble and Stone	1,206	206	2,292	390	986
Cement	664	131	1,688	349	1,024
Coal & Coke (non- railroad)	1,072	396	1,501	594	429
Wood and Lumber	853	209	1,172	268	321
Petroleum Products	608	304	812	394	204
Oil Seeds	253	90	400	141	147
Raw Cotton	184	55	323	85	139
Fodder	302	133	410	181	108
Fruits and Vegetables	266	80	410	137	144
Sugar	161	65	199	65	38
Iron and Steel	274	150	409	216	135
Military Materials	637	167	713	210	76
Railroad materials & Equipment	2,661	390	3,395	540	734
Other	1,775	601	2,062	719	287
Total All Commodities	<u>12,642</u>	<u>3,557</u>	<u>17,712</u>	<u>4,968</u>	<u>5,070</u>

16. The situation in East Pakistan is quite similar. During the Second Plan period, it is expected that the annual increase in traffic of 2,270,000 tons will include some 900,000 additional tons of such agricultural commodities as grains, jute, sugar, fruits and vegetables, as well as nearly 550,800 tons of coal, coke, peat and petroleum products. The basic problem for the next Five-Year Plan period will clearly be whether the transport system is capable of handling the large increase in bulk cargo, in addition to the large amounts of U.S. aid-financed agricultural commodity imports plus the traffic that will result in West Pakistan from the Indus Basin Settlement Plan.

Table 5: VOLUME AND COMPOSITION OF FREIGHT CARRIED BY EAST PAKISTAN'S RAILROADS IN 1959/60 AND FORECAST FOR 1964/65
(all figures in thousands of tons)

	<u>1959/60</u>	<u>1964/65</u>	<u>Expected Increase in Tonnage to be Transported</u>
Grains and Pulses	1,168	1,487	319
Raw Jute	697	978	281
Tea	30	35	5
Tobacco	24	25	1
Raw Cotton	16	24	8
Sugar, Raw Fruits & Vegetables	440	730	290
Oil Seeds	57	90	33
Salt	225	212	- 13
Sugar, Refined	50	100	50
Other Foods	48	80	32
Manufactured Jute	26	45	19
Manufactured Cotton	16	35	19
Cement	176	300	124
Iron and Steel	62	120	58
Marble and Stone	216	330	114
Railway Material & Equipment	732	900	168
Miscellaneous	343	504	161
Coal, Coke, Peat	907	1,313	406
Petroleum Products	297	434	137
Total	<u>5,290</u>	<u>7,560</u>	<u>2,270</u>

Traffic for the Indus Project During the Second Plan Period

17. The Indus Project will involve two large dams, one across the Jhelum at Mangla and the other across the Indus at Tarbela. Furthermore, five new barrages will have to be constructed. The railways will have to carry a considerable amount of material needed for the project, including machinery, steel, bitumen, oils, coal, cement, sand, gravel, stone and wood, of which gravel and stone will be the largest items. According to the most recent figures (November 1960) from West Pakistan, WAPDA, the year of heaviest Indus traffic will be around the latter part of the Second Plan period. The weight of the various commodities around that time will be of the order of two to two and a quarter million tons or over 10% of the total of goods tonnage moved. The load will move up gradually from some 1,250,000 tons in 1962/63 and 1,600,000 tons in 1963/64. An evaluation of these preliminary WAPDA estimates by the railroads in terms of origin and destination has resulted in a determination that an extra 23 diesel locomotives and 2,240 goods wagons will be required above the requirements originally stated in the Second Plan. As a further consequence of the impact of the Indus traffic on train-density of various line sections, additional signalling equipment and terminal facilities will be required, which have been separately assessed

and for which provision has been made in the railway's enlarged program. The railway has analyzed and assessed the WAPDA estimate of Indus traffic demands in the coming years and expects to be able to meet these demands. The Mission feels that these estimates will have to be carefully re-examined at periodic intervals.

Traffic Resulting from Import of U.S.-aided Agricultural Commodities

18. The existing imports of grains and perhaps some other agricultural commodities will increase substantially as the result of recent agreements between the U.S. and Pakistan. It is envisaged that the amount of wheat being imported may increase over the Plan's level by about one million tons per year. No precise estimates are available at this time of the amount of additional traffic that will have to be carried as the result of this program. One Government estimate indicated that the North-Western Railway alone might require an additional 900 wagons and 8 locomotives to handle this traffic. Whatever the actual requirements prove to be, they will most likely be additional to the railway's present program.

Physical Achievements of the Railroads During the First Plan Period.

19. The railroad's physical program to date has been quite satisfactory. Rolling stock put on line during the First Plan period included 144 diesel locomotives, 24 diesel railcars and 24 trailers, 645 passenger carriages, and 9,158 wagons. Domestic equipment production has been expanding. The Pakistan Western Railway has developed capacity to manufacture 1,000 wagons per annum which it is expected will substantially reduce the foreign exchange component of the Second Plan program. Assembly and welding of carriage body shells and interior furnishing of these carriages has been undertaken on both railways. Diesel locomotive repair shops have been constructed at Karachi and Chittagong and construction of a workshop in Lahore for servicing and maintenance of diesel locomotives is in progress. The West Pakistan diesel fleet at the end of the First Plan consisted of 176 diesel locomotives and 24 diesel railcars; the East Pakistan Railway had 51 diesel locomotives.

20. The track renewal program as provided for in the First Plan period involved 1,463 miles of rail renewals and 2,430 miles of sleeper renewals. There was actually carried out during the period rail renewals of only 808 miles and sleeper renewals of 1,200 miles. In East Pakistan the program was carried out according to schedule whereas in West Pakistan there are large parts of the program carried over mainly due to the scarcity of wooden sleepers in the world market. Rails and fittings necessary for the renewals program were procured in the First Plan period whereas large numbers of sleepers are now on order. Renewals carried forward are expected to be completed in the early years of the Second Plan period.

21. Progress on the construction of a new bridge across the Rohri Channel of the Indus River is now satisfactory. The construction is about 10 weeks behind schedule and some additional delay may occur during the very hot summer season when temperatures of construction parts may rise beyond the point that they can be touched by hand. The railroads expect completion to be some time in October 1961.

22. All girders of the bridge across the Sukkur Channel of the Indus River a few hundred yards beyond the Rohri bridge are to be renewed for which construction tenders will be invited shortly. The railways hope to have this work started immediately after completion of the Rohri Channel bridge while the construction equipment is still at the site.

Status of the Railroad Program in the Second Five-Year Plan

23. In 1958, the railways formulated a Second Five-Year program which was expected to cost Rs. 1,078.5 million and was based upon the assumption that traffic would grow at a rate of 5% per annum. The program was provisionally approved by the Planning Commission with a tentative allocation included in the Plan of Rs. 960 million. The railways themselves initiated a detailed traffic survey at about that time for both the East and West Pakistan railways, the results of which were made available at the end of 1960. The survey indicates that the number of passengers is expected to increase over the next five years by 30%, the tonnage of goods carried by 45% and the ton-miles of freight by 36%. The Mission feels that these forecasts furnish an acceptable base for the railway's program although additions may be necessary to handle Indus traffic and the U.S.-aided agricultural import program.

24. The program as now estimated by the railways would cost Rs. 1,167 million to which an amount of Rs. 97 million would have to be added for requirements arising from traffic generated by the Indus project, and Rs. 359 million as the result of the carry-over from the First Five-Year Program, resulting in a total program of Rs. 1,623 million. The foreign exchange component would be Rs. 1,024 million (US \$215 million equivalent) of which some 30% is already covered by existing loans and aid. The local currency cost of the program, roughly Rs. 600 million is expected to be met from the railway's earnings and reserves.

25. The Mission feels that with the exception of the new line construction, most of the railway's program is required, if they are to be able to move the traffic that is forecast for the Second Plan period. The Plan, of course, should be kept flexible and adjusted to traffic trends as they develop. There are already indications in West Pakistan as noted above that goods and passenger traffic increase may exceed the estimates by a considerable margin during the first year of the Plan. The Mission is of the opinion that the railroad program is of high priority and that only modest reductions should be made. The Planning Commission in reconsidering recently the original Plan allocation approved an increase from Rs. 960 million to Rs. 1,400 million which is reasonably close to covering most parts of the railroad's program

indicated above. Lower priority projects such as the proposed new line construction of 48 miles in West Pakistan, costing Rs. 80.0 million (foreign exchange component, Rs. 25 million) and two lines of 28.6 and 19.6 miles respectively, in East Pakistan costing Rs. 11.2 and 6.0 million could be deferred without unduly curtailing the country's ability to meet expected transport demand.

Table 6: OUTLAY AGAINST MAIN ITEMS OF THE RAILWAYS'
SECOND FIVE-YEAR PROGRAM
(in million rupees)

	<u>Pakistan Western Railway</u>	<u>Pakistan Eastern Railway</u>	<u>Total</u>
Rolling Stock	547.44	289.18	836.62
Plant and Machinery	18.77	14.41	33.18
Track Renewals	176.68	52.81	229.49
Bridge Works	54.05	9.48	63.53
Improved Signalling	20.02	17.83	37.85
Line Capacity Works	54.85	18.37	73.22
Diesel Back Shop at Rawalpindi	12.13	-	12.13
Rehabilitation & Expansion of Workshops	11.38	2.24	13.62
Rehabilitation of Dilapidated Buildings	7.71	4.37	12.08
Engineering & Structural Works:			
Other Engineering Works & Unremunerative Works	46.91	7.54	54.45
ICA Works (Regional Afghan Transit Aid)	14.38	-	14.38
Passenger Amenities	5.06	4.50	9.56
Staff Welfare Works	6.26	3.97	10.23
Staff Quarters	13.25	12.78	26.03
Telecommunications Works	1.88	-	1.88
Divisional Schemes	2.83	4.00	6.83
New Constructions	127.54	41.65	169.19
Contribution to Road & Water Transport	10.00	8.25	18.25
Total	<u>1,131.14</u>	<u>491.38</u>	<u>1,622.52</u>

26. The program that probably will be carried out during the years 1960/61 and 1961/62 will entail expenditures as indicated below in Table 7. The foreign currency component of these planned expenditures of the next two years is equivalent to US \$96.5 million, which is some 45% of the total foreign currency expenditures expected for the railways during the Second Five-Year Plan period. Expenditures of Rs. 701.8 million comprise 43% of the total program proposed by the railway.

Table 7: EXPECTED OUTLAYS BY THE RAILWAYS DURING THE
YEARS 1960/61 AND 1961/62
(in million rupees)

	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
Pakistan Western Railway	169.0	336.9	505.9
Pakistan Eastern Railway	<u>73.5</u>	<u>122.4</u>	<u>195.9</u>
Total Pakistan Railways	<u>242.5</u>	<u>459.3</u>	<u>701.8</u>

27. The railway's detailed proposals for the Second Plan include Rs. 837 million to cover the cost of 223 locomotives, 915 passenger coaches and 14,763 wagons. The locomotive requirements have been based on the assumption that one diesel locomotive will do the work of 1.5 steam locomotives which at this stage of dieselization is probably reasonable although somewhat conservative inasmuch as a diesel locomotive on the West Pakistan Railway (PWR) now moves twice as many gross ton-miles as a steam locomotive, and three times as much on the East Pakistan Railway (PER). On the Broad Gauge of PWR, 69 diesel locomotives will replace some 103 steam locomotives to be scrapped out of a total of 283 steam locomotives aged over 45 years. On the Meter Gauge of PER, 35 steam locomotives are to be scrapped out of 104 which are over 45 years old. Requirements for coaching stock and wagons have also been based on the age of existing equipment. In the provision made in the program, because of the necessity to keep the level of capital investment as low as possible, very little is included for replacement which means that by the end of the Plan period a large amount of stock over 45 years of age will still remain in service.

28. Another large part of the program, amounting to Rs. 230 million, covers the renewal of some 3,811 miles of track. Normal renewal of track fell into heavy arrears after 1940 because of the war and subsequent difficulties during Partition. Moreover, scarcity of foreign currency needed for rails and sleepers made it impossible to eliminate the backlog that continued throughout recent years. Another drawback was the scarcity of wooden sleepers on the world market. During the Second Plan period, renewals of an additional 475 miles of rails and 1,299 miles of sleepers will become due. The track renewals program of the Second Plan aims at clearing these as well as most of the renewals which had accumulated up to the beginning of the Second Plan period.

Table 8: AMOUNT OF RENEWALS OF TRACK AND SLEEPERS
DUE ON PAKISTAN RAILWAYS
(in miles)

	<u>West Pakistan Railways</u>	<u>East Pakistan Railways</u>	<u>Total Railways</u>
Number due at Beginning of First Plan Period			
Rails	1,839	130	1,969
Sleepers	2,268	615	2,883
Fallen due during First Plan Period			
Rails	300	139	439
Sleepers	228	819	1,047
Total Due by and of First Plan Period			
Rails	2,139	269	2,408
Sleepers	2,496	1,434	3,930
 Provided in First Plan Period			
Rails	1,333	130	1,463
Sleepers	1,866	564	2,430
Carried out During First Plan Period			
Rails	678	130	808
Sleepers	636	564	1,200
 Balance Carried Forward to Second Plan Period			
Rails	1,461	139	1,600
Sleepers	1,860	870	2,730
 Program for Second Plan Period			
Rails	1,054	207	1,261
Sleepers	1,779	771	2,550

29. New lines and additional construction work amount to some Rs. 176 million in the Plan. Construction of the Karachi Circular Railway at a cost of Rs. 35 million was started during the last year of the First Plan but most of the work will be carried out during the Second Plan. This railway will be about 17 miles long and will provide transport through and around the industrial area of Karachi for both passengers and goods. It will also divert from the city stations some goods trains to and from the port area and thus relieve traffic pressures on these stations and yards.

30. The Plan includes a scheme involving a sum of Rs. 17.5 million providing for the shifting of the Dacca railway station from the center of the city to a site adjacent to the city. Available space at the present site of Dacca station is not sufficient to accommodate all necessary traffic facilities. Adequate land will be available at the new station to provide for all facilities needed to handle present as well as future traffic. The existing station with its shortage of yard facilities at Dacca is now one of the main bottlenecks on the East Pakistan Railway. Passenger trains have had to be handled in Narayanganj in order to relieve the traffic situation in Dacca, but this, in turn, has resulted in congestion in the Narayanganj yard. Work on the new site has started; the new station will become operational by the end of 1962 which should help remove the congestion now impeding traffic throughout the region between Chittagong and Dacca.

31. The shortage of ballasting material has been one of the most serious problems confronting the East Pakistan Railway. A solution is proposed in the form of a ropeway between Bholaganj and Chhatak at a cost of Rs. 7 million. It is intended that boulders and gravel will be brought to the railhead at Chhatak Bazar, where they can be shipped readily to points of use. The annual capacity will be five million cubic feet which will not only meet the railway's needs of two million for ballasting its tracks but also supply other construction requirements. The deposit at Bholaganj is one of the few known sizeable sources of stone in East Pakistan. The PIR now has many miles of track without ballast, which makes maintenance and upkeep of alignment and level difficult. Construction of the ropeway is expected to start in 1961 and will need two dry seasons to complete.

32. The lowest priority part of the program in the Mission's opinion is the expenditure of around Rs. 100 million for several new lines. In West Pakistan, as far back as 1929, a survey was carried out for railway line from Kashmir to Kot Adu, 198 miles long to form a second rail link between the southern and the northern part of the system. This line would run west of the Indus River whereas the existing (double track) line is east of the River. Abnormal floods of the Indus in 1942 and again in 1948 caused a break in the railway which completely cut off the northern from the southern part of the system for several months. The proposed new line would provide an alternate route in case of such emergencies. It would also serve the land to be brought under cultivation by the Taunsa and Guddu Barrage projects during the Second Plan period. The line would cross the Indus over the Taunsa Barrage which has been built with provision to take the railway track and for this reason the railways have contributed about Rs. 10 million towards the construction cost of the dam. The original proposal in the railway's program was for construction of the first 48 miles of the line, from Kot Adu across the Indus and southward to Dera Ghazi Khan. This part of the country is an agricultural development area and traffic will undoubtedly increase in the future. However, the existing highways seem to be adequate to take care of this traffic, at least for the next five years or more. It would, therefore, seem that there is no urgent need for the proposed construction in the Second Plan period.

33. In East Pakistan, the railway program includes construction of two new lines which might well be postponed. There is the line between Narsinghdi and Madanganj, 28.6 miles long at a cost of Rs. 11 million and the other from Kurigram to Chilmari, 19.6 miles long at a cost of Rs. 6 million. The first one connects Madanganj directly across the Sitalakhya River from Narayanganj with the main line between Dacca and Chittagong. Madanganj is a jute baling center with grain silos nearby. Presently, a considerable amount of jute bales are ferried across to Narayanganj and carried by rail to Chittagong. Grain for storage is brought by rail and also ferried across to Madanganj. It would seem that improvement of IWT would greatly help to take care of most of this traffic if unloading of more food grains at Chalna Anchorage could be arranged. The jute also could then be shipped via Chalna. Furthermore, there is a paved road from Madanganj to Narsinghdi to carry whatever other traffic originates in the area. It seems, therefore, that the proposed new line although useful would not be urgently needed at this time. A similar project is the proposed construction of a line from the railhead at Kurigram to Chilmari, situated on the west bank of the Brahmaputra, which would serve a jute growing area. The main commodity would be raw jute to be transported to baling centers at Khulna or Narayanganj. An improved IWT service should be able to carry the traffic under discussion and a new railway line as proposed by the railways would not seem to be an immediate necessity.

34. Conversion of the Hyderabad-Mirpurkhas section in West Pakistan from meter to broad gauge at a cost of Rs. 20 million is not in the same class as the above and perhaps might well be carried out in the Second Plan period. This is the busiest section (42 miles) on the meter gauge system near Hyderabad. But for the difficulties created by the transshipment to broad gauge at Hyderabad, the traffic volume would be much higher with better mobility of service. The shifting of the transshipment point from Hyderabad to Mirpurkhas would reduce the total volume of traffic requiring transshipment considerably as almost half of the entire meter gauge traffic originates and terminates on this section of the line. The project would also increase the yard and terminal facilities at Hyderabad. At present, half of the yard space is taken up by the meter gauge and each part (meter and broad gauge) is inadequate to cope with its traffic requirements. Hence, it would otherwise be necessary to remodel the Hyderabad Yard at considerable cost. The project is also likely to result in savings in operating expenses, and would lessen the chance of damage and pilferage because of reduced transshipment. The existing track material is below standard and maintenance expenses are high. After conversion to broad gauge, these expenditures would be greatly reduced.

Relative Priority of Railroad Program

35. With the exception of the new lines discussed above, the railway program as approved by the Planning Commission is the minimum required to permit the effective movement of the traffic projected during the Second Plan period. The program will, of course, have to be kept flexible and adjusted to traffic trends as they develop. The demands on the Pakistan Western Railways carrying capacity likely to arise from execution of the Indus Basin Settlement Project can most likely only be met if the railway's program of additional motive power, goods wagons and signalling equipment is carried out. In West Pakistan, road transport development is only beginning to reach the point where it might assume some of the burdens from the railroad. Its development should be encouraged. In East Pakistan, high priority will have to be given to developing Inland Water Transport so that more bulk commodities can be imported directly or via Chalna Anchorage and distributed by IWT. It is quite possible that the overall traffic survey now underway will conclude that the inland water transport program as it is now being carried out is inadequate. The recent merger of the Joint Steamer Companies with the Railway Flotilla should facilitate the cooperation between the Pakistan Eastern Railway and the Inland Water Transport interests. In any case, before IWT can remove a substantial part of the burden from the railways, a large and long drawn out program for improvement will be necessary. The railways will have to continue to be the basis of the transport system in both East and West Pakistan. Administering the railroad program seems feasible as the railways are well-managed and operation is reasonably efficient. Although there is a shortage of civil and mechanical engineers and also supervisors in the various fields of the railway service, training programs now underway will help as they are expected to supply additional personnel by the end of 1962.

Roads and Road Transport

36. The original proposed expenditures in the Second Plan for roads and road transport amounted to Rs. 1.18 billion or approximately 35% of the total allocation for transport and communications. A small increase in these expenditures is envisaged in the latest revision of the Plan, but no details are available. The original allocation is broken down as follows:

<u>Roads</u>	<u>Rs. Millions</u>
West Pakistan	250
East Pakistan	250
Karachi and Special Areas	45
Sub-total Roads	545
<u>Road Transport</u>	
West Pakistan (semi-public sector)	107
East Pakistan (semi-public sector)	13
Pakistan (private sector)	520
Sub-total Road Transport	640
Total	<u>Rs. 1,185</u>

Present Highway System

37. Pakistan has roughly 10,000 miles of paved roads and 15,000 miles of unpaved roads, 90% of which are located in West Pakistan while the remainder consist of unconnected sections of roads throughout East Pakistan. The mileage of fair-weather roads is extensive.

38. In West Pakistan most of the main centers are connected by paved roads. While these provide a fairly reliable means of communication, they are not adequate for the present volume of traffic. The more important of these roads may have to be provided with double-lanes in the course of the Second Plan period as with few exceptions they are only paved to a single-lane width. The determination of the order of priority of this work will probably, in most cases, have to wait for the completion of the transport survey which is now being carried out. The secondary road system, a portion of which is also paved, appears to be generally adequate at the present time, except in certain areas where a concentrated effort is being made to increase agricultural production.

39. In East Pakistan none of the main centers are connected as yet although it is estimated that since 1950 over Rs. 200 million has been spent on road construction. Work was scattered over many projects throughout the province. The road system in East Pakistan now consists of a large number of unconnected stretches of roads and isolated bridges. At the present rate of construction it will still take five years or more before any through roads are completed. Thus, inland waterways and railways will continue to be the main methods of transport in the province.

40. Most of the population of Pakistan lives in villages which are accessible only by fair-weather earth roads which are impassable during part of every year. Detailed information regarding plans for improving village roads is not available as their construction and maintenance has largely been left to the villages themselves.

Proposed National Highway System

41. The Central Government is presently considering establishing a national highway network which it would finance and control. This network would consist of seven main roads in both provinces which already exist or are under construction. The roads would be designated as National Highways and their maintenance and improvement would be financed from a Central Road Fund. This Fund which is supported by receipts from road user taxes, is now being primarily used for the development of new roads. The Ministry of Finance is not in favor of including maintenance in the purposes of the Fund, nor does it favor the prior commitment of these revenues which the above proposal would entail. The Mission feels that some arrangement must be made for the financing of maintenance. In addition to the Fund, the Central Government also now finances road construction through grants and loans to the Provincial Governments. The Provincial Governments contribute to maintenance and construction by allocations from their general revenues which is pooled from all sources, including road user taxes.

Administration

42. The Communications and Transport Division in the Ministry of Railways and Communications of the Central Government is directly responsible for roads in federal areas and finances certain works of strategic and national importance through the Central Road Fund. The Provincial Governments act as executing agents, and construct and maintain all public roads within their jurisdictions with the exception of village roads. Road works are the responsibility of the Buildings and Roads Divisions in the Public Works Departments (PWD) of East and West Pakistan and of the Central Government. While the construction of village roads has been organized on a self-help basis in close cooperation with Village Aid, the PWD has been asked to provide technical assistance.

43. The PWDs in both provinces have a rather complex organizational structure. For the purpose of administration, the provinces are divided into sections, sub-sections, districts and sub-districts, each with its own staff responsible to its immediate superior. This organization is apparently patterned after the former colonial administrative system and seems needlessly cumbersome now that telephone and telegraph communications exist in most areas. Projects are usually originated and carried out at the district level where the design specifications, estimates and tender documents are prepared. The rest of the hierarchy devotes itself to reviewing these documents rather than planning the road system, establishing design standards, assuring adequate inspection and expediting progress.

44. The Provincial Public Works Departments are also responsible for the construction and maintenance of Government buildings. This is a time-consuming assignment with the personnel spending as much as 80% of their time on buildings, although over half the budget is spent on roads. The combination of roads and buildings in one Department is unsatisfactory and consideration is being given to establishing separate Departments.

45. The engineering staff has civil service status, with promotion based on seniority. The senior engineers are conservative and their experience has been limited to local road building methods. The PWD in West Pakistan has acquired a degree of competence in construction work, but in East Pakistan, where road building is much more difficult, the results indicate that the PWD there will need additional experienced staff if it is to carry out the present program.

46. Many of the younger engineers who have been trained abroad in modern road building techniques, find it difficult to introduce changes under the existing system. As these engineers are promoted, improvements will undoubtedly be made but it will probably be a slow process. Both Departments have, in the past, had a reputation for graft and, as a result, they are often handicapped by restrictions and controls placed on them by the Finance Departments. At present, it did appear to the Mission that frequently work is not properly supervised and there is still opportunity for contractors to defraud the Government. Interference in technical matters by non-technical administrators seems widespread and has been causing difficulties for the technical staff.

Planning and Design

47. The Mission found little evidence in either province of any overall planning in the highway programs or of coordination in the location of new highways especially as related to existing railway and inland waterway facilities. According to the Planning Commission, the selection and location of roads has, in the past, been often determined by political influence rather than by economic need. Apparently, in the past, roads have even at times been located with a view to land speculation and to spreading work throughout the country.

48. In West Pakistan, surveys of the road system, and origin and destination studies are available, yet the impression is given that they are not used in planning new work. For example, in East Pakistan, the design of vehicle ferries required over the many major river crossings has not been related to anticipated traffic. Most road engineers in Pakistan classify roads by the types of surface rather than on the basis of design standards. Design standards in Pakistan are not normally based on an appraisal of the importance of the road in the overall highway system or upon anticipated traffic. Insufficient attention is paid to the selection of design standards and, as a result, they are sometimes inconsistent and inadequate. In East Pakistan, main roads are being paved to a single-lane width with reinforced concrete on a base consisting of two layers of brick. This type of pavement is very costly as the cement and materials to make the bricks must be imported, and sand and aggregate shipped in from sources up to several hundred miles away. Consideration is now being given to increasing the pavement width of certain roads now under construction after stretches have already been completed.

49. Suitable road building materials are not available over much of Pakistan. Consequently, the tendency is to pave roads with asphalt or concrete where the traffic may only warrant a low cost surface. Engineers have frequently been subject to criticism for favoring high cost pavement, but until a low cost surface has been developed that will stand up to iron wheeled bullock-cart traffic which predominates in some areas, they have little choice. Laboratory facilities exist in both East and West Pakistan but insufficient use is made of them to resolve these problems.

50. Roadway designs and specifications are generally antiquated and based on the use of hand labor. With the exception of several strategic roads, roads are designed for seven-ton axle loading and restricted vehicle lengths and thus, do not hold up to the heavy type vehicles frequently used for military traffic. Design is generally based on rules of thumb rather than soil investigations. Roads in well drained areas where good materials exist are often satisfactory, while roads in areas where drainage and soil conditions are poor may fail. Insufficient attention is paid to drainage so that embankments are sometimes built too low, ditches too shallow and drainage structures too small.

51. In East Pakistan, where a third of the country is flooded, in some parts to a considerable depth, the design of roads presents complex problems. If roads are to be all-weather and survive the annual floods, they must be constructed on high embankments with ample provision for bridging to allow flood waters to pass. Drainage structures, however, seem to be designed on the basis of trial and error so that some are damaged or the flow of flood waters obstructed, creating higher than usual flooding upstream.

52. Location work appears to be carelessly performed in East Pakistan with the result that the alignment contains unnecessary horizontal and vertical curves. When the alignment crosses a stream in an oblique direction, it is normal practice elsewhere to build a skew structure. However, this is often avoided in East Pakistan by designing the bridge at right angles to the stream and placing the bridge approaches on reverse curves.

Construction

53. With few exceptions, roads in Pakistan are built almost entirely with hand labor, equipment being limited to a few essential units such as rollers, concrete mixers and trucks. The labor force is hard working and particularly in East Pakistan, remarkable feats of embankment and bridge construction have been accomplished with little or no equipment. Apart from brick makers and layers, workmen are largely unskilled. Labor and local materials are generally provided by contractors with the Government supplying some imported materials and equipment on a rental basis. The contractors are generally small entrepreneurs although there are a few larger firms with foreign connections.

54. Field inspection ranges from satisfactory on a few projects in West Pakistan to inadequate or non-existent on most work in both provinces. Field laboratories are not available and little use is made of the two laboratories at Lahore and Dacca. The one at Lahore is especially well-equipped and the staff competently directed. Moreover, the techniques of scheduling, progress reporting and follow-up are generally not in use. It has not been possible, for instance, to obtain information as to the progress of road construction under the Plan for the six-month period ending December 1960.

55. The cost of construction of roads varies widely, ranging from Rs. 100,000 per mile in West Pakistan for a single-lane asphalt surfaced road on a low embankment to over Rs. 400,000 per mile in East Pakistan for a single-lane concrete paved road on a high embankment with frequent culverts and bridging. An undesirable tendency has developed especially in West Pakistan to use Rs. 100,000 per mile as a rule of thumb average and to expect roads to be built for about that price without any consideration being given to the variable nature of materials and drainage. As allocations are often based on this rule of thumb average cost, engineers are sometimes obliged to perform inferior work in order to complete the mileage, knowing that the work will not stand up or work has had to be stopped from time to time until more funds are appropriated.

Maintenance

56. The more important roads in Pakistan are fairly well-maintained considering that only hand labor is used, while the earth roads become unusable in the wet season. A separate maintenance organization does not exist but labor is permanently assigned to each section of road and work is carried out on a regular basis. Maintenance equipment in West Pakistan is limited to rollers, asphalt kettles and a few superannuated trucks. In East Pakistan some maintenance equipment is available but it is ineffectively used.

57. Separate provision is made in the Provincial Government budgets for maintenance funds and there seems to be an increasing awareness at high levels in Government that it is pointless to build roads if they are not to be properly maintained. Maintenance costs range from Rs. 500 to over Rs. 2,000 per mile per year in West Pakistan, although where flood damage has occurred the costs may be much higher. In East Pakistan, it is doubtful whether the high cost of maintaining a road system across the flood plains has yet been fully recognized.

Repair Shops and Equipment

58. The shops at Lahore, Dacca and Chittagong are well-equipped with power tools and trained machinists available to operate them. Spare parts warehouses are located at these shops, but they are inadequately stocked. District shop facilities are almost nonexistent.

59. In West Pakistan, the PWD is using equipment on one major construction project, but it is not efficiently operated as the engineers in charge have had little experience with such equipment. Routine servicing on the equipment is being carried out but repair facilities are very limited. The equipment is operated by a mechanical division which is separate from the construction division so that while it is probably better serviced, those in charge of construction do not have direct control over its use.

60. In East Pakistan, a large quantity of road building equipment was purchased some years ago, but none of it was seen in operation during the Mission's visit. Some units have been cannibalized, some require major overhauls and others only minor repairs. This situation is a result of (i) an acute shortage of spare parts and skilled mechanics; (ii) a lack of equipment standardization and (iii) the practice of purchasing equipment with electrical and hydraulic controls which are too complicated for local mechanics to repair.

61. Any decision to reduce the amount of hand labor in Pakistan and change over to equipment calls for a thorough study of the issues involved. There are a number of disadvantages to the use of hand labor including (i) a lack of uniformity in pavement surfaces which leads to failures under heavy traffic, (ii) the use of unsatisfactory roadside topsoil for embankments because it is closeby, (iii) the difficulty of obtaining proper compaction without the use of rolling and watering

equipment, (iv) the use of a labor force that is too widely dispersed and difficult to supervise and (v) the use of labor which is sometimes difficult to obtain during the harvesting season which coincides with the construction season. After 10 years of highway construction in East Pakistan no through roads are yet completed. While this is partly because the work has not been carried out methodically an important factor is that hand labor sometimes does not provide the most expeditious means of construction of earthworks and bridging even where wages are low.

62. It is difficult to say whether the effective use of equipment would lead to lower costs, but it would certainly lead to an earlier return on investment. However, any decision to use equipment in Pakistan would have to be taken in the light of the present lack of personnel trained in its use and maintenance. Nevertheless, it seems evident that if modern highways are to be built to present day specifications for heavily loaded, high-speed traffic, more road construction and maintenance equipment will have to be used. This would still not rule out the use of primarily hand labor on secondary and village roads.

Ability to Implement a Road Program

63. It is difficult to base any firm conclusions as to the capacity of Pakistan to implement the Second Five-Year Plan on the basis of accomplishment under the First Plan. It is worthwhile to note the problems which arose as the result of the execution during First Plan of the construction and improvement of a total of 3,875 miles of roads in both provinces. By the end of the Plan period 3,215 miles of roads had been completed, while work was in progress on 2,660 miles of roads. Thus, a greater mileage than provided for in the Plan was started while the mileage completed fell short of the Plan target. As has already been noted, the work was too widely spread out especially in East Pakistan with the result that none of the main population centers in that province were connected. Under the First Plan Rs. 15 million was allocated for expanding road research in West Pakistan, but this work was not done. It is still not being done although it is widely recognized that the country is lacking in research in road construction and that the practice of stage construction should be adopted rather than the immediate building of high-type surfaces. The Second Plan also calls attention to the urgent need to revise existing road specifications which are outdated and costly. This work has not yet been started. As the Plan was prepared in part at least by the Planning Commission and its advisers, there is some doubt as to whether their recommendations have really been fully accepted by those directly responsible for implementing the Plan. While the weakness in spreading road construction too widely is recognized by the Commission, it does not appear that the provincial PWDs are aware of it, as they are already making the same mistakes in their execution of the first year's program under the Second Plan.

64. At the time of the Mission's visit, over 10% of the Second Plan period had elapsed so that it should have been possible to obtain some indication as to the capability of Pakistan to implement the Plan by comparing the progress to date against scheduled progress. Data on schedules or progress were not available from the provincial FWDs or the Planning Commission. This is indicative of the lack of follow-up on the part of the Commission as well as the inadequacy of the scheduling and reporting by the executing agencies. It seems essential that the Commission assume a stronger role in supervising the executing agencies during the Second Plan.

65. The FWD in West Pakistan and the Central FWD which is responsible for roads in Karachi and special areas should not have much difficulty in carrying out their share of the program. In East Pakistan, the FWD will not complete any of the five main highways now under construction within the Plan period at the present rate of construction. Furthermore, it will not finish a number of the new highways on which work was scheduled to start in 1960. Although the Chief Engineer has stated that the FWD could assume even larger commitments, it is evident on the basis of past and present performance that the department would have to be reorganized and strengthened if it is to carry out road construction effectively.

The Second Plan Road Program

66. The Plan provides for the completion, construction and improvement of a total of 5,240 miles of roads of unspecified type including the construction of a number of major bridges at an estimated cost of Rs. 545 million. In addition, 1,000 miles of village roads are to be built under the direction of the Agricultural Department at a cost of Rs. 25 million. The Plan does not provide for the construction of any roads by Village AID, although during the First Plan, 7,000 miles of such village roads were built or improved. The total amount allocated for road construction is over 50% larger than the allocation for this purpose in the First Five-Year Plan. The road programs for both the First and Second Five-Year Plans are shown in Table 9, and the location of the more important roads indicated on the two transport maps attached to this Annex.

67. In formulating the road program for the Second Plan, the Planning Commission intended to eliminate uneconomic projects carried over from the previous Plan period by relating all the work, where possible, to the overall requirement for transport. All schemes already in progress were to be carefully reviewed in the light both of the costs already incurred and prospective costs of completion. Low priority schemes were either to be slowed down, reduced in scope or stopped altogether. Top priority also was to be given to nearly completed roads which presently could not be used because bridges and culverts were lacking or there were missing links or inadequate stretches.

Table 9: ROAD PROGRAMS FOR THE FIRST AND SECOND FIVE-YEAR PLAN ^{a/}
(in miles)

<u>First Five-Year Plan</u>	<u>Federal Area</u>	<u>East Pakistan</u>	<u>West Pakistan</u>	<u>Total</u>
New Roads (completed)	-	665	1,150	1,815
Improved Roads (completed)	-	-	1,400	1,400
New Roads (in progress)	-	1,560	850	2,410
Improved Roads (in progress)	-	-	250	250
	-	<u>2,225</u>	<u>3,650</u>	<u>5,875</u>
<u>Second Five-Year Plan</u>				
On-going Road Schemes	-	740	1,100	1,840
New Roads	870	130	1,200	2,200
Roads to be Improved	-	-	<u>1,200</u>	<u>1,200</u>
	<u>870</u>	<u>870</u>	<u>3,500</u>	<u>5,240</u>

^{a/} Does not include village roads built by Village Aid or by the Agricultural Department.

68. The use of objective economic criteria by the Public Works Departments in the formulation of the road program and also by the Planning Commission in evaluating that program has not in practice proved very satisfactory. The PWD has usually submitted programs to the Planning Commission which they probably did not expect to be fully approved. Accordingly, the Commission, as it does not have economic and transport data needed to appraise the projects, often accepted them with the provision that new projects must be approved by the Development Working Party, before work can be started. Unfortunately, however, no order of priority has been indicated so that the projects have arbitrarily been cut to suit the financial limit imposed by the Commission.

69. Over one-third of the total road mileage in the Plan consists of on-going projects, i.e., roads on which construction has already been started. In East Pakistan all the on-going projects were reduced by over half, while in West Pakistan all such projects were included in the Plan. The Mission feels that insufficient consideration has been given to the criteria for determining which roads are to be continued and which new roads to be started. There is some doubt if the process for reviewing roads is rigorous enough.

70. In West Pakistan, the on-going projects, which were included in the Plan cost Rs. 92 million. Many of these are relatively short and were almost finished during the First Plan period. There probably is a prima facie case that they should be completed as soon as possible. Some of the projects, however, notably the Indus Highway, the Karachi-Lahore road and the Karachi-Quetta road still require large sums for completion. Judging from some of the work already completed, it is doubtful whether the standards will be adequate for the rapidly increasing traffic on these main highways of the province. Furthermore, the piecemeal approach of breaking these projects into many small sections and spreading construction of each section over a several-year period constitutes a waste of resources.

71. According to the Plan, new projects in West Pakistan form about two-thirds of the road mileage to be built or improved. Included in this category is the Coastal Highway and a number of roads to serve areas where irrigation works are now underway and a large number of secondary roads in the northern part of the province. It is difficult to judge how economically important these new roads would be on the basis of the limited information available to the Mission. The list of roads originally submitted to the Planning Commission has recently been revised considerably so that the on-going roads are now estimated to cost almost double the original figures of Rs. 92 million. Thus, it appears that much of the new work proposed in the Plan will have to be dropped if the ceiling of Rs. 250 million established by the Commission is to be maintained.

72. In East Pakistan five trunk routes totalling 740 miles have been selected for completion under the Plan. They are considered national highways as they will connect the major population and administrative centers. These roads will, for the most part, supplement existing railway and waterway facilities and while they will permit a speed-up in passenger movement, it is unlikely that they will be used for any significant part of the bulk cargo moving through East Pakistan. The demand for roads to permit improved passenger services might be better accommodated by expanding domestic airline operations.

73. While highways normally permit economically fast and flexible passenger movement, their construction in East Pakistan is even more costly than railroads because of the much wider embankment and bridges required. For these reasons, railways and waterways have large cost advantages. Existing transport services probably should be improved or expanded before a highway system is constructed which would largely duplicate services already available. Thus, although the mileage of on-going projects was reduced by 50% in East Pakistan, the justification of much of the remainder is open to question. Rather than proceeding on five cross-country routes at the same time, it would have been more reasonable to select one road for early completion. A basis would then be available on which to determine with a greater degree of reliability the feasibility of constructing roads to compete against rail and water communications. Little attention appears to have been given to the location of low cost roads to serve agricultural areas where no transport facilities are presently available.

Obviously, it is especially important for Pakistan's transportation sector to provide facilities to move agricultural requisites to where they are needed, and the output of agriculture and industry to market. Emphasis has been placed in principle by the Planning Commission on the need to improve roads in rural areas where all-weather transportation is not available. Some thought will have to be given to integrating into the existing road network the vast system of irrigation roads which are available. In building irrigation and drainage canals, the excavated material is usually used to build roads alongside the canals. These roads are usually restricted to official use so that parallel public roads often have to be built. This seems to be a needless waste of resources and consideration should be given to opening these roads to the public and reducing the construction program accordingly.

74. The Mission feels that the road program in Pakistan will never be completely sound until an economic evaluation is made of each individual road under consideration. There is, today, little or no coordination at the PWD level where projects are originated, with other Departments such as Agriculture, Irrigation and Industry, nor at the secretarial level as the Transport Coordinating Boards are not yet functioning. The Mission is of the opinion that until sufficient economic and traffic data are available on which to base accurate judgements, no large road program should be carried out. Detailed transportation surveys in both provinces are now being undertaken. The survey in East Pakistan has been started and a report is expected by the end of the year. The West Pakistan survey is to be commenced shortly and completed early in 1962. These surveys may permit the determination of priority for both new and on-going projects.

75. The Planning Commission has indicated its intention to wait until the surveys are available before taking any action as it believes that they may indicate that a substantial or complete change should be made in the road program within the present allocations and that possibly these allocations might be reviewed in the light of changes in other sectors. It seems advisable that approval of all large new projects by the Commission should be withheld until the recommendations of the surveys become available.

The Road Transport Industry

76. There has been a considerable increase in the number of motor vehicles in the country increasing from 35,000 in 1947 to 47,000 in 1955 and to 75,000 in 1959. The rise in the number of private motor cars has been more substantial than the increase in commercial vehicles with the number of passenger cars increasing from about 27,000 in 1955 to 48,000 in 1959. The number of commercial vehicles rose from about 13,000 trucks and 7,000 buses in 1955 to 16,000 trucks and 9,000 buses in 1960.

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Table 10: COMMERCIAL VEHICLES IN PAKISTAN IN 1955,
IN 1960 AND THE PLAN TARGET FOR 1965

<u>Number of Buses</u>	<u>1955</u>	<u>1960</u>	<u>Plan Target 1965</u>
East Pakistan	1,600	1,600	2,200
West Pakistan	<u>5,400</u>	<u>7,400</u>	<u>9,800</u>
Total	<u>7,000</u>	<u>9,000</u>	<u>12,000</u>
 <u>Number of Trucks</u>			
East Pakistan	2,650	2,650	4,000
West Pakistan	<u>10,350</u>	<u>13,350</u>	<u>20,000</u>
Total	<u>13,000</u>	<u>16,000</u>	<u>24,000</u>
 <u>Total No. of Commercial Vehicles</u>			
East Pakistan	4,250	4,250	6,200
West Pakistan	<u>15,750</u>	<u>20,750</u>	<u>29,800</u>
Total	<u>20,000</u>	<u>25,000</u>	<u>36,000</u>

77. Little information is available on the condition and average age of trucks and buses. In West Pakistan, the average age of vehicles is at least five-years, while in East Pakistan most of the vehicles are wartime or early postwar models. The program for the Second Plan period will only result in a modest expansion of the existing fleet of vehicles. It is expected that about one-third of the existing fleet will have to be retired between 1960 and 1965. The situation with regard to trucks in the country is especially unsatisfactory. For the country as a whole, the average increase over the four years 1955 to 1959 was only 500 trucks per year. There was no increase registered in East Pakistan. The number of trucks registered in Karachi increased from 2,868 in 1954 to 4,740 in 1958 while in the rest of West Pakistan, the increase was only from 7,927 to 8,047 respectively.

Table 11: NET INCREASE OF BUSES AND TRUCKS IN SERVICE
EXPECTED BETWEEN 1960 AND 1965

	<u>Semi-Public Sector</u>	<u>Private Sector</u>	<u>Total</u>	<u>Trucks</u>	<u>Total Vehicles</u>
Number in 1960	1,800	7,200	9,000	16,000	25,000
Number to be retired 1960-1965	900	2,400	3,300	5,000	8,300
Number to be added 1960-1965	<u>2,300</u>	<u>4,000</u>	<u>6,300</u>	<u>13,000</u>	<u>19,300</u>
Number in 1965	<u>3,200</u>	<u>8,800</u>	<u>12,000</u>	<u>24,000</u>	<u>36,000</u>

78. The amount carried by this small number of vehicles can hardly be more than a relatively insignificant part of the total number of ton-miles of freight carried each year in Pakistan. Nonetheless, it is beginning to play an important role for certain manufactured goods moving between the larger cities of West Pakistan. Urban passenger traffic is dependent on bus service. Traffic densities on main roads already run to several hundred buses and trucks per day. Both city and inter-urban buses are usually crowded and trucks are fully loaded. Passengers seem to prefer buses to the railway because of the more frequent and direct service. Manufacturers of high-priced goods being moved even over such long distances as from Lahore to Karachi, indicate a preference for shipping by truck because of faster delivery and less likelihood of damage.

79. Motorized road transport is not involved in the bulk of short haul road traffic of agricultural produce in the rural areas of West Pakistan. This cargo is generally carried on bullock carts or by pack animals, with the real cost, to a farmer using his own bullocks, low. The use of trains of animals and drivers is also a relatively cheap form of transport for the farmer. However, the large number of carts and pack animals are greatly restricting traffic movement on the main roads. If a modern highway system is to be established in West Pakistan, these more primitive forms of transport will have to be limited in access to anything but the smaller secondary and feeder roads. On the other hand, in East Pakistan only limited cart and animal traffic is used. Bicycle rickshaws for passenger traffic and cargo carrying by head are used extensively for short hauls on land and country-craft on water.

The Regulation and Organization of Road Transport

80. The dimension and loading of commercial vehicles are limited by the Motor Vehicle Act of 1939 to an overall width of buses of eight feet; a width of trucks of 7.5 feet; a length of buses and trucks of 30 feet and a maximum gross weight of vehicles of 10 tons. These regulations, in effect, promote the use of vehicles built on a standard two-axle chassis with axle loads of somewhat less than seven tons. The above restrictions are necessary because of the large mileage of single-lane pavement and the generally light design of surface and base. In general, these regulations appear to be satisfactorily enforced. However, growing agricultural and industrial demands, the many large construction projects currently underway and planned, and military needs all result in considerable pressure to use heavier equipment. This may be accomplished by use of tandem axles to avoid increasing individual axle loads but there is then the problems caused by such long vehicles. Bridges are already being built for heavier loadings and undoubtedly roadway design standards should be raised.

81. The Motor Vehicle Act also regulates the operation of vehicles. All vehicles must be registered and in the case of those used for public transport, examined for mechanical fitness. Public carriers are required to take out a route permit for each vehicle. Buses are restricted to assigned routes, although competition is permitted on some city and inter-urban routes. Regulations restricting the movement of trucks within regional boundaries were in existence until recently.

82. Provincial Transport Authorities (PTA) have been established in each province to regulate the operation of public transport. Government-sponsored agencies are specifically exempted from control of the PTA. The PTA's are responsible for the development of motor transport, the coordination of road and rail transport, the prevention of damage to the road system and the regulation of competition among motor vehicles. Regional Transport Authorities have been delegated power by the PTAs to prohibit or restrict the transport of prescribed classes of goods, regulate passenger and freight rates, issue route permits and supervise the facilities and operations of the industry as a whole.

83. Road transport is for the most part operated and financed by small private entrepreneurs. The major exception is the passenger bus services which are operated by large Government-sponsored agencies such as the Karachi Transport Corporation and the West Pakistan Transport Board. Only a few organizations have fleets as large as 50 to 80 vehicles. Expansion and modernization of existing fleets has been severely handicapped to date by import restrictions, and the fear that the Government may further nationalize the industry.

84. The Karachi Road Transport Corporation operates a city bus service in competition with private operators, while the West Pakistan Road Transport Board operates as a monopoly in Lahore and other northern cities and also serves a number of inter-urban routes throughout the province. Both agencies have new equipment and modern repair and terminal facilities. They are well-managed and eager to expand their operations into areas now served by private operators. In East Pakistan, a Government-sponsored agency was established earlier this year to provide bus services throughout that province. Its immediate responsibility is to establish badly needed intra-urban bus service within Dacca and Chittagong.

85. The original intention in establishing Government-sponsored agencies was to provide services which small operators did not have the capacity to organize and finance, and to establish a model for private services. These agencies in West Pakistan are now fulfilling this purpose and the question now before the Government is whether they should be allowed to expand further or be restricted both in size and to their present routes.

86. These agencies are undoubtedly providing a mass transportation service within large cities which is beyond the capacity of private operators. On the other hand, private operators with older equipment have been providing inter-urban service often at a cheaper rate than the larger agencies. If the semi-governmental agencies were to take over all transport, not only would a large number of entrepreneurs be driven out of business, but the present incentive to maintain low fares might be lost. A large-scale expansion of these governmental organizations would require large amounts of public funds which are badly needed for other programs. Private funds would probably be forthcoming for these purposes. The Mission believes that it is sound policy for the Government to assure private operators that they will be permitted to participate in common carrier transport commensurate with their ability to provide satisfactory service.

87. Consolidation of the private operators into larger companies or associations may prove to be economically sound. It has been claimed that the private operators are too small to furnish a satisfactory service and that individual operators experience difficulty in obtaining credit for expansion and cannot afford adequate repair facilities. The Mission was impressed that some of the fleet operators apparently could expand provided that the problem of obtaining vehicles and parts was eased, and the future more assured. Another important obstruction to consolidation is the legal requirement that at least seven persons are needed to form a company. The Mission believes that once the future of the industry is clarified, the private operators will take the initiative through their associations to organize and supply adequate regional service.

Present Cost of Road Transport

88. Passenger charges at present range from 0.5 U.S. cents to 1.25 U.S. cents per passenger-mile on buses. This compares to 0.7 to 3.0 U.S. cents per passenger-mile on the railways, depending on the class traveled. The fact that bus travel is somewhat cheaper accounts to a certain extent for its growing popularity in West Pakistan.

89. It is more difficult to document the freight rates charged by trucks. These charges are established regionally and depend on the type of road surface and the length of haul. In West Pakistan, the charge averages about 4 U.S. cents per ton-mile on paved roads and 5 U.S. cents per ton-mile on gravel roads. In East Pakistan rates are much higher, ranging upward from about 10 U.S. cents per ton-mile. Truck rates, however, are subject to negotiation and may vary greatly. One textile manufacturer in West Pakistan making regular shipments over a long distance stated that he paid only 2.6 U.S. cents per ton-mile. The average rail rates for similar freight over comparable distances are much cheaper being around 1.0 U.S. cents per ton-mile. Average rail rates are in general low at about 1.4 U.S. cents per ton-mile in West Pakistan and 2.1 U.S. cents per ton-mile in East Pakistan. However, these averages are dominated by the large volume of relatively long distance bulk cargo which makes for a low average rate.

90. The higher truck rates in East Pakistan are, to a certain extent, the result of the state of the roads and the low volume of truck traffic on existing sections of road. These rates are hardly an indication of the future rates that would apply if an integrated road system were to be built. The charge for transport by bullock-wagon in both parts of Pakistan where they are used is about 8 to 10 U.S. cents per ton-mile. As a matter of fact, for relatively short distances most of these alternative forms of transport are quite competitive in Pakistan from the purely cost point of view. In West Pakistan, average transport cost estimates prepared for WAPDA indicated that railroad charges for a wide variety of construction equipment and materials from cement to steel wire amounted to 7.85 U.S. cents per ton-mile for the first 300 miles to 5.25 U.S. cents per ton-mile for the next 300 miles.

91. Transport rates at the present time in Pakistan do not present a burden to the growth of road traffic. The average cost of trucking probably ranges around 4 to 6 U.S. cents per ton-mile which is not substantially different from comparable costs in the United States and many other parts of the world. The Mission believes that all of these forms of land transport in Pakistan are economic when limited to the uses for which they are best designed. Animal-drawn vehicles as they are now used certainly perform an economic means of feeding into the more advanced transport network. Roads when serving the requirements for high-speed, high-value, low-volume cargo are not an uneconomic form of competition for railroads. The quantity of this type of cargo available in Pakistan is not yet known and thus, road planning must remain tentative. This should become clearer as a result of the traffic survey that is now to be carried out.

Vehicle Procurement Under the Second Plan

92. The Second Plan provides for an increase in the rate of vehicle expansion which took place under the First Plan. The Planning Commission recommends that the number of commercial vehicles be increased by around 4,000 per year. This estimate was based on the expectations that passenger traffic by bus would increase at the same rate as anticipated for railway passenger traffic (20%), that truck traffic would increase at the same rate as the estimated growth of agricultural and industrial production over the Plan period (40%), and that the number of commercial vehicles should be expanded at the same rate as the mileage added to the highway system. The Mission, while questioning these assumptions, believes that an increase of about 4,000 commercial vehicles per year would be a very large step forward, considering the past. However, it should also be recognized that commercial road traffic may well need to be increased at a more rapid rate because of the large unsatisfied demand for vehicles which now exists and the recent freeing of this type of traffic from regional restrictions as to movement.

93. In a mainly subsistence economy such as Pakistan an increase in production has often been followed by a greater increase in demand for transport. This has already occurred in the case of the railways as has been noted above. The Mission feels that it is not unreasonable to assume that the demand for road transport will similarly increase at a faster rate of growth than production. The Mission also believes that the share of production moved by road will increase in West Pakistan during the next Five-Year Plan period although in terms of total volume, it will undoubtedly remain relatively small.

94. Finally, it would seem likely that as the road system expands into more remote areas, the volume of transport carried by motorized vehicles will increase relatively more than that carried by bullock-carts in West Pakistan and inland water in East Pakistan. However, the Mission believes that this development will be a very slow process especially as it is applied to local traffic in the more rural areas.

95. The above factors may offset each other to some extent and thus, there is no accurate way to confirm quantitatively, the extent of the needs for more vehicles. In any case, the delivery time of vehicles is relatively short and the supply can be easily regulated. It is not difficult to increase the size of the program if more capital is available. The private sector is expected to finance over 80% of the estimated requirements for vehicles. It is suggested, therefore, that the estimate in the Second Plan for vehicle requirements is reasonable at least for the present.

96. The overall investment projected for vehicles in the Plan is now estimated at Rs. 640 million to cover the cost of 19,300 vehicles (8,300 replacements and 11,000 additional units), and the necessary garages, workshops and other premises. The private sector would assume the major responsibility for expanding road transport, although the Government-sponsored agencies are expected to continue to play a significant part in the expansion of passenger transport in densely populated areas. Both are considered by the Mission to be competent to execute their respective programs, provided that they are given the opportunity to do so, for example, by a relaxation of import restrictions on vehicles.

97. A certain number of vehicles can now be obtained through the use of bonus vouchers but these more than double the import price and often determine the type of vehicles procured. The present Government road policy is considered contradictory as it allocates large sums to the expansion of the road system and at the same time severely curtails the importation of commercial vehicles. The importation of spare parts is also essential for the maintenance of existing vehicles. The Mission is encouraged to note a Government estimate that some Rs. 50 million per year will be allocated for spare parts. Existing equipment is now lying idle because of a lack of spare parts.

98. As was stated earlier, the Mission has doubts about the need for the large-scale expansion of the road system in East Pakistan. The same doubts do not apply equally as well to the expansion of vehicle procurement for East Pakistan. The East Pakistan vehicle fleet is in especially bad condition. Buses and light trucks are greatly needed for urban and local use.

The Effect of Indus on the Road Program

99. The main burden of supplying transport to the Indus Basin Settlement Project must lie with the railways as highway design standards are too low to permit the use of heavy vehicles. According to the West Pakistan Water and Power Development Authority, the present intention is that practically all transport requirements will be met by the railway. However, contractors will be required to build their own service roads in the site areas, while on public roads the strengthening of a few bridges may be necessary.

The Special Problem of the Karachi-Hyderabad Road

100. There has recently been proposed a two-lane concrete highway between Karachi and Hyderabad which would reduce the present road distance to about 130 miles. This road is not at present included in the Second Plan. The road would follow a direct line between the two cities and would cost an estimated \$20.0 million. It would be used to assist the railways to move a part of the additional grain which is to be imported under United States PL 480 aid. Apart from expediting the movement of grain, the proponents of this project feel that it would be a good start towards the badly needed improvement of the country's main arterial highway from Karachi to Lahore. They also feel that the project would provide an opportunity to demonstrate to the PWD how to design and build a high-standard highway with modern equipment.

101. The proposed alignment would be located north of the irrigated areas where the existing road is at present deteriorating badly. Pakistan road engineers have questioned whether it is advisable to use an entirely new alignment, suggesting that the existing road from Karachi should be followed for a distance of some 40 miles. This can only be resolved by a detailed study. A more accurate cost estimate is also needed, and should be available when the survey of the new alignment is completed.

102. This proposal, however, raises a number of issues. First, it will obviously be impossible to complete the highway soon enough to relieve the strain of shipping imported grain. Secondly, there is, in any case, considerable doubt as to how much the railway would be relieved by constructing the highway as most of the traffic is destined for areas beyond Hyderabad. Thirdly, the problems of grain transfer and storage have apparently not been studied. A terminal grain elevator at Karachi or properly located inland storage might do more to relieve the railway. Such storage

facilities are also now under investigation. From an economic point of view, the project is probably sound only if it is combined with a program for improving the entire road to Lahore. There seems to be a prima facie case that this is one of the most justified roads in the country today.

Inland Water Transport in East Pakistan

103. Inland Water Transport (IWT) is especially important as the only means of transportation in many parts of East Pakistan. It is very economical for transporting bulk agricultural products, which account for most of all traffic being moved. Most of this water transport in East Pakistan is carried on non-motorized country craft, usually operated by individual owners. There are no reliable statistics available regarding this trade but it has been estimated by the Inland Water Transport Authority, the organization in charge of IWT in East Pakistan, that it amounts to nearly one billion ton-miles of freight per annum. In addition, it is estimated that slightly more than 200 million ton-miles are carried on motorized water craft. In other words, the amount transported by IWT most likely exceeds the total carried by all other forms of transport in East Pakistan.

Organization of IWT

104. The predominant organization in IWT is private enterprise. The mechanically-propelled vessels consisting of some 800 self-propelled vessels plus 650 dumb craft are predominantly owned by private companies. The more than 110,000 country craft as well as some 200,000 passenger boats of all sizes are also privately-owned. Some 2,800 miles of navigable waterways have to be maintained increasing normally to about 4,000 miles during the monsoon period. The river districts along the coast, except in the Chittagong area, depend mostly wholly on river transport. The Chalna Anchorage facility, a short distance south of Khulna, which has become an important center for exports is entirely dependent on inland water transport both for exports and for bringing sizeable amount of imports on into the interior.

105. Until recently, the major services necessary for the efficient operation of inland water transport such as navigational aids, maintenance of water channels through dredging and river training, pilotage and salvage facilities, survey of vessels and country craft, maintenance of inland ports the provision of terminal facilities for passengers as well as for the handling and storage of cargo were spread through a number of diverse independent agencies with no central coordination or control. The result was that the work was inadequately carried out, making inland water transport both inefficient and expensive. The Joint Steamer Company, the largest of the private shipping companies, took care of its own most urgent needs for facilities on the river at a cost of over a million rupees a year. Other IWT operators were usually dependent upon these facilities. The Joint Steamer Company also provided a modest number of buoys and other navigational aids.

106. The Irrigation Department of East Pakistan Provincial Government was responsible for dredging whereas the province's Central Engineering Authority was to provide buoys and other navigational aids. Meanwhile, all laws relating to inland water transport were to have been administered jointly by the Transport Department of the Provincial Government, District Magistrates, and to some extent, by the Registrar of Inland Shipping. But, the confusion which resulted led to a serious neglect of necessary river improvements. The Government's planning authorities recognized this as an impediment to the economic development of the province.

107. The First Plan recommended that "the clarification of overlapping responsibilities and the unification of some of them in a single body are essential for the development of inland water transport". The establishment of an Inland Waterways Board was proposed so that it could be "responsible for all waterways and river conservancy services, for the provision and improvement of inland ports, terminal facilities and storage capacity and for the supervision of inland water transport operations, including the registration of vessels and the levy of port dues and other charges". As a result, an Inland Water Transport Authority for East Pakistan was set up in October 1958 in accordance with the Plan proposals. The young organization is now well established and appeared to the Mission to be energetically starting the work of reorganizing and improving IWT.

IWT Development Programs

108. The work of improving inland water facilities now appears to be gaining momentum after a very disappointing start. Virtually no public development expenditures were made during the first four years of the First Plan period. Once established, the Inland Water Transport Authority made efforts to set up schemes for the improvement of navigational aids and development of inland ports, but it managed to execute only about Rs. 15 million of this development work out of a Plan allocation of Rs. 83 million.

109. The Second Plan envisages a more ambitious program "with an expansion of waterways to maximize navigable mileage throughout the year; development of major and secondary river ports; research in the various fields of navigation; modernization and better maintenance of the inland water transport fleet; and development of rural water transport". Around Rs. 175 million including investment in both the public and private sectors is allocated for these purposes. The emphasis in the Second Plan is on development of major and secondary inland water ports, on dredging navigational channels and providing landing platforms, research centers and aids to navigation. In the private sector, the program includes modernization and replacement of the existing fleet, development of shipyards and pilot yard for the construction of tugs and other small craft. This program by any standard is modest compared to the needs of Inland Water Transport. It is especially modest in comparison with the allocations set forth in the Second Plan for other forms of transport. The Mission recognizes that IWT is a new organization and must plan its work realistically. The Mission, however, also believes that it is imperative for the long-term economic development of East Pakistan that the activities of IWT be intensified.

Table 12: INLAND WATER TRANSPORT DEVELOPMENT PROGRAM
1960/61 TO 1964/65

<u>Semi-Public Sector (IWTA)</u>	<u>Million rupees</u>
Development of Inland Ports	25.0
Development of 250/400 concrete floating landing stages with facilities for passengers	4.0
Technical training scheme for inland water transport in various sectors	2.5
Workshop facilities for conservancy equipment	0.6
Building at ten river ports	1.4
Research center for development in the fields of craft design & motive power, port & harbor installations & aids to navigation	2.0
Extension of facilities for river conservancy & aids to navigation & acquisition of river conservancy craft & ancillary equipment	12.0
Development of telecommunications for IWT	1.0
Dredging of navigational channels	29.0
Completion of works in progress	<u>2.5</u>
Total IWTA	80.0
 <u>Private Sector</u>	
Raw materials, spare parts and diesel marine engine replacements for overhaul survey and repairs of IWT fleet	20.0
Modernization of existing IWT craft, fleet replacements and acquisition of new craft	45.0
Provision of fast passenger vessels for inter-island traffic to Chittagong and fast passenger launches for general service	12.0
Provision of modern slipways and docks for construction and repair of small craft	5.0
Development of shipyards and ship repair capacity	8.0
Development of rural water transport, establishment of a pilot yard and construction of pocket tugs	<u>5.0</u>
Total Private Sector	95.0
Total Inland Water Transport	<u><u>175.0</u></u>

IWT Shipping Cost

110. The high cost of inland water transport in East Pakistan today is an especially serious problem when it is recognized that it is cheaper in most cases to ship by rail than by water. The example of jute, an important cargo for both rail and water is illustrative. The timing of jute shipments makes it necessary that both rail and water facilities be used simultaneously. It is a seasonal cargo most of which moves during a period of some seven months of each year, thus placing a burden beyond the capacity of either rail or water facilities to handle by themselves. Waterway rates are fixed independently on the basis of negotiations between jute manufacturers and carriers and thus, would normally be in a position to undercut effectively railroads. However, as far as the Mission could ascertain, shipping by

water in East Pakistan is more costly than by rail. For instance, the rate for shipping baled jute by rail from Dacca-Narayanganj is Rs. 17.8 per ton compared to Rs. 28.5 per ton by water. There is no way of knowing at this stage if the railroads are transporting this cargo below cost. In any case, the result of this rate structure plus the existence of additional taxes on water transport out of Chittagong is that 90% of the jute exported through Chittagong port is carried by the railway from the baling centers situated both in the eastern and western regions. On the other hand, the railroads must take a complicated roundabout route to Khulna and with transshipment to Chalna which results in a much higher rate than shipments by water at Rs. 28 for the trip Narayanganj to Chalna. Thus, railway carried only about 26% of the jute traffic from up-country stations over the western region to Khulna and Daulatpur. Nearly all of this rail traffic consisted of raw jute coming by rail to the baling centers at Daulatpur and Khulna where it is pressed and then sent by IWT to Chalna. The rest is handled as through traffic by IWT. Of a total output of raw jute in 1959/60 of about six million bales (1.2 million tons) in East Pakistan, some 4,700,000 bales were exported, 70% of which was carried by rail. Generally, the railway handles from half to three-fourths of the annual production of raw jute in the country.

111. The choice between IWT and rail, according to the members of the industry, is usually made on the basis of the rates charged. The 1960 Jute Enquiry Commission said that "the IWT services are generally considered satisfactory. The IWT flats take jute to the side of the ship and there is seldom any case of damage to jute by water or otherwise. But the IWT freights are much higher than the railway freights from the same points to Chittagong and Chalna. In particular, the IWT freights from Daulapur and Khulna to Chalna are extraordinarily high compared to the distance. The high IWT freights are attributed to the fact that flats get hardly any return cargo from the ports. Moreover, at Chalna, the unloading is sometimes delayed as there is no warehouse and this reduces the effective carrying capacity of the flats". The lack of coastal and inland river shipping facilities at practically all the ports undoubtedly is an important factor in the inefficiency of water transport in Pakistan. The Mission received numerous reports that the turn-round of both coastal and river vessels is extremely slow, forcing vessels to spend a considerable time idling. The IWT traffic to Chittagong also is difficult because it must traverse rough open sea.

112. The Mission recognizes that there are real problems standing in the way of the development of inland water traffic. A key problem in the high cost of water transport is the condition of the existing fleet. Ships need to be modernized, and new vessels designed especially for East Pakistan conditions must be procured. Extensive dredging is necessary as the major rivers in East Pakistan are unstable and tend to silt badly during the annual floods. Channel conditions are extremely uncertain and restrict navigation at night. Modernization of navigation aids is expensive and time-consuming. The organization of dredging also presents problems. In the past, the Government of East Pakistan has usually undertaken whatever dredging was done for the maintenance of navigable channels. With the formation of IMTA and the

East Pakistan Water and Power Development Authority, it has been decided to devise a proper formula for apportioning the cost of dredging between the users of the waterways and the Government. This has not been done as yet and all but the most important maintenance dredging has been stopped. Serious siltation seems to be closing up an increasingly large number of channels during the dry season.

113. The cost of domestic ship-building is exceptionally high and places a burden on the rehabilitation of the fleet. Essential materials have not been available. The PIDC shipyard at Narayanganj and their facility at Khulna have been slow and not able to meet demand. Their repair work has been slow and unusually expensive. Some of the larger shipping companies have been forced to carry out their own repair work. Ship repair and new construction has become a serious bottleneck for the growth of IWT.

114. One of the most widely repeated complaints heard by the Mission has been that regarding the price of fuel. Most river craft use coal all of which has to be imported at high cost. Inland Water Transport is said to pay higher prices for its coal than the railway. Coal is an important part of IWT costs, accounting for some 30% of total operating costs in the motorized part of the industry. Furthermore, the shortage of import licenses had made the modernization and maintenance of the fleets difficult. It is also reported that there are an extraordinary number of taxes and tolls on river transport. For example, it is said that river dues paid by water transport is double that paid by the railway at Chittagong port. The Mission had no opportunity to evaluate these points. It is hoped that all of these problems will be fully examined by the transport survey now underway in East Pakistan.

Role of IWT in an Integrated Transport Network

115. The peculiar role that inland waterways now play in the transport system of East Pakistan is partially due to the situation existing at the time of Partition. Most of the trade in this part of the sub-continent had been oriented towards Calcutta. Transport routes, therefore, had to be redirected after Partition. Chittagong despite its poor location far to the southeastern corner of the province, had to act as the seaport for East Pakistan. It was originally designed and operated as a railroad port. This was, to a certain extent, an inconvenience inasmuch as rail transport across the province north and west is difficult. Water transport has to face the open sea crossing to feed into Chittagong. The Chalna Anchorage has, therefore, been developed for the carriage of commodities by inland water, especially for export. Diversion of traffic has developed with the use of this new port and one-third of total foreign trade and much of the exports are now being handled along waterways by the motorized fleet. This development, however, also has limitations because Chalna only has lighterage facilities.

116. The country boats dominate the primarily internal traffic, carrying unprocessed agricultural products to railroads or directly to mills for further processing. These boats as well as other types of relatively primitive transport such as "head" carrying, act as "feeder" traffic supplementing the railroads which are the basis of the long-distance network. This system is described by the Jute Enquiry Commission as follows: "from the grower's house, jute is carried mainly by country-boats and bullock carts and sometimes by pack animals and in head loads to primary markets and baling centers. ----- Transport from baling centers to Narayanganj, Chittagong and Chalna is mainly by railway and IWT flats, the rest being by big boats."

Table 13: PROPORTION OF JUTE CROP CARRIED BY DIFFERENT MEANS OF TRANSPORT IN RIVERINE AND NON-RIVERINE AREAS DURING THE YEAR

Means of Transport	Riverine Areas During				Non-Riverine Areas During			
	July/ Sept.	Oct./ Dec.	Jan./ Mar.	Apr./ June	July/ Sept.	Oct./ Dec.	Jan./ Mar.	Apr./ June
Country Boats	95	65	35	25	50	40	15	10
Bullock Carts	-	25	50	60	35	45	65	75
Pack Animals	-	-	5	5	5	5	10	10
Head Loads	5	10	10	10	10	10	10	5
Total	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

N.B. Figures are percentages of the total crop carried during each period.

117. The location of industry in East Pakistan is, to a great extent, determined by the availability of inland water transport and the water levels during the year. (See Table 13). Jute mills, as well as a substantial amount of other processing centers for agricultural products, are located along waterways. Most jute mills are located either in the Dacca-Narayanganj area, near Khulna-Daulapur or around Chittagong-Sholashahar. The easiest lines of communication between these areas in the east and in turn to the west are by water. The railroads are now called upon during the seasonal peaks to handle bulk traffic for which they were not designed. The burden of this traffic will be increasingly removed as IWT is developed. Not only are the mechanically-propelled craft concentrating on the transport of pucca bales and jute goods from Narayanganj and Khulna-Daulatpur for export via Chalna, but also with the opening of Chalna, increasingly large quantities of export jute from the Narayanganj area is being diverted by IWT from Chittagong to Chalna.

118. Highways offer no reasonable alternative in East Pakistan. Road construction is very difficult and expensive. Waterways are the only potentially low cost alternative to railroads which is clearly indicated by the present pattern of traffic. Short movements of bulk cargo do not now usually use railroads. In 1959/60, despite a total output of grain in East Pakistan of 7,642,000 tons plus an import of 564,000 tons, the railroads only handled some 1,168,000 tons or 14% of the total. Most of the imports as well as surpluses from such areas as Khulna and Sylhet were shipped by rail to the consuming areas around Dacca and Tippera. The average haul on this traffic was probably about 170 miles.

119. Motorized water traffic also plays a similar role but only for modest amounts. The total traffic carried on the waterways by mechanized craft has been annually about 1,400,000 tons during recent years. Half of this is jute with only 200,000 tons food grains, and 100,000 tons coal. The bulk of cargo is carried by country craft. For example, 200,000 tons of salt produced along the southern coasts is moved by country boats to the main consuming centers. Out of a total production of other agricultural produce such as fruits, vegetables and sugar cane amounting to 7,000,000 tons, only some 8% was carried by rail in 1959/60. The larger part either is consumed in the area where it is grown or if it enters markets, say 50-100 miles away, most often it is shipped by small country craft. Most coal is carried by rail. Petroleum products are imported by sea through Chittagong and carried by rail inland. There are also certain limited quantities of oil carried in tankers and barges from Chittagong to Narayanganj and Khulna from where they are in turn distributed by rail. It is extremely difficult because of the lack of statistical data available to quantify the amount of traffic being carried by country craft. The indications are as noted above that it is probably the largest part of what is being carried by the transport system today in East Pakistan.

Size of IWT Traffic

120. The total traffic carried by mechanized craft for 1959/60 amounted to 1,460,000 tons which was carried on the average some 150 miles or a total of 217,000,000 ton-miles. Nearly 85% of this traffic was carried to and from major ports entering into overseas trade. The largest part of this traffic was carried between the Narayanganj-Dacca area and Khulna-Chalna. Less than 20% went to Chittagong. The traffic of country craft, estimated by the IWTA to be around one billion ton-miles, is carried in some 110,000 boats, one-third of which have a capacity of more than four tons. Apparently, there are some 10-15 million tons of produce carried annually by country craft, perhaps a distance of 65 to 100 miles. IWT probably, today, accounts for 1.2 billion ton-miles of cargo out of a total freight carried in East Pakistan of 2 billion ton-miles. The railroads most likely carry no more than 40% of total traffic with road transport accounting for an insignificant share.

121. The passenger traffic carried by IWT is also impressive. The motorized part of the industry carries some 14 million passengers annually compared to 67 million on the railroads. According to IWTA estimates the country craft can carry nearly 1,500,000 passengers at any one time. There are no estimates available as to how many passenger-miles these craft may carry in any one year.

Balanced Transport Program

122. IWT is so important that it should receive the maximum attention possible in the long-term planning of transport in East Pakistan. The Second Plan allocation is small compared to other forms of transport, especially roads. Progress has been too slow. The Mission is of the opinion that even before the results of the transport survey are available, a maximum effort be made to insure a more effective IWT. Specifically, this should involve high priority for an improved fleet and inland port development plus serious consideration for direct coastal shipping service between Dacca, Khulna and Karachi. This might be accomplished with 12-foot draft coastal vessels similar to those used in the North Atlantic. A detailed examination of the hydraulic information available must be made at once to determine which parts of such a program could be expedited and which must wait for the completion of an extensive survey of the rivers which is to be undertaken. This sort of a program could relieve the pressure on the railroads leading to Chittagong and also might well be an alternative to building an expensive highway between Dacca and Chittagong.

Ports

123. The sea-going ports of Pakistan are Karachi in West Pakistan, Chittagong and the Chalna Anchorage in East Pakistan. They have been recently expanded and all are in reasonably good condition to handle the traffic being offered. The port situation in Pakistan has undergone a substantial change since Partition. At that time, they were not especially suited to the traffic they were called upon to handle. Both Karachi and Chittagong had only relatively modest facilities. The Chalna Anchorage did not exist. Port expansion was thus, rightly considered a very important part of early development plans. The expansion of Chittagong Port was begun in 1949 with the construction of additional jetties with related facilities and a remodelled railroad yard. As the result of this work, the capacity of the port was expanded from 500,000 tons to over 2,000,000 tons by 1955. The problems of the Karachi Port were somewhat different. It had, at Partition, been one of the largest wheat exporting ports of the British Commonwealth having handled as much as 2,800,000 tons during the war year of 1944/45. The facilities were geared, however, to the export of commodities such as grain. Thus, when it was called upon to handle substantial general cargo imports and total volume reached 4,000,000 tons as in 1952/53, there was considerable congestion and costly delays to shipping. The port facilities were old and needed modernization. They were unsuited to the change in the composition of traffic which took place after Partition. Most of the cargo berths were over 60 years old and needed reconstruction. They had to be

provided with modern electric cranes, storage sheds and a remodelled railway yard. Although the port facilities were nominally capable of handling 3,000,000 tons and at peak level operations could be worked at an annual rate of 4,500,000 tons, operations could not be done economically and without unduly delaying the turn-round of vessels. Therefore, construction work was initiated as quickly as plans could be drawn and was actually started in 1954 on 13 of the old cargo berths.

124. In East Pakistan, although Chittagong's expansion was started quickly, its location was convenient only for the area lying east of the Brahmaputra and the Ganges. The demand for a second port for ocean-going vessels to serve the western part of the province led to the establishment of an anchorage at Chalna a short distance south of Khulna on the river Pussur in December 1950. This was intended as a temporary location until a detailed survey of the behavior of the river could determine a suitable site for a new port. It has, however, not yet been possible to locate the site of a new port due to the difficulties of a highly unstable river and lightering is still being carried on at Chalna. The rest of the port program has been progressing quite expeditiously. The actual expenditures during the First Plan period exceeded the original allocation for both Karachi and Chittagong. The proposed allocation for the Second Plan involves a modest reduction from a total expenditure of Rs. 183 million to a proposed allocation of Rs. 154 million. The large reduction is in the allocation for Chittagong Port inasmuch as the program in the port is essentially complete.

Table 14: DEVELOPMENT EXPENDITURE ON PORT CONSTRUCTION AND ALLOCATION FOR SECOND PLAN, 1955/56 TO 1959/60 (in million rupees)

	Provision in the First Plan	Additional works Subsequently Approved	Total First Plan Allo- cation	Actual Expendi- tures 1955/56 to 1959/60	Alloca- tion for Second Plan
Karachi Port	89.0	24.0	113.0	133.0	124.0
Chittagong Port	28.0	10.0	38.0	43.0	15.0
Chalna/Mangla Anchorage	12.5	-	12.5	7.0	15.0
Total	<u>129.5</u>	<u>34.0</u>	<u>163.5</u>	<u>183.0</u>	<u>154.0</u>

Karachi Port

125. Congestion and delay in the movement of cargo has been a serious problem in Karachi Port for many years. This has been due in part to the inadequacy of facilities and also as the result of poor operational techniques, inefficient management and poor overall productivity. After Partition, substantial changes were necessary if Karachi were to adjust to its new pattern of traffic. It had been substantially an export port, whereas after Partition, 75% of its traffic was imports and only 25% exports. Further, the volume of traffic increased substantially from around three million tons to well over four million tons.

Table 15: TRAFFIC THROUGH KARACHI PORT
(in million tons)

<u>Year</u>	<u>Imports</u>	<u>Exports</u>	<u>Total</u>
1949/50	1.9	0.9	2.8
1954/55	2.1	0.8	2.9
1955/56	2.6	1.1	3.7
1956/57	3.0	1.0	4.0
1957/58	3.3	0.9	4.2
1958/59	3.0	0.9	3.9
1959/60 ^{a/}	3.4	1.1	4.5

^{a/} Fiscal year ending June 30 - other years ending March 31.

126. The increase in traffic took place at a time when the port was undergoing substantial reconstruction. Excessive handling of cargo was necessary because of the shortage of equipment. Severe restrictions were placed on operations by the limited access to available berths and the need to direct traffic around construction work. Nonetheless, the port remained operational throughout and now the expansion is nearly completed. All the cargo berths are in operation; new electric cranes have been installed; new paved storage areas are in use; and the railway yard's remodelling is well underway. It is reasonable to assume that in a short time, the capacity of the port will have been increased to around 5,500,000 tons. It is also reasonable to assume that capacity could be raised somewhat more by improving handling and storing operations.

127. The Second Plan program for Karachi has already been started. Four more cargo berths are under reconstruction. An old bulk oil pier is to be replaced, new staff quarters constructed, facilities for an additional fresh water supply installed, and the replacement of some old tugs, barges, dredges and other craft. This program is estimated to cost about Rs. 124 million. It should permit the further improvement of the port's capacity especially if the administration of the port is also improved.

Some progress has already been made. The railroad layout on the quays has been improved and with the better facilities in the marshalling yard, the movement of traffic in the port is being speeded up. There is, however, still room for improved railway operating techniques and the port suffers from occasional shortages of suitable railway wagons particularly for special and heavy loads. The accounting department has been quite unsatisfactory in the past and is undergoing reorganization. The port has been short of suitable skilled personnel and at the present time a number of foreign experts have been assisting the work of the individual departments.

128. Some improvement is already apparent. The amount of congestion has declined somewhat during recent months, despite a rather large volume of traffic. The volume of imports and exports for the month of August 1960 reached a peak of 462,779 tons, the highest for over six years and the total for the three-month period, July to September 1960 at 1,333,119 tons is equivalent to a projected annual rate of over 5.0 million tons. Such a volume of traffic will continue to cause some operational difficulty until the overbridges and transit sheds adjacent to the reconstructed berths are completed. Handling as well as the locating and documenting of cargo continues to be very time-consuming because the cargo must be stored, often as much as miles away from the point of landing. On the financial side, increased costs have been offset by higher port charges and a greater volume of traffic so that operations continue to be profitable.

129. There is still a shortage of berths which forces vessels to "double-bank" and to work into lighters both at berths and at the sheltered anchorage. Heavy lifts are also a problem, now being handled by a 30-ton and 60-ton floating crane. The largest shore-based crane is a 27-ton derrick crane located at a very restricted heavy-lift yard. A 125-ton floating crane is to be obtained, but the Second Plan program does not include any additional heavy-lift yards. With the increased import of heavy machinery and large pieces of equipment early in the Plan period due to the Indus program, a serious bottleneck could develop in the port before the new large floating crane can be obtained.

130. Although congestion had eased somewhat during the Mission's visit, it is expected to increase in the course of U.S. aid-financed grain shipments during the coming years. Congestion during much of 1960 was a most serious problem. During the three-month period ending September 30, 1960, 315 ships were delayed outside the port an average of 69 hours each. These delays have been very costly. During 1958, 1,537 ship-days were lost awaiting berths, 700 ship-days in 1959 and 1,912 ship-days in the first eight months of 1960 alone. The handling of bulk cargo has been the greatest cause of difficulty. There are no modern bulk-cargo handling facilities and the rate of handling is of the order of only 15 tons per gang per hour. During the first eight months of 1960, of 1,027 ships handled, 143 were bulk cargo ships. More than half of the traffic handled during this period was bulk cargo amounting to 1,278,975 tons compared to 1,126,631 tons of general cargo.

131. A team of experts have been working on this problem of the handling of bulk cargo, in view of the expected increase of U.S. PL 480 agricultural shipments. Some mechanical loading equipment is soon to be installed. Grain silos may be built in the port area or near the port, although this program is still under discussion.

Table 16: PRINCIPAL IMPORTS AND EXPORTS THROUGH KARACHI
1954/55 AND 1959/60
(in thousand tons)

<u>Commodities</u>	<u>1954/55</u> ^{a/}	<u>1959/60</u> ^{a/}
<u>Exports</u>		
Cotton	163	133
Bones	15	21
Flour	3	3
Gram	3	12
Oil Seeds	80	80
Wheat	30	22
Wool	13	15
Cement	-	90
Rice	144	207
Other	389	595
Total Exports	<u>840</u>	<u>1,078</u>
<u>Imports</u>		
Coal	187	194
Iron and Steel	213	154
Sugar	66	-
Cement	-	115
Wheat	-	773
Petroleum	955	1,410
Other	631	779
Total Imports	<u>2,052</u>	<u>3,425</u>

a/ 1954/55 fiscal year to March 31. 1959/60 fiscal year to June 30.

132. The Mission is particularly concerned whether the Karachi Port can meet the needs of both the Second Plan and the Indus Basin Settlement Works. The increase in especially difficult cargo such as machinery during the next years will be a serious burden. The port as well as the Government has indicated its confidence that existing facilities can meet these needs. Estimates for the Indus project prepared by WAPDA indicate that in the year of peak traffic some 2,200,000 tons of material will require transport by railroad. A part of this must pass through the port. The Port Trust has made its own estimates that the Indus loads would amount to approximately 6% of the total annual imports coming into the port and that the extension now under construction would be sufficient to permit the handling of this traffic.

133. The Mission suggests the possibility that difficulties might arise from the nature of the traffic. Even if Indus results in an increase of only 200,000 tons per annum for the port, if much of this is heavy machinery, iron and steel, etc., the port may well become very congested. A new 125-ton floating crane is to be obtained and will help solve the problem of heavy lifts but, most likely, will not be installed until 1964/65. The port's planning has been based on the assumption that during the intervening period, most heavy lifts would be handled by the ship's own derricks and loaded directly on rail cars. The railroads are ordering a large number of flat cars and the rail sidings in the port area are at present capable of carrying up to 150-ton loads.

134. The Mission still doubts whether the port can handle all of Indus traffic without having heavy congestion. There may be as much as 30,000 tons of heavy equipment for Mangla alone. Such an amount of heavy equipment could tie up the port for a substantial length of time if it were brought in over a short period. Serious study will have to be given to this problem if the Indus project is to be carried out effectively.

Chittagong Port

135. Chittagong has only recently completed a large expansion. The construction of additional jetties with related facilities was started very shortly after Partition. About Rs. 88 million was spent on the port before 1955 and Rs. 43 million during the First Five-Year Plan period. Thirteen new berths were constructed, most of which have been equipped with modern cranes and related new storage areas and sheds. The capacity of the port has grown from only 500,000 tons at Partition to 2,500,000 tons by 1955. Traffic which was 323,865 tons in 1947/48 and 1,005,000 tons in 1949/50 grew to 2,139,000 tons by 1958/59 and 2,643,727 tons during the most recent fiscal year.

136. Although the present capacity of the port is approximately 2,500,000 tons under normal operating conditions, the Port Trust has indicated that its capability under an emergency could be some 40% higher. The requirements for the Second Plan period are very modest, with some Rs. 15 million allocated mainly for river training schemes, floating craft and a small amount of handling equipment. The facilities appear to the Mission to be adequate for the probable traffic expected during the Second Plan period especially in view of the fact that considerable amount of export traffic is being increasingly diverted to the Chalna Anchorage.

137. The facilities and handling capacity of the port do not seem to the Mission to be a limiting factor for the development of this part of Pakistan. The main restrictions to increasing traffic are the limited capacity of the railroad connecting the port and the rest of the country and the inadequate depth of water in the river channel between the sea and the port. Ships drawing more than 23 feet of water can enter the port only at high tide. Furthermore, the channel can only be maintained at this depth through constant dredging.

138. The training of the Karnaphuli River so that it will flow alongside the port's jetties and thus, increase the depths within the port area is apparently a very complex problem. Studies have been carried out over many years and there has been some improvement in the river channel. This is very expensive and time-consuming work and will clearly continue to be a major problem for this port.

139. A large expansion of the rail capacity into and out of the port would be difficult and expensive. For example, doubling the track of the existing railroad north would be quite prohibitive. The construction of a highway between Chittagong and Dacca as an alternative would also be extremely expensive. An inland water route to permit small IWT vessels to use the port would require a long canal which would probably also be prohibitive. There is a prima facie case that all of these approaches would be uneconomic. In any case, the economics of these projects and the selection of one project from among the various alternatives could be justified only after very careful investigation. Moreover, these are not the only alternatives. It might be possible to increase the use of the Chalna Anchorage for imports, although this would require improved facilities which must wait upon a careful study of the location of a new port. This will also be time-consuming and probably costly. A partial solution might be the use of suitable coastal vessels which could travel directly between Karachi, Dacca and Khulna, absorbing some of the traffic that now goes through Chittagong.

140. Some 475,000 tons of coastal traffic currently is carried from Karachi to Chittagong and 160,000 tons in the other direction. That part of this traffic which is discharged at Chittagong for shipment by rail to the Dacca area, might well be carried directly inland on, say, 12-foot draft vessels. The final solution to the problem of Chittagong will, undoubtedly, have to wait for the results of both the transport survey and the complete investigations of the rivers now being carried out in East Pakistan.

141. The solution to the problem of bulk cargo at Chittagong as distinct from the burden of coastal shipping and general cargo is more difficult. Chittagong receives nearly 500,000 tons of food grains, 600,000 tons of petroleum, 240,000 tons of cement and 211,000 tons of coal or some 1,550,000 tons of bulk cargo out of a total of 2,150,000 tons of imports. Most of this cargo is transported northward by railroad. It is difficult to visualize a substantial amount of this cargo being transshipped inland by waterways. Perhaps, some can. This is, undoubtedly, the crux of the bulk cargo problem. The railroad must probably continue to bear the brunt of the transport of bulk cargo inland. For this reason, the Mission recognizes that additional improvement on the railways cannot wait for the final results of the various surveys.

Table 17: IMPORTS AND EXPORTS THROUGH THE PORT OF CHITTAGONG
1946/47 THROUGH 1959/60
(in short tons)

<u>Commodities</u>	<u>1946/47</u>	<u>1948/49</u>	<u>1954/55</u>	<u>1959/60</u>
<u>Imports</u>				
Food Grain	8,775	130,029	38,213	488,108
Salt	74,366	109,653	108,712	131,721
Coal	-	7,617	77,006	211,110
Cement	-	3,722	38,544	238,312
Iron and Steel	-	1,363	15,014	40,905
Cotton	-	7,476	30,564	17,251
Petroleum	n.a.	55,975	302,302	604,422
Fertilizer	-	1,635	2,898	25,116
General Cargo	2,711	87,176	269,646	374,828
Miscellaneous	1,325	9,231	29,954	15,018
Total Imports	<u>87,177</u>	<u>413,877</u>	<u>912,853</u>	<u>2,146,791</u>
<u>Exports</u>				
Jute	5,566	220,469	314,578	258,502
Tea	30,523	14,035	27,508	29,181
General Cargo	60,828	5,011	107,151	120,205
Hessian Cloth	-	-	1,499	60,306
Paper	-	-	-	8,434
Rice and Paddy	38,828	-	8,474	-
Wax	8,480	5,960	-	-
Hides and Skin	-	1,639	2,706	4,049
Cotton	330	1,038	1,331	4,137
Miscellaneous	13,352	4,609	9,715	12,122
Total Exports	<u>155,907</u>	<u>252,761</u>	<u>502,962</u>	<u>496,936</u>
Total Trade	<u>243,084</u>	<u>666,638</u>	<u>1,415,815</u>	<u>2,643,727</u>

The Chalna Anchorage

142. Chalna Anchorage was originally intended to meet temporarily the needs of that part of East Pakistan not conveniently served by Chittagong. It is an inland port located 70 miles upstream from the mouth of the Pussur River. The Anchorage has increased the tonnage handled from some 32,000 tons in 1950/51 to more than 800,000 tons in 1958/59. It has been extremely helpful in taking off of Chittagong the pressure of export traffic and also to cater to the main import needs of the area west of the Brahmaputra River. The port is not yet permanently located. Cargo is transported to and from the hinterland in barges and transferred to ocean-going vessels at a location called Chalna close to Khulna. This site which is 30 miles south of Khulna has been in use since 1954. The previous harbor basin had too strong a current during the monsoon period. The final location of a permanent port is now

under investigation. Very extensive river studies will be necessary and thus, it will be many years before a new port can be built. Rail connections are available at Khulna where some pontoon landing stages and storage space has been constructed. However, it is doubtful whether more than 16 feet of water can ever be made available at the Khulna location during the dry season.

Table 18: IMPORTS AND EXPORTS THROUGH THE CHALNA ANCHORAGE
1950/51 THROUGH 1958/59
(in short tons)

<u>Commodities</u>	<u>1950/51</u>	<u>1954/55</u>	<u>1958/59</u>
<u>Imports</u>			
Food Grains	1,429	-	132,263
Salt	-	37,910	-
Cement	-	3,521	14,698
Coal and Coke	-	-	85,950
Petroleum	-	12,388	6,893
General Cargo	-	41,329	32,267
Total Imports	<u>1,429</u>	<u>95,148</u>	<u>272,071</u>
<u>Exports</u>			
Raw Jute	31,773	375,908	438,503
Jute Goods	-	10,963	74,717
General Cargo	-	6,295	17,347
Total Exports	<u>31,773</u>	<u>393,166</u>	<u>530,567</u>
Total Trade	<u>32,202</u>	<u>488,314</u>	<u>802,638</u>

143. The First Plan allocated only a limited amount for port facilities at Chalna. Some provision was included for storage accommodation at the site of the anchorage and some facilities at Khulna at a cost of Rs. 12.5 million. Moorings, lighting equipment, buoys and some floating equipment were acquired as planned during the past five years.

144. No major improvement is expected to start during the Second Plan period until hydraulic investigations of the Pussur River are completed. There is to be minor work effected such as the construction of a jetty and two transit sheds at Khulna. Electricity is to be made available at the Anchorage. Additional floating craft and navigational aids are to be acquired. The cost of this limited program is estimated to be Rs. 15 million. The recent Plan revision added Rs. 14 million to this program, but no details are available.

145. The relationship between Chalna and Chittagong is being widely discussed in Pakistan. Chalna is primarily an export port with river boats going to the port area fully loaded while returning empty. At Chittagong a substantial part of the railway wagons come to the port empty. Studies are being undertaken to ascertain whether this transport capacity can be more effectively utilized. A Traffic Survey Committee set up to study this problem concluded in early 1960 that "there can be no balancing of imports and exports passing through Chittagong and Chalna, as the total imports and exports of the province are in the ratio of 2:1 respectively". It was further concluded that the "Chalna Anchorage has satisfactorily handled direct shipments of raw jute and jute products and it should be allowed to remain as an Anchorage". Furthermore, the jute industry has contended that the use of inland waterways and the Chalna Anchorage offers a substantial cost advantage plus a savings in time during the peak periods of the year, when congestion usually occurs at Chittagong.

The Problem of Coastal Shipping

146. At the time of Partition there were only some 20,000 tons of merchant shipping in Pakistan. The development of a merchant fleet was encouraged and by 1955 some 180,000 dead-weight tons were available. The ships were, however, mostly over 30 years old, largely uneconomic and due for scrapping. Only about six of them, totalling 50,000 tons were reasonably modern.

147. The First Plan set forth proposals "to develop a dependable modern merchant fleet to carry the coastal trade as well as to share in the country's foreign trade". The Plan indicated that the cost of replacing the fleet then in existence would be about Rs. 140 million which would be beyond the resources of the private shipping companies. It was, therefore, proposed that there be established a national shipping corporation "to participate in both coastal and international traffic". Rs. 60 million were included in the Plan for the purchase of six or seven ships and for working capital for the proposed National Shipping Company.

148. The Pakistan private companies were, however, very active in investing in shipping, so a public shipping company was not established. They purchased 10 comparatively new cargo ships at a cost of somewhat less than Rs. 20 million. They now own 26 ships, 16 of which are less than 20 years old. The Pakistan flag vessels handle annually about 700,000 tons of coastal traffic. However, the Second Plan estimates that capacity equivalent to 10 old ships in this trade will have to be replaced. It is proposed that three new ships be built at a cost of Rs. 27 million. A private shipping company has already placed an order for a new passenger ship for coastal traffic at a cost of Rs. 15 million. It is also proposed that a passenger ship for pilgrims visiting Mecca be built at a cost of Rs. 15 million.

149. The interzonal coastal traffic is earmarked for national flag vessels but foreign vessels have had to be chartered in the past. In 1957, a total of 175,000 tons of rice, salt and cement was carried in some 25 foreign flag voyage charters. By 1959, it was estimated that 80 voyages have been made in the coastal trade from East to West with 588,000 tons of cargo and 155,000 tons in the opposite direction. The Government's Shipping Advisory Board had estimated that 20 ships with an average capacity of 7,000 tons each have been required for this trade. This is considered the minimum number of vessels needed for the coastal traffic. Additional requirements for reserves during periods of repair and for the movement of cargo such as rice from Burma has resulted in an increase in the estimate of the number of ships needed to 24. Inasmuch as 22 are now available, but ten are old, the Plan estimates that three more ships should be immediately obtained for the coastal trade and allocates an amount of Rs. 27 million for their procurement. Six ships are to be added to the existing international fleet at the cost of Rs. 40 million.

150. The allocation to coastal shipping seems to the Mission to be highly desirable. The Mission, however, believes that the program might be reconsidered; perhaps smaller cargo vessels of around 1,500 tons carrying capacity and a draft of 12 feet might be useful for trading directly to the Dacca and Khulna areas from Karachi. The Mission does not feel that the allocation for international shipping is quite as essential as that for coastal shipping. The amounts are not especially large and all of it is allocated to the private sector.

Table 19: SHIPPING DEVELOPMENT PROGRAM, 1960/61 TO 1964/65
(in million rupees)

	Number of Ships	Expenditure		
		Private Sector	Public Sector	Total
Cargo ships for coastal traffic	3	27	-	27
Passenger ship Karachi-Chittagong	1	15	-	15
Passenger ship Haj traffic	1	15	-	15
Cargo ships for international traffic	6	40	-	40
Oil tankers	2	6	-	6
Merchant Navy Academy at Chittagong	-	-	2	2
Total	<u>13</u>	<u>103</u>	<u>2</u>	<u>105</u>