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DEPARTMENT OF STATE  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
Washington, D.C. 20523

CAPITAL ASSISTANCE PAPER

Proposal and Recommendations  
For the Review of the  
Development Loan Committee

WEST PAKISTAN - LAHORE-MULTAN HIGHWAY

AID-DLC/P-324

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DEPARTMENT OF STATE  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
Washington, D.C. 20523

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AID-DLC/P-324  
May 21, 1965

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Pakistan - Lahore-Multan Highway

Attached for your review are the recommendations for authorization of a loan in an amount not to exceed \$15,000,000 to the President of Pakistan to assist in financing the foreign exchange costs of equipment, materials and services for the construction of a hard-surfaced two-lane highway from Lahore to Multan in West Pakistan together with required ancillary facilities including bridges.

This loan proposal is scheduled for consideration by the Development Loan Staff Committee at its meeting on May 26, 1965.

Helen E. Nelson  
Secretary  
Development Loan Committee

Attachments:

Summary and Recommendations  
Project Analysis  
Annexes I-III

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WEST PAKISTAN

LAHORE - MULTAN HIGHWAY

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WEST PAKISTAN  
LAHORE-MULTAN HIGHWAY  
SUMMARY AND RECOMMENDATIONS

1. BORROWER

The Borrower would be the President of Pakistan. The executing agency would be the Communications and Works Department of the Government of West Pakistan.

2. AMOUNT OF LOAN

\$15,000,000

3. TOTAL ESTIMATED COST OF PROJECT

	<u>Rupee</u> <u>(\$ Equivalent)</u>	<u>Foreign</u> <u>Exchange</u>	<u>Total</u> <u>Cost</u>
Engineering Services	\$1,411,000	\$ 1,343,000	\$ 2,754,000
Construction Contract	12,894,000	13,657,000	26,551,000
Asphalt and Cement	1,372,000*	0	1,372,000
Rt. of Way and Government Levees	<u>4,710,000</u>	<u>0</u>	<u>4,710,000</u>
	\$20,387,000	\$15,000,000	\$35,387,000

4. DESCRIPTION AND PURPOSE OF PROJECT

The loan will enable the borrower to finance the U.S. foreign exchange costs of a modern highway between Lahore and Multan in West Pakistan. Total length will be approximately 207 miles, of which 117 miles consist of improvement to the existing road and 90 miles of which are new alignment. The existing road has reached maximum utilization and is becoming totally inadequate for the present and anticipated traffic growth.

The project provides for bypasses of principal towns along the route, the elimination of 5 grade crossings of the Pakistan Western Railway, and the shortening of the road by 8 miles near Multan. American Association of State Highway Officials (AASHO) geometric standards for modern main roads will be followed. Shoulders will be 10 feet wide with a 6 foot stabilized strip

\*The GOP will be required to finance out of its own foreign exchange any part of these requirements that cannot be obtained out of domestic production.

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adjacent to the highway. The highway itself will have an asphaltic concrete pavement 24 feet wide and of sufficient strength to carry 21,600 lb. axle loads. A separate asphaltic surfaced cart road 12 feet wide will be built to serve slow moving traffic and keep it off the main roadway.

5. BACKGROUND

The present highway, and the improved alignment traverse one of the richest agricultural areas of the Punjab. In addition, industrial development is rapidly increasing in the towns and cities served by the route. Complementing the single track railway line which it roughly parallels, the road provides an important means of moving people, farm produce, fertilizer, and industrial products.

Traffic is increasing at a rapid rate, and by the usual standards, the present road is already overtaxed. The existing road varies from 12' to 24', with an average width of 16'. Shoulders consist of unconsolidated local silt, sight distances and clearances are inadequate at railways and waterways, and the roadway strength is insufficient for the traffic loads. Slow-moving cart, bicycle, and pedestrian traffic are heavy and limit the useful capacity.

6. EXPORT-IMPORT BANK AND WORLD BANK INTEREST

At a meeting of the Export-Import Bank - A.I.D. Coordinating Committee on May 21, 1965 the Bank representative stated that the Bank would not be willing to consider the proposed loan to Pakistan for the Lahore-Multan Highway project. Coordination with the World Bank (IBRD) established the understanding that the proposed AID loan for the Lahore-Multan Highway project would not conflict with the IBRD's highway development program in Pakistan.

7. MISSION VIEWS

The Capital Assistance Paper for the proposed loan was prepared by the Mission and reflects its views.

8. STATUTORY CRITERIA

All statutory criteria have been met. (See Annex I.)

9. ISSUES

None

10. RECOMMENDATION

Authorization of a loan in an amount not to exceed \$15,000,000 to the President of Pakistan for relending to the Government of West Pakistan, under the following terms and conditions:

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- (a) The Government of Pakistan to repay the loan to A.I.D. in U.S. dollars within 40 years from the date of the first disbursement under the loan, including a grace period of not to exceed 10 years from the date of the first disbursement. During the grace period the Government of Pakistan to pay interest to A.I.D. in U.S. dollars at the rate of 1% per annum on all amounts of outstanding principal. From and after the expiration of the grace period, the Government of Pakistan to pay interest to A.I.D. in U.S. dollars at the rate of  $2\frac{1}{2}\%$  per annum on all amounts of principal outstanding under the loan.
- (b) Relending terms between the Government of Pakistan and the Government of West Pakistan for the project to be satisfactory to and approved by A.I.D.
- (c) The Government of West Pakistan to produce evidence satisfactory to AID that other funds, both foreign exchange and local currency, sufficient to complete the project have been or will be made available.
- (d) All goods and services financed from the loan to be procured from and have their source and origin in the U.S.
- (e) The loan to be subject to such other terms and conditions as A.I.D. may require.

Capital Activity Committee Members

	<u>At the Mission</u>	<u>At AID/W</u>
Loan Officer	J. Standish	W.A. Underwood
Engineer	C. Inman	J.R. Yarrow
Legal Advisor		R.L. Bard
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Drafting Officers: Standish/Inman/Barrett

LAHORE-MULTAN HIGHWAY

I. BACKGROUND

A. General

An adequate system of transport is essential to the expanding economic development of West Pakistan. The provincial government has recognized this need and is giving high priority to the development of its transport facilities. It is aware that the execution of agricultural and industrial projects and the growth of supporting activities will require the rapid and reliable movement of materials, equipment, machinery, consumer goods and foodstuffs. Its transport plans call for, among other things, the extension and rehabilitation of the main National Highway System linking all the major population and commercial centers in West Pakistan.

The Government of West Pakistan's proposed program for the Third Five Year Plan (1965-70) reflects the high priority given to the development of a modern highway system for the Province. The total Second Five Year Plan utilization of funds for highways and highway bridges, based on financial documentation from the Communications and Works Department (CWD), totalled 488 million rupees (\$102.5 million) whereas the proposed allocation for the Third Five Year Plan totals 1,088 million rupees (\$228.7 million), an increase of approximately 123 per cent. The following major highway projects are projected through the Third Five Year Plan, in order of priority:

	<u>Million of Rupees</u>
1. Karachi-Hyderabad Highway (Financed by IDA)	175.00
2. Lahore-Multan Highway	150.00
3. Lahore-Sargodha-Khushab Highway	140.00
4. Lahore-Lyallpur Highway	45.00
5. Reti-Multan Highway	20.00
6. Hyderabad-Reti Highway	<u>20.00</u>
Total	550.00

B. Transportation System

Western Pakistan is served by a railway system, airlines and a highway net. The railway system, known as the Pakistan Western Railway, consists of over 5,300 route miles of which all but 700 miles are broad gauge (5'6"). It extends from the port of Karachi northeastward into the Punjab area including Multan and Lahore and on into the Northwest Frontier area of Peshawar. The bulk of the system is concentrated in the Punjab, but, a line runs to Quetta and a branch to Iran at the far Western border. No new lines have been added since Independence, but extensive improvements have been made to the bridges, trackage, signalling, rolling stock,

conversion from steam to diesel locomotives, work shops and passenger amenities. Foreign exchange loans and credits have been extended to the PWR by IBRD, UK, West Germany, DLF and AID for a total of approximately \$156 million equivalent.

Pakistan International Airlines serves all major cities in West Pakistan with a fleet of modern two and four motor planes. International flights by both PIA and foreign lines serve Karachi, and to a limited extent, Lahore. Growth of air travel has been rapid, with a 25% annual increase of emplaned passengers at Lahore. The latter has ten arrivals and departures daily, while Multan has one each.

The present highway system in West Pakistan totals 19,200 miles, of which 45% are bituminous surfaced, 26% graveled and 29% dirt. Bituminous surfacing is single or dual lane, but in almost all cases it is too narrow, with unstabilized shoulders, inadequate sight distance, understrength and generally substandard.

C. Highway Development

West Pakistan has had a large highway construction and maintenance program since its inception, which has been substantially increased in recent years. Expenditures, converted to \$ million since 1955 are shown below:

	<u>Construction</u>	<u>Maintenance</u>
1st Five Year Plan, Fiscal Yr. 1955-60, actual	33.4	23.1
2nd Five Year Plan, Fiscal Yr. 1960-65, approx.	54.3	47.7

This does not include expenditures under the Rural Works Program for improvement of local link roads for which the GOWP has provided approximately \$100 million in the 3rd Five Year Plan.

Construction and maintenance have relied largely on hand methods, with a minimum of mechanical equipment which has been limited mostly to hard-wheeled rollers, tar kettles and some trucks. Design and construction standards have been low, so that much repair work and new construction has failed. Significant recent improvements in construction have included the employment of prestressed concrete for a few bridges, use of motor graders for shoulder maintenance, and the laying of premixed asphalt pavement by machine. These are isolated examples, however, and a great deal of modern equipment and technical know-how is required.



AID and its predecessors have supported the West Pakistan highway program under PL 480 as follows:

	<u>Dollar Equivalent</u>	
1962-63	\$ 12 million	Grant for highway construction and maintenance
1963-64	3.3 "	Rural Works Program, Secondary Roads
1964-65	13.0 " (Est.)	Rural Works Program, Secondary Roads
Total	<u>\$ 28.3 million</u>	

( \$1.00 = Rs. 4.76 )

Also, AID has sponsored and financed the cost of the Karachi-Hyderabad Highway preliminary survey and evaluation as well as the extensive Transportation Survey of West Pakistan, 1962.

The World Bank (IDA) has recently granted Pakistan a loan of \$17 million to finance design and construction of the Karachi-Hyderabad highway, three major river crossings and consultant services for improving the management and methods of the Highway Division, Communications and Works Department of West Pakistan. The Bank has also expressed an interest in financing the Lahore-Lyallpur Highway and at least 2 more major bridges provided that there is effective response to the recommendations and assistance of the general consulting team.

D. Proposed Loan

The proposed loan is to assist in financing the foreign exchange costs of constructing approximately 207 miles of modern main highway between Lahore and Multan in West Pakistan. The highway will consist of a single two lane hardsurfaced highway with one parallel cart road. Approximately 90 miles consist of new highway, while the balance of 117 miles involves the widening, strengthening and straightening of an existing road.

The highway forms a part of the planned Pakistan Federal Highway network, and, after the Karachi-Hyderabad link, has the highest priority for major road construction in West Pakistan.

E. Borrower

The Borrower would be the President of Pakistan. The executing agency would be the Communication and Works Department (CWD), Government of West Pakistan, which is responsible for the construction and maintenance of government buildings and all but municipal and village roads. The headquarters are located at Lahore. Its organizational structure is an out-dated and cumbersome historical carry-over from the Pre-Independence era when communications were poor. Except for the design and supervision of bridges, which is centralized, the technical responsibility for the planning, execution, and maintenance of road works is delegated to five regional engineers who in turn may assign work to various subordinate offices, several of which may be in the same city. A separate maintenance organization does not exist and both maintenance and construction are carried out by the same forces.

The Government of West Pakistan (GOWP) is actively considering both the separation of the building and roads functions, and the reorganization of the administration of road works. To assist the government in this matter and as a condition of its loan for the Karachi-Hyderabad Highway, the IBRD has included financing for a General Consultant to provide advisory services to the CWD. The general consultant, Howard, Needles, Tammen and Bergendoff, a reliable U.S. firm has been selected and is currently working with the CWD. The consultants' team will consist of seven to nine experts in all phases of highway operations including administration, accounting, design, materials, construction and maintenance.

There is every expectation that with the assistance of the general consultants, and the selection and financing of engineering consultants for the design and supervision of new major construction projects, the CWD will be fully capable of implementing the project. AID will require as a condition precedent evidence that an adequate maintenance program is being developed for the project.

II. Engineering Analysis

A. Description of Project

The project is based on a feasibility study prepared by the U.S. firm of Ammann and Whitney and financed from Government of Pakistan's own resources.

The proposed highway follows substantially the alignment of the existing road between Lahore and Multan, except for a 10 mile relocation at the Lahore end and 30 miles at Multan. All major towns along the route are bypassed to avoid congested streets, with the old road remaining in place to give access. The highway will have a paved width of 24', with a 10' wide shoulder on each side. A separate paved cart road 12 feet wide will be constructed alongside the main road. Five level railway crossings will be eliminated, and two overpasses constructed over the most heavily travelled railway crossings.

Following is a condensed tabulation of the proposed highway construction, based on the consultant's plan-profile sheets:

<u>Station Mile</u>	<u>Widen &amp; Strengthen Length, Miles</u>	<u>New Road Length, Miles</u>	<u>Description</u>
1-3	4	6	Existing Bund Road
3-9		6	Realignment
9-33	24		
33-37		4	Bhai Pheru Bypass
37-55	18		
55-59		4	Railway Overpass
59-66	7		
66-69		3	Renala Khurd Bypass
60-74	5		
74-81		7	Okara Bypass
81-97	16		
97-105		8	Montgomery Bypass
105-126	21		
126-131		5	Chichawatni Bypass
131-139	8		
139-159		20	Realignment
159-161	2		
161-164		3	Kacha Khu Bypass
164-176	12		
176-206		30	Realignment
	<u>117 miles</u>	<u>90 miles</u>	<u>Total 207 miles</u>

Distances are approximate and are not corrected for minor improvements in alignment. The cost estimate is based on a total length of 202.7 miles. It is considered that any cost variation resulting from the design survey is adequately covered by the contingency factors.

American Association of State Highway Officials (AASHO) geometric standards were used for roadway configuration and alignment. A nominal 18,000 lb. axle load plus 20% impact was used for road design while India Road Congress standards were used for bridge design. See discussion under Section II, paragraph D.

#### B. Route Selection

1. General: The "Transportation Survey of West Pakistan, 1962", prepared by the U.S. Army Corps of Engineers with the assistance of Transportation Consultants Inc. of Washington, D.C., recommended the construction of a main north-south highway extending from Peshawar to Karachi and an east-west highway from Lahore to Quetta. The routes proposed by the Survey for these highways would be the shortest feasible distances between the terminal points. Both of them would by-pass Multan.

There is a large and rapidly growing volume of highway and railway traffic between Lahore and Multan which are two of the major cities in the Punjab. Multan is in the heart of the irrigated farmland in the southern part of the Indus Plain and is an important commercial and industrial center. It should be included in the main highway system planned for West Pakistan and serve as a junction for the segment of the north-south highway between Lahore and Hyderabad and the east-west highway from Lahore to Quetta. Based on present and anticipated future highway traffic, the Lahore-Multan highway is next in importance after the Karachi-Hyderabad highway which is being financed by the IDA credit of \$17 million.

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2. Specific: An alternate routing on the north side of the Ravi River was investigated, but rejected for the following reasons:

- a) High cost (\$60 million total) due to poorer soils, river flooding, need for a major river bridge, and increased costs of right-of-way.
- b) Only 10% of traffic is over the entire Lahore - Multan run, the rest being local. The alternate route would pass through a relatively undeveloped area of much less local traffic.

Likewise, a study was made of routing from the south (Karachi) thru Bahawalpur to Montgomery, bypassing Multan entirely, to accommodate through traffic. This routing was rejected for similar reasons. A road between Montgomery and Lyallpur was also studied, in lieu of Montgomery to Lahore but the limited traffic available ruled this out.

The alignment proposed by the consultants best fills the most immediate needs and offers the highest return on investment.

The terminus in Multan has been selected to provide access to major roads leading into the center of the city as well as to provide a good connection point to the proposed extension of the new highway from Multan southward to Bahawalpur and ultimately Karachi.

The terminus in Lahore along the presently existing bund road will similarly provide access to the center of the city as well as for connection to the proposed new Ravi River bridge for traffic to Lyallpur and northerly cities. Location of this Ravi bridge and long range planning for Lahore urban highways are both under study by the Government of West Pakistan. Final exact location of the terminus of the Lahore -- Multan road cannot be determined until these locations are made. However, it is not anticipated that there will be sufficient change to significantly effect the cost estimates. Prior to approval of final designs, final locations should be settled and the highway design can proceed with an exact terminus.

### C. Geometric Standards

AASHO geometric standards were used, with design capacity of 900 hourly vehicles (DHV) and 8500 average daily traffic (ADT) which requires a paved width of 24 feet. By the feasibility study projections, this capacity will be reached between the 15th and 20th years. The

Transportation Survey, 1962 also recommends a 24 foot width for primary roads in Pakistan. This width has been standardized throughout all the new West Pakistan highways for which feasibility studies have been made, has received the approval of the IBRD, and is recommended by the general consultants.

Shoulders are adequately designed for 10 foot total width as recommended by AASHO, although they should be stabilized as discussed in Section II.E. Other standards are in accordance with modern highway practice.

#### D. Pavement Design

1. New Roadway - A cost comparison showed that the use of flexible pavement instead of rigid pavement would result in a considerable saving including maintenance and replacement costs. No advantage would result from using concrete from the standpoint of reduced cost of imports because of the current and anticipated shortages of locally produced portland cement and high cost of aggregates.

Based on an assumed California Bearing Ratio (CBR)\* value of subgrade of 8, subbase of 20 and base course of 80, according to Amman and Whitney, a total pavement thickness of  $12\frac{1}{2}$ " is required for a wheel load of 18,000 lbs. plus 20% impact on the basis of California Highway Dept. curves. The consultants have designed the pavement for a total thickness of 14", allowing for possible lesser strength of subbase and base actually obtained in field tests made in the final design. Also, they fixed on a 6" minimum thickness of subbase and base. It may be found in final design that these courses can be reduced, provided the total required design thickness of pavement is obtained.

As part of the final design process, the GOWP will have to determine the weight which the road should be designed to bear. AID believes that the design figure of a gross 21,600 axle loading will prove adequate.

2. Overlay - The original feasibility study as prepared by the consultants was deficient in field investigation and analysis on which to base the recommendation for a 3" overlay. At the request of the Mission the consultant made additional examination of the existing pavement including CBRs of the subgrade. The revised recommendations of the consultant, Amman and Whitney, provide for 2" overlay, instead of a 3" overlay as before, for the portions of the road of

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\*The California Bearing Ratio is a standard measure of the supporting value of the various materials used in highway construction.

adequate original strength and where the surface is relatively level and shows little cracking, and for a 2" or 3" stone leveling course plus a 2-inch overlay for the balance of the road to provide adequate strength.

However, all road surfaces require leveling and/or crowning. Therefore, overlay should be 3" minimum when placed directly over the old surface and the stone course should be a minimum of 4". The leveling course has been discussed with the general consultants, who agree that it is needed.

Field investigation has shown the present road, including the widening strips, to generally consist of brick on edge overlaid with crushed rock and an asphaltic concrete surface, for a total thickness varying from 8" to 10", except for a small portion of 6½" and 7" thickness. Soaked CBRs of the subgrade are generally well over the design figure of 8, except for 3 determinations of 3 to 6. No areas of significant subgrade failure were observed. The 3" overlay will be structurally adequate wherever the present thickness is 7" or more and the subgrade soaked CBR is 8 minimum, resulting in a total minimum thickness of 10" as required. For the thinner original sections, and for areas of severe undulation and/or cracking, a stone overlay with 2" of asphaltic surface will be required. The areas with subgrade CBRs below 8 will either require a thickening of the proposed 4" stone overlay or rebuilding, as determined in the final design.

The effect on the cost estimate by partially changing to this stone plus surfacing type of overlay will be minor. The deletion of 1" of surfacing on portions of the road will largely offset the cost of stone, except for the extra placing and leveling costs. The effect of the above changes is calculated to be about \$330,000, divided equally between local and foreign exchange. GOWP has agreed to these changes.

3. Subbase Stabilization - The cost estimate for the subbase is based on using a mixture of broken brick and local fine silts, the plasticity index of which should be limited to 6 or less. This material is suitably strong for the purpose and is cheaper than any of the natural aggregates available. Soil cement stabilization was considered, but was rejected due to the high cost and to the shortage of cement. Based on an 8 percent cement content, approx. 30,000 tons of cement would have been required.

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E. Shoulder Stabilization

The feasibility study only provides for turfing of the shoulders, which is not considered adequate. The semi-arid conditions and lack of any rainfall throughout many months of the year will preclude growth of an effective stand of grass. Furthermore, the fine silty material which will be used for the shoulders will quickly break down to dust, or occasionally mud, under traffic.

A.I.D. will require, therefore, that a minimum 6 foot wide portion of each shoulder adjacent to the pavement be stabilized. This width would allow disabled vehicles to park with all wheels off the pavement, and also allow a vehicle to swing partially off the pavement in a passing emergency. A cost estimate has been made on the basis of a 6" crushed brick base a prime cost and a single bituminous surface treatment. The additional costs, including contractors profit, engineering and normal contingencies would be:

Local	\$ 1,174,000
Foreign	
Exchange	881,000
	\$ <u>2,055,000</u>

GOWP has agreed to these changes.

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Final design of the shoulder stabilization should be developed by the design consultant based on detailed field investigations and cost comparisons. However, the above estimate should provide a reasonable basis on which to provide adequate funds under the loan.

F. Structures

Bridges have been designed to the India Road Congress criteria (IRC) for Class AA loading. This consists of single military tank of 70 long tons and is much more severe than the consultants' recommendation of an AASHO H20-S16 load. In East Pakistan, the government has adopted the H20-S16 loading, although West Pakistan still has the matter under consideration. This will be resolved by the time final design is initiated. Either design would be acceptable to AID.

The widths of the new bridges on the Lahore-Multan road will provide for a 28 foot clear roadway.

At Miles 179.7 the consultants have only provided for a level (grade) crossing of the Khanewal-Bahawalpur railway line. Traffic is now 13 trains per day and, since this is a cutoff saving 27 miles on the run between Karachi-Bahawalpur and Lahore, it is expected that traffic will increase substantially in the foreseeable future. In fact, Third Five Year Plan provides for improvements to the line for an increase in expected traffic to 19 trains per day. For comparison, at the proposed overpass at mile 57 there are now 23 trains per day, with 29 per day estimated in the Third Five Year Plan.

AID will require that an overpass be constructed at mile 179.7. Estimated additional cost is:

Local	\$ 80,000
Foreign Exchange	<u>\$120,000</u>
Total	\$200,000

GOWP has agreed to these changes.

### G. Cart Road

Ox carts now constitute 50% of the vehicles on the Lahore-Multan road. These wide, slow-moving carts are an extremely serious hazard for motor vehicle traffic and reduce the capacity of the road below tolerable limits. For example; the capacity of a road according to AASHO design standards is reduced by 50% when only 15% of vehicles of this type (ox carts) are in the traffic stream.

A separate paved road 12 feet wide will therefore be built alongside the main roadway for use by ox carts and other non-motorized traffic. One cart road will be sufficient because the use of carts is expected to decrease as feeder roads become passable to trucks and trucks begin to supplant carts in general. The cart road will be located so that it would become the basis for future widening of the main highway. When a second set of lanes is needed to accommodate traffic on the main highway, they can be located in the area reserved for the cart road.

### H. Rights of Way

The GOP should secure adequate rights-of-way to allow for construction of a divided four-lane highway for the full length of the project. As a minimum AID will require that the full four-lane width right of way between the Lahore terminus and Mile 10, and between Mile 199 and the Multan terminus, a total distance of about 12 miles, be obtained prior to the start of construction.

### I. Materials

The project will require asphalt, cement and steel, all of which are now imported into West Pakistan to meet inadequate local production. Although the GOP originally requested that part of the AID loan funds be used to finance the procurement of these commodities, it has since agreed to finance these requirements with its own resources.

(a) Asphalt - The National Refinery, Ltd., Karachi, is erecting a refinery at Korangi with an annual capacity of 133,000 tons of asphalt. It is expected to go into production during the spring of 1966. The time table calls for operating at 50 percent capacity by the end of 1966, 75 percent capacity at the end of 1967, and 100 percent capacity at the end of 1968.

To insure that a supply of asphalt is available, should domestic production prove inadequate, AID will require the GOP's assurance as a condition precedent that the borrower will provide the necessary foreign exchange for the procurement of free world asphalt.

b) Cement from the United States is also more costly than from domestic production. It is recommended that the 8400 long tons involved be excluded from the loan and financed by Pakistan. Indications are that it will be obtained from domestic production; if not, GOP furnished foreign exchange will be required to purchase the cement from free world sources. Although the feasibility study indicated that the cement would be procured from the U.S., the unit cost figure used was for local cement and consequently too low (\$252,000). In the following cost adjustment, this amount has been subtracted from the foreign exchange and added to the local costs.

c) Steel. Due to the small quantity involved, the borrower should provide the necessary foreign exchange for procurement from free world sources.

d) Base Material. The consultants have recommended broken brick in lieu of natural gravel for the subbase and base, on the basis of economy. Investigations are in progress to use a synthetic aggregate for the AID-sponsored Dacca-Aricha road in East Pakistan. Should this prove feasible, savings may also accrue by using the same material in the Lahore-Multan Highway. AID is recommending to the CWD of the GOP that the general consultant investigate this possibility. This should be considered by the design consultant on the basis of the latest information available at the time of final design.

#### J. Cost Summary

With the foregoing changes, the revised cost of construction will be as follows, to nearest thousands:

	Rupees * (\$ Equivalent)	U.S. Dollars	Total Cost
Original Cost Summary pg. IV-8 of Feasibility Study	\$16,461,000	\$16,280,000	\$32,741,000
Adjustment for changed design	+ 165,000	+ 165,000	+ 330,000
Railroad Crossing, Mile 179.7	+ 80,000	+ 120,000	+ 200,000
Shoulder Stabilization	+ 1,174,000	+ 881,000	+ 2,055,000
Elimination Second Cart Road	- 800,000	- 1,100,000	- 1,900,000
Cement procurement	+ 252,000	- 252,000	-
Asphalt procurement	+ 1,120,000	- 2,150,000	- 1,030,000
Revised Cost Summary (Unadjusted)	\$18,452,000	13,944,000	32,396,000
	(\$1.00 - Rs. 4.76)		

\* This column includes the dollar equivalent of possible foreign exchange costs to the GOP for materials not available locally.

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The consultant's cost estimate, and the adjustment above, are based on 1963 prices with only the usual 10% contingency for design and construction unknowns. Construction and material costs can be expected to increase during construction which will be completed in 1970. On the Karachi-Hyderabad Highway, the World Bank included a contingency factor of 10% and a cost increase factor of 8%. To provide for possible adverse cost changes on the Lahore-Multan Highway, AID has added 10½% to local costs and 7% to the loan amount, which are based on an analysis of cost trends in both the U.S. and Pakistan.

Adjusted costs are as follows:

Local currency or GOP foreign exchange	\$20,387,000
Foreign exchange, dollars	<u>14,920,000</u>
Total	\$35,307,000

The loan amount, rounded, would be \$15,000,000.

K. Design and Construction Schedule

1. Number of Contracts: AID will recommend that the borrower and the consulting engineer consider the comparative advantages of one project for construction of the entire road or alternatively two sub-projects for construction of two 100 mile + segments. If the borrower and consulting engineer decide that two sub-projects would be more advantageous, the engineer would prepare complete bidding documents for two segments of road to be advertised simultaneously and to permit tied bids. In that event there might be two construction contracts, one for each segment of the road, or a single contract for both segments, depending on the bids received.

2. Timing: The consultants have presented a reasonable schedule for design and construction, the essential factors of which are as follows:

Mobilization of Design and Supervision Team	2 months
Preparation Drawings and Specifications	10 months
Advertise and Award Construction Contracts	4 months
Mobilization Construction Contract and start Materials Procurement	6 months
Construction	<u>32 months</u>
Total	54 months

If the loan is approved and that there are no inordinate delays in implementation, it should be possible to select the architect-engineer firm by January 1, 1966. In that case the completion date for the project would be June 30, 1970.

L. Maintenance

The consultant points out the importance of adequate maintenance and the initiation of a program immediately upon completion of the project. Present road maintenance in West Pakistan is inadequate in both scope and quality to handle even the present road system, let alone the proposed new highways. Methods and materials are the same as 40 or more years ago.

This deficiency has been recognized by the World Bank and by the GOWP. One of the objectives of the consultant team now being financed by the Bank is to recommend an organization and methods for maintenance and to help in its establishment. Bank officials have indicated that a condition to its financing of new highways is the establishment of an adequate maintenance program. Likewise, AID, as a condition precedent to financing, should also require positive planning and implementation by the GOWP. This should be a staged requirement, both prior to release of funds for the design, and later for construction. There should be notable progress by CWD in implementing a maintenance program between the initiation of the design and initiation of the construction phase.

The periodic reports of the CWD consultants should be furnished to AID and an assessment made of progress of the highway departments in the field of maintenance. Other reports and information pertinent to the Lahor-Multan highway project should be furnished AID upon request.

### III. ECONOMIC ANALYSIS

#### A. Economic Priority of the Project

The Lahore-Multan Road constitutes a major link in the Grand Trunk Road being developed in West Pakistan. When completed, the Grand Trunk Road will link the major cities of Karachi, Hyderabad, Multan, Lahore, Rawalpindi and Peshawar. The Lahore-Multan section of the road has received a high priority in the highway construction program for West Pakistan since this route is one of the most heavily traveled in the Punjab area.

##### 1. Agriculture

The proposed road parallels the Rechna-Doab area, the site of the SCARP projects for which U. S. assistance has already been provided to improve utilization of land and water resources, and will serve the richest part of the Indus Basin which is now in the process of development. A recent evaluation of the growth of agricultural production in West Pakistan indicates that West Pakistan achieved an annual agricultural growth rate in excess of 4% during the Second Five Year Plan. It is expected that during the Third Plan this annual growth can be accelerated to reach 8+ %. In Pakistan's Second Five Year Plan agriculture in West Pakistan was assigned the formidable task of attaining, by the end of the 1964-65 crop year, an output of foodgrains 23% above the average annual production during the previous plan period. Other major production targets are equal or more impressive. Statistics now show that 90% of the foodgrain target of 7,169,000 tons will likely be met. The production of fruits and vegetables and of tobacco will probably exceed these goals. With continued expansion of the number of tubewells, increased use of fertilizer, and an accelerated agricultural and educational support program, it is expected that agricultural output in the area adjacent to this road will nearly double by 1975. It is also possible that agricultural production will increase by another two-thirds by 1985. With this increase in the production of foodgrain, sugar cane, fruits and vegetables,

cotton and other commodities, it is essential that an adequate roads system be established to facilitate the transport of these commodities to urban market centers.

## 2. Industry

During the Third Plan, agriculture and water resource development will continue to receive major emphasis in both public and private sector allocations of funds. Prospective increases in such crops as sugar cane, cotton and citrus present opportunities for greater investment in agriculture-related industries, particularly sugar refineries, cotton gins, vegetable oil plants, paint processing industries, etc. Although complete and accurate information is not available concerning future plans for these industries, it is anticipated that establishment of these industries will be encouraged to provide additional markets for increased agricultural production. For example, the Third Plan targets for the production of sugar cane and cotton, 9 million tons and 700,000 tons respectively, would provide the raw materials for additional refineries, gins and oil presses. Many of these industries will be established within the Lahore-Multan area because of proximity to the vast and rapidly developing agricultural area of the Indus Basin.

The Lahore-Multan region is already a rapidly developing area of industrialization where a variety of manufactured products, including agricultural machinery, chemicals, food, footwear, metal goods, textiles, pottery and ceramic products are being produced. Considering the general pattern of investment in industries in these areas during the Second Plan, it is expected that in the Third Plan new or additional capacities will be established.

## B. Traffic Growth

### 1. Population Projection

During the period 1951-1961 the population in West Pakistan as a whole grew about 20.6% or slightly over 2% per year.

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However, the population of the Lahore-Multan area grew at an annual rate of approximately 3% per year. Given this annual population growth and the influx of people from other parts of West Pakistan, it is expected that the Lahore-Multan area will experience an annual growth of approximately 5% per year through the 1970's. A minimum population projection, based on a 1961 population of 7,400,000 indicates a total of 11,300,000 persons in the combined Lahore-Multan area by 1981. The bulk of this population growth is expected to be confined to the urban areas.

## 2. Traffic Projection

The present Lahore-Multan Road carries one of the heaviest traffic flows in West Pakistan averaging 1,020 motorized vehicles and an additional 1,600 traffic units of bicycles and animal-drawn carts each day. Given the projected 5% annual increase in population and the anticipated 8% annual increase in agricultural production and continuous increase of motorized transportation, the feasibility study estimates an annual traffic growth rate of 12 to 14%. This compares with the traffic forecast of the TCI report of 10.0% to 11.2% increase per annum for ton-miles moved by trucks in all of West Pakistan. Government records show an increase of registered motorized vehicles in West Pakistan except Karachi from a total of 22,690 in December of 1953 to 104,201 in December of 1963, an average annual increase of 14% per year.

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Based on the present rate of increase of transportation growth, the continued increase of registered motor vehicles and the population and production trends discussed above, a 12% average annual increase in traffic over the next 20 years is considered to be a conservative figure which would justify the proposed capital investment in the project. A similar conclusion is also possible if only an 8% average annual traffic increase results.

### 3. Relationship of Highway to Railroad Traffic

A.I.D. believes that this road basically will be complementary and not competitive with the adjoining system of the Pakistan Western Railway (PWR). Despite an extensive expansion program of the facilities and equipment for the PWR, the railway is still not able to carry the increased passenger and freight traffic which developed during the Second Plan period. Construction of the Lahore-Multan road will facilitate the transport of goods and people on a local basis and provide relief of further congestion of PWR passenger and freight traffic. Transfer of this traffic to highway modes of transportation will permit more economic movement of passenger and freight traffic over longer distances on the PWR.

#### IV. Financial Analysis

##### A. General

The project requires foreign exchange which the Government of Pakistan cannot supply. As stated previously, the IBRD is furnishing foreign exchange in the amount of \$17.0 million for construction of the Karachi-Hyderabad Highway, three major bridges and a team of consultants to provide overall planning and guidance for strengthening all aspects of the highway branch of the West Pakistan Communications and Works Department.

AID and IBRD representatives have discussed the proposed AID loan for the Lahore-Multan road and have agreed that the loan would not conflict with IBRD's highway program. No other external financing is in prospect. The Government of Pakistan will provide the local currency required for the project and foreign exchange if necessary for procurement of asphalt, cement and steel from sources other than Pakistan.

##### B. Cost Estimates

The estimated cost breakdown of the project is as follows:

<u>Foreign Exchange Requirements</u> ( <u>including ocean freight</u> )	<u>Cost</u>
Engineering design and supervision	\$ 1,343,000
Construction contract including imported equipment, materials and manpower	<u>\$13,657,000</u>
Total:	<u>\$15,000,000</u>
 <u>Local Currency Requirements</u>	
Engineering design and supervision	\$ 1,411,000
Construction contract	\$12,894,000
Materials to be financed by the GOP	\$ 1,373,000
Right of way	\$ 2,153,000
Government levees	<u>\$ 2,557,000</u>
Total:	<u>\$20,387,000</u>
Total Cost of Project	\$35,387,000

C. Impact on U.S. Economy

The proposed loan will have a favorable impact on the U.S. economy since all of the equipment, materials and services to be financed by the loan will be procured from the United States. The project will not compete with U.S. production and will not affect the U.S. balance of payments.

D. Repayment Prospects

The Government of Pakistan has demonstrated its capacity to repay the loan at the proposed interest rate and there is a reasonable prospect of repayment of the loan. Since securing its independence in 1947 the Government of Pakistan has proved to be a good credit risk in meeting payments of interest and principal on all of its international obligations. Debt service requirements on loans made by A.I.D. to the Government of Pakistan have been met promptly on due dates. The ability of the Government of Pakistan to repay this loan depends basically upon the rate of economic development of the country, as well as on the growth of exports and other foreign exchange earnings. This loan will further U.S. policy toward assisting in its economic development and it will fund a portion of the U.S. commitment to the Consortium, which commitment has been considered at the highest levels of the U.S. government.

V. COVENANTS AND CONDITIONS

AID proposes to include the following non-standard conditions precedent in the Loan Agreement:

A. Maintenance

Evidence that an adequate program is being developed for maintenance of the road.

B. Master Plan

Submission of a plan for the termination of the highway near Lahore, integrated with the proposed new Ravi River Bridges and new highway to Sheikhupura, and including the master plan for connection of these bridges and highways.

C. Bridge Loading Determination of bridge loading standards to be used for the national highway net.

D. Rights of Way, etc.

Evidence of arrangements to obtain all necessary permits, easements and rights of way.

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In addition, AID will require fulfillment of standard conditions precedent, including submission of a firm program for carrying out the project; engineering and construction contracts satisfactory to AID; and evidence that the GOP will provide the necessary local currency and foreign exchange, not provided by the loan, to complete the project.

VI. IMPLEMENTATION PLAN

A. Engineering Consulting Services

The Government of West Pakistan will select and negotiate a contract with an architect/engineer to design the project, prepare construction contract tender documents, assist CWD in evaluating bids, make recommendations for award of the construction contract, and supervise the construction of the project.

B. Terminal Dates

The Loan Agreement will provide that the conditions precedent to initial financing shall be met within 90 days and conditions precedent to financing other than engineering services shall be met within 20 months after the Loan Agreement is signed. The terminal date for requesting issuance of Letters of Committee will be 36 months and the terminal date for disbursements under the loan will be 60 months after the Loan Agreement is signed.

C. Disbursement Schedule

The estimated schedule for issuance of Letters of Commitment and for disbursements is as follows:

	<u>Letters of Commitment</u>				<u>Disbursements</u>				
	<u>U.S. Fiscal Years</u>				<u>U.S. Fiscal Years</u>				
	<u>1966</u>	<u>1967</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	
Engineering	1,343	-	(\$000) 130	355	416	180	180	82	
Construction	-	13,657	-	1,457	3,500	4,000	3,500	1,200	

ANNEX I

CHECK LIST OF STATUTORY CRITERIA

PAKISTAN: LAHORE-MULTAN HIGHWAY

1. FA Sec. 102. Take every possible precaution to assure that development assistance is not diverted to short-term emergency purposes (such as budgetary purposes, balance-of-payments purposes, or military purposes) or any other purpose not essential to the long-range economic development of recipient countries — The loan proceeds will be used to pay the foreign exchange costs of equipment, materials and services required for the construction of an important segment of road and ancillary facilities in West Pakistan. See Section II A.
2. FA Sec. 201(b). Promote the country's economic development, with emphasis upon assisting long-range plans and programs designed to develop economic resources and increase productive capacities. — The loan will promote economic development by providing needed improvement of the West Pakistan road system. See Section III A.
3. FA Sec. 201(b)(1). Take into account whether financing is obtainable from other free world sources. — This assistance is being provided under consortium arrangements. The EXIM Bank indicated that it was not willing to consider the loan.
4. FA Sec. <sup>201</sup>(b)(2). Take into account the economic and technical soundness of activity to be financed. — AID has determined that the project is technically and economically sound. See Section II and III.
5. FA Sec. 201(b)(3). Take into account whether the activity contributes to economic development. — The project will contribute to the development of economic resources by facilitating the movement of commodities and passengers in West Pakistan. See Section I and III A.
6. FA Sec. 201(b)(4). Take into account the relationship of the activity to other development activities, and its contribution to realizable long-range objectives. — This project is part of the program for the development of a modern road system in West Pakistan. See Section I A.
7. FA Sec. 210(b)(5). Take into account the country's self-help measures. — Pakistan has instituted the full AID Investment Guarantee Program. The Government of West Pakistan will provide all of the local currency and foreign exchange not financed under the loan required for the project.
8. FA Sec. 201(b)(6). Take into account the possible effects upon the U.S. economy, with special reference to areas of substantial labor surplus. — See p. iii and Section IV C. All goods and services purchased with loan funds will be procured from the United States.

9. FA Sec. 201(b). Loans shall be made only upon a finding of reasonable prospects of repayment. — Pakistan is making a determined effort to develop its economy and become self-supporting; and there are reasonably good prospects for the repayment of the loan.
10. FA Sec. 201(d). Funds shall not be loaned or reloaned at rates of interest excessive or unreasonable for the borrower. Lending and relending rates will be reasonable. See p. iii.
11. FA Sec. 201(e). Funds in excess of \$100,000 not to be set aside unless an application for such funds has been received together with sufficient information and assurances to indicate reasonably that the funds will be used in an economically and technically sound manner. — An application has been received with sufficient information to assure that the funds will be used in an economically and technically sound manner. See Section II and III.
12. FA Sec. 201(f). No assistance to be furnished for a project unless it will promote the economic development of the requesting country, taking into account the country's human and material resource requirements and the relationship between the ultimate objectives of the project and the country's over-all economic development. — See Section I A and III.
13. FA Sec. 201(f). No assistance to be furnished for a project unless it specifically provides for appropriate participation of private enterprise. The project will assist the Government of West Pakistan to provide improved road transport facilities for a large number of private industrial and commercial enterprises. Private firms will engineer and build the project.
14. FA Sec. 202(a). Not less than 50% of the funds appropriated for development loans to be available for loans made to encourage economic development through private enterprise. See #13 this Annex.
15. FA Sec. 601. Policy of the United States to (a) increase the flow of international trade, (b) foster private initiative and competition, (c) encourage the development and use of cooperatives, credit unions and savings and loan associations, (d) discourage monopolistic practices, (e) improve the technical efficiency of the less-developed countries industry, agriculture and commerce, and (f) strengthen free labor unions. — (a) the loan will encourage the flow of international trade since all the funds will be spent for items to be imported from the U.S. and the project will facilitate the movement of imports and exports in West Pakistan. (b) Private initiative and competition will be encouraged by improved road transport in West Pakistan. (c) The loan will have no effect on the development and use of cooperatives, credit unions and savings and loan associations. (d) The loan will not encourage monopolistic practices. (e) The project will promote the technical efficiency of industry, agriculture and commerce by expediting the movement of commodities, including capital goods and raw materials as well as products of industry and agriculture. (f) The loan will indirectly assist such free labor unions as exist in Pakistan by fostering economic development.

16. FA Secs. 601, 602. Policy of the United States to (a) encourage U.S. private trade and investment abroad, (b) encourage private U.S. participation in foreign assistance programs (including the use of private trade channels and the services of U.S. private enterprise), and (c) assist American small business to participate equitably in the furnishing of goods and services financed with development loan funds. -- (a) The loan will encourage the export of U.S. products to Pakistan. (b) All goods procured under this loan will be sold by U.S. private enterprise. (c) The procurement procedure under this loan will permit equitable participation of U.S. small business.
17. FA Sec. 604(a). Limitation of commodity procurement to U.S. except as otherwise determined by the President and subject to statutory reporting requirements. -- All goods and services financed by the loan will have their source and origin in the United States.
18. FA Sec. 604(b). Limitation on price of bulk commodity procurement to prices no higher than the market price prevailing in the U.S. at time of purchase. -- No bulk commodities will be financed under the loan.
19. FA Sec. 604(d). U.S. funds to be available for marine insurance on commodities where such insurance is placed on a competitive basis. -- The Loan Agreement will contain a provision expressly covering this point.
20. FA Sec. 611(a)(1). If substantive technical or financial planning is required, no obligation to be made until engineering, financial and other plans necessary to carry out the assistance and a reasonably firm estimate of the cost of the assistance to the United States have been provided. -- Satisfactory plans and cost estimates have been made. See Section II, III and IV.
21. FA Sec. 611(a)(2). If legislative action within recipient country is required, no obligation to be made unless it may reasonably be anticipated to be completed in time to permit orderly accomplishment of purpose of loan. -- No legislative action required.
22. FA Sec. 611(b); App. Sec. 101. Cost-benefit computation required for water related land resource construction project or program. -- Not applicable since this is not a water or water related land resource construction project or program.
23. FA Sec. 611(c). Contracts for construction to be made on competitive basis to maximum extent practicable. -- The Loan Agreement will so provide.
24. FA Sec. 619. Assistance to newly independent countries to be furnished through multilateral organizations or plans to maximum extent appropriate. -- Although Pakistan is no longer a newly independent country, this assistance is being furnished pursuant to consortium arrangements.

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25. FA Sec. 620(a); App. Sec. 107. Prohibition against assistance to Cuba and any country which sells or furnishes assistance to Cuba or permits ships under its registry to carry assistance to Cuba. -- Pakistan is not providing assistance to Cuba and none of its ships are stopping at Cuba.
  26. FA Sec. 620(b). No assistance to the government of any country unless determined not to be controlled by the international Communist movement. -- Pakistan is not controlled by the international Communist movement.
  27. FA Sec. 620(c). No assistance to the government of any country which is indebted to a U.S. citizen for goods or services furnished or ordered where such citizen has exhausted available legal remedies or where the debt is not denied or contested by such government or the indebtedness arises under an unconditional guaranty of payment given by such government. -- Pakistan is not ineligible under this section.
  28. FA Sec. 620(d). No assistance for any productive enterprise which will compete with U.S. enterprise unless the recipient country agrees to prevent enterprise during the life of the loan. -- A road is not strictly speaking a productive enterprise; in any event the road will not compete with U.S. enterprise.
  29. FA Sec. 620(e). Suspend assistance to the government of any country when such country on or after January 1, 1962, has nationalized or expropriated or taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of the property of U.S. citizens without taking appropriate steps. -- Pakistan has not nationalized any U.S. property.
  30. FA Sec. 620(f); App. Sec. 109. Prohibitions against assistance to any Communist country. -- Pakistan is not a Communist country.
  31. FA Sec. 620(g). No assistance to be used to compensate owners for expropriated or nationalized property. -- Funds will not be used to compensate owners for nationalized property.
  32. FA Sec. 620(h). No assistance to be used in a manner which contrary to the best interests of the U.S. promotes or assists the foreign aid projects or activities of the Communist bloc countries. -- Provision will be made in the loan agreement prohibiting any of the funds from being used to assist Communist bloc activities or projects.
  33. FA Sec. 620(i). No assistance to a country determined to be engaging in or preparing for aggressive military efforts. -- Pakistan is not ineligible under this section.
  34. FA Sec. 620(k). No assistance for construction of a productive enterprise where the aggregate value of the assistance to be furnished by the U.S. will exceed \$100 million. -- Not applicable.
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35. FA Sec. 620(1). After December 31, 1965, no assistance to be provided to the government of any country which has failed to enter into an agreement to institute an investment guaranty program providing protection against the specific risks of inconvertibility and expropriation or confiscation. — Pakistan has instituted the Investment Guarantee Program.
36. FA Sec. 636(h). Take appropriate steps to assure that, to the maximum extent possible, (1) countries receiving assistance contribute local currencies to meet the cost of contractual and other services and (2) foreign currencies owned by the U.S. are utilized to meet the cost of such services. — All local currency AID administrative and program costs and the local costs of AID-financed projects are met with either Pakistani or U.S. owned rupees.
37. App. Unnumbered. No part of the funds appropriated for development loans for the fiscal year ending June 30, 1965, to be used to carry out the provisions of Section 205 of the Foreign Assistance Act of 1961 which pertains to the IDA. — No contribution to IDA is involved.
38. App. Sec. 102. Payments in excess of \$25,000 for architectural and engineering services on any one project to be reported to Congress. — All such payments will be so reported.
39. App. Sec. 104. Prohibition against payment of pensions, etc., for military personnel. — Funds not to be used for paying pensions.
40. App. Sec. 111. Security clearances of U.S. personnel under contracts. This provision will be complied with where applicable.
41. App. Sec. 112. Approval of contractors and contract terms for capital projects. — The loan agreement will so provide.
42. App. Sec. 114. No assistance to pay assessments, etc. of U.N. member. — The loan funds will not be used to pay U.N. assessments.
43. App. Sec. 117. Receipts of U.S. dollars in the Development Loan Fund and Alliance for Progress revolving funds, derived from loan repayments and interest collections, may, when so specified in appropriation Acts, be used for the purposes for which the revolving funds are available. — This loan will be made from appropriated funds.
44. App. Sec. 118. After April 30, 1965, no funds to be obligated for financing the direct costs of contracts for construction work performed by persons other than qualified nationals of the recipient country or qualified U.S. citizens. — This provision will be complied with, where applicable.
45. App. Sec. 601. No part of the appropriated funds to be used for publicity or propaganda purposes within the U.S. — None of the loan funds will be used for publicity or propaganda purposes within U.S.

## ANNEX II

CAPITAL ASSISTANCE LOAN AUTHORIZATION  
(Provided from Development Loan Funds)  
Pakistan: (Lahore-Multan highway)

Pursuant to the authority vested in the Administrator of the Agency for International Development (hereafter referred to as "A.I.D.") by the Foreign Assistance Act of 1961, as amended, and the Delegation of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter 2, Title I, the Development Loan Fund, to the President of Pakistan, of not to exceed Fifteen Million United States Dollars (\$15,000,000) to assist in financing the foreign exchange costs of equipment, materials and services required for the construction of a hard-surfaced two-lane highway from Lahore to Multan in West Pakistan together with required ancillary facilities including bridges, this loan to be subject to the following terms and conditions:

1. Interest and Terms of Repayment:

This loan shall be repaid within forty (40) years after the date of the first disbursement thereunder, including a grace period of not to exceed ten (10) years. The interest on the disbursed balance of the loan shall be one per cent (1%) per annum during the ten (10) year grace period and two and one half percent (2-1/2%) per annum thereafter.

2. Current of Repayments:

Provision shall be made for repayment of principal and interest in United States dollars.

3. Other Terms and Conditions:

- (a) Equipment, materials and services financed under the loan shall be procured from the United States;
- (b) The Borrower shall produce evidence satisfactory to A.I.D. that other funds, both foreign exchange and local currency, sufficient to complete the project have been or will be made available; and
- (c) The loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

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Administrator

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Date

EFFECT OF LOAN ON PRIVATE ENTERPRISE

ANNEX III  
AID-DLC/P-324  
May 21, 1965

AID Manual Order No. 1242.1, Capital Assistance Application: Intensive Review, as revised on April 6, 1965, requires that each loan paper answer the following questions with regard to the effects of the proposed loan on U.S. or host country private enterprise.

A. Of the total proposed loan:

1. How much is to be lent directly to private enterprise?

Answer: None.

2. How much is to be lent to intermediate credit institutions for relending to private enterprise: Answer: None.

3. How much is to be lent to a government for disbursement to finance the import of commodities by private enterprise or for the use by private enterprise? Answer: None. The loan funds will be used to assist in financing the foreign exchange costs of a road which will be utilized by privately owned as well as publicly owned vehicles.

4. How much is to be lent to a government to finance project work (including procurement) to be carried out under contract by private enterprise? Answer: The entire amount of the loan.

5. How much is to be lent to a mixed private-public enterprise? Answer: None.

6. How much is to be lent to a government for direct purchase by the government for its own use of goods from private enterprise? Answer: No goods will be directly purchased by the Government of Pakistan with the proceeds of this loans. The completed highway will be utilized by government as well as private entities.

B. The contemplated impact of the proposed loan on the development of private enterprise in the host country will be substantial for industry, agriculture and commerce, as outlined in Section III of the loan paper.

MEMORANDUM FOR THE NESAS ADVISORY COMMITTEE

SUBJECT: Pakistan - Dacca-Aricha Road (A.I.D. Loan 391-H-092)

Attached is a Supplement to the subject Capital Assistance Paper dated May 1, 1968. A draft of this Supplement was prepared by the Pakistan Mission and approved by its Development Loan Committee on February 7, 1968. Revisions were made to the Mission draft, particularly with respect to cost estimates, by NESAS/ENGR and NESAS/CDF, and are reflected in the revised Supplement attached.

Project Committee

Loan Officer: Emerson Gardner  
Engineers: Howard Bixby & Jack Nelson  
Counsel: William McCulloch  
Desk Officer: Stewart Ullman

Attachment

SUPPLEMENT TO  
CAPITAL ASSISTANCE PAPER  
DACCA-ARICHA ROAD  
(AID LOAN 391-H-092)

May 1, 1968

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VI. CONCLUSIONS	13

EXHIBIT 1 - Dacca-Aricha Project Map

ANNEXES:

- A - Basis For Revising Planning Commission (PC) -1  
Dollar Cost Estimates
- B - Amendment to Capital Assistance Loan  
Authorization (draft)
- C - Amendment to Loan Agreement (draft)

Currency Equivalents

4.76 Rupees = U.S. \$1.00  
1 Rupee = U.S. \$0.21

## I. BACKGROUND

In June 1964, AID authorized a loan of \$14.0 million to the Government of Pakistan (GOP) for the Dacca-Aricha Road project (see Map - Exhibit 1). The project consisted of:

- design and construction of a two-lane all-weather paved road extending from Tongi, approximately 12 miles north of Dacca the capital of East Pakistan, westward for approximately 58 miles to Aricha on the east bank of the Brahamaputra River;
- ferry landings at Aricha, and Nagarbari and Goalundo Ghat on the western bank of the river;
- design and construction of three ferries; and
- short connecting road links on the west of the Brahamaputra River both north and south of the Ganges River.

A loan agreement was signed in January 1965 and a contract for consulting engineering services signed with Louis Berger Inc. in a joint venture with Consulting Engineers (Pakistan) Ltd. (hereafter referred to as Engineering Consultants) for design and construction supervision.

When the detailed engineering cost estimates were submitted to the Government of East Pakistan (GOEP) by the Engineering Consultants in August 1966, it was apparent that funds approved would be insufficient to complete the Project, as shown by the following table:

(all figures in dollars)

	<u>FREX</u>	<u>LC</u>	<u>Total</u>
Original estimates based on Amman & Whitney feasibility Study (1963)	16,098,000*	10,502,000	26,660,000
Engineering Consultants' detailed cost estimates (1966)	17,200,000	23,310,000	40,510,000
% Increase	7%	122%	52%

\* \$2,098,000 was to be funded from GOP resources, the balance of \$14.0 million under the AID loan.

The sharp increase in estimated costs between 1963 and 1966, primarily in local currency elements, was due largely to refinement of engineering work which revealed that considerably greater quantities (primarily earthwork) were involved than preliminary studies indicated. The plan of execution also was changed to make more extensive use of local labor vis-a-vis expatriates. Since the Engineering Consultants' cost estimates were based on detailed designs and were up-to-date, the GOEP and AID agreed that the project needed to be re-studied before proceeding with construction tenders.

Various discussions between all interested parties were held during 1966 in an attempt to determine ways of bringing project costs closer to budgeted amounts while still serving its basic purposes. It soon was apparent that major modifications would have to be made.

In April 1967, representatives of the GOEP, USAID and the Engineering Consultants reached an agreement on a modified project concept that would produce the desired result - namely an all-weather road from Dacca to the east side of the Brahmaputra River at Aricha. The major changes to the original project were as follows:

(1) Delete the provision for raising and widening the existing road between Mile 22 and Aricha, except for the approaches to bridges and structures. It was determined that this portion of the road is subject to only minimal flooding (perhaps six or seven days per year) and that improvements to this section could be made by the GOEP itself in stages as traffic increases.

(2) Delete the provision for improving the road between Tongi-Joydapur-Konabari (part of the Dacca-Mymensingh Highway) with the exception of the two bridges to be built at Baimail and Turag. This highway can be improved by the Roads and Highways (R&H) Department through its own resources.

(3) Delete the connecting road (the so-called Shumate Alignment) between Konabari on the Dacca-Mymensingh Highway and Mile 21 on the Dacca-Aricha Road. Under the GOEP Third Plan development program, the R&H Department already has begun construction of a connecting road between these two highways.

(4) Delete construction of the three ferry boats. Although agreement to this change was reached in April 1967 based on the expected availability of a number of newly-acquired German ferries, current Mission opinion is that additional ferries may have to be acquired by the GOEP by the time the Dacca-Aricha Road project is completed (estimated 1972). Present country-wide ferry fleet

utilization indicates that no significant additional capacity can be made available without curtailing services at other locations. The Mission reports the GOEP is preparing plans for its ferry needs; adequate plans will be made a Condition Precedent to Disbursement for other than engineering services under the Loan Agreement Amendment.

(5) GOEP raise the grade and improve approximately 5 miles of the existing road from Mirpur to Sabhar on the Dacca-Aricha Road. This work is already in progress.

(6) GOEP build the connecting roads at Nagarbari Ghat and Goalundo Ghat on the west side of the Brahamaputra River.

(7) In addition to the Baimail and Turag Bridges mentioned above and other structures originally conceived from Mile 22 to Aricha, AID finance foreign exchange costs of bridges and their approaches at Mirpur and Bansi at Miles 8 and 22 respectively on the Dacca-Aricha Road.

This revised scheme not only eliminates the need to borrow foreign exchange to engage a U.S. contractor for elementary earthwork but also presents an ideal opportunity for the R&H Department to train its operating personnel in the construction and maintenance principles instituted by their General Consultants, DeLeuw Cather & Company, during the last three years under a program financed by the International Development Association (IDA). (Note: A recent IDA paper indicates DeLeuw Cather's services will be extended for an additional two years through 1970). Foreign exchange is utilized primarily for engineering services and employment of a U.S. construction contractor to build major structures - a field in which there is insufficient capability and experience in East Pakistan. The GOEP and AID agree that the revised project concept makes better use of the AID loan funds.\*

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\* It should be noted that IDA has had much the same experience with its East Pakistan Road Project from Chittagong to Dacca. Their project also was based on the 1963 Amman & Whitney studies; later detailed cost estimates by the same firm indicated a much higher cost for the Project (up 65 percent); the portion of the project to be funded by the IDA has been reduced; and the GOEP has now reached the stage of requesting pre-qualification documents from construction contractors - about two months behind the present Dacca-Aricha schedule (See Section IV).

## II. THE REVISED PROJECT

The revised Dacca-Aricha Road project to be financed with AID-loan funds (foreign exchange costs only) consists of the following elements:

- (1) Design and construction of the Mirpur Bridge and its approaches at Mile 8 on the Dacca-Aricha Road;
- (2) Design and construction of the Bansi Bridge and its approaches at Mile 22 on the present road;
- (3) The design and construction of new bridges and culverts including their approaches between Mile 22 of the existing road and Aricha;
- (4) Design and construction of the Turag and Baimail Bridges and their approaches at Mile 23 of the Dacca-Mymensingh Road;
- (5) Design and construction of improved ferry approaches at Aricha, Nagarbari and Goalundo Ghat: and
- (6) Design and construction of ten (10) box culverts on the Goalundo Ghat approach road from Faridpur.

As mentioned above, the GOEP will:

- (1) Up-grade the present road from Mirpur to Sabhar to provide an all-weather two-lane road with asphalt-treated shoulders and proper sub-grade drainage;
- (2) Complete the north-south connector between the Dacca-Aricha and Dacca-Mymensingh Highways;
- (3) Construct the connector roads at Nagarbari and Goalundo Ghat including the approaches to the loan-financed box culverts; and
- (4) Provide the foreign exchange for bitumen, cement, coal and reinforcing steel requirements.

Further improvements to the Dacca-Aricha Road from Mile 22 to Aricha and the Dacca-Mile 22 section (other than Mirpur Sabhar) will be undertaken by the R&H Department under its continuing road improvement and maintenance program.

III. REVISED PROJECT COSTS

The revised estimated foreign exchange and local currency costs of the work items to be financed (foreign exchange costs only) under the AID loan are as follows:

(In thousands of dollars)

	<u>FREX</u>	<u>Local Currency</u>	<u>Total</u>
1. Box Culverts	504.9	862.4	1,367.3
2. Rathora Bridge	104.4	79.9	184.3
3. Kaliganga Bridge	3,362.0	2,186.9	5,548.9
4. Bansi Bridge	772.3	505.0	1,277.3
5. Mirpur Bridge	1,337.7	885.7	2,223.4
6. Turag & Baimail Bridges	582.5	452.2	1,034.7
7. Maintenance Stations	13.5	97.0	110.5
8. Embankment in Place	817.9	606.0	1,423.9
9. Roadway, Paving & Revetment	282.5	2,009.9	2,292.4
10. Miscellaneous	1,108.5	2,963.2	4,071.7
11. Mobilization & Demobilization	1,123.6	1,143.3	2,266.9
12. Engineering & Superv. Const.	2,075.0	1,194.0	3,269.0
13. Contingencies*	1,679.2	<u>1,858.0</u>	<u>3,537.2</u>
		(14,843.5)	(28,607.5)
14. Bitumen, Cement & Coal	-----	1,034.7**	1,034.7
Total	\$13,764.0	\$15,878.2	\$29,642.2
Use for Loan	\$14,000.0		

\* 15 percent on costs other than sunk costs.

\*\* This represents a foreign exchange cost to be borne by the GOP.

It should be noted that these cost estimates, revised by AID/W with the assistance of Louis Berger U.S. staff, are considerably higher than those submitted with the Mission-prepared "Supplement to Capital Assistance Paper" dated February 1968. The bases for these changes are set forth in Annex A to this paper. AID/W and Louis Berger Inc. believe these cost estimates, based on a re-check of current quantity costs and expected escalation during a three and one-half year construction period, are reasonable. Contingency amounts of about 15 percent have been added to both dollar and rupee cost estimates to provide for unforeseen increases.

#### IV. IMPLEMENTATION

All plans and surveys, except for the newly added Bansi and Mirpur Bridges, have been accomplished under the original loan agreement. Approximately \$1,200,000 (including \$750,000 in foreign exchange) has already been disbursed for design costs. The GOEP and their Engineering Consultants have reached an agreement on fees for the additional work of preparing all necessary documents for the additional structures. A contract amendment has been approved by the GOEP for the additional engineering work and the plans and specifications substantially completed. (A Letter of Commitment covering the costs of this additional work will be issued as soon as this loan amendment is authorized.) The Engineering Consultants estimate they will complete all additional work and the Invitation For Bid package by May 31, 1968.

The bridges will be built using, for the most part, standard U.S. criteria modified as required to correspond to actual conditions in East Pakistan. A unit price construction contract is proposed.

The construction contractor will be required to import qualified American personnel to accomplish much of the work. There is a sufficient local labor force, both skilled and unskilled, to perform work which the contractor determines can be best performed by indigenous labor. Most of the equipment and spare parts required for the project will have to be imported. Fuel, P.O.L. products, sand, gravel and bricks are available in sufficient quantities in the local market. AID has agreed to financing the purchase, in the U.S., of the required structural steel; the GOP has agreed to provide necessary quantities of reinforcing steel, cement and bitumen.

Due to the monsoons, construction of structures of this size will take longer than is usual elsewhere and a three-and one-half year construction period is anticipated. Construction scheduling and project logistics are of primary importance due to the limited capability of the ports of Chittagong and Chalna and the need to

arrange for timely delivery from ports to worksites. The revised scheme for the Project was approved by the Pakistan National Economic Council on December 15, 1967, and established the following work schedule:

1. Advertizing for Pre-qualification of Contractors Feb. 15, 1968
2. Approval of Revised Scheme of Project by USAID (DLC meeting scheduled 7 Feb. 1968) March 15, 1968
3. Completion of Designs, Plans and Tender Documents by Project Consultants March 30, 1968
4. Receipt of Pre-qualification Documents from Contractors April 15, 1968  
(extended to April 30, 1968)
5. Approval of Plans, and Tender Documents by Pakistan and USAID April 30, 1968
6. Approval of Pre-qualified Contractors May 15, 1968
7. Calling of Tenders June 1, 1968
8. Reception of Tenders Sept. 1, 1968
9. Awarding of Contract Nov. 15, 1968
10. Mobilization of Contractor and beginning of work Dec. 31, 1968
11. Completion of work June 30, 1972

The Engineering Consultants report that pre-qualification documents were received from nine (9) contractors by April 30th. Thus the Project is generally on schedule.

## V. ECONOMIC CONSIDERATIONS

### A. The Road's Importance In The Primary Transportation System

In formulating a comprehensive plan for basic economic development of the country, the Government of East Pakistan gives a high priority to the establishment of a rudimentary, primary transportation system. Improvements of inland waterway, rail and highway transport, planned to complement each other to obtain maximum benefit at the least outlay of scarce fiscal and physical resources, have been major items in the national budget since inception of the First Five Year Plan in 1955.

Although a great amount still remains to be done, significant improvements have been realized in ports and inland waterways and in railway transport. Less has been accomplished in establishing a connected primary highway system that will provide the basic backbone or skeleton for a reasonably comprehensive road network that would support secondary and feeder road development. Due to its geography, East Pakistan's inland waterway network presents a great asset from a transportation viewpoint. For various reasons, however, it also presents serious problems due to tremendous and erratic water level fluctuations and periodic floods. Not the least of these problems, from a highway system viewpoint, is the extremely high construction costs created by unstable channels and the great delta flood plains.

An interconnected system of primary highways is absolutely essential to the progressive development of East Pakistan. The numerous U.S. and international agencies and experienced consulting engineering firms, which have acted as advisors to the GOEP, have been virtually unanimous in recommending a backbone system which in the east would link Chittagong-Comilla-Dacca and thence the north-east area of the Province, and in the west would connect Barisal and Khulna in the south with the important cities and towns in the central and northwestern districts. The Dacca-Aricha Road is the vital section connecting these two systems. Without this section; the entire concept of a basic highway system providing continuity of travel becomes invalid; most portions of the Eastern and Western sections of the country would remain largely separated and disconnected as far as overland transportation of people, food products and goods are concerned.

The Transportation Survey of East Pakistan (1961) placed completion of Trunk Route No. 1 in the highest priority of all the roads proposed for the Second Five Year Plan (1960-65). This route extends from Cox's Bazaar through Chittagong and Comilla to Dacca and on to Aricha. The IBRD has financed the portion from Chittagong

to Dacca and AID from Dacca to Aricha. Escalating costs and right-of-way problems have hampered the implementation of these projects. Ferry crossing of the Jamuna River (which are a part of the revised Dacca-Aricha Road project) providing connections to the Western provinces were included as Priority No. 2 in the same study. These recommendations were essentially re-confirmed in 1963. At that time, AID financed the services of Mr. Charles E. Shumate, Chief Engineer of the Colorado Highway Department, to evaluate feasibility studies which had been contracted for by GOP following completion of the aforementioned Transportation Study. His conclusion was that priorities one and two in the development of East Pakistan's transportation were the Chittagong-Dacca and Dacca-Aricha Roads.

There is an existing road between Dacca and Aricha, although it is a sub-standard one by practically any yardstick, including cognizance given to East Pakistan's state of underdevelopment. While it has been a serious factor in curtailing the amount of vehicles usage to far less than would otherwise be the case, this has not been the major deterrent, however. The lack of or poor condition of bridges and other drainage structures, which either cause constant, inordinate traffic delays or make the road entirely impassable at times, create exorbitant user costs that have effectively kept the Dacca-Aricha Road from yielding but a fraction of the economic, social and internal security potential it represents to East Pakistan. The worst bottleneck is at the Kaliganga River, approximately twelve (12) miles east of Aricha, where traffic must use ferries for the river crossing and existing facilities are economically inadequate to handle even the present demand. A bridge and its approaches at the Kaliganga River is one of the major structures to be constructed under the revised project concept.

#### B. Industrial and Agricultural Factors

Prior to partition of the Indian subcontinent in 1947, orientation of transportation in Bengal was toward Calcutta. Dacca then had no more than local importance, Khulna was a small stagnating town and the Chalna anchorage did not exist. Today Dacca is the political, commercial and industrial center of East Pakistan, the Khulna-Jessore area is becoming increasingly important as an industrial area, and the Chalna anchorage is handling an increasingly large volume of cargo each year, providing a much needed alternative to Chittagong Port where limited port facilities have led to congestion and increasing difficulties in handling the growing volume of traffic.

Intermodal studies of transportation in East Pakistan have been carried out by the GOEP Planning Department and have revealed that the volume of freight traffic will increasingly shift from the Chittagong to Dacca route to the Chalna to Dacca route. This

will mean a very significant increase in the flow of river traffic, which will have to be supplemented by a good road for truck traffic. Both water and rail connections from Khulna and Chalna to Dacca now require about 24 hours and more during monsoon flood conditions. The Dacca-Aricha Road is now the only road connection between the provincial capital and the western districts of the province. Its improvement through this project will permit the movement of traffic between Khulna and Dacca by road in approximately seven hours. The improved road will provide a vital adjunct to the river system in handling the projected substantial increase in traffic over the course of the next decade. It will likewise act as an important stimulus to the growth of industry in the Jessore-Khulna area, where two new industrial estates were recently established by the East Pakistan Small Industries Corporation (EPSIC). The project also is expected to encourage industrial growth at various points along the road where raw materials are available, since it will open up new markets and permit industries to move away from over-congested urban areas. From the point of view of further industrialization of the southwestern part of the Province and the future domestic distribution and transport of an ever expanding volume of goods entering international trade, the improvement of the Dacca-Aricha Road is very important.

In addition to this essential role in serving as an artery for the internal movement of goods entering international trade, the Dacca-Aricha Road should serve a most useful role in stimulating the growth of agricultural production in the region it services. Crops grown for consumption in urban markets must be provided with speedier access to those markets than can be provided by waterways. This is particularly true of fruits, vegetables and fish, which will spoil if not rapidly transported to markets where they can be sold. The income elasticity of demand for these items is high, and the GOEP's food self-sufficiency program requires a sharp increase in their production during the next two years. The East Pakistan Agricultural Development Corporation (EPADC) has programs for starting agricultural estates in the vicinity of large cities to augment urban supplies of fish, vegetables, eggs, poultry and milk. EPADC also has programs for the development of horticulture. The agricultural hinterland near the road could serve as an admirable location for such estates needed to supply Dacca and Khulna with these products. Road transport is the most satisfactory means for the local distribution of foodstuffs. Moreover, experience had demonstrated that the mere existence of a paved road can serve as a powerful stimulus for farmers to increase their output by giving the farmer greater access to the consumer goods he wishes to purchase with a higher cash income. In this important sense roads serve agriculture as a lead sector to induce greater investment and output.

The National Economic Council (NEC) recently indicated in a publication that agricultural production in East Pakistan had been increasing by only one percent a year during the past three years (FY 1965-1967). But East Pakistan has a population growth rate of over three percent. Thus the most critical problem facing East Pakistan is to increase agricultural production rapidly to feed a fast growing population. Failure to do so could mean either mass starvation or the diversion of large amounts of funds from economic development activities to the purchase of imported foods. The Dacca-Aricha Road project will help stimulate agricultural growth in a larger sector of East Pakistan, and supporting industrial and agro-industrial production and distribution. Thus the project constitutes an important infra-structure investment in support of the food self-sufficiency program.

### C. Benefit-Cost Analysis

Various attempts have been made to quantify the economic value of this and other road projects in East Pakistan - none of them very satisfactory. The reasons for this are well stated in the World Bank Group Appraisal Report for the Chittagong-Dacca Road project:

"A quantitative assessment of benefits would be arbitrary and conjectural. There is little over-the-road transport at present. Information about the traffic volumes and traffic patterns on the present road is sketchy. The available data on vehicle operating costs is poor..... Trends in population size; its urban-rural distribution; agricultural productivity; industrial output and per capita incomes are still uncertain variables... Slight variations in the assumptions relating to the foregoing factors would compound the margin of error in a rate of return calculation."

The World Bank Group assessment with respect to the Chittagong-Dacca Road is equally applicable to the Dacca-Aricha Road.

Despite the above shortcomings, a benefit-cost analysis was attempted in the loan paper for the original project (one significant benefit calculated was additional tax revenue, not a true economic benefit; foreign exchange costs were not shadow-priced), with a resultant 1.7:1 benefit-cost ratio. A benefit-cost analysis dated May 1967 was prepared by DeLeuw, Cather & Company on the revised Dacca-Aricha Road project, which resulted in the following calculations:

<u>Discount Rate</u>	<u>B/C Ratio</u>
10%	2.02:1.00
15%	1.21:1.00
20%	0.79:1.00

Plotting these figures on a graph, the Consultants arrived at an internal rate of return of 17.0 percent.

These analyses are not a good representation of the direct economic return of the revised project for several reasons. Most importantly, no attempt has been made to measure the related benefits which would accrue from the project in terms of increased agricultural and industrial production, which would many times outweigh the direct benefits of the project such as induced traffic and reduction of vehicular delays and operating costs.\* The lack of adequate data with which to quantify economic returns dictate that the Dacca-Aricha Road must be justified on the grounds of its evident importance to the industrial and agricultural development of the region it serves and because it provides a vital link in the internal transportation system. The discussion under Section V. A. & B. presents this justification.

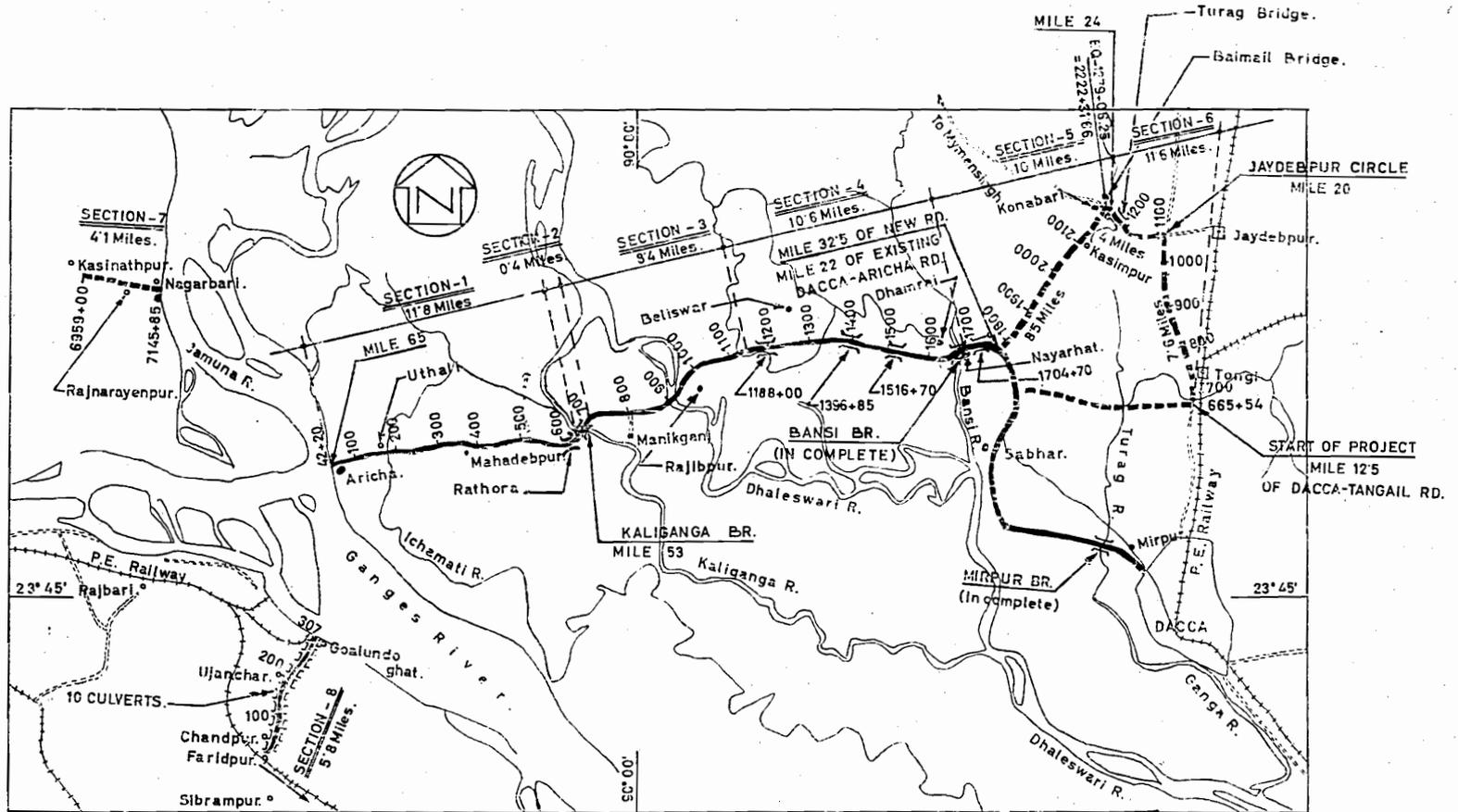
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\* Other deficiencies in these analyses are (1) the costs of the project are taken as only the non-sunk foreign exchange costs of the AID loan-financed items (\$18.3 million used); project costs should include non-sunk foreign exchange and local currency costs of both AID loan-financed items and GOEP financed items; (2) foreign exchange costs are not shadow-priced; (3) no attempt has been made to measure benefits of GOEP items of work; (4) traffic surveys have been conducted at different times by various groups, with varying degrees of comprehensiveness and under conditions which are not indicative of future conditions after the project (e.g. traffic counts via the existing Mirpur Bridge and ferry are lower now than three years ago when all traffic could use the bridge) - there are no figures which serve as a sound basis for projection to base year 1971-72; and (5) assumptions concerning economic costs are very tenuous, e.g. a zero cost of labor has been assumed for truck operating costs on the assumption there are no alternative employment opportunities.

VI. CONCLUSION

This project is technically sound, the plans are satisfactory and the cost estimates are reasonable. The project is justified from an economic point of view. It will help the rapid industrial and agricultural development of the area served by the road and assist in the handling of increasing volume of cargo traffic from Chalna to the interior of the country.

The revised concept of project, as presented in this Supplement, should be approved in order that implementation may proceed as planned.



LOCATION MAP

Miles 5 4 3 2 1 0 5 10 Miles

Scale: - 1:250,000.  
Or  
1" = 3'946 Miles.

**DACCA-ARICHA PROJECT.**

Prepared By  
A. Sobhan.  
31. 8. 67  
(Draftsman)

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BASIS FOR REVISING PC-1  
DOLLAR COST ESTIMATES

The following discussion points up several major areas where AID/W questioned the cost estimates in the revised PC-1 (and used as the basis for costs in the Mission Loan Paper Supplement) submitted by the GOP for the subject project. These areas were discussed in detail on April 2, 1968 by NESAs/ENGR with Mr. Stanley Jewkes, an official of Louis Berger & Associates. The following agreements or understandings were reached:

1. Drainage Structure Costs (Items 1-6)\*. Discussion revealed that very minimal consideration had been given to traffic maintenance costs in the PC-1 estimate. The same applied to demolition of existing structures, an operation where serious and costly problems could be encountered. Mr. Jewkes felt that a workable construction schedule had been used but admitted it left little leeway for unforeseen but possible problems. Also, the short construction seasons forced by the monsoons and annual floods would create construction problems and costs beyond those normally encountered. Of some significance in this regard would be protection of in-place work and the retention and/or demobilization-remobilization of personnel. Agreement was reached that these costs should be increased by \$750,000.

2. Mobilization Costs (Item 11). Mr. Jewkes agreed that contractor mobilization costs, which is a bid item, might well be in excess of that estimated in the PC-1 due to major components of the work being widely dispersed. Other circumstances mentioned, which could contribute to increased mobilization costs, were the uncertainty of local skilled labor availability and the source of required heavy construction equipment. It was agreed a \$700,000 increase should be accepted for project cost estimating purposes.

3. Engineering Costs (Item 12). Mr. Jewkes was asked about the adequacy of the estimates of the costs of required engineering services in the PC-1. The PC-1 puts the U.S. dollar component cost of these at \$890,000 for Phases I, II & IIIa -- Engineering Surveys and Explorations, Final Design and Preparation of Specifications and Cost Estimates, and Compilation of Bid Packages and Review of Tenders, respectively -- and \$550,000 for Phase IIIb, Engineering Supervision of Construction. The \$890,000 almost entirely represents sunk costs and was not a matter of concern. However, the \$550,000 for engineering supervision of construction was of considerable concern. Original estimates put the foreign exchange costs

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\* Item numbers refer to items listed under "Revised Project Costs", Page 5.

of these services at \$600,000 for 300 man months. AID/W and the Mission went on record at that time with a judgement that this would not provide adequate supervision of the work over the life of the construction period and insisted on a provision in the engineering contract that would permit assignment to the work of several additional technicians and engineers. Mr. Jewkes stated that the GOP had arbitrarily set the \$550,000 estimate and that Berger & Associates would have to use more local employees in relation to qualified U.S. engineers than might be desirable to stay within fund limits and even then supervision coverage would be minimal. It was agreed after the meeting that the estimate would probably have to be raised by about \$275,000 to obtain an acceptable depth and quality of engineering supervision of construction.

4. Contingencies (Item 13). Mr. Jewkes' material revealed that a moderate allowance had been made in the estimate for construction contractor contingencies. However, it was agreed that the allowance had probably been too moderate and it developed that no consideration had been given to probable customer (or Engineer) induced contingencies. Numerous contract change orders, for example, are almost invariably necessary and/or desirable on construction projects of this magnitude and it is very seldom that they result in an aggregate or net reduction in contract costs. For these reasons, it was agreed that a straight 15 percent contingency factor should be adopted for both dollar and rupee costs in lieu of the lower, variable rates used in the PC-1 estimate.

5. Cost of Bitumen and Portland Cement (Item 14) - Miscellaneous Items. It was verified that bitumen and Portland cement were not eligible for procurement with U. S. dollar loan funds as shown in the PC-1. The \$1,035,000 allocated for these items in the PC-1 cost estimates would be deleted from the AID component of the estimate and carried either as a rupee cost or a foreign exchange item to be financed by the GOP from their own resources.

With regard to other miscellaneous cost estimates, Mr. Jewkes stated that he felt their estimates were reasonable although they might be subject to some reduction. It was agreed that the miscellaneous cost estimate should be reduced by \$150,000.

6. Normal Escalation. It was disclosed that either none or completely inadequate allowances had been in the PC-1 work item estimates for this important consideration. Mr. Jewkes noted that the estimates were based mostly on 1966 price indexes and that

Louis Berger & Associates had, in fact, gone on record that they should be revised upward to reflect current and/or normally expected future price indexes. It was agreed that a three-year time frame (from 1966-67 to a point about 1½ years into the expected 3½ years construction period) and a 7 percent per annum or 21 percent overall factor would be used for price escalation.

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Summary of Above Changes

PC-1 Estimate (Dollar Component - AID Loan): - \$11,073,500

Less:

Cost of bitumen & cement	=	\$1,035,000 *	
Miscellaneous items	=	75,000 **	
Sunk engineering costs	=	890,000	
Existing contingency allowance	=	821,600	2,821,600
		<u>\$2,821,600</u>	<u>8,251,900</u>

Plus increased:

Mobilization costs	=	\$ 350,000 **	
Drainage structure costs	=	375,000 **	
Engineering costs	=	275,000	1,000,000
		<u>\$1,000,000</u>	<u>9,251,900</u>

Contingencies @ 15%, plus		<u>1,387,800</u>
Escalation @ 21%, plus		<u>10,639,700</u>
		<u>2,234,300</u>
Plus sunk engineering costs		<u>12,874,000</u>
		<u>890,000</u>

REVISED ESTIMATE (AID Loan Funds): \$13,746,000

\* Ineligible for loan financing, to be provided by GOP from their own resources.

\*\* 50-50 division of costs between dollars and local currency assumed.

TOTAL ESTIMATE

	<u>AID Loan</u>	<u>Gov't of Pakistan</u>		<u>Total</u>
	\$	\$	Rupees	\$
PC-1 Estimate:	\$11,073,500	-0-	48,995,000	\$21,366,500
Rev. Estimate:	13,764,000	1,035,000	70,655,000	\$29,624,000

A.I.D. LOAN No. 391-H-092A

AMENDMENT TO CAPITAL ASSISTANCE  
LOAN AUTHORIZATION  
(Pakistan: Dacca- Aricha Road)

Pursuant to the authority vested in the Administrator of the Agency for International Development (hereafter referred to as "A.I.D.") by the Foreign Assistance Act of 1961, as amended, and the Delegations of Authority issued thereunder, I hereby amend the Capital Assistance Loan Authorization dated June 27, 1964, for A.I.D. Loan No. 391-H-092 (the Dacca-Aricha Road) by deleting in the first paragraph the language:

"to assist in financing the foreign exchange costs of equipment, materials, and services required for the construction of the road from Dacca to Aricha in East Pakistan together with required ancillary facilities including ferrys, ferry landings and connecting roads, this loan to be subject to the following terms and conditions"

and replacing such language with the following:

"to assist in financing the foreign exchange costs of equipment, materials and services required for the improvement and construction of a road and ancillary facilities from Dacca to Aricha in East Pakistan, this loan to be subject to the following terms and conditions:"

William S. Gaud  
Administrator

Dated: \_\_\_\_\_

A. I. D. Loan No. 391-H-092 A

AMENDMENT

TO

LOAN AGREEMENT

(Pakistan: Dacca-Aricha Road)

BETWEEN THE

PRESIDENT OF PAKISTAN

AND THE

UNITED STATES OF AMERICA

Dated:

AMENDMENT  
TO  
LOAN AGREEMENT

AGREEMENT dated \_\_\_\_\_ amending Loan Agreement No. 391-H-092, dated January 11, 1965, between the PRESIDENT OF PAKISTAN ("Borrower") and the UNITED STATES OF AMERICA, acting through the Agency for International Development ("A.I.D.").

1. Section 1.2 of said Loan Agreement is hereby deleted and there is substituted in its place the following:

"Section 1.2. The Project. As used in this Agreement "Project" shall mean the design and improvement or construction of a two-lane, all weather paved road from the Greater Dacca area to Aricha, with related ancillary facilities including connecting roads and ferry landings."

2. Sections 3.1(c) and (d) are hereby deleted and Section 3.1(e) is hereby renumbered Section 3.1(c).

3. Section 3.2 of said Loan Agreement is hereby deleted and there is substituted in its place the following:

"Section 3.2. Conditions Precedent With Respect to Financing Additional Eligible Items. Prior to the issuance of letters of commitment for procurement of Eligible Items other than Engineering Services, Borrower shall furnish in addition to the conditions specified in Section 3.1, the following in form and substance satisfactory to A.I.D.:

(a) A program, time schedule and final cost estimates for the procurement of goods and construction necessary to complete the Project.

(b) Evidence of the availability of funds other than those to be provided hereunder, necessary for the construction, installation and operation of the Project.

(c) Evidence of relending or other financial arrangements satisfactory to A.I.D. with regard to the use of the funds to be provided hereunder.

(d) An executed contract satisfactory to A.I.D. with a United States firm satisfactory to A.I.D. for construction services necessary to carry out the Project.

(e) Evidence that arrangements for all privileges, easements, rights of way, and permits necessary for the construction of the Project have been obtained.

(f) Evidence that all labor and materials planned to be obtained in Pakistan are available in sufficient quantities and of satisfactory quality.

(g) Evidence that arrangements have been made to maintain the Project, including but not limited to obtaining consulting services for the Roads and Highways Department of the Ministry of Railways, Waterways, and Road Transport to assist the Department in administering a highway system in East Pakistan.

(h) Evidence that arrangements satisfactory to A.I.D. have been made to avoid encroachments on the Project roads.

(i) Evidence of adoption of satisfactory plans for provision of adequate ferry capacity and operation of the ferry services including the tolls to be charged therefor between Aricha and Goalundo GHAT and Aricha and Nagarbari.

(j) Evidence of satisfactory progress towards the adoption of a satisfactory Motor Vehicle Code.

4. Section 3.4 in said Loan Agreement is hereby deleted and there is substituted in its place the following:

"Section 3.4 Terminal Date for Fulfillment of Conditions Precedent. All Conditions Precedent listed under Section 3.1 of the Agreement were submitted to and accepted by A.I.D. as of January 19, 1968. Except as A.I.D. may otherwise agree in writing, if the conditions established by Section 3.2 have not been satisfied by December 31, 1968, A.I.D. at any time thereafter, at its option, may terminate this Agreement by giving notice to Borrower. Forthwith upon receipt of such notice, Borrower shall repay the unrepaid Principal and any accrued interest, whereupon all obligations of Borrower and A.I.D. under this Agreement shall cease."

5. Section 4.3 of said Loan Agreement is hereby deleted and there is substituted in its place the following:

"Section 4.3. Terminal Date for Requests for Letters of Commitment and for Disbursements. Except as A.I.D. may otherwise agree in writing, no letters of commitment shall be issued in response to requests received after June 30, 1971, and no disbursement shall be made against documentation received after June 30, 1972."

6. Except as hereby amended, the Loan Agreement is in all respects confirmed and approved.

PRESIDENT OF PAKISTAN

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

UNITED STATES OF AMERICA

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_