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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

BRITISH GUIANA - Atkinson Field-Mackenzie Road

AID-DLC/P-351

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

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AID-DLC/P-351
June 22, 1965

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: British Guiana - Atkinson Field-Mackenzie Road

Attached for your review are the recommendations for authorization of a loan in an amount not to exceed \$5,500,000 to the Government of British Guiana for the construction of a highway from Atkinson Field, British Guiana, to Mackenzie, British Guiana.

This loan proposal is scheduled for consideration by the Development Loan Staff Committee at its meeting on June 25, 1965.

Helen E. Nelson
Secretary
Development Loan Committee

Attachments:

Summary and Recommendations
Project Analysis
Annexes I-IV

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BRITISH GULANA--ATKINSON FIELD-MACKENZIE ROAD

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BRITISH GUIANA--ATKINSON FIELD-MACKENZIE ROAD

SUMMARY AND RECOMMENDATION

1. **BORROWER:** The Borrower of this loan will be the Government of British Guiana, acting through the Ministry of Finance. The Minister of Works and Hydraulics will be responsible for administration of the construction and implementation of the project.
2. **AMOUNT:** Total cost of the project is estimated to be \$6,500,000. A.I.D. will finance \$5,500,000 of the project costs which include \$4,400,000 in foreign exchange and \$1,000,000 in local currency. The GOBG will finance the other \$1,000,000 in local currency costs and a condition to loan execution requiring such Government contribution will be in the authorization. In addition, the GOBG has paid for a portion of the preliminary design and will be required to prepare and implement a comprehensive development program of the areas affected by this road project.
3. **DESCRIPTION OF PROJECT:** This project proposes the construction of a 50-mile highway from Atkinson Field to Mackenzie, which will connect the two largest cities in British Guiana, and will be the first road to open the interior for development. The road will in general parallel the Demerara River, transversing the white sand country through second-growth forests. Final plans, specifications and preliminary draft contract documents have already been prepared for the project. As redesigned, the road will have a 22-foot, two-lane bituminous surface with five-foot shoulders, the shoulders being necessary for bicycle traffic. Bridges will be constructed of Greenheart timber superstructures and reinforced concrete substructures resting on Greenheart timber piles. Culverts will be reinforced concrete pipe.

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4. **PURPOSE OF THE PROJECT:** To assist in financing the engineering and construction costs of a 50-mile road from Atkinson Field to Mackenzie, British Guiana, which will open the interior of the country for economic development. Mackenzie, which is the only major interior city in the country, has no adequate land link with Georgetown, the capital and most populous city, except for a dirt trail to Atkinson Field and an existing paved road from Atkinson Field to Georgetown. This project proposes the construction of a road which would permit the free flow of land traffic between the two major urban centers of British Guiana. At the present time transportation between the two cities is either by air or by the Demerara River.

Of additional interest is the fact that there exists a dirt road at Mackenzie which goes south for about 40 miles to Ituni, a mining community. This road is suitable for car and truck traffic and would provide an effective link with the proposed road. Going in a northeasterly direction from Ituni for about 35 miles are trails leading to Ebini, on the Berbice River, where experimental farming is being conducted by FAO. Thus, with the construction of the Atkinson Field-Mackenzie Road, there would be adequate transportation penetrating 115 miles into the interior of British Guiana and ready access from the interior to the Berbice.

5. **BACKGROUND OF PROJECT:** The construction of a road from Atkinson Field to Mackenzie has been studied in varying degrees, the latest study being a report by the consulting engineering firm of Metcalf and Eddy. Their report covered a much broader road construction program, of which the Atkinson Field-Mackenzie stretch was a part. Subsequent field investigations by A.I.D. personnel led to the development of sufficient additional data to prepare this report.

The A.I.D. long-term strategy for British Guiana establishes as top priority the opening up of the interior of the country for social, economic and political reasons. The construction of a road from Atkinson Field to Mackenzie is a first step in carrying out that strategy.

6. ALTERNATE FINANCING: IBRD advised A.I.D. on March 17, 1965, that it would not be in a position to consider a loan for this project at this time. Additionally, on the Export-Import Bank advised that it was not interested in financing this project.
7. COUNTRY TEAM VIEWS: The Country Team has stated that because of the urgent need to connect Georgetown on the coast and Mackenzie in the interior, and because of the social, economic and political impact which the road would have, the Atkinson Field-Mackenzie Road must be given first priority.
8. STATUTORY CRITERIA: All statutory criteria have been or will be met.
9. ISSUES: An issue presented and discussed in the paper relates to A.I.D. financing of local costs.
10. RECOMMENDATIONS: Authorization of a loan to the Government of British Guiana up to Five Million Five Hundred Thousand Dollars (\$5,500,000). The loan would be subject to the following terms and conditions:

A. Interest and Terms of Repayment

Borrower shall repay the loan to A.I.D. in United States dollars within forty (40) years from the first disbursement under the loan, including a grace period of not to exceed ten (10) years. Borrower shall pay to A.I.D. in United States dollars on the disbursed balance of the loan interest of one (1) percent per annum during the grace period and two and one-half ($2\frac{1}{2}$) percent per annum thereafter.

B. Other Terms and Conditions

- (1) Prior to the execution of an agreement between the United States and Borrower for the purpose of making the loan ("Loan Agreement"), A.I.D. shall receive satisfactory evidence that the Government of Great Britain has no objection to the loan.
- (2) Prior to the execution of the Loan Agreement, Borrower shall submit evidence satisfactory to A.I.D. that Borrower will make available financial and other resources apart from the loan as necessary for the successful and timely completion of the Project.
- (3) Prior to any disbursement of the loan for construction costs, Borrower shall submit a plan satisfactory to A.I.D. for maintaining the Project.
- (4) Equipment, materials and services (except shipping and marine insurance) financed under the loan shall have their origin in and be procured from the United States or British Guiana. Shipping financed under the loan shall be procured from the United States, and marine insurance financed under the loan shall be placed in the United States.
- (5) United States dollars utilized under the loan to finance local currency costs shall be made available to Borrower or its designee through appropriate procedures and shall be used only for procurement in the United States.
- (6) Borrower shall covenant to use its best efforts to submit to A.I.D. within one year from the execution of the Loan Agreement in form and substance satisfactory to A.I.D.:
 - (i) a plan for the orderly development of access trails and roads within the geographic areas affected by the Project;

- (ii) a plan for effective control of the agricultural areas opened by the Project to insure the orderly development and utilization of such land; and
- (iii) a plan for settlement of farmers in the agricultural areas having access to the Project, including a plan for the establishment of a supervised agricultural credit program with the assistance, as necessary, from free world countries.

Borrower shall covenant that, within one year after the submission, in form and substance satisfactory to A.I.D., of the plans described in (i), (ii) and (iii) above, Borrower shall submit to A.I.D. evidence of action taken to implement such plans.

- 7. Borrower shall covenant to maintain the Project and shall covenant to make adequate provision in its budget annually for that purpose. Such amount shall be in addition to amounts Borrower provides in its budget annually for the maintenance and upkeep of other roads and trails in British Guiana.
- 8. The loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

Capital Assistance Committee:

Loan Officer	:	Norman Cohen
Engineers	:	Karl Kohler/Fitzhugh McRee
Counsel	:	Duncan Cameron
Desk Officer	:	Patricia Price
US AID Representative	:	Harry Yoe
Economic Advisor	:	Robinson Newcomb

Drafted: NCohen/RNewcomb/FMcRee

SECTION I - DETAILED DESCRIPTION OF PROJECT

AID-DLC/P-351
June 22, 1965

A. Borrower

1. Name and Description. The Borrower of this loan will be the Government of British Guiana ("GOBG") acting through the Ministry of Finance. The administration of the construction contract and the following maintenance work will be the responsibility of the Ministry of Works and Hydraulics.

2. Organization and Experience of Administering Agency. The Ministry of Works and Hydraulics is the governmental agency responsible for the road program, including new construction and road betterment and improvement and has had considerable experience in this area. The maintenance operations are divided into seven districts, each district being responsible for road maintenance and reconditioning in its area. The 1965 budget is proposing \$2,000,000 for maintenance, which is almost a 7% increase over 1964 and 25% increase over the 1963 budget allotment. The usual maintenance requirements will be included in the Loan Agreement.

3. Previous U. S. Assistance to Borrower. Between 1954 and 1965, U. S. assistance to GOBG was in the form of technical assistance, through experts in agriculture, transportation, health and education. In addition, Guianese technicians were sent to the United States for advanced training in 1962. Total expenditures on U. S. technical assistance to British Guiana has been approximately \$5,000,000. There has been no U. S. loans to GOBG; however, an A.I.D. assistance program is now being developed, of which this loan is a part. Grant aid in the amount of \$5.3 million is being provided to accomplish three impact developmental projects: (1) reconstruction of existing roads that were allowed to deteriorate by the previous government; (2) improvement of the Atkinson Field Airport to allow for safe, modern international travel; and (3) sea defenses which were allowed to deteriorate under the previous government will be strengthened and new economically designed stable structures introduced to prevent future failures.

Other financial help has come from Great Britain, Canada, West Germany, and from the UN Technical Assistance Board and Special Fund and IBRD. Much of this assistance has been in the form of grant, although loans of varying rates and terms have been made to British Guiana--by the U.K. and IBRD, mostly for agricultural development. For FY1965, the GOBG has planned for the receipt of a total of \$11 million in grants from U.K., UN, Canada and West Germany. Also proposed are \$13.5 million in loan assistance, the bulk coming from local sources and some from contractor financing. Government-to-government loans are planned from U.K. (\$3.5 million) and United States (\$1.5 million) (figures represent 1965 drawdowns only).

B. History and Background of the Project

A 1953 report prepared by IBRD recommended that a survey be made of the possibility and costs of a road connecting Atkinson Field and Mackenzie leading into the interior of the country. Limited studies were subsequently made and, in late 1961, a feasibility report on a highway program for British Guiana was prepared by the engineering firm of Metcalf and Eddy International of Boston, Massachusetts. Their report studied several possible road programs and concluded that a road development between Atkinson Field, located in the northern part of the country just 25 miles south of Georgetown, cutting through Mackenzie and going down to Lethem on the western border with Brazil and 350 miles southwest of Georgetown, would be economically feasible. The Metcalf and Eddy report did not, however, specifically study the economic aspects of the 50-mile stretch of road between Atkinson Field and Mackenzie. Subsequent field investigations by A.I.D. personnel, including a transportation economist, lead to the development of sufficient additional information which forms the basis for this paper. Cost estimates have been prepared by the engineering firm of J. E. Greiner Company.

There is presently a road from Georgetown to Atkinson Field. The GOBG now wishes to commence development of a national highway system leading into the interior and plans to start on the most logical first-step of the program by building, with U. S. assistance, a road connecting Atkinson Field and Mackenzie. Loan assistance has been requested.

C. Country Team Comments

The Country Team has stated that because of the urgent need to connect Georgetown, the capital city, and Mackenzie, the second largest and only interior city in the country, and because of the social, economic and political impact which this road would have by opening road access to the interior, the Atkinson Field-Mackenzie Road must be given first priority.

D. Alternative Sources of Financing

IBRD advised A.I.D. on March 17, 1965, that it would not be in a position to consider a loan for this project at this time. Additionally, on _____, Export-Import Bank advised that it was not interested in financing this project.

E. Engineering Analysis

1. General Description of Project

This project proposes the construction of a 50-mile highway from the Atkinson Field Airport near Georgetown to Mackenzie, the second largest city in British Guiana. The road will in general parallel the Demerara River transversing the white sand country through second-growth forests. Plans, specifications and preliminary draft contract documents have already been prepared for the project. As designed, the road had a 24-foot, two-lane bituminous surface with 10-foot shoulders. The plans will need revision to reduce the lane width to 11 feet and shoulder width to five feet which standard has been adopted. Bridges will be constructed of Greenheart timber superstructure and reinforced concrete substructures resting on Greenheart timber piles. Culverts will be reinforced concrete pipe.

The total estimated cost of the road including mobilization and engineering costs is \$6.46 million of which \$2.0 million is local currency.

2. Engineering Plan

a. Technical Feasibility - The technical and economic justification of the project is based on information contained in a report made by the U. S. consulting engineering firm of Metcalf and Eddy and an economic report made by an A.I.D. economist. See Section F. 3.

Since detailed construction plans have already been prepared for the project, the estimate of quantities is more accurate than is usual at the time a capital assistance paper is written. The cost estimate has recently been analyzed and revised by a U. S. consulting engineering firm from the standpoint of the work being done by a U. S. contractor. Therefore, it is considered that the cost estimate is firm.

b. Engineering Plan for Execution of Project - The project will be carried out in accordance with detailed construction plans and specifications which have already been prepared by the British Guiana Highway Department under guidance of US AID/BG engineers. As originally prepared, the cost estimate did not contemplate the use of a U. S. contractor for construction. The cost estimate has been recently revised by a U. S. consultant to consider this procedure and to consider reduced lane and shoulder width.

A U. S. consulting engineering firm will be retained under contract with the GOBG for revision of the plans, contract documents, assist in advertising and award of the construction contract, and for engineering supervision of construction. It is contemplated that the U. S. firm will utilize British Guiana engineering personnel to the maximum extent possible.

The construction contract will be awarded on the basis of competitive unit price bidding by U. S. contractors.

c. Implementation Schedule - As a condition to disbursement of funds under the project, the GOBG will be required to employ a U. S. consulting firm for the services indicated in (b). The first work of the consultant will be the revision of the existing plans and of the contract documents to provide for A.I.D. requirements as expressed in M. O. 1443.2. After revision of the plans and documents, the project can be advertised for bids. Following is a tentative schedule for carrying out the project:

Selection and contracting with U. S. Engineering firm by the GOBG -	3 months
Revision of construction plans and contract documents -	1 month
Advertising and receipt of bids -	2 months
Analysis of bids and award of contract -	1 month
Mobilization by construction contractor -	2 months
Construction of Road -	2 years

d. Road Maintenance

The Roads Division, which is a sub-division of the Ministry of Works and Hydraulics, operates under a chief engineer, with highway maintenance being the responsibility of an executive engineer reporting directly to the Chief Engineer. As presently organized, the Maintenance Division is divided into seven districts each under a district engineer or commissioner.

It is planned that maintenance of the Atkinson Field-Mackenzie road will be under the East Bank Demerara district with headquarters at Atkinson Field. Direct maintenance operations will be under an overseer or inspector who will be assisted by two foremen with appropriate equipment and staff of operators and laborers. There will be at least one field station on the route at approximately the half-way point or at Mackenzie. This station will have a small office with living quarters for the staff as well as sheds for equipment and supplies.

The GOBG has indicated that an allowance of \$3,600 BWI per mile per annum will be requested for the road in their annual budget. This is \$2,180 U. S., which is high considering maintenance costs in this and other countries. However, they may be charging a large part of the equipment cost and the new station to the first years. Over a 20-year period a figure of \$1000 per mile for annual maintenance has been used in the economic analysis.

e. Compliance with Section 611 of FAA

Detailed construction plans have already been prepared; consequently, the estimate of quantities is more accurate than is usual at this stage of a highway project. The unit prices, considering construction to be performed by a U. S. contractor, have recently been reviewed by a competent U. S. consulting engineering firm and the cost estimate revised and updated. Therefore, adequate planning and the cost estimates are considered to be sufficiently firm to indicate the cost of the construction to the U. S. Government. Also, all contracts for construction will be made on a competitive basis.

In view of the above factors, it is determined that the pertinent technical requirements of Section 611 have been met.

F. Economic Analysis

1. GOBG Economic Situation

The economy of British Guiana is basically agrarian and is founded primarily on sugar which totals 35% of exports. In recent years, rice has become a major commodity and now accounts for 13.5% of exports. The second major industry is mining. Bauxite and alumina account for 29% of exports, and a sizable manganese operation began in 1960. Gold, diamonds and hardwood timbers play smaller roles in the economy. There has been little industrialization, other than in mining and sugar, and the tourist trade is negligible.

British Guiana has just completed the execution of a five-year BWI \$110 million (U.S. \$64.8) development plan. However only BWI\$70.0 million was spent, representing approximately 50% of the program since the estimated cost had increased to BWI \$140.0 million by 1964. This plan proposed to concentrate on (1) agriculture and fishing (including sea defenses, drainage and irrigation, land development and agricultural credits), estimated to be 40 percent of the program's expenditures, and (2) transport and communications (civil aviation, roads, railways, shipping, tele-communications, and postal services) estimated to be almost 25% of program expenditures. Actually the expenditures were 90% on agriculture, mostly rice farming with other elements of the program unattended.

The GOBG recently proposed an ambitious budget for 1965 which totals an amount equivalent to U. S. \$68 million, almost 50% larger than the 1964 program. For the most part, funds to finance this budget will come from customs and excise taxes and inland revenues, the balance coming from a variety of other sources. Greater emphasis in budget expenditures--Current Account--will be given to improvement of the Civil Service System. However, education will continue to demand the lion's share of the Current Expenditures--16.5%--to be followed closely by Debt Charges--15%. Total 1965 Current Budget is 13% higher than 1964. The real increase in the new budget can be found in the Capital Account which exceeds the previous year's capital allotment by 266 percent, the largest element being an allocation for roads equal to 27 percent of the total capital budget. Other capital projects receiving priority include drainage and irrigation schemes, improvement of airport facilities, further development of land and construction of schools, homes and public buildings. To meet the demands of this new program and create a better business climate, new proposals are made in the budget which reflect favorably on the present administration. Among others, these include:

1. Extension of duty-free concessions to certain industries and organizations;
2. Strengthened control over sale of alcoholic beverages;
3. Allowance of depreciation and initial allowances on all buildings used for business purposes;
4. Encouragement of local savings;
5. Stimulation of investment in home mortgages; and
6. Stimulation of employment in the construction industry.

This 1965 budget is the largest ever presented to any legislature in British Guiana and represents an earnest attempt on the part of the administration of Prime Minister Burnham to strengthen and develop the economic, social and political life of the country.

To help finance this capital program, the GOBG will rely in large measure on external assistance (approximately U.S. \$16 million out of an estimated need of U.S. \$23 million) in the form of grants and loans. Assistance comes almost entirely from four countries with whom British Guiana transacts a major portion of its external trade: United Kingdom, Canada, United States, and West Germany. The 1965 budget contemplates the receipt of \$11 million in grants and \$5 million in loans, the balance of about \$7 million coming from local sources which will more than cover the estimated current account deficit of \$2.9 million. These figures do not represent total loan figures, but rather drawdowns needed to meet 1965 demands. Terms on past loans vary considerably and range from a low of three percent, 15 and 20 years on Colonial Development and Welfare Loans, up to 5½ percent - 6 percent, 25 years on Exchequer Loans which are tied to the Bank of England rate. Most external assistance, however, is in the form of grants.

Given the underdeveloped nature of British Guiana's economy and political instability in recent years, reporting on trade activity has been quite sparse. 1964 figures on imports and exports were recently obtained, however, and they show imports of U. S. \$90 million and exports of \$96 million. The largest item of import was machinery and transport equipment, followed closely by manufactured goods (metals and textiles) and food (wheat flour, dairy products and fresh and dry vegetables). The largest items of export were sugar, rice and bauxite. Trade activity with the United States for eleven months of 1964 showed imports of \$30.6 million and exports of \$22.8 million, leaving a net import balance of \$7.4.

Of export earnings, a little over 5½ percent was allocated to the servicing of debt, which is not too high for an underdeveloped country. However, when relating debt expenditure to total budget expenditures, the debt burden becomes quite sizable totaling about 12.8 percent of total budget expenses. This burden is not expected to decline substantially in the coming years because of the increased borrowings required to meet proposed capital development needs. Projections for 1965 show debt consuming almost 10.5 percent of the proposed total budget expenditures.

While debt servicing requirements are fairly high for this country, given the fact that debt obligations have in the past been honored regularly, the existence of a favorable trade balance and an estimated net growth of the economy of 3 percent, it is believed that there are reasonable prospects of repayment.

2. Relation of Project to U. S. Assistance Strategy

The Atkinson Field-Mackenzie Road is an important segment of our long-term strategy for British Guiana. The road will promote political and economic stability in the immediate future through employment of a limited number of people directly engaged in the construction of the road and a far greater number who will be employed indirectly in the supplying of materials and services required in the construction. It will also offer visible activity and proof of the present government's intent and ability to move ahead in the development of the country. This will in turn stimulate confidence and promote both local and foreign investment.

From the long-term standpoint the road is important to our over-all strategy in that it is the first step in opening up the interior of the country and providing an escape valve for the racial tensions and economic frustrations which are promoted by the over-population of the narrow coastal strip now constituting what, to all practical purposes, is the inhabited portion of British Guiana. One of the prerequisites for any political party's success in British Guiana is that it be able to show that it has the will and the means to promote political and economic development within the country. Since the Atkinson Field-Mackenzie Road has been under discussion for some time and was a part of all political parties' platforms for some three years, it offers an excellent opportunity to demonstrate the interests of the incumbent government in development and its ability to secure U. S. assistance, as contrasted to the previous government's ineptitude in this respect. For these reasons, it is most important that this project move ahead now.

3. Relation of Project to Economic Development

The proposed road will connect points hitherto unconnected by road or rail, and open up undeveloped territory. Therefore, the customary ASHO approach of calculating benefits by estimating the reduction in transport costs and multiplying that by increased traffic volume cannot be used. Instead, the approach recommended by Brookings and being used by the World Bank of estimating the impact on the economy that the proposed road will cause, and comparing the cost of the road with the benefit of that expected impact is used in this study.

The logic of the analysis is as follows:

1. What transport mode, linking what parts of the country would bring the greatest benefits? The answer is the proposed road.
2. What may happen along the road, and in the new territories opened by the road? The answer: benefits over the next twenty years are calculated as having a possible present value, discounted at 8%, of up to U.S.\$50,000,000. The values could be much less, if the government proves unstable, or if it does not effectively encourage development in the areas the road opens up. On the other hand, if the areas are not opened up imports of food must increase, and unemployment may increase.
3. What is the cost? Estimates provided by LA/ENGR are used for the road, and rough estimates of FAO and other experts are used for the related investments required. They approximate a present value of U.S.\$20 million discounted at 8%.
4. What is the estimated rate of return and benefit/cost ratio? The estimated rate of return is approximately 20% and the benefit cost ratio with the investment discounted at 8%, is 2.5/1.

5. Could the same or a higher benefit/cost ratio be secured with stage construction--by building one lane now and adding a second lane later? The engineers say the soil and weather conditions make stage construction of this particular route impractical. It would be more expensive to build in two stages than in one, and traffic could not be handled safely on a one lane road.

Discussion - British Guiana has an estimated population of over 600,000. About 25% live in Georgetown and its suburbs, another 25% live within three miles or less of the three short roads, having a total length of about 110 miles, that converge on Georgetown, and just under 30% live along some additional 75 miles of roads that are accessible to Georgetown by ferry. Half of the population lives on possibly seven-tenths of one percent of the land and about 30% more live on about another seven-tenths percent. Some 1.5% of the land accommodates almost 80% of the population.

This concentration is due to two factors: (1) the limited amount of fertile land, and (2) the very limited accessibility to the area that can be farmed, grazed or mined.

Tidewater land embraces 7,000 square miles, of which only about 550 square miles is moderately accessible to Georgetown. It has the most fertile soil and the soil which is most expensive to maintain. Much of it is below high tide and must be protected by expensive sea walls. The stretch along the coast that is directly accessible to Georgetown by rail or road is about 85 miles long, and is heavily farmed.

A moderately good, but narrow and winding paved road, extends about 26 miles up the Demerara River from Georgetown. The last 20 miles of this road, which runs to the airport, was built during World War II. The fertile soil along this road is being farmed relatively intensely. The available data suggest that the land along this road was under relatively complete cultivation by 1961, some seventeen years after the road was completed and open for general use.

The concentration of population and land use around Georgetown is due secondly to lack of ready accessibility of the rest of the country to centers of population and distribution. The width of the estuary means that a ferry ride of about 25 miles is required to reach Bartica, on the west bank of the Essequibo River. The uneven road from Georgetown east to the Berbice River ends at Rosiquol where a slow and infrequent ferry ride of about 1.5 miles crosses the river to the second largest city, New Amsterdam.

The relatively good, though winding and rather narrow road along the east bank of the Demerara provides better access to Georgetown for the area it serves. While this road is only 26 miles long, and 20 miles of this stretch has been in existence only since World War II, the arable land on both sides of the road is being effectively used.

Aside from these 110 miles of road and rail, the only connection to the interior is by (1) an eight-hour boat trip to Mackenzie, some 55 miles as the crow flies, but 80 miles as the river runs; (2) by a few roads reached by ferries, which run along another 100 miles of coast; (3) with decreasing capacity, over largely jeepable trails, by several hundred miles of routes which reach a few small villages in the interior; and (4) air service by light planes, using DC-3 and smaller land planes, a few small amphibious craft, and company planes. Some 29 landing strips and several seadromes make it possible for much of the interior to be reached by regular or by charter service. Gold and diamond mining would be seriously hampered and even the larger bauxite and manganese operations would be hindered without air access to Georgetown. And beef production in the southwest of the country has been able to function only because it could ship beef by air to Georgetown.

The population is concentrated about Georgetown then, not just because all the arable land is near Georgetown--less than 10% of the class I and II soils and only about 2% of the class I, II and III soils are on land directly accessible to Georgetown--but more importantly because there is poor access to most of British Guiana.

British Guiana has been able until recently to accommodate itself to the concentration of 80% of its population on less than 2% of its area because its population was growing but slowly and its balance of payments and net capital inflow positions were relatively good.

This situation has changed. The growth of population which averaged about 1% per year in the 1930's became about 3% by the 1950's. It is estimated to be in the neighborhood of 3% today and the total population is believed to be growing by not far from 20,000 per year. The population is estimated to be about 70% above what it was at the end of World War II, and it may double in the next quarter century.

And the balance of payments and net capital inflow positions are no longer strong. The political uncertainties of the last few years resulted, among other things, in a decline in investment. Retained imports of machinery and equipment are estimated to have dropped from a peak of over 30 million U.S., to about \$18 million U.S. last year, and domestic production of machinery is estimated to have dropped from a peak of about \$4.5 million to \$1 million U.S. Gross domestic capital formation may have dropped from a peak of \$56 to about \$33 million U.S. Net capital inflow, which exceeded \$20 million U.S. in 1958, is estimated to have been negative last year. Data are not exact and estimates supplied by the Ministry of Finance have been used for these comparisons.

The hesitancy to invest domestically is exacerbated by the fact that over 60% of the GNP is earned by exports, of which some 80% is produced and handled by five firms. These firms do not want to increase their dominance over the economy under current conditions and might well hesitate to do so even under the most favorable circumstances. So they tend to leave a large portion of their earnings abroad. This could slow economic growth.

And plantation agriculture is now mechanized. As wages in British Guiana are higher than they are in the rest of the Caribbean and in Dutch Guiana, the companies have mechanized in self-defense. This added to unemployment or at least helped reduce the rate of growth in employment at a time when the labor force was increasing markedly.

This is causing increased interest in the agricultural potentials of land not now farmed, as a source of employment and income. There is a growing market for agricultural output. The latest available data (January-November 1964) nevertheless indicate that food imports approximated \$17 million U.S. in 1964, about \$27 U.S. per capita. If the per capita income was about \$200 U.S. and if half of this went for food, over a quarter of the food expenditures were for imported food products. Over 90% of the food imports in 1964 (excluding spices) were in the form of meat, dairy products, fruit and flour--most of which could be produced domestically in one form or another. In addition, about \$500,000 U.S. was spent for imported animal and vegetable fats and oils in 1964. There is room for a marked expansion of domestic agricultural output.

An expansion of industrial output could help relieve unemployment, but this by itself might result in an increase in food imports. And business investment, even with considerable outside assistance, may not grow rapidly enough to provide relief. Improved access to the hinterland however would permit some of the population to move to unused land suitable for farming, with a minimum of imported capital and a maximum of relief to the foreign exchange situation.

Unpublished FAO studies indicate that land in the extreme southeast, near the Brazilian border could be exploited more fully, largely by raising stock. But the cost of building the 250 miles or more of road required would total, according to the mission engineer, over \$10 million U.S. if it were to be built to very minimum standards. If this were done access would still have to be provided to Mackenzie to tie to this 250 miles of roads to the south.

The FAO studies suggest the availability of over 4,500 square miles of arable land in the NW mostly along the coast. The preliminary report say, however, that "the soils have poor drainage and generally require the installation and/or maintenance of artificial drains to reach high production levels." This means more capital than is available today.

Roads offer the only feasible commercial access to this area. The mud banks and swampy areas back of the beaches make traffic along the coast unprofitable. Infrequent boat trips between Georgetown and the northwest tip of the coast, the Managanese River Port of Mabaruma, are possible. But stops cannot be made at intermediate points. If agriculture, or other sources of employment are to develop along the coast east of Mabaruma a road will be needed, and if development is to be extensive a seawall will be needed as well. The most feasible connection for the road would be through Mackenzie, which again brings us back to the route under consideration.

The FAO study reports that the upland soils of the northwest are deep, well-drained, low in natural fertility and may be somewhat droughty during dry seasons. In order to reach this area best the road probably should start from Bartica and go northwest along the base of the hills. This road could connect with Georgetown by a 25-mile ferry. A more satisfactory connection would be provided through Mackenzie, the terminus of the proposed road. A rail bridge crosses the Demerara River at Mackenzie, and the rail bed goes as far as Rockstone, six miles from the existing road to Bartica. The bridge and rail bed are now available for road use, and the British Guiana Government has indicated it would tie the Bartica road to Mackenzie if the Atkinson-Mackenzie road is built. The best access to the upland northwest region therefore is through Mackenzie.

Access from Mackenzie south is readily available also for about 40 miles to Ituni over an existing dirt road built for use by local mining companies. This road is suitable for car and truck traffic and would provide an effective link with the proposed road. Thus, there would be 115 miles of roads leading south from Georgetown into the interior. Going east from Ituni there are trails which the Government has agreed to upgrade, leading in a northeasterly direction to Ebini on the Berbice River where experimental farming is being conducted by FAO. It can be seen, therefore, that with the construction of the Atkinson Field-Mackenzie Road, there will be an effective road system from Georgetown running 115 miles south to Ituni, then about 35 miles northeast to Ebini. The cutting of a trail from Ebini for approximately 50 miles north to New Amsterdam, which can come after the Ebini area starts to build up, would provide a triangular road scheme connecting the presently uninhabited interior with the populous coastal cities.

One possible alternative method of reaching Mackenzie must be considered, water transport. A small mining company steamer makes four scheduled round-trips per week to Mackenzie, just below the rapids on the Demerara and the end of feasible navigation. The trip is 80 miles long and takes eight hours. The boat carries about 1200 tons of freight per month at a charge of U.S. \$4.80 per ton, or 8.7¢ U.S. per ton mile as measured by the road length. From 2500 to 3000 passengers are carried each week at a charge of U. S. \$2.60 per cabin class, \$1.35 for first class, and 63¢ for third class. This is a charge per mile of U.S. 4.7¢, 2.5¢ and 1.1¢, respectively. The rates are modest, as the mining company must provide service to the town, but the company anticipates that it will lose most of the passenger business to bus and private car when the new road is opened. Nevertheless, the company wants the road built because the town is now too isolated for the social and mental health of its inhabitants. Few passengers and little freight are dropped off or picked up between Georgetown and Mackenzie.

As access to Mackenzie then is the best way to reach the northwest, and the near portions of the southwest, south and southeast alternative transport modes, or road locations, should not be given priority over this route. The question then becomes, is the construction of this road warranted on the basis of what it will do for the area it will open up between Atkinson Field and Mackenzie, and between Mackenzie and the Berbice River, and for the area west of the Essequibo River. The value of the improvement of contacts with the rest of the country will be hard to delineate and may be considered as so much extra gravy.

This boat trip is too long to encourage passenger service, and too long to make the transport of fresh produce feasible. Access to farms along the river would require the building of farm roads to docks and the building of docks, and if fruit and produce are shipped, the provision of refrigerator space on a ship. This would be expensive and frequent boat stops to pick up produce would

lengthen the trip still further. The capital cost of providing adequate transport of food and of people by water would be greater than the capital cost of providing it by land. The road is the more feasible and lower cost transport mode to Mackenzie.

We probably should note also that the trip can be made by jeep over a sandy trail. In good weather--when things are not too dry or too wet--the journey can be made in three to four hours. In bad weather when the sand is very loose, or in monsoon weather, when it is not compacted, the journey may take longer and may be hazardous. This sandy trail is not a commercially feasible route.

The question is largely, are the agricultural and other potentials of the area that would be opened by the road sufficient to warrant its construction?

The soil along the Demerara River between Atkinson Field and Mackenzie is similar to that between the Diamond Estate seven miles from Georgetown and Atkinson field. According to unpublished FAO studies there are about 13,000 acres suitable for farming along the east bank of the Demerara River which will be given accessibility to Georgetown by the road. An additional 9500 acres of good soil on the west bank would be given some accessibility, as farmers could use existing trails to reach the bridge at Mackenzie and reach Georgetown on the new road inside of three hours by truck, bus, or car in wet or dry weather. The equivalent of 2000 acres of this good soil in the west bank may be farmed as a result of the road.

The FAO studies indicate that the road to Atkinson Field opened about 19,000 acres to cultivation on the east bank. This may be roughly 25% more than will be opened directly along the river by the new road.

It is believed the land along the route will be made available to settlers as fast as the road opens it up. The government holds title to much of the land, and we were informed that it plans to take possession of any unused land suitable for cultivation, to which it does not have clear title, and establish title, see that the land is used, or acquire title so that it can be distributed to those who will use it.

If 15,000 acres are cropped along the road and yield an average annual income of only \$250 U.S. per acre, the value added would be in the neighborhood of \$3,750,000 U.S. per year. Tobacco can be grown in the area. It is already being grown further south, but transport costs have proven prohibitive. Technicians report bananas, mangoes, vegetables, cassava, pineapples, citrus, cocoa and chickens are now being produced successfully between Georgetown and Atkinson Field. As tobacco, fruit and vegetable imports now exceed \$3 million U.S. per year. If the population doubles in the next 25 years, imports of such crops might have to more than double unless domestic production is greatly increased. Georgetown would provide a growing market for such crops.

No safe forecast can be made as to how rapidly the area along the road will build up or how much value per acre will be added. Judging from scanty traffic data the land to Atkinson Field was built up in under 17 years. With population and balance of payments pressures providing a greater incentive for taking up available land, with the government actively pushing this rather than being neutral, and with the stock of motor vehicles about three times what it was a decade ago, it may be reasonable to expect that the land along the proposed road will be settled and farmed as rapidly after the road is built as was the land up the river to Mackenzie following the construction of the Georgetown-Mackenzie road.

It may be reasonable to expect however that the acreage farmed may be some 20% less than that farmed between Atkinson Field and Diamond Estate.

With the Government emphasizing truck and fruit crops it may be reasonable to expect finally that the average value added per acre would soon be in the neighborhood of \$250 per year per acre U.S. 1965 dollars. That would be a total annual value added after possibly 15 years of about \$3,750,000 U.S.

The maintenance cost of the road may average about \$50,000 U.S. per year, though this may be a high estimate. Discounted at 8% over a twenty-year period, this figure has a present value of \$500,000 and in effect brings the cost of the road up to about \$6,500,000 U.S.

It will be necessary also to provide capital for the farming operations. This can be relatively light for truck and fruit farming along the river, and can be largely self-created; that is, it can be capital created by men who otherwise would be idle. If a capital investment of \$200 U. S. per acre or \$200,000 per year is made as the area is developed steadily over a 20-year period, with interest at 8%, this would be the equivalent of a present value of \$2 million U.S. for the entire farmed area. This would raise the total capital cost by \$2 million U.S. and bring the present value of the total investment along the river to \$8,500,000 U.S.

The land along the river is but part of the area that will be opened up by the road. The Government covenants to improve the trails leading to settlements between the Essequibo and the Berbice and west of the Essequibo River. This will open the Savannahs to farming.

Yields from the Savannahs are very low today. An FAO report of 1963 which reflects the consensus of informed judgment on the subject reports that "Most of the very few settlers on the intermediate Savannahs have home gardens and one is producing a few truck crops to supply a limited market at Kwakwani. Cassava, tomatoes, sweet potatoes, bora, eggplant and melons are the principal crops grown. Problems are encountered with fertilizers, insects, and unpredictable weather. Informal trials at Ebini have shown that melons, peanuts, sorghum cowpeas and other field crops have much promise, but also emphasized the problems of production; fertilizers, insects and drought." One sugar company has experimented with supplementing pasture with molasses, which is a low value product of British Guiana, supplemented with cane tops for roughage (also a low value item in British Guiana) and some urea. It reported that it produced healthy, readily fattened animals. The molasses cost about 10¢ per gallon and supplies the minerals the brown sands lack. With this diet they reported they could produce one 800-pound animal per acre per year, which could be sold for about \$100 U.S. The animals ate 90 gallons of molasses each per year, at a cost of \$9. The urea and cane tops would cost a little more, so the feed bill may approximate \$25 per animal. With this feeding no fertilizer was required.

The FAO reports that there is a big market for beef in Trinidad which is being supplied by the United States and Australia. British Guiana could capture some of this market. The FAO studies indicated that with fertilizer, pesticides and water, truck and fruit could be grown as well as beef. Fertilizer has been expensive because, in part, of transport costs. Boat charges to Mackenzie alone were \$4.50 per ton and the cost of moving it by jeep to the farmstead has been still greater. Water has not been available for irrigation because demand has been too light for commercial development, and the government has had no irrigation program.

Water is available in the rivers, and if necessary could be furnished through plastic pipes in a volume adequate for dry season needs. Tube wells may prove to be much cheaper. Fertilizer costs \$61 U.S. per ton for $\text{N}(\text{H}_2)_2\text{SO}_4$, \$120 for urea, \$96 for phosphorous, \$72 for potassium, \$13.25 for lime at Georgetown. It can be delivered to the Savannahs by truck, once the roads are available for \$5 or less per ton, as a back haul commodity. With a governmental program pushing irrigation and roads, it would be possible to grow truck and fruit crops in the Savannahs at a profit.

The Government is committed to pushing roads through the Savannahs, but there is as yet no comparable investment program for helping the agricultural development of the Savannah areas. The tests made of the possibility of raising beef without fertilizer, but with molasses and urea, suggest that it is possible to dispense with fertilizer or at least reduce the requirements markedly in raising beef, but at least enough water must be available to meet the needs of the animals. This can be handled by trucking water, as is done at Ebini now, but that is an expensive and inefficient system.

What will happen in the Savannah areas appears therefore to depend in considerable measure on governmental action. Of course it would be possible for private entrepreneurs to sink wells, or run pipes to the rivers, but entrepreneurs are more likely to be interested in urban than in rural investment until beef, fruit and truck farming have proven themselves. And this type of operation takes more capital per unit of output than will be required for exploitation of river lands above Mackenzie. So it would not be wise to expect a rapid influx of population to the Savannahs without considerable governmental support. If government aid results in a

5% growth per year in the population for the first decade, the area would support nearly 60,000 people at the end of ten years. If development proves satisfactory and Savannah culture proves attractive, the growth might then increase to 7% per year. This would give a population of about 115,000 at the end of 20 years. If the per capita income lags behind that of the rest of the country, and averages only \$250 U.S. per year, this would mean increased income in the twentieth year of about \$19 million U.S. The present value of an income growing at this rate, discounted at 8% is about \$55 million.

Against this, however, it is necessary to place the cost of the connecting roads, irrigation, and other facilities necessary to support farming in the Savannah. The roads may cost \$6 million U.S. by the time they are completed, with a present value for this expenditure, plus maintenance, of about \$4 million. Irrigation may be as expensive even though water is so generally available. If the present worth of these complementary non-indigenous capital costs is \$7.5 million U.S., this gives a total cost for the Savannahs of \$11.5 million U.S. on a present value basis.

We have no way of insuring that this development will take place, nor that it will occur at the suggested rate. If the road is not built the development will not occur. If the road is built and access roads are constructed as the government promises, but irrigation and other needs are left entirely to private initiative, the development will be much slower. The present value of the increased income earned in the area might be \$25 million U.S. instead of \$75 million U.S. (\$20 million along the road plus \$55 million in the Savannahs). With a few government demonstration projects the return might be in between these two figures. But without the road the prospects for the Savannahs are very gloomy. The benefit/cost ratio table assumes a total benefit of \$50 million present value basis over a 20-year period.

Mining is a major industry in British Guiana. Large bauxite operations are underway at Kwakwani on the Berbice, which will be connected to the new road, and at Mackenzie, which also will be served by the new road. These operations account for about 20% of the value of British Guiana exports, and are very important to the economy and to the balance of payments of the country. Mining officials believe the new road will make it easier to attract and to keep good employees at these locations. The importance of this can not be measured from the data available.

Gold and diamond miners are scattered along the trails that will be connected to the new road. At present much of this mining is supported by charter air flights to the many landing strips scattered throughout the central and western portions of the country. The exports of gold and diamonds average between \$3 and \$4 million U.S. per year. Geologists state that the main lodes have not yet been found and that the prospects for rich finds are very good. Prospectors today are limited to the use of equipment which can be flown in or carried in by pack or by dugouts. The new road will improve the accessibility to the gold bearing area, and may increase the number of prospectors and result in the use of better equipment. The value of the road to mining cannot, however, be reduced to numbers.

Lumbering is another important industry. It is estimated to account for about 5% of the GNP and 2% of the exports. It is being carried on actively between the Demerara and the Essequibo Rivers, and west of the Essequibo, largely north and west of Rockstone and of Bartica. The road would improve access somewhat but as the rivers below Mackenzie and Monkey Jump Rapids are tidal they can be used for moving cut timber to the coast. The road would improve accessibility to the logging centers, but it cannot be credited with much of an assist to this industry.

Finally, if this proposed road will provide the best access to Mackenzie, and to the northwest, west, south and east, and will pay a rate of return of about 20% per year, is it still necessary to build as expensively as is planned? Could a cheaper road do the work, with a consequent higher return on the investment?

Traffic counts taken on May 24 showed 590 motor vehicles going clear to Atkinson Field. The maximum hourly traffic at Atkinson was 54 between 8 a.m. and 9 a.m. and 55 between 4 p.m. and 5 p.m. At Diamond, seven miles from Georgetown, the total motor traffic was 2,378, with maximum hourly volumes of 222 and 170. Bicycle traffic may have approximated an additional 600 trips at Diamond.

If the economy grows along the road as projected as possible, the traffic at Mackenzie derived from agriculture along the river, and from the town of Mackenzie, in about 15 years will approximate that at Atkinson now. If the Savannah population grows as outlined, the traffic then would be more than double that at Atkinson now. The traffic a few miles beyond Atkinson, under these conditions, may exceed 1200 motorized vehicles per day. This is more traffic than can be handled efficiently by a one-lane road, particularly when the sandy shoulders are hazardous for passing in dry and very wet weather.

The engineers report there would be no saving in building a one lane road now and widening it to two lanes when traffic requires two lanes. The soggy nature of much of the terrain requires a relatively expensive road bed, surface and drainage. The alignment should be surfaced to protect against the heavy rains, or no passing will be possible in the wet areas. So, the engineers report, the road should be made a two-lane route at the start. The engineers estimate that this will cost about \$6 million, and that a cheaper type of construction would be wasteful.

Putting the facts discussed thus far together yields the following picture.

<u>Along the Road</u>	Present Value of outlay \$US (discounted at 8%)	Present Value of benefits \$US (discounted at 8%)	Rate of return
Cost of Road	\$6,000,000		
Cost of Maintenance	500,000		
Farm capital required along the road	<u>2,000,000</u>		
Total along the road	\$8,500,000		
Increased income		\$20,000,000	20%
 <u>In the Savannahs</u>			
Connecting road cost (assuming a fairly rapid construction rate includes maintenance)	\$4,000,000		
Farm capital * 100,000* acres at \$150 per acre over 20 years	\$7,500,000		
Increased income	_____	<u>\$30,000,000**</u>	_____
Total away from the road	<u>\$11,500,000</u>	<u>30,000</u>	<u>20%</u>
GRAND TOTAL	<u>\$20,000,000</u>	<u>\$50,000,000</u>	<u>20%</u>

* Not over half the acreage farmed may need irrigation.

** A suggested upper limit of \$55,000,000 was used in the next.

G. Financial Analysis

1. Financial Plan

The total cost to construct the Atkinson Field-Mackenzie Road is estimated by J. E. Greiner Company and US AID to be \$6.46 million. Of this amount, A.I.D. will finance \$5.46 million (rounded to \$5.5 million) which includes \$4.4 million in foreign exchange and \$1.0 million in local currencies. The GOBG will finance the other \$1.0 million in local costs and their agreement to such arrangement will be required by the loan authorization as a condition precedent to loan execution. In addition to this local contribution, the GOBG has paid for a portion of the preliminary design and will be required to prepare and implement a comprehensive development program of the areas affected by the road project (See Section III--Covenants and Conditions).

The consulting engineer estimates it will take two years to build this road, from which disbursements are estimated as follows (amounts in U.S.\$):

CY1965	\$ 60,000
CY1966	2,067,200
CY1967	2,100,000
CY1968	1,229,900

2. Proposed Terms

Terms recommended for this loan are:

Amortization	- 40 years
Grace Period	- 10 years
Interest	- 1% during grace period 2 1/2% for remaining 30 years

It is believed that the terms recommended for this loan are reasonable. This conclusion is based on the following five points:

- a. Annual debt service requirements are over 5% when related to export earnings and 10%-15% of budget expenditures. This is expected to continue. Concessional terms will minimize the impact on debt requirements thereby freeing GOBG funds for further developmental purposes.
- b. Most of the external assistance to British Guiana is in the form of grant aids.
- c. A.I.D. is taking its first step in providing loan funds for infrastructure to assist in the economic development of British Guiana.
- d. In the 1965 GOBG budget a deficit is expected in the current account and the capital account contemplates sizable external assistance to meet programmed needs.
- e. Per capita annual income is figured to be \$280-\$290 only.

SECTION II - IMPACT ON U. S. ECONOMY

A. Competition with U. S. Enterprise

No competition with U. S. enterprise will arise from this project.

B. Source/Origin Procurement of Goods and Services

The loan provisions will limit procurement to the United States and British Guiana.

SECTION III - COVENANTS AND CONDITIONS

1. In addition to the usual conditions precedent, the Loan Authorization and Agreement will contain the following statements:

- a. Prior to the execution of an agreement between the United States and Borrower for the purpose of making the loan ("Loan Agreement"), A.I.D. shall receive satisfactory evidence that the Government of Great Britain has no objection to the loan.
- b. Prior to the execution of the Loan Agreement, Borrower shall submit evidence satisfactory to A.I.D. that Borrower will make available financial and other resources apart from the loan as necessary for the successful and timely completion of the Project.
- c. Prior to any disbursement of the loan for construction costs, Borrower shall submit a plan satisfactory to A.I.D for maintaining the Project.

The implementation letter will contain an explanatory statement stating that such evidence necessary to comply with paragraph (c) should indicate the necessary staff, equipment and funds that will be made available to carry out the maintenance plan.

2. In addition to the usual covenants included in the loan agreement, there will be the following:

- a. Borrower shall covenant to use its best efforts to submit to A.I.D. within one year from the execution of the Loan Agreement in form and substance satisfactory to A.I.D. :
 - (i) a plan for the orderly development of access trails and roads within the geographic areas affected by the Project;

- (ii) a plan for effective control of the agricultural areas opened by the Project to insure the orderly development and utilization of such land; and
- (iii) a plan for settlement of farmers in the agricultural areas having access to the Project, including a plan for the establishment of a supervised agricultural credit program with the assistance, as necessary, from free world countries.

Borrower shall covenant that, within one year after the submission, in form and substance satisfactory to A.I.D., of the plans described in (i), (ii) and (iii) above, Borrower shall submit to A.I.D. evidence of action taken to implement such plans.

- b. Borrower shall covenant to maintain the Project and shall covenant to make adequate provision in its budget annually for that purpose. Such amount shall be in addition to amounts Borrower provides in its budget annually for the maintenance and upkeep of other roads and trails in British Guiana.

SECTION IV - ISSUES

An issue of this project is the fact that A.I.D. will be financing about 50% of the local currency costs of the road. As discussed earlier in the paper, the GOBG is embarking on an aggressive capital development program and has proposed large scale capital expenditures in its budget. This program will require not only external loan assistance, but also sizable local GOBG self-help. This will undoubtedly place a great burden on British Guiana's available and potential resources, and any allocation of funds to this road project will otherwise reduce the funds which might be available for other project financing. If, then, the capital program is to be carried forward, as proposed, it will be necessary for the Government to obtain loan funds at possibly conventional terms thereby placing a greater burden on their debt servicing capacity.

It is the project committee's opinion that in view of the proposed capital development program and the limited GOBG resources, A.I.D. financing of about half the local costs is justified.

As an additional point, from the United States point of view, there exists a favorable trade balance with British Guiana in an amount of \$7.4 million. This more than offsets the \$2.0 million in local cost financing for the project.

SECTION V - IMPLEMENTATION PLAN

It is expected that this loan will be authorized before the end of FY1965 and that the Loan Agreement will be signed within a thirty-sixty-day period thereafter.

Unless delegated otherwise to the US AID/BG, it is planned that review and approval of conditions precedent and subsequent implementation matters will be handled by the AID/W project committee. Specific delegations to the Mission will be made on an ad hoc basis.

The loan project committee estimates that approximately three months will be required after signing of the Loan Agreement to satisfy the usual legal conditions precedent and the requirement for evidence of consulting engineering services. Review and approval will be necessary of the consulting engineering firm selected by the GOBG, the scope of work to be performed and the final draft contract agreed to by the GOBG and the engineering firm. Four conformed copies of the signed contract will have to be sent to A.I.D., one copy remaining with the US AID and the other three copies being forwarded to AID/W.

The consulting engineer will be required to revise construction plans and contract documents, advertise and receive bids, evaluate bids received and make an award recommendation to the GOBG. AID/W review and approval of the bidding documents, evaluation and award recommendation, will be required as a further condition precedent to disbursement under the loan. This, together with review and approval of a construction schedule prepared by the consulting engineer, evidence of right-of-way over the road route and maintenance plans will require an estimated four months.

It is, therefore, estimated that seven months will be needed to meet all conditions precedent. Thus, by early CY1966, the construction contractor could begin mobilization.

Loan disbursements could have already commenced in favor of the consulting engineer in latter CY1965 and would start in favor of the contractor in early CY1966. It is estimated that by the end of CY1965, \$60,000 will be disbursed under the loan. For the remaining period of mobilization and construction, estimated to require two and one-third years, the table under Financial Analysis presents the projected disbursement schedule.

During the course of construction, the GOBG will be required to submit quarterly progress reports. These reports may be prepared on their behalf by the consulting engineer. In such event, the GOBG must indicate its acceptance of the report.

Additionally, the US AID/BG will be required to submit monthly progress reports in a form suggested by AID/W. These reports should be based on information presented by the GOBG and on periodic site inspections made by designated US AID/BG personnel. It is expected that an occasional TDY by an AID/W engineer or loan officer may be necessary.

Within a year after signing the loan agreement, the GOBG will be required to submit plans for orderly development of access trails and roads, effective control over newly opened agricultural lands, and settlement of farmers including establishment of a supervised agricultural credit program.

Upon conclusion of construction of the road project, including any needed clean-up, the consulting engineer will prepare a final report and certify to the GOBG that it accepts the work of the contractor, and that the project covered by this A.I.D. loan is finished. A site inspection by A.I.D. and the GOBG will then be carried out. If the project is accepted, the contractor and consulting engineer, in that order, will be paid the remaining amounts under their contracts and released. The US AID/BG will then submit a final report to AID/W.

BRITISH GUIANA--ATKINSON FIELD-MACKENZIE ROAD

CHECK LIST OF STATUTORY CRITERIA (ALLIANCE FOR PROGRESS)

1. Foreign Assistance Act of 1961, as amended (hereinafter FAA), Section 102. Precautions that have been or are being taken to assure that loan proceeds are not diverted to short-term emergency purposes (such as budgetary, balance of payments, or military purposes) or any other purpose not essential to the country's long-range economic development.

The proceeds of this loan will be used to construct a road in British Guiana.

2. FAA Section 201(d). Information and conclusion on legality (under laws of country and United States) and reasonableness of lending and relending terms of the loan.

Loan terms are consistent with United States and British Guiana laws.

3. FAA Section 251(a). Manner in which loan will promote country's economic development and contribute to the welfare of its people.

Road will open up interior of country for economic development and reduce social and political pressures resulting from overcrowded conditions in populous coastal cities.

4. FAA Section 251(b)(1). Extent to which country is adhering to the principles of the Act of Bogota and Charter of Punta del Este and is showing a responsiveness to the vital economic, political, and social concerns of its people, and extent to which country has demonstrated a clear determination to take effective self-help measures.

Account has been taken of the provisions of this section.

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5. FAA Section 251(b)(2). Information and conclusion on activity's economic and technical soundness. See Sections E and F.
6. FAA Section 251(b)(3). Information and conclusion on activity's relationship to other development activities, and its contribution to realizable long-range objectives. See Sections A and E.
7. FAA Section 251(b)(4). Information and conclusion on possible effects on U. S. economy, with special reference to areas of substantial labor surplus. This project will not have an unfavorable impact on the U. S. economy.
8. FAA Section 251(b). Information and conclusion on availability of financing from other free world sources, including private sources within the United States. Other free world financial sources are not interested in financing this project.
9. FAA Section 251(b). Information and conclusion on capacity of the country to repay the loan. It is believed that British Guiana has the capacity to repay this loan.
10. FAA Section 251(b). Information and conclusion on country's efforts to repatriate capital invested in other countries by its own citizens. Capital flight is considered not to be a major problem in British Guiana at this time.
11. FAA Section 251(b). Information and conclusion on reasonable prospects of repayment. It is believed that there are reasonable prospects of repayment of this loan.
12. FAA Section 251(c). Information and conclusion on availability of an application together with sufficient information and assurances to indicate reasonably that funds will be used in an economically and technically sound manner. There is sufficient information to indicate that the funds under this loan will be used in an economically and technically sound manner.

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13. FAA Section 251(g). Information and conclusion on use of loan to assist in promoting the cooperative movement in Latin America. NOT APPLICABLE.
14. FAA Section 252(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources. All funds under this loan will be used to procure goods and services from private sources.
15. FAA Section 601. Information and conclusion on whether loan will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; (f) strengthen free labor unions. Loan funds will be used to construct a road into interior of British Guiana thereby leading to strengthen the country's trade efforts and private initiative.
16. FAA Section 601(b); 621. Information and conclusion on how the loan will encourage and facilitate participation by private enterprise to the maximum extent practicable. If the facilities of other Federal agencies will be utilized, information and conclusion on whether they are particularly suitable are not competitive with private enterprise, and can be made available without undue interference with domestic programs.

Procurement of goods and services will be from private sources.

17. FAA Section 601(d). Conclusion and supporting information on compliance with the Congressional policy that engineering and professional services of U. S. firms and their affiliates are to be used in connection with capital projects to the maximum extent consistent with the national interest. This policy will be complied with.

18. FAA Sections 601, 602. Information and conclusions whether loan will (a) encourage U. S. private trade and investment abroad; (b) encourage private U. S. participation in foreign assistance programs (including use of private trade channels and the services of U. S. private enterprise), and (c) permit American small business to participate equitably in the furnishing of goods and services financed by it.

Loan will encourage private trade and participation, and American small business will have the opportunity to furnish goods and services.

19. FAA Section 604(a). Compliance with restriction of commodity procurement to U. S. except as otherwise determined by the President and subject to statutory reporting requirements. Will be complied with.
20. FAA Section 604(b). Compliance with bulk commodity procurement restriction to prices no higher than the market price prevailing in the United States at time of purchase. Will be complied with.
21. FAA Section 604(d). Compliance with requirement that marine insurance be purchased on commodities if the host country discriminates, and that such insurance be placed in the United States. Will be complied with.
22. FAA Section 611(a)(1). Information and conclusion on availability of engineering, financial, and other plans necessary to carry out the assistance and of a reasonably firm estimate of the cost of the assistance to the United States.

Necessary substantive technical and financial planning for the project has been completed and a reasonably firm estimate of cost for the project has been obtained.

23. FAA Section 611(a)(2). Necessary legislative action required within host country and basis for reasonable anticipation that such action will be completed in time to permit orderly accomplishment of purposes of loan.

Legislative approval of the loan is required before the Loan Agreement may be signed. It is expected that this approval will be obtained within a short period of time to permit orderly accomplishment of the purposes of the loan.

24. FAA Section 611(b); App. Section 101. If water or water-related land resource construction project or program, information and conclusion on benefit-cost computation. Not applicable.
25. FAA Section 611(c). Compliance with requirement that contracts for construction be let on competitive basis to maximum extent practicable. Will be complied with.
26. FAA Section 619. Compliance with requirement that assistance to newly independent countries be furnished through multilateral organizations as plans to maximum extent appropriate. British Guiana is a dependency of the United Kingdom. Other lenders are not interested in financing this project.
27. FAA Section 620(a); Foreign Aid and Related Agencies Appropriations Act of 1965 (Hereinafter "App.") Section 107. Compliance with prohibitions against assistance to Cuba and any country: (a) which furnishes assistance to Cuba or failed to take appropriate steps by February 14, 1964, to prevent ships or aircraft under its registry from carrying equipment, materials, or supplies from or to Cuba; or (b) which sells, furnishes or permits any ships under its registry from carrying items of primary strategic significance, or items of economic assistance to Cuba.

British Guiana provides no assistance to Cuba.

28. FAA Section 620(b). If assistance to the government of a country, existence of determination it is not controlled by the international Communist movement.

British Guiana is not controlled by the international Communist movement.

29. FAA Section 620(c). If assistance to the government of a country, existence of indebtedness 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. Not applicable.
30. FAA Section 620(d). If assistance for any productive enterprise which will compete in the United States with U. S. enterprise, existence of agreement by the recipient country to prevent export to the United States of more than 20% of the enterprise's annual production during the life of the loan. Not applicable.
31. FAA Section 620(e). If assistance to the government of a country, extent to which it (including government agencies or subdivisions) has, after January 1, 1962, taken steps to repudiate or nullify contracts or taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U. S. citizens or entities beneficially owned by them without taking appropriate steps to discharge its obligations.

British Guiana has taken no such action.

32. FAA Section 620(f); App. Section 109. Compliance with prohibitions against assistance to any Communist country. British Guiana is not a Communist country.
33. FAA Section 620(g). Compliance with prohibition against use of assistance to compensate owners for expropriated or nationalized property.

Will be complied with.

34. FAA Section 620(h). Compliance with regulations and procedures adopted to insure against use of assistance in a manner which, contrary to the best interests of the United States promotes or assists the foreign aid projects or activities of the Communist-bloc countries.

This project will not promote or assist the foreign assistance aid projects or activities of the Communist-bloc countries.

35. FAA Section 620(i). Existence of determination that the country is not engaging in or preparing for aggressive military efforts.

British Guiana is not engaging in such activity.

36. FAA Section 620(k). If construction of productive enterprise where aggregate value of assistance to be furnished by United States will exceed \$100 million, identification of statutory authority. Not applicable.

37. FAA Section 620(l). Compliance with prohibition against assistance after December 31, 1965, for the government of a country which fails to institute investment guaranty program. British Guiana has an investment guaranty program.

38. FAA Section 636(h); 612(c). Appropriate steps that have been taken to assure that, to maximum extent possible, country is contributing local currencies to meet the cost of contractual and other services and foreign currencies owned by the United States are utilized to meet the cost of contractual and other services. Borrower is contributing 50% of the local cost financing to this project. For discussion, see Section IV.

39. App. (Section Unnumbered). Use of funds to carry out FAA Section 205, which pertains to IDA. Not applicable.
40. App. Section 102. Compliance with requirement that payments in excess of \$25,000 for architectural and engineering services on any one project be reported to Congress. This requirement will be complied with.
41. App. Section 104. Compliance with bar against funds to pay pensions, etc., for military personnel. Funds under this loan will not pay for pensions, etc. for military personnel.
42. App. Section 111. Compliance with requirement for security clearance of personnel under contracts for services. Security clearance of personnel under contract for services will be obtained.
43. App. Section 112. Compliance with requirement for approval of contractors and contract terms for capital projects. Contractors and contract terms will be approved by A.I.D.
44. App. Section 114. Compliance with bar against use of funds to pay assessments, etc., of UN member. No funds under this loan will be used to pay assessments, etc., of UN.
45. App. Section 117. Compliance with regulations on employment of U. S. and local personnel for funds obligated after April 30, 1964 (Regulation 7). This requirement will be complied with.
46. App. Section 401. Compliance with bar against use of funds for publicity or propaganda purposes within United States not heretofore authorized by Congress. This requirement will be complied with.

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AID-DLC/P-351
ANNEX II
June 22, 1965

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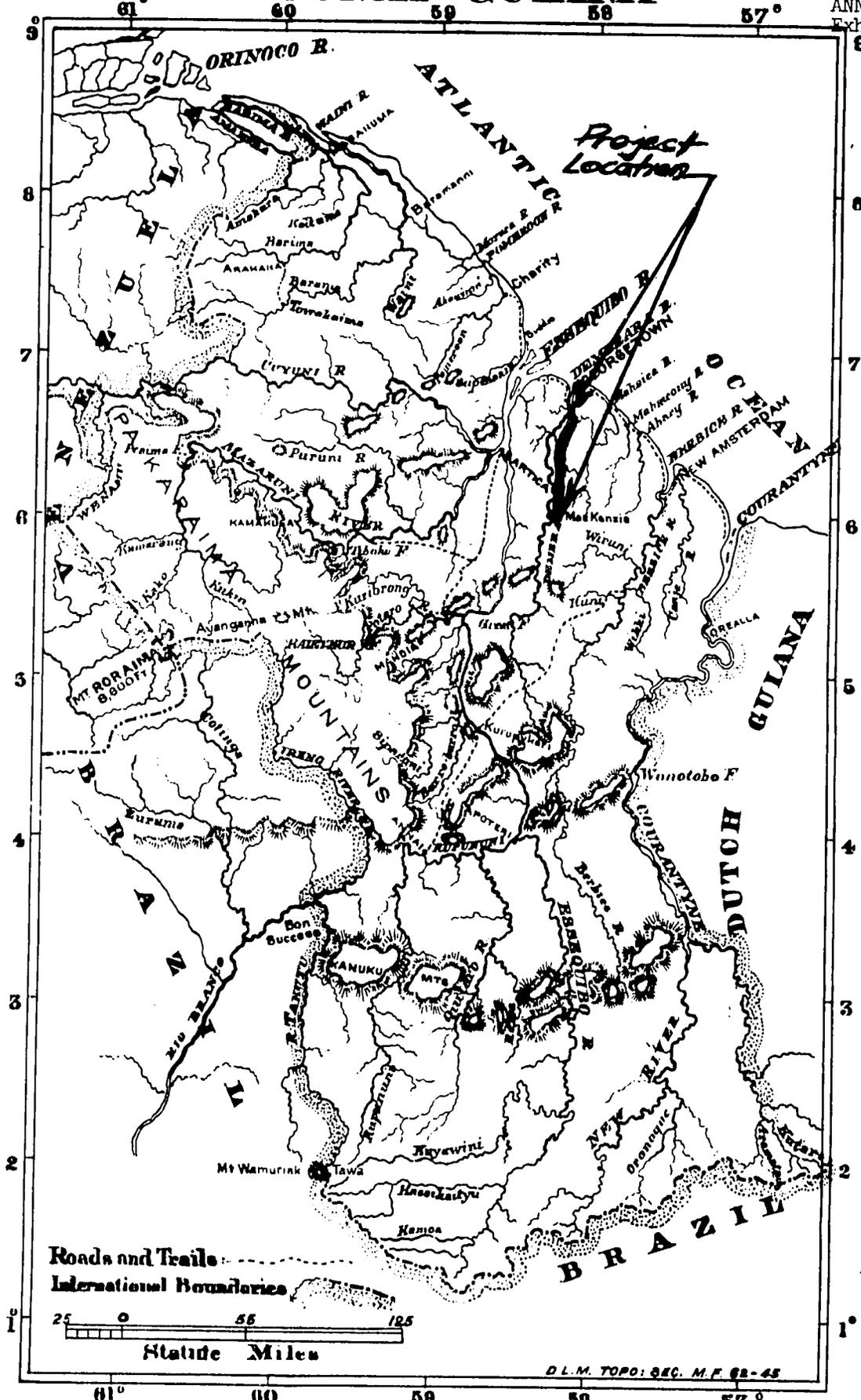
- 1 - Project Area Map
- 2 - Detailed Description of Project
- 3 - Design Standards
- 4 - Cost Estimate
- 5 - Bar Chart - Schedule of Operations
- 6 - Map - "Alternative Typical Section Paving"

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BRITISH GULANA

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Exhibit 1



Roads and Trails: - - - - -
International Boundaries: - - - - -



D.L.M. TOPO: SEC. M.F. 62-45

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Drawn by A. L. S. Own

DETAILED DESCRIPTION OF PROJECT

This project consists of the construction of 49,716 miles of highway from Atkinson Field, British Guiana's principal airport, to Mackenzie, the country's second largest city. In general, the location follows the Demerara River on top of the escarpment as close to the river as possible. At Mackenzie the road provides a direct connection with the Ituni Road toward the interior.

Plans, specifications, cost estimates and contract documents for the highway were prepared by the roads' division of the Ministry of Works and Hydraulics of the Government of British Guiana with the aid and advice of two U. S. A.I.D. engineers. Recently the cost estimate was reviewed by a U. S. consulting engineering firm to provide for construction by a U. S. contractor and to include engineering and contingency costs and to reduce the lane width to 11 feet and shoulder width to 5 feet.

The plans, as prepared, divide the road into five (5) sections with Section No. I (12,154 mi.) starting at Soesdyke on the Georgetown Atkinson Field Road. This section crosses the northerly end of the Atkinson Field reserve and thence southward to a point opposite the air terminal of Atkinson Field. At this point a connection of 3.86 miles is made to the air terminal and other facilities. Section II (8,523 mi.), III (11,303 mi), IV (11,110 mi.) and V (6,626 mi.) make up the balance of the 49,716 miles to Mackenzie.

Generally, the location from Atkinson Field to Mackenzie traverses the white sands along the escarpment as near as practicable to the good agricultural land near the river. Vegetation over the project varies from light shrub and second growth on the higher sand areas to heavy growth in low swampy ground.

The plans will provide for a two-lane 22 foot width one inch bituminous concrete pavement with 5-foot shoulders. The bituminous concrete surface will be placed on a one inch sand bitumen binder course with a six-inch cement stabilized base course.

Bridges will be constructed of a combination of timber and reinforced concrete, the superstructure being of Greenheart timber and the substructure of reinforced concrete bents and abutments with Greenheart timber piles. Greenheart timber is used because of its long life, prevalence in the country, and for economy as concrete aggregate is scarce and costly.

Culverts will be of reinforced concrete pipe in singles or multiples and of sizes as required.

DESIGN STANDARDS

Design Speed	50 m.p.h.
Minimum Curve Radius	1432 ft.
Maximum Grade	6%
Width of Pavement	22 ft.
Width of Shoulders	5 ft.
Minimum Width of Bridges	30 ft.
Width of R.O.W.	300 ft.
Design Loading	
Bridges	H15-S12-44
Pavement	9000 lb. wheel load

COST ESTIMATE

The estimated costs presented below are based upon a rate of exchange of 1.65 BWI dollars to 1 U.S. dollar:

<u>Description</u>	<u>U. S. \$</u>		<u>B.W.I. \$</u>	<u>Total U.S. \$</u> <u>Equivalent</u>
Construction Items	\$3,675,000	plus	\$3,014,100	\$5,501,700
Contractor Mobilization and Demobilization	110,000		---	110,000
Engineering Services	227,000	plus	58,400	262,400
Four Jeeps	12,000		---	12,000
Two Mobile Test Laboratories	21,000		---	21,000
Contingencies 10%	368,000	plus	301,400	550,000
TOTALS	U.S.\$4,413,000	plus	BWI\$3,378,900	US \$6,457,100

(US \$2,044,100)

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ESTIMATED COST OF CONSTRUCTION ITEMS
ATKINSON FIELD - MACKENZIE HIGHWAY
BRITISH GUIANA

Item Nos.	Estimated Quantity	Unit of Measure	Description	Unit Price		Amount	
				U.S. \$	B.W.I. \$	U.S. \$	(plus) B.W.I. \$
100 (1)	1,065.0	Acres	Clearing	\$135.00	\$115.00	\$ 143,775.00	\$ 122,475.00
100 (2)	486.0	Acres	Grubbing	40.00	32.00	19,440.00	15,552.00
102 (3)	2,470,000	Cu. Yds.	Common Excavation	0.54	0.24	1,333,800.00	592,800.00
102 (4)	260,000	Cu. Yds.	Borrow Excavation Class I	0.48	0.21	124,800.00	54,600.00
102 (8)	44,000	Cu. Yds.	Stripping Borrow Pits	0.21	0.08	9,240.00	3,520.00
102 (9)	8,858	Lin. Ft.	Furrow Ditches	0.06	0.25	531.48	2,214.50
102 (11)	340,000	Cu. Yds.	Swamp Excavation	0.38	0.20	129,200.00	68,000.00
103 (2)	1,261	Cu. Yds.	Excavation for Structures	3.78	2.60	4,766.58	3,278.60
104 (1)	none	Sq. Yds.	4-Inch Select Material Subbase	---	---	---	---
105 (1)	none	Yd/Mile	Overhaul Sandclay Binder Material	---	---	---	---
105 (2)	677,000	Ton/Mile	Overhaul Sandclay Base Material	0.08	0.08	54,160.00	54,160.00
	18,000	Tons	Cement for Soil Cement Base	23.00	1.16	414,000.00	20,880.00
200 (7)	1,000,000	Sq. Yds.	6-Inch Soil Cement Base	0.19	0.15	190,000.00	150,000.00
310 (3)	none	Gal.	Bituminous Prime Coat MC-O Cutback Asphalt	---	---	---	---
311 (1)	107,500	Gal.	Bituminous Tack Coat RC-2 Cutback Asphalt	0.30	0.04	32,250.00	4,300.00

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Item Nos.	Estimated Quantity	Unit of Measure	Description	Unit Price		Amount	
				U.S. \$	B.W.I. \$	U.S. \$	(plus) B.W.I. \$
322 (2)	1,910,000	Gal.	Asphalt Cement 60-70 Penetration	\$ 0.13	\$ 0.06	\$248,300.00	\$114,600.00
322 (6)	65,000	Ton	Hot-Mix Sand Bitumen Binder Course Grading C	3.03	6.09	196,950.00	395,850.00
322 (7)	37,500	Ton	Hot-Mix Bituminous Concrete Surface Course Grading D	3.63	10.42	136,125.00	390,750.00
400 (1)	8,192	Lin. Ft.	Untreated Timber Piles	0.75	2.60	6,144.00	21,299.20
400 (2)	432	Lin. Ft.	Test Piles	2.25	8.00	972.00	3,456.00
400 (22)	201	Each	Pile Shoes	5.40	1.00	1,085.40	201.00
400 (24)	6	Each	Load Tests	125.00	1,400.00	750.00	8,400.00
406 (3)	684.9	Cu. Yds.	Concrete Structures - Class AA Concrete	30.00	107.00	20,547.00	73,284.30
406B (1)	50	Cu. Yds.	Sandcrete	23.75	20.00	1,187.50	1,000.00
407 (1)	105,100	Lbs.	Reinforcing Steel	0.19	0.10	19,969.00	10,510.00
430 (1)	303.03	MBM	Untreated Timber	50.00	470.00	15,151.50	142,424.10
452 (1-A)	314	Lin. Ft.	18-Inch Spun Concrete Culvert Pipe	6.50	2.75	2,041.00	863.50
452 (1-B)	1,400	Lin. Ft.	24-Inch Spun Concrete Culvert Pipe	7.00	3.50	9,800.00	4,900.00

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Item Nos.	Estimated Quantity	Unit of Measure	Description	Unit Price		Amount	
				U.S. \$	B.W.I. \$	U.S. \$	(plus) B.W.I. \$
453 (2-A)	191	Lin. Ft.	24-Inch 14-Gauge Bituminous Coated Corrugated Metal Pipe	\$ 7.50	\$ 3.78	\$ 1,432.50	\$ 721.98
453 (2-B)	502	Lin. Ft.	30-Inch 12-Gauge Bituminous Coated Corrugated Metal Pipe	12.64	6.30	6,345.28	3,162.60
453 (2-C)	610	Lin. Ft.	36-Inch 12-Gauge Bituminous Coated Corrugated Metal Pipe	15.00	7.57	9,150.00	4,617.70
453 (2-D)	720	Lin. Ft.	42-Inch 8-Gauge Bituminous Coated Corrugated Metal Pipe	27.00	12.45	19,440.00	8,964.00
453 (2-E)	1,175	Lin. Ft.	48-Inch 10-Gauge Bituminous Coated Corrugated Metal Pipe	25.70	12.58	30,197.50	14,781.50
453 (2-F)	420	Lin. Ft.	54-Inch 8-Gauge Bituminous Coated Corrugated Metal Pipe	35.20	17.00	14,784.00	7,140.00
453 (2-G)	73	Lin. Ft.	72-Inch 10-Gauge Bituminous Coated Corrugated Metal Pipe	40.30	21.00	2,941.90	1,533.00
453 (2-H)	445	Lin. Ft.	78-Inch 8-Gauge Bituminous Coated Corrugated Metal Pipe	52.88	28.60	23,531.60	12,727.00
513 (1)	2,671	Sq. Yds.	Sacked Sandcrete Riprap	10.20	8.65	27,244.20	23,104.15
515 (1)	188,000	Lin. Ft.	Vertical Sand Drains	1.05	0.65	197,400.00	122,200.00
520 (5)	1,554	Lin. Ft.	6-Inch Bituminous Coated Perforated Corrugated Metal Pipe	2.60	1.10	4,040.40	1,709.40
520 (7) A	550	Cu. Yds.	Porous Back-Fill Material 3/4"	4.50	22.50	2,475.00	12,375.00

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Item Nos.	Estimated Quantity	Unit of Measure	Description	Unit Price		Amount	
				U.S. \$	B.W.I. \$	U.S. \$	(plus) B.W.I. \$
520 (7)B	524.9	Cu. Yds.	Porous Back-Fill Material 1/4"	\$ 4.50	\$ 22.50	\$ 2,362.05	\$ 11,810.25
521 (2)	8	Each	Drop Inlet	138.00	130.00	1,104.00	1,040.00
521 (10)	279	Each	Shoulder Dike Outlet	96.00	80.00	26,784.00	22,320.00
525 (1)	132,244	Lin. Ft.	Paved Drain Type I	0.90	3.00	119,019.60	396,732.00
525 (2)	598	Lin. Ft.	Paved Drain Type II	1.05	3.48	627.90	2,081.04
525 (3)	6,665	Lin. Ft.	Paved Drain Type III	0.86	2.48	5,731.90	16,529.20
525 (4)	9	Each	Paved Bends Type I	230.00	140.00	2,070.00	1,260.00
525 (5)	None	Each	Paved Bends Type II	---	---	---	---
525 (6)	111	Each	Paved Inlet Terminal Type I	72.00	60.00	7,992.00	6,660.00
525 (7)	2	Each	Paved Inlet Terminal Type II	76.80	64.00	153.60	128.00
525 (8)	110	Each	Paved Outlet Terminal Type I	72.00	60.00	7,920.00	6,600.00
525 (9)	3	Each	Paved Outlet Terminal Type II	74.40	67.00	223.20	201.00
525 (10)	57	Each	Dike Outlet Terminal Type A	72.00	60.00	4,104.00	3,420.00
525 (11)	120	Each	Dike Outlet Terminal Type B	55.20	46.00	6,624.00	5,520.00
525 (12)	102	Each	Dike Outlet Terminal Type C	62.40	52.00	6,364.80	5,304.00
531 (1)	64	Each	Traffic Separator Type I	18.36	13.80	1,175.04	883.20

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Item Nos.	Estimated Quantity	Unit of Measure	Description	Unit Price		Amount	
				U.S. \$	B.W.I. \$	U.S. \$	(plus) B.W.I. \$
531 (2)	70	Each	Traffic Separator Type II	\$24.00	\$20.00	\$ 1,680.00	\$ 1,400.00
533 (1)	177,623.2	Lin. Ft.	Bituminous Shoulder Dike	0.14	0.24	24,867.25	42,629.57
560 (4)	1,237	Each	Wood Guard Post	0.60	7.20	742.20	8,906.40
560 (5)	1,853	Each	Wood Delineator Post	0.40	4.50	740.20	8,338.50
TOTALS						\$ 3,674,253.18 (+)	\$ 3,014,117.69
TOTAL COST EXPRESSED IN U.S. DOLLARS						=	\$ 5,500,991.57
TOTAL COST EXPRESSED IN B.W.I. DOLLARS						=	\$ 9,076,636.09

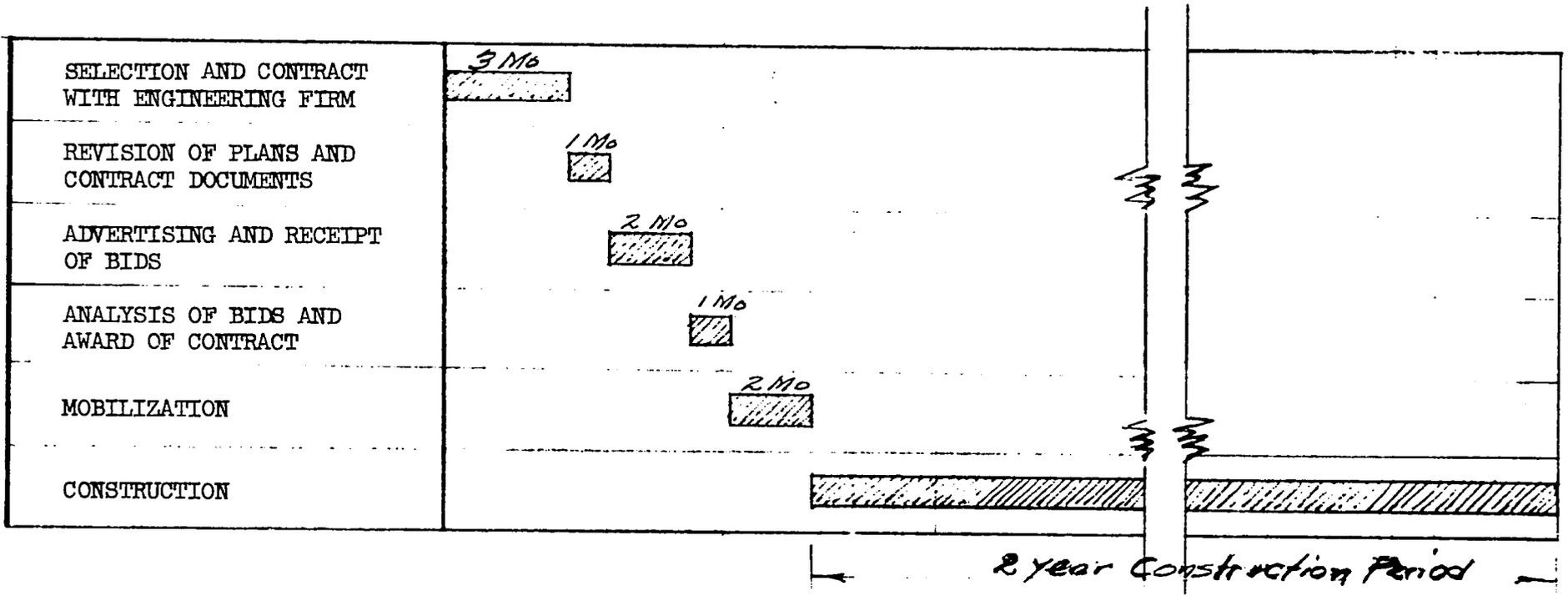
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BAR CHART

SCHEDULE OF OPERATIONS

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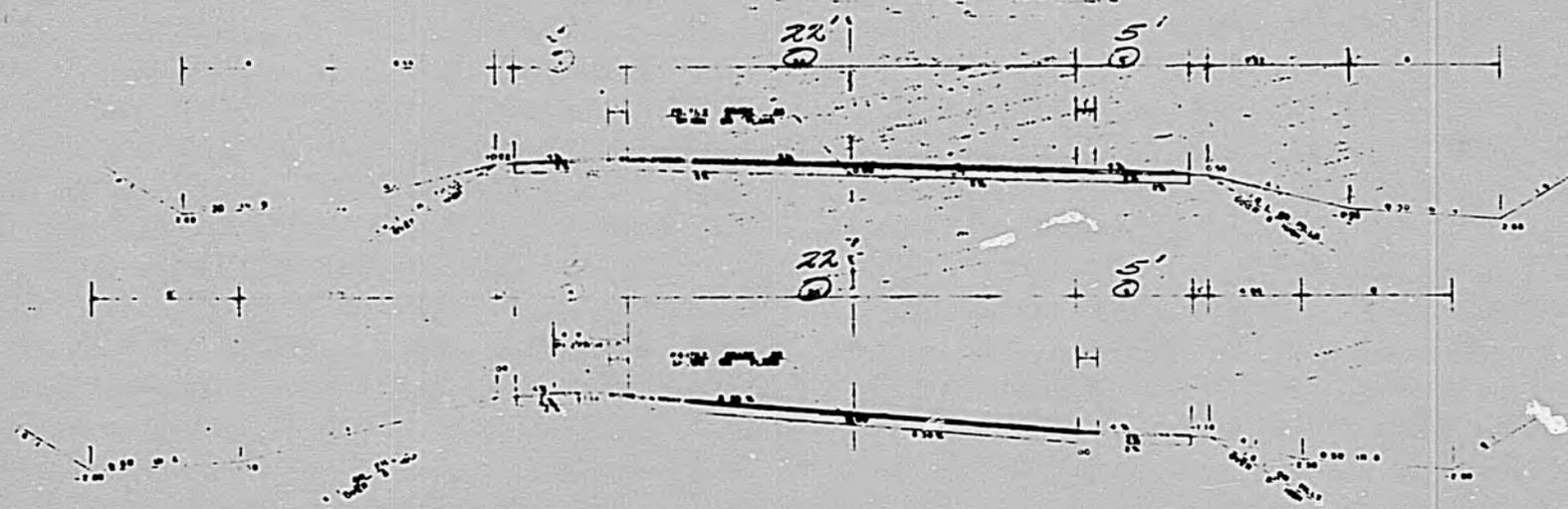
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to ~~4/15/65~~ **HEMC**
4/15/65
10/1

BITUMINOUS CONCRETE PAVEMENT



NORMAL CROSS SECTION



SUPER-ELEVATION SECTIONS

THE SHOULDER GRADES SHALL BE CONSTRUCTED IN FIRST CLASS THEN THE TRAFFIC SURFACE SHALL BE CONSTRUCTED TO FEET AND THEN THE SHOULDER SHALL BE CONSTRUCTED.

DESIGNED BY	CHECKED BY
DRAWN BY	APPROVED BY
DATE	SCALE
PROJECT NO.	DATE

MINISTRY OF WORKS & TRANSPORT
ROADS DIVISION
ATWENTH AVENUE ROAD

ALTERNATIVE TYPICAL SECTION PAVING

SCALE: 1" = 10'-0"

DATE: 4/15/65

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APPENDIX

A. <u>Population as Reported by the Census</u>	<u>Annual Rate of growth</u>	<u>% Growth</u>
1921 - 297,691	.00	
1931 - 310,933	.42	5
1946 - 369,678	1.13	19
1960 - 560,450	3.00	52

Geographical Distribution of 1960 Population

	<u>Number</u>	<u>%</u>
Georgetown	72,964	12.80
Suburbs of Georgetown	75,427	13.24
Sub-total	<u>148,391</u>	<u>26.04</u>
Accessible by Road to Georgetown		
East Demerara	108,517	19.04
West Berbice	23,249	4.08 /1
Sub-total	<u>131,766</u>	<u>23.12</u>
Total Accessible without Ferries	280,157	49.16
Accessible with Ferries to Georgetown		
West Demerara	62,216	10.92
Berbice	101,458	17.80 /2
With ferries	<u>163,674</u>	<u>28.72</u>
Total with and without ferries	443,831	77.89
Population that would be served initially by new road (largely Savannah)		
Upper Demerara	18,845	3.31
*East between rivers	1,500	.26
Polaro	12,029	2.11
Berbice River	3,275	.58
Sub-total	<u>35,649</u>	<u>6.26</u>

*Estimate

/1 - less Berbice River)

/2 - less West Berbice & Berbice River

	<u>Annual Rate of Growth</u>	<u>% Growth</u>
Total served, present and new road	479,480	34.14
To be served later with connect- ing roads		
Rupuduni	10,031	1.76
Essequibo	<u>80,326</u>	<u>14.10</u>
Sub-total	90,357	15.86
Total* with new and subsequent roads	569,837	100.00

B. Population Projections

1960	560,450	
1965 @ 3% per year	650,000	16
1970 @ 3% per year	753,200	34
1975 @ 3% per year	873,150	56

Population Served Initially by New Road

1960	35,649	
1965	36,500	.75 5 (assumed)
1975	60,000	5 63
1985	118,000	7 97

Note: The access trails that the government covenants to improve to useable roads, and for which we allowed an investment of \$10 million, will reach an additional population estimated at about 93,800 for 1965. (The 1960 population of 90,357 increased by 3/4% per year for five years.) As these roads are developed, and the tributary population grows, the total population served by the road may considerably exceed the 118,000 figure shown above. If the present estimated 93,800 population grows by 2% per year as a result of improved access, it would approximate 140,000 by 1985. This, added to the 118,000 figure shown above, yields a total of about 260,000, more than twice the figure used in the text. Even should the government proceed more slowly than planned, the economic activity in the area that will be made tributary to the road may therefore be as great or greater than that allowed for in the text. (continued)

*This does not quite jibe with the present census totals (which are ordinarily about 560,500); but we could not find the discrepancy (except for the 1,500 estimate for East between rivers) which comes to under 2%. The order of magnitude of the distribution is not affected by this discrepancy.

Note: (continued)

One possibility, for instance, is the shipment of beef from the Pupununi area. Cattle are raised in this area but beef must be shipped out by air. When the beef can be shipped by truck, as will be possible once the road to Mackenzie is built and the trail south from the 45-mile road already in existence leading from Mackenzie towards Rupununi, is improved, then beef and other agricultural operations, can be increased. This was not allowed for in the text and provides an additional safety factor for the benefit/cost and rate of return estimates.

SOILS

Only a small proportion (about 3%) of the useable land is farmed. The following figures are taken from unpublished FAO studies.

Class* soil in square miles

Region	Total	%	I & II	%	III	%	IV	%	Unmapped	%
N.E.	17,340	100	6,460	37	4,635	27	5,695	33	550	3
S.E.	14,040	100	00	0	12,425	89	1,155	8	460	3
W. Central	12,720	100	00	0	1,690	13	6,730	53	4,300	34
S.W.	18,965	100	170	1	14,445	76	4,185	22	165	1
N.W.	19,590	100	4,755	24	9,990	51	1,565	8	3,280	17
Total	82,655	100	11,385	14	43,185	52	19,330	23	8,755	11

*Class I and II are good to moderate for farm purposes; class III are poor, class IV are not suitable for farming, they require heavy fertilizing and possibly irrigation as well, even when flat.

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SAVANNAH CULTURE

The Ministry of Agriculture submitted the following estimates of "minimum value of output per acre" and suggested acreage of "two types of brown sands suitable for agricultural purposes (810 and 820)". Note: these are Class II sands.

Crops	Value output per acre	Suggested Acres -	Area Sq. Mile	Value of output
In U.S. Dollars				
Fruit	180	\$50,000	78.1	\$9,000,000
Pineapples	360	10,000	15.6	600,000
Corn*	65	20,000	31.3	1,300,000
Legumes	215	20,000	31.3	4,300,000
Vegetable crops etc.	240	5,000	7.8	1,200,000
Tobacco	1,000	1,000	1.6	1,000,000
Cabbage	540	1,000	1.6	540,000
Grass for stock	<u>120</u>	<u>90,000</u>	<u>140.6</u>	<u>10,800,000</u>
Total	160	197,000	307.8	\$31,740,000

* Suggested value along the river was but \$30 per acre, U.S. yields average about 65 bu. per acre, at unsubsidized price on the farm of about \$1.10 or \$71 per acre farm value. The \$65 per acre for British Guiana seems high. Fertilizer costs per acre are estimated at about \$10.

ESTIMATES OF TIMBER RESOURCES

Dem/Ess. Rivers between the Wismar Rockstone Road

AND

Arisauru Mountain Area - and as shown on attached map.

SUMMARY

(a) VOLUMES

Estimated volume of timber on area	100,000,000 cu.ft.
- 20% to convert to Hoppus Volume	20,000,000
	<hr/>
	80,000,000 cu.ft. Hoppus
- 20% Defective timber	20,000,000
	<hr/>
	60,000,000
- 30% losses due to fire, extraction etc. since time of survey.	30,000,000
	<hr/>
	30,000,000 cu.ft.
	<hr/>

(b) Timber species available - USES

The most abundant species in the area are listed below, with frequencies .2 trees per acre and over.

Species	No. trees per acre	Uses
Wallaba	1	Firewood, Charcoal.
Dakama	.7	Firewood, Charcoal.
Kabukalli	.4	Heavy construction, flooring.
Yaruru	.4	Paddles, axes, tools.
Wamara	.2	Furniture etc.
Moroballi	.2	General construction.

ESTIMATES OF TIMBER RESOURCES

Dem/Ess. Rivers between the Wismar Rockstone Road

and

Arisauru Mountain Area - and as shown on attached map.

METHOD "A" - Based on pre 1952 Forest Surveys

(i)	TOTAL AREA	516,000 acres
(ii)	Total No. of trees per acre - <u>16" Diam & over all species</u> - as shown at Group 3 of Forestry Bulletin 1	6 trees per acre
(iii)	Total No. of trees on total area	3,096,000 trees
(iv)	Volume of timber available assuming that the average tree has 30 cu. ft.	
		92,880,000 cu.ft

METHOD "B" - Based on other data compiled in misc: areas since 1952 - for all species 12" Diameter and over.

Categories of Forest area	Acres	No of trees per acre	Total No. of trees on area	Estimated Total Volume
(i) Rain Forest	61,000	20	1,220,000	(30 cu.ft. per tree)
(ii) Wallaba	71,500	20	1,430,000	
(iii) Low Forest	218,500	1	218,000	
(iv) Wet Savannah	17,500	1	17,500	
(v) Dry Savannah	32,500	-	-	
(vi) Evergreen Forest	60,000	10	60,000	
(vii) Swamp Forest	55,000	15	825,000	
TOTAL	516,000	7	3,770,500	113,115,000

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GROSS CAPITAL FORMATION *

BY TYPE INVESTMENT

(\$000,000 B.W.I. omitted)

	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
Retained Imports of Machinery, etc.	50.6	40.4	29.8	3.50	25.0
Domestic Production of Machinery, etc.	7.4	3.6	1.8	2.0	1.0
Private Construction	14.1	10.8	10.4	15.0	10.0
Government Construction	9.9	15.6	15.5	30.0	20.0
Plantations & Mines	5.9	7.0	2.4	3.0	2.0
Inventories	1.8	-1.0	5.2	0.0	0.0
	<u>89.7</u>	<u>76.4</u>	<u>65.1</u>	<u>85.0</u>	<u>58.0</u>

* Estimates supplied by the Ministry of Finance.

Estimate of possible Agricultural Production along Mackenzie
Atkinson Road (based on material from Ministry of Agriculture)

Acreage*	Commodity	Output**	Unit value US	Gross Value ***	Value per acre
1,000	Tobacco	1,200	\$700	\$ 850	\$850
100	Tomatoes	800	90	70	700
200	Peas & beans	400	150	60	300
100	Leaf crops	2,000	35	70	700
500	Cabbage	2,500	90	225	450
1,500	Corn	2,250	25	45	30
3,750	Coffee	2,500	250	625	165
3,000	Cassava	33,500	12	400	135
2,000	Sweet Potatoes	20,000	24	480	240
500	Tannias	4,400	24	105	210
600	Yams	6,000	24	145	240
750	Eddoes	6,700	12	80	100
500	Pineapples	7,500	35	260	130
500	Bananas	7,500	70	520	260
15,000	Total	99,750	\$	\$3,935	\$260

* These crops are already grown in British Guiana. Poultry and commercial operations not included in above. They can be handled on land not suitable for farming.

** In 1000 lb. units.

If corn and cassava are omitted, the average yield per acre, as estimated here would exceed \$320 U.S. Tobacco is being grown successfully. If its culture is expanded more than shown here, and the more successful crops are pushed, the yield may be held above the \$250 per acre used in the text.

The corn yield estimates are probably too low. Other government officials estimated a yield of \$60 U.S. per acre, double the figure used here. Other estimates of pineapple yields came to \$240 per acre - nearly double the figure in this table. I have tried to be conservative in the estimates. The soil is good, but the husbandry may not match it for some time.

*** In thousands of dollars.

Area farmed along Georgetown Mackenzie Road (quote of G. Steele-
24 March 1965)

Between the Diamond Estate and Atkinson Field, on the east side, Demerara River, are about 34 square miles (21,760 acres) of soils that are mainly river deposited silts and clays. East of this band is a large acreage of deep peat that is used as a water conservancy.

The deep silts and clays are good soils for agriculture. Near the peat there is in many places a peaty clay that contains toxic amounts of aluminium and of sulphates. These soils make up perhaps 10 or 15 percent of the total area, about 2500 acres. Where the surface layer of peat has been burned, toxicity of the remaining soil is increased.

Nonfarming establishments along this strip include poultry producers near Atkinson Field.

Note: 21,760 acres less 2,500 = 19,160 acres available for farming (and now taken up for farming). Robinson Newcomb

SOILS ALONG THE PROPOSED ATKINSON-MACKENZIE ROAD7th April, 1965

Without time to make even an exploratory field study, the following estimates of soils along the Demerara River have been made from aerial photographs and available reconnaissance soil surveys.

The road itself runs almost entirely through white sand, designated on recent soil surveys as Tiwiwid sand, map symbol 700. According to all reports and observations, this soil has little value for cultivation unless the farmer is prepared to supply all the needed plant nutrients and to irrigate frequently. Some soils suitable for farming, however, lie along the river banks.

Soils suitable for farming, according to the best estimate than can be made now, amount to about 22,500 acres; 13,000 acres along the east (right) bank, and 9500 acres along the west bank. These are the fine loamy and the clayey soils that lie on the natural levee near the river. Peat and other low, wet soils, back of the natural levees and in valleys of the tributary streams, amount to about 27000 acres more; 17,000 acres on the east and 10,000 acres on the west bank. These wet, mostly organic soils are not suitable for farming without extensive drainage, and most of them would be of low quality even if drained. They will offer problems in location of feeder roads.

Width of the band of favourable soils on each side of the river ranges up to almost one mile. Average width on the east bank is nearly one-half mile; on the west bank it is somewhat less. The maximum width on the east bank, at Long Creek, is about one mile.

Study of the aerial photographs, which were made in 1950, suggests that from one-fourth to one-third of the favourable soils were cleared some time or other before that date. Most of the clearings were in the northern half of the strip, within about 20 miles of Atkinson field.

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Among the soils judged to be favourable for farming, the principal types appear to be similar to those designated on soil surveys as De Velde (1s and 1c), Canje (31) and probably Tuschen (39) and Brickery (36) soils. De Velde silt loam and De Velde clays are in Capability Subclass If, and with proper fertilizer are well suited for a wide variety of crops. They are well suited for banana, ground provisions, vegetables, soybeans, and maize and moderately well suited for citrus, coconuts, cocoa and planted pasture. Canje clay is in Capability Subclass IIm because of slow permeability and some resulting difficulty in water management along with the need for a good programme of soil fertility. It is moderately suited for most of the crops named. Tuschen clay is underlain, beneath a depth of 36 inches, by soft wet clay that in many places contains acid sulphates. It is classified in Capability Subclass IIf, suitable for many crops but moderately limited by acid sulphates or toxic salts in the lower subsoil. Brickery clay (36) has a depth of 12 to 36 inches over soft clay that contains sulphates. In many places it lies close to areas of peat or of acid sulphate soils. It must be regarded as poor agricultural land, and its Capability Subclass is IIIIt, severely limited by toxic salts.

Relative proportions of Class I, class II and class III land cannot be estimated at this time, but will be revealed by soil surveys.

FOREIGN EXCHANGE

UNCLASSIFIED
ANNEX III, 13 of 13

If the population grows a third by 1975, and 50% by 1980 (or by slightly less than 3% per year) and if imports of food continue at the 1964 rate, they will exceed \$2.3 million U.S. in 1975 and exceed \$30 million U.S. in 1985. By 1990 they would reach \$3.4, if per capita imports are not changed and the population continues to grow at about 3% per year.

If it is possible to reduce per capita imports by 3% as a result of this road, and its related investments by 1975, by 10% by 1980, and by 20% by 1985, this would mean an annual reduction in imports of about \$700,000 per year by 1975, \$2.7 million by 1980 and if over, \$6 million per year by 1985. The cost of paying \$6.5 million in equal annual installments, over a 20-year period, with interest at 8% is about \$650,000 per year. The cost of the estimated \$20 million investment suggested as needed, will approximate \$2 million per year, for the twenty years, with interest at 8%. Under the assumptions listed the road will save its own foreign exchange costs within ten years, and be earning nearly ten times its foreign exchange costs in twenty years. It will be earning its own and the related other investment costs assuming they are all foreign investment costs, within 15 years, and more than three times the total investment costs, in terms of foreign exchange saved in twenty years.

Actually the road should do much better than this.

UNCLASSIFIED

LOAN AUTHORIZATION (D R A F T)

Provided from: Alliance for Progress Funds
BRITISH GUIANA: Atkinson Field-Mackenzie Road

Pursuant to the authority vested in the Deputy U. S. Coordinator, Agency for International Development ("A.I.D."), by the Foreign Assistance Act of 1961, as amended, and the delegations of authority issued thereunder, I hereby authorize the establishment of a loan ("Loan") pursuant to Part 1, Chapter 2, Title VI, Alliance for Progress, to the Government of British Guiana ("Borrower") of not to exceed five million five hundred thousand United States dollars (\$5,500,000) for the construction of a highway from Atkinson Field, British Guiana, to Mackenzie, British Guiana ("Project"), this loan to be subject to the following terms and conditions:

1. Interest and Terms of Repayment

Borrower shall repay the loan to A.I.D. in United States dollars within forty (40) years from the first disbursement under the loan, including a grace period of not to exceed ten (10) years. Borrower shall pay to A.I.D. in United States dollars on the disbursed balance of the loan interest of one (1) percent per annum during the grace period and two and one-half ($2\frac{1}{2}$) percent per annum thereafter.

2. Other Terms and Conditions

- (a) Prior to the execution of an agreement between the United States and Borrower for the purpose of making the loan ("Loan Agreement") A.I.D. shall receive satisfactory evidence that the Government of Great Britain has no objection to the loan.
- (b) Prior to the execution of the Loan Agreement, Borrower shall submit evidence satisfactory to A.I.D. that Borrower will make available financial and other resources apart from the loan as necessary for the successful and timely completion of the Project.
- (c) Prior to any disbursement of the loan for construction costs, Borrower shall submit a plan satisfactory to A.I.D. for maintaining the Project.

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- (d) Equipment, materials and services (except shipping and marine insurance) financed under the loan shall have their origin in and be procured from the United States or British Guiana. Shipping financed under the loan shall be procured from the United States, and marine insurance financed under the loan shall be placed in the United States.
- (e) United States dollars utilized under the loan to finance local currency costs shall be made available to Borrower or its designee through appropriate procedures and shall be used only for procurement in the United States.
- (f) Borrower shall covenant to use its best efforts to submit to A.I.D. within one year from the execution of the Loan Agreement in form and substance satisfactory to A.I.D.:
 - (i) a plan for the orderly development of access trails and roads within the geographic areas affected by the Project;
 - (ii) a plan for effective control of the agricultural areas opened by the Project to insure the orderly development and utilization of such land; and
 - (iii) a plan for settlement of farmers in the agricultural areas having access to the Project, including a plan for the establishment of a supervised agricultural credit program with the assistance, as necessary, from free world countries.

Borrower shall covenant that, within one year after the submission, in form and substance satisfactory to A.I.D., of the plans described in (i), (ii) and (iii) above, Borrower shall submit to A.I.D. evidence of action taken to implement such plans.

- (g) Borrower shall covenant to maintain the Project and shall covenant to make adequate provision in its budget annually for that purpose. Such amount shall be in addition to amounts Borrower provides in its budget annually for the maintenance and upkeep of other roads and trails in British Guiana.

- (h) This loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

Deputy U. S. Coordinator
Alliance for Progress

Date

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