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

Proposal and Recommendations
For the Review of the
Development Loan Committee

COLOMBIA - SMALL FARMER MARKET ACCESS LOAN

AID-DLC/P-2121

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

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September 17, 1975

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Colombia - Small Farmer Market Access Loan

Attached for your review are the recommendations for authorization of a loan in an amount not to exceed \$5.0 million to the Government of Colombia to assist in financing the United States dollar and local currency cost of a project for access and construction and maintenance activities and institutional development of the implementing agency, Caminos Vecinales (CV).

The loan proposal is scheduled for consideration by the Development Loan Staff Committee on Wednesday, Sept. 24, 1975; please note your concurrence or objection is requested by close of business on Friday, Sept. 26, 1975. If you are a voting member a poll sheet has been enclosed for your response.

Development Loan Committee
Office of Development Program
Review

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COLOMBIA

SMALL FARMER MARKET ACCESS LOAN

August 30, 1975

COLOMBIA: SMALL FARMER MARKET ACCESS

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PROJECT COMMITTEE:

JAMES KEARNEY - CHAIRMAN - LOAN OFFICER
ALFONSO CORREDOR - TRANSPORTATION PLANNER
DWIGHT STEEN - AGRICULTURAL ECONOMIST
RAY RIFENBURG - PROGRAM OFFICER
BRUCE ODELL - AID/W LOAN OFFICER
WILBUR CAMP - AID/W ENGINEER
VALIENTE DEL VALLE - PROJECT ADVISOR

CREDIT MUST BE GIVEN TO THE CAPITAL ASSISTANCE
COMMITTEE WHICH PREPARED A CAP FOR THIS PROJECT
PRESENTED JUNE 12, 1975:

RICHARD FREDERICK - CHAIRMAN
JAMES KEARNEY - LOAN OFFICER
RAYMOND RIFENBURG - NUTRITION ADVISOR
CHRISTIAN GOMEZ - MARKETING ADVISOR
ROBERT CATE - AGRICULTURAL ADVISOR
DAVID PEACOCK - AGRICULTURAL ECONOMIST
DWIGHT STEEN - AGRICULTURAL ECONOMIST
AGAPITO OLEA - AGRICULTURAL ADVISOR
DOUGLAS ROBERTSON - LEGAL ADVISOR
LORENZO HAUSMAN - AID/W LOAN OFFICER
MICHAEL DEMETRE - AID/W ECONOMIC ENGINEER
WALTER McDONNELL - AID/W ENGINEER

STATISTICAL ANALYSIS

HECTOR SARMIENTO
CONSUELO ALARCON
MARIA CRISTINA GALAN

B. RECOMMENDATIONS

Loan	US\$5,000,000
(Terms: 40 Years, 10 Year Grace, 2% during Grace -----3% thereafter)	_____
Total New AID Obligation-----	US\$5,000,000

C. DESCRIPTION OF THE PROJECT

The proposed \$12.0 million project, including the \$5.0 million AID loan, will consist of two major components: access road construction and maintenance activities and institutional development of the implementing agency, Caminos Vecinales(CV).

Loan funds will be used to shift the Pico y Pala focus from feeder road construction as an employment generating mechanism to feeder road construction as a key factor in promoting increased-agricultural productivity. The road construction funds under this project would be used, along with GOC counterpart, to build approximately 890 Km. of access roads in areas which have been selected on the basis of having a considerable socio-economic payoff, primarily measured by agricultural productivity and economic internal rate of return calculations. The Pico y Pala project will complement, although not be necessarily limited to, road construction in those areas within the GOC's Integrated Rural Development (DRI) plan. Loan funds would give equal priority to areas where related inputs and services are assured and where considerable production potential exists for the nine crops given priority under the GOC's Nutrition Plan. To insure continued benefit from project-financed roads (and earlier AID-financed roads), \$1,000,000 of the GOC funds during the loan disbursement period would be used, to provide for adequate maintenance.

The technical assistance and training components of the proposed project would be used to institutionalize key factors necessary for the long-term effectiveness of Pico y Pala. The principal improvement will be the establishment and staffing of a Subproject Selection and Evaluation Office within CV. This office, staffed by engineers, economists and agronomists and assisted with short-term technical assistance, will participate in pre-selection studies of proposed road projects in order to establish the economic rate of return and to insure that projects satisfy most of the selection criteria. The office will also initiate an impact study to provide baseline data to aid in assessing the actual impact of specific feeder road projects. A second objective of the technical assistance and training will be to instill in Pico y Pala engineers an active awareness of key design, maintenance and environmental considerations in road construction.

D. SUMMARY FINDING

On the basis of the conclusions of the Project Committee that the Project is technically, economically and financially sound, it is recommended that a loan be authorized to the Government of Colombia in an amount not to exceed \$5.0 million.

The recommendation is based on the overwhelming finding that the project will have a substantial and lasting effects to improve the welfare of the poorest of the rural poor. It has been recognized that careful management of the inputs of this project will be necessary for achievement of the purposes of this loan. The Project Committee finds the various aspects of the project ready for implementation as indicated in the Implementation Plan Section IV.B.

The Project meets all applicable statutory criteria (See Annex I, Exhibit 1). The USAID Mission Director in Colombia has certified that Colombia has the capability to effectively maintain and utilize the Project. (See Annex I, Exhibit 2).

E. PROJECT ISSUES

1. The DAEC Instruction Cable (State 87272)

A. Project Rationale

Part II.B. of the PP discusses the project strategy to increase agricultural production through an attack on the transportation constraint in marketing.

B. Previous AID Experience

Section II.A. of the PP describes previous AID experience. Although available information is very limited, the roads appear to have achieved their employment generation objective. The agricultural impact could not be quantified, but interviews with groups of small farmers have shown several varied but generally positive results. Part II.B.5.c. discusses the maintenance problem and proposes a correcting strategy.

The principal problems, besides maintenance, include the need for development-oriented selection criteria and an evaluation office. The project description address these concerns.

C. Institutionalization

The institutional changes desired in Caminos are discussed in Part II.B.5.c. of the Project Description.

D. Sub-project Analysis & Selection

New project selection criteria and a methodology for project analysis are discussed in the Project Description. Small farmers are the principal beneficiaries of the proposed project. The other constraints to increased agricultural production are discussed in Section II.A. Caminos Vecinales will seek correction of GOC policies which pose serious constraints to specific subprojects.

E. Community Participation

Community willingness to provide voluntary labor during construction is a criterion included in the project selection criteria checklist. As regards maintenance, the local communities are not responsible for road maintenance, although occasionally they contribute to it out of self interest. A maintenance capacity study will focus on ways to incorporate community participation in maintenance service.

F. Cost and Labor/Equipment Mix

Section III.A. includes a discussion of costs of construction.

G. Relationship to Other AID Activities

Section II.B.4 discussed this subject.

H. Disbursement

The project has a three year disbursement period. The fixed reimbursement issue is discussed below.

I. Supervision and Monitoring

The Mission currently has a loan officer - engineer and a transportation engineer assigned to this project. They are capable of adequate supervision and monitoring of this project.

J. AID/W Assistance

Excellent AID/W assistance was provided in the preparation of the CAP and the PP.

2. The DAEC Instruction Cable (State 176842)

A. Fixed Amount Reimbursement method FAR

AID/W suggested that the Mission consider a fixed reimbursement method for this project. It has been determined that a fixed amount of AID financing can be determined before sub-project initiation. Such fixed amounts will be estimated from base unit costs for different types of terrain. Also, reimbursement after completion can be affected if some monthly progress payments are allowed. Part IV.B.2. explains how loan disbursements will be made for road construction.

B. "On-Going" Construction

All sub-projects will be considered as new projects for selection purposes from the physical point of departure of the existing connecting road. Therefore, no AID loan funds can be considered as financing "on-going" construction.

C. Maintenance

Camino Vecinales will assume the responsibility for

maintenance of Pico y Pala roads. National Government funds will be available to carry out the maintenance. 1976 calendar year funds are programmed to more than adequately cover maintenance requirements in 1975. Caminos Vecinales will covenant to provide necessary maintenance funds as programmed in Part II.B.a.

Caminos Vecinales is preparing the mechanisms to effect such maintenance and will be assisted by the loan in the financing of a study to examine maintenance mechanisms. The GOC and AID are particularly interested in developing a sound mechanism that would allow community groups to participate in the maintenance of their own community roads.

PART II - PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. BACKGROUND

1. Colombian Agriculture Sector - Summary

Agriculture continues to play the critical role in the Colombian economy, contributing approximately 30% of the nation's gross domestic product, employing almost half of the country's labor force and providing 85% of the value of exports, excluding petroleum. Despite recent progress, the sector is not, however, developing its potential sufficiently or making the optimum contribution to overall growth.

Agriculture in Colombia is highly dualistic. The older and far more populous small farmer or "traditional" subsector has subsisted over hundreds of years, predominantly in the mountainous areas of the country and along portions of the north coast. Except for coffee, the bulk of the crops produced by this group consists of the basic foods suited to the area and elevation in which they live. The principal crops grown are food (corn, potatoes, wheat, yuca, peas, carrots, arracacha and barley). There is also considerable production of dairy and beef cattle. Out of necessity, the small farmer has been primarily a "subsistence" farmer with a "no input" or "low input" operation. His technological level is low and consequently so are his levels of production. In many instances new practices have not been readily adopted even when available because of the additional risk inherent in change.

The second or so-called "commercial" subsector has developed in Colombia largely since World War II. It consists primarily of medium, and larger farms principally located in the flatland areas of the valleys and savannas and a large part of the north coast region. This commercial subsector is mainly engaged in the production of cotton, rice, oil crops, sorghum, sugar, beef, dairy and poultry. In general the commercial producer uses a much higher level of technology than the small farmer. He is more highly mechanized because his land is more suitable to mechanization and he has access to the capital required for farm machinery. However, because of the nature of the terrain, and in the lowland areas, the climate, he is faced more often with serious problems of flooding, drainage and more serious insects and diseases than his mountain counterpart. Consequently, the commercial operation requires a greater investment per unit of production and demands a higher level of technology in order to break even.

Since 1960 there has probably been only a slight shift from large to medium size farms, and no significant change in the minifundio problem. There have been, however, some significant colonization expansion on some frontiers. The work of INCORA in land redistribution and its encouragement to colonize public lands has been responsible for a great deal of this shift.

Although there have not been significant changes within land holding patterns, there appear to be an increasing number of "small farmers" that are moving into "commercial" status. Smaller owner operators who are fortunate enough to be located near a road and within a reasonable distance of a city are gradually changing their production patterns. They are producing more vegetable or other high value crops for the market and thus are rising above the "subsistence" level.

This probably accounts for the interesting phenomenon discussed in the Agriculture Sector Analysis, where data exists showing that a steady decline in income per acre results as farm size increases. This may indicate that on the average the smaller farms are producing on a greater proportion of their land than are larger farms. At least a part of the reason for this, however, is because larger farms tend to be located on poorer land, some of which is suitable only for extensive production or is limited by lack of infrastructure. Income per acre harvested may be quite different; nevertheless, the data indicates that small farms are making relatively good use of their land resources. A very large part of the potentially productive agricultural land in Colombia is only beginning to be utilized for agriculture or is not being used at all. This consists of a sizeable portion of the eastern Llanos, the southeastern forest (or Amazonia jungle) area and the lower Magdalena river valley, including large sections of the northern lowlands. Most of this area has little or no infrastructure. Most also has very scarce or extremely scattered population at present, although colonists are beginning to push rapidly into the western edge of the Llanos and the western edge of the Amazonian area in Putumayo and Caqueta. The total agricultural potential of this undeveloped area is estimated to be considerably greater than the total present agricultural production in Colombia.

Besides transportation which is discussed elsewhere, there are many serious constraints to the development of the rural populace. The majority of farmers live in the mountainous regions between 3,000 and 9,000 feet. (A very high proportion of the land in these areas is too steep to mechanize and the constraints imposed by the nature of the terrain are sufficient to preclude any significant increase in farm size in this area. A large part of the land that is sufficiently level to permit a high degree of mechanization is presently in areas of limited accessibility or with limited services. These highland regions are further characterized by serious problems of erosion, poor soil, etc. Secondly, traditional farmer yields have barely increased in the past decade, since this group has little access to good land, necessary production inputs and technology, transportation and stable marketing arrangements. Between low productivity and high intermediary costs, the return to the small farmer has been low.

2. Characteristics of the Rural Populace

Rural Colombia represents approximately 40% (9.5 to 10 million) of the total population. A 1970 DANE survey indicates that 48% of the available male labor force and 6.5% of the female labor force are economically active in agriculture. Estimates of unemployment and under-employment vary widely, although the Colombian Agriculture Sector Analysis estimated that

overall yearly unemployment and under-employment is 25% (P.170).

Incomes of most farmers are limited; an estimated 60% of the rural populace have monthly cash incomes of less than \$17 (compared to under 30% in urban areas). Most of the rural inhabitants are traditional small farmers. Approximately half (48%) of the rural families operate their own small farms, although only 24% receive wages solely from agricultural work. A small number (13%) both operate small farms and receive agricultural wages.

Farm Size in Colombia, as in most Latin countries, is sharply skewed to small holdings. Farms under 20 hectares constitute 94% of the land under cultivation for most food crops. The Sector Analysis estimates that almost two thirds of all farms are less than five hectares in size (P.14).

Education in the rural areas is minimal. An average of two and one-half years of schooling for rural children gives a meager literacy base, but one which enables continuous informal information (ag publications radio extension courses) to be effective. Rural Health services leave much to be desired in Colombia and improvement in the general rural health would most likely result in increased productivity per workers. Under the GOC Nutrition Plan Strategy rural health is a sector that will receive considerable attention.

3. GOC Development Strategy

The Colombian Government that assumed office in August, 1974 has moved slowly in establishing its development priorities. It has, however, already indicated that it will give the highest priority for government investment to programs aimed at improving the quality of life of the lowest half of the income distribution. In early 1975, with the publication of its National Health and Nutrition Plan, the GOC provided a central focus for its development strategy. In the short run, it believes that improved nutrition is the most effective means by which the poorer half of the population can be assisted.

The GOC nutrition strategy has two basic objectives: (1) to ensure that more and higher quality food reaches the poorer elements of the population, both urban and rural, and (2) to increase the absolute availability of food through the stimulation of increased agricultural production. This second element is two-pronged, assuming that increased agricultural production will be reflected both in the availability of additional food for the urban poor and, by increasing farm incomes, in improved nutrition among agricultural workers. The proposed project addresses the second strategy element -- stimulation of agricultural production.

The GOC Nutrition Plan identifies seven general headings and 26 specific projects to be developed to achieve the two basic objectives. The third general category of projects is: production increases of basic foods for direct consumption. The fourth general category of projects is improvement in food processing facilities and marketing infrastructure. Within these two general categories in the Plan, a specific project was identified, to construct Pico y Pala (labor intensive construction) access roads to link up existing and potential markets as one means of stimulating increased production of specific crops. The Nutrition Plan has identified the need for increased production of the following nine crops: beans, peas, soybeans, rice, wheat, corn, potatoes, yuca and plátano.

The GOC agricultural production strategy has concentrated primarily upon achievement of production increases of these priority crops by small farmers. Towards this end, the GOC is in the process of selecting six to eight priority areas which contain a high concentration of small farmers. Approximately 63,000 small farmers, defined as farmers with land holdings of less than 10 hectares, are included. These areas will constitute the integrated development regions (DRIs) that will be the focus of a large-scale GOC and international donor assistance effort. For a discussion of the DRI areas see Annex II.5. Both the World Bank and the IDB have expressed interest in providing substantial support (upwards of \$100 million) to the DRIs.

The DRI program has two basic objectives: (i) to rationalize the linkage of the rural economy to the urban markets, and (ii) to increase real rural income and employment. To accomplish these objectives, the DRI program proposes to integrate a wide variety of economic and social activities aimed at improving the quality of life of the rural inhabitants of these regions. The activities include the expansion of health and education facilities, rural electrification, and potable water and sewage. The main thrust of the DRI program, however, is the stimulation of agricultural development through provision of technical assistance, agricultural inputs, credit, marketing facilities and roads. The latter will include both secondary roads (financed by the international banks) and rural access roads (financed by the GOC and the proposed AID loan).

4. USAID Role in GOC Strategy

USAID's approach to Colombia's agricultural development has evolved over time based upon our assessment of the rural sector, past AID experience and the present Congressional emphasis on food and nutrition. The major limiting factors to Colombian agricultural development do not in general appear to be either major policy considerations, trained manpower, or even financial resources. Colombia's matrix of policies, with the notable lacking of a well-defined national marketing policy (which will be approached by a newly formed task force within the Ministry of Agriculture), provides the basis for wide-spread agricultural development. Colombia's agricultural credit program (Fondo Financiero Agropecuario) provides a mechanism for allocation of a specified quantity of available

credit to the rural sector, rediscounting of commercial and public bank credits to farmers, and the capacity to expand overall credit to the agricultural sector, through internal or external borrowings by the Central Bank. Further, it requires that commercial farmers hire technical assistance in conjunction with their loans to be paid for by the farmer, and provides for a source of revenue to cover the costs of technical assistance to be given to small farmer borrowers.

The Government has an ongoing program to support the prices of major commodities at levels announced in advance; these levels are reviewed and adjusted on an annual basis; Colombia has a workable land reform law and a presumptive tax on land to encourage its most appropriate utilization. Past Colombian laws have provided incentives for exports in the form of certificates for tax rebates based upon the value of the exports. With the present emphasis on small farmers, there is little fault that can be found regarding the broad policies pursued in Colombia.

Although there is need for additional trained personnel in the agricultural sector, and AID should continue to support such training, Colombia can be credited with a large number of well-trained and competent personnel in the agricultural sector. As an example, among professionals employed by ICA, 138 have been trained at the Masters and 41 at the PhD level, many as a result of previous AID programs. Further, graduate agriculture training at the Masters level is presently available within the country. In summary, there exists a sizeable cadre of trained manpower in Colombia to implement rural development.

Finally, in general terms, financing is probably not a major stumbling block. As mentioned earlier, bank credit for agriculture, including small farms, is allocated from the total credit available within the banking system and can be expanded by rediscounting and through Central Bank internal and external borrowing. The World Bank is presently reviewing a US\$60 million loan to the GOC to expand the credit through this system for agricultural, livestock and agro-industrial development. At the same time, project preparations and negotiations are underway for IDB and World Bank loans of US\$120 million in support of the Rural Integrated Development program.

The development of the rural sector is more complex than simply devising a national program directed toward providing modern inputs, credit, technical assistance and marketing to small farmers. The complexity lies in such questions as how to develop, implement and administer the subprojects which provide new benefit streams, credit delivery systems which are cost-efficient to the lender and relate to the risks faced by the borrower, dissemination of new technology to a large number of farmers with a limited number of extension personnel,

and how to provide more efficient marketing to benefit both the farmer and the consumer. The problems at the implementation level are where Colombia's knowledge of rural development breaks down.

USAID's experiences with sector loans, in a large part directed toward credit for small farmers, pilot integrated rural development efforts in small farm areas, and research and extension has led us to focus greater emphasis on collaborating with the Colombian government in developing projects which provide the methodological and technological basis for implementation of rural development on a broad scale. It is at the project level, especially with respect to exploring, developing and proving alternative approaches to solving parts of the rural development puzzle, that we believe AID can make an unique contribution in Colombia.

This approach will undoubtedly result in series of relatively small project loans which, on the surface, appear not to provide a coordinated AID approach to rural development in Colombia. This concern must be taken in the context of World Bank and IDB's willingness to finance rural development on a large scale and the lack of rationale for USAID/Colombia to duplicate such efforts, especially in terms of AID recognition that our resources alone would be insufficient to accomplish the rural development task in the near term. Given the availability of external resources for large scale rural development and the perceived need for improved methodological and technological basis for rural, USAID/Colombia has chosen to focus on pilot programs for the purpose of testing and institutionalizing new approaches which have a potential for affecting many people. Thus, we believe that "we may have a comparative advantage in research and pilot programs of limited scale, developing new approaches with a low per capita cost that LDC's (Colombia) can afford to replicate on a wider basis". Thus, USAID/Colombia would argue for assisting Colombia with the development, proving (in the field) and institutionalizing new approaches to specific rural development problems through relatively small project loans. In this way, it is believed that our limited financial resources can have a major impact on the poor majority by providing the basis for future broad-scale programs funded from Colombia's own resources and external resources from other international lending institutions.

5. The Problem

An analysis of the Colombian agriculture sector indicates that for a substantial number of farmers the chief constraint to increased agricultural production is a lack of access to external markets. This can be traced to the geography of the country, which has set the pattern for Colombia's agricultural growth. The three towering ranges of the Andes branch northward from the southern border and separate the more densely settled portions of the country into distinct and frequently isolated geographic areas. Although improved communications and transportation have begun to break through the inter and intra-regional isolation, large numbers of small farmers are still only marginally linked to external markets.

Comisión Vecinales estimates that approximately 10% of Colombia's rural population (200,000) is not served by a road of any kind, including at least 80 known municipalities and 620 rural communities. Without ready access to markets for their agricultural products there is little incentive for farmers to produce a marketable surplus.

Given the stress placed by the new Government in its National Nutrition Plan on solving the problems of malnutrition and under nutrition by increasing the availability of food for the poorer 50% of Colombia's population, this untapped potential source of supply, represented by farmers with restricted market access, is assuming a growing importance.

The large increases in urban population have made the problem of stimulating additional food production increasingly acute. The population dynamics of Colombia have resulted in very rapid changes in the urban-rural population mix, with a result that Colombia has one of the highest percentages of urbanization in Latin America. In 1972, approximately 55% of the total population was living in urban centers. This percentage is expected to continue to increase. By 1980 it is projected that at least 17 Colombian cities will have populations in excess of 200,000 (source: DANE - Proyecciones de Población).

This continued growth of urban centers has created a strong demand pull on the food production/distribution system. "Along with the growth of these large urban centers there is an emerging national market made possible by improvements in the transportation and communication networks. As a result, there is now increasing regional specialization in agricultural production and a gradual lengthening of the distances over which products are transported to reach the ultimate consumer". (Colombian Agricultural Sector Analysis Papers, p.44).

To a large extent, however, the isolated farming communities are unable to respond to or benefit from this increased demand. Those farmers who comprise the target group for purposes of this project are essentially excluded from potential marketing outlets and from the benefits accruing to increased production. Without regular access to agricultural collection and marketing centers the demand pull function cannot elicit the desired supply response from farmers, thus resulting in foregone income opportunities and a limited potential for income redistribution on the production side, as well as a reduction in the absolute availability of food on the consumption side. Once access roads are constructed, however, as evidenced in sample studies discussed in Section II A.7 increases in agricultural production can be expected to result.

6. Pico y Pala Program

An Agreement signed on November 8, 1971 between the Ministry of Agriculture and the Ministry of Public Works, set forth the specific responsibilities of each party for the implementation of the Pico y Pala feeder and access road program. The Inter-Ministerial Agreement

set up a coordinating committee composed of representatives from the Planning Office of the Ministry of Agriculture (OPSA), National Planning Department, Caminos Vecinales, and AID. This Committee was responsible for the overall direction of the program and for selecting the priority areas where the roads were to be built. The factors taken into consideration in selecting the priority areas were:

- 1) Pilot areas previously selected for intensive development by ICA (Agriculture Research Agency).
- 2) Areas where the local farmers have indicated a high interest and are willing to contribute either money, labor, or both.
- 3) Areas where the agriculture production potential is high.
- 4) Rural areas where farm labor is under-utilized.
- 5) Areas where the terrain is suitable for pick and shovel construction.

During 1972, the program was slow in getting started for two reasons: the selection process was time-consuming; and normal start-up delays. As a result, expenditures were below the programmed levels, despite the fact that all the AID funds available to Pico y Pala from Agriculture Sector Loan 064 were disbursed. Actual construction work was not initiated until June 1972, and only 65 kilometers of road was constructed in 1972. In 1973, the program began to operate at its expected levels of efficiency. Approximately, 140 kilometers of roads were constructed.

In 1974, Caminos was handicapped by delays with regard to AID's reprogramming efforts under Loan 067 and the confusion surrounding the authorization of Agricultural Sector Loan VI 514-6-071 (it was deauthorized in late 1974). As a result, Caminos did not receive the AID loan funds until late 1974 and had used about 32 million pesos for its early 1975 expenses. In spite of these problems, Pico y Pala still constructed 132 kilometers of road in 1974, at a cost of about 60 million pesos.

Table 1 shows a breakdown of kilometers of road constructed by year and by Departments, including their estimated total construction cost. From the initiation of the program in June 1972 to December 1974 the work completed consisted of 435.6 road length kilometers of excavation, 157.3 kilometers of gravel surfaced road, as well as bridges and other works for 221.7 kilometers of roads. Averaging these three figures results in total road construction of about 337 kilometers at a cost of \$4.1 million. Caminos Vecinales estimates that Pico y Pala has created employment for an average of 100 farmers per month of road construction, or a total of approximately 14,000 jobs.

The Pico y Pala program under the AID Sector Loans increased its annual expenditure rate from 14 to 61 million pesos from 1972-74. Receipts increased from 76 to 82 million pesos in the same period. A major problem affecting the operation has been the irregular flow of funds from all sources. The GOC budgetary process was slow, with few funds available during the first half of the calendar year. The flow of AID funds was interrupted when the GOC delays in certifying AID reserves or when AID, for policy reasons, was not disbursing funds to the agriculture sector. These problems are normal to many GOC agencies, but were particularly acute for Pico y Pala. This program could not function without cash in hand. Work on feeder roads did not begin or continue until regional offices had cash in hand to pay workers. Pico y Pala local offices had to cease planning and construction until the GOC and/or AID worked out the specific budgetary problem impeding the flow of funds.

USAID became particularly concerned over the flow of funds problem during the implementation of the sector loans. To prevent a recurrence, USAID in this loan has proposed a direct disbursement system passing funds directly to Caminos Vecinales, under the proposed project.

Since 1972 Caminos Vecinales has received US\$2.6 million from AID for its Pico y Pala (Pick and Shovel) program from Agricultural Sector Loan funds, channelled through the Ministry of Agriculture. Table 2 presents a breakdown of that assistance from 1972 through 1974.

7. The Agricultural Impact of Pico y Pala

Only one extended study of the impact of Pico y Pala was completed during AID's two years of experience with the program. The study, The Impact of Pico y Pala Road Building Project in Some Colombia Minifundia Areas, was completed in May 1974. Michael and June Jennings visited several road sites to survey the impact of the feeder roads on agricultural technology, marketing, production, farm labor, income, health and education.

The general objective of the program that they surveyed was to provide employment in rural areas, with agricultural production as a secondary goal. The target group for the program tended to be the workers on the roads, rather than the small farmers affected by the roads. The Jennings Report saw the program's benefits as relative to the employment objective: (a) a source of offseason employment to farmers to discourage urban migration; (b) the incentive nature of the employment which paid workers according to the work done; and (c) the road construction was able to proceed at several points at the same time, increasing total employment.

Given the employment objective, the Jennings Report attempted to examine how workers used the additional income. Unfortunately, little solid information was encountered. Some of the workers who were small

TABLE NO. 1 PICK & SHOVEL PROJECT: Kms. OF ROAD CONSTRUCTED AND COST. 1972-1974 (US\$.000)

Departments	<u>1972</u>		<u>1973</u>		<u>1974</u>		<u>1975</u>	
	Kms. Constructed	Cost (US\$)	Kms. Constructed	Cost(US\$)	Kms.Con- structed	Cost(US\$)	Kms.Con- structed	Cost(US\$)
Antioquia	2.46	13.1	5.20	69.7	3.14	52.4	10.80	155.0
Bolívar-Sucre-Magdalena	-	.5	-		.50	34.9	0.50	33.4
Boyacá	8.15	31.5	25.20	69.2	7.77	37.1	41.12	157.8
Caldas	3.40	43.3	8.90	183.8	16.90	368.9	29.20	396.0
Cauca	16.93	224.7	29.10	329.0	9.97	345.4	56.00	899.1
Cundinamarca	8.51	91.9	25.60	248.5	7.69	122.5	41.80	462.9
Chocó	-		3.50	40.2	5.30	100.5	8.80	140.7
Guajira	-		-		4.50	20.1	4.50	20.1
Huila	-		-		17.00	164.4	17.00	164.4
Nariño	1.72	18.8	7.90	95.8	8.28	103.9	17.90	218.8
Norte de Santander	9.69	36.8	6.40	98.0	16.41	179.6	32.50	314.4
Risaralda	3.82	49.3	4.80	60.8	21.08	241.3	29.70	361.4
Santander	0.63	19.0	3.90	55.7	.87	85.0	5.40	159.7
Tolima	3.00	26.2	3.10	16.4	11.60	186.2	17.70	228.8
Valle	6.57	65.1	16.70	147.6	.33	64.9	23.60	277.6
Meta	-		-		.60	14.4	.60	14.4
TOTALS	64.88	620.2	140.30	1,414.7	131.94	2,121.5	337.12	4,156.4
Exchange Rate: US\$1.00 =		22.88		24.89		28.69		

Source: Caminos Vecinales

The figures shown in this table as "kilometers constructed" are a weighted average of the total kilometers excavated. Kilometers of gravel surfacing as well as bridges and other works for kilometers of roads.

TABLE NO. 2PICK & SHOVEL PROJECT RECEIPTS BY SOURCE 1972-1974 (US\$.000)

	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>TOTAL</u>
GOC (O.O.P.F.)	338.5	791.5	1,030.7	2,160.7
Coffee Federation	295.5	75.3	303.2*	674.0
AID	922.2	149.1	1,526.7	2,598.0 <u>1/</u>
	<hr/>			
TOTALS	1,556.2	1,015.9	2,860.6	5,432.7
Exchange Rate: US\$1.00 =	22.88	24.89	28.69	

1/ Includes US\$790,519 peso equivalent released to Caminos Vecinales on December 1974 but not spent in 1974.

farmers said they used the income to purchase agricultural inputs such as fertilizer and seeds. Yet total use of such inputs in the area studied did not appear to rise, suggesting the income was only used to pay higher prices.

Perhaps the most important findings in the Jennings Report related to the need to give higher priority to the agricultural impact of the roads before construction. Some expected agricultural benefits did not occur for example, the affected farmers did not report any significant increases in fertilizer use, pesticides, seeds, contour planting or irrigation. Another problem was the absence of coordination with the ICA extension service; technical advice was often not available. (Subsequent USAID follow-up in some areas has noted that new technology did begin to appear in the areas after the Jennings Report was completed.) Better communication regarding placement of the roads was needed as farmers reported little interaction between Caminos and the towns. Farmers were concerned over the environmental impact of the roads. There was some damage to farmland due to poor design and location. A clear need was for a land terracing and soil conservation program. Soil studies and research for methods of earth stabilization were needed prior to construction.

On the positive side, the Jennings Report noted significant production and marketing improvements. There was increased production of traditional crops and increased commercialization of animals and animal products such as milk. In marketing, Pico y Pala roads substantially reduced travel time in sending produce to markets, enlarged the market area, opened markets for highly perishable produce, and reduced overall produce damage. Reduced travel time allowed farmers to travel to market towns more frequently to negotiate sales directly and educate themselves on market conditions and prices. Reduced travel time eliminated staying overnight in the marketing town and other travel related costs. Trucks and buses were effectively using the Pico y Pala roads, promoting an intermediary transportation industry which was not only hauling produce but was transporting agricultural inputs to farmers. The Report indicated transportation costs had been reduced 50% after truck transport was initiated. (USAID field trips have confirmed a 33-50% reduction in transport costs). The farmers in the survey reported that the roads helped them receive GOC social services. Medicines and medical help were more readily available. Educational facilities, including materials were more accessible to rural children.

In summary, the Jennings Report concluded that the impact of the roads was generally positive. Some of the negative findings can be traced to the fact that several of the roads visited were newly constructed, and the inputs and assistance were not yet coordinated. Still, there appear to have been significant agriculture and marketing benefits accruing to the project's beneficiaries, despite the fact that the roads were basically an employment generating mechanism.

Recent USAID field trips have attempted to test some of the above mentioned conclusions, especially on four points: increased land cultivation, technology levels, crop switching patterns and availability of GOC social services. The results have been mixed. In the Silvia area, for example, the major finding was that fertilizer use had increased substantially, resulting in more productive cultivation of small plots - 0.25 to 2.50 hectares each. The local farmers attributed the increase in fertilizer use solely to the reduction in transport costs, (an estimated 33% savings) and the increased volume efficiency. On the other hand, the local farmers reported no increase in contact with extension agents or other TA, there were no seed or fertilizer salesmen in the area. There was little change in cropping patterns or area under cultivation. The farms were so small that all land was being cultivated before the road came. There was also no evidence of increased use of GOC social services; the health posts and schools had been in use prior to the road. The impact of the road to Silvia was to lower transport costs for produce and inputs, and increase yields and income --the latter was attested to by evidence of substantial new housing construction.

In Santander Department, USAID advisors were told by local farmers that land cultivation had increased considerably, especially in corn and sugar cane. Most of the farmers, who averaged about 2 hectares of land, indicated they had neither increased their use of fertilizer nor done any significant crop switching as a result of the road. There were some indications that more children were going to school as a result of the road.

In May 1974, Mario Camacho of the Ministry of Public Works evaluated the Pico y Pala program and found:

- a. The program provided over 14,000 jobs;
- b. Average salaries were double the rural minimum wage;
- c. Land cultivation near the roads increased by 30%;
- d. Volume of production near the roads increased by 40-60% depending on the crops.
- e. Typical production increases were in potatoes, corn, sugar cane, coffee, beans, citrus, fique and tobacco;
- f. Transport costs were reduced by 60-70 and transport time by 70%;
- g. There was little evidence of crop switching or of higher technological inputs;
- h. Road construction salaries were used to buy seeds, build new housing, and repay Caja Agraria credit.

Camacho provided little data or analysis to support his conclusions. The impact of the roads therefore is still subject to further confirmation.

In conclusion, existing field experience and evaluation of the impact of the feeder roads suggests positive results, but without a consistent pattern. In some municipios land cultivation increased; in others, fertilizer use increased and encouraged more intensive farming on small plots. The common effect on some 30-40 small farmers in the sample is that their incomes did increase significantly, due to lower transport costs and/or the ability to transport a greater volume of produce and inputs.

8. Other Caminos Vecinales Programs

The Pico y Pala program is aimed at increasing agricultural productivity, access to markets, and increasing rural employment. Its roads are designed for daily traffic of less than fifty vehicles and are constructed by labor intensive methods. Two other Caminos' programs - the IDB and the Ordinary Program - operate under different philosophies. They concentrate on roads in flat areas with fifty to one hundred vehicles per day, using high equipment and lower labor components. The Ministry of Public Works builds the more heavily travelled roads to higher specifications.

- a. The IDB Program - In January 1970, Caminos Vecinales expanded its feeder roads program with the help of an IDB project loan for construction of 45 secondary roads, totalling 1,550 kms. of construction over a period of four years. The sub-projects were to be primarily special and first order roads (more than fifty vehicles per day). This \$36.6 million dollar program was financed by an IDB Loan of US\$ 17 million and by GOC counterpart of \$19.6 million. The GOC was principally responsible for administrative labor costs, while the IDB paid for construction materials, TA in road design and supervision, consultant services, and machinery.

The project selection criteria for each road was designed to insure that the internal rate of return exceeded 10 percent and that 50 percent of the potential increase in the agricultural production in the affected area could be attributable to the road. One such optimistic study utilizing this criteria was done in December 1970, by Roberto Solarte, Section Chief for Caminos Vecinales in Caldas. He completed a socio-economic evaluation of a proposed IDB financed access road, San Felix-Valle Alto. He concluded that the 25 kilometer road would have a zone of influence of 15,000 hectares, contributing to a 45% increase in the value of agricultural production after the fifth year of the road. Future production of potatoes would increase by 39%, wheat by 82% and barley by 75%.

Cattle production would increase by 58%. After 9 years of use, total net benefits from the road would be about 2.4 million pesos. Transportation costs were estimated to diminish by c\$0.87/ton due to the road construction and by another c\$0.43/ton due to the higher volume of traffic. The IDB's experience to date has been mixed. IDB officials indicated little has been done to measure the actual rate of return and production increases. As of December 31, 1974, construction had not made expectations - 1,107 kms. had been constructed. The IDB was pleased with the engineering work under the program. However, despite a \$2 million IDB-financed investment in maintenance equipment, the IDB indicated dissatisfaction with the Departmental maintenance of the secondary roads.

b. The Ordinary Program

From its inception, Caminos Vecinales has received significant financial resources from other GOC agencies that have asked CV to build specific roads. These include feeder roads requested and financed by several Colombian Departments, Juntas de Acción Comunal, and other groups. The Ordinary Program has constructed 6,134 kms. of standard equipment built roads, valued at \$1,172,000 pesos). The following is an illustrative list of the kinds of projects under this program:

1. The National Institute of Radio and TV (INRAVISION):
a road of 72 kms. to facilitate the operation of a transmitting tower for the Llanos Orientales.
2. The Colombian Institute of Electric Power (ICEL):
feeder roads to important hydroelectric power dams.
3. INCORA: penetration roads to the eastern plains, with a total investment of \$60,000,000 pesos. At present there are 200 kms. built under this colonization project.
4. The National Federation of Coffee Growers:
\$23,000,000 pesos of roads in coffee growing departments.

B. Detailed Description of the Project

1. Goal and Sub-goal

The program goal is to improve the level of welfare among the rural poor. The improvement of welfare among the target population will be measured by increases in income, improvements in nutritional status, changes in dietary habits and incidence of morbidity among the target population. An additional indicator of the loans impact on the target population will be increased temporary paid employment on the road construction projects themselves under this loan. The measurement of the loan's impact will be an integral part of the functions of the Caminos Vecinales Evaluation Office. This office will conduct a program of continuous impact evaluation and report the evaluation findings to A.I.D. both upon completion of the evaluation and within the context of annual reports which are to be presented to A.I.D. as part of the Mission's reporting requirements for annual evaluation of ongoing projects. The means to verify achievement of the goal and sub-goal will be provided by project-required studies of the before and after status of the level of welfare and nutritional well-being. Additionally, achievement of the goal will be verified by analyses of IBRD macroeconomic reports on the Colombian economy and development situation, FAO reports on nutritional status of the rural populace, and Ministry of Health rural clinic treatment records re morbidity.

Certain assumptions impinge upon success in meeting the goal. The GOC tax structure should not mitigate against small farmers as they attempt to improve their status. The GOC must also continue to expand public services in the affected rural areas, and in the policy arena, the national government will have to foster conditions which will permit prices of commodities produced by small farmers to remain favorable.

To reach the overall goal of improving rural welfare, an increase in agricultural production in the program area is perceived as the most direct mechanism. This is the project's sub-goal. Principal indicators of sub-goal achievement would be increased use by small farmers of "modern" inputs (credit, fertilizer, improved seeds), and an increase in the value of marketed production per hectare. Elsewhere in this paper, it is estimated that incremental production as a result of this program will amount to Col. pesos 1,500/annum on a present traditional base of Col. pesos 1,000. Increased agricultural production assumes (a) urban consumer demand remains high, (b) farmers themselves are motivated to use the new technologies made available to them, and (c) small farmers plow back "windfall" profits realized from reduced transportation costs as farm capital investment.

2. Purpose

One of the means of reaching the program goal is through construction of access roads to farming communities to integrate them with public and private sector activities dependent upon transportation. This relates to the basic purpose of this project which is to improve farmer access to markets and reduce transport costs.

Conversely, this project will open those areas to government and private sector institutions and services, particularly agriculture, education and health. A secondary or sub-purpose is to introduce institutional improvements in the agency implementing the project, Caminos Vecinales, particularly in project selection and upgrading of technical personnel. End of project status will be measured by, inter alia, increases in the amount of land under production (a 15% increase is expected over the timeframe of 1976-78), adoption by three-quarters of affected farmers the new agricultural technologies within six years of the project's start, a 10% increase in school attendance over the project life, and greater availability of needed inputs from private and public sources.

3. End of Project Status

The Government's identification of a lack of transportation as a major constraint to increased agricultural production corresponds to the conclusions of the USAID sector analysis. As the analysis suggests, without transport the agricultural sector would be little more than a mass of subsistence farmers scattered throughout the country. Agricultural production patterns in Colombia are largely determined by the accessibility to markets and the availability of production inputs. Both of these are directly related to the availability and cost of transportation, which in turn is related to the existence of access roads.

In examining this relationship, past experience indicates that once access roads are constructed certain benefits are likely to occur to farmers living in the road's area of influence. Without additional inputs, one can expect a reduction in the cost and time of **transporting agricultural products and inputs (costs are estimated to decline by some 50%)** and an expansion of the marketing opportunities open to the farmer. Together these factors should induce increases in agricultural production in at least one of three ways:

- (i) bringing presently idle land into production (which may include land that is "involuntarily" idle, i.e., land lying fallow could be brought into regular production with the addition of fertilizers and soil nutrients);
- (ii) improvement in yields by changes in production technology, i.e., use of hybrid seed, fertilizer, irrigation, etc.; and,
- (iii) increasing the value of output by switching to crops with a higher market value per unit of land.

The list of expected benefits that are likely to occur may be expanded to include the following, although the direct economic impact of an access road will still be measured in terms of increased production/income accruing to the target farmer.

(i) increased marketing opportunities which permit farmers to increase production beyond the volumes required for on-farm and local consumption, in accordance with demand existing in more distant but now accessible markets;

(ii) greater efficiencies in the use of local transport (economics of volume, reduced transit time) which should be reflected in lower transportation costs. Such benefits may be passed along in the form of lower prices of agricultural inputs to farmers and lower food prices to urban consumers;

(iii) increased likelihood of receiving agricultural services from government agencies and the private sector, including agricultural extension services, veterinary coverage, assistance from marketing cooperatives, credit agencies, equipment repairs, and others;

(iv) more ready access to storage and processing facilities, providing farmers with marketing outlets for seasonal crops and tending to stabilize prices;

(v) stimulation of production of perishable crops, e.g., fruits, vegetables, milk products, eggs, etc., which depend on rapid access to markets to avoid spoilage, or livestock production, where truck transportation greatly reduces weight losses among animals;

(vi) promotion of direct social benefits, including improved access to health, education, public utility and other social services.

Indirect economic, social and political benefits are also likely to accrue to project beneficiaries in varying degrees. The overall objective, however, is that of facilitating the entry of an increasing number of relatively isolated farming communities into the economic mainstream of the country.

4. Important Purpose-Related Assumptions and Constraints

The feasibility analysis of this project has examined and rejected the simple assumption that once access roads are constructed, other inputs and expected project benefits will flow as a matter of course. Instead, the project committee has attempted to analyze and address possible constraints which may keep the project from realizing its full potential. This included an examination of the other external factors that influence increased agricultural production -- credit, technical assistance, availability of agricultural inputs, suitable technology, transportation, marketing opportunities and adequate demand.

For those access roads to be built in the DRI areas and with respect to credit, technical assistance, agricultural inputs and suitable technology, the anticipated GOC-IDB-IBRD development program in the DRI areas is expected to make available adequate production inputs. Since the subject loan will be complementary in those areas, care will be taken to coordinate road selection with the related activities.

The Board of Directores of Caminos Vecinales has representation from all the major GOC agencies active in the agriculture sector and will ensure that such coordination takes place.

In other areas of the country, the project selection criteria will require a determination of the adequacy of existing and proposed mechanisms for providing necessary production inputs. In addition, the federations supported by the AID Rural Cooperatives Development loan will be almost exclusively active in areas that contain a concentration of small farmers. The proposed FY 76 Small Farm Development loan will concentrate on developing and field testing production technologies specifically aimed at the target small farmers. In both cases, an effort will be made to coordinate the various activities to maximize the respective project benefits. See also Part II.A. for a discussion of credit availability.

As regards marketing activities, the national marketing federation (CECORA) will receive at least US\$1.5 million under the AID Cooperative Loan to finance marketing investments that are identified as being particularly responsive to small farmer production patterns. In addition, the DRI program will contain a marketing element designed specifically to respond to the anticipated increases in production.

A loan is being prepared to assist two service organizations active in the rural areas, the National Apprenticeship Service (SENA) and the Acción Cultural Popular (ACPO). SENNA will provide skills training in basic agriculture-related activities and ACPO will provide courses on rural leadership training. Both activities are expected to benefit members of farming communities serviced by the access road loan.

In each instance, the accessibility of rural inhabitants to municipios that are already linked to outside services and markets is a necessary (though not sufficient) condition to their receiving similar benefits. At the very least, access greatly increases the likelihood that government and/or private services will become available to the target group.

No constraint is evident with regard to demand. For one thing, the Nutrition Plan highlighted the necessity for increasing production of nine principal crops; most of these are crops that are grown by small farmers who will participate in the program. For another, the anticipated production increases will come from just over one percent of the total farms in Colombia and are therefore unlikely to raise any difficulties with regard to absorptive capacity.

One area of marketing which does appear to present an immediate constraint is that of transportation. Most agricultural production is currently moved by truck; this is expected to be the case in the areas of influence of the roads to be constructed under the proposed loan.

The growth in the capacity of public service truck freight in the country has been falling behind the growth in G.N.P. since 1967. Because transport requirements generally tend to increase at a faster rate than national income in a developing economy, some transport officials fear that this may be indicative of an impending shortage of truck transport. If so, it could seriously affect the marketing of farm products as well as the timely delivery of agricultural production inputs.

The national truck fleet has been increasing at a rate of about 4 percent annually, which has not been sufficient to meet the needs of the country. In 12 Asian countries, for example, the annual increase in road and rail traffic during the 1950's varied between 6 and 20 percent, while national income grew at a rate of 2 to 5 percent per year. In other words, it is not unusual for traffic to grow at multiples of 2 to 4 times that of economic activity. 1/

Figure 1 shows the relationship of the actual growth of total public service truck capacity for Colombia in tons 2/ as compared to a 7 percent GNP growth rate. It is interesting to note that from 1957 to 1966 the total public service trucking capacity and GNP were growing at or near the same rate. However, between 1966 and 1969 the trucking capacity had fallen behind GNP by almost 10 percent where the reverse should have been true. This would certainly indicate the development in the near future of a serious shortage of truck transport capacity. As this shortage becomes more pronounced the first and some of the heaviest losses to occur may be in agriculture, where the transport requirements are highly seasonal, where the products are perishable or semi-perishable.

This slowdown in the growth of truck freight capacity can be largely traced to a 1967 policy decision of the GOC to encourage local assembly of motor vehicles, utilizing an increasing percentage of local parts. At the present time, locally assembled trucks must be 32 percent by weight Colombian parts. By 1970, locally assembled motor vehicles

1/ "Sector and Project Planning in Transportation" by Hans. A. Adler.

2/ Las Empresas y el Parque Automotor de Carga de Servicio Público, Características - Corporación Financiera del Transporte, Octubre 1969. Inventario Nacional Automotor de Carga, Instituto Nacional del Transporte, Marzo de 1970.

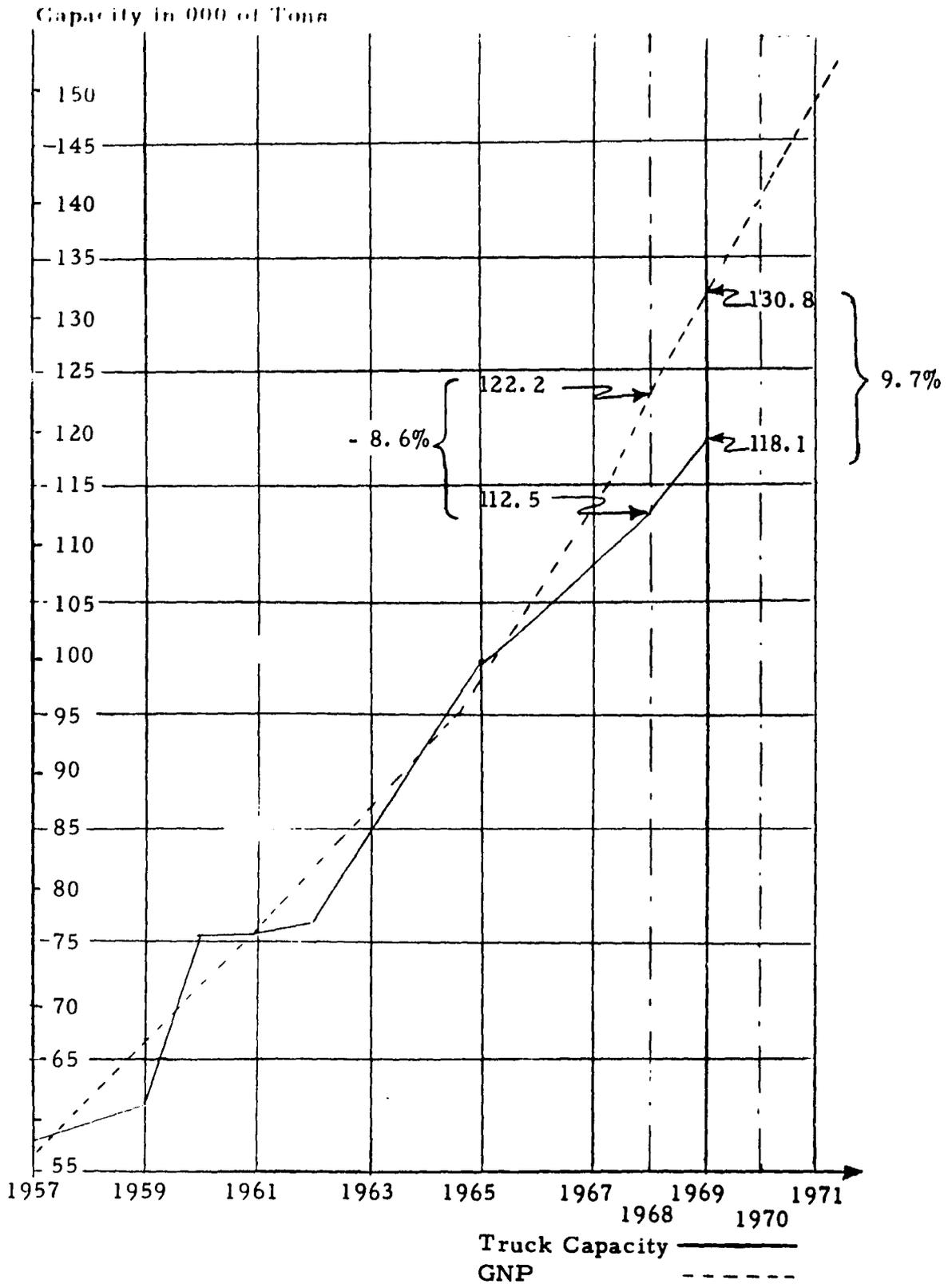


Figure 1 - Total Tons of Public Service Truck Freight Capacity in Relation to a GNP Growth Rate of 7%

surpassed imports. While transport is not presently a constraint, The Project Committee recognizes that transport may pose a potential future constraint in marketing the agricultural produce generated by the project. The GOC action in liberalizing import duties on trucks is an obvious step in addressing the constraint, although the adequacy of the measure cannot yet be determined.

5. Planned Outputs

a. Road Construction

In preparing their original request for AID financial assistance to the Pico y Pala program, Caminos Vecinales prepared a four year investment plan, covering 2,282 kilometers of labor-intensive feeder road construction.

The overall plan, listed in Annex II, Exhibit 1, had several serious deficiencies. Financing was not available for the entire Plan. Neither AID nor the GOC was willing to put up their entire \$15 million shares. Furthermore the Plan projected a four-fold increase in Caminos' annual construction capacity from the current 130 kilometers to about 550 kilometers. This increase was highly unrealistic. Finally, the Plan provided no indication of the expected developmental impact of this massive feeder road effort.

During the Intensive Review, USAID and Caminos Vecinales developed a more realistic aggregate investment plan for the disbursement period of the proposed project. In total, approximately 890 kilometers would be constructed, or an average of 297 kilometers annually -- a significant but feasible increase. And as the Implementation Plan proposes, 89 sub-projects would be completed and 22 sub-projects initiated.

In addition to the AID/GOC program above, the Federación de Cafeteros (Coffee Federation) is expected to contribute up to \$60 million pesos over three years to Pico y Pala for construction of feeder roads in predominantly coffee growing areas. These roads will not be subject to the selection criteria and analysis developed in the PP, and as such are not included in the project.

Having agreed upon aggregate levels of output and financing, USAID and Caminos then began to discuss a means to narrow down the 2,282 kilometers of the original Plan to the 890 kilometers which seems to be a feasible output during the time frame of the project. Caminos agreed that the 890 kilometers had to be selected and constructed in accordance with the GOC's rural development strategies. As part of

the Pico y Pala effort to maximize the impact of labor intensive feeder roads upon agricultural development, Caminos agreed that the proposed project would finance only those roads which meet the following selection criteria.

(i) Project Selection Criteria

To provide Pico y Pala with a first level method of analysis, enabling it to quickly reject those project applications which are of a very low priority, project selection criteria were developed.

Sound selection criteria should lead to selection of sub-projects that would be expected to achieve the agricultural production objectives of this Project. Necessary conditions for achievement of objectives should be present in sufficient form and substance to complement the road building activities. In this project, the benefits from the road construction, the necessary conditions for the benefits to be realized and examples of indicators that could be used for description and evaluation of the necessary conditions are presented below. The criteria and the necessary conditions are key factors; indicators are included to provide a guide for assessing whether the criteria are being met. Pico y Pala is expected to develop an informal weighing system which will be applied to the indicators:

<u>Benefits from Road Construction</u>	<u>Necessary Conditions</u>	<u>Criteria</u>	<u>Indicators</u>
I. Incremental Marketable Agricultural Production Leading to Increased Net Income to Small Farmer	A. Demand	A. Effective demand exists for agricultural products that are or can be produced in the area.	A.1. Demand for agricultural products that are part of GOC Nutrition Plan. A.2. Demand for other agricultural domestic product. A.3. Demand for export agricultural products.
	B. Storage, Processing and Sales Outlet Facilities	B. Sufficient public or private market facilities exist or are planned shortly.	B.1. Sufficient storage capacity exists. B.2. Sufficient processing capacity exists. B.3. Sufficient sales outlets exist.

<u>Benefits from Road Construction</u>	<u>Necessary Conditions</u>	<u>Criteria</u>	<u>Indicators</u>
	C. Credit, Technical Inputs and Technical Assistance.	C. Public or private institutions exist or are planned to provide inputs to small farmers.	C.1. Credit available to small farmer. C.2. Technical inputs available. C.3. Technical assistance available.
	D. Small Farmers	D. Farmers in area of road influence have small land holdings.	D.1. 90 percent of farmers less than 2 has. D.2. 90 percent of farmers less than 5 has. D.3. 90 percent of farmers less than 10 has. D.4. 90 percent of farmers less than 20 has. D.5. 75 percent of farmers less than 20 has. D.6. 50 percent of farmers more than 20 has.
	E. Potential for increased Agricultural Production	E.1. Climate, water, soil and topography favorable. E. 2. Idle land suitable for increased agricultural production	E.1.a. Rainfall adequate. E.1.b. Dry or wet season not severe. E.1.c. Flooding in area of influence minimal. E.1.d. PH of soil adequate. E.1.e. Minimal rocky or sandy soil. E.1.f. Land slopes adequate for farming. E.2.a. Cultivated land may be doubled. E.2.b. Cultivated land may be increased by 50%. E.2.c. Cultivated land may be increased by 20%. E.2.d. Cultivated land may be increased by 10%. E.2.e. Cultivated land may not be increased.

<u>Benefits from Road Construction</u>	<u>Necessary Conditions</u>	<u>Criteria</u>	<u>Indicators</u>
	F. Transport Services	F. Trucking and bus service readily available.	F.1. Existing service readily expandable. F.2. Existing service expandable with additional capital. F.3. No existing service.
	G. Construction Labor	G. Excess agriculture labor available	G.1. Excess labor available all year without interfering with agricultural planting or harvesting. G.2. Excess labor available 1/2 year. G.3. Excess labor available 1/4 year. G.4. No excess agricultural labor available.
	H. Community Participation	H. Community desires to construct and maintain Pico y Pala road	H.1. Community Action Group exists. H.2. Community requests roads. H.3. Community participates in route selection and design. H.4. Community provides volunteer labor for construction. H.5. Community agrees to maintain road.
	I. Route Location	I. Road is located to promote adequate marketing of agricultural production with the least cost.	I.1. Road links isolated communities to existing markets with access. I.2. Small farmers in area of influence are maximized. I.3. Costly cuts, fills and bridge structures are minimized. I.4. Landslide areas are avoided if possible. I.5. Erosion prone areas are avoided if possible. I.6. Areas with drainage problems avoided if possible.

<u>Benefits from Road Construction</u>	<u>Necessary Conditions</u>	<u>Criteria</u>	<u>Indicators</u>
	K. Maintenance	K. Road is maintained adequately by Department, or community to insure continuous service.	K.1. Department agreement to maintain road. K.2. Department financing available to maintain Pico y Pala roads. K.3. Department organization, personnel and equipment to maintain pica y pala roads. K.4. Community agreement to contribute to maintenance. K.5. Community personnel and equipment to maintain roads.
II. Enrichment in the Quality of Life in Rural Areas and other Socio-Economic Benefits	A. Health Services	A. Coordination with AID assisted GOC Health Sector Program in Rural Areas	A.1. Health Post in or near area of influence. A.2. Para-Medical Personnel in or near area. A.3. Ambulances available. A.4. Hospital facilities near. A.5. Rural Sanitation Program (INPES). A.6. Malaria Program (if applicable). A.7. Maternal Child Health Care Facilities.
	B. Education Services	B. Coordination with AID Assisted GOC Education Sector Program in Rural Area	B.1. Primary school teachers and teacher training. B.2. Primary school books. B.3. Primary school classroom availability. B.4. School lunch program.

<u>Benefits From Road Construction</u>	<u>Necessary Conditions</u>	<u>Criteria</u>	<u>Indicators</u>
	C. Electricity	C. Coordination with Rural Electrification Program	C. Electric power availability and plans for provision of electric power to the area.
	D. Housing	D. Building supplies available	D.1 Cement supplies D.2 Roofing supplies D.3 Brick supplies. D.4 Lumber supplies
	E. Cultural Activities	E. Cultural Programs are available	E.1 ACPO programs available. E.2 Sports programs E.3 Religious institutions.

(ii) Procedures.

The above listed selection criteria will be applied to each project application and will be used as a first level analysis of all Pico y Pala roads financed under this project. In requesting AID financing, Caminos will provide AID with a copy of their analysis indicating how the road addresses the criteria.

As section II.5.b. indicates the Sub-project Selection and Evaluation Office of Caminos Vecinales will have three teams - composed of an engineer, economist and agronomist to carry out project analysis. These teams will assist the regional chief in preparing a prefeasibility study of the proposed road before the National Coordinator and USAID give final approval to the project for AID financing. (Caminos will use the criteria for projects exclusively receiving their own funds, but AID will not review such projects). Once a project application is found to meet the initial project selection criteria, it will be subjected to a more rigorous, second level of analysis as part of the feasibility study procedure. The feasibility study will examine all the criteria and will calculate an internal rate of return on each proposed feeder road. In order for the road to be eligible for AID financing, the internal rate of return must exceed the opportunity cost of capital - currently estimated at 15%.

This procedure is more rigorous than originally presented in the Capital Assistance Paper presented June 12, 1975 where so called "on going" Pico y Pala roads would not be subjected to a second level of analysis. In the presently proposed procedure all proposed road construction will be considered as new sub-projects and be subjected to the same criteria and analysis. The second level of analysis will consider the rate of return from the point of departure of an existing connecting road. In such a manner, AID would not be considered to be financing "on going" projects.

c. The Institutional Improvements

The Pico y Pala program is an on-going activity being implemented by the National Fund for Feeder Road Construction (Caminos Vecinales), which also is involved in Government and IDB financed feeder road construction programs (see discussion II.A.8). In line with the new GOC strategy of stimulating agricultural production, particularly among small farmers, the emphasis of Caminos Vecinales Pico y Pala program will be shifted away from creating temporary, rural employment opportunities towards providing better access between existing markets and largely isolated farming communities that have a potential for increasing agricultural production. Although the target group in both instances will doubtlessly overlap, the project selection criteria and analysis will reflect the new emphasis on expanding production.

The Mission believes that the institutional changes to be accomplished by the loan will have a beneficial impact on the other feeder road activities that Caminos Vecinales is engaged in. As a result, it is anticipated that the GOC or other international donors will be interested in financing all future Pico y Pala programs once the effectiveness of the proposed institutional changes is demonstrated.

(i) Sub-Project Selection and Evaluation

The principal organization change to Caminos Vecinales within the proposed project is the creation of a Sub-Project Selection and Evaluation office for Pico y Pala road construction. Previously, the main emphasis of the program was to build feeder roads for employment generation purposes with little concern for the actual impact of the roads upon development. Little evaluation was done or even planned by Pico y Pala. When USAID began assembling supporting material for this project, there was almost no means to evaluate how the previous AID financed feeder roads had contributed to Colombian development.

The proposed project would provide technical assistance and training to support a new Sub-Project Selection and Evaluation office for Pico y Pala construction. The office would have two general functions: 1) to carry out the selection and economic analysis of the proposed roads, and 2) to develop an evaluation mechanism for on-going assessments of the impact of completed roads, especially in relation to agricultural production and provision of GOC social services.

The first function is designed to submit each project proposal to two levels of analysis. Initially, proposals must satisfy the project selection criteria (see Section II.B.5.a.) Then successful proposals will be submitted to an economic analysis that will test projects in terms of meeting an internal rate of return of 15% or better (see Section III.D.). It is expected that maintenance and environmental factors will receive more attention in the preliminary

stages of project design through the participation of this office. In the course of this preliminary analysis, the office will be responsible for assessing the availability of agricultural and social services to support the proposed road. The second function includes the establishment of baseline data to permit a subsequent determination of development changes brought about with the help of the road. At the end of the project, this function should enable Pico y Pala to present a better statistical case for financial support from the GOC or other external lenders.

The office would have a permanent staff of three selection/evaluation teams consisting of three economists (one is already on board), three agronomists and three engineers well trained in both maintenance and environmental concerns.

(ii) Road Design and Construction Capability

Camino Vecinales in its Pico y Pala program will improve its design and construction methods to help optimize the construction of access roads along with proper selection and evaluation. It is expected that Camino Vecinales will have the capability to perform well such activities as low cost and simple soil studies, surface and sub-surface water control, erosion control, landslide area detection, and route localization assisted by aerial photo methods.

(iii) Consideration of Environmental Effects

The problems of erosion, landslides, sedimentation and flooding are destroying a considerable amount of Colombia's agriculture potential. See Part III.A and Annex 4 for further discussion of Environmental Effects. Access road construction contributes a portion of such adverse effects. Camino Vecinales will be instilled an awareness of adverse environments effects of Pico y Pala road construction and will be provided with expedient methods to deal with such effects.

(iv) Budgetary and Cost Accounting

Camino Vecinales will have an improved system to account for expenditures and costs to improve its planning and executing capability. Improvements are also expected in the cash flow process from National sources to Camino Vecinales and to field payment offices.

c. Maintenance

The maintenance of Pico y Pala roads must be viewed from two aspects: before completion and final acceptance, and after acceptance. Before completion is the stage when most large repairs are frequently needed. The initial construction work tends to disturb the land equilibrium. Some slides will occur until a new equilibrium is established. During this period of construction and before final acceptance of the road by the Department, Pico y Pala retains responsibility for the maintenance of the road. Final acceptance is accomplished after the road has been utilized for some time and initial landslides, road failure, settlements, and washouts have been cared for. Pico y

Pala, utilizing Caminos' equipment where necessary, has an excellent record on this maintenance.

With improved capability in design and construction methods and with capacity to consider and address environmental factors, Caminos Vecinales will lessen the need for large repairs during construction and even after acceptance. After the receipt and acceptance of the road, responsibility for repair and maintenance fell upon the department. In most cases, departmental highway offices did not have adequate budgets, personnel or equipment to maintain all roads under their responsibility. The available funds for maintenance (40% of annual funds) are considered considerable for an LDC. However, costs are high due to Colombia's mountainous terrain, overloaded trucks, inadequate drainage, exposed cuts and fills which are continually subject to erosion and sliding, and poorly prepared road beds with excessive curves and narrow shoulders. Most available maintenance funds went for primary or highly used secondary roads. Tertiary or feeder roads have the lowest priority. In some cases, small feeder road maintenance is done by the local municipios.

With the aim to resolve the problem and with National Government approval, Caminos Vecinales will assume the responsibility for "after acceptance" maintenance of all Caminos Vecinales constructed road, including Pico y Pala roads, ordinary and IBD constructed roads. Caminos Vecinales is preparing the mechanisms to effect such maintenance. It will sub-contract the maintenance to capable Departmental Highway Offices, National Highway Offices which have willingness and excess capacity to assume feeder secondary road maintenance, private contractors, or community groups. The GOC and AID are particularly interested in developing a sound mechanism that would allow community groups to participate in the maintenance of their own community roads. Acceptable maintenance mechanisms and means to allow community groups to participate will be determined by Caminos Vecinales.

6. Planned Inputs

a. Road Construction

Financial inputs will be provided for Pico y Pala road construction as follows:

(Expenditures in Millions of Pesos (Dollars))

	<u>CY</u> <u>1976</u>	<u>CY</u> <u>1977</u>	<u>CY</u> <u>1978</u>	<u>TOTAL</u>
G.O.C.	51 (1.5)	72 (2.0)	95 (2.5)	221 (6.0)
A.I.D.	6.0 (0.175)	97.5 (2.7)	69.5 (1.825)	173.0 (4.7)
TOTAL	57.0 (1.675)	169.5 (4.7)	164.5 (4.325)	391 (10.7)

Note: Figures in parentheses represent equivalent dollar amounts based on the following exchange rates: 1976 - 34:1. 1977 - 36:1, 1987 - 38:1

b. Institutional Improvements

(i) Sub-Project Selection

Transportation economists are needed with experience in the analysis for selection of feeder roads. They will help to prepare an overall selection methodology and refine the project selection criteria. They will return at intervals to review and revise the methodology. The following is an estimate of needs and costs:

		<u>Cost</u>
1 Foreign Consultant	Time: 2 mos. at start	US\$8,000
	2 wks. at 9 mos.	2,000
	2 wks. at 21 mos.	2,000
	1 mo. at 33 mos.	4,000
		<u>US\$16,000</u>
1 Local Consultant	Time: 2 mos. at start	3,000
	2 wks. at 5 mos.	750
	2 wks. at 9 mos.	750
	2 wks. at 15 mos.	750
	2 wks. at 21 mos.	750
	2 wks. at 27 mos.	750
	1 mo. at 33 mos.	1,500
	<u>US\$ 8,250</u>	
TOTAL		US\$24,250
or		US\$25,000

Possibly, if at the end of one year it was determined that there were no need to review and revise the system such of the consultants work could be eliminated.

(ii) Sub-Project Evaluation

Assistance is to be provided in establishing and implementing an ongoing system for evaluating the impact of Pico y Pala roads. Collection of Baseline Data will be made in areas where roads are planned and in several areas where roads are not to be provided so as to provide reference cases. The data will describe the agricultural development stage of the areas of influence, approximate fallow and potential agricultural land, number of affected inhabitants, levels and sources of income, marketing practice, cropping patterns, educational and health levels, and community centers. The baseline and analytic data will be considerably more detailed than is required in the normal project selection process, in that the evaluation study would not just be an estimate of benefits but would, in fact, prove what benefits had been achieved in an area where roads had been constructed and where other inputs were to be provided. A carefully designed and executed impact study will bring to light interesting phenomena that could be of value to all future agricultural programs.

A breakdown of activities and estimated costs are as follows:

<u>Activity</u>	<u>Personnel</u>	<u>Time</u>	<u>Cost US\$</u>
1. Prepare evaluation methodology, number of samples, required data, formats, personnel needs.	1 Foreign Consult.	2 mos.	8,000
	1 Local Consultant	2 mos.	<u>4,000</u>
			\$ 12,000
2. Collect baseline data on 10 roads per year, 3 years (assumed)	2 Local Surveyors	70 M/mos.	14,000
	1 Local Supervisor	36 M/mos.	<u>15,000</u>
			\$ 29,000
3. Processing and tabulations	- -	-	8,000
4. Collect impact data	Same as collection of Baseline Data		29,000
5. Processing and Tabulation	- -	-	8,000
6. Analysis and Recommendations	- -	-	<u>14,000</u>
			US\$ 200,000

(iii) Design and Construction Capacity

(a) Expert Assistance

Two engineer/economists will be financed to assist the evaluation office in two specific areas: an evaluation of the labor/capital ratios being used and an evaluation of the current road design practices with recommendations for addressing the design, environmental and maintenance problems. The estimated cost is two mm for each expert annually for two years at \$3,500 per month or \$28,000.

(b) In-Country Training Seminars

With the help of outside experts, in-country training seminars and sessions will be included in the project. Their purpose will be to introduce the new project selection criteria and to stress the design, environmental and maintenance considerations to the regional personnel who supervise road construction.

Caminos will pay support costs and AID will finance up to \$30,000 for short-term technical assistance (8 mm). The training seminars are expected to last three days in the 24 Departmental offices or Regional offices.

(c) Observational Training Interchange

Several other Latin American countries are experimenting with rural roads programs. Examples include Honduras, Mexico, Nicaragua, Bolivia and Jamaica. The proposed project would attempt to develop an interchange between Colombia and these countries. Pico y Pala staff from other countries will be invited to Colombia to visit the national and regional offices of the Colombian Pico y Pala Program, as well as actual construction sites (proposed, underway and completed), to facilitate the transfer of technologies and administrative methodologies among the various country programs. In addition, Colombian personnel would be able to visit other countries to evaluate their experiences. The estimated cost of this portion is \$30,000 , to include travel, per diem and related expenditures.

(iv) Consideration of Environmental Factors

On the basis of Professor Liggett's discussion of the potential environmental problems, the proposed project would finance a full environmental assessment. The assessment would go beyond simple identification of impact but would address such topics as recommended actions for mitigation of adverse effects, and identification of alternatives that would result in the best quality development.

Based on the previous assessment, it is expected that specific problems will be encountered requiring: research into environmental problems which are unique to, or particularly severe in Colombia; and, training in the environmental problems associated with road construction. The research and training, would probably be carried out in conjunction with a U.S. university familiar with feeder road construction. The secondary objective of this research and training is to help create institutional links between the U.S. and Colombian universities with an interest in this area, e.g., Universidad de los Andes, Universidad Nacional in Bogotá, and in the Universidad del Valle in Cali. Up to \$60,000 will be made available for these purposes. The specific personnel and technical requirements will be determined by Caminos Vecinales.

(v) Cash Flow, Budgetary, and Cost Accounting Study

As will be noted later in Part IV. B.2., COC budgetary cash flows to Caminos Vecinales are not regular and in some cases have proven to be non-existent in the first two months of the CY year (GOC fiscal year). The proposed project includes a study of the progress of National funds to Caminos Vecinales and to the field offices, and recommendations to improve the cash flow process.

Also, in the preparation of this project, USAID has discovered that Caminos Vecinales has an unusual and unclear budgetary accounting process. For example, it was impossible to relate cost data to road completion data due to Pico y Pala's weighted system of accounting. Costs per kilometer of road completed tended to vary greatly. While some of this is explained (See Table I, Part III.A). USAID and Caminos Vecinales believe a better system can be developed. The proposed project includes up to \$12,000 for six local man months of TA in the various aspects of this study.

(vi) Evaluation of Maintenance Capacity

Local Studies are to be financed by this loan to investigate the capacity and arrangements for maintenance to be contracted possibly with Department Highway Offices National Highway Offices, private contractors, or community groups. The studies will be formulated with the aim to attract community participation in the maintenance service as much as possible. A consultant will study the financial, equipment, personnel and organizational factors, determine problems and constraints, and formulate recommendations. Caminos Vecinales will contract for the study, agree to consider such recommendations, and present an acceptable maintenance plan to AID. Loan funds in the amount of US\$15,000 will be reserved for studies of this purpose.

(vii) Summary of Project Funding for Institutional Aspects

(US\$ 000)

	<u>TA</u>	<u>Training</u>	<u>Total</u>
1. <u>Sub-Project Selection</u>	25	--	25
2. <u>Sub-Project Evaluation</u>	100	--	100
3. <u>Design & Construction Capacity</u>	28	60	88
a. Expert Assistance	(28)		
b. In-country Training Seminars		(30)	-
c. Observation training interchange		(30)	-
4. <u>Consideration of Environmental Factors</u>	30	30	60
5. <u>Budgetary and Cost Accounting</u>	12	--	12
6. <u>Evaluation of Maintenance Capacity</u>	15	--	--
	<u>210</u>	<u>90</u>	<u>300</u>

c. Maintenance Funding

The GOC will provide national funds to Caminos Vecinales for maintenance of Caminos Vecinales constructed roads including Pico y Pala roads. It has been estimated that a total of US\$ 1.0 million for maintenance will be required until the end of the project for presently constructed and those Pico y Pala roads to be constructed under the project. The required input is based on an assumed annual maintenance cost of US\$ 1000 per kilometer or approximately 10% of investment cost per kilometer per annum. This figure is a generally accepted standard for similar type roads and has been determined to be realistic in the Colombian context. Indeed, the figure is somewhat conservative since it is anticipated that the communities will carry out some of the regular maintenance functions. These maintenance funds are expected to cover only maintenance costs associated with AID-financed roads, including those roads constructed under previous sector loan assistance. The schedule of maintenance disbursement is anticipated as follows:

TABLE 3

Projected GOC Maintenance Disbursements
(thousands of dollars)

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>Total</u>
Previous AID-Financed Pico y Pala roads	233	233	234	700
Access Road Loan	- <u>233</u>	100 <u>333</u>	200 <u>434</u>	300 <u>1,000</u>

The GOC will be required to demonstrate on a yearly basis that the above funds will be available in its National Budget for maintenance of Pico y Pala roads.

d. Summary of Project Inputs
(US\$000)

	<u>AID</u>	<u>GOC</u>
<u>Road Construction</u>	4,700	6,000
<u>Institutional Improvement</u>	300	---
<u>Sub-project Selection</u>	(25)	---
<u>Sub-Project Evaluation</u>	(100)	---
<u>Design and Construction Capacity</u>	(88)	---
Expert Assistance	((28))	---
In-Country Training		
Seminar	((30))	---
Observation Training		
Interchange	((30))	---
<u>Consideration of Environmental Factors</u>	(60)	---
<u>Budgetary and Cost Accounting</u>	(12)	
<u>Evaluation of Maintenance Capacity</u>	(15)	
<u>Maintenance Funding</u>		<u>1,000</u>
TOTAL	<u>5,000</u>	<u>7,000</u>

PART III - PROJECT ANALYSIS

A. TECHNICAL ANALYSIS INCLUDING ENVIRONMENTAL ASSESSMENT

1. Technical Description of the Project

The Project consists of the construction of low cost farm-to-market feeder roads under a labor intensive Pico y Pala (Pick and Shovel) method of construction, to provide vehicular access from small isolated rural farm communities to the market economy.

The road systems of Colombia, under the jurisdiction of the Ministry of Public Works and the Fondo Nacional de Caminos Vecinales (CV), fall into three major categories: special, primary, and secondary. CV established standard design specification and construction criteria for secondary and feeder roads. The engineering portion of this project encompasses the selection, planning, field survey, design and construction of Pico y Pala feeder roads. In general, these roads will follow the established CV design criteria for second order road construction.

After Pico y Pala feeder road selection is made by the Coordinating Office, the CV regional office in that area has the responsibility for surveys, design, cost estimates, labor contracts and supervision of construction. Drainage structures and bridges are included in the design, as required, but kept to minimal needs, insofar as drainage and runoff calculations permit. All Pico y Pala feeder road design and construction documents must have the approval of the Director of CV, prior to construction. CV capability in this regard appears to be good. Construction is actually carried out by contractors who hire rural workers. The regional CV office supervises the contractors.

2. Preliminary Technical Considerations

The basic staff of a typical Caminos regional office is composed of a chief engineer, who supervises: (a) an administrative team of two warehousemen, one treasurer, and two bookkeepers; (b) a shop with equipment; and (c) the chief of the technical group. The chief of the technical group supervises the three program groups (Ordinary, IDB, and Pico y Pala) each of which contains civil engineers, inspectors, and topographers. A controller-auditor section reports directly to the chief engineer.

There are CV regional offices in each of the 22 departments and 2 national territories. Each regional office has about 65 people working on all three CV programs. Each regional office is equipped with a pool of basic vehicular road construction equipment. A typical equipment pool consists of: 4 jeeps, 3 dump trucks, 10 bulldozers (D-4, D-8), and 1 towed vibrating compactor.

The proposed method of operation for these offices under Pico y Pala is as follows:

The regional CV staffs report possible technical problems when submitting their projects for approval by the CV central office. These technical considerations should involve, but are not limited to:

- Coordinating route selection and receiving community approval of a selected route.

- Securing agreement on access and right of way (R. O. W.) where routing involves private property.

- Noting unfavorable soil conditions, including areas subject to landslides, and proposing remedial methods.

- Identifying surface and ground water problems in erosion of disturbed and loose soils.

- Locating spoil areas to receive excess excavation.

- Recommending methods of stabilizing the road banks in critical areas, e.g. better drainage control, terracing, planting, etc.

Before new projects are approved, the regional CV staffs should also make known the condition of existing feeder roads constructed in their areas with respect to the condition of the roads, maintenance, usage, adequacy, deficiencies of design and construction errors to be avoided in future planning.

3. Implementation Plan

After meeting all the selection criteria and receiving approval to proceed, the regional office should proceed to the step procedures outlined below:

- Make detailed topographic route survey of route selected and approved.

- Contract for the preparation of the design, cost estimates, proposed progress schedule and other required documents. Design the drainage structures and incorporate in the plans. Submit all plans, specifications and other required documents to CV headquarters for approval.

- Insofar as possible, schedule the work for the dry season, or during the slack agriculture production season, in order to maximize the use of manual labor.

- Negotiate with a contractor who will subcontract manual labor.

- Keep accurate time and payroll records on all contracts, and their effective beginning and termination dates.

- Provide adequate on-site supervision of construction at all times.

- Schedule the use of vehicles and/or purchase and delivery of construction materials and equipment in a timely fashion, as required, so that the equipment and material can be at the job site when needed.

- Prepare construction progress reports, maintain project files, and submit a final completion report in accordance with the reporting procedures defined in the Loan Agreement.

- Insure that future arrangements for road maintenance are satisfactory.

4. Design Standards

The Pico y Pala feeder roads will be constructed through the use of labor intensive, pick and shovel construction methods using an absolute minimum of mechanical equipment. It is anticipated that these roads, for the most part, will be constructed in mountainous terrain. These roads are to be constructed to serve vehicular type traffic year round.

The design standards for Pico y Pala feeder roads will, in general, follow the Caminos Vecinales standard specifications for design and location studies for second order roads. Final design is based upon conditions found in the field and modifications to these standards are permitted when justified by terrain problems.

All materials used in construction and the methods of construction will meet the standards as specified by CV and the Ministry of Public Works (MOP).

Geometric Standards

Average Mountainous Road

- Design speed (kilometers per hours)	30
- Minimum platform (roadbed) width-meters	4.30
- Minimum pavement (lane) width-meters	3.50
- Minimum horizontal radius (meters)	30
- Maximum gradient (%)	7
- Maximum superelevation (%)	6
- Sight distance - passing (meters)	200
- Typical surface of road	As approved
- Drainage	Permanent & Temporary
- Design load for bridges	HS-15
- Width of R. O. W. (meters)	0

As a general rule, all Pico y Pala feeder roads will consist of one lane with turnouts or widened areas for passing placed approximately every 200 meters and at sharp curves as conditions and design dictate. The wearing course will be select borrow material. Cuts for excavation will be limited to a maximum of 8 (vertical) meters. Fill will be compacted by approved methods and limited to a maximum vertical depth of one meter.

Drainage will be provided by means of side ditches, together with reinforced concrete pipe culverts, drop inlets, box culverts and bridges as required to provide adequate drainage and cross-drainage facilities. Bridges will be one lane roadway width and designed for HS-15 loading.

5. Equipment

There is little call for equipment in the construction of Pico y Pala type feeder roads, especially for those roads in mountainous areas which will make up the bulk of road construction under this program.

When equipment is needed, it will represent a fractional part of the total construction cost. Vehicular and construction equipment is used and can be expected to be utilized under certain soils or terrain conditions. For example, if cuts occur in clay or silty soils, better material will have to be brought in, possibly, as an admixture, with selected borrow material used for the wearing course. In cases like this, 6 to 8 metric ton dump trucks will be used to haul the better material to the site; scarifying and blading will be done by the use of grader, and compaction can be accomplished by towed, vibrating, compaction equipment available in the CV regional offices. Most of this equipment is rented by CV to Pico y Pala for specific needs. No procurement of equipment is planned under this program; equipment that may be necessary is already available and deemed adequate for the project.

6. Appraisal of Technical Soundness

a. Labor

The pre-selection study will establish that there is ample unskilled labor available in all of the areas where projects are contemplated. The construction of these roads will use pick and shovel methods almost exclusively, with material being transported short distances by wheelbarrow. This type of labor intensive feeder road construction program has proved to be successful in recruiting labor since its inception and has been very instrumental in alleviating unemployment for the farmers during the dry season or when the farms are not being worked. With few exceptions, no skilled labor such as equipment operators are required.

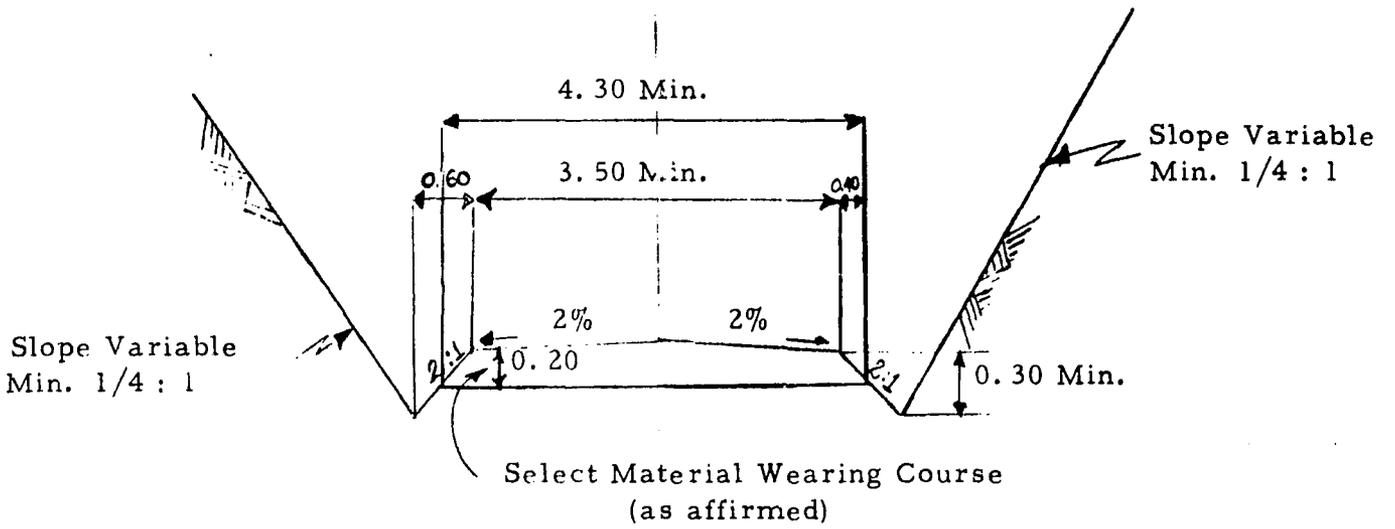
b. Equipment

So little equipment is needed that it does not present any anticipated construction problems. The few pieces of construction equipment that may be required are available in the various regions where the feeder roads will be programmed and constructed.

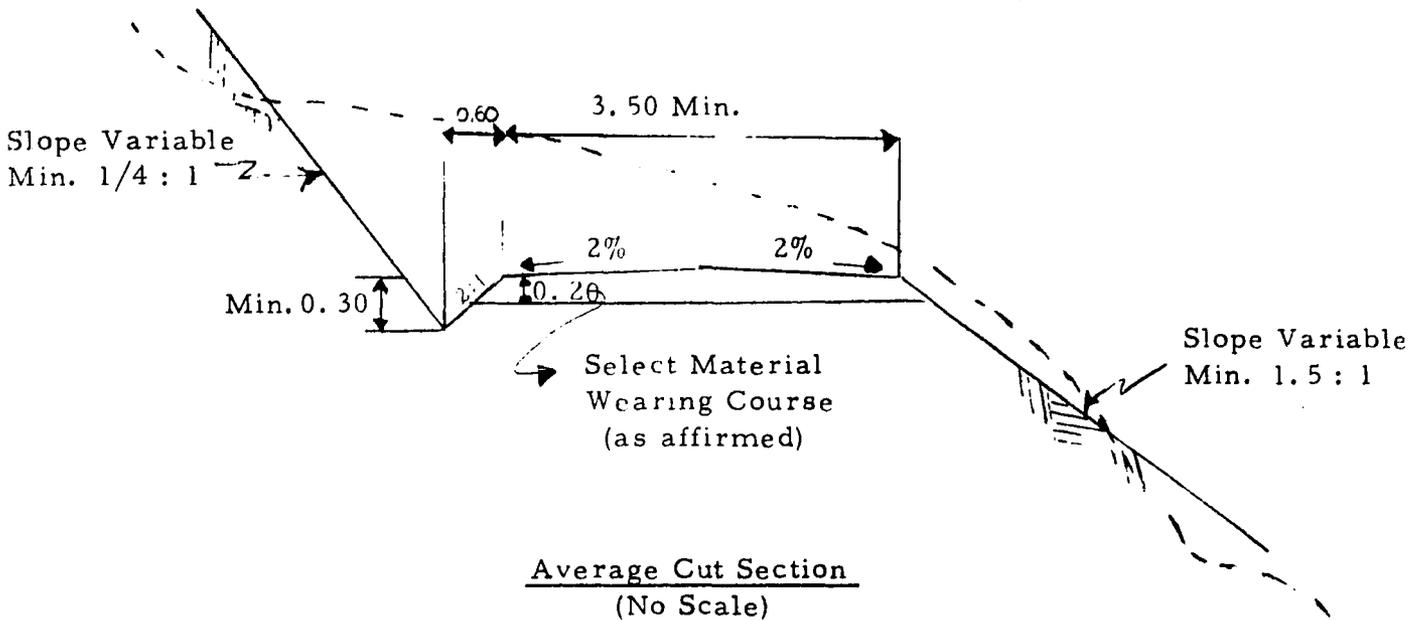
c. Design

Standards for design and construction of roads have been established by the CV for the various order of feeder roads under its jurisdiction. The Pico y Pala feeder road standards generally follow those for roads of second order with modifications permitted to meet exceptional terrain or field conditions. Adequate technical input for this

Typical Cross Sections
Pico y Pala Feeder Road



Full Cut Section
(No Scale)



type of road design and construction is available in the CV regions. The regional staffs are equipped to accomplish the surveys, design the drainage structures and small bridges, provide the specifications, negotiate labor contracts, supervise construction and accomplish all other basic engineering requirements. Contracts are negotiated with local A & E firms for the design and preparation of plans, profiles, sections, quantities, and other related contract documents. All engineering contractors are prequalified and selections are made by approved methods. When design problems such as large bridges are beyond the scope of regional staff capabilities, the central CV office is called upon for assistance.

d. Materials

Other than the natural earth found in its many forms during the progress of Pico y Pala road construction in mountainous areas, there is little call for other construction materials. Drainage requirements such as reinforced concrete pipe, concrete headwalls and culverts, concrete and steel for relatively few bridges make up the majority of outside materials needed. It is anticipated that the cost of these materials will be minimal compared to the total cost of construction.

e. Bridges

For the most part, box culverts will carry the major runoffs from small streams. Bridge construction is expected to be infrequent, with no bridges anticipated to be more than 5 meters in length. These small single lane spans of reinforced concrete construction should present no problem to the regional Caminos Vecinales staff in design and construction. Should larger structures be needed beyond the design and construction capabilities of the regional staff, central office assistance can be called upon. However, no large bridge construction is anticipated and will, in fact, be discouraged, with recommendations to reroute, relocate, or reject the road.

7. Land Expropriation and Compensation for Access

a. Authority

Expropriation is authorized by Article 30 of the National Constitution. Whenever the application of a law results in a conflict of the rights of individuals with the needs recognized by law, private interest must defer to the public or social interest. For reasons of public benefit or social interest as defined by law, expropriation can be carried out by judicial order and previous compensation.

b. Formal Procedures

A suit for expropriation must be instituted before a Civil Circuit Court and filed against the owner of the property. If expropriation is decreed, then the Court shall proceed to appoint two experts to make an appraisal of the value of the land and its improvements. After payment is made, the judge shall give the agency the possession of the land. This possession can be granted to the agency even before the appraisal of the land, subject to previous deposit of the cadastral land value plus 50% of such value by the agency.

c. Actual Caminos Experience

The above formal judicial procedure for expropriation has never been used by Caminos Vecinales during its short existence, since communities have not seen fit to contest Caminos' existing procedures. The programs of Caminos Vecinales have generally been welcomed by the landowners due to the nature and desirability of roads constructed by this agency. Indeed, some landowners have given land to Caminos for roads without compensation.

The following is the procedure practiced by Caminos Vecinales to acquire land and compensate for damages caused by the agency's road construction:

Two land appraisers are appointed: one by the landowners and one by Caminos Vecinales. In case of disagreement between the two appraisers, a third one is appointed by the corresponding municipality where the land is located. This decision is final. The appraisal document for the price of the land is included in the draft of a Resolución Ejecutiva to declare the land of public benefit or social benefit to be signed by the President of the Republic and the Ministry of Public Works. Based upon the above resolution, immediate payment to landowners is made, charging the funds allocated to the corresponding road.

d. Compensation for Damages

A similar procedure is implemented when a Caminos Vecinales road damages private property. When damage is done to crop production rather than land, the value of the damaged crops is evaluated according to the Ministry of Public Works Code. This amount is paid to the owner.

8. Overall Cost Estimates

Under the Pico y Pala program from June 1972 to December 1974, 78 feeder roads in 16 departments were constructed. Considering only fully completed roads, a total of 190 kilometers was completed at a total cost of 65.9 million pesos. The average cost per km. of these 78 feeder roads, ranging in length from 3.5 to 20 kms. was about 350,000 pesos or about \$11,400 per km.

The average costs under varying terrain conditions are in accordance with the following estimates:

Rocky terrain	- 500,000 pesos /km.
Normal soiled conditions (loose material)	- 350,000 pesos /km.
Side slopes fairly flat (normal conditions)	- 180,000 pesos /km.
Flat terrain - some fill	- 150,000 pesos /km.
Flat terrain - firm base	- 120,000 pesos /km.

Annex II 6 provides the wide range of costs experienced so far by Pico y Pala. Average projected kilometer costs under the proposed project have been projected by year through 1978. Escalation costs have been estimated by conditions and projections assumed for each department.

Table 1

Pico y Pala Road Cost Projections

<u>Year</u>	<u>Average Cost Km/Yr. (Pesos)</u>	<u>Exchange Rate</u>	<u>Cost (\$)</u>
1975	366,000	32.1	11,500
1976	395,000	34.1	11,700
1977	430,000	36.1	11,900
1978	480,000	38.1	12,100

Based on historical experience and these projections, the costs for this project appear to be reasonable.

9. Labor and Material Costs

Chart "A" was prepared by the Oficina del Coordinador Nacional de Pico y Pala and lists unit costs for different materials as established by the FNCV for the several regional offices listed. Picks, shovels, and other required hand tools are supplied to the contractor by the FNCV and charged to his account at nominal costs. Contracts for labor are based upon excavating a fixing amount of material in cubic meters at a predetermined unit cost per cubic meter, which is dependent upon the type of material to be excavated. A hard working individual can make up to 80 pesos a day, but the average income runs around 40 pesos/day. Both labor and material costs appear reasonable.

10. Environmental Aspects

A full discussion of the environmental impact of the proposed project is contained in Annex 4 in a report, "Land Damage Caused by Road Construction in the Mountainous Areas of Colombia," by Professor James Liggett of Michigan State University. This proposed project will have significant environmental impact. On the positive side, favorable effects include access to health services, higher living standards, employment, increased agricultural production, increased educational services, and improved nutritional status. Most of these positive factors are discussed elsewhere in this PP.

The proposed project is expected to have a neutral, or negligible, impact on several environmental factors. The areas where the roads will be built are highly populated with small farmers, resulting in a relatively stable ecological balance at present. The existing wildlife and natural resource balance should not be greatly upset by the intrusion of feeder roads. Although agricultural land use patterns should change as a result of the roads, the change is expected to be gradual, so as to not drastically affect ecological balances.

The proposed project is not expected to include any roads to areas where primitive cultures exist and where access could cause cultural shock to the inhabitants. No major dislocations of population will result from the narrow right of way for the roads, as this factor is taken under consideration in the original road design study. Finally, low traffic volumes are not expected to have any serious effects upon noise levels or air quality.

Chart A

Pico y Pala Program
Unit Prices (Pesos)

<u>Regional Offices</u>	<u>Clearing and Grubbing</u>	<u>Topsoil</u>	<u>Soil</u>	<u>Conglomerate</u>	<u>Clay</u>	<u>Rock</u>	<u>Landslide</u>	<u>F.L.</u>	<u>Ditches</u>
	M2	M2	M3	M3	M3	M3	M3	M3	M. L.
Antioquia	2.50/rastrojo 6.00/mountain	2.00	8.00	13.00	6.85	20.00	10.00	-	-
Atlantico	-	-	17.00	27.00	22.00	40.00	10.00	17.00	-
Boyaca	-	-	5.90	9.20	-	26.87	4.00	-	-
Caldas	1.50	0.80	7.00	9.50	5.80	21.00	3.60	-	-
Cauca	4.00	4.00	6.00	10.00	8.00	20.00	6.00	-	-
	-	-	7.00 ^{1/}	9.50 ^{2/}	9.50 ^{1/}	-	-	-	-
	-	-	-	8.00 ^{3/}	-	21.50 ^{2/}	-	-	-
Cundinamarca	-	-	5.50	7.50	-	18.00	3.00	-	-
Choco	3.00	3.00	8.00	12.00	10.00	28.00	6.00	-	3.00
Guajira	0.10	-	18.00	25.00	-	40.00	-	18.00	-
Huila	0.40	0.50	6.00	9.00	-	22.00	4.50	-	-
Meta	-	-	10.00	15.00	-	30.00	-	-	-
Nariño	1.60	0.70	8.00	11.00	7.70	24.00	4.30	-	-
Norte Santander	1.50	0.70	5.85	9.20	6.50	20.15	4.00	10.00	1.40
Quindio	1.50	0.80	7.00	9.50	5.80	21.00	3.60	-	-
Risaralda	1.00	1.00	6.00	9.00	-	21.00	6.00	-	-
Santander	1.50	-	6.00	9.50	-	21.00	3.40	-	-
Tolima	1.60	0.75	8.50	14.00	-	22.00	6.00	-	-
Valle	-	-	7.89	13.89	10.29	23.97	4.89	-	-
Intend. Casanare	0.50	-	10.00	11.70	14.00	23.30	9.00	-	1.50

1/ Prices in effect in: Silvia-Puente Real-La Campana, e Inza-Turmina

2/ Prices in effect in: Inza-Turmina

3/ Prices in effect in: Florencia-Esmeraldas, y San Juan-Granadillos

M2 - Square Meter

M3 - Cubic Meter

M. L. - Linear Meter

Prepared: 4/24/75

There are possible adverse environmental effects of the proposed loan, including erosion, landslides, farmland loss and damage, and water resources damage. Most landslides are likely to occur during or shortly after construction, when Caminos can correct the damage. However, there is always the threat of subsequent slides which would be unattended. Erosion is usually caused by the redistribution of surface waters from the road construction; sedimentation in the rivers leads to a number of problems which include flooding, frequent changes in the course of the river and subsequent damage to permanent structures and agricultural land, contamination of personal and public water supplies, high rates of reservoir sedimentation, and a greatly increasing difficulty in the development of water resources for small or large uses.

Each of these potential dangers may or may not exist at a given road construction site. The best remedies for prevention of environmental damage in these areas is a knowledge of the problems on the part of the parties involved in the construction. This knowledge should be utilized in the route location process, including a review of stable and unstable zones, drainage pattern, soil types, topography, and vegetation. In order to minimize construction damage, the borrow and spoils areas should be selected with a view towards preventing erosion and sediment production.

The proposed project will address these environmental problems. The engineers who will be planning and building roads will be made increasingly aware of and concerned over the environmental impact through a technical assistance and training program. CV engineers will use this training during the pre-construction socio-economic evaluation of the road, and the road design. The possibility of slides and the consequent sediment production and erosion will be reviewed carefully.

B. FINANCIAL ANALYSIS AND PLAN

1. Recurrent Budget Analysis of Implementing Agency

a. Caminos Vecinales

Caminos Vecinales has three basic programs. Its Ordinary Resources program is financed by its own resources, which consist of 10 percent of the total GOC funds received from the national gasoline tax; a 2 centavo tax on every bottle of beer sold by the Departments; contributions from GOC Agencies such as ICEL, INCORA, and the Cafeteros; and various Departmental contributions. Gasoline tax revenues have accounted for about 35 percent of CV's total revenues. Second, its IDB road construction program is financed by GOC budgetary allocations: (58 percent) and an IDB loan (42 percent). (A new IDB loan for CV to build secondary roads in two pilot DRI areas is under discussion.) Third, its Pico y Pala program is financed by Ministry of Agriculture, Ministry of Public Works, National Coffee Federation, AID and Caminos Vecinales resources.

Tables 1 and 2 provide past and projected cash flow figures for Caminos Vecinales. On the revenue side, CV is shifting its revenue base from departmental and voluntary contributions to tax-based sources in order to even out the flow. CV has had an increasing and steady income flow from the gasoline tax. It is expected to increase in the future, as the degree of GOC subsidy of the price of gasoline is likely to decline. The projection that GOC budget resources available to CV will increase from 240 million pesos in 1975 to 435 million pesos in 1978 is optimistic, but feasible. CV's second largest source of internal revenues is the beer tax, which is expected to increase from 36 million pesos in 1975 to 46 million pesos in 1978. As with the gasoline tax, these revenues have usually reached budgetary targets, making them more dependable than departmental and voluntary contributions. The Departments simply lack the interest and funds to support the program. The communities expect pico y pala to pay for the roads, especially in cases when the communities contribute free labor to finish the road sooner. It should be pointed out that CV's attempts to utilize the appraisal tax as a source of revenue have failed thus far. The Consejo Nacional de Valorización, the GOC agency responsible for collecting the tax, cannot bill anyone before the road is finished - delaying for two-three years any return to CV on its construction costs. The tax collections are not significant - the small farmers affected by the roads have very limited incomes and the legal difficulties of collection are numerous. As a result, CV has begun to budget its funds without unrealistic expectations of immediate tax returns from this source.

On the expenditure side, several shifts in program direction are occurring. CV is placing less future emphasis on

its Ordinary Program and more emphasis on the Pico y Pala and DRI programs. This shift reflects a desire to play a greater role in the GOC strategy of concentrating resources on agricultural development. In addition, the shift to Pico y Pala and the halting of the capital intensive BID program reflect increased CV emphasis on labor-intensive construction rather than equipment-intensive construction. Another trend is the increased budget for road maintenance from 10.8 million pesos in 1971 to 50.0 million pesos in 1978. On a budget execution basis, there is also a significant increase as CV received 7.1 million pesos in 1971 and 18.9 million pesos in 1974. This maintenance represents the cost of protecting the roads until CV construction has been completed.

b. Pico y Pala Program

The increases in expenditures for the Pico y Pala program have been substantial and are projected to further increase in the future. In 1972, the first year of the program, Pico y Pala received 7 percent of the total CV expenditures budget. In 1973 this increased to 17 percent, and in 1974 it was 29 percent. By 1978 the Pico y Pala program will account for a projected 42 percent of the budget. These figures are further explained in Table 2.

REVENUES MUNICIPALES
Past and Projected Cash Flow
1972 - 1978
(000000)

Table 1

	1972		1973		1974		1975		1976		1978	
	Budget	Execution	Budget	Execution	Budget	Execution	Budget	Execution	Budget	Execution	Budget	Execution
REVENUES												
<u>National Budget</u>												
1. Ordinary Resources/ 10% Gas	115,300	99,792	115,450	128,246	166,204	187,344	158,694	140,984	243,070	-	196,000	435,600
2. Other: GOC Contributions 1/	11,870	16,457	55,161	14,719	30,821	2,215	47,615	23,811	31,210	-	-	-
3. BID Contract	57,000	25,011	109,032	111,032	87,200	59,162	85,795	37,191	-	-	-	-
4. AID Loans	-	-	20,000	5,571	47,065	16,139	34,120	43,800	13,300	-	35,000	19,000
SUB-TOTAL	184,170	141,259	309,643	369,628	331,300	264,660	326,224	245,786	287,580	-	476,000	458,600
<u>Departmental Budgets</u>												
1. Voluntary Contributions	108,800	17,237	103,738	33,790	62,559	18,540	53,957	8,022	39,300	-	5,000	-
SUB-TOTAL	108,800	17,237	103,738	33,790	62,559	18,540	53,957	8,022	39,300	-	5,000	-
<u>Own Resources</u>												
1. Appraisal Tax	1,000	1,014	7,000	43	19,147	1,893	15,920	1,930	16,000	-	5,000	15,000
2. Investment Recoveries	1,575	2,177	5,500	2,352	9,454	3,982	1,296	2,628	804	-	-	-
3. Warehouse Sales	1,572	1,151	50	543	2,350	663	300	112	1,500	-	-	-
4. Neighbors-Municipalities-Communities Contributions	10,000	23,111	1,000	1,596	6,850	1,553	-3,806	2,170	50	-	-	-
SUB-TOTAL	14,647	8,453	16,750	6,454	37,801	8,091	21,322	6,840	18,354	-	5,000	15,000
<u>Beer Tax</u>	15,000	26,651	27,000	26,167	29,940	32,539	30,396	32,317	36,040	-	35,000	46,000
<u>Other Entities</u>												
1. Medecafe	12,800	5,799	44,267	11,302	47,920	12,686	39,309	11,982	9,000	-	20,000	30,000
2. INCOHA	25,876	10,624	17,500	11,609	13,734	4,534	10,000	2,175	-	-	-	-
3. Other (Invasion, ICED, COA, EEPP Medellin, CAF, Texas, etc.) 2/	74,371	20,929	298,250	11,490	105,306	22,157	51,567	5,640	36,296	-	-	-
SUB-TOTAL	113,047	37,352	360,017	34,401	166,960	39,379	100,876	19,747	45,296	-	20,000	30,000
TOTAL REVENUES	307,117	260,192	799,223	761,492	628,111	363,409	533,274	312,712	426,570	-	476,000	545,600

Past and Projected Cash Flow
(continued)

Table 2

	1971		1972		1973		1974		1975 1/		1976	1977	1978
	Budget	Execution	Budget	Budget	Budget								
EXPENDITURES													
I Investments													
1. Ordinary Program	356,000	146,090	242,510	121,014	182,664	80,697	179,367	63,203	245,791	-	100,000	100,000	95,024
2. BID Program	100,000	73,470	260,500	158,802	229,291	136,244	154,551	76,740	-	-	100,000	-	-
3. Pico y Pala Program	-	-	60,790	20,639	118,999	40,905	58,365	55,374	79,067	-	112,000	146,000	147,000
4. DRI	-	-	-	-	-	-	-	-	-	-	100,000	90,000	100,000
SUB-TOTAL	456,000	219,560	563,800	300,445	530,954	257,846	432,863	195,317	324,858	-	312,000	340,000	342,024
II Roads Maintenance													
	10,000	7,079	5,405	3,299	66,010	5,029	30,007	18,943	27,310	-	10,000	45,000	50,000
III Other Investments 3/													
	12,278	4,433	6,950	2,957	28,007	13,752	36,087	10,524	4,756	-	-	-	-
V Operating Expenses													
1. Payroll and Fees	36,317	30,105	34,573	29,062	43,416	28,030	48,127	41,107	61,126	-	-	-	-
2. General Expenses	12,533	9,815	14,283	12,250	15,807	12,301	18,944	16,648	13,926	-	-	-	-
3. Expendable Equipment	1,000	1,407	4,966	3,767	4,809	3,186	5,621	4,165	5,475	-	100,000	100,000	126,576
4. Overhead	10,000	8,954	10,550	5,477	8,941	4,357	6,052	3,828	5,402	-	-	-	-
SUB-TOTAL	59,850	52,281	64,372	50,566	72,973	47,874	78,744	65,748	85,929	-	-	-	-
Debt Service													
	10,000	7,126	7,676	5,479	29,324	19,367	2,603	2,357	3,402	-	-	-	-
Technical Assistance and Studies													
	7,000	5,642	5,023	2,792	22,392	1,642	9,094	3,968	12,059	-	-	-	-
TOTAL OUTLAYS	513,000	296,121	773,325	396,548	749,660	345,516	589,418	296,877	458,214	-	422,000	500,000	519,600

NOTES

Other GOC contributions include (a) MOP and (b) additional special contributions from GOC 2/ Others include contributions from entities such as ICEL, ICA, etc and resources coming from equipment rented and similar own transactions
 Other Investment includes (a) Purchase of Real State property (b) works made by contract
 "Obras Negadas", Contributions to Junta de Accion Comunal d) Fondo Vivienda Empleados/ Data will be available by June 30, 1975.

2. Financial Plan/Budget Tables

a. Funding Requirements

The total costs of the proposed project are summarized in the following tables:

TABLE 3

SUMMARY COST ESTIMATE AND FINANCIAL PLAN
(US\$ 000)
PROJECT PAPER

<u>USE</u>	S O U R C E						TOTAL
	A I D		H O S T C O U N T R Y		O T H E R		
	FX	LC	FX	LC	FX	LC	
Road Construction	--	4,700	--	6,000	--	--	10,700
Institutional Improvement	130	170	--	--	--	--	300
Maintenance	--	--	--	1,000	--	--	1,000
TOTAL	130	4,870	--	7,000	--	--	12,000

The Loan Agreement will clearly establish the principle of the Host Country's contribution in the equivalent of the U.S.Dollar amount.

TABLE 4

COSTING OF PROJECT OUTPUTS/INPUTS
(In US\$000 or equivalent)

PROJECT PAPER

X NEW
-REV.#

Project # 514-0220

Title: Small Farmer Market
Access Loan

<u>Project Inputs</u>	<u>Project Outputs</u>			TOTAL
	Road Construction #1	Institutional Improvements #2	Maintenance #3	
AID APPROPRIATED ROAD FUNDS	4,700			4,700
Sub-Project Selection TA		25		25
Sub-Project Eval. TA		100		100
Design & Construction TA		28		28
In-Country Seminars		30		30
Observation Interchange		30		30
Environmental Considerat.		60		60
Cash Flow, Budgetary Study		12		12
Maintenance Study		15		15
Other U.S.	--	--	--	0
Host Country	6,000		1,000	7,000
Other Donors	--	--	--	0
TOTAL	10,700	300	1,000	12,000

TABLE 5. Project Summary by Source of Financing and Disbursement Period
(US\$ 000)

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>Total</u>	<u>%</u>
1. <u>Local Costs</u>					
a. Road Construction					
GOC Funds	1,500	2,000	2,500	6,000	56
AID Loan Funds	<u>175</u>	<u>2,700</u>	<u>1,825</u>	<u>4,700</u>	44
Sub-total	<u>1,675</u>	<u>4,700</u>	<u>4,325</u>	<u>10,700</u>	
b. Institutional Improvements					
AID Loan Funds	60.5	54.25	55.25	170	100
c. Maintenance					
GOC Funds	233	333	434	1,000	100
2. <u>Dollar Costs</u>					
Institutional Improvements					
AID Loan Funds	47	49	34	130	100
<u>Total Project Summary</u>					
AID Loan Funds					
Local Costs (Construction, & Institutional improvement)	235.5	2,754.25	1,880.25	4,870	
Dollar Costs	<u>47</u>	<u>49</u>	<u>34</u>	<u>130</u>	
TOTAL AID Loan	282.5	2,803.25	1,914.25	5,000	42
TOTAL GOC	<u>1,733</u>	<u>2,333</u>	<u>2,934</u>	<u>7,000</u>	58
TOTAL PROJECT	2,015.5	5,136.25	4,848.25	12,000	

3. Summary Opinions

The Implementation Plan schedules conservatively the financial needs and inputs to the project. Based upon such a schedule, the Project Committee conclude that the financial plan is more than adequate and more than reasonably firm. The Project Committee has found the project to be overall financially sound.

C. SOCIAL ANALYSIS

1. Target Group

The primary long-run beneficiary of this project will be those small farmers who live within five kilometers of the roads constructed and those small farmers who participate directly in the construction activity. For purposes of this project the target beneficiary can be described as a farmer who:

- has land holdings of up to 10 hectares, with an average holding of less than 5 hectares, of which approximately one half is in production;
- uses a subsistence technology that requires minimal or no inputs other than labor and seeds;
- has a family cash income of less than US\$200 per annum;
- has relatively high transport costs;
- has little or no experience with formal credit;
- has limited or no contact with agricultural technicians;
- has little or no access to GOC health or education services.

(For a more detailed description of how the project will be focused on the target group see Part II.B.5.a.(i). Project Selection Criteria).

The total number of potential target beneficiaries has not been determined since this will depend on the final project selection process. The roads will, however, be concentrated in the more densely populated, minifundia areas of the country. Based on their past experience, Caminos Vecinales estimates that the 875 kilometers of roads to be constructed under this project could have a direct impact on between 50,000 and 75,000 small farmers.

2. Characteristics of the Rural Populace

See Part II.A. Background.

3. Small Farmer Organization

There exist in Colombia a wide range of farmer and community level organizations. These organizations may exist for the purpose of conducting business, such as the farmer cooperatives or they may exist for the sole purpose of promoting community well-being, such as the Junta de Acción Comunal (Community Action Groups). In any case, it is through one of these farmer organizations that Caminos Vecinales usually receives a request for a pick and shovel road. Because the beneficiaries themselves usually initiate the request for a road, their motivation and willingness to work on the roads are ensured.

From USAID and GOC past experience with the pick and shovel road program financed under former sector loans, no significant changes in beneficiary level behavior patterns, organization, etc. are anticipated. (See Part II.A.7. The Agricultural Impact of Pico y Pala). In short, the Project Committee believes the project to be totally feasible from the socio-cultural point of view.

4. Spread Effect

It is not anticipated that the target beneficiaries will produce a significant spread effect among themselves as a result of this project. The pick and shovel program is already well-known in the rural areas of Colombia. In the past, demand on the part of local action groups has always exceeded Caminos Vecinales capacity to administer the construction of pick and shovel roads.

The Project Committee expects that the important spread effect of this project will be within the Caminos Vecinales institution. It is anticipated that the utilization of a set of project selection criteria will be adopted by Caminos Vecinales for the other roads which they construct. This could have a significant impact on the location of other roads in Colombia, which would lead to positive social impacts.

Another important spread effect is expected to be with respect to the question of road maintenance. The mechanisms being built into the project to ensure adequate maintenance is expected to have a beneficial impact on the maintenance of other roads by the various levels of government responsible. Once the importance of properly maintaining existing roads is established, it is anticipated that budget allocations for construction and maintenance will be shifted in order to provide for adequate maintenance.

5. Social Consequences and Benefit Incidence

a. Access to Resources

The pick and shovel roads to be constructed under this project have as their purpose to provide the small farmer beneficiary access to markets and health and education services. The selection criteria take the access question into account. There is no doubt that the project will have a significant impact on the beneficiaries with respect to access.

b. Employment

Because of the labor intensive technology used in the construction of roads financed under this project, employment in the rural areas will be affected. Based on past experience, this project should provide at least 3,200 man-years of work distributed among 19,000 farmers. While this may not be significant in terms of the rural unemployment problem in Colombia, employment is not the primary purpose of this project.

Past experience with this program has demonstrated that there has never been a lack of available labor for road construction. Caminos Vecinales has a policy of establishing wages to workers that are both competitive to capital intensive methods and are sufficient to attract an adequate labor force. With an intelligent wage policy, availability of labor is not anticipated to be a problem.

As farmers obtain access to markets, it is expected that they will intensify their production, which in turn will require more labor. The marketing function per se will also be a source of increase labor demand. These factors taken together could cause a substantial impact on employment.

c. Rural Urban Migration

Rural-urban migration in Colombia is presently considered to be a primary problem. The major cities have been growing at alarming rates due, in part, to this migration. This project, however, is expected to have somewhat of a stemming effect on rural-urban migration. This is expected to happen as a result of increased demand for labor in the rural areas both by small farmers, who, because of their access to market are able to intensify their production and through the increased activity in marketing, etc. The general improvement in the welfare of the people living in the areas of the new roads is expected to deter rural-urban migration.

d. The Role of Women

The impact of this project upon women is significant. The following are some tentative hypotheses as to the impact on women:

1. Increased mobility will provide adult rural women with better opportunities for improved health services, such as pre-natal and post-natal care; and more access to the cash economy to sell cottage-industry products.
2. Higher rural family incomes should facilitate educational opportunities for young girls.
3. Better transportation should encourage rural women to increase their contribution to agricultural production through small gardens, etc., creating more disposable income for women.
4. To the extent that women have previously transported produce to the market place, this chore will be reduced in scope to permit women to spend time on personal pursuits.
5. Currently, women play a very active role in the marketing of the farm production. This project should enhance that role by making additional production available for the market.

e. Other Beneficiaries

As mentioned in Part III.D. Economic Analysis, some increase in land values is expected in areas of the new roads. This is an economic benefit which will accrue to the owner of the land, but it could have some social implication in cases as sharecroppers and renters particularly if the landlord increase the rent. This, however, is not anticipated to be a serious problem since less than 17 percent of the farms of five hectares or less are rented or sharecropped, while more than 67 percent are owned outright. Furthermore, there has been a substantial decrease (over 50 percent for renters and 32 percent for sharecroppers) in this form of tenure between 1960 and 1970/1.

Indirect benefits are expected to accrue to that group of people who are engaged in the chain of marketing agricultural products. This group would include truck drivers (who often act as market intermediaries) market middlemen, purchasing agents, wholesalers and retailers. Other indirect benefits will also be derived by the consumers of the increased production. These benefits are impossible to quantify but they clearly have positive social implications.

D. ECONOMIC ANALYSIS

Summary

Fundamentally the economic analysis will be accomplished through two tests of acceptability. The tests will subject all project proposals to descending levels of analysis. At the first order, a checklist of project selection criteria has been developed to screen all project applications. The suggested criteria (See Section II. B) are designed to provide a rough indication of the feasibility of the project with respect to availability of services, road cost, production potential, etc. Assuming a proposal is not rejected, it is passed through a second order of analysis which consists of (a) an area stratification by farm sizes measured by a weighting scheme which favors projects comprised predominantly of the target small farmer group, and (b) an economic rate of return analysis (projects that produce a rate higher than the opportunity cost of capital). All projects that successfully pass both levels of analysis have proven their economic worthiness and (once approved by AID) are eligible for AID loan financing. It is understood that Pico y Pala will apply the same acceptability tests to GOC financed projects, however, AID will not be required to approve those projects.

Lastly, as a test for total project appraisal, an illustrative case is presented to determine a rather conservative measure of the total "Roads Program" impact. That analysis yielded a Benefit/Cost Ratio of 1.25 when discounted at 15 per cent, and an economic rate of return of 19.4 percent.

1. Project Selection

Although this program is characteristically similar to the earlier AID assistance for Pico y Pala roads, there is an important departure tailored toward improving the selection process. The main tools used throughout the project selection are those of economic analysis. Consequently, the problem is to find investment policies that give rise to the most efficient utilization of all resources, including the stock of highways and secondary roads. In short, the primary criteria by which we judge these various policies is that of economic efficiency - getting the most from the least.

The lynch-pin of the approach taken here is the classic penetration road methodology enhanced by a weighting scheme favoring areas predominantly made up of small farmers.

Of course, it is generally accepted that the level road design suggested within this loan, and the subsequent low-cost value of the road hardly suggests a rigorous project analysis for each project. Given the global coverage of potential project site selection, and the desirability of an economic analysis, the magnitude of analytical effort and associated costs would become astronomical. Selection is further bound by the dual objectives of ensuring maximum small farmer participation and stimulating increased production.

The two objectives overlap but they are not statistically coincidental. Therefore, in an effort to satisfy both objectives an optimizing scheme has been devised to include both interests.

The rationale for some form of economic analysis both on the macro and micro levels has been promoted largely because of resource restraints and scarce capital resources. A universal return or minimum acceptable return is probably the best gauge of project selection. That return, expressed as the opportunity cost of capital, is suggested herein as the best measure of acceptability of any project. In Colombia, the cost of capital approaches 15 percent.

Using an economic rate of return and the weighting scheme described below, will ensure that both objectives are optimized and also that socially attractive and profitable projects are selected. Simplicity has been the mainstay of the weighting scheme but should not render it less appropriate than more analytically rigorous approaches.

2. The Weighting Scheme

Farm Distribution and Stratification

The 1970 Colombian census results and DANE household survey data suggest that 41 percent of the Colombian population is rural. The average family size and farm stratification data suggests that 64 percent of the rural populace are farm family members, while 16 percent are exclusively engaged in farm work.

Given the AID objective of reaching as many small farmers as possible, and cognizant of GOC objectives to improve the level of welfare among rural inhabitants, the two objectives were combined to provide the project analyst with a weighting scheme tailored to favor projects predominantly weighted with the target farm size to maximize the quantity of target farmers lying within the project zone. */

*/ By definition, the project is meant to include all farms contained within the zone of influence of the proposed road.

TABLE I

Average Land Holdings in Selected Departments

General Total By Departments	Total Farms	Under 1 Ha.	% of Total	1 - 4 Has.	%	5-10 Has.	%	10-20 Has.	%	Over 20 Has.	%
Antioquia	33,830	13,601	40.2	12,383	36.6	3,683	10.9	2,006	5.9	2,157	6.4
Boyacá	102,713	29,456	28.7	51,432	50.1	12,718	12.4	5,794	5.6	3,263	3.2
Caldas	3,275	2,034	24.6	3,689	44.6	1,338	16.2	679	8.2	535	6.4
Cauca	10,621	2,835	26.7	5,043	47.5	1,407	13.2	707	6.7	624	5.9
Cundinamarca	77,654	27,352	35.9	30,087	38.7	10,290	13.3	5,431	7.0	3,994	5.1
Huila	1,664	426	25.6	765	46.0	220	13.2	116	7.0	137	8.2
Mariño	39,060	7,373	20.2	20,500	52.5	6,048	15.5	2,979	7.6	1,660	4.2
Norte Santander	1,466	142	9.7	841	57.4	279	19.0	128	8.7	76	5.2
Quindío	1,015	198	19.5	405	39.9	199	19.6	118	11.6	95	9.4
Risaralda	1,415	359	25.4	645	45.6	222	15.7	124	8.8	65	4.6
Santander	20,422	3,234	15.8	11,153	54.6	3,035	15.1	1,774	8.7	1,176	5.8
Tolima	1,656	260	15.7	726	43.8	316	19.1	230	13.9	124	7.5
Valle	2,968	740	24.9	1,163	39.2	470	16.0	302	10.2	287	9.7
	<u>302,759</u>	<u>89,010</u>	<u>29.4</u>	<u>138,887</u>	<u>45.9</u>	<u>40,279</u>	<u>13.3</u>	<u>20,388</u>	<u>6.7</u>	<u>14,195</u>	<u>4.7</u>
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

Weight assignments were derived from the "municipio" stratification and correlated with results from Table I. Fundamentally, total land accumulated under a curve-envelope on a farm-by-farm size basis was utilized to peak out the mean farm size. The solution suggests that the farm size lies somewhere between the range of 1-5 has. and 5-10 has. sizes. After further refinement it was determined that farms between 4 and 6 hectares in size are the largest group. The weighting indicators were assigned as 100 percent at the median of 1.0 to 5.0 hectares representing 100 percent desirability declining outwardly to the less complementary farm sizes. ^{1/}

	<u>Farm Index Level</u>					
<u>Farm Size</u>	<u>Less Than</u>	<u>1 - 5</u>	<u>5 - 8</u>	<u>8 - 12</u>	<u>12 - 15</u>	<u>15-30</u>
	<u>1 Has.</u>	<u>Has.</u>	<u>Has.</u>	<u>Has.</u>	<u>Has.</u>	<u>Has.</u>
Farm Index	0.50	1.0	0.90	0.75	0.50	0.40

The simplified demonstration that follows illustrates the uses of the weighting scheme. Both examples consist of 17 family units per 100 has. As noted, in the unweighted case (See Table 2), Project "A" and "B" are allowed to compete equally in the economic analysis, although clearly, Project "A" appears to match our AID/GOC objectives more closely than Project "B". After weighting (Table 3) the indices allow for AID/GOC target objectives to prevail, confirming the desirability of Project "A".

At this juncture, the preselection of project sites will have been reduced to an array of subjects that fulfill the combined AID/GOC small farmer objectives. The weighting system does not, however, determine the allocation of scarce resources, nor does it provide a rationale for economic justification of each project. A further analysis is required. This refinement is proposed by submitting each project to an economic rate of return test, an analytical process to be undertaken by the Caminos Vecinales project analysis teams. Additionally, AID and Caminos Vecinales will mutually agree to a minimum standard of small farmer participation for sub-project selection.

^{1/} Actually this approach has one shortfall, it cannot distinguish between cultivated land and land which is either fallow, virgin, or unsuitable for cultivation. However, this factor will be investigated further within the project analysis desk survey. The equity relationship which is sought at this level of investigation is strictly ownership size.

TABLE 2
 - Unweighted Ranking -

Farm Stratification / (Total Area)	<u>Project "A"</u>	<u>Project "B"</u>
	100 Has.	100 Has.
<1 Ha.	0/0	6/6
1 - 4.99 Ha.	11/53	6/24
5 - 7.99 Ha.	4/24	1/6
8 - 11.99 Ha.	1/8	1/9
12 - 14.99 Ha.	0/0	0/0
15-30 Ha.	1/15	3/55
Total Unweighted	<u>17/100</u>	<u>17/100</u>

TABLE 3
 - Weighted Ranking -

Farm Stratification/Distributional Weights	<u>Weighted Project "A"</u>	<u>Weighted Project "B"</u>
<1 Ha. 0.50	0/0	3.0/6
1 - 4.99 Ha. 1.0	11.0/53	6.0/24
5 - 7.99 Ha. 0.90	3.6/24	0.9/6
8 - 11.99 Ha. 0.75	0.75/8	.75/9
12 - 14.99 Ha. 0.50	0/0	0/0
15-30 Ha. 0.40	0.40/15	1.2/55
Totals	<u>15.25/100 has.</u>	<u>11.85/100 has</u>

Select Project "A" = 15.75

3. Economic Analysis Teams and the "Desk Top Survey" approach.

In 1972, AFD financed a cadastral program (AID Loan 514-L-062) to assist the Colombian government in developing data on land holdings. As a result of that program, NASA-ERTS imagery and conventional aerial photo reconnaissance have covered approximately 90 percent of Colombia's rural areas and all of the urban centers. Using this photo coverage, which provides data on soils classes as well as land holding patterns, the task of farm measurement and crop yield estimates within each project zone will be greatly simplified. It will afford the economic analysis teams a means of measuring the potential expansion of farms and farm production and road construction cost estimate within the project area.

The project analysis teams will be comprised of 3 professionals, a project economist, an engineer, and an agronomist, as well as a community representative from the project region. They will visit each project area to ascertain the levels of farm technology, analyze the land expansion possibilities and coordinate the road alignment. In this rather cursory fashion, the economic returns will be determined through a discounted cash flow methodology providing the necessary measurement of project worthiness.

This rationale provides the GOC with the assurance that scarce resources will be allocated to projects with returns greater than alternative investments within the rural sector, and provides a first-step introduction to economic analysis. Over time the outcome should lead eventually to a planning section within Caminos Vecinales capable of developing projects of its own, along with the appropriate economic analysis, adequate for submission to the international lending institutions or other national ministries.

Discussion of Project Life

The analysis suggests that a rather unsophisticated geometric design would suffice for the Pico y Pala roads. The limiting criteria illustrated in the Technical Analysis (Section III.A) suggests that roads of this nature usually deteriorate within 10 years through normal wearing, weathering and erosion of the side slopes. Assuming the road fulfills our developmental expectations, it will have reached volumetric vehicle capacity at some point within the economic life timeframe. At that juncture, a new project investment may be required, including perhaps reshaping of the roadbed, minor realignments, and widening. Obviously, the residual value at the end of the road life is not zero, because the roadbed represents a substantial investment in future construction costs.

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This should be accounted for in the economic analysis as a residual value to the project. It is usually represented as a discrete cash income at the termination of project life (i.e. the 10th year). Generally, it is acceptable to allow 20 percent of the initial road cost as residual for the roadbed. However, given the rocky nature of the Colombian terrain, it is suggested that a 30 residual factor be used in light of the heavy construction cost outlays. On the other hand, concrete culverts and bridges should be assigned with economic lives somewhat greater than 10 years.

4. Economic Returns to Society as a Whole: An Illustrative Case

The purpose of this section is to provide some illustrative statistical basis for estimating what aggregate impact the access roads are likely to have on agricultural production and incomes of small farmers.

The limited information in Colombia does not provide much statistical data on the impact of feeder roads. Consequently, an illustrative benefit/cost analysis for the total project has been calculated, based upon reasonable estimates of the following parameters:

- 1) Estimated increment in income per hectare as a result of the various economic benefits from the roads;
- 2) Estimated land area affected by the roads;
- 3) Rate at which farmers will adopt new agricultural and marketing practices which would result in the estimated income increment.

As a rough estimate of possible income increments, a random subsample of 50 observations was selected from 2500 INCORA questionnaires taken in 1970. A frequency distribution was made by categories of net income per hectare, in 500 peso intervals. Extreme observations were eliminated as special cases, leaving 42 observations with net income between 0 and 4200 pesos. These displayed a fairly well defined bimodal distribution which was taken as a proxy between traditional and technified agriculture. The means of the two modal groups were C\$886 and C\$2336. These means were rounded upward to approximate inflation since 1970, giving means of C\$1000 and C\$2500, or a difference of C\$1500. This was checked against 1973 OPISA and FFA surveys, which yielded differences between traditional and technified farms of roughly the same magnitude (actually slightly higher: C\$1315 versus C\$3160, or a difference of C\$1845).

On the assumption that access to transport vs. isolation is at least crudely comparable to the technified vs. traditional split, it seemed reasonable to use C\$1500 as an approximation (which is probably conservative) of the income increment possible given the advantages offered by the road. Based on an average cost of US\$12,000 per km. this would mean that with a \$12 million project of which \$10.6 million would be for construction, about 890 km of roads could be constructed.

After considerable discussion about the zone of influence on each side of the road, given Colombian conditions (largely mountainous terrain) a realistic (walkable) 5 km zone was assumed, creating 875,000 has. of total area that could be potentially affected by the roads. Of this, it was assumed (based on the overall average of municipalities studied) that only about 20 percent of the total area was presently cropland, e. i., where incomes could be improved simply by new technology. This suggests a total of 175,000 hectares of potential cropland, a figure which was utilized in the benefit/cost analysis. Should more intensive utilization of the land area in the zones of influence take place, it is because an additional 15 percent of the area in the zone of influence is in "fallow" (having been previously cropped) representing another source of increased income.

To be realistic, it was assumed that the income increment would occur over time as farmers adopted new agricultural and marketing practices. Based upon "adoption theory" a rate of adoption was constructed in which a small percentage of farmers would adopt such produces in the first year, with a growing rate of adoption in succeeding years until roughly 3/4s of the farmers would have adopted by the sixth year following completion of the road, and a slowed rate of adoption from that point on until all farmers were taking advantage of the potential income increment. This S-shaped curve of adoption is consistent with the theory and although somewhat conservative, represents a realistic pattern for the flow of benefits over time.

Using these assumptions, the illustrative benefit/cost analysis as given in following tables was derived. The results indicate a benefit cost ratio of 1.25 using a 15 percent opportunity cost to capital and an internal rate of return of 19 percent. Benefits were staggered, representing the completion of the roads in each year and the starting of the flow of the benefits in the year following road completion. The adoption rate assumed is included in the calculation of the benefits.

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10.5 Mil Construction (\$ x 1000)

Year	Road Invest.	Drainage	Mainten.	1/ Total Cost	Discounted Cost at 15%	\$1500 ea. of Income Incr.	Benefits Annual Accum.	Benefits Derived from 1st Yr.	Benefits Derived from 2nd Year	Benefits Derived from 3rd Yr.	Benefits Total	Discounted Benefits at 15%	Net Cash Flow
1	96,375	10,675	--		-106,750	--	--	--	--	--	-0-	--	-106,750
2	96,375	10,675	5,337		-112,067	--	--	--	--	--	-0-	--	-112,067
3	96,375	10,675	10,675		-117,425	2.5	5,542	2,187	--	--	2,187	1,437	-115,238
4			16,012		-16,012	7.5	15,685	6,562	2,187	--	8,749	5,903	-7,263
5			16,012		-16,012	17.5	45,937	15,312	6,562	2,187	24,061	11,963	8,004
6			16,012		-16,012	32.5	55,313	28,437	15,312	6,562	50,311	21,745	34,299
7			16,012		-16,012	52.5	137,612	45,937	28,437	15,312	89,686	33,713	73,674
8			16,012		-16,012	77.5	223,438	67,812	45,937	28,437	142,186	46,482	126,174
9			16,012		-16,012	97.5	282,687	76,562	67,812	45,937	190,311	53,725	174,299
10			16,012		-16,012	93.5	245,428	81,812	76,562	67,812	226,186	55,913	210,174
11			16,012		-16,012	97.5	225,337	85,312	81,812	76,562	243,686	52,365	227,674
12			10,675		-10,675	100.0	262,500	112,052*	85,312	85,312	279,176	52,175	268,501
13			5,337		-5,337	--	--	-0-	112,052*	85,312	197,364	32,073	112,052
14			-0-		-0-	--	--	-0-	-0-	112,052*	112,052	15,853	112,052
					-304,889							362,435	

$$\text{Benefit/Cost Ratio} = 1.25 \left(\frac{362,435}{294,889} \right)$$

* Includes 20% Salvage Value = 21,350 (Roads) + 2428 (Drainage) = 24,552
 1/Maint. = 5% of Construction Costs

10-year project (i.e. Economic = 10 Yrs. per Road)

RATE OF RETURN (ECONOMIC)

Year	Net Cash Flow	Discounted at 20%	Discounted Amount	Discounted at 15%	Discounted Amount
1	-106,750	.8333	-88,955	.8696	-92,830
2	-112,087	.6944	-77,833	.7561	-84,750
3	-115,238	.5787	-66,688	.6575	-75,770
4	- 7,263	.4823	3,503	.5718	- 4,153
5	8,004	.4019	3,216	.4972	3,979
6	34,299	.3349	11,487	.4323	14,827
7	73,674	.2791	20,548	.3759	27,694
8	126,174	.2326	29,348	.3269	41,246
9	174,299	.1938	33,779	.2843	49,553
10	210,174	.1615	33,943	.2472	51,955
11	227,674	.1346	30,645	.2149	48,927
12	268,501	.1122	30,175	.1869	50,183
13	192,027	.0935	17,955	.1625	31,204
14	112,052	.0779	8,729	.1413	15,833
			-10,198		77,898

$$IRR = 15\% + \frac{77,898}{88,096} (5) = 19.42\%$$

$$RR = 2 + \frac{PW_2}{PW_1 - (PW_2)} \quad 20-15$$

PART IV - IMPLEMENTATION ARRANGEMENTS

A. ANALYSIS OF THE RECIPIENT'S AND AID'S ADMINISTRATIVE ARRANGEMENTS

1. Recipient: Caminos Vecinales

a. Structure and Legal Status

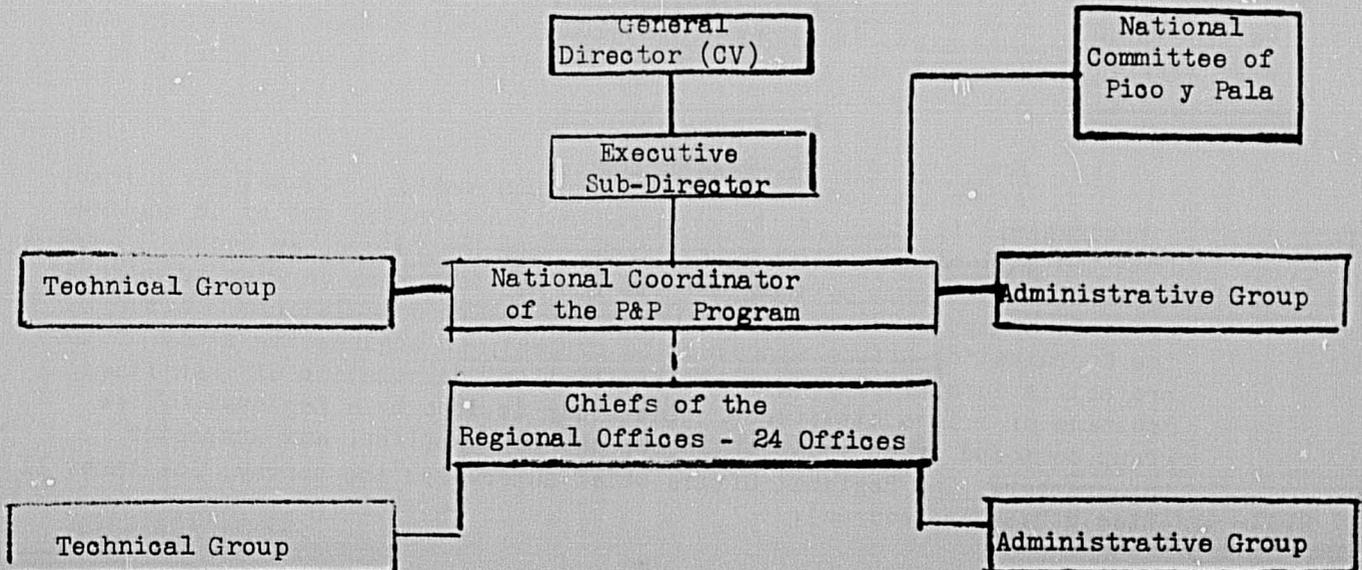
The Fondo Nacional de Caminos Vecinales was created in 1961 as an autonomous agency under the Ministry of Public Works, in accordance with Decree-Law 1650 of July 14, 1960 and Decree-Law 1084 of May 23, 1961. Its principal function is the construction, improvement, and maintenance (until completion) of feeder roads. This proposed project would be accomplished through the National Coordinator of Pico y Pala, who is responsible for the labor-intensive activities of Caminos Vecinales.

Caminos Vecinales is governed by a Junta Directiva, composed of the Minister of Public Works; representatives of the Ministry of Agriculture; Ministry of Government; and the National Coffee Federation; and three representatives of the President. Caminos' daily operations are managed by the Executive Director who is appointed by the Minister of Public Works. His principal subordinate offices are: Program and Control; Engineering; Administration; Pico y Pala; and Regional Units.

The Pico y Pala program has a total of 173 professional employees of which 92 are direct-hire and 81 are sub-contracted from Caminos Vecinales. Currently, there are approximately 40 engineers, 30 cashiers, 53 inspectors, 45 surveyors, and 4 accountants under the National Coordinator. (See Annex II, Exhibit 4 for personnel chart.) There are 24 Regional Offices throughout the country which report to the National Coordinator (See following chart):

Organization

Caminos Vecinales Organization



(i) National Coordinator of the Pico y Pala Program

The National Coordinating Office of the Pico y Pala program is headed by the National Coordinator who reports directly to the Executive Subdirector. His activities include managing, directing, and coordinating planning activities, reviewing studies prior to construction of Pico y Pala roads; and monitoring construction progress.

(a) Technical Group (Central Office)

The Central Technical Group coordinates and supervises the work of the technical groups at the regional levels. This office has two engineers. Each one is assigned a zone of the country; it is his duty to see that all roads are progressing properly, are meeting specifications according to original design, and are satisfactory in all other engineering aspects.

(b) Administrative Group (Central Office)

The administrative group in the Central Office is in charge of central bookkeeping and supervision of the administrative regional offices. They receive all the accounting data of how much has been paid, social security payments, and other accounting information. The professional personnel of this office consists of two accountants and two assistant accountants.

(ii) Regional Offices

Each regional office is in charge of coordination, direct supervision, payments for the roads constructed in that region.

(a) Technical Group

There is an approximate ratio of 1 audit engineer for every 2 roads in construction. Currently there are 38 engineers. Their responsibilities include direct supervision of physical accomplishments in each road, and technical auditing with respect to location, specifications, etc.

(b) Administrative Group

This group is formed of a cashier/supplier and a secretary who maintain all books and records, make all payments, and keep records on all tools and equipment.

b. Road Construction Procedures

After the community or a GOC agency makes a request for a road, a prefeasibility study of the proposed road is carried out by an engineer from the National Coordinating Office. (In the future, an economist and agronomist will form part of the team). The team then carries out an economic analysis using internal rates of return calculations. After, the Coordinating Office approves the project, an engineering study of the project is done, including a route selection, calculation of quantities, drainage or bridge structures. The study is done by a Regional Office group composed of an audit engineer, cashier-supplier, and inspector topographer. The Regional Office chief supervises the survey. See Annex II.3 (Pico y Pala procedures).

After the survey is finished and funds are available, CV prepares a contract with a local contractor who hires the personnel. The CV audit-engineer supervises the work under the direction of the Regional Chief. The farmers in the area are contracted to do the excavation work. Culverts or bridges are contracted separately following the excavation phase. A crushed rock or gravel surface is then applied, also by separate contract. The excavation phase contracts are with individuals for short segments of the road. The unit price in excavation contracts are roughly similar to the cost of the same work using mechanized equipment.

The individual and team contractors are supplied with picks, shovels, and wheelbarrows. The cost of any explosives are deducted from the contract. Culverts and bridges are taken from Ministry of Public Works standard designs.

In the Pick and Shovel program, advantage is taken of the unskilled labor that the farmer can provide and road sections are held exclusively in cut section since fill sections would require compaction. Nevertheless, a fill section occasionally cannot be avoided and hand methods of compaction are employed. A "resident" CV engineer and a local farmer are assigned to each project. There do not appear to be any technical difficulties in coordinating the work effort.

After the road is finished, a final liquidation report is prepared, including the documentation for delivery of the road to the Departmental Public Works Office.

To provide additional communication with the national office, two engineers cover the country. One is assigned to each of the two zones. He visits the working fronts of his zone periodically and serves as a liaison between the National Coordinating Office and the Regional Unit. In their visits, the engineers verify work quality and progress, given instructions, and solve technical problems, in coordination with the regional office chief. After each visit, they report to the National Coordinator. This arrangement appears to satisfy the need for field-headquarters communication, although the effectiveness of the arrangement varies with the personnel.

c. Observations

Based on AID's experience with the program, the executing agency is capable and experienced in feeder road construction. Several AID/W engineers have commented favorably on their capacity. The IDB has had the same experience. Three areas do appear to need improvement however: better support to agricultural development through road selection, further efforts to improve "after acceptance" maintenance, and the need for an evaluation section within Pico y Pala. The project description points out how AID loan funds will be used to address these problems.

2. AID Loan Monitoring and Evaluation

The USAID Project Committee will review CV subproject analysis to verify adherence to the mutually agreed criteria and analytical procedures. All projects using AID funds will require prior AID approval. Periodic on-site inspections of selected subprojects will be carried out by Mission personnel.

For each subproject approved for financing under the program CV will provide USAID with copies of:

- a. the schedule for project execution;
- b. financial plan including disbursement schedule;
- c. the CV report setting forth the planned implementation of the project, including compliance with the selection criteria.

The CV will submit to USAID monthly, quarterly and annual reports with information on progress against that planned in the implementation plan and as reflected in the output targets of the logical framework. Periodic review and evaluation of the Fixed Amount reimbursement method for disbursement for road construction will be made for loan implementation and general AID purposes.

Starting in 1976, evaluation reports will be prepared annually by the CV Office of Evaluation and will include evidence of changes in the goal and purpose level indicators in the logical framework. The Mission will use the above mentioned periodic reports plus the evaluation reports to prepare, in cooperation with the CV staff an annual joint review of the loan's progress.

There is, at present, sufficient expertise in USAID/C to backstop this project. USAID/C currently has a full time transportation engineer and one full-time loan officer-engineer. USAID/C will conduct on-site engineering inspections periodically. There will be closer monitoring by CV which will provide adequate assurance of proper implementation. Further, annual inspections are anticipated by TDV engineer assistance from AID/W.

IMPLEMENTATION PLAN

1. Borrower and Implementing Agency

The Borrower and Implementing Agency will be Caminos Vecinales, a semi-autonomous agency under the Ministry of Public Works of the Government of Colombia. Caminos Vecinales is responsible for the planning and construction of feeder roads in Colombia. The Government of Colombia represented by the Ministry of Finance will guarantee the repayment of the loan. For repayment purposes, the Ministry of Finance will include the AID loan scheduled repayments in the budget of the Borrower, in this case Caminos Vecinales, and then will carry out financial transfers where AID is repaid from National treasury sources.

2. Loan Disbursements for Road Construction

The proposed loan represents a change from recent AID experience in Colombia in that a road construction disbursements will be made directly to the implementing agency, Caminos Vecinales. Disbursements of the loan are to be made over three years from meeting Initial Conditions precedent to Disbursement.

Timely cash flow for labor intensive road construction is essential for success of this project. Local small farmers are actually the road construction "contractors" and require weekly payments punctually or they will not participate as road builders. The following paragraphs include an analysis of the cash flow and the implications for AID loan disbursements with a recommended method of disbursement.

Figure 1 is an attempt to graphically demonstrate the expected sub-project cash requirements that must flow to the small farmer contractors. Cash requirements are based on several assumptions:

- Average road length - 9.0 kilometers
- Average construction cost - \$12,000 per km.
- Average road construction progress - 0.9 km/month
- The 10.7 million dollars of road construction financing will be spent for completed sub-projects necessitating start-up of the last sub-project 10 months before TDD.
- Start-up of the first roads can commence two months after meeting initial CP.

From the above assumptions 100 roads are scheduled on Figure 1 to be started and completed within 36 months.

Also charted are the GOC counterpart budgetary cash inflows expected to reach the field offices for payment to the small farmer "contractors". As can be seen, the GOC budgetary inflow is not regular. In the first two months of the CY no appreciable amounts are expected to be available. Fortunately, no sub-projects are expected to start-up in the first two months of the first year of the project. Methods to eliminate stoppage of GOC budgetary funds in the first part of the CY will be discussed with the GOC and included in the loan financed budgetary and cost accounting study. Using a strict method of Fixed Amount Reimbursement after completion of sub-project, AID disbursements are imposed in Figure 1.

Figure 1 gives some interesting insights to sub-project implementation and to the feasibility of constructing and completing 100 roads within the cash flow parameters established. The Graph indicates that if the project is to complete 100 roads at .9 kilometers each in the period to be allowed for disbursement, cash flow shortages will occur 7 months after the meeting of the Initial Conditions Precedent for Disbursements and continue to occur until the 26th month when AID reimbursements and GOC budgetary flows will be much greater than cash requirements. The possibility of requiring the Borrower to change the principles of budgetary cash flows or borrowing to meet the cash requirements was rejected by the Mission as not very feasible in Colombia at this time. Also the alternate of reducing the number of sub-projects and reducing cash requirements to meet GOC budgetary cash inflows was rejected by the Mission. Lowering the number of sub-projects would be contrary to the objective to benefit the rural poor by providing access.

One of the most important observations from Figure No. 1 is the indication that as the project is terminated, GOC budgetary cash inflows will be greater than the current cash requirements. The timing is such that these late cash inflows cannot be used as counterpart to completing the 100 sub-projects as scheduled. A possibility is to stretchout and slow down the sub-projects to allow the use of the GOC cash inflows for the project. This alternative has been rejected by the Mission as being inferior to another alternative - that the excess of GOC cash flows over requirements should be used for new projects which cannot be completed by the TDD of the loan. It has been judged essential that at the TDD, there are ongoing sub-projects in implementation for the continuation of the Pico y Pala program in CY 1979.

Camino Vecinales will start up a limited number of sub-projects per month in the last 9 months of the project out of its own counterpart funds to the project. The number of start-ups could be expanded if the GOC could gather additional resources in late CY 1978, but even without additional resources the number of start-ups would be a good beginning to an ambitious or similar CY 1979 Pico y Pala program. The sub-projects to be started-up in CY 1978 are calculated to cost US\$1,080,000 leaving US\$9,620,000 available in the project to complete 89 sub-projects in 36 months.

Figure 2 illustrates the cash flow requirements for 89 sub-projects to be completed with GOC and AID financing before the TDD and 22 sub-projects to be initiated with GOC funds only. With this scheduling, the excess flow of GOC inputs are accounted for at the end of the project. However, the cash flow shortages still remain. The USAID Mission proposes to solve the cash flow shortages with payments after completion of sub-projects and with progress payments if and only when necessary and on a monthly cash requirement basis. Progress payments, not advances, will be assigned to individual sub-projects and reconciled against the final payment when the sub-project is completed. The sub-project cost will be determined before initiation of each sub-project and the AID share will be determined from the overall ratio of AID/GOC inputs to sub-projects to be completed under the project. In this manner, the Fixed Amount Reimbursement Method for completed sub-projects with some progress payments can be implemented in this project. The method is detailed in Annex V.

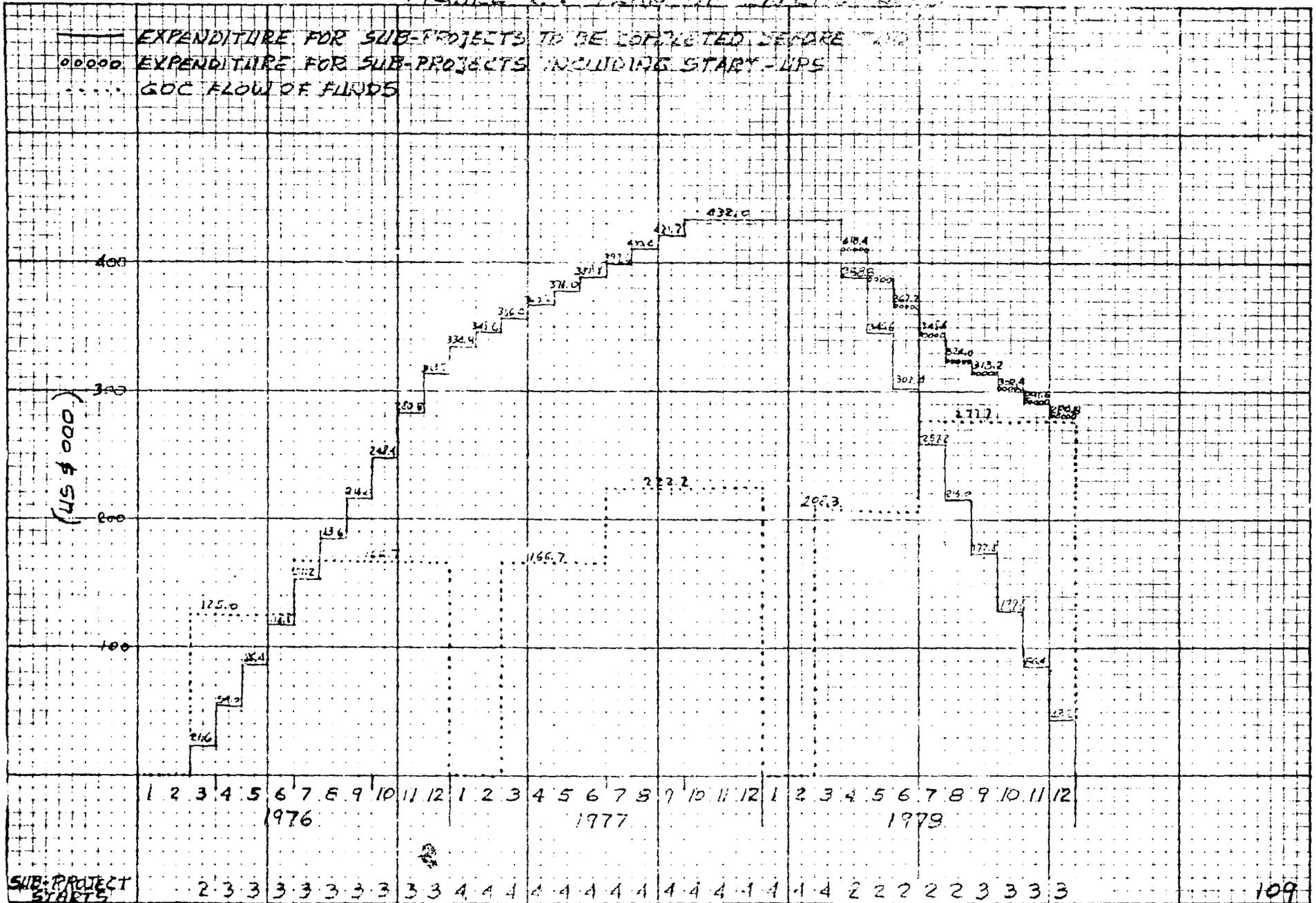
Basically, the method will not require progress payments until the 11 month. Progress payments will be made on those sub-projects started or about to start in the month when there exist cash requirements. Final Fixed Payments will begin in the 13th month to meet cash flow requirements and will be reconciled against any progress payments made previously.

For purposes of establishing sub-project costs in accordance with a Fixed Amount Reimbursement method, before initiation of each sub-project, three types of terrain conditions were considered.

These types or combinations could be encountered in any sub-project. They are:

- a. Comparatively level and/or gently undulating high-potential agricultural soils.
- b. Highly undulating to hilly medium-potential agricultural soils.
- c. Hilly to mountainous mediocre potential agricultural soils.

FIGURE 2. PLAN OF EXPENDITURES



Based upon costs of previous Pico y Pala projects, it is believed that reasonable US dollar costs per kilometer of construction in the above types of terrain would be about + \$2,000/km:

- a. \$6,000
- b. \$12,000
- c. \$18,000

The above costs will be used as a starting point in establishing the cost of a sub-project. In all requests for AID road construction financing, estimated costs will be presented to reflect the above terrain conditions and any wide variance in the above unit costs will have to be justified.

3. Loan Disbursements for Institutional Improvement

Disbursement for training and technical assistance will be made directly by AID using standard obligating documents, contracting and payment procedures.

4. Planned Performance Tracking System

The Planned Performance Tracking Network is attached in Annex VI. From the network it can be seen that the most critical action will be the contracting and arrival of the technical assistance input for preparation of the sub-project selection methodology. Several transportation/agricultural economists have been contacted and it is planned to contract the services as soon as possible. The contract for the services will be considered eligible for loan financing even if signed before the effective date of the loan agreement. However, if their participation cannot be scheduled as planned, AID/W TDY assistance is possible under AID operating expenses. In this same regard, Caminos Vecinales has made assurances that the Selection and Evaluation Office will be fully staffed when the technical assistance is scheduled to arrive.

Other technical assistance and training inputs are scheduled as early as practically possible given the best estimate of the capacity of Caminos Vecinales to identify and contract TA and implement training.

C. EVALUATION ARRANGEMENTS FOR THE PROJECT

Evaluation arrangements have been built into the project as indicated in Part II.A.6.a.(ii) Sub-Project Evaluation and as explained in Part IV. A.2 AID Loan Monitoring and Evaluation.

D. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

In addition to the normal AID conditions and covenants, the proposed loan will require as:

1. Conditions Precedent to Initial Disbursement

Camino Vecinales with USAID approval will have contracted for or already received technical assistance in the preparation of a sub-project selection methodology.

2. Conditions Precedent for Road Construction

Camino Vecinales will submit to USAID for approval detailed sub-project criteria and the methodology of sub-project analysis which would be utilized in the selection of all Pico y Valle roads in this program.

3. Special Covenants

- a. Camino Vecinales will covenant to have counterpart funds available as needed for road construction and maintenance purposes as indicated in the Project Description annexed to the Loan Agreement.
- b. Camino Vecinales will covenant to take such necessary actions to implement institutional improvements as indicated in the Project Description annexed to the Loan Agreement.
- c. Camino Vecinales will covenant to provide counterpart funds to terminate loan financed road construction before committing funds to new road construction financed other than by the loan.

ANNEX I

EXHIBIT I

Checklist of Statutory Criteria

All statutory criteria for this project have been satisfied as set forth in the "Checklist of Statutory Criteria", consisting of 24 pages. It is available in the official file of Latin America Bureau, Office of Development Resources (LA/DR).

ANNEX 1
Exhibit 2
Page 1 of 1

CERTIFICATION PURSUANT TO SECTION 611 (e) OF THE
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

SUBJECT: COLOMBIA - Capital Assistance - Small Farmer Market Access

Having taken into account, among other things, the maintenance and utilization of projects in Colombia previously financed or assisted by the United States, I certify hereby that in my judgment Colombia has the financial capability and the human resources (when supplemented by the specific technical assistance to be required under the proposed loan) to maintain and utilize effectively the proposed Small Farmer Market Access Loan.

This judgment is based primarily on the facts developed in the Project Paper for the proposed loan of \$5.0 million which discusses in detail the capabilities of the Caminos Vecinales and Government of Colombia and finds them in possession of adequate financial and human resource capability to effectively utilize and maintain the project.



Philip R. Schwab

August 30, 1975

DRAFT LOAN AUTHORIZATION

Provided from: FAA Section 103 ("Food and Nutrition")
COLOMBIA : Small Farmer Market Access

Pursuant to the authority vested in the Deputy U.S. Coordinator, Alliance for Progress 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 Section 103 of said Act to the Fondo Nacional de Caminos Vecinales ("Borrower") of not to exceed five million United States dollars (\$5,000,000) to assist in financing the United States dollar and local currency costs of the Borrower's program to construct farmer access roads.

The Loan shall 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 outstanding balance of the Loan, interest at the rate of two percent (2%) per annum during the grace period, and three percent (3%) per annum thereafter.

2. Other Terms and Conditions:

- (a) Goods and services (except ocean shipping) financed under the Loan shall have their source and origin in Colombia or in countries included in Code 941 of the A.I.D. Geographic Code Book. Marine insurance financed under the Loan shall be procured by the exporter on a CIF basis and placed in any country included in Code 935 of the A.I.D. Geographic Code Book. Ocean shipping financed under the Loan shall be procured in any country included in A.I.D. Geographic Code 941.

(b) United States dollars utilized under the Loan to finance local currency costs shall be made available pursuant to procedures satisfactory to A.I.D.

(c) The Government of Colombia (GOC) shall guaranty the Loan.

3. Conditions Precedent to Initial Disbursement

Camino Vecinales with USAID approval will have contracted for or already received technical assistance in the preparation of a sub-project selection methodology.

4. Conditions Precedent for Road Construction

Camino Vecinales will submit to USAID for approval detailed sub-project criteria and the methodology of sub-project analysis which would be utilized in the selection of all Pico y Pala roads in this program.

5. Special Covenants

a. Camino Vecinales will covenant to have counterpart funds available as needed for road construction and maintenance purposes as indicated in the Project Description annexed to the Loan Agreement.

b. Camino Vecinales will covenant to take such necessary actions to implement institutional improvements as indicated in the Project Description annexed to the Loan Agreement.

c. Camino Vecinales will covenant to provide counterpart funds to terminate loan financed road construction before committing funds to new road construction financed other than by the loan.

6. The Loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

UNOFFICIAL TRANSLATION

LOAN APPLICATION

Sept. 1, 1975
DG #355

Mr. Philip R. Schwab,
Acting Director
Agency for International Development
Bogota

Dear Mr. Schwab:

In our letter 154 L.B.12, signed by our previous general director, we requested to AID a loan on the amount of US\$4,500,000 with counterpart resources of US\$6,000,000 for the continuation of the Caminos Vecinales Pick and Shovel Program.

After a careful review about needs and costs of the program made jointly with AID and the National Planning Department, it was concluded that these amounts were insufficient.

On this regard, I am kindly requesting the reconsideration of the amounts and like to obtain your help in making the loan for an amount of five million dollars from AID, US\$4,700,000 will be used for road construction and three hundred thousand for technical assistance. The counterpart, in the amount of seven million dollars, will be assigned in the amounts of six million for construction and one million for maintenance.

Thank you very much for your collaboration.

/S/

Jaime Alberto Garcia Rivera
General Director
Fondo Nacional de Caminos Vecinales

DRAFT DESCRIPTION OF PROJECT
TO BE ANNEXED TO LOAN AGREEMENT

Goal

The program goal of this project is to improve the level of welfare among rural poor by stimulating the agricultural development of those rural areas of Colombia which do not presently have ready access to external markets and services. A Sub-goal of the program is to improve the nutritional well-being of the lower income groups of the Colombian population by helping to satisfy their basic dietary requirements through increased availability of basic foods.

Purposes

The purposes of the project in declining order of importance are to stimulate increased agricultural production among small, heretofore isolated farmers, principally by improving their access to markets and reducing transport costs; to open to those same small isolated farmers the services of governmental and private sector institutions, particularly agriculture, education and health; to introduce institutional improvements on the agency implementing the project, Caminos Vecinales, particularly in project selection and upgrading of technical personnel, and to supplement the incomes of underemployed agricultural workers, providing them with temporary employment.

Planned Accomplishments

Approximately 890 kms of labor intensive feeder roads are to be constructed. Based on an estimated 9 km length per feeder road and average cost of US\$12,000 per km, it is expected that approximately 110 feeder roads are to be initiated and approximately 80 feeder roads are to be completed during the life of the Project. As part of the feeder road construction, emphasis will be placed on completion of individual sub-projects in the timeframe of the program.

A Selection and Evaluation Office will be established to use road selection and evaluation methodologies to promote achievement of the agriculture and social objectives of the project. Design and construction processes are to be improved in the Pico y Pala program, and environmental effects of road construction will be considered in the design and construction process. In addition, it is expected that cash flows to the small farmer "contractor" will improve along with complementary budgeting and accounting functions.

In addition, Caminos Vecinales will assume the responsibility for maintenance of Pico y Pala roads and will explore ways to incorporate community participation in the maintenance services.

PLANNED INPUTS

The use and source of inputs for this Project are as follows:

ITEM	Use	SOURCE (US\$000)					
		AID - CY			COC - CY		
		76	77	78	76	77	78
A.	Road Construction Funds	175	2,700	1,825	1,500	2,000	2,500
B.	Sub-Project Selection Study	14	5	6			
C.	Sub-Project Evaluation	41	29	30			
D.	Design and Construction Capacity Study	10	40	38			
E.	Consideration of Environmental Factors Study	15	30	15			
F.	Cash Flow, Budgetary and Cost Accounting Study	12	--	--			
G.	Evaluation of Maintenance Capacity	15	--	--			
H.	Maintenance Funds	--	--	--	233	333	434
		282	2,804	1,914	1,733	2,333	2,934
	TOTAL		5,000			7,000	

The amounts of inputs for Item B. through G. for Institutional Improvement are tentative and may be adjusted as mutually agreeable.

ANNEX II

The following exhibits are on file in LA/DR:

Exhibit 1 - Original Pico y Pala Request

Exhibit 2 - Summary of Small Farm Concentration and
Cultivation Status Related to Feeder Road
Programs

Exhibit 3 - General Information on the Pico y Pala Program

Exhibit 4 - The Pico y Pala Program - Actual Personnel and
Requirements

THE DRI AREAS

The GOC is currently negotiating with the IDB and the IBRD with regard to possible loans for the Integrated Rural Development areas totalling \$120 million. Few details of the loans are available now, as negotiations are proceeding slowly. However, USAID has secured the following unofficial information from DNP.

The DRI program has two targets: (a) To rationalize the linkage of the rural economy to the market, and (b) to increase real rural income, and employment. To do so, the program will deal with production variables such as: credit, technology, labor, commercialization and the development of labor force (education, health services, etc.)

This program will utilize existing government service institutions to channel public expenditures towards these pre-selected DRI areas. There are 6 areas that have been already chosen as DRI areas in the country as listed on the following chart:

<u>Desarrollo Rural Integrado</u>			
<u>Usuarios del Proyecto</u>			
<u>Distritos</u>	<u>Población</u>	<u>No. de</u>	<u>Familias por</u>
<u>Area 1</u>	<u>Total</u>	<u>Familias de</u>	<u>Atender con</u>
		<u>Pequeños</u>	<u>el Proyecto</u>
Ipiales	158.364	13.745	3.436
Pasto	359.121	17.606	4.402
Mercaderes	228.227	22.183	5.546
Popayán	<u>240.865</u>	<u>15.026</u>	<u>3.756</u>
Sub-Total		68.560	17.140

<u>Distritos</u>	<u>Poblacion Total</u>	<u>No. de Familias de Pequeños</u>	<u>Familias por Atender con el Proyecto</u>
Area 2			
Facatativá	132.452	10.082	2.521
Fusagasugá	99.170	5.696	1.424
La Mesa	118.678	7.652	1.913
Girardot	156.652	5.648	1.412
Déqueza	<u>39.454</u>	<u>5.522</u>	<u>1.380</u>
Sub-Total		34.600	8.650
Area 3			
Yarumal	158.926	6.775	1.694
Rionegro	<u>385.237</u>	<u>25.744</u>	<u>6.436</u>
Sub-Total		32.519	8.130
Area 4			
Monterfa	266.688	13.126	3.282
Sincelejo	228.685	6.133	1.533
Tierralta	41.042	786	786
Chiriguaná	<u>47.351</u>	<u>656</u>	<u>656</u>
Sub-Total		20.701	6.257
Area 5			
Soatá	101.305	13.581	3.395
Duitama	337.691	26.758	6.690
Tunja	1.238.060	26.393	6.348
Tenza	93.545	14.602	3.651
Chiquinquirá	<u>73.786</u>	<u>18.848</u>	<u>2.712</u>
Sub-Total		91.182	22.796

Cont.

Cont.

<u>Distritos</u>	<u>Población</u> <u>Total</u>	<u>No. de</u> <u>Familias de</u> <u>Pequeños</u>	<u>Familias por</u> <u>Atender con</u> <u>el Proyecto</u>
Area 6			
Guavatá	226.100	25.624	6.406
Socorro	203.102	18.452	4.613
Málaga	<u>96.955</u>	<u>12.540</u>	<u>3.135</u>
Sub-Total		56.616	14.154
TOTAL		<u>304.178</u>	<u>77.127</u>
BID - Boyacá-Santander			36.950
BIRF - Areas 1 a 4			40.177

Selection of specific municipios within these broader areas will be made later on the basis of the following production criteria: land availability, small farmer density, potential for increased cultivation, gross family income, hectare productivity, usage intensity, percentage of owned property, credit received, value of coffee production, and number of coffee growers. Social criteria will include: rural centers with car access, rural population density, poor population density, percentage of houses with electricity, sewers, and water, and numbers of schools, health posts and hospital beds.

The initially selected locations that fit these criteria have been divided into 6 areas for IDB and IBRD funding. The proposed \$50 million IDB loan will finance Areas 5 and 6 in Boyacá and Santander. (See above Table). The proposed \$70 million IBRD loan will finance Areas 1-4 in Cauca, Nariño, Cundinamarca, Cordoba and Santander.

The administration of the Integrated Rural Development Program will be, at both the national and regional/local levels, under the direction of the Caja Agraria. The Caja Agraria will chair a committee composed

of key representatives from the agricultural, educational, health and public work agencies who have programmed activities in the Integrated Rural Development areas. The committee will be responsible for coordinating and integrating the participating agencies activities within the Integrated Rural Development areas, and to assure that the desired integration occurs, the committee will have control over the preparation and execution of the budgets of each agency participating in the Integrated Rural Development areas activities being funded by the Inter-American Development Bank and the International Bank for Reconstruction and Development.

COLOMBIA
Labor Intensive Access Road Program (Pick and Shovel Program)
Status of Cost and Length of Roads Completed as of June 1974

LOCATION	Total Length of Roads Kms.	Distance Completed as of June 1974 Kms.	Cost of Construction as of June 1974 000 Pesos	Average Cost per Km 000 Pesos	Average Cost per Km US\$
<u>ANTIOQUIA</u>					
01 Verdun-Gibraltar	4.9	4.3	1,346	313	10,433
02 Alto Mantequilla-Puente Roto	4.1	1.4	788	563	18,770
03 Crucero Alto del Corral	6.0	0.3	102	339	11,286
04 Marinilla-Montañitas	3.0	3.0	334	111	3,713
	18.0	9.0	2,570	286	9,518
<u>BOLIVAR</u>					
05 Santa Rosa-Canelos-Buenavista	12.0	-0-	200		
06 Bayunca-Arroyo de Piedra	12.0	-0-	150		
	24.0	-0-	350		
<u>BOYACA</u>					
07 Zetaquirá-Hormigas	16.0	13.4	954	71	2,373
08 Vía Paez-La Cumbre	16.0	8.7	714	82	2,736
09 Moniquirá-El Naranjal	6.4	6.4	427	67	2,224
10 Parma-Otro Mundo	18.0	11.1	740	67	2,221
	56.4	39.6	2,835	72	2,386
<u>CALDAS</u>					
11 Canaan-Alsacia	2.8	1.8	1,006	529	17,646
12 San Diego-Berlín	17.0	9.4	5,678	604	20,136
13 San Lorenzo-Pasmi	3.8	3.3	1,628	493	16,440
14 La Sivia-La Pola	3.5	-0-	150		
15 Buenos Aires-Guacas	8.0	0.9	260	289	9,639
16 La Quiebra-El Placer	11.0	0.9	147	163	5,439
17 Pensilvania-Pta. Linda	20.0	0.9	475	528	17,606
18 Risaralda-La Rice	10.0	0.9	257	285	9,514
19 Aguadas-Río Arriba	14.0	0.6	150	250	8,333
20 San Pablo-Monón-La Esperanza	3.0	0.2	80	400	13,333
21 Cabras-La Miel	6.0	-0-	150		
	99.1	18.9	9,981	528	17,603

LOCATION	Total Length of Roads Kms.	Distance Completed as of June 1974 Kms.	Cost of Construction as of June 1974 000 Pesos	Average Cost	Average Cost	
				per Km. 000 Pesos	per Km. US\$	
CAUCA						
22	Silvia-Puente Real-La Campana	19.5	6.2	3,589	579	19,295
23	Alto San José-Puente Santander	15.0	5.9	2,239	386	12,570
24	Tres Quebradas-Guaitatá	9.1	6.8	1,714	252	8,404
25	Quebraditas-Media Naranja	6.0	2.6	1,788	688	22,910
26	Santa Rosa-Mota	9.0	7.8	1,799	231	7,688
27	San Juan-Granadillos	11.2	3.3	1,806	531	17,703
28	Inza-Turmina	10.5	6.3	2,360	369	12,290
29	Florencia-Esmeraldas	18.0	6.6	2,471	374	12,478
		98.3	45.5	17,766	390	13,015
CUNDINAMARCA						
30	El Resguardo-El Carmen-Vereda Ponta	3.0	2.4	854	356	11,860
31	Cáqueza-Vda. Centro-Vda. Páramo	7.8	6.6	1,759	267	8,980
32	El Charco-Mercaditos-La Batea	7.0	5.4	1,190	220	7,347
33	Florencia-Mogambó-El Palmar	5.1	4.3	852	194	6,450
34	Alto de la Cruz-Bateas	4.5	3.6	998	277	9,237
35	Horizonte-Guavio-Sta. Lucia	6.1	5.5	1,025	186	5,881
36	La Palma-Topaipí-El Naranjal	5.0	3.3	1,138	345	11,497
37	Sasaima-El Limonal-La Vega	5.0	3.5	991	283	9,437
38	Gachetá-Muchindote	5.0	2.0	335	168	5,580
		48.5	36.6	9,143	250	8,327
CHOCO						
39	Bagadó-Certeguf	13.5	8.1	3,147	388	12,949
		13.5	8.1	3,147	388	12,949
GUAJIRA						
40	Barrancas-Pozo Hondo	15.0	1.7	156	91	3,049
		15.0	1.7	156	91	3,049

Exchange Rate: 30 Pesos = US\$1

Source: Fondo Nacional de Caminos Vecinales - Informe del Director Ejecutivo 1973/74

LOCATION	Total Length of Roads Kms.	Distance Completed as of June 1974 Kms.	Cost of Construction as of June 1974 000 Pesos	Average Cost per Km. 000 Pesos	Average Cost per Km. US\$
	<u>HUILA</u>				
41 El Recreo-San Guillermo	15.0	2.9	1,217	190	6,343
42 Riveria-Siberia	15.0	2.6	1,117	430	16,421
43 Pueblitos-Galicia-Begonia	45.0	0.8	32	40	1,330
44 El Parafso-Balsillas	15.0	0.1	32	322	10,732
	90.0	6.3	2,399	375	12,495
<u>NARIÑO</u>					
45 San Fco. -Tapialquer Alto-Guayabal	14.3	5.1	1,600	314	10,458
46 Beruecos-Santa Rosa	12.0	6.2	1,895	364	12,144
47 Yaramal-Floresta	8.0	0.8	236	262	8,757
48 Lucha-Leiva	17.0	0.2	150	750	25,000
	51.3	12.3	3,881	315	10,513
<u>NORTE DE SANTANDER</u>					
49 Convención-Soledad	8.6	6.0	2,500	417	13,886
50 Toledo-Roman-Ima	25.0	7.2	1,658	230	7,675
51 Gramalote-El Zambador	15.0	1.0	538	538	17,932
52 Los Mangos-La Carrera	6.6	0.2	216	862	28,746
53 San Calixto-Guaduales	10.0	-0-	32		
54 Hacari-San Miguel-Castrillon	10.0	-0-	22		
	75.2	14.4	4,965	342	11,414
<u>RISARALDA</u>					
55 Quinchia-Santa Helena	13.0	10.0	1,687	169	5,621
56 Santuario-Pueblo Vano-Calichal	14.0	7.9	2,473	309	10,304
57 Napoles-Alto Cauca	6.0	0.4	63	126	4,185
58 Campoalegrito-Colmenas	3.0	0.3	137	456	15,232
59 Totui-La Laguna	13.0	-0-	48		
60 El Manzanillo-Santo Domingo	3.4	0.8	157	175	5,820
61 Mil Ochenta-Corozal	3.2	0.7	205	256	8,532
62 La Argentina-El Dinde-El Silencio	13.0	0.2	89	263	8,757
	68.6	20.4	4,848	237	7,883

LOCATION	Total Length of Roads Kms.	Distance Completed as of June 1974 Kms.	Cost of Construction as of June 1974 000 Pesos	Average Cost per Km. 000 Pesos	Average Cost per Km. US\$
<u>SANTANDER</u>					
63 Málaga-Guasimo	6.6	2.7	1,166	417	13,884
64 Molagavita-Laguna de Ortices	13.6	1.4	1,281	854	28,469
65 La Paz-Santa Helena	12.0	-0-	200		
66 Soata-Onzaga	12.0	-0-	120		
67 Contratación-El Guacamayo	8.5	-0-	150		
	52.8	4.1	2,917	694	23,154
<u>SUCRE</u>					
68 Chalán-Chengue	13.0	-0-	57		
	13.0	-0-	57		
<u>TOLIMA</u>					
69 Betulia-Santa Barbara	9.1	8.1	1,664	185	6,164
70 Olaya Herrera-Maco-Los Guayabos	12.0	2.0	706	353	11,761
71 Rovira-Luisa-El Guadual	12.0	1.0	466	424	14,135
72 Planadas-Bilbao-La Herrera	12.0	0.1	80	800	26,666
73 Limites del Valle-La Herrera	3.0	0.1	81	810	26,990
	54.1	11.3	2,998	265	8,842
<u>VALLE</u>					
74 El Vergel-La Guayaquina-El Aguila	6.6	5.5	1,859	332	11,067
75 El Cairo-El Brillante	11.6	5.4	1,515	281	9,352
76 Venecia-Cristales	3.4	3.0	348	116	3,867
77 Ulloa-Chapinero-El Placer	6.0	3.0	535	179	5,951
78 El Palmar-Centella	5.0	1.2	374	312	10,393
	32.6	18.1	4,632	244	8,126
TOTAL	810.4	346.4	72,645	295	9,823

Exchange Rate: 30 Pesos = US\$1

Source: Fondo Nacional de Caminos Vecinales - Informe del Director Ejecutivo 1973/74

LOGICAL FRAMEWORK

A.1. GOAL

To improve the level of welfare among the rural poor.

A.2. OBJECTIVELY VERIFIABLE INDICATORS

- a. Income increases per capita of small farm farmers in the affected area.
- b. Increase in employment, including temporary employment as a result of sub-project construction.
- c. Improve the nutritional well-being of the lower-income groups in rural and urban areas.
- d. Reduce morbidity.

A.3. MEANS OF VERIFICATION

- a. Evaluations, both baseline and follow-up to be carried out by the CV Sub-Project Evaluation Office.
- b. IBRD macro-economic reports and county assessments.
- c. MOH rural clinic treatment records.
- d. FAO reports on Colombian nutritional status.

A.4. IMPORTANT ASSUMPTIONS

- a. GOC tax structure does not mitigate against small farmers.
- b. Prices of commodities produced by small farmers remain favorable, permitting increases in rural income.
- c. GOC continues to expand public services in the affected area.
- d. Colombia continues to have stable political conditions.

A.A.1. SUB-GOAL

Increased agricultural production in newly-opened small farmer areas.

A.A.2. OBJECTIVELY VERIFIABLE INDICATORS

- a. Increased use of credit by small farmers.
- b. Increased use of fertilizer and improved seeds.
- c. Increased value of marketed production per hectare:
1975 BASE: ç1,000/HA average
1979 TARGET: ç2,500/HA average

A.A.3. MEANS OF VERIFICATION

- a. CV evaluations.
- b. Regional office records of FINANCIACOOP and Caja Agraria.

A.A.4. ASSUMPTIONS

- a. Small farmers are motivated to use new technology.
- b. GOC pursues consistent agricultural policies which sufficiently incentivize the small farmer.
- c. Urban demand for basic foodstuffs remains high.
- d. Small farmers use windfall profits from reduced transport costs to raise farm capital investment.
- e. Massive rural-to-urban migration does not occur as a result of CV roads.
- f. There are no natural calamities.

B.1. PROJECT PURPOSE

To permit improved access (i) by small farmers to the modern, commercialized Colombian economy and (ii) by GOC public sector institutions to small farmers.

B.2. END OF PROJECT STATUS

- a. More arable land will be under production:
1975 BASE: 175,000 HA
1979 TARGET: 201,250 HA
- b. Adoption of new technological packages by 3/4 of farmers in affected area by year six of project.

- c. Increased availability of credit, seeds, and fertilizer at local level.
- d. More frequent visits of health and agricultural promoters from GOC line agencies.
- e. Increased school attendance.
- f. Increased percentage of production which is commercially marketed.

B.3. MEANS OF VERIFICATION

Same as sub-goal.

B.4. ASSUMPTIONS

- a. Adequate bus and truck transport exists.
- b. Credit available to rural sector on national scale does not decrease.
- c. GOC line agencies are active in project areas.

B.B.1. SUB-PURPOSE

To strengthen the institutional capability of CV.

B.B.2. END OF PROJECT STATUS

- a. CV Sub-Project Evaluation Office capable of evaluating six project proposals each month.
- b. Pico y Pala projects do not cease activity due to lack of timely financial inputs from the GCC.
- c. International lending agencies express willingness to loan to CV.

B.B.3. MEANS OF VERIFICATION

Annual AID/GOC evaluations.

B.B.4. ASSUMPTIONS

- a. The GOC supports CV Pico y Pala activity.
- b. If CV is absorbed into the Ministry, it is able to retain its identity and program structure.

C.1. OUTPUTS

- a. Labor intensive feeder road construction in rural areas.
- b. Caminos Vecinales has developed and is using an improved:
 - (1) project selection methodology
 - (2) project evaluation procedure.
 - (3) project design and construction process
- c. Caminos Vecinales has an in-service training program.
- d. Project Selection and Evaluation Office to provide continuous evaluation of Pico y Pala construction projects socio-economic and ecological impact.

On all newly initiated projects the Project Selection and Evaluation Office will prepare, with the appropriate regional office, prefeasibility studies.

- e. Evaluation of maintenance capacity of various institutions and procedure for contracting for road maintenance.
- f. More reliable cash flow and budgetary accounting system.

C.2 OBJECTIVELY VERIFIABLE INDICATORS

		<u>CY76/CY77/CY78/</u>		
a.	Kilometers of Road			
	Construction	200	360	350
	Roads completed	0	38	48
	Roads Started	29	48	34
b.	1) Methodology	in use	Feb. 76	
		evaluated	Feb.77/78	
	2) Procedure	in use	Apr.76	
		evaluated	Apr.77/78	
	3) Process	in use	July 76	
		evaluated	Jul.77/78	

Report on environmental assessment prepared in collaboration with technical advisors by Jan.77.

		<u>77</u>	<u>78</u>
c.	Number of courses	8	8
	Number of employees trained	100	100
d.	Staffed and operating - Dec.75		
	Socio-economic and ecological impact studies being completed.		
	July, 1978		

- e. 1) Maintenance mechanisms defined - Sep.76
2) Maintenance contracts signed - Oct.76
- f. Monthly budgetary reports reflecting improvements in accounting methodologies - Nov.76

D.1. INPUTS

- a. Road Construction Funds
- b. Institutional Improvement Training and technical assistance
 - 1) Sub-Project selection
 - 2) Sub-Project Evaluation
 - 3) Design and Construction Capacity
 - Expert Assistance
 - In-Country Training
 - Seminars
 - Observation Training
 - Interchange
 - 4) Consideration of Environmental Factors
 - 5) Cash Flow, Budgetary and Cost Accounting
 - 6) Evaluation of Maintenance Capacity
- c. Maintenance Funding.

D.2 BUDGETS
(US\$000)

	A.I.D.			G.O.C.		
	CY 76	CY 77	CY 78	CY 76	CY 77	CY 78
	\$	\$	\$			
D.2.a.	175	2,700	1,825	1,500	2,000	2,500
D.2.b.i	14	5	6			
D.2.b.ii	41	29	30			
D.2.b.iii	10	40	38			
D.2.b.iv	15	30	15			
D.2.b.v	12	--	--			
D.2.b.vi	15					
D.2.c.				233	333	434
TOTAL	282	2,804	1,914/5,000	1,733	2,333	2,934/7,000

D.3 MEANS OF VERIFICATION

Camino Vecinales and USAID quarterly accounting reports.

D.4 IMPORTANT ASSUMPTIONS

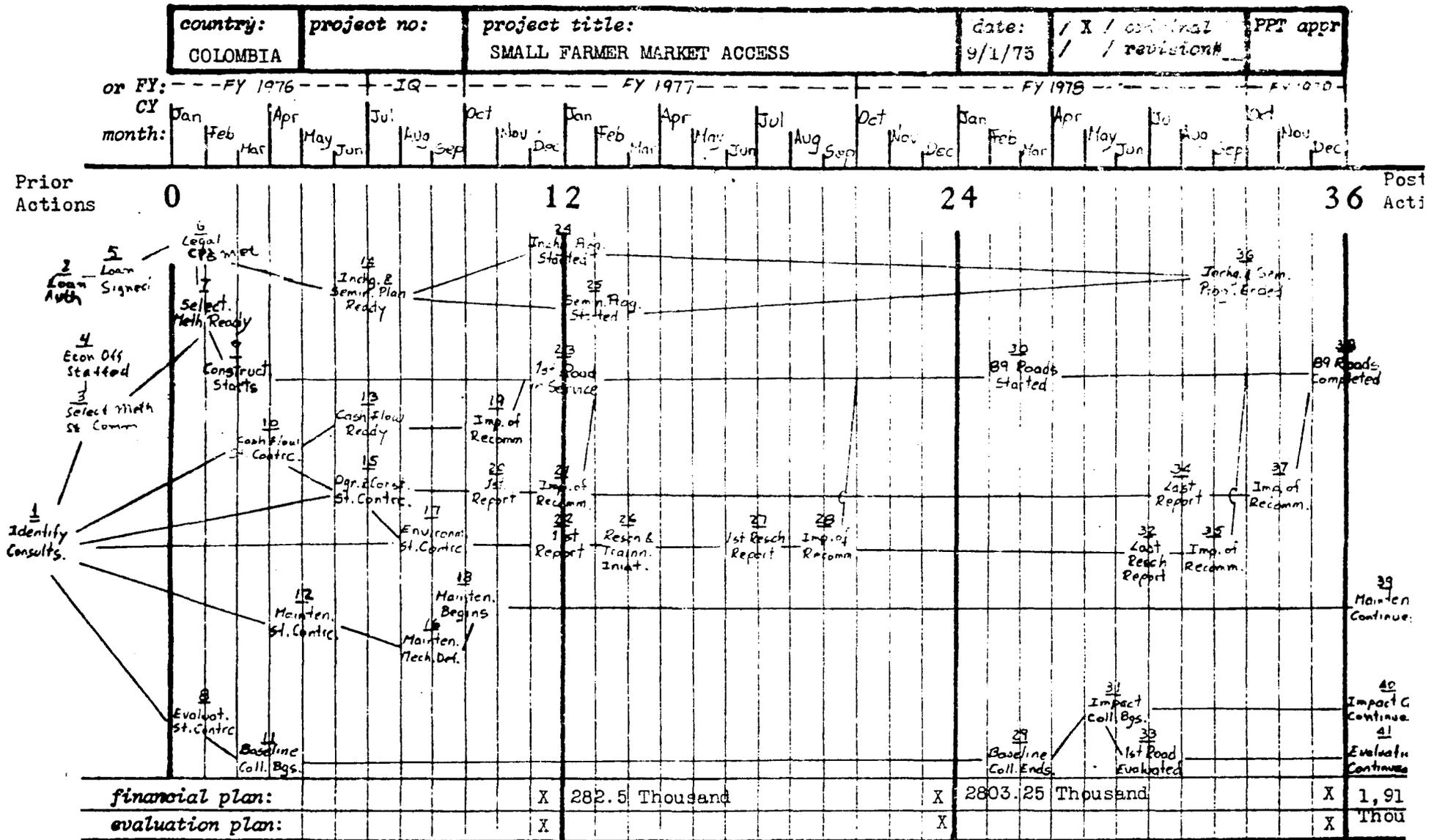
1. Camino Vecinales will be able to find and hire qualified personnel for the Evaluation Office.

Camino Vecinales can find and contract for maintenance, environmental, and impact studies.

Disbursement system is approved.

ANNEX IV

"Land Damage Caused by Road Construction in the Mountainous Areas of Colombia" by James A. Liggett, consisting of 11 pages, is on file in LA/DR.



PROJECT PERFORMANCE NETWORK

country:	project no:	project title:	date:	/ / original / / revision #	approved:
COLOMBIA		SMALL FARMER MARKET ACCESS	9/1/75		
<u>CPI NARRATIVE</u>					
1.	9/8-30/75	Start identifying consultants	28.	8/30/77	First Environmental Research Recommen-
2.	9/30/75	Loan authorized			dations Implemented.
3.	11/1/75	Selection Methodology Study Commenced	29.	2/28/78	Baseline Data Collection Ends
4.	11/1/75	Economic Evaluation Office Staffed	30.	3/1/78	89 Roads Started
5.	11/30/75	Loan signed	31.	5/1/78	Impact Data Collection Begins
6.	1/30/76	Legal CP's met	32.	6/30/78	Last Environmental Research Report
7.	1/30/76	Selection Methodology Ready			Submitted
8.	2/1/76	Evaluation Study Contracted	33.	7/1/78	First Road Evaluated
9.	3/1/76	Construction Program Starts	34.	7/30/78	Last Design and Construction Report
10.	4/1/76	Cash Flow and Budgetary Study Contracted			Submitted
11.	4/1/76	Baseline Data Collection Begins	35.	8/30/78	Last Environmental Research Recommen-
12.	5/1/76	Maintenance Study Contracted			dations Implemented
13.	5/30/76	Cash Flow and Budgetary Study Ready	36.	9/30/78	Interchange and Seminar Program Ended
14.	6/1/76	Interchange and Seminar Plan Ready	37.	10/30/78	Last Design and Construction Recommen-
15.	6/1/76	Design and Construction Study Contracted			dations Implemented
16.	8/30/76	Maintenance Mechanism Defined	38.	12/31/78	89 Roads Completed
17.	9/1/76	Environmental Study Contracted	39.	After TDD	Maintenance Program Continued
18.	10/1/76	Maintenance Program Begins	40.	After TDD	Impact Data Collection Continued
19.	10/30/76	Cash Flow and Budgetary Recommendations Implemented.	41.	After TDD	Impact Evaluation Continued
20.	10/30/76	First Design and Construction Report submitted.			
21.	12/31/76	First Design and Construction Recommen-			
22.	12/31/76	dations Implemented.			
23.	1/1/77	Environmental Report Submitted			
24.	1/1/77	First Road in Service			
25.	1/1/77	Interchange Program Started			
26.	2/1/77	Seminar Program Started			
27.	3/1/77	Environmental Research and Training Initiated			
28.	6/30/77	First Environmental Research Report Submitted.			