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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
Washington, D. C. 20523

BOLIVIA

PROJECT PAPER

RURAL ROADS II

AID/LAC/P-2292/1 (Amendment)

Loan Number: 511-T-061  
Project Number: 511-0466

UNCLASSIFIED

PDAA 714

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE

A - Add  
 C - Change  
 D - Delete

Amendment Number  
 1

DOCUMENT CODE

2. COUNTRY/ENTITY BOLIVIA

3. PROJECT NUMBER  
 511-0466

4. BUREAU/OFFICE

LAC

05

5. PROJECT TITLE (maximum 60 characters)

RURAL ROADS II

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY  
 1 2 3 1 8 5

7. ESTIMATED DATE OF OBLIGATION  
 (Under 'B' below, enter 1, 2, 3, or 4)

A. Initial FY 7 8

E. Quarter 3

C. Final FY 7 8

8. COSTS (\$000 OR EQUIVALENT \$1 = )

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total				4,247	5,095	9,342
(Grant)				300	-	300
(Loan)				3,947	5,095	9,042
Other U.S.						
1.						
2.						
Host Country						
Communities					11,284	11,284
					1,289	1,289
				4,247	17,668	21,915

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) FN	101	061	061	300	13,000	-	(3,958)	300	9,042
(2)									
(3)									
(4)									
TOTALS				300	13,000	-	(3,958)	300	9,042

10. SECONDARY TECH. CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code  
 B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

There are two project purposes: (1) enhance the capacity of the Servicio Nacional de Caminos to carry out rural road upgrading programs; and (2) improve access to and from farms by upgrading 260 kilometers of secondary roads in the Chapa and constructing bridges and drainage work to complement road upgrading work carried out under the Rural Roads I project.

14. SCHEDULED EVALUATIONS

Interim MM YY 1 8 4 Final MM YY 9 8 5

15. SOURCE OF FINANCING OF GOODS AND SERVICES

Grant Loan  
 000  941  Local  Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a page PP Amendment)

This PP Amendment proposes a 28-month extension of the PACD to December 31, 1985 and the and the deobligation of \$3,958 million (Loan). The project was suspended in August 1980. This PP Amendment is submitted to reactivate the project. Project goal and purposes, remain the same, although the geographic focus and certain implementation details have been changed.

17. APPROVED BY

Signature  
 Henry H. Bassford

Title  
 Mission Director

Date Signed  
 MM DD YY  
 1 9 8 2

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON DC 20523

PROJECT AUTHORIZATION  
(Amendment No. 1)

Name of Country: Bolivia  
Name of Project: Rural Roads II  
Number of Project: 511-0466

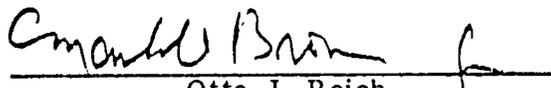
1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, the Rural Roads II project for Bolivia was authorized on May 23, 1978 (the "Authorization"). The Authorization is hereby amended as follows:

a. The First Paragraph is modified to read as follows:

"Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a loan in an amount not to exceed Nine Million Forty-Two Thousand United States Dollars (\$9,042,000) (the "Loan") and a grant in an amount not to exceed Twenty-Five Thousand United States Dollars (\$25,000) (the "Grant") to the Republic of Bolivia ("Government of Bolivia") to assist in financing certain foreign exchange and local currency costs of goods and services for a project (the "Project") which consists of a strengthening of the institutional capacity of the Bolivian National Road Service ("SNC"), the upgrading of rural access roads to all-weather standards by improving certain roads themselves, plus improving some supporting infrastructure on those and other roads, such as drainage works and bridges in the Departments of La Paz, Santa Cruz, Chuquisaca, and Cochabamba which includes the Chapare region."

b. In the Second Paragraph delete the figure \$13,300,000 and in its place substitute \$9,342,000, and delete the figure \$13,000,000 and in its place substitute \$9,042,000.

2. Except as expressly modified or amended hereby, the Authorization remains in full force and effect.



Otto J. Reich  
Assistant Administrator  
Bureau for Latin America  
and the Caribbean

Nov. 24, 1978  
Date

Clearances:

LAC/DR:NParker: 11 date 10/19/82  
LAC/SA:PFarley:      date       
LAC/DR:DJohnson:      date

## I. SUMMARY AND RECOMMENDATIONS

### A. Recommendations

USAID/Bolivia recommends the reactivation of the Rural Roads II project in accordance with the reprogramming plan presented in this PP Amendment. The plan includes a concentration of project activities on the uncompleted roads begun under the Rural Roads I project and new work in the Chapare region, and requires a 28-month extension of the PACD by AA/LAC and the deobligation of \$3,958,000.

### B. Revised Project Description

The redesigned Rural Roads II (RR II) project will have two components: (1) strengthening the institutional capacity of the Bolivian National Roads Service (SNC); and (2) upgrading rural access roads to all-weather standards. The institution-building component will be comprised of technical assistance in planning and implementing rural road improvement projects and heavy equipment maintenance, training for various levels of SNC personnel, and procurement of road-building and maintenance equipment. The road improvement component will consist of installing drainage works and bridges to complement road upgrading activities carried out in the Rural Roads I project area (selected provinces in the Departments of La Paz, Cochabamba, Santa Cruz and Chuquisaca), and upgrading of 260 kms. of rural access roads in the Chapare region of Cochabamba to all-weather standards.

The RRII project originally envisaged road upgrading activities in the Departments of Tarija, Potosí and Chuquisaca. Although SNC could set up field facilities to implement the project in these departments, this would involve a much greater investment of SNC time and resources than in the RRI project areas, where facilities already exist and road improvement is still needed. Furthermore, concentration of project activities in the Chapare is consistent with the Mission's Long Term and Short-Term Assistance Strategies.

The Chapare was selected as an area of focus for both political and developmental reasons. It is the major illicit coca growing region in Bolivia. The coca control strategy jointly agreed to by the United States and Bolivian Governments involves a two-pronged approach of reducing the amount of coca grown in the area while simultaneously launching a comprehensive development program which includes agricultural production, marketing and infrastructure improvement components. The development effort, over time, will provide Chapare residents with an economic alternative to growing coca. Additionally, there is a long-term developmental motive for focusing on the Chapare. The Mission's revised Long-Term Strategy calls for concentrating resources in the corridor stretching from La Paz through Cochabamba to Santa Cruz. The Chapare lies in this corridor; accordingly, channelling resources to the Chapare is an initial input to a long-term development scheme.

The project was originally authorized in 1978 at a total cost of \$23.1 million. The AID Contribution was \$13.3 million; a \$13.0 million loan

and \$300,000 in grant funds. The original life of project was 5 years with the PACD scheduled for August 1983. The revised total cost of the project is \$21.915 million. The revised U.S. contribution is \$9.342 million (loan and grant). Disbursements to date total \$20,000 grant and \$42,000 loan.

### C. Summary Findings

USAID/Bolivia concludes that the project as revised is technically and financially feasible for completion within the revised loan disbursement period of 39 months. Each sub-project will be individually investigated for technical and economic viability. The implementing GOB institutions have been thoroughly examined and are believed to have the capacity to carry out their respective responsibilities under the project. The financial burden of the project on SNC's budget is not great; and revised project disbursement procedures will help ensure provision of GOB counterpart. The Mission believes that the environmental determination continues to be valid. The social analysis indicates that project implementation will be entirely beneficial to the target population and the country as a whole.

The project meets all applicable statutory criteria. Checklists were included in Annex C of the original PP. The USAID Mission Director has recertified that Bolivia has the capability to effectively maintain and utilize the Project (Annex F).

USAID/B and GOB counterparts have collaborated closely on all phases of the reprogramming process and are in complete agreement on the technical and administrative configuration of the revised RRII project. Similarly, there is total accord among USAID/B, SNC and the Ministry of Finance (MOF) on the revised project budget. A Project Agreement Amendment, containing a revised project description, budget and implementation plan, is being drafted. Upon receipt of authorization to proceed, the amended Project Agreement will be signed by USAID/B and the GOB, thereby formally reactivating the project.

As demonstrated in this PP amendment, the RRII project continues to be a viable activity that will address critical rural infrastructure problems in the Departments of Cochabamba, Santa Cruz, La Paz and a portion of Chuquisaca. All past implementation problems have been addressed.

Based on the revised implementation plan and the strategy presented in this document, USAID/B with the Ambassador's concurrence, requests AID/W-LAC technical approval to reactivate all elements of the RRII project and AA/LAC approval of the required extension of the PACD to December 31, 1985. The actual reactivation date of this project will depend on State Department determination that sufficient progress has been made by the GOB in areas of interest to the U.S. Government.

SUMMARY REVISED BUDGET  
(US\$ 000)

	A	I	D	GOB	Community	Total
	Grant	Loan				
		FX	LC			
<u>A I D</u>						
1. Technical Assistance	300					300
2. Equipment, Vehicles and Spare parts		3,250	150			3,400
3. Training		27	73			100
4. Evaluation		30				30
5. Phase I Complementary activities						
5.1 Drainage activities			1,600			1,600
6. Chapare						
6.1 Rent of equipment			65			65
6.2 Drainage activities			2,009			2,009
6.3 Fuel and Oil			293			293
6.4 Local labor salaries			75			75
Sub-Total	<u>300</u>	<u>3,307</u>	<u>4,265</u>			<u>7,872</u>
<u>S N C</u>						
1. Personnel				8,197		8,197
2. Fuel and Oil				1,716		1,716
3. Operating costs				1,253		1,253
4. Facilities Improvement				118		118
Sub-Total				<u>11,284</u>		<u>11,284</u>
<u>Community</u>						
1. Community labor					707	707
2. Right-of-way access					325	325
3. Local materials					257	257
Sub-Total					<u>1,289</u>	<u>1,289</u>
Inflation/Contingencies	300	3,307	4,365	11,284	1,289	20,445
		640	830			1,470
T o t a l s	<u>300</u>	<u>3,947</u>	<u>5,095</u>	<u>11,284</u>	<u>1,289</u>	<u>21,915</u>

- Notes: 1. GOB and Community counterpart is calculated at Bolivian Pesos (\$b) 44 to one dollar which is the rate for official obligations as established by Decree of the Government. The current floating exchange rate is \$b.200/US\$1.00.
2. Revised AID contribution includes US\$ 20,000 grant funds already expended for technical assistance and US\$ 42,000 loan funds expended for training.  
The GOB contribution includes US\$ 17,000 and US\$ 118,000 already expended under SNC Personnel and Facilities Improvement components, respectively.

## II. BACKGROUND AND REVISED PROJECT DESCRIPTION

### A. The Project to Date

As redesigned, this project is a continuation of activities begun under Rural Roads I. The common goal of both the Rural Roads I and Rural Roads II projects was to improve the standard of living of rural farm families in areas affected by the projects. These families were characterized by on-farm per capita incomes of \$200 - \$300, land holding sizes below twenty hectares, and limited access to marketing facilities and basic social services (e.g. health facilities, schools). Both projects were designed originally in direct response to an IBRD "Memorandum on Bolivia" and USAID/Bolivia's 1975 Agricultural Sector Assessment which revealed inadequate transportation facilities to be one of the main obstacles to Bolivia's development, inhibiting development of potentially productive areas, the integration of these areas into the economy, and the creation of national markets for both factors of production and product output. Of the 32,478 kms. of Bolivia's secondary and local roads in 1975, 22 percent met all-weather standards, while only 29 percent were passable in the rainy season.

With minor variations, the stated purposes of the two projects were similar. To wit, both projects proposed a) to increase the income of farmers through improving access to markets, and b) to institutionalize the capability within the Bolivian National Road Service (SNC) to upgrade and maintain secondary roads. Moreover, an important additional objective of Rural Roads II was to decentralize responsibility for road rehabilitation and maintenance to the SNC district offices and the communities serviced by the road upgrading programs. RRI project activities were to be concentrated in the Department of Cochabamba and selected provinces in the Departments of La Paz, Santa Cruz and Chuquisaca, whereas RRII project activities were planned for the southern vallies -- northern Chuquisaca, Potosí and Tarija.

At the time of the cancellation of RRI and suspension of RRII following the July 17, 1980 coup, implementation progress on both projects had been disappointing. The 1980 USAID/Bolivia evaluation of the RRI project (PES 82-2, dated December 28, 1981) and the AG audit of the RRI and RRII projects (Audit Report No.1-511-80-12 dated June 17, 1980) attributed the limited progress of both projects to a series of common problems, some of which were directly related to the unstable political situation which prevailed at the time.

With regard to RRI, which began in 1976, the performance of SNC's Caminos Vecinales Division at the national level and the field offices established in the Cochabamba, La Paz, Santa Cruz and Chuquisaca departments was inhibited by inadequate staffing, insufficient training of technicians and operators (Only 36 percent of the planned number were trained), and continual delays brought on by an administrative structure over-laden with needless, time-consuming procedures and the centralization of decision-making authority at the national level. Most significantly, the MOF did not provide the necessary and agreed-upon level of counterpart funds to

carry out the project. Moreover, the planning and road design schedule of the SNC Caminos Vecinales Division was affected by the lack of anticipated support from the Ministry of Agriculture and Campesino Affairs (MACA) and the Servicio Nacional de Desarrollo de la Comunidad (SNDC). MACA was delinquent in carrying out its assigned duty of gathering required socio-economic data on the communities that were to have been included in the project. Similarly, SNDC was deficient in providing the promotional activity necessary to gain a sufficient level of community participation in road improvement and maintenance. In addition to these problems, operations were adversely affected by a delay of almost one year in the delivery of heavy equipment and spare parts as well as by problems related to cement shortages, and the unpredictable performance of explosives. Finally, the project suffered from problems with the technical assistance team. The administrative advisor's contract was terminated after one year for deficiencies in job performance; the technical equipment advisor arrived 14 months behind schedule; and there were continual delays in contracting the technical experts to upgrade SNC's capabilities in training work crews and field equipment managers. The combined result of these factors was that, of the 1,200 kms of roads that were scheduled for upgrading by the December 30, 1980 PACD, only 63 kms were completed, with another 410 kms partially completed, when the project was suspended in August 1980.

Implementation progress of RRII was even less impressive. From its initiation in 1978 until its suspension, no concrete actions were taken to carry out activities that were critical to project success. For example, Caminos Vecinales field offices in the Departments of Chuquisaca, Tarija and Potosí were not established; required long term technical assistance contracts were not entered into; and contract awards for heavy equipment were not made. While it was SNC's responsibility to take these actions, failure to do so was the result of a decision on the part of SNC not to proceed with RRII activities until the GOB honored outstanding counterpart budget requirements corresponding to the RRI project. Meeting such budget commitments was the responsibility of the MOF. Accordingly, responsibility for the inactivity of RRII devolves ultimately to the MOF and the difficult political and economic situation experienced at the time by the country. Be that as it may, the fact remains that no progress was made toward upgrading the 1,000 kms. of road planned under the project.

As noted above, RRI was cancelled and RRII was suspended following the July 17, 1980 coup. In each case, in addition to U.S. political reaction to the coup, the reasons were similar. In summary, they consisted of the following: (1) lack of GOB commitment to furnish SNC with the required counterpart contributions; (2) deficient MACA and SNDC support; (3) limited community participation; (4) poor equipment maintenance practices by SNDC resulting in deterioration of heavy road equipment; (5) deficient project-related accounts and records; (6) inordinate delays in road construction; and (7) inadequate field supervision.

Since the July 1980 coup, SNC has made progress, albeit limited, toward correcting some of these deficiencies. SNC's basic institutional structure remained intact in the RRI project area, which resulted in a continuation of road feasibility studies and construction. Studies on upgrading 635 kms have been carried out; 456 kms of upgraded roads have been completed and an additional 307 kms are being upgraded. In comparison, only 63 kms were upgraded and 410 kms under construction at the time of the cancellation of RRI. In addition, performance improved with regard to project accounting; field supervision was enhanced; and initial steps were taken to transfer community-based data gathering and promotional activities to GOB institutions more capable than MACA and SNDC of carrying out such activities. As a result of this progress, the Mission recommended (La Paz O308) that the RRII project should be reactivated but refocused on the RRI geographic area, especially the Chapare. To do this in an effective manner, a plan had to be developed to address the outstanding problems outlined above. The reprogramming plan is presented below.

## B. Revised Project Description

### 1. Project Goal and Purpose

The project goal - to improve the standard of living of rural small farm families - remains the same as described above. The new USAID/B Long-Term Strategy will concentrate resources in the La Paz-Cochabamba-Santa Cruz corridor in order to improve the standard of living of residents living in the corridor and, through the action of a multiplier effect, will contribute to the overall development of the country by assisting the development of a critical growth pole. The Rural Roads II project will contribute to this objective by improving the access of farmers in the Chapare and other selected provinces in La Paz, Santa Cruz, Cochabamba and Chuquisaca to both domestic and international agricultural produce markets. Moreover, the project will enhance farmers' access to the inputs and services needed to modernize production methods. The enhanced market will contribute, via reduced transportation costs, increases in the amount of land under production, augmented production of higher value crops, and a higher market share, to increased farmer incomes.

The project, as redesigned, has two related purposes. The first is to enhance the capacity of Bolivian implementing agencies, particularly the Camino Vecinales Department of SNC, to carry out rural road upgrading programs, including the planning, selection, design and execution of road improvement activities as well as maintenance of roads and equipment. The major thrust of this institution-building element will be to continue to decentralize the planning and implementation of rural roads activities to the district level. The second purpose is to improve access to and from farms by upgrading 260 kilometers of secondary roads in the Chapare and completing the year-round utility of approximately 500 kms of rural roads upgraded under the RRI project, through the construction of strategic bridges and roadside drainage works.

Several key assumptions link the project's goal and purposes. The first, with respect to the Chapare, is that the Coca Control Plan will be successful in reducing coca production and, in conjunction with the proposed USAID Chapare Integrated Rural Development Project, inducing farmers to cultivate other crops. The second is that cropping system packages suitable to

the Chapare and other regions where roads will be improved will be developed. The third is that internal and external markets for high value agricultural products will be further developed. The final critical assumption is that the Bolivian economy will stabilize, thereby creating an atmosphere conducive to private investment (i.e. agro-industry) in the corridor, as well as assuring the availability of counterpart funding throughout the life of the project.

By the end of the project, all existing secondary roads in the Chapare and all roads in the RRI project area begun during that project and subsequently by SNC will be upgraded to all-weather standards. SNC's Caminos Vecinales Division will have enhanced road improvement and maintenance capacity as well as an improved equipment maintenance capability -- especially at the district level. In addition, SNC's Caminos Vecinales national office in La Paz will be better able to plan and manage rural road project activities.

## 2. Revised Project Strategy

The Mission proposed that the geographic focus of the RRII project be changed in the cable (La Paz 0308, dated January 13, 1982) requesting authority to begin the reprogramming exercise. The institutional capabilities of SNC, the Departmental Development Corporations (DDCs) and the Project for the Development of the Chapare and Yungas (PRODEG), and the existing infrastructure for undertaking road construction and maintenance activities in the RRI project area, all support the decision to reactivate activities in the RRI area instead of initiating work in the RRII area. Although SNC could expand field operations in the Departments of Tarija, Potosí and northern Chuquisaca, this would require a much greater investment of time and resources than in Cochabamba, La Paz, Santa Cruz and southern Chuquisaca where field facilities have already been established. Furthermore, additional road improvement work is required in the RRI project area to upgrade existing roads to all-weather standards. In addition, this geographical redirection of the RRII project is consistent with the Mission's Long-Term and Short-Term Assistance Strategies.

USAID/Bolivia's FY 1984 CDB, to be submitted in the first half of FY 1983 will present a significant change in the Mission's previous development strategy. The new schema will be a more concentrated effort designed to accelerate the growth of a discrete geographic region -- the La Paz-Cochabamba-Santa Cruz corridor, which includes the Chapare. The region was selected in large part because of its potential as a growth pole, especially in terms of high value agricultural and agro-industrial development, critical to Bolivia's growth. Reprogramming a significant portion of this project toward the corridor will support the Mission's Long-Term Strategy by assuring a permanent GOB road construction and maintenance capacity in the area. Host country capability to upgrade and maintain rural access roads in the corridor is essential to facilitate transportation of commercial volumes of high-value agricultural products to processing and marketing centers, as well as to provide small producers access to requisite agricultural inputs and services.

The Department of Cochabamba includes the major illegal coca-growing region of Bolivia - the Chapare, which is the principal focus of USAID's approved Short-Term Strategy. The USAID Short-Term Strategy calls for redirec-

tion of some ongoing projects to the Chapare in support of the Chapare Integrated Rural Development Project. Road improvement will be a key element in the Chapare's development. The GOB's Coca Control Program will reduce the coca-related income of Chapare farmers. Without improved roads the production and marketing interventions to increase income from other crops cannot succeed. Moreover, road construction in other RRI geographic zones is being addressed by other donors. The ongoing IBRD Ingavi project is upgrading secondary roads in the Department of La Paz to all weather standards; the proposed IBRD Santa Cruz Agricultural Development project includes a component to construct a system of feeder roads north of the Chané River; and a new IFAD project includes limited road construction activities in Northern Chuquisaca.

### 3. Project Components

As redesigned, the project will have two major components: (1) institutional building; and (2) upgrading rural access roads to all-weather standards.

#### a. Institution Building

The institution-building elements of this project will continue the process of decentralization begun under RRI. The national level office of SNC will serve as the principal counterpart agency for the project. However, increased responsibility and decision-making authority will be passed to district offices. The district offices in La Paz, Santa Cruz, Chuquisaca, and Cochabamba will be responsible for letting and supervising contracts for bridge construction and drainage work installation for the completion of road rehabilitation efforts begun under RRI. The district office in Cochabamba will also be responsible, in conjunction with PRODES, for planning and implementing all road construction activity in the Chapare, including selection of roads, contractor supervision, direct execution of construction works, road maintenance, and accounting.

Project elements that will contribute directly to improving the institutional capability of SNC are technical assistance, training and procurement of heavy equipment. Concerning the first, project grant funds will finance two long-term individuals - a general engineering advisor and a heavy equipment advisor - for two years each. The general engineering advisor will work directly with the chiefs of SNC's national level Caminos Vecinales and Planning departments, as well as the chiefs of the district offices, on the planning and implementation of project activities, including the scheduling of construction, deployment of field teams, preparation of training courses and supervision of contractors. The equipment advisor, as the title suggests, will assist SNC to improve maintenance of heavy equipment with particular emphasis on promoting preventive maintenance practices and improving the efficiency of machine repair shops.

As part of its project to develop the Chimoré-Yapacani highway, the Interamerican Development Bank (IDB) is devising a comprehensive training program for SNC personnel. Thus, some of the training needs for the RRI project will be satisfied under the program to be developed by the IDB. The

project advisors will collaborate with IDB consultants to design training courses to address the requirements of personnel involved in rural access road activities. RRII project funds will finance per diem and travel of SNC personnel directly involved in the project to attend the IDB funded training activities.

The project-supported training program will be varied, consisting of several types of teaching-learning formats, designed for various level of SNC personnel. Short-term (3-4 days) seminars will be held for top echelon managers. To the extent possible, these seminars will be held at the SNC Training Center in Patacamaya. Each seminar will deal with only one topic, and probable subject areas will include personnel administration, public relations and budget preparation. It is likely that two SNC managers (the national level chiefs of the Caminos Vecinales and Planning divisions) involved with the RRII project will attend these seminars.

Courses for mid-level personnel (e.g. district chiefs) also will be held at the SNC Training Center and will last for an estimated period of from four to six weeks. Course subject matter will include personnel management, administration, budget preparation and program planning. Chiefs of all the districts in which the RRII project will be located will attend one cycle of courses. Their attendance will be scheduled during the rainy season so as not to conflict with road upgrading work in the field.

At the operational level, courses will be developed for equipment operators, foremen, drivers and equipment maintenance personnel. These courses will be held at SNC district headquarters throughout the country or in some cases at local level highway residences. They will be in-service sessions with an emphasis on practical applications and will take place in two to three successive stages. All appropriate personnel working with the two construction equipment groups to be assigned to the project and the project support equipment group in the Chapare, as well as mechanics from the highway residence in Villa Tunari (the largest town in the Chapare) and the district headquarters in Cochabamba, will attend courses related to their occupations. Once again, training will be scheduled so as not to conflict with periods of peak construction activity.

The final institution-building component will enable the purchase of replacement parts to re-fit equipment procured under RRI and the acquisition of new equipment to establish a new road construction unit. A total of up to \$ 3.4 million (\$ 2 million for new equipment and \$ 1.4 for parts) in loan funds will be used for this purpose. Both construction and maintenance equipment will be purchased. Articles of machinery to be purchased will include dump trucks, road graders, front-loaders, and an equipment repair truck which will be used for periodic field maintenance of equipment. Complete lists of new equipment as well as replacement parts for the construction equipment unit procured under RRI appear in Annex B.

b. Road Construction

Road upgrading activity under the project will be separated into two major divisions: (1) the upgrading of approximately 260 kms. of secondary roads in the Chapare; and (2) the completion of work begun under RRI to include the construction of 210 meters of bridges and the installation of drainage work in selected provinces of the La Paz, Cochabamba, Santa Cruz and Chuquisaca departments.

Road improvement work in the Chapare will follow the strategy for implementation of rural infrastructure activities elaborated in the Chapare Integrated Rural Development project PID submitted to AID/W in May, 1982. Succinctly, this strategy calls for dividing the Chapare into nine micro-regions grouped in sets of three, and carrying out one of three types of infrastructure interventions (roads, rural sanitation and community infrastructure) in one micro-region set in a given time period. The interventions will be rotated among the micro-region sets so as to provide all nine micro-regions with each type of intervention in a three-year period. Within each set of micro-regions, roads will be selected for upgrading according to a priority listing based on cost/benefit analyses. The task of carrying out the analyses will be the responsibility of SNC field personnel and the SNC National Planning Office which will collaborate with PRODES in devising yearly implementation schedules which will be presented to the Chapare District Consultative Council\* (CODICH) for review once it is established.

With the exception of the initial implementation period (September 1982 - March 1983), all road improvement work (widening, road bed preparation, levelling, and laying of gravel topping) will be carried out directly by SNC. Because the equipment will not arrive until mid-1983 and the construction unit procured under RRI is operating at partial strength for lack of spare parts, SNC itself will undertake a limited portion of the road improvement work (approximately 30 percent) during the initial phase of the project and contract with local firms for the balance. SNC will also contract for all drainage structure installation and bridge construction associated with upgraded roads in the Chapare. Concerning the drainage work, SNC will carry out the topographic work and provide the materials (e.g. cement pipe, re-bar) while the contractors will furnish the skilled labor. With respect to bridge construction, SNC will undertake only the topographic work. The furnishing of materials and skilled labor for bridges will be the responsibility of the contractors.

The drainage works installation and bridge construction required to complete the road upgrading done under RRI will be executed through contract arrangements like those described for similar work in the Chapare. The district office in each department will be responsible for letting and monitoring contracts within its jurisdiction. Rank ordering of sites for bridge construction will be established according to a set of criteria which emphasize economic factors such as the cost of delays to freight, vehicles and passengers. Data needed to comply with the criteria will be collected through field studies carried out by personnel from SNC. Study results will be submitted to the

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\*CODICH will be an inter-institutional project coordinating body for the Chapare project.

Caminos Vecinales Department in La Paz. This office in turn will draw up a priority list of bridge construction work to be undertaken which will be approved by USAID.

Project beneficiaries will assist SNC and the contractors in road upgrading and maintenance activities. They will provide manual labor for tasks such as accumulation of local materials (sand and gravel), land clearing for rights-of-way, and light repairs on roadbeds. In the Chapare, beneficiary work forces will be mobilized by PRODES community workers (polyvalent para-professionals) working through local organizations. Outside of the Chapare, mobilization of community participation will be undertaken by the Departmental Development Corporations (DDCs). At the work sites, laborers will be under the direction of SNC's resident engineer who will be in charge of Chapare activities. The involvement of PRODES in the Chapare and the DDCs in other areas in mobilizing community labor forces will help overcome one of the major impediments to the implementation of RRI - i.e. sporadic target group involvement due to the lack of promotional activity by SNDC. To assure beneficiary participation in the Chapare where special circumstances prevail\*, \$75,000, will be budgeted to finance wages for day laborers in the construction phase of the road segments. This fund will be managed by SNC's resident engineer.

c. Project Organization - Institutional Framework

The execution of the project involves the participation of a number of different government entities and multiple levels within the bureaucratic structure. As noted above, the principal counterpart organization will be SNC. At the national level, SNC's Caminos Vecinales Department will be responsible for overall coordination of the project - including preparation of documentation for international procurements, scheduling of training, coordination of project accounting, and implementation of the pari passu disbursement system\*\*. SNC has agreed to assign two accountants, one in the Central Office in La Paz and one in the District Office in Cochabamba, to facilitate administration of the pari passu system and to maintain accounting records for the project. These measures will help eliminate a series of problems (i.e. periodic absence of GOB counterpart, inadequate GOB counterpart and tardy submission of vouchers for reimbursement) which adversely affected the RRI and RRII projects in the past.

Below the national level, implementation responsibility will devolve to SNC's district highway offices -- principally the office in Cochabamba and to a lesser degree, the offices in La Paz, Santa Cruz, and Chuquisaca. The Cochabamba District Office will work with PRODES and CODICH in

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\* Social Analysis (Section III D) details the special conditions that prevail in the Chapare.

\*\* See Section III F.

devising yearly work schedules for road upgrading in the Chapare, backstop the two basic equipment groups and the support group assigned by Caminos Vecinales to the Chapare, carry out light to moderate repairs on project-related equipment, manage contracts for road upgrading, bridge construction, and drainage system installation, and undertake local procurement.

The other district offices (including the office in Cochabamba for non Chapare-related activities) will be responsible for letting and supervising contracts for bridge construction and drainage work installation in their areas of jurisdiction. They also will furnish personnel to carry out topographic work required for construction activities. Finally, the district offices will be responsible for continual maintenance of roads upgraded under the RRI project.

The highway residences, particularly the one at Villa Tunari in the Chapare, will oversee the road upgrading activity of SNC's Caminos Vecinales equipment and support units, carry out light repairs on equipment, and monitor the progress of contractors. In addition, they will furnish transportation for, and direct community work groups in, road upgrading and maintenance.

The actual road upgrading work in the Chapare will be carried out by two basic equipment groups assigned to the Chapare by Caminos Vecinales. In terms of equipment, the group that will be formed with funds from the project will have six D7 tractors, a water truck, nine dump trucks, one back hoe, a mobile cement tube-making machine, and a heavy equipment repair truck. The group to be reconditioned with replacement parts purchased by the project will have six D7 tractors, five rollers, one water tank truck, one front loader, and one road grader. The other equipment group, financed under RRI, is located in the Valle Alto region of Cochabamba Department. Throughout the course of the project, it will be shifted between the Chapare and geographic areas serviced by RRI. This group will upgrade roads in the Chapare during the dry season (April to October), after which time it will be moved to continue upgrading roads planned, but never completed, during the life of RRI. (The project will not finance support costs for this new initiative in RRI areas; such work will be financed solely by the GOB.)

Caminos Vecinales will furnish the personnel required to operate heavy equipment. Assisting the two equipment groups will be a support group, also assigned by Caminos Vecinales, made up of three dump trucks, one fuel tank truck, one stake truck, one trailer, one rock crushing machine, three pick-up trucks, two generators and the personnel required to operate this machinery.

A complete organization chart of SNC, along with descriptions of the Caminos Vecinales Department, the Cochabamba District Office, the Highway Residence in Villa Tunari as well as the basic equipment and support groups, is included in Annex A.

### III. REVISED PROJECT ANALYSES AND FINANCIAL PLAN

#### A. Technical and Engineering Analysis

##### 1. Choice of Technology

With the exception of some minor modifications to take into account the redirection of a major portion of this project to the Chapare, the technical and engineering analysis conducted for the RRI and RRII projects remain valid.

##### a. Labor/Capital Mix

An analysis of labor/capital mix contained in the RRI Project Paper considered alternatives ranging from capital intensive road upgrading techniques (at an estimated financial cost of \$8.8 million for 1200 kilometers) to the intensive use of hand labor (at estimated cost of \$30 million for the same quantity of road). Labor requirements under the capital intensive approach were 3,100 work-months and under the intensive hand labor approach, 268,000 work-months. Considering such factors as availability of local labor, the rate of progress of road upgrading and the cost of foregone agricultural production, a mix of labor and capital was proposed which utilized voluntary labor to the maximum extent possible. This technology mix resulted in a cost of between \$5,700 and \$11,500 dependent on terrain, to upgrade one kilometer of road.

In the original design of the RRII project, consideration was given to the experience under RRI as well as the results of labor intensive road building projects such as the ALDE U.N. Food for Work Program in Bolivia and the Colombia Pico y Pala (Pick and Shovel) road building effort. The end product of this analysis, given conditions in Bolivia such as a relatively low population density and highly dispersed population distribution, was a decision to retain the labor/capital mix used in RRI. Inflation between the time RRI was designed (1974) and RRII was designed (1976) pushed the per kilometer cost up to between \$9,400 and \$13,700, again depending on terrain.

The demographic factors, low density and high dispersion, which influenced the labor/capital mix when RRII was targeted for the southern valleys region of Bolivia are even more important with respect to the Chapare. As discussed in the social analysis, reasonable estimates place the population density in the Chapare at eighty families per 20 kilometer road segment. A typical family in the target area has two adult members who would be able to work on road improvements. Given the perennial nature of agricultural activity, the labor availability per family is likely to be reduced by 50 percent. Accordingly, the labor/capital mix for the portion of the project directed at the Chapare will slightly favor capital inputs. This shift, coupled with inflation since RRII was designed in 1976, has increased the estimated per kilometer cost to between \$15,000 and \$17,000.

##### b. Labor/Capital Task Allocations

The road upgrading and maintenance aspects of this project focus on secondary roads which are poorly aligned and have deficient cross drainage, inadequate cross sections and surfacing which does not permit motor

vehicle traffic during the rainy season. The program for improving these roads to allow year-around passage of vehicles will require removal of rock interfering with desired grade and alignment, excavation, movement and compaction of soils for building stable road beds, construction of drainage structures, and placement or upgrading of gravel and/or crushed rock for all-weather surfaces. Maintenance of the improved roads will provide for removal of slides and debris and regular cleaning of drainage structures. Provision will also be made for repair of holes in embankments and road surfaces and for periodic resurfacing of roadbeds. The functions that will be carried out with equipment will be: removal of tree stumps from roadway construction areas; excavating, handling and compacting earth; excavating for culverts; and crushing, loading, handling and compacting surfacing materials. Tasks that will be carried out by hand labor will include removal of brush and trees from construction areas, drain pipe fabrication, installation of culverts, headwalls and sidewalls and minor pothole patching.

## 2. Road Selection Criteria

Owing to the urgent nature of the USAID's Short Term Strategy priority for the Chapare, the first three segments of road (Villa Tunari-Tsinuta, Puerto San Francisco and Ivrigarzuma-Valle Hermoso) were selected for priority construction by SNC and PRODES in consultation with campesino leaders from the area. These roads were chosen on the basis of volumes of traffic (hence importance for marketing agriculture produce) and a micro-regional geographic strategy for developing the Chapare. According to this strategy, infrastructure improvement (roads, rural sanitation and community-based infrastructure) will be implemented throughout the Chapare's nine micro-regions on an area-by-area basis. Road upgrading initially will be concentrated in micro-regions 3, 4 and 7. In the second year of the project, activities will be concentrated in zones 1, 6 and 8; and zones 2, 5 and 9 will be the area of focus in the project's third year. Within each set of three micro-regions, roads for upgrading will be selected and ranked on a priority basis according to the following criteria.

- (1) Roads proposed for improvement must serve an area with significant agricultural or livestock potential.
- (2) Sections proposed for improvement should be linked to an all-weather trunk route.
- (3) Priority will be given to sections populated by beneficiaries showing more concern for participating in road upgrading and maintenance activities (and GOB coca control and development activities.)

Road sections will be rank ordered on the basis of cost/benefit criteria and beneficiary willingness to participate. Roads with the highest c/b ratios will be upgraded first, while those with lower ratios will be tended to afterwards. The rankings will be determined by the results of a socio-economic profile of the community corresponding to each road segment and benefit/cost analyses to be conducted by PRODES and SNC field workers. These will be passed on to the National Planning Office and used in the

formulation of yearly implementation plans.

Selection of bridges will be done according to a set of benefit/cost criteria which emphasizes savings to the beneficiaries:

- (1) savings in time resulting from the elimination of an obstruction;
- (2) savings in cargo losses (e.g., perishable agricultural produce) caused by obstructions; and
- (3) savings in costs for the **vehicle** and driver.

A fourth criterion that will be used is related to maximizing the impact of the funding available in the project. In order to avoid using the entire amount allotted for this activity on a few large structures, only bridges up to 20 meters long and under \$100,000 in cost will be constructed.

Data collection for selecting bridges will be carried out by SNC field personnel and forwarded for analysis to an economist from SNC's Camino Vecinales Department. As in the case of roads, data collected will be factored into yearly implementation plans -- both for the Chapare and the RRI areas.

### 3. Design Standards

Design standards have been developed for the project, and appropriate design criteria will be specified for each sub-project activity (see Annex D, Exhibit 1). In general, minimum standards regarding loading, vertical and horizontal alignments and width of roadway will be followed, taking into consideration that design standards affect subsequent road maintenance costs. That is, if the standards are low, road upgrading costs also may be low but follow-on road maintenance costs will be high in order to keep the road open all year.

Roads will be designed to take advantage of the natural terrain, minimizing cuts and fills, with only minor drainage structures contemplated. River crossing will avoid the construction of bridges where possible, providing culverts for low water flows, and concrete masonry fords for high water crossing, where possible. With minor exceptions, all roads will be single lane, with provisions for turnouts for passing at convenient intervals. The roads will be all-weather, using an adequate thickness of gravel or crushed rock as surfacing, except in rare cases where the native soils provide adequate surface. The road beds will be from four to five meters wide. The maximum weight capacity designed for each road will depend on anticipated loads to be carried thereon and the bearing capacity of the native soil. No major drainage structures will be built. Concrete pipes, masonry arches, small concrete bridges, and stone fords will be used for cross drainage.

#### 4. Engineering and Construction

##### a. Surveys

Surveying will be held to a minimum. In most cases, a centerline alignment and profile and determination of culvert locations will provide sufficient information for the design. As all of the access roads to be improved will follow existing trails or unimproved roads, no extensive location surveys will be necessary. In those cases where it appears that a change in alignment will result in a less expensive construction or measurably improve access, such as when the existing road lies in the river bed, the necessary surveys will be done to make a relocation determination. Surveys will be carried out by SNC's permanent employees from the district offices -- principally Cochabamba.

##### b. Soils Studies

Studies of the plasticity and bearing capacity of the soils are required for each proposed road project. Samples will be obtained in the field and tested in SNC soils laboratories.

##### c. Design

As in the case of surveys, plans for the project will be simple. In general, plans will indicate only a centerline profile and alignment. Details of drainage structures, typical roadway sections, and right of way problems will complete the requirement for the construction plans. Typical sections and design details are shown in Annex E, Exhibit 2.

##### d. Construction

Through both direct execution using its own staff and supervision of contractors, SNC will be responsible for all construction activity. In the Chapare approximately 260 kms of secondary roads will be upgraded. During the initial period of implementation (September 1982-March 1983), SNC, with the equipment unit purchased under RRI, will improve a 42 kilometer stretch of Route # 7 between Villa Tunari and Isinuta. Simultaneously, it will contract for the upgrading of two other sections of road. For the balance of the project, all Chapare road-construction (i.e., road bed preparation, widening and surfacing) will be performed by SNC. Installation of drainage works and bridge construction will be done on a contract basis. Regarding the former, SNC will do the required topographic work and provide the materials (e.g., cement, galvanized tin, concrete pipe), while the contractor will furnish the skilled labor. Concerning the latter, SNC will do the topographic work only; provision of materials and skilled labor will be the responsibility of the contractors.

The installation of drainage works and construction of bridges needed to complete the road upgrading done under RRI will be carried out through contract arrangements like those for similar work in the Chapare. SNC's district offices in each department will be responsible for letting and monitoring contracts corresponding to work done within their jurisdictions.

Since the amount of equipment is limited, emphasis will be placed on its full utilization during the construction season, although it will have to be transported from site to site as required. Normal construction practices will be followed. In side hill type locations, most of the roadbed will be excavated rather than filled as the steep slopes found in the project areas make it difficult for a fill slope to "catch." Construction in flat areas will normally use the side borrow system where excavation from the drainage ditches and other areas adjacent to the road will be used to provide material for the elevated road bed. No earth moving equipment is included in the project, since no long hauls are anticipated. If sub-base material is required to be moved from one location to another, front-end loaders and dump trucks will be used. Drainage will be provided by means of side ditches, together with reinforced concrete pipe culverts, drop inlets, and box culverts to provide adequate drainage and cross-drainage facilities.

While the equipment will be used as much as possible during the entire project period, most of the work will be done during the dry season, which varies slightly in different geographical locations but is considered to be 7-8 months (April-November) long. It should be noted that certain work can be undertaken in the rainy season such as clearing of the right-of-way, screening of aggregate and rock excavation. The time that campesinos must dedicate to crops also will be considered in programming the construction of each road.

#### 5. Road and Equipment Maintenance

Road maintenance will be the responsibility of SNC highway residences. Minor maintenance, such as filling potholes and cleaning drainage ditches, will be carried out by community members. Major maintenance, such as landslide removal or washouts, will require equipment from highway residences.

Equipment maintenance has been a problem in the past. Problems have arisen primarily for lack of spare parts, over-use of equipment and infrequent maintenance. A good supply of spare parts will be purchased for the two construction equipment groups working under the project. In addition, a maintenance truck will be purchased for the second construction group which will facilitate periodic field maintenance of equipment and minor repairs. The Cochabamba district machine shop is being improved to provide better maintenance. Lastly, both long-term TA and training in equipment maintenance will be provided. These measures are judged sufficient to improve SNC equipment maintenance practices and help prevent costly down-time during the construction season.

#### 6. Engineering Conclusions

The engineering studies, preliminary information and reports, and other data indicate that this is a feasible and sound project. The estimated costs of equipment and materials have been carefully and realistically developed, based upon the most reliable data available and taking into consideration probable escalation costs. All materials and

equipment are available, and the acquisition of these items poses no special problem. It is the judgement of the Project Committee that the requirements of Section 611 (a) of the Foreign Assistance Act of 1961, as amended, have been met.

## B. Institutional Analysis

### 1. General Organization - SNC

SNC is a dependency of the Ministry of Transport, Communications and Civil Aeronautics (MTCAC) with autonomous technical and administrative operations. The functions delegated to SNC through Supreme Decree No. 6684 of February 1964 and Law No. 7390 of February 1965 include the planning, construction, upgrading, maintenance, supervision and administration of the Bolivian road system. SNC is headed by a director who is assisted by a Board of Directors, a deputy director, and an advisory group, composed of a legal counselor and auditor. At the national level, SNC is organized into five main divisions -- Finance, Administration, Research-Design and Planning, Roads Planning and Policy, and Operation. The latter is the division that will be most involved in the project as it includes the Caminos Vecinales Department, as well as the Maintenance, Construction, Bridges and Equipment departments. Below the national level, SNC is organized into ten district highway offices, which are further subdivided into highway residences and temporary camps established at work sites to reduce the cost of transporting men and equipment. A complete SNC organization chart appears in Annex A, Exhibit 1.

Since its creation, SNC has built a reputation of being among the better organizations in the Bolivian public sector. In spite of the major difficulties encountered in implementing the RRI and RRII projects (for reasons which were largely beyond the control of SNC), SNC has an impressive implementation record. Over the past twenty years, SNC has constructed over 900 kms of paved roads and almost 1600 kms of secondary dirt and gravel roads throughout the country. In addition, the Servicio is in the process of constructing or upgrading more than 1,500 kms. of principle and secondary routes.

In large part, SNC's success is the result of sound personnel policies. Entrance, particularly at the professional level, is based on competition among candidates with relevant formal training; promotions are tied directly to job performance. Moreover, the Direction and the labor union within SNC has, throughout the Service's existence, resisted placement of political appointees. The result is a cadre of well trained, experienced individuals with a professional approach to job performance.

### 2. Caminos Vecinales

The Caminos Vecinales Department is the unit within SNC that will be chiefly responsible for executing this project. Specifically, Caminos Vecinales will be in charge of: (a) carrying out feasibility studies relative to subproject (road segment) selection, (b) selection of subprojects, (c) execution of road upgrading, (d) supervision of contracts for bridge construction and drainage works installation, (e) procurement, both inter-

national and local, of commodities, (f) in-service training, and (g) maintenance of roads and heavy equipment. Other departments within SNC will support Caminos Vecinales in carrying out its tasks. For example, the Procurement Unit will assist with the preparation of documents for international and local purchases, the Planning Department will participate in subproject socio-economic feasibility analyses, and the Maintenance Division will maintain the roads included in this project once they are upgraded.

From a personnel perspective, Caminos Vecinales is capable of carrying out this project. At the national level, the Department is staffed currently by five professional engineers (4 civil engineers and 1 mechanical engineer), one draftsman and necessary support personnel (secretaries, office clerks, drivers, messengers, etc.). Two additional positions, an engineer to serve as project manager at the national level and an accountant to work exclusively on this project, will be filled during the fourth quarter of 1982. The project engineer position will be filled through an in-house transfer as soon as the project is reactivated. The accountant slot will require recruitment from outside of SNC; the process of finding an appropriate individual is already underway.

The staff capability of SNC at the national level will be complemented by two long-term consultants to be financed with project grant funds. The first, a general engineering advisor to the project, will work directly with the chiefs of the national level Caminos Vecinales and Planning departments concerned with the programming and implementation of project activities including: scheduling of construction; deployment of field teams; supervision of contractors and preparation of training courses. The second consultant, a heavy equipment advisor, will assist SNC with the maintenance program for road-building machinery with the goal of instilling sound preventive maintenance practices and improving the efficiency of equipment repair shops. Each advisor will serve for a period of two years beginning in mid CY 1983. The staffing pattern for the Caminos Vecinales Department is included in Annex A, Exhibit 2.

In addition to staff at the national level (Those required at the district and highway residence levels will be described below.), the job-related skills of the entire SNC staff at all levels involved with the project will be upgraded through the IDB-sponsored training program.

In order to implement the project, Caminos Vecinales requires more road upgrading machinery. Currently, Caminos Vecinales has one heavy equipment unit (procured under RRI). Continual use during the past four years and some deficiencies in maintenance have reduced the operating capacity of this unit. The new unit will have the capability to undertake large volume earth-moving tasks, build road beds, facilitate installation of drainage works, and maintain both road and heavy equipment. Complete equipment lists, both replacement parts and new machinery, appear in Annex B as Exhibits 1 and 2 respectively.

### 3. District Highway Offices

As most of the activities in this project, as redesigned, will take place in the Chapare, the Cochabamba District Office will serve as the prototype for analyzing this level of SNC's organizational structure.

The "District" consists of the central office in the city of Cochabamba and four highway residences - one of which is located at Villa Tunari in the Chapare - and an asphalt treatment plant. As noted above, the District is managed by the District Chief (a civil engineer), who is assisted by a Deputy District Chief (also a civil-engineer) and department chiefs for maintenance (mechanical engineer), heavy equipment (a civil engineer) and administration (an accountant). The incumbents in each of these top five positions have at least 19 years experience with SNC. Management of the Highway Residences is the responsibility of the residence chief assisted by a deputy; in all cases these positions are filled by civil engineers. Throughout the District, this managerial staff is supported by a complement of professionals (topographers, draftsmen, laboratory specialists), skilled laborers (mechanics, welders, operators, electricians, equipment operators), semi-skilled laborers (heavy equipment operator helpers, drivers, mechanics' helpers, etc.) and administrative support staff (secretaries, accountants, bookkeepers, etc.) The staffing pattern for the Cochabamba District Office appears in Annex A, Exhibit 3.

In the execution of this project, the Cochabamba District Office will be accountable for: (a) direction, supervision and overall management of project activities within the District; (b) repair and maintenance of project equipment at the district workshop; (c) monitoring bridge and drainage work construction activities; and (d) supervising the basic equipment and support units working in the District's area. Analysis of the District Highway Office's organizational structure shows that it is capable of fulfilling its responsibilities. The staff, in terms of both quantity and quality of job performance, is more than adequate for the tasks at hand. Procurement and warehousing systems are adequate (Construction of an additional warehouse is in process.), and there is sufficient space and machinery to carry out repair of heavy road equipment. SNC has prepared simple accounting and administrative manuals which have been distributed and are in use in all district offices. The accounting system highlights the presentation of project costs and the consolidation of financial statements. This manual, together with training in the pari passu disbursement system which has been provided to SNC by USAID/Bolivia, is sufficient to meet the accounting needs of the project. Control of fixed assets is acceptable; and inventory reviews and reconciliations are carried out periodically by a team of specialists from SNC's national office.

### 4. Highway Residences

As noted above, highway residences are administratively responsible to the district offices. The Highway Residence that will be most

directly involved in road upgrading in the Chapare, the residence at Villa Tunari, was the one most closely analyzed. Its description will serve as a prototype for other residences involved in the Project.

The Villa Tunari Residence will oversee the road upgrading activity of SNC's Caminos Vecinales equipment and support units, carry out moderate repair work on equipment, and monitor the progress of contractors. Moreover, the Residence will provide transportation for community labor groups and direct their participation in road-upgrading and maintenance activities. From a personnel perspective, the Residence is sufficiently staffed to discharge its responsibilities. In addition to the two civil engineers (Residence Director and Deputy Residence Director) mentioned above, Residence personnel include one mechanic, one mechanic's assistant, eleven heavy equipment operators, two drill operators, one topographer with eight assistants, one welder, one administrative assistant, two compressor operators, and assorted support staff. To serve the needs of this project, SNC will contract a civil engineer, an accountant, a procurement specialist, two mechanics and two mechanic assistants. Beginning in 1983, SNC will contract nine heavy equipment operators and seven assistant operators and eleven drillers to operate the heavy equipment unit that will be purchased with project funds. The financial burden represented by this increment in personnel is included in the GOB contribution to the project. A typical highway residence staffing pattern appears in Annex A, Exhibit 4.

Extant workshop and equipment repair facilities are deficient; however, SNC has agreed to transfer machinery, tools and maintenance personnel to the Residence to satisfy the needs of the project. Local-level repair capability will be augmented by the acquisition, with project funds, of a repair truck that will provide on-site maintenance.

5. Collaborating Organizations (PRODES, CODICH, DDCs, CORDECO)
  - a. PRODES (PROGRAM FOR THE DEVELOPMENT OF THE CHAPARE AND YUNGAS)

PRODES is the GOB entity responsible for overall coordination of Chapare development. Under this project, PRODES will enter into an agreement with SNC which will detail the role to be played by each participating organization and the way in which road upgrading in the Chapare will be coordinated with other developmental activities. Specifically, PRODES and SNC jointly will prepare yearly implementation plans and budgets which in turn will be presented to CODICH for review and forwarding to the national level Chapare Project Board of Directors for formal approval. In addition, PRODES, through its cadre of multi-purpose village-level promoters will organize the participation of project beneficiaries for road upgrading and maintenance activities. Mobilization of community members into work groups will be carried out by base committees made up of members from PRODES (village promoter), SNC (resident engineer) and the beneficiaries. PRODES is a relatively new organization, but with the support it has received from

the INM Bureau, it has been able to hire talented personnel and has carried out its coordinating role in the design of Chapare development activities to date very well. It will be further strengthened through the Chapare Integrated Rural Development Project.

b. Chapare District Consultative Group (CODICH)

CODICH will be composed of the chiefs of the Cochabamba Department branches of the principal implementing agencies in the Chapare Development Program (including SNC), as well as representatives of major private sector entities and farmer organizations. The Council's principle function will be to coordinate the preparation of plans for Chapare development activities. In addition, the group will be charged with resolving any special implementation problems which might arise, including disagreement among implementing agencies.

c. Departmental Development Corporations (DDCs) and CORDECO (Departmental Development Corporation for Cochabamba)

The DDCs, dependencies of the Ministry of Planning, are decentralized units which plan, and in some cases implement, development activities on a regional (departmental) level. CORDECO is the development corporation for the Department of Cochabamba. With relation to the Chapare portion of this project, CORDECO's participation will be focused on its role as the chair organization of CODICH. As such CORDECO will have a voice in the approval of implementation schedules for road upgrading in the Chapare. Concerning activities in the Department of Cochabamba related to RRI, CORDECO will be responsible for organizing beneficiary participation in road maintenance. The same role will be afforded to the DDCs in the Departments of La Paz, Santa Cruz and Chuquisaca. The DDCs are still developing their outreach capacity and are receiving assistance under both the Title III Program and Project 511-0471. It will be necessary for SNC to work closely with the DDCs to ensure that they fulfill their promotional responsibilities, but they are capable of doing so.

### C. Economic Analysis

Individual road segments proposed for project financing will be analyzed in terms of their probable impact on farm income. Anticipated costs and benefits will be discounted at 15 percent\*, and roads will then be ranked on the basis of their benefit/cost ratios. Accepting only roads with a benefit/cost ratio of 1.0 or better will ensure an internal rate of return to the project of at least 15 percent. Since most roads are expected to have B/C ratios greater than 1.0, the actual rate of return is expected to be substantially higher than 15 percent.

The high number of rural road improvement segments combined with their low construction cost and low traffic count makes it impractical to conduct extensive surveys for each candidate road as is frequently done to analyze more expensive road projects. The conventional type of analysis would not only be extremely costly but time consuming as well. While incurring such costs is not justified, it still is necessary to use a method that adequately discriminates between proposed subprojects on the basis of net economic benefits.

The economic analysis in the original PP presented a simplified benefit/cost procedure that can be used with a minimum of supervision and training. It is a "cook book" approach requiring that only a few numbers and calculations be supplied by field personnel in order to obtain the B/C ratio for each road using a simple formula. Compounded discount factors have already been calculated, and the major algebraic manipulations completed. Values for the major variables that will be used have already been calculated and will be periodically updated.

Data collection will be minimal. Using aerial photographic maps and field interviews, field personnel will estimate the zone of influence of each candidate road, the number of farms within the zone, and their farm size. An engineer will travel each road segment to obtain its length and estimate the cost of construction. The economic analysis in the PP concluded that the average increase in farm income attributable to improved access roads would be 50 percent. This figure is also valid with respect to non-coca income in the project's revised concentration area. If an accurate non-coca related household income figures for the Chapare and the RRI areas where the project will be operating are available. The 50 percent figure will be applied to these weighted average income figures to obtain the average income change expected for the average farm in a road's area of influence. This figure will then be multiplied by the total number of farms within the road's area of influence to obtain the total income change expected. The economic construction cost figure will be obtained by shadow pricing the unskilled labor component, but no other price adjustments will be necessary because a floating exchange rate is in effect and actual construction costs, except of unskilled voluntary labor, reflect

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\* The estimated international cost of capital.

real costs. An average maintenance cost figure of \$500/km will be used. With the estimated total income impact, cost of construction, maintenance cost, and number of kilometers, the B/C equation can be solved.

A similar procedure will be used for bridge construction analysis.

#### D. Social Analysis

Because most of the new activity in the project will take place in the Chapare, the population of that region will be the subject of the social analysis. Participation of beneficiaries in RRI areas will be limited to maintenance tasks (to be coordinated by the DDCs of each respective region) since bridge and drainage work construction will be carried out by contractors. An analysis of the target group in RRI areas is found in the PP for that project.

##### 1. Physical Description of the Chapare Region

The Chapare is an ecological region in east central Bolivia characterized as a vast tropical rainforest area covering the subtropical portion of the Chapare Province and the Carrasco and Arani provinces of the Department of Cochabamba. The land area of the Chapare has been estimated at 2,450,000 hectares. The project area, however, is considerably smaller, limited to approximately 147,000 hectares settled by about 12,000 small farm families. In addition to the land given to the colonists (11 percent of the area), the Instituto Nacional de Colonización has an active involvement in the development of the region. The remaining land area is composed of the Isiboro-Secure National Forest and lands in the public domain.

The region is tropical with an elevation of 200 to 1,200 meters above sea level, an average temperature of 22°C, and a rainfall of 3,000 millimeters annually. It is dominated by two types of landforms: low hills and the Yungas, a part of the high Cordillera Oriental rising some 5,000 meters, and the alluvial plains and numerous rivers which flow into the Amazon region. The soils in the Chapare are of recent origin. They are clay-based but vary considerably in quality ranging from the rich alluvial soils along the river beds to poor heavy soils further inland. The best soils for agriculture are on the natural levels of the rivers.

Erosion, excessive moisture in the soils due to seasonal flooding, rapid loss of fertility through leaching, bad drainage, acidity and lack of organic materials are some of the main agronomic factors limiting agricultural development in the Chapare. A given area of land is rarely cultivated more than two or three years in succession, after which it is allowed to return to forest so that fertility can be restored through time and natural processes.

##### 2. Salient Social Characteristics of Residents

Virtually all of the residents of the Chapare are immigrants from other regions of Bolivia. The highest portion, 80 percent, are native to the Cochabamba valley. Although spontaneous colonizers began settling the region during the 1920's, the majority of the inhabitants are recent arrivals who have come under the aegis of one of a variety of "directed" colonization

programs. The current population is estimated at over 50,000, but the area has the potential to support a significantly greater number of people. From 1967 to 1979, the number of colonies grew from 54 to 183, but yet only 11 percent of the total inhabitable area in the region (not including the national parks and concessions) has been occupied. Such development that has occurred to date is a product of the efforts of the colonists themselves with little assistance from the Government.

Regardless of whether colonies originated through spontaneous or directed settlement processes, today, in terms of social organization, there is no appreciable difference between the two. Other than the nuclear family the principle social structure is the sindicato, a multipurpose civic-political organization. A sindicato or colony (the two are synonymous) is directed by a secretary and a committee elected by popular vote. The sindicatos (currently 183) are grouped into Centrales (23) which also are administered by secretaries and committees elected by popular vote from among leaders of the local sindicatos. The Centrales, in turn, have formed two federations: (1) the Federation Especial Agraria del Chapare Tropical (FEAHT); and (2) the Federation of Colonists - Chimore (FCC). The Federations meet monthly and a regional secretary, elected annually by the sindicato leaders, serves as official spokesman representing them at national meetings. The regional secretaries exert considerable influence over the formulation of policy for the Chapare especially regarding such matters as taxation, development projects and a variety of other national and local governmental programs.

Farming, on a small scale, is the principle occupation of most Chapare residents. Farms are individually owned family units with every member of the household participating in production activities. The size of holdings ranges from 10 - 20 hectares. Given the dense vegetative cover and fragile soil composition, both products of the tropical environment, slash and burn farming is the common agricultural technique employed. Rather than diversify production and rotate annual and perennial crops, typically Chapare farmers use farming systems which produce small quantities of subsistence crops and have come to rely heavily on one cash crop- coca - to generate income.

While most Chapare residents are native Quechua speakers, over 90 percent are also conversant in Spanish. In comparison with other peasant groups, they are highly literate. Over 70 percent of the adult population can read and write, and 85 percent of the children of primary school age are enrolled in school. The latter fact is in part attributable to the comparatively advanced education infrastructure in the Chapare -- nearly 50 percent of all colonies have both schools and teachers.

In contrast, health infrastructure is far below par. Potable water systems are virtually non-existent and the few health posts that do exist are poorly staffed and often lacking in basic equipment and medicine. Correspondingly, the health status of the population is among the poorest in Bolivia. Infant mortality rates are alarmingly high as is the incidence of diseases such as gastroenterites, tuberculosis and malaria.

### 3. Socio-Cultural Feasibility

The socio-cultural feasibility of the project depends on gaining the participation, in the form of labor contribution, of the beneficiaries in improving and maintaining a secondary road network. While farmers in the Chapare repeatedly have expressed the need for improved roads as a major priority, there are social and cultural factors that could inhibit progress. To avoid implementation difficulties, design strategies must be used to deal with these matters.

#### a) Cultural Distance

Even though there is a high level of enthusiasm among Chapare residents for a road upgrading effort and they are, on average, more literate than campesinos in other regions of Bolivia, there is a considerable cultural gulf between these farmers and the implementing agencies. The farmers have had limited contact with the urban sector, and clearly do not understand the sometimes slow movement of bureaucracies. Moreover, Chapare farmers are essentially "now oriented"; time horizons are limited, often spanning no more than the current crop cycle. Consequently, they will encounter difficulties in comprehending prolonged planning and analysis phases as well as implementation delays for reasons (e.g. inclement weather) that are not readily apparent. Finally, the Chapare farmers are threatened by the loss of their principle cash crop through the coca substitution program. Accordingly, they have a heightened level of suspicion of the motives of "outsiders" offering assistance.

The use of promoters by the implementing agencies will help reduce the potential impact of this problem. PRODES will have at least one promoter in every micro-region of the Chapare in which road upgrading activity is taking place. These promoters will have skills and responsibilities in a variety of sectors. One of their principle tasks will be to establish and maintain positive relationships between the beneficiaries and SNC field crews. Additional duties for the promoters will include organizing community labor groups to assist with road upgrading and maintenance, carrying out the profiles on recipient communities, and explaining to recipients the benefits of all-weather roads.

Timing is the key factor in this promotional work. Organizational efforts must begin within a relatively short period prior to the start of upgrading activity. Any time lapse exceeding two or three months would be not only difficult for the farmers to accept, but would also arouse suspicions concerning the sincerity of the assistance.

#### b) Work Cycle and Availability of Labor

While Chapare growers, owing to perennial crops, have farm-related chores year around, the cultivation of annual crops also creates a

season (October-April) of peak activity. To state the obvious, farmers will be less likely to leave planting and harvesting responsibilities to work on roads. This potential constraint will be avoided by scheduling most activities (all of the tasks in which the beneficiaries will be directly involved) during the period of less agricultural activity, i.e., April-October, as these months constitute the dry season in the Chapare. Planning road activities for this period not only meshes with the farmers' work cycle, but coincides with the time of the year when the weather will permit heavy equipment to work in the area.

While taking into account the farmers' work cycle, the availability of manual labor will be a real problem that cannot be easily discounted. The opportunity to earn a substantial daily wage by hauling illicit coca leaves to staging areas is a strong inducement to keep Chapare farmers from participating in road building labor crews -- especially if such labor is to be given voluntarily. To overcome this constraint, \$75,000 of project loan funds will be allotted to pay for salaries of community day laborers. Such payment will be made only during the construction phase -- it will not apply to road maintenance. While this practice breaks with the scheme of voluntary local labor included in previous road projects, it will help overcome a problem (faulty community participation) that hindered progress under RRI. A second design strategy to deal with this problem will be a signed contract between SNC and the Sindicato Central representing the farmers in a given area. This contract will stipulate that SNC will keep its machinery at work on a road section as long as the community furnishes manual labor. If the collaboration ceases, the machinery will be withdrawn. Finally, the presence of promoters on a regular basis, an element lacking in the past, will help assure timely and sufficient community labor contribution.

#### c) Organization of Manual Labor

Organization of work crews, scheduling of labor days, dispersment and collection of hand tools, keeping of attendance records and payment of wages are all necessary ingredients for meeting implementation targets. General responsibility for marshalling labor crew construction work will fall to the Local Coordination Committees. These committees will be made up of a PRODES promotor, SNC's resident engineer and a representative of the participating Sindicato Central. Their principle chore will be to assure that adequate numbers of laborers arrive on specified days. The tasks of handing out work assignments, monitoring work progress, keeping attendance records, paying wages, etc., will be those of a salaried employee of SNC working under the direction of the Resident Engineer.

#### 4. Social Benefit Incidence

The principle benefit that will accrue to the target group is increased income derived from improved access to markets for agricultural produce and to the inputs required to modernize their farming systems. It is estimated that incomes for beneficiary households will increase by an average of 50 percent 3 years after roads are upgraded through decreased

spoilage of agriculture commodities, the introduction of new, high value crops, and increased production and productivity. Even higher increases are possible for those farmers who respond aggressively to market incentives.

In addition, direct benefits will accrue to the target group in the form of enhanced access to social services -- health and education. Finally, all-weather roads will draw Chapare farmers closer to the national mainstream by facilitating communications and the flow of information between this essentially rural area and the urban sector.

#### 5. Impact on Women

In the Chapare, like all of rural Bolivia, women participate in economic activity at least on an even footing with men. They not only are responsible for their share of the agricultural tasks, but also take on a full complement of domestic chores. Moreover, it is not uncommon for women to work alongside of men on construction work activities -- like road upgrading. Because of their extensive involvement in all phases of family activity, women will receive those benefits which accrue to the household as a unit. They will enjoy the increases in farm family income and any reduction in physical farm labor brought about by the penetration of modern technology. Finally, they will benefit from improved access to social services and a general broadening of horizons coming from increased contact with the urban sector.

E. Environmental Conclusions

An Initial Environmental Examination was conducted when the project was designed in 1977. This Examination recommended a "negative determination", which was approved with the project and is on file in AID/W. In the redesign of this project, a concise environmental statement (See Annex E) has been prepared. This statement identifies key potential negative impacts and describes a project design strategy to deal with each problem. All roads to be upgraded will follow already established tracks; hence these will be only a minimal disturbance of the natural ecology. Moreover, in instances in which there will be some alterations to the environment, precautions have been taken to reduce any negative consequences to a minimum. For example, denuded road shoulders and rights-of-way will be reseeded to minimize soil loss through run-off; when warranted, earth berms will be used during construction of bridges as a precaution against erosion; and road realignment will be kept to a minimum. To be sure, improved roads, together with other components of the Chapare development strategy, will attract more farmers to the area which in turn could have a negative impact of the environment. While this potential exists, the introduction of a "systems" approach to farming (including intercropping, replenishment of soil fertility and rational use of space and existing vegetative cover) that will take place under the Chapare project will more than offset any deleterious effect from increased population/farming. Furthermore, the social analysis demonstrates that the project, as redesigned, is socially sound and will have no foreseen negative impact on the human ecology of the area.

## F. Financial Analysis and Financial Plan

### 1. Introduction

The revised cost of activities to be financed under this project is \$21,915,000. The AID contribution will be \$9,342,000 of which the loan will provide \$9,042,000 and the grant \$300,000. The revised AID budget includes \$42,000 in loan funds and \$20,000 in grant funds already expended.

All technical assistance related to the project will be grant-financed. Project loan funds will be used for road upgrading activities in the Chapare and bridge construction and drainage work to complete road upgrading operations in the Departments of La Paz, Santa Cruz, Cochabamba and Chuquisaca. Items to be financed for the Chapare effort include: (a) purchase of road building equipment (including spare parts); (b) rental of dump trucks Chapare; (c) purchase of fuel and oil; (d) culvert (minor drainage) and bridge construction; (e) materials for drainage works, (f) travel and per diem for SNC personnel to attend training sessions, and (g) payment to community residents for labor services in road upgrading work. Items to be loan-funded with respect to RRI areas include: (a) purchase of replacement parts for the heavy equipment unit procured under RRI; (b) culvert and bridge construction; and (c) materials for culvert construction.

The GOB contribution through SNC will be mainly for salaries of existing and additional staff of the rural roads residences in Cochabamba and the Central Office. SNC will also provide funds for operating costs and facilities. The community contribution consists of: (a) local materials such as sand, stones, and gravel; (b) hand labor necessary to maintain the upgraded roads; and (c) right-of-way.

### 2. Analysis of Recurrent Budget Expenditures of SNC

A covenant will be included in the ProAg amendment by which the GOB will commit itself to provide adequate budgetary support for the following project-related expenses: (a) personnel services (salaries) for the SNC Rural Roads Department; (b) purchase of fuel and oil for the equipment assigned to the construction of culverts and bridges on roads constructed in the project area; (c) travel and per diem costs for supervising personnel; (d) maintenance of equipment procured under the RRI and RRII projects; (e) maintenance of roads improved under this project; and (f) other operating expenses.

The following table shows the estimated total SNC budget and project related expenditures for the balance of this project (1982-1985). It demonstrates that the project will require only a small increase in the projected SNC budget without the project. As the table demonstrates, during the periods of peak project activity, 1983 and 1984, the required increment to SNC's budget is only 5.67 percent and 2.59 percent, respectively, above estimated normal requirements.

SNC BUDGET ANALYSIS  
(US\$ 000)

<u>Year</u>	<u>Receipts from National Treasury and Taxes 1/</u>	<u>Estimated Additional Expenditures for Rural Roads II</u>	<u>Percentage of the Budget</u>
1980	52,304	-	-
1981	39,121	-	-
1982	15,080 <sup>2/</sup>	108	.72
1983	15,708	891	5.67
1984	17,317	448	2.59
1985	19,040	442	2.32
1986	21,448 <sup>3/</sup>	-	-
1987	23,612	-	-
1988	25,995	-	-

3. Project Accounting and Disbursement System

The proposed project includes special measures to overcome past constraints in the administration of project funds which oftentimes led to implementation setbacks. These included delays in the disbursement of GOB funds, reductions in the amount of disbursements from levels previously agreed to by the Government, and the untimely availability of funds for operating costs (e.g. per diem, fuel and oil, etc.) necessary for field work.

To avoid such difficulties in the future with Rural Roads II, revised pari passu disbursement procedures for project funds and GOB counterpart have been negotiated. The system will provide for advances of project and counterpart local currency funds on a quarterly basis to two special project bank accounts. The implementing agency (SNC) will be responsible for disbursing funds from the special accounts in accordance with USAID/B and GOB regulations and reporting on their use to USAID/B. Counterpart payments for GOB salaries, etc. and dollar payments by USAID/B for technical assistance, etc. will not be made through the special accounts. In order to implement the new disbursement system, during the reprogramming exercise, USAID/B, the SNC and the MOF agreed on a detailed budget for the GOB counterpart contribution. The MOF had agreed beforehand to implement the revised disbursement system for all reactivated projects, where applicable, and examined the budget for the RRII project in detail before committing itself to provide the counterpart requested.

The most important feature of the new system is that it will operate on a pari passu basis. Each quarter, SNC will prepare an estimated

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1/ Source: SNC actual budget expenditures and projections.  
Excludes external receipts and other loans.

2/ GOB support to SNC has been significantly decreased in 1982 due to the current economic crisis. Projections are based on this lower level of support.

3/ Starting in 1986, post project costs are included, since rural road activities will continue.

budget for the upcoming three-month period along with reports on the use of special account funds already advanced. USAID/B's disbursement of funds for each quarter to the project's special account will be contingent upon the MOF's disbursement of counterpart funds to the counterpart special account during the quarter. If GOB funds are not deposited in the amounts agreed as required by SNC, USAID/B will withhold further disbursements until the GOB's contribution is brought up to date. The new disbursement system is intended to improve administration of project funds. It will shift more responsibility to the GOB and retain adequate USAID/B control without the necessity of prior review of every transaction. It will also help ensure that counterpart funds are made available in the amounts required when needed; and it will provide a more systematic means of monitoring project implementation.

Two full-time GOB-financed accountants, one each in SNC's Central Office and the Cochabamba District office, will be assigned to facilitate the implementation of the pari passu disbursement system and maintain separate accounting and records for the RRII project.

REVISED COST ESTIMATE AND FINANCIAL PLAN

(US\$ 000)

AID	AID			GOB	Community	Total
	Grant	Loan				
		FX	LC			
1. Technical Assistance	300					300
2. Equipment, Vehicles & Spare parts						
2.1 Road construction equipment		1,405				1,405
2.2 Vehicles		595				595
2.3 Spare parts		1,250	150			1,400
3. Training		27	73			100
4. Evaluation		30				30
5. Phase I Complementary Activities						
5.1 Minor drainage (Contract)			248			248
5.2 Major drainage (Contract)			800			800
5.3 Materials for minor drainage			552			552
6. Chapare						
6.1 Rent of equipment			65			65
6.2 Minor drainage (Contract)			218			218
6.3 Major drainage (Contract)			930			930
6.4 Materials for minor drainage			861			861
6.5 Fuel and Oil			293			293
6.6 Local labor salaries			75			75
Sub-Total	300	3,307	4,265			7,872
<u>SNC</u>						
1. Personnel				8,197		8,197
2. Fuel and Oil				1,716		1,716
3. Travel and per diem				99		99
4. Operating costs				1,154		1,154
5. Facilities improvement				118		118
Sub-Total				11,284		11,284
<u>Community</u>						
1. Community labor					707	707
2. Right of way access					325	325
3. Local materials					257	257
Sub-Total					1,289	1,289
Inflation/Contingencies						
	300	3,307	4,265	11,284	1,289	20,445
		640	830			1,470
	300	3,947	5,095	11,284	1,289	21,915

NOTES:

1. GOB and Community counterpart is calculated at Bolivian Pesos (\$b) 44 to one dollar which is the rate for official obligations as established by Decree of the Government. The current floating exchange rate is \$b 200/US\$ 1.
2. Revised AID contribution includes US\$20,000 grant funds already expended for technical assistance and US\$42,000 loan funds already expended for training. The GOB contribution includes US\$17,000 and US\$118,000 already expended under SNC Personnel and Facilities Improvement components respectively.
3. Cost escalation on GOB-funded terms is difficult to determine at this time. At the beginning of each year, and prior to each quarter, the required GOB contribution will be revised to reflect current prices in line with the pari passu disbursement system.

NOTES TO SUMMARY COST ESTIMATE AND FINANCIAL PLAN

A. AID Funds

1. Grant

Technical Assistance - \$300,000 will be provided for host country contracts for a long-term (24 months) engineering advisor (U.S.) to the Rural Roads Department of SNC and a long-term (24 months) mechanical engineer (Bolivian) to guide SNC staff in matters related to heavy equipment operation, maintenance and spare part stock control.

2. Loan

a) Equipment, Vehicles and Spare Parts - \$3.4 million will be used to purchase equipment to form a new road building unit and replacement parts to re-fit the unit procured under the RRI project.

b) Training - \$100,000 will be expended on training of SNC personnel (top-level managers, mid-level functionaries and skilled technicians (e.g., heavy equipment operators and maintenance people) in conjunction with an IDB training program.

c) Evaluation - \$30,000 will be employed to carry out interim and final project evaluations.

d) Inflation-Contingency - \$1.47 million will be reserved for inflation (14.5 percent) and contingencies (5 percent).

e) Phase I - Complementary Activities

Drainage Activities. \$1.6 million will be expended for construction of drainage works and bridges to complete roads upgraded in the Departments of La Paz, Cochabamba, Chuquisaca and Santa Cruz under RRI.

f) Chapare Activities

1) Rent of Equipment - \$65,000 will finance the renting of 24 dump trucks to work in the Chapare area.

2) Drainage Activities - \$2.009 million will fund construction of drainage works and bridges.

3) Fuel and Oil - \$293,000 will purchase fuel and oil necessary for the light and heavy equipment assigned to the Chapare area\*.

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\* The diesel fuel and most of the lubricants required for heavy equipment must be imported. Given the significant FX cost, USAID has agreed to loan-finance some POL for the Chapare. The GOB will still contribute \$1.7 million in POL to the project.

- 4) Local Labor Salaries - \$75,000 will be used to pay for wages (approximately 15,000 work days) needed for the road improvement in the Chapare area.

B. GOB Contribution\*

1. SNC Personnel - \$8,197,000 includes \$7,436,000 in-kind contribution and \$761,000 in-cash contribution for additional personnel.
2. Fuel and Oil (Phase I) - SNC will provide \$1,716,000 to purchase fuel and oil for the equipment to be used in the RRI areas.
3. Operating Costs - \$1,253,000 will be provided by SNC for office support, work clothes, small purchases, professional services, and office and shop rents.

C. Community Contribution

1. Community Labor - \$707,000 will be provided by participating communities in manual labor necessary to maintain the upgraded roads.
2. Right-of-Way Access - \$325,000 is the value assigned to the land local communities will contribute for the right-of-way for the project.
3. Local Materials - \$257,000 will be contributed by the communities in local materials, i.e., gravel, stones, sand, etc.

\* \$118,000 has already been contributed by the GOB for facilities improvement.

DISBURSEMENT SCHEDULE  
(US\$ 000)

	1982		1983		1984		1985		TOTAL
	FX	LC	FX	LC	FX	LC	FX	LC	
<u>AID</u>									
Grant									
1. Technical Assistance			140		140				280
<u>Loan</u>									
1. Equipment, Vehicles and Spare Parts									
1.1 Road construction equipment			1,405						1,405
1.2 Vehicles		50	595	50		50			1,400
1.3 Spare parts			1,250						58
2. Training				46		12			30
3. Evaluation					15		15		
4. Phase I Complementary Activities									
4.1 Minor drainage (Contract)		50		100		98			248
4.2 Major drainage (Contract)				320		320	160		800
4.3 Materials for minor drainage		110		224		218			552
5. Chapare									
5.1 Rent of equipment		65							65
5.2 Minor drainage (Contract)		75		72		71			218
5.3 Major drainage (Contract)				465		465			930
5.4 Materials for minor drainage		149		356		356			861
5.5 Fuel and Oil		43		121		119			293
5.6 Local labor salaries		6		28		28		13	45
Sub-total		548	3,390	1,792	155	1,737	15	173	7,810
<u>SNC</u>									
1. Personnel		914		2,422		2,422		2,422	8,160
2. Fuel and Oil		209		502		502		503	1,716
3. Travel and per diem		11		29		29		30	99
4. Operating costs		70		658		215		211	1,154
Sub-total		1,204		3,611		3,168		3,166	11,149
<u>COMMUNITY</u>									
1. Community labor		188		202		202		115	707
2. Right of way access		36		108		108		73	325
3. Local materials		28		86		86		57	257
Sub-total		252		396		396		245	1,289
Inflation/Contingency		2,004	3,390	5,799	155	5,301	15	3,584	20,248
		107	634	349	3	339	3	35	1,470
		2,111	4,024	6,148	158	5,640	18	3,619	21,718

NOTE: AID funds will be disbursed at the floating rate of exchange on the day on which the disbursement is made.

Does not include funds already disbursed. See note on previous table

IV REVISED IMPLEMENTATION PLAN

A. Implementation Schedule

The redesigned project will be implemented according to the following plan:

September 1982

- i. ProAg amendment signed officially reactivating project.
- ii. IFBs for international procurement finalized
- iii. Agreement signed between SNC and PRODES defining responsibilities for Chapare-related activities.
- iv. Upgrading of section of road between Villa Tunari and Isinuta in the Chapare initiated by SNC with equipment unit purchased under the RRI project.
- v. IFBs issued by SNC for consulting firms to carry out upgrading work and road sections (Puerto San Francisco and Ivergazama - Valle Hermoso in Chapare and construction work in RRI areas.)
- vi. Recruitment of long term advisors initiated.

October 1982

- i. IFBs for equipment and for replacement parts issued.
- ii. Requests for Quotation (RFQ) for local procurement issued.
- iii. Contracts awarded for road upgrading work in Chapare.

November 1982

- i. Contracts awarded for upgrading work in RRI areas.
- ii. Topographic work begun in RRI areas.
- iii. Upgrading of first 3 sections of road in Chapare completed.

December 1982

- i. Awards under international procurement IFBs made, letters of commitment issued, and orders placed.

- ii. Local procurement materials received.
- iii. Work initiated between PRODES and SNC on road selection for 1983.
- iv. Maintenance work on heavy equipment begun.

January 1983

- i. Cost/Benefit analysis completed on potential 1983 sites.
- ii. Implementation schedule for Chapare for 1983 presented to CODICH by PRODES and SNC.

February 1983

- i. First training course for SNC top-level managers held.
- ii. Topographic work for 1983 sites begun.
- iii. Survey work initiated to determine needs for drainage work and bridges for life of project in the Chapare.

March 1983

- i. Long-term technical advisors arrive.
- ii. First training course for heavy equipment operators held.
- iii. First training course for mid-level SNC functionaries held.
- iv. IFBs for 1983 construction work in Chapare and RRI areas issued.

April 1983

- i. SNC initiates road upgrading work in Chapare for 1983.
- ii. Contracts let by SNC for drainage and bridge construction related to 1983 road upgrading program in Chapare and RRI areas.

July 1983

- i. Arrival of IFB equipment in La Paz.

August 1983

- i. Arrival of IFB equipment at work sites.

October 1983

- i. Work completed on Chapare road upgrading program for 1983.

November 1983

- i. Second training course for equipment operators and maintenance personnel held.
- ii. Second training course for mid level SNC functionaries held.

December 1983

- i. Maintenance work on heavy equipment begun.
- ii. Second course for SNC top-level management held.
- iii. Cost/Benefit analyses initiated on potential 1984 sites (Chapare).
- iv. Cost/Benefit analyses for drainage/bridge construction in RRI areas carried out.
- v. IFEs issued by SNC for 1984 construction work in Chapare and RRI areas.

January 1984

- i. Chapare road upgrading plan for 1984 prepared and presented to CODICH by SNC and PRODES.
- ii. Contracts for 1984 drainage/bridge work in RRI areas awarded.
- iii. Interim project evaluation begun.

February 1984

- i. Work begun at RRI area sites.
- ii. Interim project evaluation completed.
- iii. Contracts awarded for drainage/bridge work in Chapare.

April 1984

- i. Chapare road upgrading resumes

October 1984

- i. 1984 Chapare construction completed.
- ii. All work in RRI area completed.

November 1984

- i. Third training course for SNC equipment operators and maintenance personnel held.
- ii. Third training course for SNC mid-level functionaries held.

December 1984

- i. Cost/Benefit analyses begun on potential 1985 sites Chapare.
- ii. Maintenance-repair work on heavy equipment begun.
- iii. Third seminar for SNC top-level managers held.

January 1985

- i. Upgrading plan for 1985 prepared and presented by SNC and PRODES.
- ii. IFBs for 1985 drainage-bridge construction work in Chapare awarded.

February 1985

- i. Contracts for drainage-bridge construction work in Chapare awarded.

March 1985

- i. Long term advisors depart.

April 1985

- i. Work begun on 1985 road upgrading.

October 1985

- i. Road upgrading work completed.
- ii. Final project evaluation carried out.

December 1985

- i. Drainage-bridge construction work completed.
- ii. Project ends (PACD December, 1985).

As is indicated by the above schedule, construction work in the RRI areas will be completed by the end of 1984, while activities in the Chapare will continue until December 1985. This proposed schedule will require AA/LAC approval of an extension of the PACD through December 31, 1985.

B. Project Monitoring and Evaluation

Constant monitoring of project progress will be carried out by both SNC and USAID. PRODES will also play a key monitoring role for Chapare-related work. In preparing periodic implementation plans with SNC for submission to CODICH, PRODES will have to account on past progress to justify future upgrading work. USAID, through its project manager, engineering staff, and quarterly progress reports and requests for funds under the pari passu disbursement system, will maintain a continual check on the advance of the project.

SNC has the capability to prepare designs, cost estimates and benefit/cost analyses for road improvement subprojects. Thus USAID only will require that information on the technical and economic aspects of subprojects be kept on file for USAID review at the Caminos Vecinales La Paz headquarters. Prior USAID approval of subproject designs, cost estimates and benefit/cost analyses will be required only for bridges costing more than \$50,000.

In addition to regular monitoring, two evaluations will be carried out. The first, an interim evaluation, will be conducted in January 1984. It will assess progress to date and suggest mid-course corrections if needed. The second evaluation will take place near the project's conclusion and will measure the project's overall advance against anticipated outputs. Both the interim and final evaluations will be carried out by third party consultants paid for with project funds; \$30,000 has been reserved for this purpose.

C. Conditions, Covenants and Negotiating Status

SNC, the Ministry of Finance and USAID have collaborated closely on all phases of the reprogramming process for this project. No problems are anticipated in signing a Project Agreement Amendment to reactivate the project. AID/W may wish to revise the project description in paragraph one of the Project Authorization, but no other revisions are necessary. The Mission is drafting a ProAg Amendment which will contain a revised Annex One (project description), budget and implementation plan. The conditions precedent in the original ProAg have already been satisfied. The Mission plans to revise Covenant b.1 regarding GOB budgetary support for road and equipment maintenance to widen its application to all operating cost support required by SNC to undertake the project. (See Section IV.F.2) In addition, the following covenant, originally included in the RRI ProAg, will be added to the RRII ProAg:

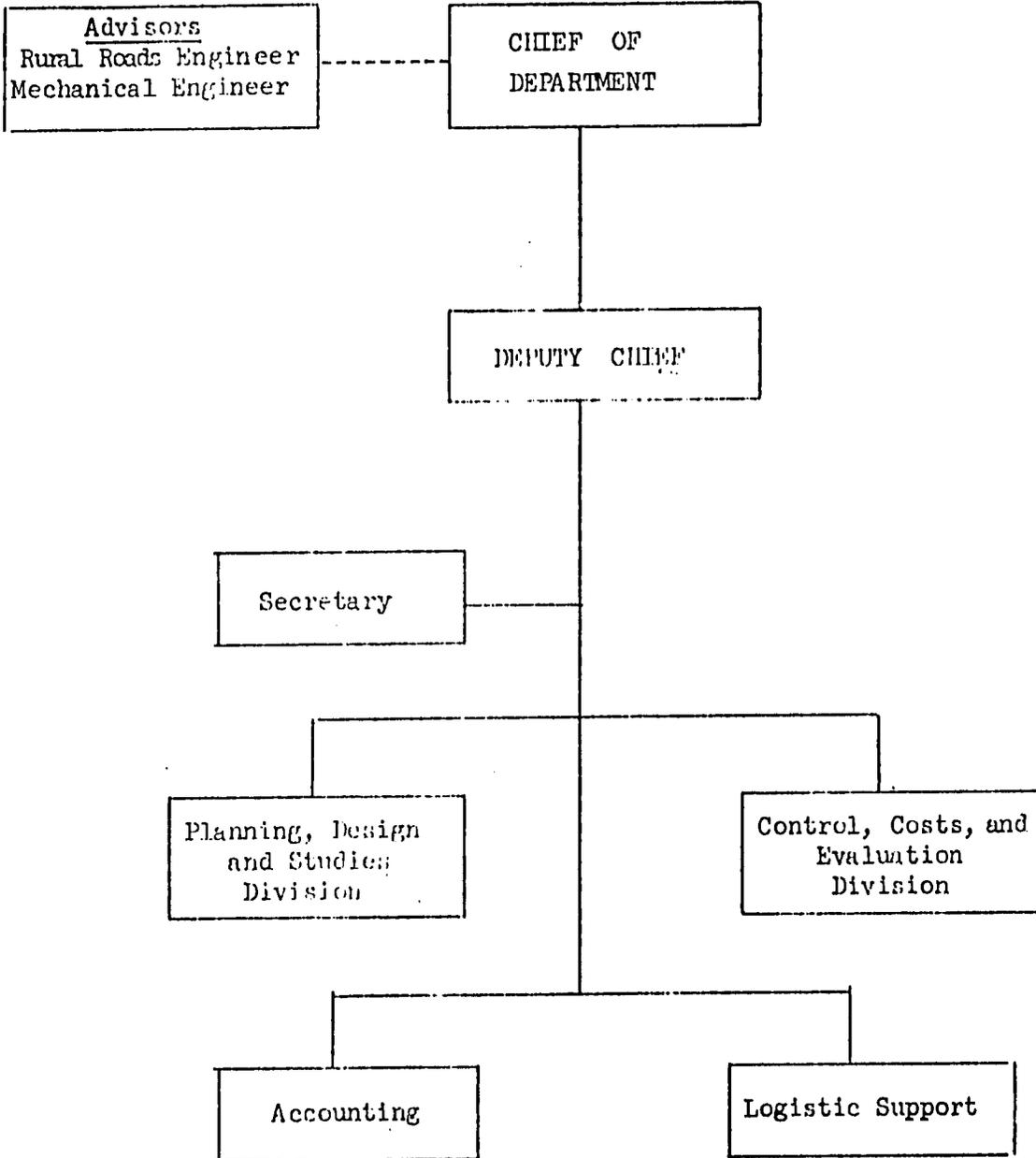
"The Government of Bolivia covenants that it will comply with all conditions and requirements under all agreements signed or to be signed with the United States Government will regard to activities to control narcotics production."



S N C

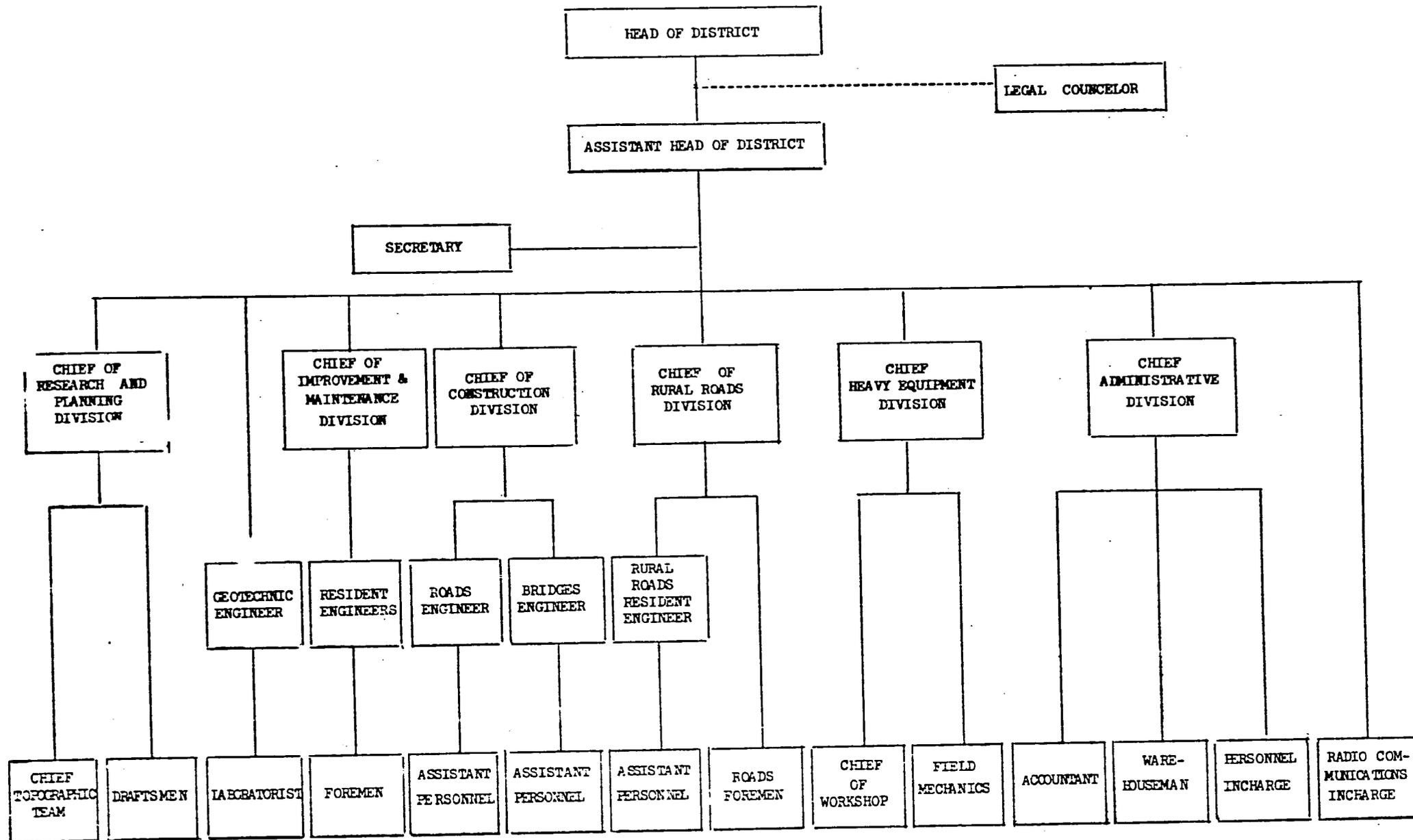
RURAL ROAD DEPARTMENT

CENTRAL OFFICE



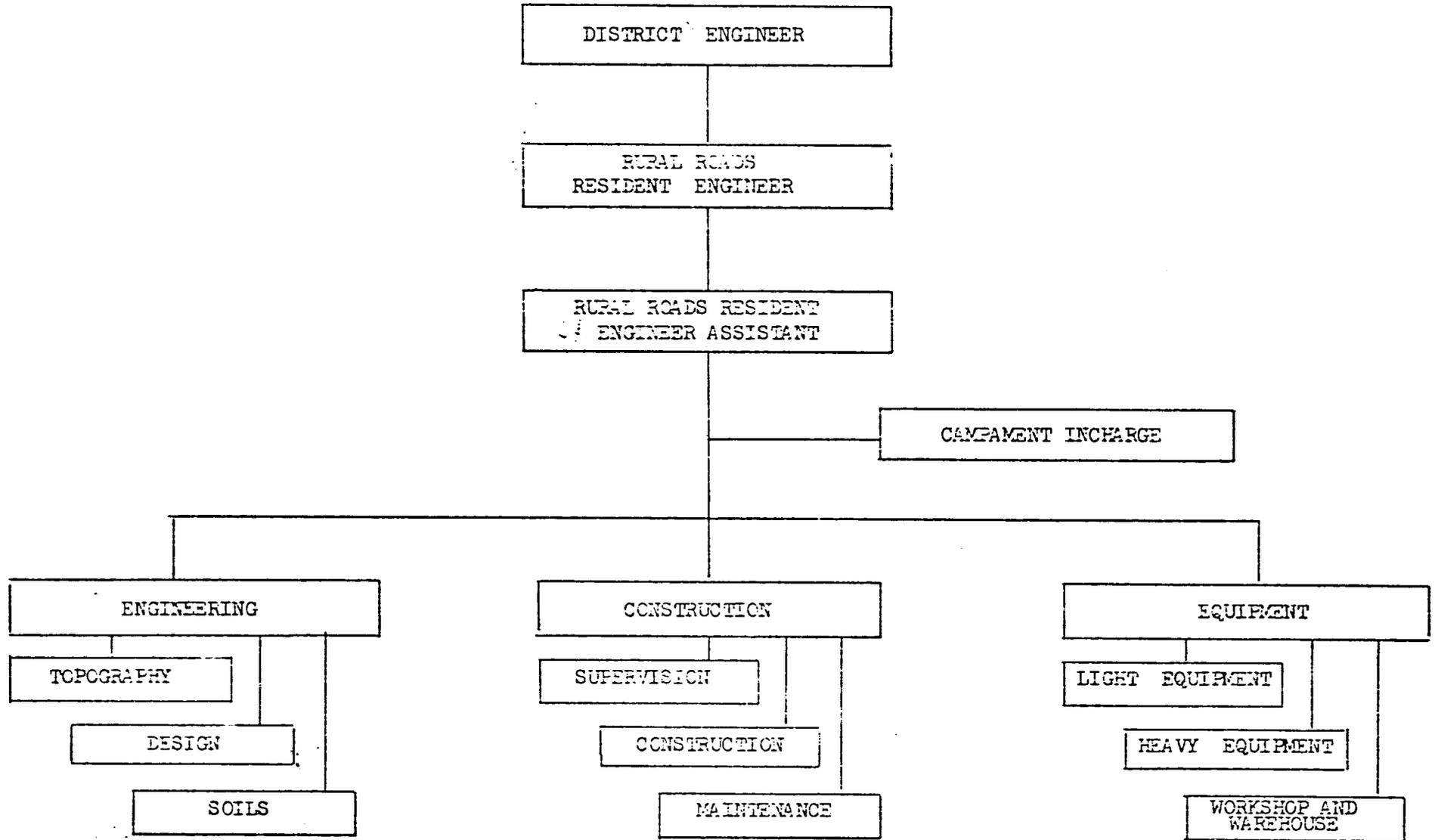
45

TYPICAL ORGANIZATIONAL CHART OF A DISTRICT OFFICE



9/17

RURAL ACCESS ROADS RESIDENCY OFFICE



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REPROGRAMMING OF THE RURAL ROADS II PROJECT  
CHAPARE REGION PROGRAM-COCHABAMBA DISTRICT D-4  
LIST OF NEW EQUIPMENT TO BE PROCURED

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- I. Earth moving equipment  
6 tractors, 180 HP  
1 water truck, 6000 liters capacity
- II. For gravelling roadbeds  
9 dump trucks, 4 m<sup>3</sup> capacity
- III. For construction of structures and drainage works  
1 dragshovel, 0.5 m<sup>3</sup> capacity  
1 concrete pipe fabricator
- IV. For road maintenance work  
1 wheeled scoop shovel, 120 HP  
1 grader, 130-150 HP
- V. For maintenance of equipment  
1 maintenance service truck (Pirata) with  
welding unit
- VI. Spare parts 15%

REPROGRAMMING OF THE RURAL ROADS II PROJECT  
BUDGET FOR PROCUREMENT OF SPARE PARTS AND MATERIALS

DESCRIPTION	QUANTITY OF EQUIPMENT	SIZE	QUANTITY TO BE PROCURED
a) Tires for graders	7	13.00 x 24	100
Tires for scoop shovels	9	17.5 x 25	90
Front tires for farm tractor	7	11.00 x 15	42
Rear tires for farm tractor	7	15.00 x 24	36
Tires for dump trucks, trucks, tank trucks, water trucks, trailers, etc.	65	11.00 x 20	1,100
Tires for pickup trucks, wagon trucks	15	7.50 x 16	150
b) Pneumatic tires	110	Dif. sizes	600
Batteries	157	Various	400
Arc welding electrodes		Various	60,000 lbs.
Iron: round, sheets, bars, thickening bars, brass		Various	
Automotive material, electric			
Spare parts for CAT D7-G tractors	16		
Spare parts for CAT D6-A tractors	7		
Spare parts for Caterpillar 120-G graders	7		
Spare parts for dump trucks, Ford F-600 trucks	53		
Tank trucks, workshop	8		
Spare parts for scoop shovels, John Deere, JD-644	9	44.109	
Spare parts for tractors, John Deere, JD-401	7	9.165	
Spare parts for compressors, INGERSOLL RANDM, Mod. 365	16	20.400	

(Cont.)

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BUDGET FOR PROCUREMENT OF SPARE PARTS AND MATERIALS  
 RURAL ROADS II (Cont'd)

DESCRIPTION	QUANTITY OF EQUIPMENT	SIZE	QUANTITY TO BE PROCURED
Spare parts for pneumatic hammer, WORTHINGTON, WS-50	48	855.44	
Spare parts for wagon trucks, pickup trucks, CHEVROLET	15		
Spare parts for generator sets, KOHLER 30 KW	7		
Spare parts for tractor trucks, MCK	4		
Spare parts for crushers, CEDARAPIDS	4		
Spare parts for skeeps cot rollet, WABCO	7		
Pneumatic hammer, lubricators hoses			40 pieces
Drills, 2.400, 1.600, 1.200			800 pieces

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FORM FOR SELECTION OF BRIDGES1. Project Data

District \_\_\_\_\_

Road \_\_\_\_\_ Route No. \_\_\_\_\_

Section \_\_\_\_\_

Km \_\_\_\_\_ From \_\_\_\_\_

Name of river \_\_\_\_\_

Estimated bridge span \_\_\_\_\_ mts.

2. Data on Average Vehicular Daily Traffic

No. of trucks \_\_\_\_\_ trucks/day

No. of buses \_\_\_\_\_ buses /day

No. of light vehicles \_\_\_\_\_ light vehicles/day

Total ADT \_\_\_\_\_ vehicles/day

3. Data on obstructions of Traffic

With assistance of the local population determine the duration of obstructions caused by river floods.

Average duration of regular obstructions: \_\_\_\_\_  
 \_\_\_\_\_ (days : 24 hours)

Frequency of regular obstructions \_\_\_\_\_ times/year

4. Data on the Area Served by the Bridge

Determine the length (kilometers from the bridge to the end of the road \_\_\_\_\_)

DESIGN CRITERIA

The Rural Access Roads will be designed for H-10 to H-15 (AASHO) loading, with a minimum of 4-1/2 meters roadbed and gravel surfacing of 15 to 30 cms. of thickness to provide all weather access. The project area includes mostly flat lands, but also some high valleys and mountainous terrain. No major drainage structures will be constructed. Concrete pipes, masonry arches and stone fords will be used for minor drainage. Concrete beam bridges will be considered on a cost comparative basis with masonry arches.

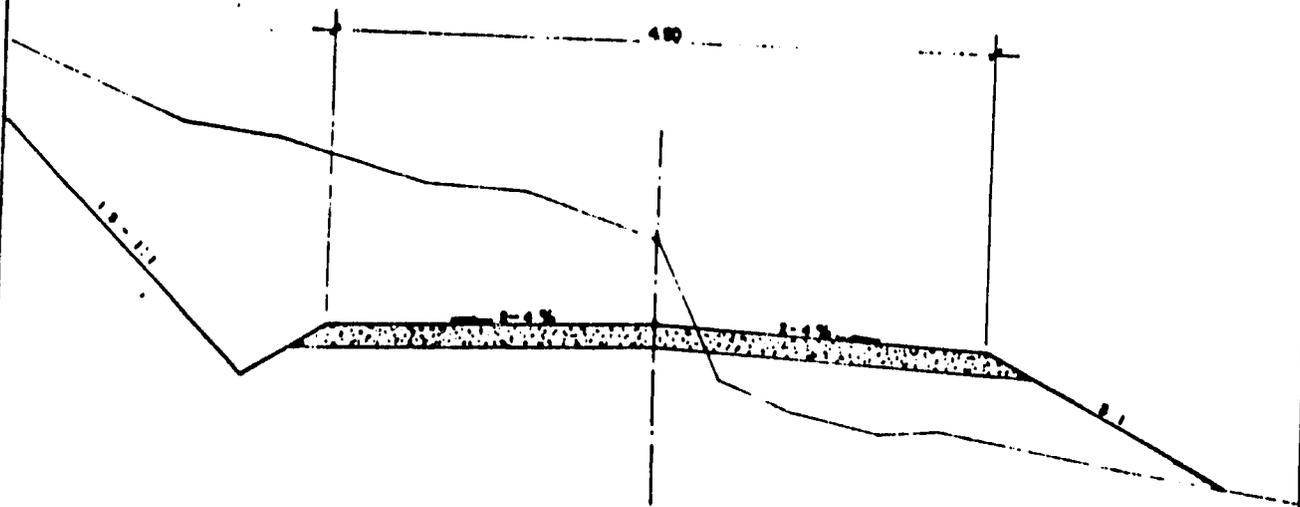
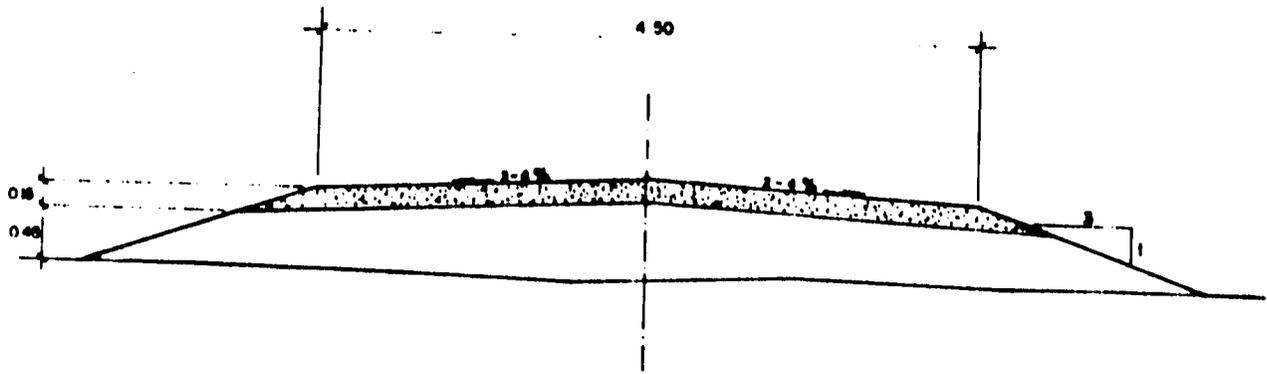
The roads serving river valleys will be aligned along the bottom of such valleys outside of the flood plain of the rivers.

<u>Designed Standards</u>	Min.	Max.
1. Roadway width	4-1/2 m.	6 m.
2. Surface thickness	15 cms.	20 cms.
3. Capacity (AASHO)	H-15	H-20
4. Radius of curves	20 m.	
5. Fill slopes	1-1/2:1	3:1
6. Cut slopes	1:5	1:1
7. Grades: cut	0.3 %	12 %
fill	0 %	10 %
8. Cross slopes	2 %	4 %
9. Average height of roadbed		60 cms.

ANNEX D  
Exhibit 2

TYPICAL TRANSVERSE SECTIONS

Scale: 1:50



UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON, D C 20523

LAC/DR-IEE-83-1

ENVIRONMENTAL THRESHOLD DECISION  
AMENDMENT

Project Location : Bolivia

Project Title and Numbers : Village Development and Rural Roads II  
511-0499 and 511-0466

Funding : \$5,958,000 - Loan

Life of Project : Seven years

IEE Prepared by : William Kaschak, USAID/La Paz

Recommended Threshold Decision : Negative Determination

Bureau Threshold Decision : Concurrence with recommendation

Action : Copy to Henry Bassford  
Director, USAID/Bolivia

: Copy to William Kaschak

: Copy to Norma Parker, LAC/DR/SA

: Copy to IEE file

James S. Hester Date 19 October 1982

James S. Hester  
Environmental Officer  
Bureau for Latin America  
and the Caribbean

## ANNEX E

### ENVIRONMENT STATEMENT

The objective of this project is to provide access to and egress from the Chapare region of Cochabamba -- a remote area that is inadequately connected to the country's transportation network. An improved road system that will enhance the two-way flow of people, goods and services, is essential for the region's growth.

From an environmental perspective the execution of this project must take into account both the natural and human ecology of the Chapare. The human side is treated in the social analysis. Accordingly, this analysis will be limited to the physical environment. Within this context, consideration must be given to possible negative impacts on altering the: (1) character of the land; (2) water quality; and (3) atmosphere.

The literature \* relative to the environmental implications of rural road projects points out that because most roads established in developing countries have sparked, during the first few years of their existence, land development extending several kilometers from the road on each side, the ecological impacts of road upgrading rarely present serious problems. As all of the road work in this project will consist of upgrading and there is no construction of new roads envisioned, the environmental consequences of the project will be minimal. The upgrading activity itself has been designed to avoid any negative effect on the environment.

#### 1. Changes in the Character of the Land

The earth-moving activities (e.g., widening, and elevating road beds, clearance of rights-of-ways, etc.) related to upgrading the secondary routes could have a negative effect on the environment. Eliminating all solid cover in the construction of road shoulders and the clearance of rights-of-ways could contribute to erosion. Careless construction of field camps and use of vehicle parking areas could result in a general fouling of the landscape.

In the redesign of this project, precautions have been taken to either eliminate any such negative fallout or reduce it to a minimum. First, earth movement will be limited to raising road beds, i.e., elevating the platform over an already existing base. The only exception will be widening the road bed from four and one-half to six meters on approximately 10 percent of the total mileage of roads to be upgraded. As a result, minimal amounts of "virgin" terrain will be disturbed. Moreover, SNC, in collaboration with PRODES and the beneficiaries, will re-seed the shoulders of all upgraded road sections to reduce run-off and erosion. PRODES will make recommendations on the type(s) of plant material to be used with the idea of providing a grazing "belt" for livestock. Second, right-of-way clearance will consist of removal

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\* Agency for International Development 1980. "Environmental Design Considerations for Rural Development Project." Washington D.C.

of secondary growth bushes to a distance of three meters from each side of the road. The entire task will be carried out by the village residents using hand tools. No chemicals will be used to reduce or eliminate vegetative cover. Consideration will be given to introducing forage grasses in these areas to increase the livestock "pasture belt". Third, SNC already has several field camps located in the Chapare, hence there will be no need to construct new ones. Moreover, no "off-track" or cross-country travel of road building equipment will occur. In addition, SNC will return, to the extent possible, burrow pits to natural contours and avoid upsetting river courses through the removal of gravel for road beds. Taken in conjunction, these precautions will limit spoilage to the environment through activities ancillary to actual road construction. Fourth, in some cases, cement and stone river defense works will be constructed. These structures will affect natural defense systems, however their impact will be positive. The need to build a defense work is because the natural system has broken down, resulting in severe damage, through flooding and erosion, to the surrounding areas. The man-made defense system will prevent such occurrences in the future, thereby contributing to the overall improvement of the environment.

Finally, the project will include some excavation work related to the installation of road drainage systems. However, the excavation strips will be extremely narrow and the benefit, in terms of water run-off and erosion control, provided by the drainage will more than offset any disturbance to natural contours caused by the excavation.

## 2. Physical State of Water Quality

The project has the potential to change the physical state/quality of the water. While this might appear prejudicial to the health of local residents, it must be emphasized that any change in water quality would be a temporary soiling limited to the actual construction period. To limit the soiling of the water and erosion, provisional berms (earthen shoulders) will be installed while bridge abutments are being built. Moreover, simultaneous to the road upgrading activities, a potable water project will be initiated in the Chapare. This project, through the installation of wells or gravity flow systems from uncontaminated sources, will provide local residents with an alternative to river water to satisfy domestic needs. With the exception of the first year of implementation, and in accordance with the rotating execution of infrastructure activities among geographic micro-regions in the Chapare, road upgrading will follow the installation of water systems in determined areas.

A second potential problem related to water quality and bridge installation is the threat of obstructing or changing the course of water flow, thereby disturbing the natural habitat marine life. To avoid this danger, all bridges will be built in such a fashion (arch construction principles supplemented in special cases with large diameter corrugated tubing) as to allow the free passage of water and maintain the balance of existing plant and animal ecosystems.

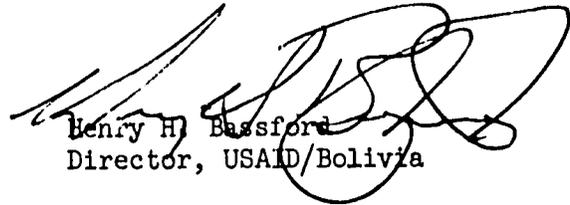
### 3. Change in Atmosphere

Potential negative changes in air quality as a result of the road project are much less critical than the possible impact on land character and water quality. However, there are two potential adverse effects on local inhabitants — fugitive dust and, to a lesser extent, exhaust emissions. Road dust is more a nuisance than a serious health hazard for those living near the road. Rather than abet this problem, the RRII project, through the stabilization of road beds and gravel resurfacing, will alleviate it. As for exhaust emissions, the current and projected volumes of traffic are at a low enough level so as not to present a difficulty.

ANNEX F

Certification Pursuant to Section 611(e) of The Foreign Assistance Act of 1961, As Amended

I, Henry H. Bassford, the principal officer of the Agency for International Development in Bolivia, having taken into account among other factors the maintenance and utilization of projects in Bolivia previously financed or assisted by the United States, do hereby certify that in my judgement Bolivia has both the financial capability and human resources capability to effectively maintain and utilize the capital assistance project: Rural Roads II.



Henry H. Bassford  
Director, USAID/Bolivia

ANNEX G  
PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

ADB (1973-74)  
SUPPLEMENT I

Project Title & Number: RURAL ROADS II

(INSTRUCTION: THIS IS AN OPTIONAL  
FORM WHICH CAN BE USED AS AN AID  
TO ORGANIZING DATA FOR THE PAR  
REPORT. IT NEED NOT BE RETAINED  
OR SUBMITTED.)

Life of Project:  
From FY 78 to FY 85  
Total U.S. Funding 9.342 million  
Date Prepared: August 15, 1982

PAGE 1

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <ul style="list-style-type: none"> <li>a. Increase the per capita income and improve the standard of living of identified segments of population.</li> <li>b. Increase small farmer incomes in Chapare, Bolivia, and Valle Alto of Cochabamba, Santa Cruz and La Paz.</li> <li>c. Foment the development of Agro-industry in the Chapare.</li> </ul>	<p>Measures of Goal Achievement:</p> <ul style="list-style-type: none"> <li>a. Achievement of average rate of growth of real per capita income in Chapare of 4 per cent per year by 1985, and in other areas of project influence by 3 per cent.</li> <li>b. Increase in income of colonists living in Chapare and other areas of project influence by 10 per cent per year.</li> </ul>	<ul style="list-style-type: none"> <li>a. Evaluation of Chapare projects.</li> <li>b. AID-financed farm policy studies.</li> <li>c. Data, reports and special studies of PRODES and Division of Statistics of MACA.</li> <li>d. National account data of Central Bank of Bolivia</li> </ul>	<p>Assumptions for achieving goal targets:</p> <ul style="list-style-type: none"> <li>a. Price incentives for food production continue to be favorable.</li> <li>b. Besides the improvement of access roads, food production programs will be implemented.</li> <li>c. General economic conditions will improve.</li> <li>d. Current political instability will ameliorate.</li> <li>e. Coca control plan will be successful thereby inducing farmers to cultivate other income generating crops.</li> <li>f. Markets for cash crops will be developed.</li> </ul>

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PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project:  
From FY 78 to FY 85  
Total U.S. Funding 9.342 million  
Date Prepared: August 15, 1982

Project Title & Number: RURAL ROADS II

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Project Purpose:</b></p> <p>a. Improve access to and from farms in Chapare and other rural areas of Valle Alto - Cochabamba, Santa Cruz, La Paz and Chuquisaca.</p> <p>b. Improve the capacity of the Bolivian Department of Caminos Vecinales of SNC to carry out rural roads programs.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <p>a. At the end of the project, 260 km of access roads in Chapare will have been improved. This includes necessary bridges and drainage structures.</p> <p>- Bridges in RRI areas will have been constructed which together with the installation of drainage work will link 500 Kms of rural roads upgraded under PRI project.</p> <p>b. At the end of the project, 15 bridges and 70 kms of culverts will have been constructed in RR I areas.</p> <p>c. At the end of the project, the SNC will have expanded its capacity of supervising and maintaining the access roads.</p>	<p>a. SNC and project advisor's periodic and final reports on project.</p> <p>b. Final project evaluation</p> <p>c. USAID Project Manager's periodic site visits.</p> <p>d. Periodic reports from PRODES.</p>	<p>Assumptions for achieving purpose:</p> <p>a. SNC obtains adequate budget to road improvement.</p> <p>b. GOB assigns adequate budget to support <u>Caminos Vecinales</u>' operating costs.</p> <p>c. BID project with training will be implemented.</p>

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PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: 78 to FY 85  
From FY 78 to FY 85  
Total U.S. Funding 9.342 million  
Date Prepared: August 15, 1980

Project Title & Number: RURAL ROADS II

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS				MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<b>Outputs:</b>	<b>Magnitude of Outputs:</b>					<b>Assumptions for achieving outputs:</b>
a. SNC District Offices (4)	1982	1983	1984	1985		
1) Increased supervisory and maintenance capability	-	4	4	4	a. SNC and project advisor's periodic and final reports on project	a. GOB makes budget provision for and provides its contribution on a timely basis.
2) Staff	10	20	20	20		
b. SNC residences (5)					b. USAID Project Manager's periodic site visits and reports.	
1) Increased construction and maintenance capability	-	5	5	5		b. Technical advisors hired on a timely basis.
2) Staff	50	150	150	150	c. PRODES periodic reports.	
c. Rural Roads improved and drainage construction					d. Mid and Final project evaluations	
1) In Chapare	20	80	80	80		
2) Culverts and bridges in Chapare	-	10	15	10		
3) Culverts and bridges - other zones		25	20			
d. SNC's administrative and technical staff trained	-	30	40	50		
<b>Inputs:</b>						
See financial plan.						

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